VISY PULP & PAPER TUMUT NSW

Farm and Environmental Monitoring Report 2025/2026

Report No: 10939
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Contents

1 Introduction 6

2 Monitoring program 2025/2026 6

2.1 Monitoring suites 9

3 Seasonal conditions 2025/26 10

4 Groundwater assessment 13

4.1 Groundwater bores introduction 13

4.2 Background bores monitoring 15

4.2.1 Chemical Analysis 15

4.3 Irrigation bores monitoring 15

4.3.1 Chemical Analysis 16

4.4 Winter storage bores monitoring 16

4.4.1 Chemical Analysis 16

4.5 Groundwater depth monitoring 17

4.6 Groundwater conclusions 19

5 Surface water assessment 20

5.1 Surface water monitoring sites 20

5.1.1 Surface Water Site 1 (SW1) 20

5.1.2 Surface Water Site 2 (SW2) 21

5.1.3 Surface Water Site 3 (SW3) 22

5.1.4 Surface Water Site 4 (SW4) 23

5.1.5 Surface Water Site 5 (SW5) 24

5.2 Chemical analysis 25

6 Wastewater assessment 26

6.1 Wastewater monitoring site 26

6.2 Chemical analysis 27

7 Irrigation assessment 28

7.1 Irrigation scheduling 30

8 Irrigated crop assessment 32

8.1 Crops grown and yields 32
8.2 Irrigation cropping program 32
9 Soil under irrigation assessment 34
9.1 Soils introduction 34
9.2 Soil monitoring sites 34
9.2.1 West of the winter storage 34
9.2.2 East and south of the winter storage 34
9.2.3 South-east corner 34
9.3 Methodology 35
9.4 Electromagnetic surveying 35
9.5 Analysis 36
9.5.1 Monitoring October 2025 37
9.5.2 Monitoring April 2026 38
10 Nutrient balance and forward management plan 39
10.1 Nutrient balance management 39
10.2 Nutrient supply 40
10.2.1 Fertiliser 40
10.2.2 Waste water 40
10.2.3 Mineralisation 40
10.2.4 Fixation 40
10.3 Nutrient removal 41
10.3.1 Seasonal influence 41
10.4 Depth of nutrient removal 42
11 Whole farm management 43
11.1 Pasture improvement 43
11.2 Tree management 43
11.3 Weed management 43
11.4 Feral animal management 44
12 By-products and the soil amendment trial 46
12.1 Summary of by-products at Visy 46
12.1.1 Dregs and Grits 46

12.1.2 Lime mud 47
13 Sludge assessment 47
13.1 Sludge monitoring site 47
13.2 Chemical analysis 48
14 Recommendations summary 49
15 References 50
16 General glossary 52
17 Chemical glossary 53
18 Attachments 55

List of Tables

Table 1: Monitoring program for all waters, soils, by-products and pasture at Gadara Park 2025/26 7
Table 2: Suite details – Testing suites for sampling schedule 10
Table 3: Historical irrigation amounts 28
Table 4: Amount of water irrigated to land 2025/26 29
Table 5: Irrigation scheduling and ETo data, January 2026 CP1 31
Table 6: Irrigated summer/autumn cropping for season 2025/26 32
Table 7: Irrigated winter/spring cropping for season 2026 33
Table 8: Irrigated summer/autumn cropping for season 2026/27 33
Table 9: Irrigated winter cropping for season 2027 33
Table 10: Irrigated summer/autumn cropping for season 2027/28 34
Table 11: Nutrient removal ranges for crops grown at Gadara Park 41

List of Figures

Figure 1: Monthly rainfall 2025 to 2026 compared to long term average. 11

Figure 2: Monthly maximum temperatures 2025 to 2026 compared to long term average. 11

Figure 3: Monthly minimum temperatures 2025 to 2026 compared to long term average. 12

Figure 4: Monthly evaporation 2025 to 2026 compared to long term average. 12

Figure 5: Bore locations around Gadara Park and the Visy mill..... 14

Figure 6: Depth of background (non-irrigation) bores at Gadara Park in metres below top of casing (BTOC)..... 18

Figure 7: Depth of irrigation bores at Gadara Park in meters below top of casing (BTOC) 18

Figure 8: Depth of winter storage bores at Gadara Park in meters below top of casing (BTOC)..... 19

Figure 9: Surface water monitoring points at Gadara Park 20

Figure 10: Surface water monitoring point number 1 21

Figure 11: Surface water monitoring point number 2 22

Figure 12: Surface water monitoring point number 3 23

Figure 13: Surface water monitoring point number 4 24

Figure 14: Surface water monitoring point number 5 25

Figure 15: Centre pivots at Gadara Park showing soil monitoring sites..... 35

Figure 16: Location of soil monitoring sites in relation to EM-38 survey..... 36

Figure 17: Tree planting..... 45

Figure 18: Figure of the origins of the lime mud and dregs and grits by-products 47

Figure 19: Sludge being applied to land (Colson 2002) 48

1 INTRODUCTION

DM McMahon Pty Ltd have prepared this report on behalf of Visy Pulp & Paper Pty Ltd (Visy). The report presents a summary and analysis of environmental monitoring conducted at Gadara Park. Gadara Park is an approximately 2,124-hectare farm that surrounds the Visy mill. The Visy mill footprint on the farm is approximately 60 hectares.

The environmental monitoring program is conducted as specified in the Visy mill's Site Development Application, and in line with the Visy mill's NSW Environment Protection Authority (EPA) Environment Protection Licence.

Gadara Park is an established cattle and sheep enterprise focused on prime beef and lamb production. Visy have a grazing rights agreement with JR Farming and Management Solutions, who presently run approximately 1,000 head of cattle and approximately 5,000 ewes and lambs. Gadara Park utilises the treated wastewater from the mill to irrigate 110 hectares using five centre pivot irrigators and a soft hose travelling irrigator. The irrigation areas produce hay, silage and fodder crops that are fed to the cattle and lambs, as part of Gadara Park's commercial prime beef and lamb production enterprise. Mill by-products have also been used as soil ameliorants in previous years for improved agricultural production as part of a Soil Amendment Trial.

The monitoring assesses the potential impacts of plant, farm, and irrigation operations on the environment. This report was commissioned by Visy as part of their annual Compliance and Monitoring report.

Limits for water quality have been drawn from the Visy EPA Licence No. 10232. Where no limit has been given in the licence, the Australian and New Zealand Guidelines (ANZG) for Fresh and Marine Water Quality (2018) or other relevant guidelines have been used.

Various sources have been used for establishing desirable ranges for soil analysis. The sources are mainly from published CSIRO and NSW Agriculture literature. Due to the wide range of test parameters, a single source could not be found that covered all analyses.

This report is a collation and interpretation of all monitoring activities and provides an annual summary of mill and farm activities.

2 MONITORING PROGRAM 2025/2026

Since November 2003, DM McMahon Pty Ltd has conducted monitoring at Gadara Park as specified in the Visy EPA Licence No. 10232. This includes, but is not limited to, groundwater, surface waters, irrigation water, sludge, and soils.

The monitoring program includes:

- Groundwater
    - Quarterly groundwater level monitoring

    - Quarterly groundwater sampling and analysis
- Surface water
    - Monthly surface water sampling and analysis (during irrigation season)
- Wastewater and sludge
    - Wastewater sampling and analysis six times per year
    - Monthly sludge sampling and monitoring
- Soil under irrigation
    - Biannual soil sampling and analysis
    - Nutrient balance and forward management plan
- By-product application
    - Monthly sampling and analysis
    - Ongoing beneficial re-use assessment
- Farm assessment
    - Farm agronomy
    - Crop planning for irrigation
    - Pasture improvement
    - Soil analysis
    - Nutrient budgeting

The following Table 1 shows the monitoring schedule of 2025/26 including sampling activity and frequency. Monitoring sludge from the wastewater treatment plant, wastewater from the decant line, and mill by-products is undertaken monthly, while activities such as surface water testing are undertaken during the summer irrigation season. Groundwater sampling and analysis is undertaken quarterly. Soil sampling is undertaken biannually to coincide with the start of the winter and summer cropping programs. Soil sampling is used as a farm management tool as well as for environmental monitoring.

Table 1: Monitoring program for all waters, soils, by-products and pasture at Gadara Park 2025/26

Date	Activity
July 2025	
2.7.2025	By-products
2.7.2025	Storm waters
2.7.2025	WWTP-sludge from SBT
2.7.2025	Decant Point 10
2.7.2025	Groundwater quality

AUGUST 2025	
5.8.2025	By-products
5.8.2025	Storm waters
5.8.2025	WWTP-Sludge from SBT
5.8.2025	Decant Point 10
SEPTEMBER 2025	
2.9.2025	By-products
2.9.2025	Storm waters
2.9.2025	WWTP-sludge from SBT
2.9.2025	Decant Point 10
OCTOBER 2025	
9.10.2025	By-products
9.10.2025	Storm waters
9.10.2025	WWTP sludge from SBT
9.10.2025	Decant Point 10
10.10.2025	Surface waters
10.10.2025	Groundwater quality
3.10.2025	Soil monitoring sites
NOVEMBER 2025	
3.11.2025	By-products
3.11.2025	Storm waters
3.11.2025	WWTP-sludge from SBT
3.11.2025	Decant Point 10
3.11.2025	Surface waters
DECEMBER 2025	
2.12.2025	By-products
2.12.2025	Storm waters
2.12.2025	WWTP-sludge from SBT
2.12.2025	Decant Point 10
2.12.2025	Surface waters
JANUARY 2026	
20.1.2026	By-products
20.1.2026	Storm waters
20.1.2026	WWTP-sludge from SBT
20.1.2026	Decant Point 10
20.1.2026	Surface waters
15.1.2026	Groundwater Quality

FEBRUARY 2026	
5.2.2026	By-products
5.2.2026	Storm waters
5.2.2026	WWTP sludge from SBT
5.2.2026	Decant Point 10
5.2.2026	Surface waters
MARCH 2026	
12.3.2026	By-products
12.3.2026	Storm waters
12.3.2026	WWTP sludge from SBT
12.3.2026	Decant Point 10
12.3.2026	Surface waters
APRIL 2026	
1.4.2026	By-products
1.4.2026	Storm waters
1.4.2026	WWTP sludge from SBT
1.4.2026	Decant Point 10
1.4.2026	Surface waters
2.4.2026	Groundwater quality
1.4.2026	Soil monitoring sites
MAY 2026	
8.5.2026	By products
8.5.2026	Storm waters
8.5.2026	WWTP sludge from SBT
8.5.2026	Decant Point 10
8.5.2026	Surface waters
JUNE 2026	
15.6.2026	By products
15.6.2026	Storm waters
15.6.2026	WWTP sludge from SBT
15.6.2026	Decant Point 10

2.1 MONITORING SUITES

Table 2 shows the parameters that are tested for each monitoring activity. The parameters tested in the monitoring suites are dictated by the Environment Protection Licence No. 10232, although some additional monitoring is undertaken to aid farm management. Soil monitoring, for example, has additional nutrient analysis conducted to assist in nutrient budgeting for the cropping program. From the additional testing,

nutrient budgets are calculated and reviewed every season to ensure maximum sustainable crop production.

A glossary with all abbreviations of chemical parameters can be seen in **Sections 16** and **17**.

Table 2: *Suite details – Testing suites for sampling schedule*

Monitoring activity	Frequency	Parameters
By-product monitoring	Monthly	As, Cd, Cr, Cu, Hg, Ni, Pb, Zn, Na, Bo, EC, Mo, pH, Se & moisture
Soil monitoring environmental	Annually	AS, Al, P (Available) EC, Ex Al, Ex Ca Ex Mg, Ex K, Ex Na, Nitrate, N (Total), OC, pH, PBI
Soil monitoring agriculture	Biannually	P(Bray), PBI, Ammonia, Ca, Mg, Na, K, Al, S, Cl, Boron
Hay / silage	As required	ME, Moisture, DM, CP, NDF, DMD, As, Cd, Cr, Cu, Hg, Ni, Pb, Zn
Groundwater monitoring	Quarterly	Depth, pH
Groundwater monitoring	Biannually	Depth, pH, EC, Nitrate
Decant Point 10	Six times per year	BOD, N, O & G, pH, P (Total) SAR, TDS, TSS, Zn
Sludge monitoring	Monthly during application	Mn, TSS, BOD, SAR, N (Total), P (Total), TDS, pH, EC, Cl, O & G
Surface water monitoring	Monthly during application	pH, TDS. BOD, TSS, Zn, P (Total), N (Total), Mn, EC, FC, O & G

3 SEASONAL CONDITIONS 2025/26

Rainfall, temperature, and precipitation data was obtained through SILO (QLD Govt., 2026) with the data being interpolated from a point on the subject site. The SILO database has information on temperature, rainfall, and evaporation date from 1889 to the current day. The seasonal conditions compared to the long-term averages from 1889 can be seen in **Figures 1** to **4**.

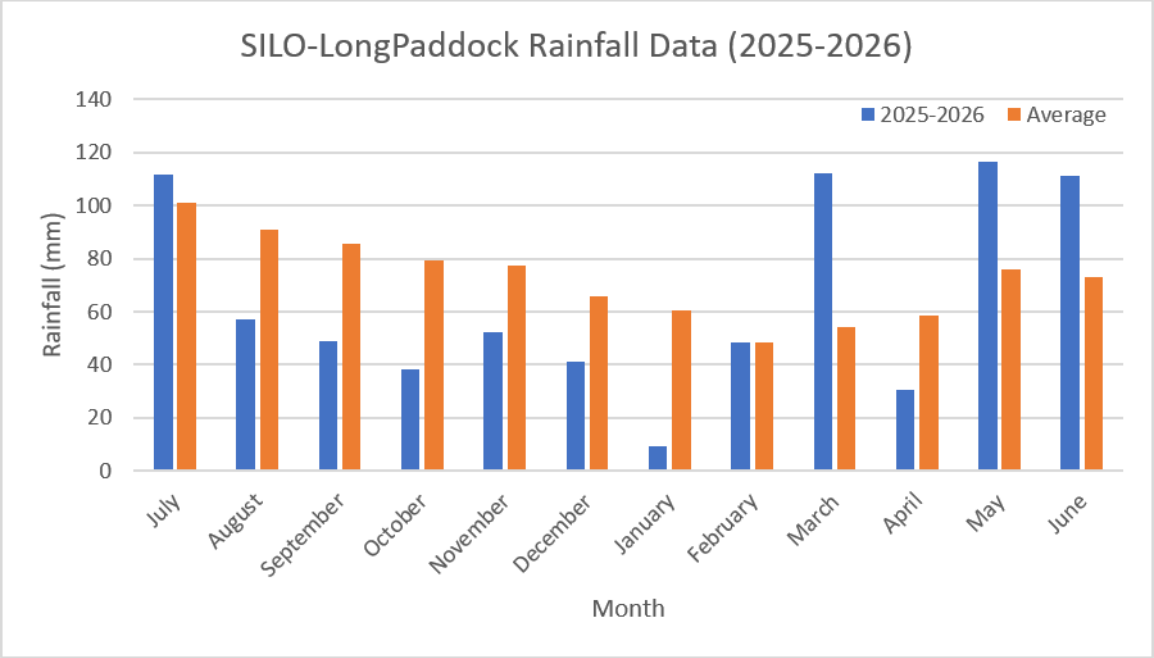


Figure 1: *Monthly rainfall 2025 to 2026 compared to long term average.*

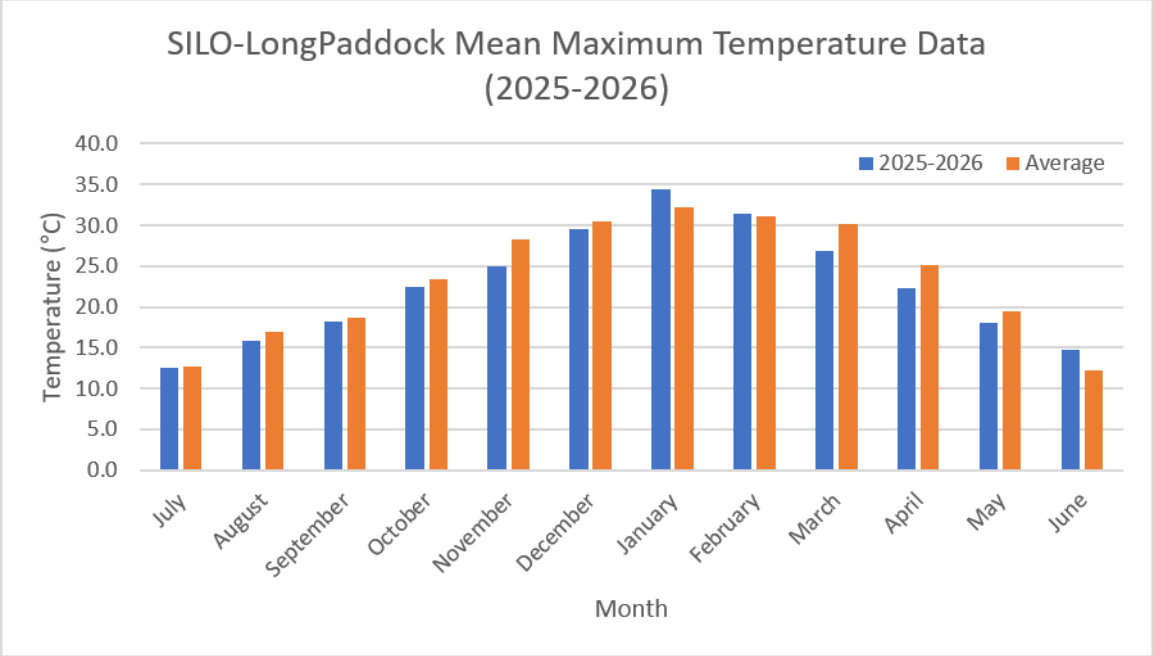


Figure 2: *Monthly maximum temperatures 2025 to 2026 compared to long term average.*

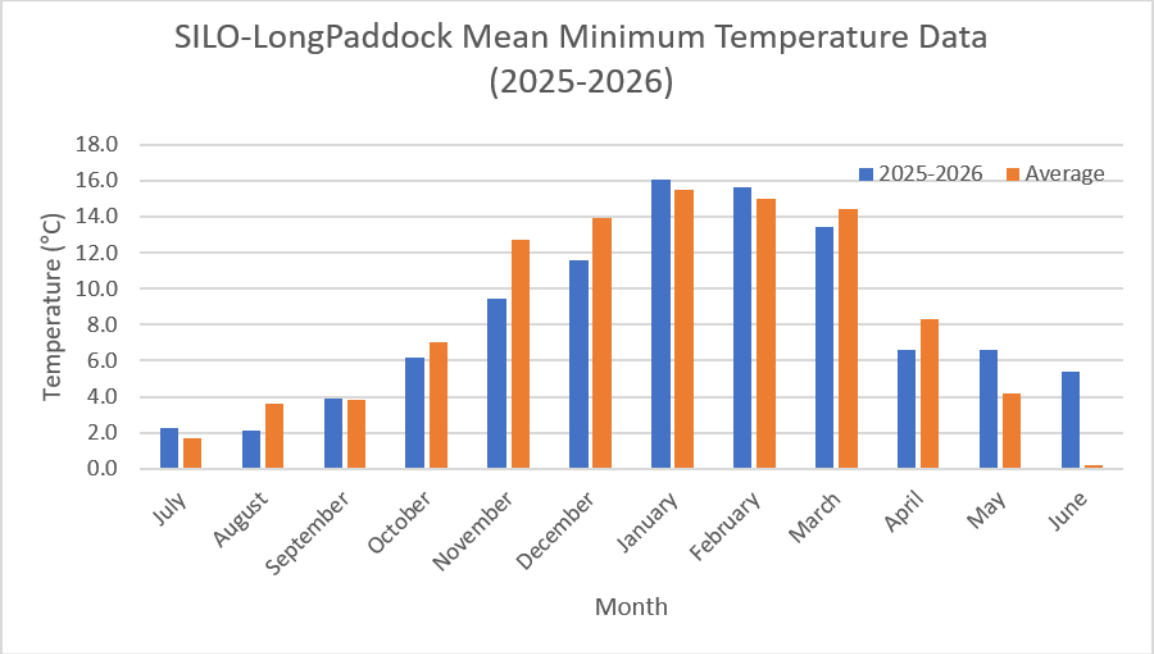


Figure 3: *Monthly minimum temperatures 2025 to 2026 compared to long term average.*

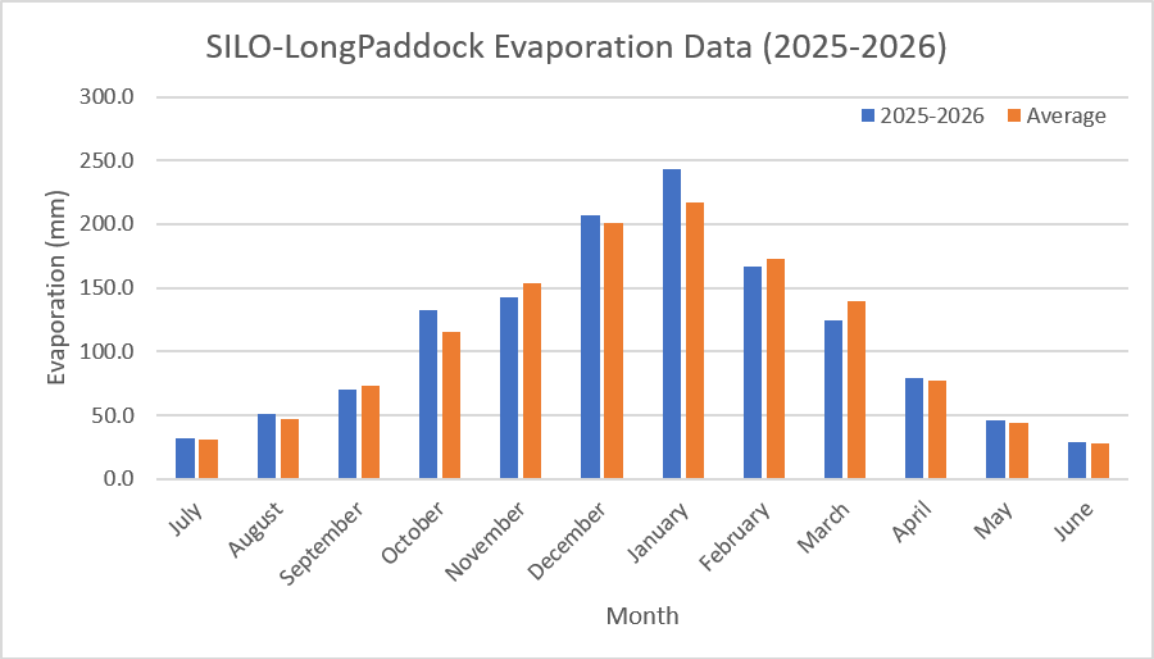


Figure 4: *Monthly evaporation 2025 to 2026 compared to long term average.*

Total rainfall for 2025/26 was 778.2mm which is lower than the annual average of 871.4mm. Monthly rainfall was above the average in July, February, March, May and April which resulted in a strong Autumn break. Maximum and minimum temperatures in 2025/26 were similar to the long-term average apart from a very mild June. Evaporation in 2025/26 was generally similar to the average, albeit slightly higher over summer.

4 GROUNDWATER ASSESSMENT

4.1 GROUNDWATER BORES INTRODUCTION

At Gadara Park, 18 groundwater bores are monitored as specified in the EPA Licence conditions. Depth to piezometric surface and groundwater quality are monitored to ascertain if the mill and irrigation operations have any impact on local groundwater conditions.

Chemical analysis is carried out on a quarterly basis with the following parameters tested:

- Depth and pH (quarterly).
- Electrical conductivity (EC) and nitrate (every 6 months).

Depth to piezometric surface is assessed manually each quarter, with a water level indicator and tape measure. Automated depth monitoring has been installed in two bores as an ongoing improvement to the monitoring program.

The monitoring bores are classified in three main groups used for comparing quality:

- Bores BH1, BH2, BH3, BH4, BH7S, BH7D, BH11S and BH11D are background monitoring bores, and are located upstream of irrigation and mill activities.
- Bores BH8S, BH8D, BH9, BH10, BH15S and BH15D are located downstream and in areas of irrigation and potentially impacting activities.
- Bores BH13, BH14, BH16, and BH17 are located immediately below the winter storage to assess any impacts of the dam on shallow groundwater.

Thirty new groundwater monitoring bores were installed in 2005/06 to gain a better understanding of the groundwater characteristics upstream of, and within the irrigation area. The piezometric surface depth of the new bores in the irrigation and winter storage area is monitored quarterly in conjunction with the existing 18 bores but most of these bores were destroyed in 2023/2024 when the pivots and paddocks were cultivated.

- Bores BH27S, BH27D, BH28S and BH28D are located on either side of the winter storage to assess any impacts of the dam on shallow groundwater.
- Bores BH21S, BH21D, BH22S, BH22D, BH23S, BH23D, BH24S, BH24D, BH25S, BH25D, BH26S and BH26D are located within the irrigation area.
- Bores BH29S, BH29D, BH30S, BH30D, BH31S, BH31D, BH32S, BH32D, BH33S, BH33D, BH34S, BH34D, BH35S and BH35D are located upstream of the irrigation and mill activities and are classified as background bores.

Figure 5 shows the location of all the monitoring bores. At some sites, shallow (S) and deep (D) bores are located alongside each other. These have been represented as a single monitoring bore site in Figure 5.

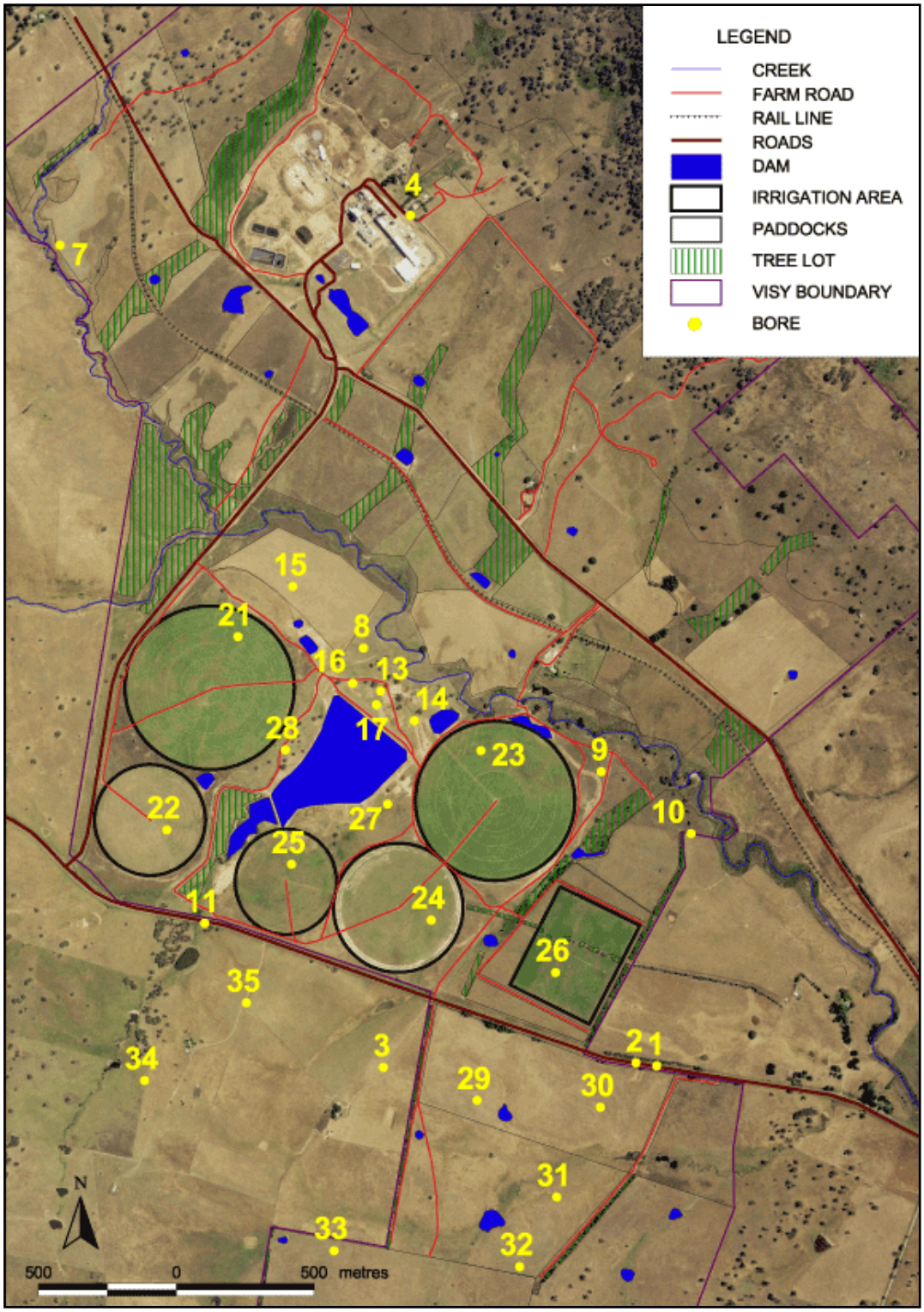


Figure 5: *Bore locations around Gadara Park and the Visy mill*

4.2 BACKGROUND BORES MONITORING

Bores: BH1, BH2, BH3, BH4, BH7S, BH7D, BH11S and BH11D

Bores BH1, BH2, BH3 and BH4 are large diameter bores (75mm to 100mm casing), ranging in depth from 10m to 30m. Bores BH1, BH2 and BH3 are located on the southern boundary of the farm and are higher in elevation compared to the irrigation area. Bore BH4 was located north of the mill site and is higher in elevation than all irrigation and mill activities. It was the deepest bore (30m) and had the highest elevation. In December 2007, Bore BH4 was destroyed during the mill expansion construction process and has not been replaced.

Bores BH7S and BH7D are located on the western margin of the Gadara Park property before the junction of Sandy Creek and Deep Creek. These bores are upstream of all mill and irrigation activities. Bores BH7S and BH7D have respective depths of approximately 7m and 14m.

Bores BH11S and BH11D are located on the Snowy Mountains Highway, at the southern boundary of Gadara Park and upstream of all irrigation and farm activities. These bores have respective depths of approximately 6m and 13m.

4.2.1 Chemical Analysis

All results are provided in **Attachment A**.

pH

All background bores are slightly acidic to slightly alkaline (5.6 – 6.8) with most sitting within the neutral range. Overall, groundwater pH has been variable since monitoring commenced. Since 2013 however, pH is becoming more neutral and stable with a gradual increase noted over time in BH1, BH2 and BH3. When compared to the 2024/25 monitoring period, pH has remained stable.

Electrical Conductivity

EC ranged from 120µS/cm (BH2, January 2026) to 830µS/cm (BH11S, July 2026). EC values have remained relatively stable with a slightly decreasing trend noted since 2001.

Nitrate

Background bores generally exhibited low and stable levels of nitrate. Levels encountered in these bores are classed as low strength for agricultural use, compared against the Australian & New Zealand Guidelines for Fresh & Marine Water Quality (2018) critical values. Nitrate levels were highest at BH2 (8ppm in October 2025).

4.3 IRRIGATION BORES MONITORING

Bores: BH8S, BH8D, BH9, BH10, BH15S and BH15D

BH8S and BH8D are located to the north-east (down-slope) of the western irrigation area slightly above the creek flats. They are 6m and 10m deep respectively.

BH9 is located to the north-east (down-slope) of the eastern irrigation area and Centre Pivot 3. BH9 is 16m deep.

BH10 is located on the eastern edge of the farm, and of all the bores is the furthest downstream of all irrigation activities. BH10 is 14m deep.

BH15S and BH15D are located to the north of Centre Pivot 1 on the creek flats. They are 6m and 17.5m deep respectively.

4.3.1 Chemical Analysis

All results are provided in **Attachment A**.

pH

All irrigation bores were typically slightly acidic to neutral across all bores (6.5 – 7.4). The irrigation bores have remained relatively stable since monitoring began.

Electrical Conductivity

EC ranged from 320µS/cm (BH15D, July 2025) to 690µS/cm (BH10, October 2025). EC in the irrigation bores has remained relatively stable since monitoring began in 2001 with some seasonal variation.

Nitrate

Nitrate levels in the irrigation bores are variable ranging from 1.0mg/L (BH8S, January 2025) to 13mg/L (BH10, October 2025 and January 2026). Nitrate levels at BH8S and BH8D have been declining gradually since 2004 but have remained relatively stable for the last three monitoring periods.

4.4 WINTER STORAGE BORES MONITORING

Bores: BH13, BH14, BH16 and BH17

All bores are located to the immediate north of the winter storage dam wall. They are all shallow bores, ranging in depth from 3m to 7.5m. These bores are all shallow in depth compared to the background and irrigation monitoring bores and are measuring shallow aquifers or moisture in colluvial layers only.

4.4.1 Chemical Analysis

All results are provided in **Attachment A**.

pH

Winter storage bores were typically neutral to alkaline across all bores (6.7 – 8.1) which is typical compared to historical data.

Electrical Conductivity

EC in the winter storage bores ranged from 660µS/cm (BH16, October 2025) to 1700µS/cm (BH17, January 2026). BH16 has remained relatively stable with a slight decrease since July 2021, with all other winter bores having remained relatively stable.

Nitrate

Nitrate values ranged from <0.005mg/L to 11.0mg/L (BH16, October 2025). All winter storage bores have exhibited low to very low levels of nitrate which is a continuing trend over the last five years, however, nitrate levels have increased during this monitoring period for BH16.

4.5 GROUNDWATER DEPTH MONITORING

Groundwater piezometric depth monitoring takes place on a quarterly basis. All depths are measured from the top of the bore casing which ranges from 200mm to 1000mm above ground level.

Monitoring commenced with the installation of four bores in 1997 and a further 14 bores followed in 2001 to coincide with the commencement of mill operations. In 2006, 30 new groundwater monitoring bores were installed to gain a better understanding of the groundwater characteristics up-gradient of, and within the irrigation area. Historically the background, winter storage and irrigation bores all exhibit similar trends, consistent with peaks and troughs that coincide with recharge from winter and spring rainfall.

Background and irrigation bore groundwater piezometric depths had progressively declined in the 2025/26 monitoring period after a slight increase between 2020 and 2023. Below average monthly rainfall for the 2024/25 monitoring period is likely the reason for the decline in groundwater depths. The winter storage bores have on average remained relatively stable with continued quarterly variation.

A graphical view of groundwater depths during the 2025/26 monitoring period is provided **in Figures 6**, **7** and **8**.

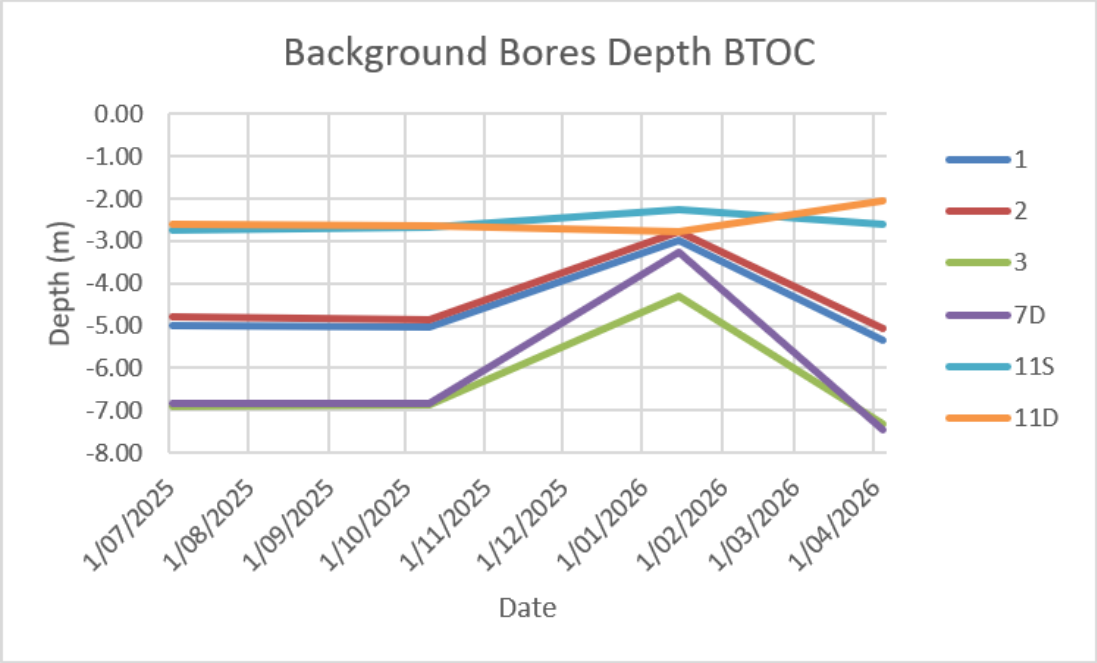


Figure 6: *Depth of background (non-irrigation) bores at Gadara Park in metres below top of casing (BTOC)*

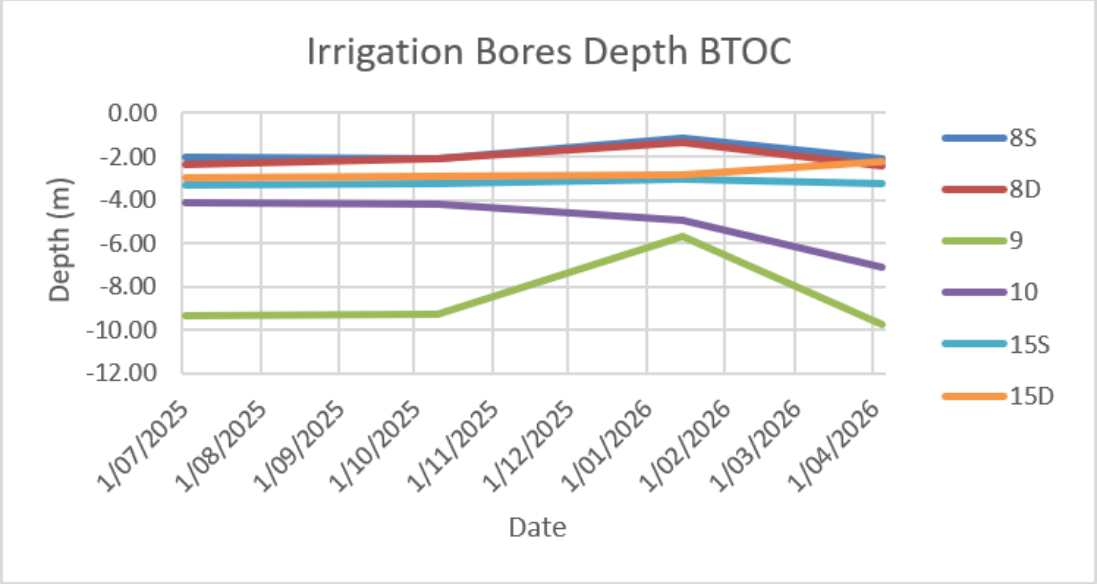


Figure 7: *Depth of irrigation bores at Gadara Park in meters below top of casing (BTOC)*

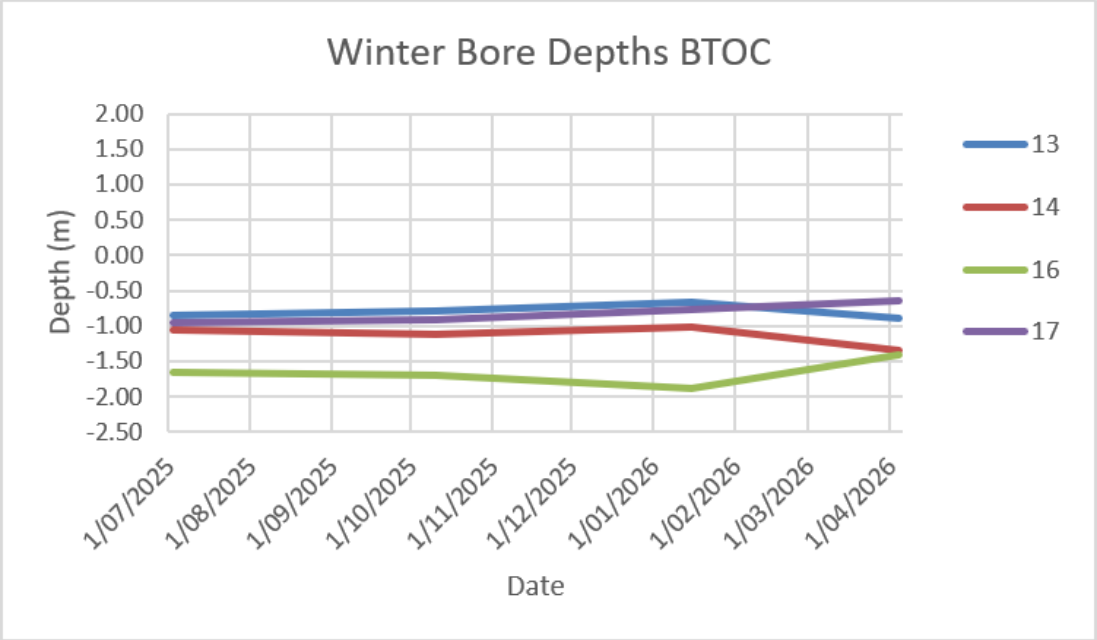


Figure 8: *Depth of winter storage bores at Gadara Park in meters below top of casing (BTOC)*

4.6 GROUNDWATER CONCLUSIONS

The groundwater piezometric levels in 2025/26 were similar to the trends monitored in the 2024-25 period. Historically, the groundwater piezometric levels are quite dynamic with a peak in October to January following recharge from winter and spring rains. The cyclic trend of groundwater piezometric levels corresponding with rainfall as explained by Coffey is apparent from the historical monitoring data (Coffey, 2003).

Background bores exhibit low levels of EC and nitrate.

The irrigation bores exhibit elevated levels of nitrate compared to the background and winter storage bores. The irrigation bores exhibit steady levels of EC typical of alluvial aquifers. The levels of EC in the irrigation bores are slightly higher than in the background bores as a historical comparison. This same comparative trend was noted by Coffey (Coffey, 2003).

Winter storage bores exhibit elevated levels of pH and EC compared to the background and irrigation bores, especially in bores 16 and 17. Levels have remained relatively stable since 2003, with some minor seasonal fluctuations consistent with the background and irrigation monitoring bores.

Overall, the bores have remained relatively stable (with some seasonal fluctuations) in piezometric depth and chemical composition since monitoring commenced, pre-mill construction.

5 SURFACE WATER ASSESSMENT

5.1 SURFACE WATER MONITORING SITES

The surface water monitoring sites are outlined in the following map of the Visy mill and Gadara Park farm site, **Figure 9**. Three of the monitoring sites are upstream (SW1, SW3 and SW4) of all mill and irrigation activities and the other two sites are downstream (SW2 and SW5).

The monitoring results from sites upstream of the mill are compared against downstream results to determine if the mill and irrigation activities are having an effect on water quality.

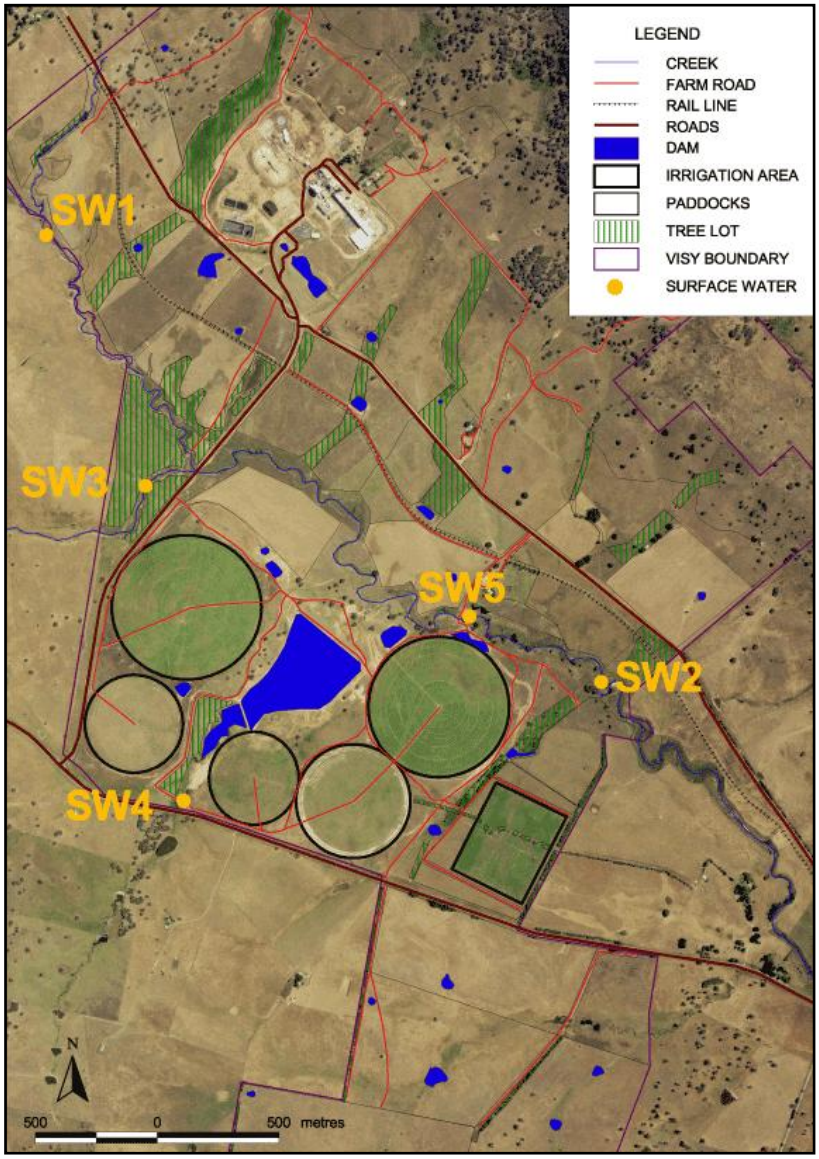


Figure 9: *Surface water monitoring points at Gadara Park*

5.1.1 Surface Water Site 1 (SW1)

SW1 (surface water monitoring north) is located on the upstream boundary of the Visy mill site. The monitoring site is in an incised creek line (around three metres deep), see

Figure 10. Cattle can access the site from the neighbouring farm. There has always been some evidence of cattle around the monitoring site in the form of manure and tracks. The water is mostly running, albeit in limited amounts and water quality has generally been good.

This sampling location monitors water quality offsite and upstream of the mill site (Visy 2003).



Figure 10: *Surface water monitoring point number 1*

5.1.2 Surface Water Site 2 (SW2)

SW2 (surface water monitoring south) is located downstream of the Visy mill site and is the widest stretch of the creek. There has always been running water at this site and it is on the bend of the creek with a small sandy beach, see **Figure 11**.

This sampling location monitors water quality downstream as it departs the mill site (Visy 2003).



Figure 11: *Surface water monitoring point number 2*

5.1.3 Surface Water Site 3 (SW3)

SW3 (surface water monitoring deep creek) is located on Deep Creek upstream of the Visy mill site. The site is a widened pool within an incised creek line, see **Figure 12**. Water quality has generally been fair to good. There has consistently been particulate matter in the form of algae observed in the water column during sampling. This area is surrounded by a tree lot that is infrequently grazed.

This sampling location monitors water quality in Deep Creek before it joins Sandy Creek (Visy 2003).



Figure 12: *Surface water monitoring point number 3*

5.1.4 Surface Water Site 4 (SW4)

SW4 (surface water monitoring Snowy Mountains Highway) is located on the Snowy Mountains Highway and is down stream of the Visy mill site and farm. Water analysis usually returns high rates of suspended solids and TDS. The site is at the plateau of an extremely large catchment that has had only intermittent low flows since monitoring commenced in November 2003. With sufficient rainfall, the monitoring site receives high flows of water from the catchment which improves chemical quality.

SW4 is aesthetically the poorest surface water monitoring site because of the usually stagnant and discolored water, see **Figure 13**. Although this site is considered aesthetically poor, there is an abundance of macro invertebrates and aquatic fauna, indicating reasonable water quality.

This sampling location monitors water quality from upstream of the mill and irrigation areas, (Visy 2003).



Figure 13*: Surface water monitoring point number 4*

5.1.5 Surface Water Site 5 (SW5)

SW5 (surface water monitoring Sandy Creek) is located on the Visy farm at the creek crossing in the center of the farm, see **Figure 14**. The water quality has generally been fair to good with constant running water.

This sampling location monitors water quality in Sandy Creek as it passes beside the irrigation areas, (Visy 2003).



Figure 14: *Surface water monitoring point number 5*

5.2 CHEMICAL ANALYSIS

All results are provided in **Attachment B**.

Total Dissolved Solids

All sites exhibit low levels (<700mg/L) of TDS. The results ranged from 140mg/L (SW1, October 2025) to 660mg/L (SW4, March 2026). There are no significant long-term trends developing other than seasonal peaks in summer and autumn, consistent with lower surface water flows.

Electrical Conductivity

All sites exhibited relatively stable EC readings for all sites over the 2025/26 monitoring period, with values ranging from 240µS/cm (SW1, October 2025) to 800µS/cm (SW4, March 2026). The EC readings are consistent with the long term data.

Biochemical Oxygen Demand

All BOD readings met the (ANZG, 2018) criteria of <15mg/L except SW4 in November 2025 (28mg/L), December 2025 (18mg/L), and March 2026 (210mg/L), which is typical water quality for SW4.

pH

The surface water pH for all sites ranged from 6.3 (SW4, March 2026) to 7.7 (SW5 November 2025 and SW1 November 2025). The recommended pH range for upland streams is between 6.0 and 7.5 (ANZG, 2018). Although the surface water pH is sometimes above the upper guideline value, pH results are consistent between all upstream and downstream monitoring sites suggesting this is inherent to the locale, (ANZG, 2018). Historical data shows similar pH levels since monitoring commenced in 2003.

Faecal coliforms

All surface water monitoring sites exhibit levels of faecal coliforms with a range between 3fcu/100mL (SW1 November 2025) and 27,000fcu/100mL (SW4 March 2026). These are consistent with historical data and high levels coincide with cattle grazing up gradient of the surface water monitoring point at the time of sampling.

Nitrogen and phosphorus

Nitrogen levels for all sites ranged from 0.14mg/L (SW1 December 2025) to 11.0mg/L (SW4 March 2026). Phosphorus ranged from <0.02mg/L (multiple readings) to 3.1mg/L (SW4 March 2026). The nitrogen and phosphorus levels are consistent with historical data.

Oil and grease

Oil and grease readings were <5mg/L for all samples.

The Hexane Extractable Matter (HEM) APHA 5520 D EPA method was used to test oil and grease. This test detects non-volatile hydrocarbons, chlorophyll, animal fats, vegetable oils, waxes, soaps, greases etc. The HEM method is not designed specifically to detect fuel or fuel oil. Any results that are historically above detectable levels could be due to the detection of any of the above material and are likely to be from a natural source. No known fuel-related, grease-related, or oil-related contaminating activities take place at or upstream of the surface water sites.

6 WASTEWATER ASSESSMENT

6.1 WASTEWATER MONITORING SITE

Treated wastewater was sampled from a tap on the decant line (Point 10) that runs from the 2.5ML decant storage dam to the winter storage dam until December 2021, after unusually high readings (8 December 2021) were observed owing to alterations to pipework in the system. Since December 2021, the treated wastewater sample has been taken directly from the 2.5ML decant storage dam at the direction of Visy for a more representative sample of the wastewater that runs to the winter storage dam. In total, 12 samples were collected in 2025/26.

6.2 CHEMICAL ANALYSIS

All results are provided in **Attachment C**.

BOD

BOD levels ranged from <5mg/L to 15mg/L with a mean of 7.2mg/L, which is classed as low strength effluent (<40mg/L) for irrigation (DEC 2004) and below the licence limit of 40mg/L.

TDS

TDS ranged from 150mg/L to 290mg/L. All results are classed as a low strength effluent (<600mg/L) for irrigation, (DEC 2004).

SAR

SAR ranged from 3 to 5. The mean SAR for the 2025-26 monitoring period is 3.8, which is similar to the readings from the previous six monitoring periods.

Nitrogen and phosphorus

The levels of total nitrogen range from 2mg/L to 12mg/L which are classed as a low strength effluent (<50mg/L) for irrigation, (DEC 2004) and below the licence limit of 20 mg/L.

Phosphorus levels range from below detectable limits 0.66mg/L to 2.3mg/L. All results are below the licence limit of 5mg/L and are classed as a low strength effluent (<10mg/L) for irrigation, (DEC 2004).

pH

The pH of the wastewater samples ranged from 6.3 to 7.1 and are inside the suitable range of 6.0 to 8.5 for irrigation, (ANZG, 2018).

Suspended solids

The suspended solids readings ranged from 7mg/L to 68mg/L. There were two results were above the EPA licence limit of 45mg/L (February 2026, 50mg/L and May 2026, 68mg/L).

Zinc

Low levels of zinc were found in all samples ranging from 0.014mg/L to 0.058mg/L. The results were under the guidelines for irrigation of 2mg/L, (ANZG, 2018).

Oil and Grease

Oil and grease levels were all <5mg/L and are below the EPA licence limit of 5mg/L.

The Hexane Extractable Matter (HEM) APHA 5520 D EPA method was used to test oil and grease. This test detects non-volatile hydrocarbons, chlorophyll, animal fats, vegetable

oils, waxes, soaps, greases etc. The HEM method is not designed specifically to detect fuel or fuel oil. The historical results that are above detectable levels could be due to the detection of any of the above material and is likely to be from a natural source. No known fuel-related, grease-related or oil-related contaminating activities take place at or upstream of the surface water sites.

7 IRRIGATION ASSESSMENT

A total volume of 390.30 megaliters (ML) of water was land applied during the 2025/26 irrigation season. Of the 390.30ML irrigated, most of the source is treated wastewater, the remaining volume being direct runoff from rainfall into the winter storage dam, runoff pumped from the irrigation run off dams and backwash water from the irrigation filters.

The amount of wastewater irrigated in 2025/26 is well below than the long-term average of 500ML per annum, and the irrigation amount for 2024/25, Table 3. The highest monthly irrigation amounts occurred from October 2025 until April 2026. Irrigation was reduced from 2007 to 2009 owing to the mill conducting water re-use trials in the production cycle and less rainfall runoff into the winter storage dam due to the drought conditions but has increased significantly in the last three years.

Table 3: *Historical irrigation amounts*

Season	Irrigation area (ha)	Volume irrigated	
		Total (ML)	ML/ha
2003-2004	110.86	568	5.12
2004-2005	110.86	615	5.55
2005-2006	110.86	512	4.62
2006-2007	110.86	258	2.33
2007-2008	110.86	233	2.10
2008-2009	110.86	153	1.38
2009-2010	110.86	74	0.67
2010-2011	110.86	368	3.32
2011-2012	110.86	428	3.86
2012-2013	110.86	762	6.91
2013-2014	110.86	261	2.35
2014-2015	110.86	644	5.81
2015-2016	110.86	617	5.57
2016-2017	110.86	500	4.53

2017-2018	110.86	545	4.92
2018-2019	110.86	372	3.35
2019-2020	110.86	368	3.33
2020-2021	110.86	513	4.63
2021-2022	110.86	852	7.68
2022-2023	110.86	894	8.06
2023-2024	110.86	830	7.49
2024-2025	110.86	744	6.71
2025-2026	110.86	390	3.52

Table 4 presents the breakdown of the volume of water applied to the five Centre Pivot (CP) irrigators (CP1 to CP5) and a soft hose travelling (SHT) irrigator.

Table 4: *Amount of water irrigated to land 2025/26*

Month	CP1	CP2	CP3	CP4	CP5	SHT	Total
July 2025	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
August 2025	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
September 2025	0.07	0.03	0.09	0.03	0.03	0.00	**0.26**
October 2025	15.85	8.47	9.60	8.44	5.97	0.00	**48.33**
November 2025	6.19	3.87	6.43	3.35	2.91	0.00	**22.75**
December 2025	45.53	21.94	35.18	26.44	21.55	0.00	**150.64**
January 2026	26.60	15.61	23.57	14.48	10.89	0.00	**91.14**
February 2026	0.00	0.00	9.71	6.07	5.34	0.00	**21.11**
March 2026	7.17	6.20	6.73	6.78	5.55	0.00	**32.42**
April 2026	7.16	4.24	4.19	2.68	2.41	0.00	**20.68**
May 2026	0.85	0.51	0.72	0.47	0.41	0.00	**2.97**
June 2026	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Total ML	**109.41**	**60.88**	**96.23**	**68.74**	**55.06**	**0.00**	**390.30**
Area ha	28.27	12.06	25.70	16.60	11.15	17.50	110.86
ML/ha	**6.74**	**5.05**	**3.74**	**4.14**	**4.94**	**0**	

7.1 IRRIGATION SCHEDULING

Wastewater application rates aim to match crop types to ensure sustainable and efficient plant water use. The amount of water irrigated in 2025/26 (depending on water availability) is closely matched with anticipated crop water demand. Over the 2025/26 irrigation season CP1 and CP3 were sown to rye grass and clover; CP2, CP4 and CP5 were sown to lucerne, clover, and rye grass; and SHT to oats and rye.

When irrigation is taking place, scheduling is reviewed daily considering weather conditions, soil moisture, crop performance and the available irrigation resource. Gadara Park has excellent irrigation monitoring resources including:

- Soil moisture probes installed in each irrigation field with sensors located at 10cm, 30cm and 50cm;
- Evapotranspiration (ET_o) data available from interpolated dataset;
- Accurate irrigation application scheduling through the centre pivots;
- Annual soil analysis; and
- Accurate winter storage capacity data.

The correlation between crop daily water requirements, based on ET_o, and actual water use are demonstrated in Table 5. The ET_o value is from the SILO Data Drill for Lat, Long: -35.30S 148.15E (decimal degrees). This value is interpolated from surrounding Bureau of Meteorology weather stations with adjustments made for elevation. Wind speed is capped at two metres per second, which would exclude the extremely high ET_o days from the data. Potential ET_o is calculated as per FAO Irrigation and Drainage Paper 56. Effective rainfall has been calculated on the assumption that rainfalls of <5mm during the irrigation period are non-significant. In winter, all the rainfall is assumed to be effective (Qassim and Ashcroft, 2001).

At Gadara Park, water balances are regularly calculated to ensure irrigation supply is matched to crop demands. The water balance for CP3 has been supplied to demonstrate that sustainable irrigation is taking place, with applications on par with crop water demand, Table 5. Irrigation efficiency is commonly 85 to 90%, therefore the amount irrigated will sometimes be slightly more than the plants water requirement. Water losses include drift, evaporation, runoff, and deep drainage. The actual amount of water irrigated is aimed to match the daily crop water requirements, Table 5. The irrigation of CP1 in January 2026 was typical of irrigation scheduling throughout 2025/26 where irrigation occurred on an establishment or production-oriented basis favouring the planted crops used for grazing and/or hay production.

By irrigating smaller amounts more frequently, the risk of surface runoff or through drainage occurring is greatly minimised, therefore reducing potential environmental impacts. Runoff is monitored by a visual inspection of the irrigation areas while through drainage can be assessed by reviewing the real time soil moisture probes and the piezometers installed in the irrigation areas. Runoff and through drainage can occur when irrigation is scheduled in larger amounts of water at a lesser interval. The centre pivot irrigation system at Gadara Park is extremely versatile in the amount of water able

to be irrigated by altering the speed of the rotation and droplet size with the use of adjustable nozzles.

Table 5: *Irrigation scheduling and ETo data, January 2026 CP1*

Date	Temp. Min °C	Temp. Max °C	Rain mm	ETo mm	Crop factor	Water requirement mm	Actual irrigation mm
01/01/26	13.9	28.1	0	6.4	1.2	7.68	11.40
02/01/26	11.1	30.4	0	6.8	1.2	8.16	4.28
03/01/26	14.0	32.4	0	6.4	1.2	7.68	0.00
04/01/26	16.6	32.9	5.1	5.8	1.2	6.96	0.00
05/01/26	12.4	34.8	0.3	7.1	1.2	8.52	0.00
06/01/26	15.3	35.2	0	7.5	1.2	9.00	0.00
07/01/26	16.9	38.4	0	7.8	1.2	9.36	0.00
08/01/26	20.3	39.4	0	8.5	1.2	10.20	0.00
09/01/26	19.0	39.1	0.1	8.7	1.2	10.44	0.00
10/01/26	25.4	34.7	0.1	7.9	1.2	9.48	0.00
11/01/26	14.6	29.4	0	6.4	1.2	7.68	0.00
12/01/26	12.6	30.8	0	6.9	1.2	8.28	6.45
13/01/26	14.7	34.1	0	7	1.2	8.40	11.43
14/01/26	17.9	36.1	0	7	1.2	8.40	11.44
15/01/26	18.3	33.7	0.1	6.4	1.2	7.68	5.87
16/01/26	14.9	29.5	0	6.2	1.2	7.44	2.24
17/01/26	16.5	25.2	1	4.2	1.2	5.04	10.83
18/01/26	15.0	27.0	0	6.2	1.2	7.44	3.81
19/01/26	13.3	29.8	0.2	6.4	1.2	7.68	0.00
20/01/26	15.4	30.2	0	5.7	1.2	6.84	6.12
21/01/26	13.5	32.2	2.6	6.5	1.2	7.80	0.00
22/01/26	13.3	29.6	0	6.5	1.2	7.80	8.11
23/01/26	10.7	31.5	0	6.7	1.2	8.04	4.36
24/01/26	12.5	35.8	0	7.4	1.2	8.88	0.00
25/01/26	14.0	41.0	0	8.1	1.2	9.72	0.00
26/01/26	18.5	39.3	0	8.1	1.2	9.72	5.08

27/01/26	15.3	39.2	0	8	1.2	7.60	2.66
28/01/26	17.5	43.8	0	8.8	1.2	10.56	0.00
29/01/26	21.4	38.9	0	7.6	1.2	9.12	0.00
29/01/26	20.5	41.2	0	8.1	1.2	9.72	0.00
31/01/26	22.2	42.4	0	8.3	1.2	9.96	0.00
TOTALS			**9.5**	**219.1**	**-**	**263.28**	**94.09**

8 IRRIGATED CROP ASSESSMENT

8.1 CROPS GROWN AND YIELDS

In July 2026 CP1 and CP3 were sown to rye grass and clover; CP2, CP4 and CP5 were sown to lucerne, clover, and rye grass; and SHT to oats and rye. The irrigation areas will shortly be prepared and resown for the summer cropping season.

8.2 IRRIGATION CROPPING PROGRAM

Details of the crops currently grown at Gadara Park and what is planned to be grown in the following seasons are given in **Tables 6** to **10**. The amount and type of crop grown is dependent on available water, seasonal conditions and crop rotations.

Presently the cropping program revolves around having a perennial crop of lucerne planted in irrigation areas for a period of around five years then rotated with cereal crops for two to three years for a weed and disease break. Having this cropping rotation in the irrigation areas ensures flexibility of irrigation management and grazing regarding timing and amount of irrigation.

Table 6: *Irrigated summer/autumn cropping for season 2025/26*

Field	Crop	Growing season	Irrigation period
CP1 – 28.3 ha	Sorghum, Rye & Clover	Summer Autumn	Spring Summer Autumn
CP2 – 12.1 ha	Sorghum, Lucerne, Rye, Clover	Summer Autumn	Spring Summer Autumn
CP3 – 25.7ha	Sorghum, Rye & Clover	Summer Autumn	Spring Summer Autumn
CP4 – 16.6ha	Sorghum, Lucerne, Rye, Clover	Summer Autumn	Spring Summer Autumn
CP5 – 10.2ha	Sorghum, Lucerne, Rye, Clover	Summer Autumn	Spring Summer Autumn
SHT – 17.5ha	Sorghum, Oats & Rye	Summer Autumn	Spring Summer Autumn

Table 7: *Irrigated winter/spring cropping for season 2026*

Field	Crop	Growing season	Irrigation period
CP1 – 28.3 ha	Rye & Shaftal/Persian Clover	Autumn Winter Spring	Spring Summer Autumn
CP2 – 12.1 ha	Lucerne, Shaftal/Persian Clover & Rye	Autumn Winter Spring	Spring Summer Autumn
CP3 – 25.7ha	Rye & Shaftal/Persian Clover	Autumn Winter Spring	Spring Summer Autumn
CP4 – 16.6ha	Lucerne, Shaftal/Persian Clover & Rye	Autumn Winter Spring	Spring Summer Autumn
CP5 – 10.2ha	Lucerne, Shaftal/Persian Clover & Rye	Autumn Winter Spring	Spring Summer Autumn
SHT – 17.5ha	Oats	Autumn Winter Spring	Spring Summer Autumn

Table 8: Irrigated summer/autumn cropping for season 2026/27

Field	Crop	Growing season	Irrigation period
CP1 – 28.3 ha	Lucerne & Shaftal/Persian Clover	Summer active	Spring Summer Autumn
CP2 – 12.1 ha	Lucerne, Clover & Millet	Summer active	Spring Summer Autumn
CP3 – 25.7ha	Lucerne & Clover	Summer active	Spring Summer Autumn
CP4 – 16.6ha	Lucerne, Clover & Millet	Summer active	Spring Summer Autumn
CP5 – 10.2ha	Lucerne, Clover & Millet	Summer active	Spring Summer Autumn
SHT – 17.5ha	Brassica	Autumn Winter Spring	Spring Summer Autumn

Table 9: Irrigated winter cropping for season 2027

Field	Crop	Growing season	Irrigation period
CP1 – 28.3 ha	Rye & White Clover	Autumn Winter Spring	Spring Summer Autumn
CP2 – 12.1 ha	Lucerne, Clover & Rye	Autumn Winter Spring	Spring Summer Autumn
CP3 – 25.7ha	Rye & White Clover	Autumn Winter Spring	Spring Summer Autumn
CP4 – 16.6ha	Lucerne, Clover & Rye	Autumn Winter Spring	Spring Summer Autumn
CP5 – 10.2ha	Lucerne, Clover & Rye	Autumn Winter Spring	Spring Summer Autumn
SHT – 17.5ha	Oats	Autumn Winter Spring	Spring Summer Autumn

Table 10: Irrigated summer/autumn cropping for season 2027/28

Field	Crop	Growing season	Irrigation period
CP1 – 28.3 ha	Lucerne & White Clover	Summer active	Spring Summer Autumn
CP2 – 12.1 ha	Lucerne, Clover & Millet	Summer active	Spring Summer Autumn
CP3 – 25.7ha	Lucerne & White Clover	Summer active	Spring Summer Autumn
CP4 – 16.6ha	Lucerne, Clover & Millet	Summer active	Spring Summer Autumn
CP5 – 10.2ha	Lucerne, Clover & Millet	Summer active	Spring Summer Autumn
SHT – 17.5ha	Brassica	Autumn Winter Spring	Spring Summer Autumn

9 SOIL UNDER IRRIGATION ASSESSMENT

9.1 SOILS INTRODUCTION

The soil monitoring program is conducted in accordance with the Visy EPA Licence 10232. The licence stipulates topsoil monitoring annually and subsoil every three years. This monitoring forms an integral part of crop nutrient budgeting and management. Results are provided in **Attachment D.**

In addition to the test parameters stipulated in the licence, other nutrients are tested as part of the monitoring program to aid the farm manager in decision making for fertiliser application.

9.2 SOIL MONITORING SITES

There are seven soil monitoring sites at Gadara Park, **Figure 15**. These seven soil monitoring sites are split into three sample areas:

- West of the winter storage.
- East and south of the winter storage.
- South-east corner.

9.2.1 West of the winter storage

There are three soil monitoring sites in this area. There are two located in CP1 (SMS1, SMS2), and one under CP2 (SMS3) (Visy, 2003).

9.2.2 East and south of the winter storage

There are three soil monitoring sites in this area. There is one soil monitoring site located under CP3, CP4 and CP5 respectively. SMS4 is in CP3, SMS5 is in CP4 and SMS6 is in CP5, (Visy, 2003).

9.2.3 South-east corner

The only soil monitoring site in this region is SMS7 located in the SHT paddock along the eastern boundary of the Gadara Park property, (Visy, 2003).

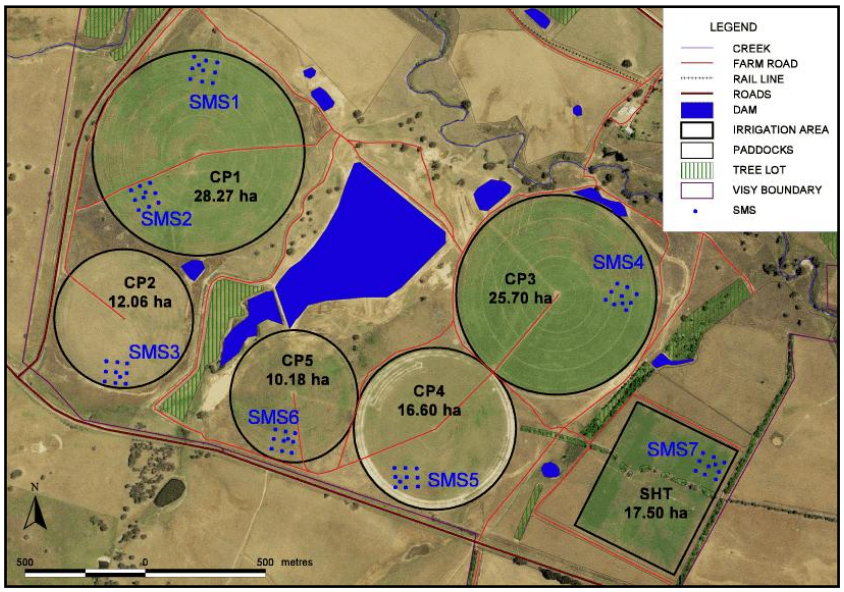


Figure 15: *Centre pivots at Gadara Park showing soil monitoring sites*

9.3 METHODOLOGY

Currently there is one soil monitoring site (SMS) per 15.7ha of irrigation area. Recommended soil sampling locations are to be distributed at one per 2 to 20ha, depending on the geological complexity of the site, use of effluent by irrigation (DEC, 2004). The SMSs were established in 2000 and have been navigated to using Global Positioning System (GPS) since 2003.

From a monitoring perspective, the SMSs are an accurate gauge of temporal changes in soil parameters at each location. Friesen and Blair (1984) detail that cluster sampling is the most appropriate procedure for estimating the nutrient status of pastures. This sampling method enables more reasonable estimates to be made of the temporal variations in soil tests.

Both surface and sub-surface samples are taken at each site. Approximately 40 topsoil sub samples are collected for compositing within each SMS. Ten subsoil samples are bulked together for analysis within each SMS.

This is in line with the EPL 10232 Condition M2.4 methodology. Special methods 1 and 2. These are as follows:

- Special Method 1: At each soil sampling site, 10 representative samples shall be taken on a 30 metre by 30 metre grid.
- Special Method 2: Sample to be collected in accordance with the current edition of “A Practical Guide for Groundwater Sampling, NSW Department of Land and Water Conservation”.

9.4 ELECTROMAGNETIC SURVEYING

The DEC recommends that an electromagnetic (EM) survey be used to identify soil sampling sites (DEC, 2004). An EM survey was carried out in 2001 and again in 2003.

Ground truthing of the EM survey was carried out with soil cores in 2003 and soil pits have also been investigated in the irrigation areas in 2005.

The EM-38 survey measures the apparent electrical conductivity of the soil profile to a depth of 1.5m, which is the effective root-zone of most irrigated crops.

The main purpose of the EM-38 is to aid in the identification of different soil types that may influence soil analysis and crop performance so that management can be tailored to soil type. The EM-38 survey demonstrated a basic correlation between EM-38 readings and soil types. Low EM-38 readings were measured in the high elevation areas, characterised by a deep well drained soil with a substrate of coarse fragments and decomposed rock. High EM-38 readings were measured in the low-lying areas of the paddocks, characterised by poorly drained alluvium overlying clay subsoils. The EM-38 survey and SMS can be seen in **Figure 16**.

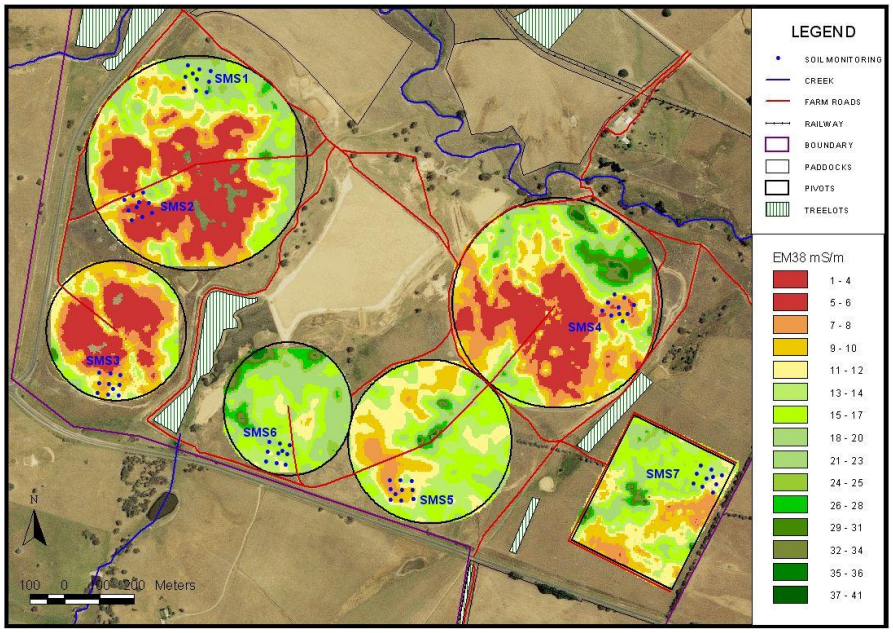


Figure 16: *Location of soil monitoring sites in relation to EM-38 survey*

9.5 Analysis

Topsoil sampling and analysis was undertaken in October 2025 and April 2026. McMahon also conducts subsoil testing every year (October 2025 and April 2026) to gain better understanding of the sustainable assimilation of nutrients and provide management recommendations based on the results, **Attachment D**.

Overall soil health appears to be good with adequate humus levels and an abundance of earthworms in the topsoil. Topsoil organic carbon levels (as an average across the 7 SMS) have risen from 2.0% in 2003 to an average of 2.2% in 2025/26 due to the introduction of perennial crops such as lucerne into the cropping program.

Over the last 20 years, macro nutrients have improved to more desirable levels due to a comprehensive fertiliser program and topsoil pH has risen with the application of soil ameliorants.

9.5.1 Monitoring October 2025

Topsoil (0-10cm) analysis was undertaken in October 2025 to coincide with the start of the spring/summer irrigation season. Fertiliser recommendations for the crops were made based on the nutrient budget.

pH

Soil pH is strongly acidic to slightly acid with results ranging from 4.8pH($CaCl_2$) (SMS7) to 6.3pH($CaCl_2$) (SMS1 and SMS5). Typically, the application of alkaline soil ameliorants has been highly successful with an improvement in topsoil pH to within the desirable range of 5.5 to 7pH($CaCl_2$), (NSW Agriculture, 1998). However, SMS6 and SMS7 are below the desirable range but can be ameliorated with lime. A neutral soil pH will improve nutrient and water availability for plants.

Cations

Calcium and magnesium ratios are typical for soils of the local area. Exchangeable Sodium percentage levels average 4.1% which is at a suitably low level (NSW Agriculture, 1998).

Aggregate stability

Emerson Aggregate Tests were performed by reference to AS1289.3.8.1 and all soils were categorised as class numbers 7 and 8. Class 7 and 8 soil are very stable and unlikely to be sodic.

Organic carbon

Organic carbon levels average 2.9% across all sites. This is indicative of soils with very good soil structure and high buffering capacity with sufficient organic matter to decrease bulk density and improve water holding capacity (NSW Agriculture, 1998).

Salinity

The salinity indicator (electrical conductivity) were very low indicating nil short-term salinity risk. Sodium as a percentage of cations has an average of 4.1% for all sites. However, SMS2, SMS3, and SMS4 were above the desirable range. Excessive sodium can cause the soil structure to deteriorate.

Nitrogen

Nitrogen and nitrate levels are generally satisfactory for agricultural production and can be improved by the addition of fertiliser if required.

Phosphorus

Phosphorus levels are generally satisfactory for agricultural production and can be improved by the addition of fertiliser if required.

9.5.2 Monitoring April 2026

Topsoil (0-10cm) analysis was undertaken in April 2026 to coincide with the start of the autumn/winter cropping season. Fertiliser recommendations for the crops were made based on analysis of soil fertility.

pH

Soil pH is strongly acidic to neutral with results ranging from 4.2pH($CaCl_2$) (SMS7) to 6.7pH($CaCl_2$) (SMS1 and SMS5). Typically, the application of alkaline soil ameliorants has been highly successful with an improvement in topsoil pH to within the desirable range of 5.5 to 7pH($CaCl_2$), (NSW Agriculture, 1998). However, SMS3 and SMS7 are below the desirable range but can be ameliorated with lime. A neutral soil pH will improve nutrient and water availability for plants.

Cations

Calcium and magnesium ratios are typical for soils of the local area. Exchangeable Sodium percentage levels average 4.0% which is at a suitably low level (NSW Agriculture, 1998).

Aggregate stability

Emerson Aggregate Tests were performed by reference to AS1289.3.8.1 and all soils were categorised as class numbers 2, 3, and 5 (SMS3). A class 2 soil may be sodic, while classes 3 and 5 are unlikely to be sodic.

Organic carbon

Organic carbon levels average 1.49% across all sites. This is indicative of soils with very good soil structure and high buffering capacity with sufficient organic matter to decrease bulk density and improve water holding capacity (NSW Agriculture, 1998). The paddocks at the time of sampling were spray fallowed and cultivated leading to lower results compared to October 2025.

Salinity

The salinity indicator (electrical conductivity) were very low indicating nil short-term salinity risk. Sodium as a percentage of cations has an average of 4.0% for all sites. However, SMS3, SMS5, and SMS6 were above the desirable range. Excessive sodium can cause the soil structure to deteriorate.

Nitrogen

Nitrogen and nitrate levels are generally satisfactory for agricultural production and can be improved by the addition of fertiliser if required.

Phosphorus

Phosphorus levels are generally satisfactory for agricultural production and can be improved by the addition of fertiliser if required.

10 NUTRIENT BALANCE AND FORWARD MANAGEMENT PLAN

The farm nutrient balance forms part of the forward management plan for the wastewater irrigation at Gadara Park, it also satisfies the load-based protocol for the Visy Environment Protection Licence. The nutrient balance and forward management plan are reviewed annually as part of irrigated cropping management. The review ensures maximum nutrient uptake for optimal crop production.

At the commencement of the Visy operations at Gadara Park, the soil nutrient status was poor with below desirable levels for all macronutrients and a very low pH. The macronutrient status and pH at Gadara Park since, has improved due to a strategic fertiliser and amelioration program, and improved cropping management.

Fertiliser is the main source of nutrient supply and application amounts are matched to anticipated crop removal. Nutrients are present in the wastewater but are at insignificant levels to make a marked impact on nutrient availability.

At present, soil testing is carried out bi-annually to coincide with the start of the winter and summer cropping programs. Nutrient budgets are calculated with current soil nutrient status for the crops to be grown, with likely nutrient efficiency and removal. Factors such as anticipated yield, irrigation amounts, rainfall, weed burden, crop variety and seeding rate are taken into account when budgeting actual nutrient removal and supply.

The aim for future nutrient application is to maintain a sustainable macro nutrient bank in the soil that will boost crop production for more efficient water use and crop production.

10.1 NUTRIENT BALANCE MANAGEMENT

The NSW EPA load based licensing protocol details that the following conditions be carried out for licensees to obtain the full fee discount for effluent irrigation.

Condition 1: Have developed a 15 year forward management plan that shows how proposed annual nutrient application rate compares with the annual amounts to be taken up by the biological or physical processes of the crop-soil system. This should be done before the construction of the effluent reuse scheme. Nutrient application rates must be based on the sustainable assimilation of nutrients over a rolling 15 year period.

The nutrient balance outlines the nutrient status from the soil testing carried out in April 2026. Nutrient removal has been calculated from the ranges outlined in **Table 11** and efficiency factors have been determined from historical seasonal conditions encountered. The nutrient balance table outlines crop species, seeding rate and an estimated sowing date. The sowing date will change from year to year to suit the cropping programs and seasonal conditions. Perennial crops such as lucerne and ryegrass for example are only sown every five years or so. The table also outlines estimated fertiliser application and nutrient addition from wastewater and biological processes. The areas for which the nutrient balance has been calculated are the centre

pivots and soft hose traveler paddock, **Figure 15**. The 15 year rolling nutrient balance can be seen in **Attachment E**.

10.2 NUTRIENT SUPPLY

Nutrients are supplied in the form of fertiliser and wastewater. Nitrogen is also supplied by soil biological processes of mineralisation and fixation.

10.2.1 Fertiliser

Fertiliser is the main source of nutrients at Gadara Park. A starter fertiliser (Nitrogen (N) Phosphorus (P) Potassium (K) Sulphur (S) at a ratio of 18.22.0.1) is used at sowing to supply the crops with the season's phosphorus supply and some nitrogen. Crops are usually top dressed with granular urea (NPKS 42.0.0.0) or with liquid nitrogen through the centre pivot or boom spray. Legumes will generally be top dressed with single super (NPKS 0.9.0.11) to supply adequate phosphorus and sulphur. Additional nutrients and trace elements can be added when suitable.

10.2.2 Waste water

A volume of approximately 390.3 megalitres of wastewater was applied in 2025/26 to approximately 110 hectares of farmland at Gadara Park via existing centre pivots (five of them) and the soft hose traveler irrigator. The irrigation of the wastewater is controlled by Visy's wastewater management plan and the EPA licence conditions. The amounts of nitrogen and phosphorus in the wastewater are very low and are the lowest contributors of nitrogen and phosphorus to the nutrient balance.

10.2.3 Mineralisation

Mineralisation is a process that releases nitrogen from soil organic matter while the temperature and moisture conditions are suitable for the soil microbes to function effectively. As a general rule, mineralisation rarely exceeds 80kg nitrogen per hectare per year. A rate of 40kg nitrogen per hectare per season has been used to approximate mineralisation.

10.2.4 Fixation

Further nitrogen addition is present in the form of fixation from legume crops. The principal annual legume crop grown will be a high density legume consisting of a clover mix. The principal perennial legume crop grown will be lucerne. It is estimated that the high density legume will add approximately 100kg nitrogen per hectare per year (Tisdale et al, 1998). Legumes fix around 20kg nitrogen per tonne dry matter per year - but most of this goes into the organic nitrogen pool. However, the amount of mineral nitrogen available to plants in autumn and early winter will increase in proportion to kilograms per hectare of legume dry matter grown the previous spring. The conversion of atmospheric nitrogen to organic nitrogen is called fixation (Agricultural Bureau of South Australia, 1997).

Experimental estimates of the total annual inputs of fixed nitrogen by grazed lucerne-based pastures range from 80-190kg nitrogen per hectare per year in a Mediterranean-type climate (Peoples et al, 1998).

10.3 NUTRIENT REMOVAL

Nutrient removal will be influenced by the type of crops grown, seasonal weather, sowing rate and general plant health. The following **Table 11** has been used as a general guide for nutrient removal ranges, (Reuter and Robinson, 1997).

Table 11: *Nutrient removal ranges for crops grown at Gadara Park*

Crop	Normal nutrient removal range (kg/ha)		
	Nitrogen	**Phosphorus**	**Potassium**
Irrigated pasture (cut)	160-400	24-60	120-300
Lucerne hay (cut)	155-465	15-45	125-375
Maize silage	220-550	50-125	200-500
Forage sorghum	220-440	30-60	240-480
Winter cereal hay	200-400	30-60	160-320
Seed barley	38-95	6-15	8-20
Seed wheat	38-95	8-20	10-25
Triticale	29-57	6-12	9-18
Seed oats	15-75	3-15	4-20
Chickpeas	20-80	2-8	2-8
Cowpeas	15-60	2-8	10-40
Faba beans	40-120	4-12	12-36
Lupins	22-90	1-6	4-16

10.3.1 Seasonal influence

Nutrient uptake is heavily influenced by seasonal conditions:

Winter season

The winter growing season at Gadara Park is considered extended because of an early sowing date made possible by irrigation. This gives the winter crops a high nutrient removal rate. Another factor influencing a long growing season is the cool spring climate which aids a long stage of plant development which in turn means a late harvest.

Summer season

The summer growing season at Gadara Park is considered short with a low to medium level of nutrient removal. The rationale for this is the comparatively cooler climate at Gadara Park and cooler temperatures which will influence nutrient removal.

10.4 DEPTH OF NUTRIENT REMOVAL

Phosphorus removal has been calculated to 10cm depth. The majority of phosphorus is placed as fertiliser at sowing which is normally to a depth of between 5cm and 7.5cm.

Nitrogen removal has been calculated to a depth of 10cm which is the effective zone of the majority of nitrogen supply and mineralisation at Gadara Park. Mineralisation has been assumed to be 40kg per hectare for the winter cropping period.

The irrigation paddocks at Gadara Park are sampled to a depth of 60cm to assess root zone nitrogen status for the summer crops. Summer crops such as maize will have an effective root zone depth of approximately 60cm and are therefore tested accordingly. The nitrogen fertiliser rate is usually determined by considering the cropping history of the field in conjunction with a soil test for mineral nitrogen (Hocking, Norton and Good, 1999). Growers are advised to use a deep (60cm) soil test for mineral N for calculating N fertiliser requirements. The deep soil test can detect any nitrate-N accumulated at depth. Values for mineral N in soils are typically 30-140kg nitrogen per hectare.

Condition 2: Review the plan every 3 years to ensure that future planned application rates will continue to achieve sustainable assimilation over a rolling 15 year period.

The current management at Gadara Park is to assess the nutrient status at the start of every summer and winter cropping program. From the soil analysis, nutrient budgets are calculated and matched to crop type and efficiency. This will ensure the maximum amount of production from the irrigation area.

Soil testing is undertaken at the start of the summer and winter cropping seasons to determine current nutrient status and budget requirements. Soil testing locations have been GPS located so the same sample sites are visited every time.

The plan will be reviewed formally every 3 years as per EPA recommendations to achieve sustainable nutrient assimilation.

Condition 3: Prepare annual nutrient balances showing nutrient application rates and the results of soil monitoring done as set out in the management plan, and how these outcomes compare with those anticipated in the management plan. Documentation of plan and annual balances must be kept for at least four years.

In October 2025 and April 2026 most soil nutrient levels are at desirable levels for agricultural production. The phosphorus levels have always been very low and targeted application of fertiliser has seen a slow build-up of levels to boost soil fertility and agricultural production.

Nitrogen levels at Gadara Park have been low but are building to more favourable conditions for agriculture after adopting a fertiliser program. Soil nitrogen has been identified as the single biggest crop nutrient limiting factor. Nitrogen can be applied to the crops at Gadara Park in the form of granular urea, and liquid fertiliser which can be center pivot applied or boom spray applied. The introduction of legumes to the cropping rotation will help fix nitrogen in the soil for subsequent crops.

11 WHOLE FARM MANAGEMENT

11.1 PASTURE IMPROVEMENT

As an ongoing pasture improvement program, paddocks are developed and renovated on a rotational basis every 5 to 10 years. Perennial pasture species are introduced to suitable paddocks to maximise production over the summer months. In some paddocks where weed burden is high, annual crops are grown for two to three years to prepare them for a wider range of crop and perennial pasture options.

The pasture improvement includes many management facets that are integral to the successful development program. They include:

- Soil testing and analysis;
- Regular paddock inspections;
- Weed monitoring and control programs;
- Insect monitoring and control programs;
- A pasture variety rotation assessment;
- Seasonal assessment and outlook considerations; and
- Budgetary assessment.

11.2 TREE MANAGEMENT

In total, Gadara Park currently has 126 hectares of planted native tree lots in riparian zones and along drainage lines. The tree lots have been established and maintained over the last 18 years as part of a riparian/drainage line stabilisation and habitat improvement program that links the creek flats to the timbered hills.

The areas of tree plantings can be seen in **Figure 17** noting that trees are planted on two other parcels of land not shown on the current tree plantings map.

11.3 WEED MANAGEMENT

The Weed Management Plan for Gadara Park was completed and approved as part of the Landscape and Native Vegetation Management Plan in the Operational Environmental Management Plan (OEMP). Two further properties were acquired in 2007 and 2008, “Havilah” and “Woomera” respectively. Weed management has also been undertaken on these properties as discussed for Gadara Park below. A range of weed control methods are employed as part of the land management on land owned by the company including spraying, insect control and “crash grazing” on the centre pivots where the sheep flock or cattle are put on in larger numbers and left for 2 to 3 weeks. This means that the pasture and weeds are grazed, the pasture recovers and continues to grow but the weed growth is checked.

Comments and observations for 2025/26 are as follows:

- Bathurst Burr has been controlled to a point with ongoing inspection and edification of any new germination. This is a summer weed and has required some spraying and chipping for control;
- Bracken Fern - an ongoing reduction program exists, and the fern is mainly occurring in the more inaccessible areas;
- Blackberry – ongoing maintenance program of spraying and treatment of any re-infestations continues;
- Paterson's curse is subject to ongoing management. Visy began working with the CSIRO and the Department of Primary Industries (DPI) on a biological control program using four types of insect for the control of Paterson's curse, in 2007 initially within the vegetation corridors, where spraying was unable to be undertaken. The insects however have now spread throughout the property and results have been outstanding. The DPI conducted an Open Day in September 2008 to monitor insect numbers and results and discuss with other landholders the use of these insects, which attracted over 40 people. Overall the insect control has been very successful. Some spraying has been undertaken on thicker areas away from the tree lines.
- Cape Weed - a pasture weed that has been subject to an ongoing spraying program with a good kill rate.
- Saffron Thistle - Spraying programs have been undertaken for this weed in the past. It is a difficult weed to control, occurring on the lower slopes with a late germination period.

The requirements of the Weed Management Plan will continue to be implemented.

11.4 Feral animal management

At Gadara Park there are three main feral animals controlled being: rabbits; foxes; and pigs. Each animal is assessed on a routine basis and baiting, trapping or shooting programs are implemented accordingly. Baiting of foxes using 1080 can be implemented on an individual farm or regional basis which is run by the Livestock Health and Pest Authorities. Rabbits are controlled by shooting, baiting, using 1080 and harbour destruction. Wild pigs are sometimes present at Gadara Park and are controlled by shooting and trapping.

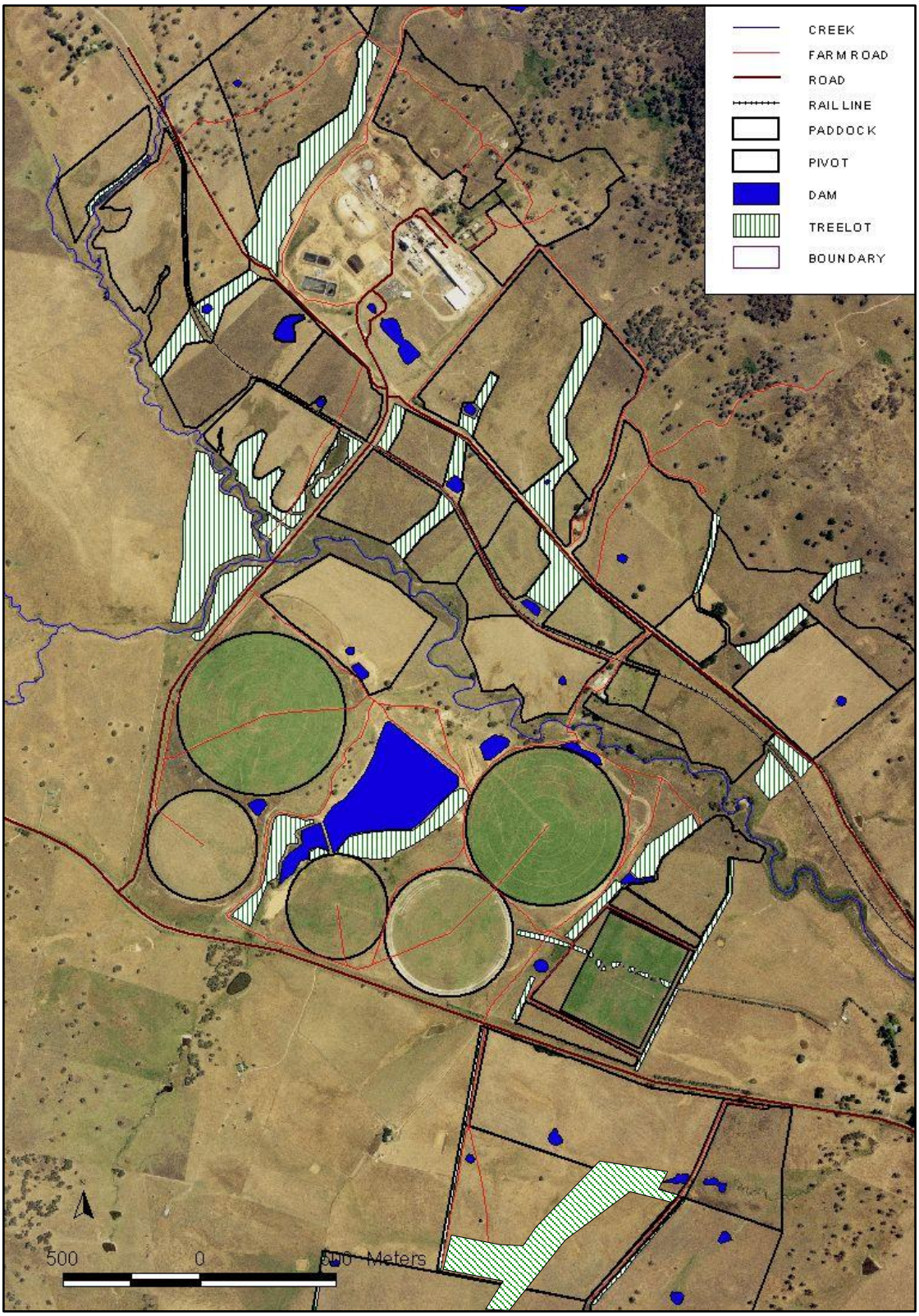


Figure 17: *Tree planting*

12 BY-PRODUCTS AND THE SOIL AMENDMENT TRIAL

The Soil Amendment Trial (SAT), for evaluating Visy mill by-products as soil ameliorants was completed in 2006 after the compilation and review of four years of soil testing, hay and silage analysis, animal tissue testing and by-product analysis.

The results show a marked increase in topsoil pH, after being measured as highly acidic pre-trial. Increased agricultural production has been a result of the correction in soil acidity, with improved nutrient availability and a greater variety of crops able to be grown.

Soil heavy metal levels have shown no significant increasing trends since the baseline testing was undertaken in 2001. Hay and silage analysis show heavy metals are not bio-accumulating in the plant tissue. Animal tissue testing indicates there are no food safety concerns, or any other concerns related to the heavy metals of interest.

Up until 30 June 2005, the criteria for the application of by-products was the Environmental Guidelines Use and Disposal of Biosolids Products, (NSW EPA, 1997). As of 1 July 2005, the EPA developed new draft guidelines in the "Land Protection Proposal" under the NSW Residue Waste Regulation. On 1 December 2005, amendments to the Protection of the Environment Operations (Waste) Regulation came into effect. The Regulation prohibited the use of the Visy by-products at Gadara Park, or otherwise, until a specific exemption is granted by the EPA.

After consultation with the EPA, Visy resumed the application of dregs & grits and lime mud in 2010 as the by-products satisfied the parameters as set out in the NSW Fertilisers Act, 1985.

300 tonnes of dregs & grits was land applied to 60 hectares of pasture in 2012 at a rate of 5 tonnes per hectare and 1,520 tonnes was applied to 600 hectares of pasture at a rate of 2.5 tonnes per hectare in January 2013. These applications were approved as one-off exemptions by the NSW EPA.

12.1 SUMMARY OF BY-PRODUCTS AT VISY

Three by-products from the paper making process were used at Gadara Park as soil ameliorants to improve agricultural production. These by-products are green liquor dregs, lime mud and fly ash. A fourth by-product (bottom sand) is inert sand which was previously used to line the roads around the farm, making the roads more readily accessible in wet weather. By-product testing results are provided in **Attachment F**.

12.1.1 Dregs and Grits

Green liquor dregs (process sediment) are a stabilised alkaline by-product. The source is un-burnt carbon and inorganics (calcium and iron compounds) from the green liquor smelt removed through clarification prior to re-causticising. Insoluble materials within the lime are separated and washed after slaking/causticising. The main components of the dregs and grits are calcium carbonate, unburnt carbon, and some sodium compounds. The benefits of the dregs and grits are the good liming characteristics that

raise soil pH and subsequently improve fertility. The drawback of the dregs and grits is the presence of low-level contaminants in chromium, lead, nickel, zinc, and copper.

12.1.2 Lime mud

Lime mud is a stabilised alkaline product. It is obtained after decanting the white liquor following re-causticising. The lime mud is not returned to the lime kiln but is purged out of the system. The main compound of the lime mud is calcium carbonate. A greater amount of lime mud is produced, but the mill reuses the lime mud in the paper making process.

The benefit of the lime mud is its similarity to superfine agricultural lime. The lime mud has a neutralising value of around 95% which is classified as the highest grade agricultural lime. The drawback of the lime mud is low level contamination with lead.

The origin of the dregs, grits and lime mud can be identified below in **Figure 18**.

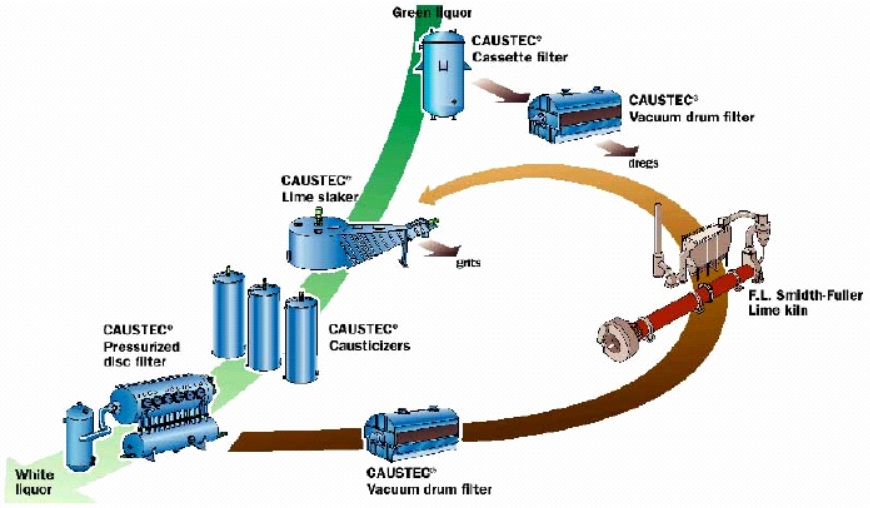


Figure 18: *Figure of the origins of the lime mud and dregs and grits by-products*

13 SLUDGE ASSESSMENT

13.1 SLUDGE MONITORING SITE

Twelve samples of sludge were collected in 2025/26 from the treated sludge line running into the storage dam. All results can be seen in Attachment G.

The sludge is transferred from the Sludge Balancing Tank to a trailer-mounted applicator from which the sludge is sprayed onto the paddocks. Approximately 268 kilolitres of sludge were land applied in 2025/26. The sludge applicator can be seen in **Figure 19**.

Up until 30 June 2005, the criteria for the application of by-products (including sludge) were the NSW EPA Environmental Guidelines Use and Disposal of Biosolids Products.

As of 1 July 2005, the EPA developed new draft guidelines in the "Land Protection Proposal" under the NSW Residue Waste Regulation. On 1 December 2005 amendments to the Protection of the Environment Operations (Waste) Regulation came into effect. The Regulation prohibited the use of the Visy by-products (including sludge) at Gadara Park, or otherwise, until liaison and subsequent approval by EPA.

After consultation with EPA, sludge application resumed in May 2008. The application rates and paddock suitability on Gadara Park is determined by following the NSW Environmental Guidelines, Use and Disposal of Biosolids Products (NSW EPA, 1997).



Figure 19: *Sludge being applied to land (Colson 2002)*

13.2 CHEMICAL ANALYSIS

BOD

The BOD of the sludge ranged from <5mg/L (July and September 2025) to 510mg/L (December 2025). The average BOD result for this monitoring period was 81mg/L which is less than half than the previous monitoring period's average.

TDS

The TDS values of the sludge ranged from 150mg/L to 300mg/L. The average TDS result was 213mg/L which is similar to the 2024/25 monitoring period.

EC

The EC values ranged from 270µS/cm to 500µS/cm. The average EC value for sludge for this monitoring period is 378µS/cm which is within the desirable range.

Nitrogen and phosphorus

Total nitrogen levels ranged from 2.7mg/L to 110mg/L. Phosphorus levels ranged from 0.9mg/L to 18mg/L. Both nitrogen and phosphorus levels are similar to the results from the previous monitoring period.

pH

The pH of sludge is moderately acidic to neutral ranging from 6.1 to 7.3 and is generally in the desirable range for agricultural purposes (ANZG, 2018).

Suspended solids

The suspended solids ranged from 14mg/L to 1400mg/L. A visual inspection of the soil where the sludge has been applied indicates free draining topsoil with good porosity, therefore the presence of suspended solids in the sludge appears to have not adversely affected the drainage by blocking soil pores.

Oil and grease

Oil and grease levels ranged from <5mg/L to 8mg/L which are considered low.

14 RECOMMENDATIONS SUMMARY

The following improvements to the monitoring program are recommended:

- The decant (point 10) sample point is recommended to be signposted for a consistent sampling location.
- The sludge sample location has recently been moved (October 2023) from the SBR to the treated sludge discharge line for improved safety. It is recommended this new sampling location be signposted for a consistent sampling location.
- The steel covers for groundwater bores BH13, BH14, BH15 and BH16 are sinking, which has made it difficult to open the lids and access the bore casings. Maintenance of these covers, or consideration of an alternative cover closure design, is recommended.
- Access to some of the surface water monitoring locations on the farm is limited due to high grass and weeds, improvement around this is recommended.
- The access road to the by-products stockpile area is heavily rutted and can be difficult following rainfall, with vehicle access constrained by the risk of sliding into rut and bottoming out. Improvements to the access road are recommended where practicable.
- Foot-valve hoses for several bores, including BH3, BH15D, BH15S, BH8S, BH17 and BH10, are too short and difficult to access during monitoring. Replacement with longer hoses, or installation of an extension to allow the hoses to be readily retrieved, is recommended

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16 GENERAL GLOSSARY

ANZECC	Australia and New Zealand Environment and Conservation Council
BTOC	Below Top of Casing
DEC	NSW Department of Environment and Conservation
DECCW	Department of Environment and Climate Change and Water NSW
DPI	Department of Primary Industries
EPA	Environment Protection Authority (NSW)
ET_c	Crop Evapotranspiration (ET_o multiplied by a Crop Factor)
ET_{pan}	Evaporation measured from a Standard Class A pan (in mm)
K_c	Crop Factor
ET_o	Potential Evapotranspiration calculated using the FAO Penman-Monteith formula (in mm)
NEPC	National Environment Protection Council
SAT	Soil Amendment Trial
TSC	Tumut Shire Council
WWTP	Waste Water Treatment Plant

17 CHEMICAL GLOSSARY

Alkalinity	The capacity of water to neutralise acid
Al	Aluminium
AS	Aggregate Stability (using Emerson Aggregate Test)
BOD	Biological Oxygen Demand
Ca	Calcium
CEC	Cation Exchange Capacity
Cl	Chloride
EC	Electrical Conductivity
FC	Faecal Coliforms
K	Potassium
Mg	Magnesium
Mn	Manganese
N	Nitrogen
Na	Sodium
OC	Organic Carbon
OCP	Organochlorine Pesticides
P	Phosphorus
PBI	Phosphorus Buffer Index
Na	Sodium
S	Sulphur
SAR	Sodium Adsorption Ratio
SS	Suspended Solids
TDS	Total Dissolved Solids
TKN	Total Kjeldahl Nitrogen
NV	Neutralising Value
ENV	Effective Neutralising Value
As	Arsenic
Cd	Cadmium
Cr	Chromium
Cu	Copper

Hg	Mercury
Ni	Nickel
Pb	Lead
Zn	Zinc
CP	Crude Protein
DM	Dry Matter
DMD	Digestibility
ME	Metabolisable Energy
NDF	Neutral Detergent Fibre
SolCHO	Water Soluble Carbohydrate

18 ATTACHMENTS

Attachment	Details
A. **Groundwater 2025-2026**	3 pages
B. **Surface water 2025-2026**	1 page
C. **Point 10 (Wastewater) 2025-2026**	1 page
D. **SMS October 2025 and April 2026**	4 pages
E. **Nutrient budget 2025-2026**	9 pages
F. **By-products 2025-2026**	4 pages
G. **Sludge 2025-2026**	1 page

Attachment A: *Groundwater 2025-2026*

Test Identity	Unit of measure	Critical Range	BH1 July 2025	BH1 Oct 2025	BH1 Jan 2026	BH1 Apr 2026	BH2 July 2025	BH2 Oct 2025	BH2 Jan 2026	BH2 Apr 2026	BH3 July 2025	BH3 Oct 2025	BH3 Jan 2026	BH3 Apr 2026
Conductivity	µS/cm	*350* [1]	330	350	320	N/A	140	140	120	N/A	180	180	150	N/A
Nitrate	ppm	*0.7* [1]	2.1	4.8	3.1	N/A	5.5	8.0	5.5	N/A	0.035	1.6	2.3	N/A
pH	pH units	*6.5-7.5* [1]	5.9	5.6	5.8	5.7	5.8	5.7	5.9	5.6	6.4	6.7	6.8	6.5

Test Identity	Unit of measure	Critical Range	BH7S July 2025	BH7S Oct 2025	BH7S Jan 2026	BH7S Apr 2026	BH7D July 2025	BH7D Oct 2025	BH7D Jan 2026	BH7D Apr 2026	BH11S July 2025	BH11S Oct 2025	BH11S Jan 2026	BH11S Apr 2026
Conductivity	µS/cm	*350* [1]	Dry	Dry	Dry	Dry	530	520	490	N/A	830	510	660	N/A
Nitrate	ppm	*0.7* [1]	Dry	Dry	Dry	Dry	0.019	<0.005	<0.005	N/A	0.013	<0.005	<0.005	N/A
pH	pH units	*6.5-7.5* [1]	Dry	Dry	Dry	Dry	6.6	6.7	6.7	6.5	6.7	6.8	6.8	6.5

Test Identity	Unit of measure	Critical Range	BH11D July 2025	BH11D Oct 2025	BH11D Jan 2026	BH11D Apr 20206
Conductivity	µS/cm	*350* [1]	760	530	560	N/A
Nitrate	ppm	*0.7* [1]	0.020	<0.005	<0.005	N/A
pH	pH units	*6.5-7.5* [1]	6.6	6.6	6.8	6.7

1. ANZG (2018) Australian & New Zealand Guidelines for Fresh & Marine Water Quality.

Bore Reference	Location
BH1	Onsite upstream of irrigated and the former by-product areas
BH2	Onsite upstream of irrigated and the former by-product areas
BH3	Deep bore off site to monitor upstream groundwater quality and any mounding as a result of the Winter storage
BH4	Deep bore to monitor groundwater quality upstream of irrigation areas, and downstream of the former Power Boiler Ash applied area
BH7S	Shallow bore to monitor groundwater quality upstream of irrigation areas and downstream of the former Power Boiler Ash and Lime Mud applied areas
BH7D	Deep bore to monitor groundwater quality upstream of irrigation areas and downstream of the former Power Boiler Ash and Lime Mud applied areas
BH11S	Shallow bore to monitor groundwater quality off site and upstream of irrigation and the former By-product applied areas
BH11D	Deep bore to monitor groundwater quality upstream of irrigated and the former By-product applied areas

Test Identity	Unit of measure	Critical Range	BH8S July 2025	BH8S Oct 2025	BH8S Jan 2026	BH8S Apr 2026	BH8D July 2025	BH8D Oct 2025	BH8D Jan 2026	BH8D Apr 2026	BH9 July 2025	BH9 Oct 2025	BH9 Jan 2026	BH9 Apr 2026
Conductivity	µS/cm	*350* [1]	560	540	500	N/A	500	500	480	N/A	620	590	630	N/A
Nitrate	ppm	*0.7* [1]	3.0	2.6	1.0	N/A	3.0	2.8	2.9	N/A	11.0	11.0	12	N/A
pH	pH units	*6.5-7.5* [1]	7	7	7.1	6.9	6.8	6.8	6.8	6.7	6.7	7.2	7.4	7

Test Identity	Unit of measure	Critical Range	BH10 July 2025	BH10 Oct 2025	BH10 Jan 2026	BH10 Apr 2026	BH15S July 2025	BH15S Oct 2025	BH15S Jan 2026	BH15S Apr 2026	BH15D July 2025	BH15D Oct 2025	BH15D Jan 2026	BH15D Apr 2026
Conductivity	µS/cm	*350* [1]	340	690	660	N/A	380	380	400	N/A	320	340	350	N/A
Nitrate	ppm	*0.7* [1]	5.2	13.0	13	N/A	6.9	3.8	5.3	N/A	6.8	<0.005	6.8	N/A
pH	pH units	*6.5-7.5* [1]	7.1	7.3	7.3	7.1	7.2	7.2	7.2	7	6.6	6.8	6.5	6.5

1. ANZG (2018) Australian & New Zealand Guidelines for Fresh & Marine Water Quality.

Bore Reference	Location
BH8S	Shallow bore to monitor groundwater quality downstream of irrigated, former By-product and Sludge applied areas
BH8D	Deep bore to monitor groundwater quality downstream of irrigated, former Lime Mud, Power Boiler Ash and Sludge applied areas
BH9	Deep bore to monitor groundwater quality downstream of the irrigated and former By-product applied areas
BH10D	Deep bore to monitor groundwater quality off site and downstream of irrigated and former By-product applied areas
BH15S	Shallow bore to monitor groundwater quality downstream of irrigated and former By-product applied areas
BH15D	Deep bore to monitor groundwater quality downstream of irrigated and former By-product applied areas

Test Identity	Unit of measure	Critical Range	BH13 July 2025	BH13 Oct 2025	BH13 Jan 2026	BH13 Apr 2026	BH14 July 2025	BH14 Oct 2025	BH14 Jan 2026	BH14 Apr 2026	BH16 July 2025	BH16 Oct 2025	BH16 Jan 2026	BH16 Apr 2026
Conductivity	µS/cm	*350* [1]	910	880	870	N/A	720	730	690	N/A	820	680	1600	N/A
Nitrate	ppm	*0.7* [1]	0.2	<0.005	0.0	N/A	0.7	1.0	0.7	N/A	6.4	11.0	3.2	N/A
pH	pH units	*6.5-7.5* [1]	7.3	7.2	7.6	7.3	6.8	6.8	6.9	6.7	7.4	7.3	8.1	7.2

Test Identity	Unit of measure	Critical Range	BH17 July 2025	BH17 Oct 2025	BH17 Jan 2026	BH17 Apr 2026
Conductivity	µS/cm	*350* [1]	1200	1300	1700	N/A
Nitrate	ppm	*0.7* [1]	0.13	0.05	0.1	N/A
pH	pH units	*6.5-7.5* [1]	7.7	7.6	7.9	7.8

1. ANZG (2018) Australian & New Zealand Guidelines for Fresh & Marine Water Quality.

Bore Reference	Location
BH13	Shallow bore to monitor seepage from the Winter Storage Dam
BH14	Shallow bore to monitor seepage from the Winter Storage
BH16 and BH17	Shallow bores to monitor seepage from the Winter Storage Dam

Attachment B: *Surface Water 2025-2026*

Surface water monitoring

Test Identity	Critical Range	SW1	SW1	SW1	SW1	SW1	SW1	SW1	SW1	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
		10/10/2025	15/11/2025	2/12/2025	20/01/2026	5/02/2026	12/03/2026	1/04/2026	5/05/2026	10/10/2025	15/11/2025	2/12/2025	20/01/2026	5/02/2026	12/03/2026	1/04/2026	5/05/2026
pH (pH units)	*6.5-7.5* [1]	7.5	7.7	7.6	7.2	7.1	7.1	7.4	7.1	7.3	7.4	7.3	7.1	7.1	7.0	7.1	6.9
Total dissolved solids (mg/L)	*N/A*	140	160	220	260	390	230	230	260	200	210	280	310	320	290	270	240
BOD (mg/L)	*<15* [1]	<5	<5	<5	<5	10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Total suspended solids (mg/L)	*<45* [2]	<5	<5	<5	160	210	130	<5	37	20	5	<5	99	65	6	110	27
Zinc (mg/L)	*<0.008* [1]	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phosphorus (total) (mg/L)	*<0.02* [1]	<0.02	<0.02	<0.02	0.32	0.70	0.16	0.04	<0.02	0.03	<0.02	<0.02	0.23	0.18	0.06	0.28	<0.02
Nitrogen (total) (mg/L)	*<0.25* [1]	0.25	0.40	0.14	1.20	2.8	0.68	0.18	0.39	0.60	0.73	0.4	1.4	1.10	0.56	1.70	0.82
Manganese (mg/L)	*<1.9* [1]	0.020	0.087	0.056	<0.001	17.000	0.010	0.43	0.018	<0.001	0.150	0.120	0.008	4.400	<0.001	<0.001	0.019
Conductivity (µS/cm)	*<350* [1]	240	270	370	470	680	440	410	410	360	350	460	540	540	510	440	390
Faecal Coliforms (fcu/100mL)	*<150* [1]	560	55	3	50	230	88	6	220	40	89	100	2000	730	56	60	60
Oil & Grease (mg/L)	*<5* [2]	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5

Test Identity	Critical Range	SW3	SW3	SW3	SW3	SW3	SW3	SW3	SW3	SW4	SW4	SW4	SW4	SW4	SW4	SW4	SW4
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
		10/10/2025	15/11/2025	2/12/2025	20/01/2026	5/02/2026	12/03/2026	1/04/2026	5/05/2026	10/10/2025	15/11/2025	2/12/2025	20/01/2026	5/02/2026	12/03/2026	1/04/2026	5/05/2026
pH (pH units)	*6.5-7.5* [1]	7.6	7.6	7.6	7.6	7.5	7.1	7.2	7.0	7.5	7.4	7.0	Dry	Dry	6.3	7.1	6.5
Total dissolved solids (mg/L)	*N/A*	230	230	320	380	400	430	370	280	350	350	410	Dry	Dry	660	210	220
BOD (mg/L)	*<15* [1]	<5	<5	<5	<5	<5	<5	<5	<5	<5	28	18	Dry	Dry	210	<5	13
Total suspended solids (mg/L)	*<45* [2]	6	32	7	31	43	48	16	41	58	350	110	Dry	Dry	190	24	200
Zinc (mg/L)	*<0.008* [1]	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.008	Dry	Dry	<0.005	0.006	0.013
Phosphorus (total) (mg/L)	*<0.02* [1]	<0.02	0.03	0.03	0.05	0.09	0.11	0.07	0.24	0.24	0.93	1.00	Dry	Dry	3.1	0.2	1.4
Nitrogen (total) (mg/L)	*<0.25* [1]	0.52	0.65	0.5	0.69	0.98	1.50	1.0	1.0	3.70	7.6	4.6	Dry	Dry	12	3	5.2
Manganese (mg/L)	*<1.9* [1]	<0.001	0.040	<0.001	<0.001	0.001	<0.001	<0.001	0.003	1.00	0.77	2.200	Dry	Dry	22	0.007	0.150
Conductivity (µS/cm)	*<350* [1]	410	380	540	660	680	700	580	440	640	580	680	Dry	Dry	800	230	280
Faecal Coliforms (fcu/100mL)	*<150* [1]	6	260	10	3	620	66	4	100	200	>2419.6	98	Dry	Dry	27000	770	200
Oil & Grease (mg/L)	*<5* [2]	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	Dry	Dry	<5	<5	<5

Test Identity	Critical Range	SW5	SW5	SW5	SW5	SW5	SW5	SW5	SW5
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
		10/10/2025	15/11/2025	2/12/2025	20/01/2026	5/02/2026	12/03/2026	1/04/2026	5/05/2026
pH (pH units)	*6.5-7.5* [1]	7.6	7.7	7.7	7.3	7.3	7.1	7.3	7.1
Total dissolved solids (mg/L)	*N/A*	180	200	280	290	290	300	270	230
BOD (mg/L)	*<15* [1]	<5	<5	<5	<5	<5	<5	<5	<5
Total suspended solids (mg/L)	*<45* [2]	6	<5	9	26	23	5	33	41
Zinc (mg/L)	*<0.008* [1]	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phosphorus (total) (mg/L)	*<0.02* [1]	<0.02	<0.02	0.04	0.10	0.09	0.03	0.11	0.09
Nitrogen (total) (mg/L)	*<0.25* [1]	0.40	0.62	0.4	0.7	0.63	0.47	0.67	0.64
Manganese (mg/L)	*<1.9* [1]	0.002	0.110	0.110	<0.001	2.600	0.002	<0.001	0.019
Conductivity (µS/cm)	*<350* [1]	350	340	460	500	510	490	430	380
Faecal Coliforms (fcu/100mL)	*<150* [1]	10	16	44	32	330	25	51	80
Oil & Grease (mg/L)	*<5* [2]	<5	<5	<5	<5	<5	<5	<5	<5

1. ANZG (2018) *Australian & New Zealand Guidelines for Fresh & Marine Water Quality* .
2. Visy P & P (2023) *NSW EPA Environmental Protection Licence 10232 dated 5-Jul-2023* .

Sampling Sites	Location
SW1	Sandy Creek upstream of Winter Storage Dam
SW2	Sandy Creek downstream of Winter Storage Dam
SW3	Deep Creek
SW4	Upstream of Winter Storage Dam
SW5	Downstream of Winter Storage Dam

Attachment C: *Point 10 (Wastewater) 2025-2026*

Monitoring Point 10 - DECANT

Grab sample

Pollutant	Unit of measure	Critical Range	Wastewater monitoring 2025-26											
			2/07/2025	5/08/2025	2/09/2025	9/10/2025	3/11/2025	2/12/2025	20/01/2026	5/02/2026	12/03/2026	1/04/2026	8/05/2026	15/06/2026
BOD	mg/L	<40 [1]	<5	<5	<5	<5	<5	5	9	9	8	6	15	9
Nitrogen (total)	mg/L	<20 [1]	4.2	4.9	4.4	4	2.0	3.1	6.5	4	3.9	5	12	6
Oil & Grease	mg/L	<5 [1]	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
pH	pH	5.5-9.5 [1]	6.9	6.6	6.9	7.1	7.1	7.0	6.8	6.7	6.5	6.3	6.7	6.3
Phosphorus (total)	mg/L	<5 [1]	1.2	1.1	0.78	0.68	0.79	1.0	1.5	1.40	1.2	1.10	2.3	1.10
Sodium Adsorption Ratio	SAR	<4.5 [2]	5	3.4	4.0	4	4.1	4.3	3.7	3	3.9	3.2	3.3	3
Total Dissolved Solids	mg/L	<1000	260	160	200	150	170	200	260	170	200	210	290	220
Total Suspended Solids	mg/L	<45 [1]	15	8	10	20	7	11	32	50	41	10	68	7
Zinc	mg/L	no data	0.023	0.041	0.028	0.058	0.014	0.028	0.019	0.021	0.014	0.036	0.019	0.029

1. Visy P & P (2023) NSW EPA Licence 10232. Chatswood, NSW.

2. DEC (2004) NSW EPA Environmental Guidelines. Use of Effluent by Irrigation. Chatswood, NSW.

Attachment D: *SMS October 2025 and April 2026*

Parameter	Desirable Range	Soil Monitoring Sites (SMS) - 2 October 2025						
		SMS1	SMS2	SMS3	SMS4	SMS5	SMS6	SMS7
		0-10cm	0-10cm	0-10cm	0-10cm	0-10cm	0-10cm	0-10cm
Nitrate Nitrogen (ppm)	>30[3]	6	6.5	10	8.3	8.4	65	5.5
Phosphorus - Colwell (ppm)	>30[3]	20	34	33	15	73	36	27
Phosphorus - (available) Bray (ppm)	>30[3]	-	-	-	-	-	-	-
Phosphorus Sorption Capacity (P-Sorp)	> 30[4]	250	290	300	330	260	320	370
Available K (ppm)	> 225	-	-	-	-	-	-	-
Sulphate Sulphur (KCl40) (ppm)	>10[1]	-	-	-	-	-	-	-
DTPA Zinc (ppm)	1 - 5[6]	-	-	-	-	-	-	-
DTPA Copper (ppm)	0.2 - 5[6]	-	-	-	-	-	-	-
DTPA Iron (ppm)	*no data*	-	-	-	-	-	-	-
DTPA Manganese (ppm)	1 - 5[6]	-	-	-	-	-	-	-
Boron (ppm)	>0.3[2]	-	-	-	-	-	-	-
EC (dS/m)	<0.5[1]	0.037	0.052	0.046	0.054	0.046	0.17	0.022
ECe (dS/m)	<2[1]	-	-	-	-	-	-	-
Organic C (% C)	2[1]	2.4	2.9	2.9	2.5	3.7	2.9	2.9
Chloride (ppm)	< 125[4]	-	-	-	-	-	-	-
pH (H2O)	6 - 8[1]	6.9	7.0	6.6	6.9	6.7	6.2	5.9
pH (CaCl2)	5.5 - 7[1]	6.3	5.9	5.5	5.9	5.8	5.4	4.8
CEC (meq/100gm)	5 - 15[1]	7.4	7.4	7.2	7.7	9.9	9.4	4.6
Exchangeable Aluminium (ppm)	*no data*	-	-	-	-	-	-	-
Exchangeable Potassium (ppm)	*no data*	62.6	238.5	54.7	62.6	78.2	125.1	78.2
Exchangeable Sodium (ppm)	*no data*	188.5	124.1	193.1	87.4	25.3	119.5	9.2
Exchangeable Magnesium (ppm)	*no data*	80.2	116.7	114.3	133.7	12.2	170.2	58.3
Exchangeable Calcium (ppm)	*no data*	1022.0	3807.6	1262.5	921.8	320.6	1302.6	641.3
Aluminium (meq/100gm)*	<1[2]	-	-	-	-	-	-	-
Calcium (meq/100gm)	n/a	5.1	19	6.3	4.4	5.9	6.5	3.2
Magnesium (meq/100gm)	n/a	0.66	0.96	0.94	0.88	0.53	1.4	0.48
Sodium (meq/100gm)	<4.3[2]	0.82	0.54	0.84	0.51	0.26	0.52	0.04
Potassium (meq/100gm)	*no data*	0.16	0.61	0.14	0.16	0.2	0.32	0.2
Ca:Mg Ratio	>2[1]	-	-	-	-	-	-	-
K:Mg Ratio	*no data*	-	-	-	-	-	-	-
Aluminium %	<5%[1]	-	-	-	-	-	-	-
Calcium %	65-80%[1]	77.2	78.3	75.1	77.1	85.7	72.3	80.7
Magnesium %	10-15%[1]	15.7	13.6	16.8	14.4	9.6	16.6	13.9
Sodium %	<5%[1]	4.5	5.3	5.4	5.2	2.3	4.5	1.6
Potassium %	1-5%[1]	2.6	2.8	2.7	3.2	2.3	6.6	3.8
EAT (H2O Class)	*no data*	7	7	8	7	8	7	7
EAT (Low SAR Class)	*no data*	-	-	-	-	-	-	-
EAT (High SAR Class)	*no data*	-	-	-	-	-	-	-
Aluminium total (mg/kg)	*no data*	3800	1900	2200	5200	2300	5300	3100
Arsenic (mg/kg)	<20[7]	-	-	-	-	-	-	-
Cadmium (mg/kg)	<1[7]	-	-	-	-	-	-	-
Chromium (mg/kg)	<100[7]	-	-	-	-	-	-	-
Copper (mg/kg)	<100[7]	-	-	-	-	-	-	-
Lead (mg/kg)	<150[7]	-	-	-	-	-	-	-
Mercury (mg/kg)	<1[7]	-	-	-	-	-	-	-
Nickel (mg/kg)	<60[7]	-	-	-	-	-	-	-
Zinc (mg/kg)	<200[7]	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen (mg/kg)	500-3000[4]	2000	1600	2200	2000	3100	2700	2300
Total Phosphorus (mg/kg)	>30[4]	280	230	280	290	470	390	330

1. NSW Agriculture (1998) Interpreting Soil Results: Rules of Thumb. NSW Agriculture, Wagga Wagga

2. Soils: their properties and management: a soil conservation handbook for NSW. (1991) Ed. Charman & Murphy. Oxford University Press.

3. Gunter S (1997) Understanding Soil Tests. NSW Agriculture Publication, Tamworth.

4. Peverill, Sparrow & Reuter (1999) Soil Analysis: An Interpretation Manual. CSIRO Publishing, Collingwood.

5. Incitec Fertilisers et al. Technical Bulletin.

6. Soil Description Book (1997), Ken Wetherby, Cleve SA

7. NSW EPA (1997) Environmental Guidelines: Use & Disposal of Biosolids Products. NSW EPA Publication, Chatswood.MASCC Agricultural Land

Parameter	Desirable Range	Soil Monitoring Sites (SMS) - 2 October 2025						
		SMS1	SMS2	SMS3	SMS4	SMS5	SMS6	SMS7
		50-60cm	50-60cm	50-60cm	50-60cm	50-60cm	50-60cm	50-60cm
Nitrate Nitrogen (ppm)	>30[3]	1.5	2.8	1.5	0.46	0.36	3.4	0.52
Phosphorus - Colwell (ppm)	>30[3]	4	2	2	7	4	6	6
Phosphorus - (available) Bray (ppm)	>30[3]	-	-	-	-	-	-	-
Phosphorus Sorption Capacity (P-Sorp)	> 30[4]	700	400	450	550	480	520	780
Available K (ppm)	> 225	-	-	-	-	-	-	-
Sulphate Sulphur (KCl40) (ppm)	>10[1]	-	-	-	-	-	-	-
DTPA Zinc (ppm)	1 - 5[6]	-	-	-	-	-	-	-
DTPA Copper (ppm)	0.2 - 5[6]	-	-	-	-	-	-	-
DTPA Iron (ppm)	*no data*	-	-	-	-	-	-	-
DTPA Manganese (ppm)	1 - 5[6]	-	-	-	-	-	-	-
Boron (ppm)	>0.3[2]	-	-	-	-	-	-	-
EC (dS/m)	<0.5[1]	0.067	0.11	0.039	0.04	0.053	0.065	0.029
ECe (dS/m)	<2[1]	-	-	-	-	-	-	-
Organic C (% C)	2[1]	0.44	0.27	0.21	0.42	0.32	0.42	0.63
Chloride (ppm)	< 125[4]	-	-	-	-	-	-	-
pH (H2O)	6 - 8[1]	7.2	5.7	6.6	7.0	7.3	6.1	5.3
pH (CaCl2)	5.5 - 7[1]	5.9	5.3	5.1	5.6	6.4	4.5	4.1
CEC (meq/100gm)	5 - 15[1]	9.1	6.8	5.1	6	4.8	8	4.6
Exchangeable Aluminium (ppm)	*no data*	-	-	-	-	-	-	-
Exchangeable Potassium (ppm)	*no data*	82.1	58.7	31.3	62.6	39.1	86.0	46.9
Exchangeable Sodium (ppm)	*no data*	213.8	188.5	147.1	87.4	25.3	229.9	25.3
Exchangeable Magnesium (ppm)	*no data*	328.2	255.3	158.0	133.7	12.2	352.5	133.7
Exchangeable Calcium (ppm)	*no data*	1062.1	741.5	601.2	921.8	320.6	781.6	641.3
Aluminium (meq/100gm)	<1[2]	-	-	-	-	-	-	-
Calcium (meq/100gm)	n/a	5.3	3.7	3	3.8	4	3.9	3.2
Magnesium (meq/100gm)	n/a	2.7	2.1	1.3	1.3	0.31	2.9	1.1
Sodium (meq/100gm)	<4.3[2]	0.93	0.82	0.64	0.66	0.33	1	0.11
Potassium (meq/100gm)	*no data*	0.21	0.15	0.08	0.16	0.1	0.22	0.12
Ca:Mg Ratio	>2[1]	-	-	-	-	-	-	-
K:Mg Ratio	*no data*	-	-	-	-	-	-	-
Aluminium %	<5%[1]	-	-	-	-	-	-	-
Calcium %	65-80%[1]	58.1	55	59.8	64	84.4	49.1	70.6
Magnesium %	10-15%[1]	29.3	30.7	26	22.1	6.5	35.7	24.5
Sodium %	<5%[1]	10.3	12	12.5	11.1	6.9	12.5	2.4
Potassium %	1-5%[1]	2.4	2.3	1.7	2.7	2.2	2.7	2.5
EAT (H2O Class)	*no data*	5	2	2	3	3	2	5
EAT (Low SAR Class)	*no data*	-	-	-	-	-	-	-
EAT (High SAR Class)	*no data*	-	-	-	-	-	-	-
Aluminium total (mg/kg)	*no data*	16000	6400	6400	13000	7400	16000	15000
Arsenic (mg/kg)	<20[7]	-	-	-	-	-	-	-
Cadmium (mg/kg)	<1[7]	-	-	-	-	-	-	-
Chromium (mg/kg)	<100[7]	-	-	-	-	-	-	-
Copper (mg/kg)	<100[7]	-	-	-	-	-	-	-
Lead (mg/kg)	<150[7]	-	-	-	-	-	-	-
Mercury (mg/kg)	<1[7]	-	-	-	-	-	-	-
Nickel (mg/kg)	<60[7]	-	-	-	-	-	-	-
Zinc (mg/kg)	<200[7]	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen (mg/kg)	500-3000[4]	540	240	380	450	490	390	590
Total Phosphorus (mg/kg)	>30[4]	160	55	85	170	120	97	170

1. NSW Agriculture (1998) Interpreting Soil Results: Rules of Thumb. NSW Agriculture, Wagga Wagga

2. Soils: their properties and management: a soil conservation handbook for NSW. (1991) Ed. Charman & Murphy. Oxford University Press.

3. Gunter S (1997) Understanding Soil Tests. NSW Agriculture Publication, Tamworth.

4. Peverill, Sparrow & Reuter (1999) Soil Analysis: An Interpretation Manual. CSIRO Publishing, Collingwood.

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6. Soil Description Book (1997), Ken Wetherby, Cleve SA

7. NSW EPA (1997) Environmental Guidelines: Use & Disposal of Biosolids Products. NSW EPA Publication, Chatswood.MASCC Agricultural Land

Parameter	Desirable Range	Soil Monitoring Sites (SMS) - 1 April 2026						
		SMS1	SMS2	SMS3	SMS4	SMS5	SMS6	SMS7
		0-10cm	0-10cm	0-10cm	0-10cm	0-10cm	0-10cm	0-10cm
Nitrate Nitrogen (ppm)	>30[3]	19	27	13	6.6	3.3	12	8.5
Phosphorus - Colwell (ppm)	>30[3]	22	31	17	26	9	56	19
Phosphorus - (available) Bray (ppm)	>30[3]	-	-	-	-	-	-	-
Phosphorus Sorption Capacity (P-Sorp)	> 30[4]	250	250	370	280	240	330	460
Available K (ppm)	> 225	-	-	-	-	-	-	-
Sulphate Sulphur (KCl40) (ppm)	>10[1]	-	-	-	-	-	-	-
DTPA Zinc (ppm)	1 - 5[6]	-	-	-	-	-	-	-
DTPA Copper (ppm)	0.2 - 5[6]	-	-	-	-	-	-	-
DTPA Iron (ppm)	*no data*	-	-	-	-	-	-	-
DTPA Manganese (ppm)	1 - 5[6]	-	-	-	-	-	-	-
Boron (ppm)	>0.3[2]	-	-	-	-	-	-	-
EC (dS/m)	<0.5[1]	0.120	0.083	0.062	0.043	0.065	0.074	0.029
ECe (dS/m)	<2[1]	-	-	-	-	-	-	-
Organic C (% C)	2[1]	1.5	1.2	1.9	1	0.52	2.3	2
Chloride (ppm)	< 125[4]	-	-	-	-	-	-	-
pH (H2O)	6 - 8[1]	7.6	8.0	7.5	6.4	7.5	6.5	5.0
pH (CaCl2)	5.5 - 7[1]	6.7	5.6	5.2	5.7	6.7	5.5	4.2
CEC (meq/100gm)	5 - 15[1]	10	5.3	4.8	5.4	5.2	7.7	2.6
Exchangeable Aluminium (ppm)	*no data*	-	-	-	-	-	-	-
Exchangeable Potassium (ppm)	*no data*	46.0	60.0	28.0	130.0	23.0	310.0	55.0
Exchangeable Sodium (ppm)	*no data*	60.0	56.0	83.0	48.0	69.0	100.0	5.0
Exchangeable Magnesium (ppm)	*no data*	58.0	63.0	77.0	63.0	29.0	170.0	42.0
Exchangeable Calcium (ppm)	*no data*	1800.0	880.0	750.0	870.0	920.0	1000.0	420.0
Aluminium (meq/100gm)*	<1[2]	-	-	-	-	-	-	-
Calcium (meq/100gm)	n/a	9.1	4.4	3.8	4.3	4.6	5.1	2.1
Magnesium (meq/100gm)	n/a	0.48	0.52	0.63	0.52	0.24	1.4	0.34
Sodium (meq/100gm)	<4.3[2]	0.26	0.24	0.36	0.21	0.3	0.44	0.02
Potassium (meq/100gm)	*no data*	0.12	0.15	0.07	0.34	0.06	0.79	0.14
Ca:Mg Ratio	>2[1]	-	-	-	-	-	-	-
K:Mg Ratio	*no data*	-	-	-	-	-	-	-
Aluminium %	<5%[1]	-	-	-	-	-	-	-
Calcium %	65-80%[1]	91.4	82.8	77.9	80.3	88.4	66.3	80.5
Magnesium %	10-15%[1]	4.8	9.7	13.1	9.6	4.7	17.8	13.2
Sodium %	<5%[1]	2.6	4.6	7.4	3.9	5.8	5.7	0.9
Potassium %	1-5%[1]	1.2	2.9	1.5	6.3	1.1	10.3	5.5
EAT (H2O Class)	*no data*	3	3	5	3	2	2	3
EAT (Low SAR Class)	*no data*	-	-	-	-	-	-	-
EAT (High SAR Class)	*no data*	-	-	-	-	-	-	-
Aluminium total (mg/kg)	*no data*	2600	1600	3200	1500	2000	6500	2900
Arsenic (mg/kg)	<20[7]	-	-	-	-	-	-	-
Cadmium (mg/kg)	<1[7]	-	-	-	-	-	-	-
Chromium (mg/kg)	<100[7]	-	-	-	-	-	-	-
Copper (mg/kg)	<100[7]	-	-	-	-	-	-	-
Lead (mg/kg)	<150[7]	-	-	-	-	-	-	-
Mercury (mg/kg)	<1[7]	-	-	-	-	-	-	-
Nickel (mg/kg)	<60[7]	-	-	-	-	-	-	-
Zinc (mg/kg)	<200[7]	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen (mg/kg)	500-3000[4]	2000	1600	2200	2000	3100	2700	2300
Total Phosphorus (mg/kg)	>30[4]	280	230	280	290	470	390	330

1. NSW Agriculture (1998) Interpreting Soil Results: Rules of Thumb. NSW Agriculture, Wagga Wagga

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7. NSW EPA (1997) Environmental Guidelines: Use & Disposal of Biosolids Products. NSW EPA Publication, Chatswood.MASCC Agricultural Land

Parameter	Desirable Range	Soil Monitoring Sites (SMS) - 1 April 2026						
		SMS1	SMS2	SMS3	SMS4	SMS5	SMS6	SMS7
		50-60cm	50-60cm	50-60cm	50-60cm	50-60cm	50-60cm	50-60cm
Nitrate Nitrogen (ppm)	>30[3]	20	1.7	3.4	3.3	4.2	1.9	1.7
Phosphorus - Colwell (ppm)	>30[3]	2	3	3	12	4	16	3
Phosphorus - (available) Bray (ppm)	>30[3]	-	-	-	-	-	-	-
Phosphorus Sorption Capacity (P-Sorp)	> 30[4]	200	640	220	170	600	780	500
Available K (ppm)	> 225	-	-	-	-	-	-	-
Sulphate Sulphur (KCl40) (ppm)	>10[1]	-	-	-	-	-	-	-
DTPA Zinc (ppm)	1 - 5[6]	-	-	-	-	-	-	-
DTPA Copper (ppm)	0.2 - 5[6]	-	-	-	-	-	-	-
DTPA Iron (ppm)	*no data*	-	-	-	-	-	-	-
DTPA Manganese (ppm)	1 - 5[6]	-	-	-	-	-	-	-
Boron (ppm)	>0.3[2]	-	-	-	-	-	-	-
EC (dS/m)	<0.5[1]	0.096	0.076	0.025	0.027	0.140	0.130	0.013
ECe (dS/m)	<2[1]	-	-	-	-	-	-	-
Organic C (% C)	2[1]	0.31	0.44	0.17	0.55	0.63	0.65	0.38
Chloride (ppm)	< 125[4]	-	-	-	-	-	-	-
pH (H2O)	6 - 8[1]	7.4	5.2	5.9	6.6	6.6	5.1	5.1
pH (CaCl2)	5.5 - 7[1]	6.8	4	5	5.8	6	3.9	4.1
CEC (meq/100gm)	5 - 15[1]	2	8.2	1.4	3	11	5.6	2.7
Exchangeable Aluminium (ppm)	*no data*	-	-	-	-	-	-	-
Exchangeable Potassium (ppm)	*no data*	11.0	200.0	12.0	68.0	170.0	420.0	29.0
Exchangeable Sodium (ppm)	*no data*	31.0	190.0	39.0	32.0	220.0	170.0	7.0
Exchangeable Magnesium (ppm)	*no data*	8.0	350.0	27.0	31.0	260.0	130.0	65.0
Exchangeable Calcium (ppm)	*no data*	360.0	800.0	190.0	490.0	1400.0	540.0	420.0
Aluminium (meq/100gm)	<1[2]	-	-	-	-	-	-	-
Calcium (meq/100gm)	n/a	1.8	4	0.96	2.4	7	2.7	2.1
Magnesium (meq/100gm)	n/a	0.07	2.9	0.22	0.25	2.1	1.1	0.54
Sodium (meq/100gm)	<4.3[2]	0.14	0.85	0.17	0.14	0.95	0.72	0.03
Potassium (meq/100gm)	*no data*	0.03	0.51	0.03	0.17	0.43	1.1	0.08
Ca:Mg Ratio	>2[1]	-	-	-	-	-	-	-
K:Mg Ratio	*no data*	-	-	-	-	-	-	-
Aluminium %	<5%[1]	-	-	-	-	-	-	-
Calcium %	65-80%[1]	88.5	48.4	69.4	81.2	66.9	48.1	76.6
Magnesium %	10-15%[1]	3.3	35.1	16	8.4	20.1	19.7	19.6
Sodium %	<5%[1]	6.8	10.3	12.4	4.6	9	12.9	1.1
Potassium %	1-5%[1]	1.4	6.2	2.2	5.8	4	19.3	2.8
EAT (H2O Class)	*no data*	2	3	1	2	1	3	3
EAT (Low SAR Class)	*no data*	-	-	-	-	-	-	-
EAT (High SAR Class)	*no data*	-	-	-	-	-	-	-
Aluminium total (mg/kg)	*no data*	1100	9000	1200	1200	17000	16000	3900
Arsenic (mg/kg)	<20[7]	-	-	-	-	-	-	-
Cadmium (mg/kg)	<1[7]	-	-	-	-	-	-	-
Chromium (mg/kg)	<100[7]	-	-	-	-	-	-	-
Copper (mg/kg)	<100[7]	-	-	-	-	-	-	-
Lead (mg/kg)	<150[7]	-	-	-	-	-	-	-
Mercury (mg/kg)	<1[7]	-	-	-	-	-	-	-
Nickel (mg/kg)	<60[7]	-	-	-	-	-	-	-
Zinc (mg/kg)	<200[7]	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen (mg/kg)	500-3000[4]	540	240	380	450	490	390	590
Total Phosphorus (mg/kg)	>30[4]	160	55	85	170	120	97	170

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Attachment E: *Nutrient Budget 2025-2026*

WINTER 2025	CROP (VARIETY)	DATE SOWN	SOIL P STATUS (kg/ha)	SOIL N STATUS (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	RYE & CLOVER	n/a	32.4	7.5	13.2	42.2	1	180	45	200	1.6	29.7
CP2	LUCERNE, CLOVER, & RYE	n/a	39.6	12.0	52.8	42.2	1	180	45	200	48.4	34.2
CP3	RYE & CLOVER	n/a	18.0	10.0	52.8	42.2	1	180	45	200	26.8	32.2
CP4	LUCERNE, CLOVER, & RYE	n/a	87.6	10.1	13.2	42.2	1	180	45	200	56.8	32.3
CP5	LUCERNE, CLOVER, & RYE	n/a	43.2	78.0	13.2	21.1	1	180	45	200	12.4	79.1
SHT	OATS	n/a	32.4	6.6	52.8	211	1	65	50	250	36.2	32.6

SUMMER 2025/26	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	SORGHUM, RYE & CLOVER	n/a	1.6	29.7	39.6	42.4	1	180	60	250	0.0	2.1
CP2	SORGHUM, LUCERNE, RYE & CLOVER	n/a	48.4	34.2	26.4	42.4	1	180	60	200	15.8	56.6
CP3	SORGHUM, RYE & CLOVER	n/a	26.8	32.2	39.6	42.4	1	180	60	250	7.4	4.6
CP4	SORGHUM, LUCERNE, RYE & CLOVER	n/a	56.8	32.3	26.4	42.4	1	180	60	250	24.2	4.7
CP5	SORGHUM, LUCERNE, RYE & CLOVER	n/a	12.4	79.1	26.4	42.4	1	180	60	250	0.0	51.5
SHT	SORGHUM, OATS & RYE	n/a	36.2	32.6	52.8	211	1	45	60	250	30.0	38.6

WINTER 2026	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	RYE & CLOVER	tba	0	2.1	52.8	42.4	1	180	45	200	8.8	24.5
CP2	LUCERNE & RYE & CLOVER	tba	15.8	56.6	39.6	0	1	180	45	200	11.4	36.6
CP3	RYE & CLOVER	tba	7.4	4.56	52.8	42.4	1	180	45	200	16.2	27.0
CP4	LUCERNE & RYE & CLOVER	tba	24.2	4.68	39.6	42.4	1	180	45	200	19.8	27.1
CP5	LUCERNE & RYE & CLOVER	tba	0	51.5	69.6	0	1	180	45	200	25.6	31.5
SHT	OATS & RYE	tba	30	38.6	52.8	126.6	1	45	50	200	33.8	10.2

SUMMER 2026/27	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	LUCERNE & CLOVER	tba	8.8	24.5	52.8	84.8	1	180	45	250	17.6	39.3
CP2	LUCERNE, CLOVER & MILLET	tba	11.4	36.6	52.8	84.8	1	180	60	250	5.2	51.4
CP3	LUCERNE & CLOVER	tba	16.2	26.96	52.8	84.8	1	180	45	250	25.0	41.8
CP4	LUCERNE, CLOVER & MILLET	tba	19.8	27.08	52.8	84.8	1	180	60	250	13.6	41.9
CP5	LUCERNE, CLOVER & MILLET	tba	25.6	31.5	26.4	84.8	1	180	60	250	0.0	46.3
SHT	BRASSICA	tba	33.8	10.2	52.8	211	1	45	50	250	37.6	16.2

WINTER 2027	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	RYE & WHITE CLOVER	tba	17.6	39.3	52.8	42.2	1	180	45	200	26.4	61.5
CP2	LUCERNE / CLOVER / RYE	tba	5.2	51.4	52.8	0	1	180	45	200	14.0	31.4
CP3	RYE & WHITE CLOVER	tba	25	41.76	52.8	42.2	1	180	45	200	33.8	64.0
CP4	LUCERNE / CLOVER / RYE	tba	13.6	41.88	52.8	0	1	180	45	200	22.4	21.9
CP5	LUCERNE / CLOVER / RYE	tba	0	46.3	52.8	0	1	180	45	200	8.8	26.3
SHT	OATS	tba	37.6	16.2	52.8	211	1	45	50	250	41.4	22.2

SUMMER 2027/28	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	LUCERNE & WHITE CLOVER	tba	26.4	61.5	52.8	42.2	1	180	45	250	35.2	33.7
CP2	LUCERNE / CLOVER / MILLET	tba	14	31.4	52.8	42.2	1	180	60	250	7.8	3.6
CP3	LUCERNE & WHITE CLOVER	tba	33.8	63.96	52.8	42.2	1	180	45	250	42.6	36.2
CP4	LUCERNE / CLOVER / MILLET	tba	22.4	21.88	52.8	84.4	1	180	60	250	16.2	36.3
CP5	LUCERNE / CLOVER / MILLET	tba	8.8	26.3	52.8	84.4	1	180	60	250	2.6	40.7
SHT	BRASSICA	tba	41.4	22.2	52.8	211	1	45	50	250	45.2	28.2

WINTER 2028	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	LUCERNE	tba	35.2	33.7	22	0	3	193	25	200	35.2	26.7
CP2	LUCERNE	tba	7.8	3.6	22	44	3	193	25	200	7.8	40.6
CP3	RYEGRASS	tba	42.6	36.16	26.4	44	1	45	21	93	49.0	32.2
CP4	RYEGRASS	tba	16.2	36.28	26.4	44	1	45	21	93	22.6	32.3
CP5	RYEGRASS	tba	2.6	40.7	26.4	18.6	1	90	21	93	9.0	56.3
SHT	RYEGRASS	tba	45.2	28.2	26.4	88	1	45	21	93	51.6	68.2

SUMMER 2028/29	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	LUCERNE	tba	35.2	26.7	26.4	0	3	193	25	200	39.6	19.7
CP2	LUCERNE	tba	7.8	40.6	26.4	44	3	193	25	200	12.2	77.6
CP3	RYEGRASS	tba	49	32.16	22	11	3	53	21	47	53.0	49.2
CP4	RYEGRASS	tba	22.6	32.28	22	11	3	53	21	47	26.6	49.3
CP5	RYEGRASS	tba	9	56.3	22	11	3	53	21	47	13.0	73.3
SHT	RYEGRASS	tba	51.6	68.2	22	23	3	53	21	47	55.6	97.2

WINTER 2029	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	LUCERNE	tba	39.6	19.7	22	23	3	193	25	200	39.6	35.7
CP2	LUCERNE	tba	12.2	77.6	22	23	3	193	25	200	12.2	93.6
CP3	RYEGRASS	tba	53	49.16	26.4	23	1	45	21	93	59.4	24.2
CP4	RYEGRASS	tba	26.6	49.28	26.4	23	1	45	21	93	33.0	24.3
CP5	RYEGRASS	tba	13	73.3	26.4	23	1	45	21	93	19.4	48.3
SHT	RYEGRASS	tba	55.6	97.2	26.4	18.6	1	45	21	93	62.0	67.8

SUMMER 2029/30	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	LUCERNE	tba	39.6	35.7	26.4	0	3	193	25	200	44.0	28.7
CP2	LUCERNE	tba	12.2	93.6	26.4	0	3	193	25	200	16.6	86.6
CP3	RYEGRASS	tba	59.4	24.16	0	23	3	53	21	47	41.4	53.2
CP4	RYEGRASS	tba	33	24.28	0	23	3	53	21	47	15.0	53.3
CP5	RYEGRASS	tba	19.4	48.3	26.4	23	3	53	21	47	27.8	77.3
SHT	RYEGRASS	tba	62	67.8	22	23	3	53	21	47	66.0	96.8

WINTER 2030	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	LUCERNE	tba	44	28.7	22	0	3	193	25	200	44.0	21.7
CP2	LUCERNE	tba	16.6	86.6	22	0	3	193	25	200	16.6	79.6
CP3	WHEAT	tba	41.4	53.16	48.4	18	1	45	45	100	45.8	16.2
CP4	WHEAT	tba	15	53.28	48.4	39	1	45	45	100	19.4	37.3
CP5	RYEGRASS	tba	27.8	77.3	26.4	18	1	45	21	93	34.2	47.3
SHT	RYEGRASS	tba	66	96.8	26.4	39	1	45	21	93	72.4	87.8

SUMMER 2030/31	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	LUCERNE	tba	44	21.7	26.4	0	3	193	25	200	48.4	14.7
CP2	LUCERNE	tba	16.6	79.6	26.4	0	3	193	25	200	21.0	72.6
CP3	FALLOW	tba	45.8	16.16	0	0	0	0	0	0	45.8	16.2
CP4	FALLOW	tba	19.4	37.28	0	0	0	0	0	0	19.4	37.3
CP5	RYEGRASS	tba	34.2	47.3	22	23	3	53	21	47	38.2	76.3
SHT	RYEGRASS	tba	72.4	87.8	22	0	3	53	21	47	76.4	93.8

WINTER 2031	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	LUCERNE	tba	48.4	14.7	22	0	3	193	25	200	48.4	7.7
CP2	LUCERNE	tba	21	72.6	22	23	3	193	25	200	21.0	88.6
CP3	WHEAT	tba	45.8	16.16	39.6	63.6	1	45	45	100	41.4	24.8
CP4	WHEAT	tba	19.4	37.28	52.8	63.6	1	45	45	100	28.2	45.9
CP5	RYEGRASS	tba	38.2	76.3	22	18.6	1	45	21	93	40.2	46.9
SHT	RYEGRASS	tba	76.4	93.8	11	18.6	1	45	21	93	67.4	64.4

SUMMER 2031/32	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	RYEGRASS	tba	48.4	7.7	0	23	3	53	21	47	30.4	36.7
CP2	RYEGRASS	tba	21	88.6	22	23	3	53	21	47	25.0	117.6
CP3	LUCERNE	tba	41.4	24.76	37.4	0	3	193	25	200	56.8	17.8
CP4	LUCERNE	tba	28.2	45.88	37.4	0	3	193	25	200	43.6	38.9
CP5	RYEGRASS	tba	40.2	46.9	0	23	1	53	21	47	20.2	75.9
SHT	RYEGRASS	tba	67.4	64.4	0	23	3	53	21	47	49.4	93.4

WINTER 2032	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	RYEGRASS	tba	30.4	36.7	26.4	23	1	45	21	93	36.8	11.7
CP2	RYEGRASS	tba	25	117.6	26.4	23	1	45	21	93	31.4	92.6
CP3	LUCERNE	tba	56.8	17.76	22	0	3	193	25	200	56.8	10.8
CP4	LUCERNE	tba	43.6	38.88	22	0	3	193	25	200	43.6	31.9
CP5	RYEGRASS	tba	20.2	75.9	26.4	23	1	45	21	93	26.6	50.9
SHT	RYEGRASS	tba	49.4	93.4	26.4	23	1	45	21	93	55.8	68.4

SUMMER 2032/33	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	RYEGRASS	tba	36.8	11.7	22	0	3	53	21	47	40.8	17.7
CP2	RYEGRASS	tba	31.4	92.6	22	0	3	53	21	47	35.4	98.6
CP3	LUCERNE	tba	56.8	10.76	22	0	3	193	25	200	56.8	3.8
CP4	LUCERNE	tba	43.6	31.88	22	23	3	193	25	200	43.6	47.9
CP5	RYEGRASS	tba	26.6	50.9	22	0	3	53	21	47	30.6	56.9
SHT	RYEGRASS	tba	55.8	68.4	22	0	3	53	21	47	59.8	74.4

WINTER 2033	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	WHEAT	tba	40.8	17.7	39.6	46	1	45	45	100	36.4	8.7
CP2	WHEAT	tba	35.4	98.6	39.6	46	1	45	45	100	31.0	89.6
CP3	LUCERNE	tba	56.8	3.76	22	46	3	193	25	200	56.8	42.8
CP4	LUCERNE	tba	43.6	47.88	22	0	3	193	25	200	43.6	40.9
CP5	WHEAT	tba	30.6	56.9	26.4	55	1	45	45	100	13.0	56.9
SHT	RYEGRASS	tba	59.8	74.4	26.4	23	1	45	21	93	66.2	49.4

SUMMER 2033/34	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	FALLOW	tba	36.4	8.7	0	0	0	0	0	0	36.4	8.7
CP2	FALLOW	tba	31	89.6	0	0	0	0	0	0	31.0	89.6
CP3	LUCERNE	tba	56.8	42.76	22	0	3	193	25	200	56.8	35.8
CP4	LUCERNE	tba	43.6	40.88	22	0	3	193	25	200	43.6	33.9
CP5	MAIZE	tba	13	56.9	44	206	3	53	50	250	10.0	65.9
SHT	RYEGRASS	tba	66.2	49.4	0	0	3	53	21	47	48.2	55.4

WINTER 2034	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	WHEAT	tba	36.4	8.7	39.6	69	1	45	45	100	32.0	22.7
CP2	WHEAT	tba	31	89.6	39.6	46	1	45	45	100	26.6	80.6
CP3	LUCERNE	tba	56.8	35.76	22	0	3	193	25	200	56.8	28.8
CP4	LUCERNE	tba	43.6	33.88	22	0	3	193	25	200	43.6	26.9
CP5	WHEAT	tba	10	65.9	39.6	55	1	45	45	100	5.6	65.9
SHT	RYEGRASS	tba	48.2	55.4	26.4	46	1	45	21	93	54.6	53.4

SUMMER 2034/35	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	LUCERNE	tba	32	22.7	26.4	21	3	193	25	200	36.4	36.7
CP2	LUCERNE	tba	26.6	80.6	26.4	21	3	193	25	200	31.0	94.6
CP3	LUCERNE	tba	56.8	28.76	22	21	3	193	25	200	56.8	42.8
CP4	LUCERNE	tba	43.6	26.88	22	21	3	193	25	200	43.6	40.9
CP5	FALLOW	tba	5.6	65.9	0	0	0	0	0	0	5.6	65.9
SHT	FALLOW	tba	54.6	53.4	0	0	0	0	0	0	54.6	53.4

WINTER 2035	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	LUCERNE	tba	36.4	36.7	22	0	3	193	25	200	36.4	29.7
CP2	LUCERNE	tba	31	94.6	22	0	3	193	25	200	31.0	87.6
CP3	RYEGRASS	tba	56.8	42.76	26.4	22	1	45	21	93	63.2	16.8
CP4	RYEGRASS	tba	43.6	40.88	26.4	22	1	45	21	93	50.0	14.9
CP5	RYEGRASS	tba	5.6	65.9	26.4	22	1	45	21	93	12.0	39.9
SHT	RYEGRASS	tba	54.6	53.4	26.4	22	1	45	21	93	61.0	27.4

SUMMER 2035/36	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	LUCERNE	tba	36.4	29.7	26.4	0	3	193	25	200	40.8	22.7
CP2	LUCERNE	tba	31	87.6	26.4	0	3	193	25	200	35.4	80.6
CP3	RYEGRASS	tba	63.2	16.76	11	22	3	53	21	47	56.2	44.8
CP4	RYEGRASS	tba	50	14.88	11	22	3	53	21	47	43.0	42.9
CP5	RYEGRASS	tba	12	39.9	22	22	3	53	21	47	16.0	67.9
SHT	RYEGRASS	tba	61	27.4	11	22	3	53	21	47	54.0	55.4

WINTER 2036	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	LUCERNE	tba	40.8	22.7	22	0	3	193	25	200	40.8	15.7
CP2	LUCERNE	tba	35.4	80.6	22	0	3	193	25	200	35.4	73.6
CP3	RYEGRASS	tba	56.2	44.76	11	18.6	1	45	21	93	47.2	15.4
CP4	RYEGRASS	tba	43	42.88	11	18.6	1	45	21	93	34.0	13.5
CP5	RYEGRASS	tba	16	67.9	11	42.6	1	45	21	93	7.0	62.5
SHT	RYEGRASS	tba	54	55.4	11	18.6	1	45	21	93	45.0	26.0

SUMMER 2036/37	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	LUCERNE	tba	40.8	15.7	22	0	3	193	25	200	40.8	8.7
CP2	LUCERNE	tba	35.4	73.6	22	0	3	193	25	200	35.4	66.6
CP3	RYEGRASS	tba	47.2	15.36	0	0	3	53	21	47	29.2	21.4
CP4	RYEGRASS	tba	34	13.48	22	0	3	53	21	47	38.0	19.5
CP5	RYEGRASS	tba	7	62.5	22	0	3	53	21	47	11.0	68.5
SHT	RYEGRASS	tba	45	26	22	0	3	53	21	47	49.0	32.0

WINTER 2037	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	LUCERNE	tba	40.8	8.7	22	0	3	193	25	200	40.8	1.7
CP2	LUCERNE	tba	35.4	66.6	22	0	3	193	25	200	35.4	59.6
CP3	WHEAT	tba	29.2	21.36	39.6	44	1	45	45	100	24.8	10.4
CP4	WHEAT	tba	38	19.48	26.4	44	1	45	45	100	20.4	8.5
CP5	RYEGRASS	tba	11	68.5	26.4	23	1	45	21	93	17.4	43.5
SHT	RYEGRASS	tba	49	32	26.4	23	1	45	21	93	55.4	7.0

SUMMER 2037/38	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	LUCERNE	tba	40.8	1.7	22	22	3	193	25	200	40.8	16.7
CP2	LUCERNE	tba	35.4	59.6	22	22	3	193	25	200	35.4	74.6
CP3	FALLOW	tba	24.8	10.36	22	22	3	53	21	47	28.8	38.4
CP4	FALLOW	tba	20.4	8.48	22	23	0	0	0	0	42.4	31.5
CP5	RYEGRASS	tba	17.4	43.5	22	23	3	53	21	47	21.4	72.5
SHT	RYEGRASS	tba	55.4	7	22	23	3	53	21	47	59.4	36.0

WINTER 2038	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	LUCERNE	tba	40.8	16.7	22	0	3	193	25	200	40.8	9.7
CP2	LUCERNE	tba	35.4	74.6	22	0	3	193	25	200	35.4	67.6
CP3	WHEAT	tba	28.8	38.36	52.8	46	1	45	45	100	37.6	29.4
CP4	WHEAT	tba	42.4	31.48	26.4	46	1	45	45	100	24.8	22.5
CP5	RYEGRASS	tba	21.4	72.5	26.4	18.6	1	45	21	93	27.8	43.1
SHT	RYEGRASS	tba	59.4	36	26.4	18.6	1	45	21	93	65.8	6.6

SUMMER 2038/39	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	RYEGRASS	tba	40.8	9.7	22	23	3	53	21	47	44.8	38.7
CP2	RYEGRASS	tba	35.4	67.6	22	0	3	53	21	47	39.4	73.6
CP3	LUCERNE	tba	37.6	29.36	37.4	0	3	193	25	200	53.0	22.4
CP4	LUCERNE	tba	24.8	22.48	37.4	23	3	193	25	200	40.2	38.5
CP5	RYEGRASS	tba	27.8	43.1	0	0	1	53	21	47	7.8	49.1
SHT	RYEGRASS	tba	65.8	6.6	0	23	3	53	21	47	47.8	35.6

WINTER 2039	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	RYEGRASS	tba	44.8	38.7	22	0	3	193	25	200	44.8	31.7
CP2	RYEGRASS	tba	39.4	73.6	11	0	3	193	25	200	28.4	66.6
CP3	LUCERNE	tba	53	22.36	22	46	1	45	45	100	31.0	13.4
CP4	LUCERNE	tba	40.2	38.48	44	46	1	45	45	100	40.2	29.5
CP5	RYEGRASS	tba	7.8	49.1	26.4	18.6	1	45	21	93	14.2	19.7
SHT	RYEGRASS	tba	47.8	35.6	26.4	18.6	1	45	21	93	54.2	6.2

SUMMER 2039/40	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	RYEGRASS	tba	44.8	31.7	0	12.5	22	53	21	47	45.8	50.2
CP2	RYEGRASS	tba	28.4	66.6	0	0	22	53	21	47	29.4	72.6
CP3	LUCERNE	tba	31	13.36	37.4	0	3	193	25	200	46.4	6.4
CP4	LUCERNE	tba	40.2	29.48	22	0	3	193	25	200	40.2	22.5
CP5	RYEGRASS	tba	14.2	19.7	0	23	22	53	21	47	15.2	48.7
SHT	RYEGRASS	tba	54.2	6.2	0	23	3	53	21	47	36.2	35.2

WINTER 2040	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	RYEGRASS	tba	29.4	72.6	22	0	3	193	25	200	29.4	65.6
CP2	RYEGRASS	tba	46.4	6.36	22	63.6	3	193	25	200	46.4	63.0
CP3	LUCERNE	tba	40.2	22.48	44	63.6	1	45	45	100	40.2	31.1
CP4	LUCERNE	tba	15.2	48.7	44	63.6	1	45	45	100	15.2	57.3
CP5	RYEGRASS	tba	36.2	35.2	26.4	44	1	45	21	93	42.6	31.2
SHT	RYEGRASS	tba	36.2	35.2	26.4	55	1	45	21	93	42.6	42.2

SUMMER 2040/41	CROP (VARIETY)	DATE SOWN	SOIL P AT SOWING (kg/ha)	SOIL N AT SOWING (kg/ha)	P FERTLISER (kg/ha)	N FERTILISER (kg/ha)	P ADDITIONAL (kg/ha)	N ADDITIONAL (kg/ha)	P REMOVAL (kg/ha)	N REMOVAL (kg/ha)	P AFTER CROP (kg/ha)	N AFTER CROP (kg/ha)
CP1	RYEGRASS	tba	29.4	65.6	0	0	22	53	21	47	30.4	71.6
CP2	RYEGRASS	tba	46.4	62.96	0	0	22	53	21	47	47.4	69.0
CP3	LUCERNE	tba	40.2	31.08	37.4	0	3	193	25	200	55.6	24.1
CP4	LUCERNE	tba	15.2	57.3	37.4	0	3	193	25	200	30.6	50.3
CP5	RYEGRASS	tba	42.6	31.2	0	0	22	53	21	47	43.6	37.2
SHT	RYEGRASS	tba	42.6	42.2	26.4	0	3	53	21	47	51.0	48.2

Attachment F: *By-Products 2025-2026*

Pollutant	Unit of measure	Boiler Sand by-products monitoring 2025-26												
		2/07/2025	5/08/2025	2/09/2025	9/10/2025	3/11/2025	2/12/2025	20/01/2026	5/02/2026	12/03/2026	1/04/2026	8/05/2026	15/06/2026	Mean
Arsenic	ppm	< 1	< 1	< 1	< 1	2	< 1	< 1	< 1	< 1	1	1	< 1	1
Cadmium	ppm	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	0.3
Chromium	ppm	6.4	8.2	5.2	5.5	6.6	7.6	6.4	6.0	5.1	6.3	7.0	6.0	6.4
Copper	ppm	3.2	3.6	2.6	3.4	7.0	5.3	4.8	4.7	4.4	5.8	6.5	4.3	4.6
Lead	ppm	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1	1	< 1	1
Mercury	ppm	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Nickel	ppm	3.7	4.1	3.1	3.2	2.8	4.0	4.6	3.7	3.1	3.9	5.8	4.0	4
Zinc	ppm	41	34	27	34	24	38	29	30	27	30	27	48	32.4
Sodium	ppm	310	230	150	170	200	240	370	500	230	440	360	480	307
Moisture	%	< 1	2.7	3.6	7	< 1	2	< 1	< 1	< 1	3.6	3.3	< 1	2.3
Boron	ppm	15	23	13	17	14	22	21	23	18	21	14	16	18
Conductivity	dS/m	0.470	0.360	0.170	0.450	0.510	0.780	1.200	0.740	0.180	0.690	0.029	0.340	0.5
Molybdenum	ppm	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1
pH	pH	10.9	10.1	10.0	10.0	10.8	10.5	10.5	10.3	9.5	10	9.7	10	10.2
Selenium	ppm	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	2

Pollutant	Unit of measure	Fly ash by-products monitoring 2025-26												
		2/07/2025	5/08/2025	2/09/2025	9/10/2025	3/11/2025	2/12/2025	20/01/2026	5/02/2026	12/03/2026	1/04/2026	8/05/2026	15/06/2026	Mean
Arsenic	ppm	11	12	7	5	61	23	16	28	8	9	5	7	16
Cadmium	ppm	1.2	1.7	1.0	1.2	1.9	1.4	1.7	1.3	1.3	1.4	0.9	1.3	1.4
Chromium	ppm	18	24	17	19	42	32	29	30	17	20	14	20	23.5
Copper	ppm	31	44	34	32	60	54	65	54	38	39	32	45	44.0
Lead	ppm	9	16	14	10	14	11	14	15	13	14	9	16.0	13
Mercury	ppm	0.11	0.13	0.08	0.09	0.17	0.11	0.09	0.13	0.13	0.12	0.08	0.16	0.1
Nickel	ppm	16	24	16	19	18	20	30	18	17	17	14	19.0	19
Zinc	ppm	180	280	210	230	300	300	380	270	300	270	180	260.0	263
Sodium	ppm	2400	1800	1300	1200	2200	1500	3000	2500	2300	1400	1500	3000.0	2008
Moisture	%	16.3	19.4	21.7	19.5	13.4	10.8	13.2	9	1.8	20	2.1	23.8	14.2
Boron	ppm	170	250	160	180	200	190	250	200	200	190	150	210.0	196
Conductivity	dS/m	8.900	12.000	6.100	12.000	17.000	13.00	21.00	11.00	12.00	9.10	12	11.0	12.1
Molybdenum	ppm	1	1	< 1	1	3	2	2	2	1	2	1	2	2
pH	pH	12.1	12.2	11.7	12.1	12.3	11.8	12.3	11.7	12.1	11.7	12.2	12.1	12.0
Selenium	ppm	< 2	3	< 2	< 2	< 2	<2	2	2	< 2	< 2	< 2	<2	2.1
Total Organic Carbon	ppm	6700	6700	7700	6200	10000	13000	11000	11000	9300	9100	8600	12000	9275

Pollutant	Unit of measure	Lime mud by-products monitoring 2025-26												
		2/07/2025	5/08/2025	2/09/2025	9/10/2025	3/11/2025	2/12/2025	20/01/2026	5/02/2026	12/03/2026	1/04/2026	8/05/2026	15/06/2026	Mean
Arsenic	ppm	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1	1	1
Cadmium	ppm	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0	0.3
Chromium	ppm	6.7	7.0	7.3	5.8	5.4	5.1	6.0	6.2	5.5	7.6	6.4	6.7	6.3
Copper	ppm	0.5	0.6	0.7	0.7	0.8	< 0.5	< 0.5	0.7	0.6	1.8	< 0.5	1	0.7
Lead	ppm	310	160	730	390	380	120	250	250	310	320	140	230	299
Mercury	ppm	< 0.05	<0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0
Nickel	ppm	< 0.5	0.5	0.8	1.1	1.0	0.9	0.9	0.7	< 0.5	1.8	< 0.5	0.5	1
Zinc	ppm	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	9	< 2	< 2	2.6
Sodium	ppm	11000	14000	14000	15000	13000	12000	11000	12000	13000	12000	12000	11000	12500
Moisture	%	21.5	23.1	26.6	20.2	8.5	4.8	10.4	14.7	5.7	22	19.4	15	15.9
Boron	ppm	10	12	9	9	7	9	10	10	13	11	13	15	11
Conductivity	dS/m	2.900	2.500	1.000	2.900	0.750	2.200	1.100	# 0.480	4500	15000	800	1	1692.9
Molybdenum	ppm	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1
pH	pH	12.0	11.6	10.1	10.2	10.1	10	11	10	10.6	12	10.0	10	10.7
Selenium	ppm	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	2.0

Pollutant	Unit of measure	Dregs & Grits by-products monitoring 2025-26												
		2/07/2025	5/08/2025	2/09/2025	9/10/2025	3/11/2025	2/12/2025	20/01/2026	5/02/2026	12/03/2026	1/04/2026	8/05/2026	15/06/2026	Mean
Arsenic	ppm	< 1	2	2	< 1	2	19	2	3	2	1	1	< 1	3
Cadmium	ppm	2.3	3.6	< 0.3	0.9	0.5	0.8	1.4	0.9	0.8	1.1	0.9	0.7	1.2
Chromium	ppm	28	69	5.0	23	22	21	38	24	22	29	18	16	26.3
Copper	ppm	99	170	5.6	66	24	33	83	49	51	74	45	41	62
Lead	ppm	230	190	280	310	87	45	150	100	490	460	83	44	206
Mercury	ppm	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.09	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Nickel	ppm	21	54	2.9	18	12	11	24	14	14	19	10	11	18
Zinc	ppm	490	880	34	310	130	180	460	260	250	340	260	220	318
Sodium	ppm	12000	11000	22000	14000	12000	22000	11000	13000	14000	19000	8200	5800	13667
Moisture	%	34.6	41.0	16.3	42	18.3	16.4	23.0	1	20.5	32	22.1	22	24.1
Boron	ppm	20	57	33	30	25	100	28	34	41	31	25	21	37
Conductivity	dS/m	2.300	2.800	2.200	4.700	14.000	2.300	4.200	6.400	4.600	10.000	2.700	2.400	4.9
Molybdenum	ppm	< 1	< 1	2	< 1	< 1	3	< 1	1	< 1	1	< 1	< 1	1
pH	pH	11.0	11.2	12.3	10.0	12.2	12.1	10.1	10.3	10.2	10.1	10.0	11	10.9
Selenium	ppm	3	5	< 2	< 2	< 2	< 2	2	< 2	< 2	2	< 2	< 2	2

Attachment G: *Sludge 2025-2026*

Monitoring Point - Sludge
Sampled from SBR

Pollutant	Critical Range	Unit of measure	Sludge (treated) monitoring 2025-26											
			2/07/2025	5/08/2025	2/09/2025	9/10/2025	3/11/2025	2/12/2025	20/01/2026	5/02/2026	12/03/2026	1/04/2026	8/05/2026	15/06/2026
Manganese	0.2 [1]	mg/L	0.060	0.040	0.066	0.046	0.044	0.260	0.270	0.140	0.130	0.140	0.150	0.110
Total suspended solids	<45 [2]	mg/L	14	80	19	22	37	1400	900	19	27	17	75	26
BOD	<15 [1]	mg/L	<5	33	<5	8	8	510	310	8	42	9	26	8
Sodium Adsorption Ratio	<4.5 [1]	SAR	4.2	3.9	3.5	5	4	3.9	3.1	3	4	3	3.3	3
Nitrogen (total)	<20 [2]	mg/L	4.0	5.3	2.7	6	3.8	110	66	4	13	5	13	5
Phosphorus (total)	<0.05 [1]	mg/L	1.2	1.5	1.0	0.9	1.1	18	10	1.40	2.7	1.50	0.25	1.2
Total dissolved solids	<225 [1]	mg/L	230	180	230	180	160	220	280	180	150	220	300	220
pH	6.0-8.5 [1]	pH	6.9	6.8	7.0	7.3	7.1	6.7	6.6	6.5	6.3	6.1	6.6	6.2
Conductivity	<350 [1]	uS/cm	370	340	430	340	270	410	500	320	360	350	500	340
Chloride	175	mg/L	29	32	52	26	28	34	58	35	32	37	51	36.0
Oil & Grease	<5 [2]	mg/L	<5	<5	<5	<5	<5	5	8	<5	<5	<5	<5	<5
Sodium - dissolved	115	mg/L	59	49	56	61	49	59	42	42	54	49	56	45

1. ANZG (2018) Australian & New Zealand Guidelines for Fresh & Marine Water Quality.

2. Visy P & P (2023) NSW EPA Licence 10232. Chatswood, NSW.