PUBLIC NOTICE DETAILS

PLANNING APPLICATION DETAILS

Application Number:	DA 2026/27
Application Type:	Discretionary Development Application
Property Location:	230, 2A & 66 Hollow Tree Road, Bothwell (CT 167795/1, 124612/2, 124612/1, 124613/3, 124613/4 & 211119/1)
Proposal:	Land Application (Spreading of Biosolids)
Advertising Commencement Date:	25 May 2026
Representation Period Closing Date:	09 June 2026
Responsible Officer:	Louisa Brown, Senior Planning Officer

The relevant documents may be viewed at Council's website www.centralhighlands.tas.gov.au or at Council's Offices 19 Alexander Street, Bothwell & 6 Tarleton Street, Hamilton during normal business hours.

Enquiries regarding this Application can be made by contacting Central Highlands Council on (03) 6259 5503 or by emailing development@centralhighlands.tas.gov.au. Please quote the "Application Number" when making your enquiry.

Representations on this application may be made to the General Manager in writing either by:

Post: 19 Alexander Street, Bothwell TAS 7030
Email: development@centralhighlands.tas.gov.au

All representations must include the authors full name, contact number and postal address and be received by 5.00pm on the representation period closing date.

RMCG

1 APRIL 2026

Biosolids Management Plan: Rothamay

Final Report

TasWater

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Victoria — Tasmania — NSW — Queensland

Certified B Corporation

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ACKNOWLEDGEMENT OF COUNTRY

Tasmania is Aboriginal land. We acknowledge the palawa and pakana, the Tasmanian Aboriginal people, as the Traditional Owners and continuing custodians of the lands, seas and waterways of lutruwita, Tasmania on which this project has been conducted. We recognise their continuing connection to land, waters and culture and pay our respects to their Elders past and present, and we acknowledge emerging leaders. Moreover, we express gratitude for the knowledge and insight that Traditional Owners and other Aboriginal and Torres Strait Islander people contribute to our shared work in Australia.

We pay respects to all Aboriginal and Torres Strait Islander communities. We recognise that Australia was founded on the genocide and dispossession of First Nations people and acknowledge that sovereignty was not ceded in this country. We embrace the spirit of reconciliation, working towards self-determination, equity of outcomes, and an equal voice for Australia's First People.

Executive summary

RMCG have been engaged by TasWater to assist them and their designated spreading contractor (Spectran Environmental Management (Spectran) with the development of a Biosolids Management Plan (BMP) to support the beneficial reuse of biosolids at a property at Bothwell (Rothamay). This BMP assesses and quantifies the biosolids TasWater are proposing to spread on the property. It identifies application rates as well as controls to mitigate potential environmental impacts and impacts on the nearby community. All proposed measures are in line with the requirements of the *Tasmanian Biosolids Reuse Guidelines 2020* (TBRG).

The proposed biosolids are sourced from seven of TasWater's southern Sewage Treatment Plants (STPs) that produce biosolids continuously. These STPs are: Cameron Bay, Macquarie Point, Prince of Wales Bay, Rokeby, Selfs Point, Rosny & Green Point. It is proposed to spread biosolids at a rate that is higher than given in the *Approved Management Method for the Reuse of Biosolids 2020* (AMM). This means an application for spreading the biosolids will be submitted for approval to the Council in the first instance. If the Council determines that the activity is permitted under the Planning Scheme an application to the EPA will be lodged together with a Regulation 21 application.

To determine the appropriate application rates both the Nitrogen Limiting Application Rate (NLAR) and the Contaminant Limiting Application Rate (CLAR) have been determined. TasWater have also adopted the requirements from the PFAS National Environmental Management Plan (NEMP 3.0) that was released in early 2025. As part of the NEMP 3.0 threshold concentrations for common PFAS chemicals in biosolids and the maximum allowable concentrations in receiving soil have been identified and have been assessed as part of this BMP. Further soils properties, apart from nitrogen levels (such as phosphorus and salinity) were also considered when determining the application rate for each management zone (paddock).

Table ES-1 identifies the zones (paddocks) to be utilised for biosolids application, the area available, application rates, total amount of biosolids to be applied and any notes and/or site-specific setbacks.

All spreading activities must comply with the management actions identified in Section 7 of this report. Actions have been identified to manage:

- Odour
- Buffer zones and physical restrictions
- Transport and delivery of biosolids
- Biosolids application method
- Biosolids stockpiling and application controls
- Record keeping.

Table ES-1: Summary of application rates and available areas within the identified zones at Rothamay

ZONE	APPLICATION AREA (HA)	APPLICATION RATES (WET T/HA)	TOTAL BIOSOLIDS (T)	NOTES/SETBACKS
Barn Circle	10.1	22	218	▪ 100m setback from road ▪ Avoid areas mapped by the Waterway and coastal protection area ▪ Do not apply lime amended biosolids in this paddock ▪ Reduced application rate due to P levels
Big River Run 3	23.1	49	1127	▪ Steeply sloped areas (>15%) have been excluded ▪ Avoid occasional rocky areas
Big River Run Central	23.9	53	1262	
Big River Run East	19.6	53	1035	
Big River Run West	11.6	50	585	▪ 100 m setback from Clyde River
Chickory & Round Hill	15.5	43	670	▪ 10 m setback from drainage line
Front Gate & Southern Road	12.7	23	290	▪ 100 m setback from road ▪ 20 m setback from central drainage line and associated dam ▪ 10 m setback from small drainage lines ▪ Reduced application rate due to P levels
Front Run	5.5	45	246	
Humbies Central	35.2	46	1605	▪ Avoid steeply sloped area in south (>15%) ▪ Avoid occasional rocky area
Humbies East	24.7	50	1225	▪ 50 m setback from dam and Abyssinia Creek ▪ Avoid all areas mapped by the Waterway and coastal protection area ▪ Avoid occasional rocky areas ▪ 100 m setback from road

ZONE	APPLICATION AREA (HA)	APPLICATION RATES (WET T/HA)	TOTAL BIOSOLIDS (T)	NOTES/SETBACKS
Humbies South	30.0	42	1248	▪ Avoid steeply sloped areas (>15%) ▪ 50 m setback from property boundary ▪ 100 m setback from road ▪ Avoid all areas mapped by the Waterway and coastal protection area
Humbies West	21.6	42	899	▪ 10 m setback from native vegetation ▪ Avoid all areas mapped by the Waterway and coastal protection area
Kirwins	11.4	46	529	▪ 100 m setback from Clyde River
Little River Run East	13.3	48	638	▪ 50 m setback from dam and Grass Hut Rivulet ▪ Avoid all areas mapped by the Waterway and coastal protection area ▪ 10 m setback from drainage lines
Little River Run West	13.3	44	585	▪ 100 m setback from Clyde River and Grass Hut Rivulet ▪ Avoid all areas mapped by the Waterway and coastal protection area ▪ Avoid steeply sloped sections (>15%)
Middle Creek	9.6	54	522	▪ Avoid all areas mapped by the Waterway and coastal protection area ▪ 50 m setback from Abyssinia Creek ▪ Only apply biosolids in the northern and southern sections of the paddock, not in the middle.
Middle Falls	5.7	45	255	▪ 100 m setback from dam and Grass Hut Rivulet
Middle North	15.9	27	426	▪ 50 m setback from property boundary ▪ 10 m setback from drainage lines ▪ Reduced application rate due to P levels
Middle North west	7.2	46	334	▪ 20 m setback from drainage lines ▪ 50 m setback from Abyssinia Creek
Middle South	16.9	47	798	▪ 50 m setback from Abyssinia Creek

ZONE	APPLICATION AREA (HA)	APPLICATION RATES (WET T/HA)	TOTAL BIOSOLIDS (T)	NOTES/SETBACKS
Northern	6.2	24	151	▪ 100 m setback from road ▪ 50 m setback to property boundary ▪ Avoid all areas mapped by the Waterway and coastal protection area ▪ 50 m setback from Abyssinia Creek ▪ Reduced application rate due to P levels
Northern Tower East Tulip	20.1	45	900	▪ 100 m setback from ▪ 20 m setback from drainage line
Northern Tower West	20.4	38	767	▪ 20 m setback from drainage line and small farm dam
Number 4 Circle	9.8	29	282	▪ 250 m setback from northern property boundary ▪ Do not apply lime amended biosolids in this paddock ▪ Reduced application rate due to P levels
Phalaris	17.0	23	394	▪ Avoid all areas mapped by the Waterway and coastal protection area ▪ 50 m setback from property boundary ▪ 50 m setback from Abyssinia Creek ▪ Avoid all areas mapped by the Waterway and coastal protection area ▪ Reduced application rate due to P levels
Ram	17.0	36	612	▪ 100m setback from road ▪ 250 m setback from dwellings to the east ▪ 10 m setback from drainage line ▪ .Do not apply lime amended biosolids in this paddock
Red Point	29.9	48	1435	▪ 100 m setback to Abyssinia creek ▪ Avoid steeply sloped areas (>15%) ▪ 20 m setback to drainage line to the west
Red River Run	20.9	46	970	▪ 100 m setback from the Clyde River and Abyssinia Rivulet ▪ 10 m setback from drainage line ▪ Avoid steeply sloped areas (>15%)

ZONE	APPLICATION AREA (HA)	APPLICATION RATES (WET T/HA)	TOTAL BIOSOLIDS (T)	NOTES/SETBACKS
Riffle Range East	18.1	51	927	▪ 250 m setback from northern boundary ▪ 20 m setback from drainage line ▪ 10 m setback from native vegetation ▪ Do not apply lime amended biosolids in this paddock
Riffle Range West	22.1	48	1061	▪ 20 m setback from drainage line ▪ 10 m setback from native vegetation ▪ Do not apply lime amended biosolids in this paddock
River Burnt Stack	17.5	42	728	▪ 100 m setback from Clyde River ▪ Avoid all areas mapped by the Waterway and coastal protection area
Road Burnt Stack	13.7	49	669	▪ 100 m setback from road
Road East	22.1	38	849	▪ 100 m setback from road ▪ Avoid steeply sloped areas (>15%) ▪ Avoid rocky areas
Road West	18.8	36	677	▪ Avoid steeply sloped areas (>15%) ▪ Avoid rocky areas ▪ 50 m. setback from Abyssinia Creek
Rocky	20.3	49	991	▪ Avoid all areas mapped by the Waterway and coastal protection area ▪ 20 m setback from small dams ▪ 100 m setback from road
Rocky South	21.8	40	872	▪ 50 m setback from property boundaries ▪ 50 m setback from Abyssinia Creek ▪ 10 m setback from drainage lines
Round Hill Circle	8.6	55	475	▪ 100 m setback from road ▪ Do not apply lime amended biosolids in this paddock due to nearby stock yards

ZONE	APPLICATION AREA (HA)	APPLICATION RATES (WET T/HA)	TOTAL BIOSOLIDS (T)	NOTES/SETBACKS
Round Hill Large	19.7	49	961	▪ 100 m setback from road ▪ 50 m setback from Grass Hut Rivulet ▪ Do not apply biosolids to the south of Grass Hut Rivulet ▪ Do not apply lime amended biosolids in this paddock
Southern Towers East	11.5	42	488	▪ 100 m setback from road ▪ Avoid southern area where there is a drainage line, associated wet area and is mapped by the Waterway and coastal protection area
Southern	11.4	50	565	▪ 50 m setback from property boundary ▪ 20m setback from drainage lines
Southern Towers West	17.6	30	535	▪ Avoid southern area where there is a drainage line, associated wet area and is mapped by the Waterway and coastal protection area ▪ 20 m setback from drainage line and small dam in north western section ▪ 50 m setback from Abyssinia Creek
Two Halves Cut	7.1	43	307	▪ 10 m setback from drainage line
Two Halves East	14.6	56	818	▪ 10 m setback from drainage line
Two Halves West	14.0	58	818	
Woolshed Creek	17.0	41	694	▪ 50 m setback from Grass Hut Rivulet
Woolshed Hill Back	17.2	38	647	▪ Avoid occasional rocky areas ▪ Avoid steeply sloped areas (>15%) ▪ 100 m setback from road
Woolshed Hill Front	15.2	44	669	▪ 100 m setback from Road
Total	**776.4**		**33,757**	

1 Introduction

1.1 OVERVIEW

RMCG have been engaged by TasWater to assist them and their designated spreading contractor (Spectran Environmental Management (Spectran) with the development of a Biosolids Management Plan (BMP) to support the beneficial reuse of biosolids at a property near Bothwell (Rothamay). This BMP assesses and quantifies the biosolids TasWater are proposing to spread on the property. It identifies a preliminary application rate as well as controls to mitigate potential environmental impacts and impacts on the nearby community. All proposed measures are in line with the requirements of the *Tasmanian Biosolids Reuse Guidelines 2020* (TBRG).

A further purpose of this BMP is to provide Council with sufficient information to determine if the proposed activity is considered a permitted activity under the *Tasmanian Planning Scheme – Central Highlands* (the Planning Scheme).

The proposed biosolids are sourced from seven of TasWater's southern Sewage Treatment Plants (STPs) that produce biosolids continuously. These STPs are Cameron Bay, Macquarie Point, Prince of Wales Bay, Rokeby, Selfs Point, Rosny & Green Point. It is proposed to spread biosolids at a rate that is higher than given in the *Approved Management Method for the Reuse of Biosolids 2020* (AMM). This means an application for spreading the biosolids will be submitted for approval to the Council in the first instance. If the Council determines that the activity is permitted under the Planning Scheme an application to the EPA will be lodged together with a Regulation 21 application.

TasWater have adopted the requirements from the PFAS National Environmental Management Plan (NEMP 3.0) that was released in early 2025. As part of the NEMP 3.0 threshold concentrations for common PFAS chemicals in biosolids and the maximum allowable concentrations in receiving soil have been identified and have been assessed as part of the BMP. Further soils properties, apart from the required nitrogen levels (such as phosphorus and salinity) were also considered when determining the application rate for each management zone (paddock).

To determine the appropriate application rates both the Nitrogen Limiting Application Rate (NLAR) and the Contaminant Limiting Application Rate (CLAR) have been calculated. For the NLAR, the identified application rate will be 80% of the identified NLAR. Application of biosolids must comply with Sections 10, 11, & 12 of the TBRG. Furthermore, application rates must align with the requirements set out in Support Document 1 of the NEMP 3.0.

2 Property details

2.1 OVERVIEW

Rothamay has a total area of 1,770 ha. The majority of the property is run as a mixed grazing (cattle and sheep) enterprise with some irrigated cropping on suitable land. There is a conservation covenant over the northeast of the property with an approximate area of 160 ha. Biosolids are only proposed to be spread on areas that are managed as pasture and are not part of any cropping rotations. In total there are six titles associated with the property, all of which are proposed to potentially receive biosolids. Property title information is provided in Table 2-1.

Publicly accessible soil mapping[1] is only available for roughly the northeastern third of the property. These soils are mapped as:

- A (undifferentiated alluvial soils) – undifferentiated soils developed on Quaternary alluvium
- Pss (podzol and podzolic soils on sandstone) – undefined soil developed on Triassic sandstone bedrock and colluvium on undulating to rolling land (3-32%)
- Bd1 (brown soils on dolerite 1) – undefined brown soils developed on Jurassic dolerite bedrock and colluvium on rolling to steep (10-56%) land
- Bb-Bd1 (Brown soils on basalt with brown soils on dolerite 1) – as for Bb soils with moderately well drained brown soils developed on Jurassic dolerite bedrock and colluvium on rolling to steep (10-56%) land.

Published Land Capability[2] maps identify the majority of the property to be comprised of Class 4 land with some areas of Class 5 land and Class 6 land in the southwest. Class 4 land is described as land well suited to grazing, but which is limited to occasional cropping or a very restricted range of crops. Class 5 land is described as land unsuited to cropping and with slight to moderate limitations to pastoral use. Class 6 land is land marginally suited to grazing due to severe limitations. There is no mapped 'prime agricultural land' (Class 1-3) mapped on the property. Mean annual rainfall based on long-term averages for the area is 537 mm[3].

2.2 TITLE INFORMATION AND APPLICATION AREAS

Table 2-1 provides title information for the Rothamay property. This includes zoning as well as identification of the titles that are proposed to receive biosolids and those that are not. It also identifies which titles have an existing dwelling and which titles have an adjacent dwelling within 100 m of the title boundary. Maps showing property titles, and proposed application areas area located in Appendix 1.

1 Available on LISTmap
2 Available on LISTmap
3 From Bothwell (Franklin St) BoM Site (95001), data from 1915-2024.

Table 2-1: Rothamay title information

PROPERTY	TITLE REFERENCE	ZONING	AREA (HA)	DWELLING ONSITE	ADJACENT DWELLING (<100M)	PROPOSED TO RECEIVE BIOSOLIDS
Rothamay	167795/1	Agriculture	528.5	Yes	Yes	Yes
	124612/2	Agriculture	752.1	No	No	Yes
	124612/1	Agriculture	198.3	Yes	No	Yes
	124613/3	Agriculture	61.2	No	No	Yes
	124613/4	Agriculture	38.1	No	Yes	Yes
	211119/1	Agriculture	191.6	No	No	Yes

3 Statutory requirements

This report and associated activities follow the *Tasmanian Biosolids Reuse Guidelines 2020* (TBRG) and the Approved Management Method (AMM) for biosolids reuse to ensure compliance with the *Environmental Management and Pollution Control Act 1994* (EMPCA). Under EMPCA, environmentally polluting activities are divided into categories and the responsibility for the regulation of activities is split between the Environment Protection Authority (EPA) Tasmania and Local Government. Biosolids reuse activities are either:

- A "permitted use". Under some Local Government Planning Schemes biosolids land application reuse activities may be considered a "permitted use" (agricultural right) and therefore may not require a permit under the *Land Use Planning and Approvals Act 1993* (LUPAA). Local Government has an obligation, even in those cases which do not require a permit, to ensure pollution does not arise as a consequence of these activities.
- A "Level 1" Activity under EMPCA. That is, an activity which may cause environmental harm and in respect of which a permit under LUPAA is required but does not include a Level 2 or a Level 3 activity. Local Government are the regulatory authority of Level 1 activities. It is the EPA's position, that all spreading of biosolids that are Class 1 or Class 2 biosolids (see Section 4) is considered a Level 1 activity[4].

This plan proposes an application rate of greater than 50 wet tonnes per hectare. As these proposed application rates exceed the 'low rate' method outlined in the *Approved Management Method 2020* (AMM), Environmental Approval potentially is required to be obtained from the Director of the EPA under Regulation 21 of the *Waste Management Regulations 2020*, prior to any spreading as well as any approvals potentially required by Council.

3.1 LOCAL GOVERNMENT ROLES & RESPONSIBILITY UNDER THE TBRG

Under the TBRG (Section 5.5), Local Government is responsible for:

- Administering EMPCA in regard to activities that are not Level 2 or Level 3 activities, including the assessment and permitting as necessary and regulation of development proposals under LUPAA
- Responding to any incidents resulting from biosolids activities with the potential to cause environmental nuisance and / or affect public health
- Regulating 'Level 1' wastewater treatment plants
- Providing advice on applying these Guidelines.

The responsible entity for the end use of the Class 2 biosolids must ensure that they have obtained all required approvals from Local Government before proceeding. This document (BMP) is to be provided to Local Government to assist with the assessment of the activity. The activity shall not proceed until Local Government has (a) advised no permit is required or (b) provided an appropriate approval (permit).

[4] Per comms with EPA Tasmania, dated 18 March 2025.

3.1.1 BIOSOLIDS REUSE AND PLANNING SCHEME ZONE

A key requirement of using land for agriculture is the replacement of nutrients removed by biomass removal (grazing, crop harvest) and the maintenance of soil conditions. Hence, the application of biosolids is consistent with the definition of Agricultural Use (Table 3.1 of the Planning Scheme). Agricultural Use is one of many activities that falls into the category of Resource Development (Table 6.2 of the Planning Scheme).

Resource Development may have a No Permit Required (NPR) qualification depending on the zoning of the land where the Resource Development activity is taking place (see Table 3-1).

Table 3-1: Resource development qualification per zone – examples

ZONE	RESOURCE DEVELOPMENT QUALIFICATION
8.0 General Residential	Prohibited
11.0 Rural Living	No permit required if the Resource Development activity is grazing
18.0 Light Industrial	Prohibited
20.0 Rural	No permit required
21.0 Agriculture	No permit required if the activity does not damage the soil profile or preclude the soil from future use as a growth medium
22.0 Landscape Conservation	Discretionary
30.0 Future Urban Zone	Permitted

3.1.2 BIOSOLIDS REUSE & PLANNING SCHEME CODES

Further to Planning Zone requirements for Resource Development activities, there are also a number of Codes within the Planning Scheme that require consideration. The relevant Codes for the application of biosolids to land are detailed below in Table 3-2, as are mitigation measures to ensure the activity will be compliant with each Code's requirements

Table 3-2: Planning scheme code compliance

CODE	CODE REQUIREMENT	COMPLIANCE MEASURE
C1 Signage	Biosolids Reuse requires erection of Regulatory Signage (as per definition in Table C1.3 of the Planning Scheme).	Regulatory signs are exempt from specific requirements of the Code, as per Table C1.4. It is noted that areas that will receive biosolids have suitable signage as per Section 11 of the TBRG. Proposed signage is further detailed in Section 7.5.2 of this document.
C7 Natural Assets	Biosolid reuse must minimise impacts on water quality, native riparian vegetation, river condition, and ecological function of watercourses.	Managed via compliance with the TBRG and additional measures identified in this Biosolids Management Plan (Section 7). It is noted that all titles that are proposed to receive biosolids are zoned Agriculture, hence the Natural Assets Code generally does not apply, except for Waterway and coastal Protection Areas. Biosolids application will not occur within the areas mapped as Waterway and Coastal Protections Areas of the Natural Assets Code.

CODE	CODE REQUIREMENT	COMPLIANCE MEASURE
C9 Attenuation	Biosolids application is listed as an activity likely to cause emissions under Table C9.1 of the Code, which requires a 100 m buffer from sensitive uses. Hence, spreading activities must comply with either the Acceptable Solutions or the Performance Criteria of C9.5.1.	Managed via compliance with the TBRG and additional measures identified in this Biosolids Management Plan (Section 7.2). CT 167795/1 has an existing dwelling located on it and also has adjacent dwellings within 100m of its boundary. Spreading will not occur within 100m of the dwelling located on the site and will not occur within at least 250m of any dwellings on adjacent titles (see Section 7.2). CT 124612/1 has an existing dwelling located on it. Spreading will not occur within 100m of this dwelling. This title also wraps around CT 132633/1, which has commercial stockyards located on it. As an additional measure biosolids will not be spread within 100m of this property boundary. There is an adjacent dwelling to the east of CT 124613/4 that is within 100m of the property boundary. As per Section 7.2 no biosolids will be spread within at least 250m of this dwelling. None of the other three titles associated with the property have an existing dwelling located on them or within 100m of their boundary.

4 Biosolids sources & quality assessment

4.1 BIOSOLIDS SOURCES

Biosolids to be supplied to the subject property will be sourced from sewage treatment plants (STPs) in the south of the state of Tasmania. The STPs are listed below.

1. Macquarie Pt
2. Selfs Pt
3. Cameron Bay
4. Green Pt[5]
5. Prince of Wales Bay
6. Rokeby
7. Rosny.

4.2 BIOSOLIDS DATA

TasWater has supplied RMCG with analytical data for the biosolids from the STPs for the purposes of preparing this BMP and demonstrating a sound process of quality classification to allow reuse in accordance with the requirements of the TBRG.

TasWater has provided data on the 27th of March 2026 detailing information on nutrients and solids percentages for the preceding 12 months. 12-sample rolling Biosolids Adjusted Contaminant Concentration (BACC) and *E. Coli* data for quality classification is provided to Spectran (spreading contractor) and RMCG on a weekly basis.

4.3 BIOSOLIDS QUALITY CLASSIFICATION

All biosolids supplied to the subject land for direct land application must be classified (in accordance with the TBRG) as Grade 2 as a minimum. Biosolids quality classification combines an assessment of:

1. Contaminant grade: the level of contamination from heavy metals or other typical biosolid contaminants; and
2. Stabilisation grade: the degree of pathogen reduction, vector attraction, and odour.

For biosolids classification to be Class 2, both stabilisation and contaminant grade must be a minimum of Grade B. Non-Grade B material requires further processing (e.g. composting) prior to application to land. See Table 4-1 for the biosolids classification system and allowable end uses.

[5] Only recently back online after upgrades. Available data is included in this section, however, further nutrient assessments to be completed before these biosolids can be applied to land.

Table 4-1: Classification of Biosolids Allowable End Uses (TBRG Table 9.1)

CLASSIFICATION	CONTAMINANT GRADE	STABILISATION GRADE	ALLOWABLE END USE	ADDITIONAL REQUIREMENTS
Class 1 biosolids	A	A	Home garden (retail sale) Urban landscaping	Labelling
Class 2 biosolids	A	B	Site rehabilitation Agriculture Forestry Composting	Demonstrate application is below NLAR LUPAA permit may be required, contact Local Government
	B	A		
	B	B		
Sewage sludge	A or B	Unclassified	EPA approval licensed facility (landfill and reprocessing facilities)	Sewage sludge is a Controlled Waste and therefore subject to legislated requirements
	Unclassified	A or B		
	Unclassified	Unclassified		

4.3.1 CONTAMINANT GRADE ASSESSMENT

TasWater undertakes rolling analyses of biosolids from each STP to assess contaminant grade. The contaminant grade assessment assumes that TasWater have undertaken a recent risk-based assessment and considered the testing of additional analytes. See Table 4-2 for Grade A and Grade B biosolids acceptable contaminants concentration (BACC) thresholds.

Table 4-2: Contaminant acceptance concentration threshold for biosolids (TBRG Table 7.1)

CONTAMINANT	GRADE A (mg/kg dry weight)	GRADE B (mg/kg dry weight)
Arsenic	20	60
Cadmium	1	20
Chromium (total)	50	300
Copper	100	2,500
Lead	150	420
Mercury	1	15
Nickel	60	270
Zinc	200	2,500

Should any analyte present with a BACC above the Grade B threshold then biosolids from that site are unsuitable for reuse in accordance with this BMP until the BACC becomes Grade B compliant. TasWater is required to advise all stakeholders on changes in BACC classification as soon as possible. See Table 4-3 for the BACC grading of the biosolids from each of the STPs that are proposed to be spread on the subject sites. The BACC for each STP is based on each site's last 12 samples.

Table 4-3: Biosolids adjusted contaminant concentration (BACC) in supplied results and associated contaminant grading

CONTAMINANT*	CAMERON BAY	GREEN POINT	MACQUARIE POINT	PRINCE OF WALES BAY	ROKEBY	ROSNY	SELFS POINT
Arsenic	3.5	3.4	2.9	2.7	3.0	3.1	6.8
Cadmium	2	5.7	2.7	6.1	0.8	1.1	5.2
Chromium	32.2	36.0	55.7	44.2	46.1	13.8	18.1
Copper	537.3	431.3	997.4	629.0	143.0	189.1	558.7
Lead	33	47.5	67.1	54.7	10.7	18.2	21.2
Mercury	0.9	1.1	6.3	3.5	0.3	0.6	0.9
Nickel	39	25.3	25.8	158.3	20.6	25.8	18.2
Zinc	1128.9	1692.2	1662.2	1885.6	537.9	565.2	309.3
Grade	B	B	B	B	B	B	B

** Green shading indicates the contaminant meets Grade A standard and blue indicates the contaminant meets Grade B standards.*

Biosolids from all listed STPs meet Grade B requirements as a minimum for BACC.

4.3.2 STABILISATION GRADE ASSESSMENT

To address health and nuisance odour risks, sewage sludge must be treated to an appropriate standard before reuse. Biosolids that have been suitably treated are considered “Stabilised”.

The stabilisation grade of biosolids from mechanical treatment plants is assessed by demonstrating an approved treatment method as defined within Section 8 of the TBRG. Stabilised biosolids prevent the generation of offensive odours, pathogen growth, and the encouragement of vermin and other disease vectors.

Biosolids intended for reuse as detailed in this plan must meet the Microbiological Criteria for Stabilisation Grade B (Table 4-5). Biosolids that do not meet this criterion shall be sent to an alternative approved facility for further processing.

Stabilisation requirements fall into three categories, all of which must be met:

1. Biosolids must not exhibit a strong, offensive odour

These biosolids are constantly being applied to farmland in areas in Southern Tasmania. Through well planned management TasWater have not received an odour complaint in 18 months. It is noted that lime stabilised biosolids can occasionally have odours associated with them. To further offset the possibility of this impacting adjacent residents, a 500 m setback is recommended between lime amended biosolids and nearby off-site dwellings.

2. An approved vector attraction reduction requirement must be met (TBRG Table 8.1)

Table 4-4 shows the vector attraction reduction (VAR) option used for the biosolids from each STP proposed to be applied to the land. All biosolids meet one of the required VAR options identified in Table 8.1 of the TBRG.

Table 4-5 shows the stabilisation grading of each of the treatment plants of the biosolids that will be spread on the site.

Table 4-4: Vector attraction reduction process

OPTION	VECTOR ATTRACTION REDUCTION OPTION	BIOSOLIDS MOST SUITED	STP
1	Biosolids treatment process reduces volatile solids by >38%	Al biological anaerobic or aerobic processes. This is what can be achieved in a completely mixed high-rate anaerobic digestor treating raw sludge at 35^{o}C in 15 days	Cameron Bay, Macquarie Point, Green Point
2	<17% additional volatile solids loss during bench-scale anaerobic batch digestion of sludge for 40 additional days at 30-37^{o}C	Only anaerobically digested sludge that cannot demonstrate Option 1	Prince of Wales Bay
7	Biosolids pH raised to >12, and without addition of further alkali, pH maintained at >12 for 5 days	Alkali treated biosolids	Rokeby, Rosny, Selfs Point

3. The Pathogen reduction criteria must be achieved for the intended end use

Biosolids intended for reuse as detailed in this plan must meet the Microbiological Criteria for Stabilisation Grade B (Table 4-5). Biosolids that do not meet this criterion shall be sent to an alternative approved facility for further processing. Table 4-6 shows the stabilisation grading of the biosolids from each of the STPs that will be spread on the subject site.

Table 4-5: Microbial Criterion Stabilisation Grade B (from Table 8.4 of the TBRG)

MICROBIOLOGICAL CRITERIA (BASED ON DRY WEIGHT OF PRODUCT)	MONITORING REQUIREMENTS
<2,000,000 E. coli CFU (or MPN) per gram (geometric mean of at least 7 sample results).	Initial verification process

Table 4-6: Stabilisation grading of biosolids to be delivered to the site

SITE	STABILISATION METHOD	E. COLI/MPM/g GEOMETRIC MEAN	STABILISATION CLASSIFICATION
Cameron Bay	Anaerobic digestion	1239.7	Grade B
Green Point	Anaerobic digestion	209868.7	Grade B
Macquarie Point	Anaerobic digestion	11124.3	Grade B
Prince of Wales Bay	Anaerobic digestion	71971.4	Grade B
Rokeby	Lime stabilised	500	Grade B
Rosny	Lime stabilised	500	Grade B
Selfs Point	Lime stabilised	3810	Grade B

Stabilisation grading meets Grade B requirements as per the TBRG for STPs 1 and 3-7.

4.3.3 BIOSOLIDS CLASS

Both the biosolids contamination grades and available stabilisation grades of the biosolids destined for the selected areas comply with Grade B requirements as a minimum. Hence, all biosolids from the seven treatment plants are considered Class 2 biosolids and are suitable for land application.

4.4 BIOSOLIDS NITROGEN LEVELS

Nitrogen (N) analyses have been provided for the biosolids. The mean N levels for the seven STPs from January 2025 to February 2026[6] are provided for the seven treatment plants in Table 4-7. As per the AMM process, N is the only nutrient that needs to be considered when determining biosolids application rates.

Table 4-7: Mean biosolids nitrogen levels from January 2025 to February 2026

SITE	AMMONIUM MEASURED AS AMMONIA (NH3)	NITRATE (NO3) + NITRITE (NO2)	TOTAL KJELDAHL NITROGEN (TKN)
Cameron Bay	5743	151.9	64,141.7
Green Point	TBC	TBC	TBC

[6] Not sufficient data available for Green Point at the time of writing this BMP. No Greens Point biosolids to be applied until all data available to enable appropriate assessments

SITE	AMMONIUM MEASURED AS AMMONIA (NH3)	NITRATE (NO3) + NITRITE (NO2)	TOTAL KJELDAHL NITROGEN (TKN)
Macquarie Point	3465	33.4	52,341.7
Prince of Wales Bay	5558.3	6.2	67,583.3
Rokeby	1217.7	8.1	62,541.7
Rosny	1358.3	9.5	59,225
Selfs Point	1837	9.5	54,575

4.5 PFAS

The NEMP 3.0 sets maximum thresholds for PFAS (PFOS+PFHxS and PFOA) for restricted use biosolids (Class B biosolids). These are shown in Table 4-8. There are three identified margins of safety (MOS), with 1 being the default level used (NEMP 3.0). The below table also shows the maximum allowable soil contaminant concentrations (MASCCs)

Table 4-8: Criteria for PFOS+PFHxS and PFOA

CRITERIA TYPE	MARGIN OF SAFETY	PFOS+PFHxS (µg/kg)	PFOA (µg/kg)
Biosolids threshold restricted use (Class B)	5	6.2	16
	2	15	40
	1	31	81
Maximum allowable soil contaminant concentration MASCC	5	0.22	0.6
	2	0.55	1.5
	1	1.1	3

PFAS levels in the seven STPs are shown in Table 4-9, the identified levels are the mean of the last 7 samples. Samples are conducted monthly.

Table 4-9: STP PFAS Levels 2025–2026

SITE	PFOS+PFHxS (µg/kg)	PFOA (µg/kg)
Cameron Bay	7.4	1.3
Green Point	5.9	1.3
Macquarie Point	8	1.3
Prince of Wales Bay	7.1	1.3
Rokeby	9.4	1.3
Rosny	14.1	1.3
Selfs Point	18.1	1.3

**Green shading indicates levels meet MOS 5, blue indicates MOS 2, purple indicates MOS 1 and red indicates no MOS is met.*

All other STPS are within the allowable levels.

5 Soils assessment

5.1 AREA AVAILABILITY

In consultation with the landholder at Rothamay, land was selected for potential sites for biosolids application. Table 5-1 below shows sample and biosolids application (net) areas of the 47 zones (paddocks) that were sampled, Figure A1-1 in Appendix 1 shows the aerial image of the zones. Net biosolids application areas are calculated under consideration of setbacks for public access, waterways, and other buffer zones, as per the TBRG and Section 7.2 of this BMP for the property.

Table 5-1: Application zones and areas (ha)

ZONE	BIOSOLIDS APPLICATION AREA (HA)
Barn Circle	10.1
Big River Run 3	23.1
Big River Run Central	23.9
Big River Run East	19.6
Big River Run West	11.6
Chickory & Round Hill	15.5
Front Gate & Southern Road	12.7
Front Run	5.5
Humbies Central	35.2
Humbies East	24.7
Humbies South	30.0
Humbies West	21.6
Kirwins	11.4
Little River Run East	13.3
Little River Run West	13.3
Middle Creek	9.6
Middle Falls	5.7
Middle North	15.9
Middle Northwest	7.2
Middle South	16.9
Northern	6.2
Northern Tower East Tulip	20.1
Northern Tower West	20.4
Number 4 Circle	9.8
Phalaris	17.0
Ram	17.0
Red Point	29.9

ZONE	BIOSOLIDS APPLICATION AREA (HA)
Red River Run	20.9
Riffle Range East	18.1
Riffle Range West	22.1
River Burnt Stack	17.5
Road Burnt Stack	13.7
Road East	22.1
Road West	18.8
Rocky	20.3
Rocky South	21.8
Round Hill Circle	8.6
Round Hill Large	19.7
Southern Towers East	11.5
Southern	11.4
Southern Towers West	17.6
Two Halves Cut	7.1
Two Halves East	14.6
Two Halves West	14.0
Woolshed Creek	17.0
Woolshed Hill Back	17.2
Woolshed Hill Front	15.2
Total	776.4

5.2 SOIL SAMPLING PROCEDURES

Samples from the 47 zones (paddocks) listed in Table 5-1 were taken from the 10th to the 12th of March 2026.

Samples were taken with a 100 mm tube sampler[7], with cores of approximately 20 mm diameter. Within each area a minimum of 30–40 cores were taken by following a “zig-zag” path over the paddock. All the cores within each paddock zone were bulked and retained to provide a single composite sample for each zone for nutrient analysis and a second composite sample for heavy metal analysis.

PFAS samples were collected for at least one zone in five across the sample site. This number has been chosen to assess if there are baseline PFAS level indicators at various locations across the site. If PFAS levels are detected at above the NEMP 3.0 MOS 1 levels for soils (see Table 4-8) then further testing would be conducted to assist with determining if the site is suitable to receive the identified biosolids.

Samples were dispatched to Nutrient Advantage Laboratories in Werribee, (NATA Accredited Laboratory 11958) and analysed with standard procedures. Further samples were dispatched to ALS in Scoresby (NATA Accredited Laboratory 992) to assess heavy metals and PFAS in the soils.

[7] Reference: FertSmart “Soil test guidelines for optimum dairy pasture production” by University of Tasmania

5.3 ANALYTICAL RESULTS: RECEIVING SOILS

The following results of soil analyses by zone are classified using a “traffic light” system to highlight where soil fertility levels or soil characteristics require attention when using biosolids; the “red lights” show where either low or high levels occur and may be reducing plant growth / health (Table 5-2). High levels of nutrients are not classified as affecting plant growth negatively unless they are at toxic levels. Where excessive nutrient levels are present and not likely to affect plant growth, but may cause off site impacts or environmental harm, results are highlighted separately (grey). Comment is made where high nutrient levels and or imbalances may affect the health of livestock.

Table 5-2: Table colour reference

NO ACTIONS	NEEDS MONITORING	MAY BE AFFECTING PLANT GROWTH	NOT AFFECTING PLANT GROWTH BUT MAY HAVE OFF SITE / ENVIRONMENTAL IMPACT

5.3.1 ACIDITY, pH

pH levels have been measured as pH in water and $CaCl_2$.

Table 5-3: pH in 47 zones

PADDOCK	PH (1:5 IN H20)	PH (1:5 IN CACL2)	RATING
Barn Circle	6.3	5.8	Neutral to slightly alkaline
Big River Run 3	5.6	4.9	Slightly acidic
Big River Run Central	5.5	4.9	Slightly acidic
Big River Run East	5.9	5.3	Slightly acidic
Big River Run West	5.6	4.9	Slightly acidic
Chickory & Round Hill	5.5	4.8	Slightly acidic
Front Gate & Southern Road	5.8	5.0	Slightly acidic
Front Run	5.7	5.0	Slightly acidic
Humbies Central	5.5	4.8	Slightly acidic
Humbies East	5.7	5.0	Slightly acidic
Humbies South	5.6	4.9	Slightly acidic
Humbies West	5.4	4.7	Slightly acidic
Kirwins	5.6	5.0	Slightly acidic
Little River Run East	5.8	5.1	Slightly acidic
Little River Run West	5.6	4.9	Slightly acidic
Middle Creek	5.9	5.2	Slightly acidic
Middle Falls	5.6	4.9	Slightly acidic
Middle North	5.6	4.8	Slightly acidic
Middle North west	5.7	5.1	Slightly acidic

PADDOCK	PH (1:5 IN H20)	PH (1:5 IN CACL2)	RATING
Middle South	5.7	5.0	Slightly acidic
Northern	5.7	5.0	Slightly acidic
Northern Tower East Tulip	5.4	4.7	Slightly acidic
Northern Tower West	5.5	4.9	Slightly acidic
Number 4 Circle	6.6	6.1	Neutral to slightly alkaline
Phalaris	5.6	4.9	Slightly acidic
Ram	5.6	5.0	Slightly acidic
Red Point	5.7	5.0	Slightly acidic
Red River Run	5.5	4.8	Slightly acidic
Riffle Range East	5.9	5.2	Slightly acidic
Riffle Range West	5.5	4.8	Slightly acidic
River Burnt Stack	5.3	4.7	Slightly acidic
Road Burnt Stack	5.5	4.8	Slightly acidic
Road East	5.6	5.0	Slightly acidic
Road West	5.7	5.1	Slightly acidic
Rocky	5.6	4.9	Slightly acidic
Rocky South	5.7	5.1	Slightly acidic
Round Hill Circle	5.9	5.1	Slightly acidic
Round Hill Large	5.5	4.8	Slightly acidic
Southern Towers East	5.5	4.8	Slightly acidic
Southern	5.6	4.9	Slightly acidic
Southern Towers West	5.5	4.9	Slightly acidic
Two Halves Cut	5.5	4.9	Slightly acidic
Two Halves East	7.0	6.4	Neutral to slightly alkaline
Two Halves West	7.0	6.5	Neutral to slightly alkaline
Woolshed Creek	5.5	4.9	Slightly acidic
Woolshed Hill Back	5.6	5.0	Slightly acidic
Woolshed Hill Front	5.6	5.0	Slightly acidic

pH levels are mostly slightly acidic (Table 5-3). The pH levels are in the allowable range for application of biosolids as defined in Table 11.1 of the *Tasmanian Biosolids Reuse Guidelines*.

5.3.2 ELECTRICAL CONDUCTIVITY (MEASURED IN A 1:5 SOIL: WATER SUSPENSION)

Salinity has been determined via measuring electrical conductivity (EC) as EC 1:5. The EC 1:5 values have been converted to ECse using conversion factors for loam soils: 12 and sand soils: 14.

Table 5-4: Electrical conductivity (EC) in 47 zones

PADDOCK	EC1:5 (DS/M)	SOIL TEXTURE	CONVERSION FACTOR	ECSe DS/M (CALC)	RATING
LOR	0.01				
Barn Circle	0.26	Sandy Loam	14	3.64	High
Big River Run 3	0.17	Sandy Loam	14	2.38	Moderate
Big River Run Central	0.15	Sandy Loam	14	2.10	Moderate
Big River Run East	0.17	Sandy Loam	14	2.38	Moderate
Big River Run West	0.16	Sandy Loam	14	2.24	Moderate
Chickory & Round Hill	0.17	Sandy Loam	14	2.38	Moderate
Front Gate & Southern Road	0.25	Sandy Loam	14	3.50	High
Front Run	0.18	Sandy Loam	14	2.52	Moderate
Humbies Central	0.14	Sand	14	1.96	Moderate
Humbies East	0.13	Sandy Loam	14	1.82	Moderate
Humbies South	0.17	Sandy Loam	14	2.38	Moderate
Humbies West	0.15	Loamy Sand	14	2.10	Moderate
Kirwins	0.22	Sandy Loam	14	3.08	High
Little River Run East	0.15	Sandy Loam	14	2.10	Moderate
Little River Run West	0.20	Sandy Loam	14	2.80	Moderate
Middle Creek	0.14	Sandy Loam	14	1.96	Moderate
Middle Falls	0.19	Sandy Loam	14	2.66	Moderate
Middle North	0.10	Sand	14	1.40	Low
Middle North west	0.17	Sandy Loam	14	2.38	Moderate
Middle South	0.19	Sandy Loam	14	2.66	Moderate
Northern	0.20	Sandy Loam	14	2.80	Moderate
Northern Tower East Tulip	0.17	Sandy Loam	14	2.38	Moderate
Northern Tower West	0.26	Sandy Loam	14	3.64	High
Number 4 Circle	0.20	Sandy Loam	14	2.80	Moderate
Phalaris	0.19	Loamy Sand	14	2.66	Moderate

PADDOCK	EC1:5 (DS/M)	SOIL TEXTURE	CONVERSION FACTOR	ECSe DS/M (CALC)	RATING
Ram	0.22	Sandy Loam	14	3.08	High
Red Point	0.16	Sandy Loam	14	2.24	Moderate
Red River Run	0.15	Sandy Loam	14	2.10	Moderate
Riffle Range East	0.10	Sandy Loam	14	1.40	Low
Riffle Range West	0.17	Sandy Loam	14	2.38	Moderate
River Burnt Stack	0.22	Sandy Loam	14	3.08	High
Road Burnt Stack	0.13	Sand	14	1.82	Moderate
Road East	0.23	Sandy Loam	14	3.22	High
Road West	0.23	Sandy Loam	14	3.22	High
Rocky	0.19	Sandy Loam	14	2.66	Moderate
Rocky South	0.24	Sandy Loam	14	3.36	High
Round Hill Circle	0.20	Clay Loam	12	2.40	Moderate
Round Hill Large	0.15	Sandy Loam	14	2.10	Moderate
Southern Towers East	0.21	Sandy Loam	14	2.94	Moderate
Southern	0.14	Sandy Loam	14	1.96	Moderate
Southern Towers West	0.29	Sandy Loam	14	4.06	High
Two Halves Cut	0.18	Sandy Loam	14	2.52	Moderate
Two Halves East	0.20	Sandy Loam	14	2.80	Moderate
Two Halves West	0.20	Sandy Loam	14	2.80	Moderate
Woolshed Creek	0.20	Sandy Loam	14	2.80	Moderate
Woolshed Hill Back	0.26	Sandy Loam	14	3.64	High
Woolshed Hill Front	0.17	Sandy Loam	14	2.38	Moderate

Salinity levels range from low to high (Table 5-4). Zones with high salinity levels will be closely monitored. The organic matter in biosolids may improve soil structure and thus drainage. This could lead to leaching of chloride and reduction of EC. Changes in salinity levels in the identified zones will be monitored after biosolids have been applied.

5.3.3 ORGANIC CARBON (WALKLEY-BLACK)

Table 5-5: Organic carbon in 47 zones

PADDOCK	ORGANIC CARBON %	ORGANIC MATTER %	RATING
LOR	0.20	Calc	
Rocky South	7.28	13.00	High
Southern	2.77	4.80	Generally satisfactory

PADDOCK	ORGANIC CARBON %	ORGANIC MATTER %	RATING
Front Gate & Southern Road	8.85	15.00	High
Barn Circle	2.43	4.20	Generally satisfactory
Big River Run 3	5.09	8.80	High
Big River Run Central	5.82	10.00	High
Big River Run East	5.83	10.00	High
Big River Run West	6.02	10.00	High
Chickory & Round Hill	2.73	4.70	Generally satisfactory
Front Gate & Southern Road	4.74	8.20	Generally satisfactory
Front Run	5.68	9.80	High
Humbies Central	3.43	5.90	Generally satisfactory
Humbies East	4.26	7.30	Generally satisfactory
Humbies South	4.80	8.30	Generally satisfactory
Humbies West	4.00	6.90	Generally satisfactory
Kirwins	4.71	8.10	Generally satisfactory
Little River Run East	5.16	8.90	High
Little River Run West	5.08	8.70	High
Middle Creek	4.02	6.90	Generally satisfactory
Middle Falls	5.03	8.70	High
Middle North	1.79	3.10	Marginal
Middle North west	4.76	8.20	Generally satisfactory
Middle South	4.73	8.10	Generally satisfactory
Northern	5.43	9.30	High
Northern Tower East Tulip	4.13	7.10	Generally satisfactory
Northern Tower West	5.83	10.00	High
Number 4 Circle	3.25	5.60	Generally satisfactory
Phalaris	2.79	4.80	Generally satisfactory
Ram	5.07	8.70	High
Red Point	5.77	9.90	High
Red River Run	4.45	7.70	Generally satisfactory
Riffle Range East	4.14	7.10	Generally satisfactory
Riffle Range West	4.08	7.00	Generally satisfactory
River Burnt Stack	4.35	7.50	Generally satisfactory
Road Burnt Stack	3.55	6.10	Generally satisfactory

PADDOCK	ORGANIC CARBON %	ORGANIC MATTER %	RATING
Road East	7.73	13.00	High
Road West	5.92	10.00	High
Rocky	4.88	8.40	Generally satisfactory
Rocky South	6.67	11.00	High
Round Hill Circle	3.40	5.80	Generally satisfactory
Round Hill Large	3.80	6.50	Generally satisfactory
Sourthern Towers East	5.44	9.40	High
Southern	4.50	7.70	Generally satisfactory
Southern Towers West	5.31	9.10	High
Two Halves Cut	5.18	8.90	High
Two Halves East	3.18	5.50	Generally satisfactory
Two Halves West	3.08	5.30	Generally satisfactory
WoolShed Creek	5.22	9.00	High
WoolShed Hill Back	5.96	10.00	High
Woolshed Hill Front	4.93	8.50	Generally satisfactory

Organic carbon levels range from satisfactory to high (Table 5-5). Soils will generally benefit from the additional organic matter applied via biosolids, even if levels are high.

5.3.4 PHOSPHORUS

Available phosphorus (measured as Colwell P) and Phosphorus Buffer index (PBI) are provided in Table 5-6.

Phosphorus Environmental Risk Index (PERI) is the Ratio of Colwell P / PBI. It is an indicator of risk of possible P leaching into waterways and environmental damage. The PERI should be < 1 to be safe for production and the environment.[8]

[8] Reference: https://fertsmart.dairyingfortomorrow.com.au/, Dairy Australia :

Table 5-6: Available phosphorus in 47 zones

PADDOCK	AVAILABLE P (MG/KG)	COMMENT	PBI	PBI COMMENT	PERI	RATING
LOR	5.00		Calc		Calc	
Barn Circle	98	High	65	Low	1.51	Very high
Big River Run 3	39	Low	96	Low	0.41	Optimum
Big River Run Central	33	Low	140	Moderate	0.24	Optimum
Big River Run East	38	Low	150	Moderate	0.25	Optimum
Big River Run West	31	Low	150	Moderate	0.21	Optimum
Chickory & Round Hill	60	Moderate	64	Low	0.94	Optimum
Front Gate & Southern Road	49	Low	40	Very low	1.23	High
Front Run	39	Low	100	Moderate	0.39	Optimum
Humbies Central	19	Very low	36	Very low	0.53	Optimum
Humbies East	16	Very low	65	Low	0.25	Optimum
Humbies South	24	Very low	49	Very low	0.49	Optimum
Humbies West	16	Very low	44	Very low	0.36	Optimum
Kirwins	42	Low	81	Low	0.52	Optimum
Little River Run East	31	Low	78	Low	0.40	Optimum
Little River Run West	80	High	91	Low	0.88	Optimum
Middle Creek	36	Low	37	Very low	0.97	Optimum
Middle Falls	39	Low	90	Low	0.43	Optimum
Middle North	78	High	36	Very low	2.17	Very high
Middle North west	48	Low	56	Low	0.86	Optimum
Middle South	48	Low	62	Low	0.77	Optimum
Northern	59	Moderate	49	Very low	1.20	High
Northern Tower East Tulip	39	Low	56	Low	0.70	Optimum
Northern Tower West	53	Moderate	96	Low	0.55	Optimum
Number 4 Circle	83	High	53	Low	1.57	Very high
Phalaris	51	Moderate	36	Very low	1.42	High
Ram	26	Low	67	Low	0.39	Optimum
Red Point	29	Low	80	Low	0.36	Optimum
Red River Run	41	Low	84	Low	0.49	Optimum

PADDOCK	AVAILABLE P (MG/KG)	COMMENT	PBI	PBI COMMENT	PERI	RATING
Riffle Range East	41	Low	50	Low	0.82	Optimum
Riffle Range West	43	Low	46	Very low	0.93	Optimum
River Burnt Stack	73	Moderate	71	Low	1.03	Above Optimum
Road Burnt Stack	46	Low	43	Very low	1.07	Above Optimum
Road East	79	High	69	Low	1.14	Above Optimum
Road West	59	Moderate	83	Low	0.71	Optimum
Rocky	38	Low	46	Very low	0.83	Optimum
Rocky South	56	Moderate	61	Low	0.92	Optimum
Round Hill Circle	70	Moderate	120	Moderate	0.58	Optimum
Round Hill Large	41	Low	65	Low	0.63	Optimum
Southern Towers East	53	Moderate	76	Low	0.70	Optimum
Southern	34	Low	32	Very low	1.06	Above Optimum
Southern Towers West	67	Moderate	87	Low	0.77	Optimum
Two Halves Cut	44	Low	73	Low	0.60	Optimum
Two Halves East	62	Moderate	65	Low	0.95	Optimum
Two Halves West	56	Moderate	65	Low	0.86	Optimum
Woolshed Creek	66	Moderate	87	Low	0.76	Optimum
Woolshed Hill Back	76	High	99	Low	0.77	Optimum
Woolshed Hill Front	75	Moderate	72	Low	1.04	Above Optimum

Phosphorus (P) levels in the soils range from very low to high. The phosphorus buffer index (PBI) of the soils is very low to moderate (Table 5-6). Soils with a low PBI rating have limited ability to store P in the soils, whereas soils with moderate to high PBI rating have the ability to store P in the soils. Still, soils with low PBI can accumulate P to above the agronomically desirable level; this can increase leaching risks. Leaching, as indicated by the P Environmental Risk Index (PERI), is low risk in most zones, however in 6 zones there is some risk of leaching occurring. For soils with a high or very high PERI rating, a reduced biosolids application rate is generally recommended. The land manager should closely monitor P levels and omit or minimise fertiliser application in these zones so that soil P will not be above the agronomically required level. No additional P should be applied after biosolids have been applied. Agronomically desirable P levels should not be exceeded in any zone.

5.3.5 NITROGEN

Table 5-7: Nitrogen (N, Total and Available) in 47 zones

PADDOCK	TOTAL NITROGEN (LECO) (MG/KG)	AMMONIUM NITROGEN NH_4 (MG/KG)	NITRATE NO_3 & NITRITE NO_2 (MG/KG)	TOTAL AVAILABLE NITROGEN (MG/KG)
LOR	50		1.0	Calc
Barn Circle	3400	3.8	57.0	60.8
Big River Run 3	4300	5.6	36.0	41.6
Big River Run Central	5000	8.4	22.0	30.4
Big River Run East	4900	9.0	21.0	30.0
Big River Run West	4900	11.0	26.0	37.0
Chickory & Round Hill	3000	7.6	51.0	58.6
Front Gate & Southern Road	4500	22.0	30.0	52.0
Front Run	6400	14.0	40.0	54.0
Humbies Central	3600	7.5	44.0	51.5
Humbies East	3700	13.0	26.0	39.0
Humbies South	4400	15.0	49.0	64.0
Humbies West	3300	11.0	53.0	64.0
Kirwins	3700	7.1	43.0	50.1
Little River Run East	3800	6.9	39.0	45.9
Little River Run West	4500	9.4	48.0	57.4
Middle Creek	3500	4.8	19.0	23.8
Middle Falls	3800	15.0	39.0	54.0
Middle North	2200	13.0	14.0	27.0
Middle North west	5000	17.0	32.0	49.0
Middle South	4800	11.0	36.0	47.0
Northern	5300	17.0	26.0	43.0
Northern Tower East Tulip	3200	20.0	34.0	54.0
Northern Tower West	4900	30.0	47.0	77.0
Number 4 Circle	2900	3.2	12.0	15.2
Phalaris	3300	21.0	28.0	49.0
Ram	4400	30.0	52.0	82.0
Red Point	5000	11.0	35.0	46.0
Red River Run	3900	6.9	43.0	49.9
Riffle Range East	3500	9.6	26.0	35.6

PADDOCK	TOTAL NITROGEN (LECO) (MG/KG)	AMMONIUM NITROGEN NH_4 (MG/KG)	NITRATE NO_3 & NITRITE NO_2 (MG/KG)	TOTAL AVAILABLE NITROGEN (MG/KG)
Riffle Range West	4100	9.8	36.0	45.8
River Burnt Stack	4700	9.5	55.0	64.5
Road Burnt Stack	3700	5.4	37.0	42.4
Road East	6400	22.0	53.0	75.0
Road West	5500	18.0	65.0	83.0
Rocky	3400	17.0	25.0	42.0
Rocky South	5000	17.0	52.0	69.0
Round Hill Circle	2700	2.5	19.0	21.5
Round Hill Large	3300	7.7	35.0	42.7
Southern Towers East	4400	25.0	37.0	62.0
Southern	3800	13.0	28.0	41.0
Southern Towers West	4600	35.0	64.0	99.0
Two Halves Cut	4100	18.0	41.0	59.0
Two Halves East	3100	8.3	12.0	20.3
Two Halves West	2800	4.7	8.4	13.1
Woolshed Creek	4400	15.0	52.0	67.0
Woolshed Hill Back	5400	20.0	57.0	77.0
Woolshed Hill Front	3900	19.0	39.0	58.0

Available N (NH_4 and NO_2) levels are generally low, and the pastures will benefit from available N in biosolids.

5.3.6 CLAY CONTENT

Table 5-8: Clay content (Texture) in 47 zones

PADDOCK	CLAY CONTENT %
LOR	0
Barn Circle	12.3
Big River Run 3	13.9
Big River Run Central	15.0
Big River Run East	13.9
Big River Run West	16.4
Chickory & Round Hill	8.8
Front Gate & Southern Road	10.0
Front Run	13.9
Humbies Central	6.1

PADDOCK	CLAY CONTENT %
Humbies East	14.0
Humbies South	8.8
Humbies West	7.5
Kirwins	19.0
Little River Run East	13.7
Little River Run West	16.4
Middle Creek	14.8
Middle Falls	17.4
Middle North	5.0
Middle North west	12.5
Middle South	12.5
Northern	12.3
Northern Tower East Tulip	12.5
Northern Tower West	13.9
Number 4 Circle	13.8
Phalaris	8.7
Ram	12.5
Red Point	13.7
Red River Run	13.7
Riffle Range East	11.3
Riffle Range West	8.9
River Burnt Stack	16.4
Road Burnt Stack	7.6
Road East	13.9
Road West	15.0
Rocky	11.0
Rocky South	13.9
Round Hill Circle	22.5
Round Hill Large	11.3
Southern Towers East	12.4
Southern	8.7
Southern Towers West	12.6
Two Halves Cut	12.5
Two Halves East	13.8
Two Halves West	13.7

PADDOCK	CLAY CONTENT %
Woolshed Creek	15.3
Woolshed Hill Back	15.0
Woolshed Hill Front	16.4

Soil clay content is generally low to moderate.

5.3.7 HEAVY METALS

Table 5-9: Heavy Metals (mg/kg) in 47 zones

PADDOCK	ARSENIC	CADIUM	CHROMIUM	COPPER	LEAD	MERCURY	NICKEL	ZINC
Barn Circle	<5	<0.2	41	10	6	<0.05	22	25
Big River Run 3	<5	<0.2	90	12	6	<0.05	30	25
Big River Run Central	<5	<0.2	110	13	7	<0.05	35	32
Big River Run East	<5	<0.2	130	10	7	<0.05	34	32
Big River Run West	<5	<0.2	120	13	<5	<0.05	40	35
Chickory & Round Hill	<5	<0.2	20	11	<5	<0.05	12	23
Front Gate & Southern Road	<5	<0.2	<5	<5	6	<0.05	<5	16
Front Run	<5	<0.2	100	12	6	<0.05	28	22
Humbies Central	<5	<0.2	5	5	<5	<0.05	<5	10
Humbies East	<5	<0.2	74	6	5	<0.05	28	24
Humbies South	<5	<0.2	<5	10	<5	<0.05	<5	16
Humbies West	<5	<0.2	6	11	<5	<0.05	5	16
Kirwins	<5	0	52	11	7	<0.05	28	25
Little River Run East	<5	<0.2	18	29	8	<0.05	24	38
Little River Run West	<5	<0.2	110	14	8	<0.05	46	31
Middle Creek	<5	<0.2	14	10	6	<0.05	7	19
Middle Falls	<5	<0.2	74	11	8	<0.05	31	32
Middle North	<5	<0.2	7	<5	5	<0.05	<5	13

PADDOCK	ARSENIC	CADIUM	CHROMIUM	COPPER	LEAD	MERCURY	NICKEL	ZINC
Middle North west	<5	<0.2	42	7	7	<0.05	14	18
Middle South	<5	<0.2	42	8	5	<0.05	14	21
Northern	<5	<0.2	11	5	6	<0.05	<5	17
Northern Tower East Tulip	<5	<0.2	20	6	8	<0.05	9	15
Northern Tower West	<5	<0.2	73	11	9	<0.05	31	30
Number 4 Circle	<5	<0.2	35	8	9	<0.05	13	20
Phalaris	<5	<0.2	14	9	8	<0.05	6	17
Ram	<5	<0.2	44	8	<5	<0.05	22	21
Red Point	<5	<0.2	54	10	<5	<0.05	29	31
Red River Run	<5	<0.2	36	21	8	<0.05	18	35
Riffle Range East	<5	<0.2	25	18	<5	<0.05	15	22
Riffle Range West	<5	<0.2	25	14	7	<0.05	11	26
River Burnt Stack	<5	<0.2	46	13	<5	<0.05	30	27
Road Burnt Stack	<5	0	14	7	<5	<0.05	8	20
Road East	<5	<0.2	12	18	7	<0.05	11	26
Road West	<5	<0.2	12	19	<5	<0.05	10	28
Rocky	<5	<0.2	15	6	10	<0.05	5	16
Rocky South	<5	<0.2	10	8	8	<0.05	5	25
Round Hill Circle	<5	<0.2	67	22	9	<0.05	38	43
Round Hill Large	<5	<0.2	66	17	9	<0.05	30	17
Southern Towers East	<5	<0.2	7	<5	8	<0.05	<5	13
Southern	<5	<0.2	49	10	8	<0.05	21	22
Southern Towers West	<5	<0.2	61	11	7	<0.05	26	27
Two Halves Cut	<5	<0.2	16	13	7	<0.05	10	22

PADDOCK	ARSENIC	CADIUM	CHROMIUM	COPPER	LEAD	MERCURY	NICKEL	ZINC
Two Halves East	<5	<0.2	23	15	7	<0.05	13	28
Two Halves West	<5	<0.2	50	13	9	<0.05	18	26
Woolshed Creek	<5	<0.2	23	13	7	<0.05	13	29
Woolshed Hill Back	<5	0	26	19	5	<0.05	19	33
Woolshed Hill Front	<5	<0.2	24	14	6	<0.05	13	26

Heavy metal levels are low in all soils.

5.3.8 PFAS

Table 5-10: PFAS levels (µg/kg)

PADDOCK	PFOS+PFHXS (µg/kg)	PFOA (µg/kg)
LOR	<0.2	<0.2
Southern	<0.2	<0.2
Phalaris	<0.2	<0.2
Humbies Central	<0.2	<0.2
Road West	<0.2	<0.2
Woolshed Hill Front	<0.2	<0.2
Big River Run 3	<0.2	<0.2
Two Halves West	<0.2	<0.2
Round Hill Large	<0.2	<0.2
Kirwins	<0.2	<0.2
Northern Towers East & Tulip	<0.2	<0.2

PFAS levels are below the detectable limit of reporting (LOR) levels.

Further soil sample results are provided in Appendix 3. Sample results from both laboratories have been provided to the EPA as separate documents.

6 Biosolids application

6.1 APPLICATION LIMITATIONS

Application rates of Class 2 biosolids to land are limited by the level of metal contaminants and the available nitrogen. To demonstrate compliance with the TBRG, two limiting rate calculations are required:

- Contaminant limiting application rate (CLAR)
- Nitrogen limiting application rate (NLAR).

In addition to the above calculations, consideration of potential for PFAS to impact the site is also calculated as per the NEMP 3.0 requirements.

6.2 CONTAMINANT LIMITING APPLICATION RATE

6.2.1 BIOSOLIDS ADJUSTED CONTAMINATION CONCENTRATIONS

Biosolids adjusted contamination concentrations (BACC) have been calculated (as per the methodology described by the TBRG) from data supplied by TasWater and is shown in Section 4.3.1.

6.2.2 MAXIMUM ALLOWABLE SOIL CONTAMINANT CONCENTRATIONS

According to the TBRG, the mmaximum allowable soil contaminant concentrations (MASCC) for arsenic, lead, mercury, and nickel are fixed. For cadmium, copper, and zinc, the MASCC varies with the soil conditions and can be calculated using Tables D2, D3, D4, and D5 of the TBRG. Table 6-1 shows the standard MASCC for contaminates. For cadmium, copper, and zinc, when the MASCC was calculated, see Table 6-2.

Table 6-1: MASCC for each element

ELEMENT	MASCC (MG/KG)
Arsenic	20
Lead	200
Mercury	1
Nickel	60

Table 6-2: Calculated MASCC

ZONE	CADMIUM MASCC (MG/KG)	COPPER MASCC (MG/KG)	ZINC MASCC (MG/KG)
Barn Circle	0.7	55	313
Big River Run 3	0.5	70	170
Big River Run Central	0.5	70	170
Big River Run East	0.5	99	230
Big River Run West	0.5	84	170
Chickory & Round Hill	0.5	29	170
Front Gate & Southern Road	0.5	79	230
Front Run	0.5	99	230

ZONE	CADMIUM MASCC (MG/KG)	COPPER MASCC (MG/KG)	ZINC MASCC (MG/KG)
Humbies Central	0.5	43	170
Humbies East	0.5	79	230
Humbies South	0.5	56	170
Humbies West	0.5	56	170
Kirwins	0.5	79	230
Little River Run East	0.5	99	230
Little River Run West	0.5	70	170
Middle Creek	0.5	79	230
Middle Falls	0.5	70	170
Middle North	0.5	16	81
Middle North west	0.5	79	230
Middle South	0.5	79	230
Northern	0.5	99	230
Northern Tower East Tulip	0.5	56	170
Northern Tower West	0.5	70	170
Number 4 Circle	0.7	116	426
Phalaris	0.5	29	170
Ram	0.5	99	230
Red Point	0.5	99	230
Red River Run	0.5	56	170
Riffle Range East	0.5	79	230
Riffle Range West	0.5	56	170
River Burnt Stack	0.5	56	170
Road Burnt Stack	0.5	43	170
Road East	0.5	119	230
Road West	0.5	99	230
Rocky	0.5	56	170
Rocky South	0.5	119	230
Round Hill Circle	0.5	59	230
Round Hill Large	0.5	43	170
Southern Towers East	0.5	70	170
Southern	0.5	56	170
Southern Towers West	0.5	70	170
Two Halves Cut	0.5	70	170

ZONE	CADMIUM MASCC (MG/KG)	COPPER MASCC (MG/KG)	ZINC MASCC (MG/KG)
Two Halves East	0.7	116	426
Two Halves West	0.8	164	580
Woolshed Creek	0.5	70	170
Woolshed Hill Back	0.5	99	230
Woolshed Hill Front	0.5	79	230

6.2.3 CALCULATION OF CONTAMINANT LIMITING APPLICATION RATE

The CLAR is the rate (in dry solid tonnes per hectare) that will cause the concentration of the limiting contaminant to reach the maximum allowable soil contamination concentration. The CLAR is derived from the BACC (see Section 4.3.1) and current soil concentration of contaminants (see Table 5-9).

The calculation for the CLCAR is as follows:

CLAR = (MASCC – ASCC) x SM / BACC

Where:

- CLAR = Contaminated Limited Application Rate (dry t/ha)
- MASCC = Maximum Allowable Coil Concentration (mg/kg)
- ASCC = Actual Soil Contaminant Concentration (mg/kg)
- BACC = Biosolids Adjusted Contaminant Concentration (mg/kg)
- SM = Incorporated Soil Mass per hectare (dry t/ha) (soil bulk density (g/cm^3) x incorporation depth (m) x $10,000m^2$) (1.33 x 0.1 x 10000 = 1330 SM t/ha).

CLAR calculations are in Table 6-3. Wet t/ha are calculated by dividing the dry tonnes by an average biosolids solids percentage (20%). Based on the calculated results, cadmium is the limiting contaminant for the majority of zones, with copper being the limiting factor for three zones. It noted that application rates required to exceed the CLAR are well above any likely application rate on the site.

Table 6-3: CLAR calculations

	ARSENIC		CADMIUM[9]		COPPER		LEAD		MERCURY		NICKEL		ZINC		LIMITING CONTAMINANT
	Dry t/ha	Wet t/ha	Dry t/ha	Wet t/ha	Dry t/ha	Wet t/ha	Dry t/ha	Wet t/ha	Dry t/ha	Wet t/ha	Dry t/ha	Wet t/ha	Dry t/ha	Wet t/ha	
Barn Circle	5,718	28,589	44	222	107	535	6,995	34,976	599	2,996	1,105	5,522	332	1,660	Cadmium
Big River Run 3	5,718	28,589	44	222	141	704	6,995	34,976	599	2,996	872	4,360	165	824	Cadmium
Big River Run Central	5,718	28,589	44	222	138	691	6,959	34,795	599	2,996	727	3,633	157	783	Cadmium
Big River Run East	5,718	28,589	44	222	222	1,109	6,959	34,795	599	2,996	756	3,778	227	1,134	Cadmium
Big River Run West	5,718	28,589	44	222	175	874	7,031	35,156	599	2,996	581	2,906	153	765	Cadmium
Chickory & Round Hill	5,718	28,589	44	222	37	182	7,031	35,156	599	2,996	1,395	6,976	167	836	Copper
Front Gate & Southern Road	5,718	28,589	44	222	183	913	6,995	34,976	599	2,996	1,599	7,993	246	1,227	Cadmium
Front Run	5,718	28,589	44	222	217	1,083	6,995	34,976	599	2,996	930	4,650	239	1,192	Cadmium
Humbies Central	5,718	28,589	44	222	89	443	7,031	35,156	599	2,996	1,599	7,993	182	912	Cadmium
Humbies East	5,718	28,589	44	222	180	900	7,031	35,156	599	2,996	930	4,650	236	1,181	Cadmium
Humbies South	5,718	28,589	44	222	110	548	7,031	35,156	599	2,996	1,599	7,993	175	877	Cadmium
Humbies West	5,718	28,589	44	222	107	35	7,031	35,156	599	2,996	1,599	7,993	175	877	Cadmium
Kirwins	5,718	28,589	44	222	167	835	6,959	34,795	599	2,996	930	4,650	235	1,175	Cadmium
Little River Run East	5,718	28,589	44	222	172	861	6,923	34,615	599	2,996	1,046	5,232	220	1,099	Cadmium
Little River Run West	5,718	28,589	44	222	136	678	6,923	34,615	599	2,996	407	2,034	158	789	Cadmium
Middle Creek	5,718	28,589	44	222	170	848	6,995	34,976	599	2,996	1,541	7,702	242	1,210	Cadmium
Middle Falls	5,718	28,589	44	222	144	717	6,923	34,615	599	2,996	843	4,214	157	783	Cadmium
Middle North	5,718	28,589	44	222	18	91	7,031	35,156	599	2,996	1,599	7,993	75	374	Copper
Middle North west	5,718	28,589	44	222	178	887	6,959	34,795	599	2,996	1,337	6,685	243	1,216	Cadmium
Middle South	5,718	28,589	44	222	175	874	7,031	35,156	599	2,996	1,337	6,685	240	1,198	Cadmium
Northern	5,718	28,589	44	222	235	1,174	6,995	34,976	599	2,996	1,599	7,993	244	1,222	Cadmium
Northern Tower East Tulip	5,718	28,589	44	222	120	600	6,923	34,615	599	2,996	1,482	7,412	177	882	Cadmium
Northern Tower West	5,718	28,589	44	222	144	717	6,887	34,435	599	2,996	843	4,214	159	795	Cadmium
Number 4 Circle	5,718	28,589	44	222	271	1,357	6,887	34,435	599	2,996	1,366	6,830	470	2,350	Cadmium
Phalaris	5,718	28,589	44	222	42	208	6,923	34,615	599	2,996	1,570	7,848	174	871	Copper
Ram	5,718	28,589	44	222	227	1,135	7,031	35,156	599	2,996	1,105	5,522	240	1,198	Cadmium

[9] Based on a maximum permissible cadmium application rate of 0.15kg/ha per 5 years, as per Appendix D of the TBRG.

	ARSENIC		CADMIUM[9]		COPPER		LEAD		MERCURY		NICKEL		ZINC		LIMITING CONTAMINANT
Red Point	5,718	28,589	44	222	222	1,109	7,031	35,156	599	2,996	901	4,505	228	1,140	Cadmium
Red River Run	5,718	28,589	44	222	81	404	6,923	34,615	599	2,996	1,221	6,104	153	765	Cadmium
Riffle Range East	5,718	28,589	44	222	149	744	7,031	35,156	599	2,996	1,308	6,540	239	1,192	Cadmium
Riffle Range West	5,718	28,589	44	222	99	496	6,959	34,795	599	2,996	1,424	7,121	164	818	Cadmium
River Burnt Stack	5,718	28,589	44	222	102	509	7,031	35,156	599	2,996	872	4,360	163	812	Cadmium
Road Burnt Stack	5,718	28,589	44	222	84	417	7,031	35,156	599	2,996	1,511	7,557	171	853	Cadmium
Road East	5,718	28,589	44	222	253	1,266	6,959	34,795	599	2,996	1,424	7,121	234	1,169	Cadmium
Road West	5,718	28,589	44	222	198	992	7,031	35,156	599	2,996	1,453	7,266	232	1,157	Cadmium
Rocky	5,718	28,589	44	222	120	600	6,851	34,254	599	2,996	1,599	7,993	175	877	Cadmium
Rocky South	5,718	28,589	44	222	279	1,396	6,923	34,615	599	2,996	1,599	7,993	235	1,175	Cadmium
Round Hill Circle	5,718	28,589	44	222	86	430	6,887	34,435	599	2,996	639	3,197	214	1,070	Cadmium
Round Hill Large	5,718	28,589	44	222	57	287	6,887	34,435	599	2,996	872	4,360	174	871	Cadmium
Southern Towers East	5,718	28,589	44	222	159	796	6,923	34,615	599	2,996	1,599	7,993	179	894	Cadmium
Southern	5,718	28,589	44	222	110	548	6,923	34,615	599	2,996	1,134	5,668	168	842	Cadmium
Southern Towers West	5,718	28,589	44	222	144	717	6,959	34,795	599	2,996	988	4,941	163	812	Cadmium
Two Halves Cut	5,718	28,589	44	222	138	691	6,959	34,795	599	2,996	1,453	7,266	168	842	Cadmium
Two Halves East	5,718	28,589	44	222	253	1,266	6,959	34,795	599	2,996	1,366	6,830	461	2,303	Cadmium
Two Halves West	5,718	28,589	44	222	384	1,918	6,887	34,435	599	2,996	1,221	6,104	643	3,215	Cadmium
Woolshed Creek	5,718	28,589	44	222	138	691	6,959	34,795	599	2,996	1,366	6,830	160	801	Cadmium
Woolshed Hill Back	5,718	28,589	44	222	198	992	7,031	35,156	599	2,996	1,192	5,958	226	1,128	Cadmium
Woolshed Hill Front	5,718	28,589	44	222	159	796	6,995	34,976	599	2,996	1,366	6,830	234	1,169	Cadmium

6.3 PFAS LIMITING CONTAMINANT APPLICATION RATE

Application rates may also be impacted by PFAS levels. The suitability and thus application rates are determined using the following flow chart from the NEMP 3.0 Supporting Document 1.

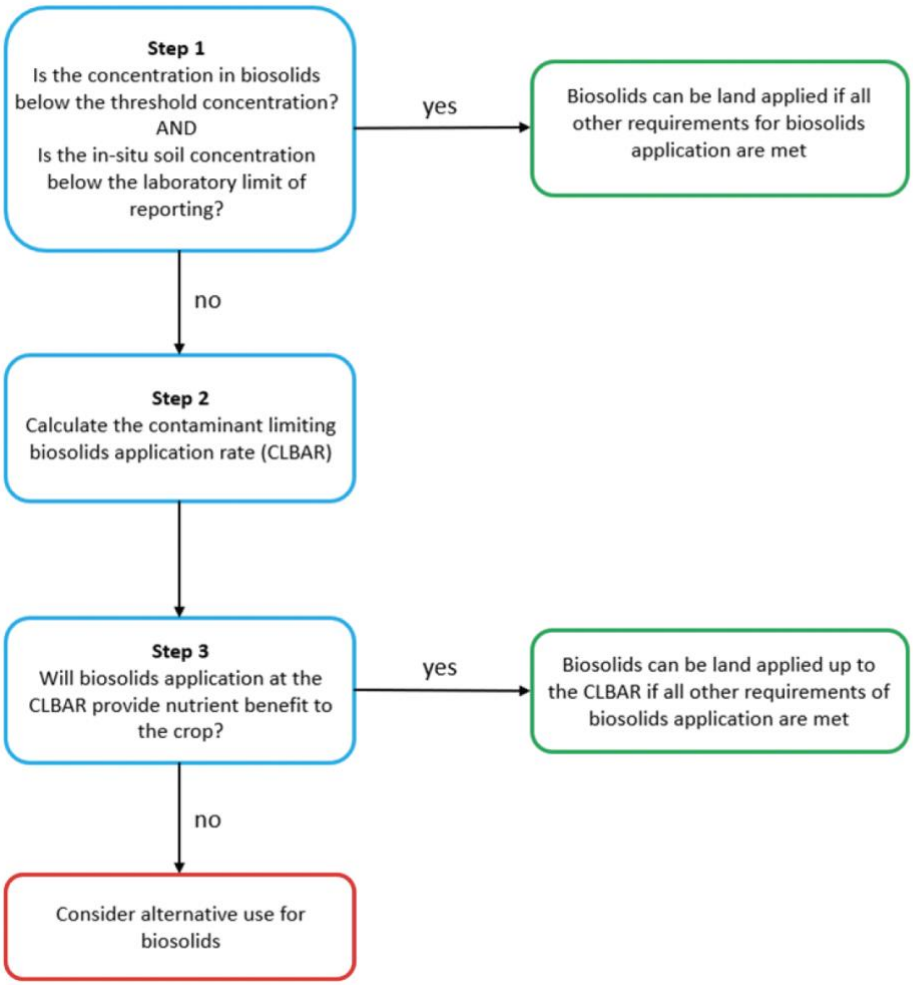

Figure 6-1: Flowchart of framework to assess suitability of Class B biosolids for land application, PFAS (NEMP 3.0)

The CLBAR is calculated via the following formula.

$$CLBAR = \frac{MASCC - MISCC}{C\ bio}\ x\ SM$$

Where:

- MASCC is the maximum allowable soil contaminant concentration (in µg/kg – see Table 6-4)
- MISCC is the measure in-situ soil contaminant concentration (in µg/kg – to be confirmed as part of soil sampling)
- C bio is the biosolids contaminant concentration (in µg/kg)
- SM is the incorporated soil mass per hectare (in dry t/ha – a stand measure of 1.3 t/m^3 will be used).

In this instance the biosolids PFAS concentrations at Selfs Point meets MOS 1 for PFOs+PFHxS and all other levels are below all threshold concentrations for all MOS levels (see Table 4-8) and the soils levels a below the laboratory limit of reporting (see Table 5-10). This mean that all measures in Step 1 of the above flow chart

are met and so biosolids can be applied to the land without further consideration of PFAS as long as other application requirements are adhered to.

Table 6-4 below shows the maximum allowable soil contaminant concentrations (MASCCs).

Table 6-4: MASCCs for PFAS

CRITERIA TYPE	MARGIN OF SAFETY	PFOS+PFHXS (µg/kg)	PFOA (µg/kg)
Allowable soil contaminant concentrations MASCC	5	0.22	0.6
	2	0.55	1.5
	1	1.1	3

6.4 NITROGEN LIMITING APPLICATION RATE

According to the TBRG, the application rate of N from Biosolids should not exceed the N demand of the crop, known as the Nitrogen Limiting Biosolids Application Rate (NLAR).

6.5 AVAILABLE N IN BIOSOLIDS

Once the amount of N is known the available N needs to be calculated. Available N refers to the mineral N (nitrate, nitrite, and ammonium). Results are determined using the formula provided in the TBRG.

$$\text{ABN (kg/t)} = \frac{(\text{ammonium N (mg/kg)} + \text{oxidised N (mg/kg)} + \text{organic N (mg/kg)}) \times \text{MR \%}/100)}{1{,}000}$$

ABN = available biosolids nitrogen

Where:

- Organic N = TKN – ammonium N
- Oxidised N = N as nitrate & nitrite
- TKN = Total Kjeldahl Nitrogen
- MR = Mineralisation Rate.

6.6 CROP REQUIREMENT FOR NITROGEN (N)

The next step is to identify the crop requirement. The pasture crop nitrogen requirement for the subject site is estimated to be 195 kg/ha annually. This is based on pasture N removal of 30 kg/t dry matter (DM), and 6.5 t/ha DM removal via grazing in the Bothwell region[10]. This was estimated by assessing nearby locations with pasture production data and adjusting for local differences in rainfall. Applications of nitrogen to pastures are usually limited to about 30-35 kg/ha per post grazing application to maximise the efficiency of nitrogen uptake and minimise losses to the air via volatilisation and / or denitrification and leaching of nitrates into groundwater or run-off to surface water.

Total annual N applications via fertilisers to pastures used for grazing in the region are commonly 60 - 300 kg/ha, depending on climate, irrigation availability, and soil/pasture quality, which greatly determines the dry matter production potential. For this case, we have based calculations on a well-managed, productive pasture with no constraints to productivity (6.5 t DM/ha) so that 195 kg N/ha can be utilised by pasture over the main growing season (late spring to mid-autumn).

[10] Based on TIAR Regional Historical Pasture Production (2005/06 to 2017/18) information for Ouse and Tunbridge (two closest sample locations), averaged.

6.7 NITROGEN LIMITED APPLICATION RATE (NLAR) FOR THE BIOSOLIDS

NLAR has been calculated using the formula provided in Appendix D of the TBRG. To ensure that excessive nitrogen is not applied in one event, the actual application rate has been calculated at 80% the NLAR. It is also strongly recommended that the total allowable application to each paddock occurs over two spreading events, to reduce leaching risks, if the soil is near or at field capacity[11]. If the soil is dry, the full rate may be applied. NLAR calculations are shown in Table 6-5.

[11] Assessed by a field guide provided to spreading contractors

Table 6-5: NLAR calculations

SITE	ANNUAL TONNES (2024-25)	AMMONIA (mg/kg)	NITRATE & NITRITE (mg/kg)	TOTAL NITROGEN (mg/kg)	AVAILABLE BIOSOLIDS N (ABN) (kg/dry tonne)	% SOLIDS	ABN (kgN/wet tonne)	AVAILABLE N (ABN kg per year)
Cameron Bay	1462	5743	151.9	64,141.7	18.72	17	3.18	4649.7
Green Point	NA	TBC	TBC	TBC	TBC	TBC	TBC	TBC
Macquarie Point	1587	3465	33.4	52,341.7	13.97	22	3.07	4872.1
Prince of Wales Bay	2822	5558.3	6.2	67,583.3	19.08	21	4.01	11,316.2
Rokeby	1974	1217.7	8.1	62,541.7	13.73	17	2.33	4599.4
Rosny	3134	1358.3	9.5	59,225	12.76	18	2.38	7458.9
Selfs Point	4407	1837	9.5	54,575	12.76	20	2.55	11,237.8
Total	**15,386**							**44,168**
							Mean Available N (kgN/tonne)	2.5
							NLAR	78 wet/t/ha
							80% NLAR	62 wet/t/ha

6.8 MAXIMUM ALLOWABLE BIOSOLIDS APPLICATION RATE

Biosolid and soil sample analysis results have been used to calculate the maximum application rates based on CLAR, NLAR and PFAS as well as other limiting soil properties such as phosphorus and/or salinity. When considering CLAR, NLAR and PFAS, all application rates are limited by the NLAR and the imposed application rate of no greater than 80% of the NLAR. Six paddocks had the application rate reduced by a further 50% due to elevated P levels.

Application rate, application area and total volume of biosolids to be applied per paddock are shown in Table 6-6. Further notes and/or setback requirements are also provided. Application rates ensure the NLAR is the limiting factor, and they will also ensure there is more than sufficient land to spread the identified biosolids from all STPs

Table 6-6: Total biosolids application rates for identified zones

ZONE	APPLICATION AREA (HA)	APPLICATION RATES (WET T/HA)	TOTAL BIOSOLIDS (T)	NOTES/SETBACKS
Barn Circle	10.1	22	218	▪ 100m setback from road ▪ Avoid areas mapped by the Waterway and coastal protection area ▪ Do not apply lime amended biosolids in this paddock ▪ Reduced application rate due to P levels
Big River Run 3	23.1	49	1127	▪ Steeply sloped areas (>15%) have been excluded ▪ Avoid occasional rocky areas
Big River Run Central	23.9	53	1262	
Big River Run East	19.6	53	1035	
Big River Run West	11.6	50	585	▪ 100 m setback from Clyde River
Chickory & Round Hill	15.5	43	670	▪ 10 m setback from drainage line
Front Gate & Southern Road	12.7	23	290	▪ 100 m setback from road ▪ 20 m setback from central drainage line and associated dam ▪ 10 m setback from small drainage lines ▪ Reduced application rate due to P levels
Front Run	5.5	45	246	
Humbies Central	35.2	46	1605	▪ Avoid steeply sloped area in south (>15%) ▪ Avoid occasional rocky area
Humbies East	24.7	50	1225	▪ 50 m setback from dam and Abyssinia Creek ▪ Avoid all areas mapped by the Waterway and coastal protection area ▪ Avoid occasional rocky areas ▪ 100 m setback from road
Humbies South	30.0	42	1248	▪ Avoid steeply sloped areas (>15%) ▪ 50 m setback from property boundary ▪ 100 m setback from road ▪ Avoid all areas mapped by the Waterway and coastal protection area

ZONE	APPLICATION AREA (HA)	APPLICATION RATES (WET T/HA)	TOTAL BIOSOLIDS (T)	NOTES/SETBACKS
Humbies West	21.6	42	899	▪ 10 m setback from native vegetation ▪ Avoid all areas mapped by the Waterway and coastal protection area
Kirwins	11.4	46	529	▪ 100 m setback from Clyde River
Little River Run East	13.3	48	638	▪ 50 m setback from dam and Grass Hut Rivulet ▪ Avoid all areas mapped by the Waterway and coastal protection area ▪ 10 m setback from drainage lines
Little River Run West	13.3	44	585	▪ 100 m setback from Clyde River and Grass Hut Rivulet ▪ Avoid all areas mapped by the Waterway and coastal protection area ▪ Avoid steeply sloped sections (>15%)
Middle Creek	9.6	54	522	▪ Avoid all areas mapped by the Waterway and coastal protection area ▪ 50 m setback from Abyssinia Creek ▪ Only apply biosolids in the northern and southern sections of the paddock, not in the middle.
Middle Falls	5.7	45	255	▪ 100 m setback from dam and Grass Hut Rivulet
Middle North	15.9	27	426	▪ 50 m setback from property boundary ▪ 10 m setback from drainage lines ▪ Reduced application rate due to P levels
Middle North west	7.2	46	334	▪ 20 m setback from drainage lines ▪ 50 m setback from Abyssinia Creek
Middle South	16.9	47	798	▪ 50 m setback from Abyssinia Creek
Northern	6.2	24	151	▪ 100 m setback from road ▪ 50 m setback to property boundary ▪ Avoid all areas mapped by the Waterway and coastal protection area ▪ 50 m setback from Abyssinia Creek ▪ Reduced application rate due to P levels

ZONE	APPLICATION AREA (HA)	APPLICATION RATES (WET T/HA)	TOTAL BIOSOLIDS (T)	NOTES/SETBACKS
Northern Tower East Tulip	20.1	45	900	▪ 100 m setback from ▪ 20 m setback from drainage line
Northern Tower West	20.4	38	767	▪ 20 m setback from drainage line and small farm dam
Number 4 Circle	9.8	29	282	▪ 250 m setback from northern property boundary ▪ Do not apply lime amended biosolids in this paddock ▪ Reduced application rate due to P levels
Phalaris	17.0	23	394	▪ Avoid all areas mapped by the Waterway and coastal protection area ▪ 50 m setback from property boundary ▪ 50 m setback from Abyssinia Creek ▪ Avoid all areas mapped by the Waterway and coastal protection area ▪ Reduced application rate due to P levels
Ram	17.0	36	612	▪ 100m setback from road ▪ 250 m setback from dwellings to the east ▪ 10 m setback from drainage line ▪ .Do not apply lime amended biosolids in this paddock
Red Point	29.9	48	1435	▪ 100 m setback to Abyssinia creek ▪ Avoid steeply sloped areas (>15%) ▪ 20 m setback to drainage line to the west
Red River Run	20.9	46	970	▪ 100 m setback from the Clyde River and Abyssinia Rivulet ▪ 10 m setback from drainage line ▪ Avoid steeply sloped areas (>15%)
Riffle Range East	18.1	51	927	▪ 250 m setback from northern boundary ▪ 20 m setback from drainage line ▪ 10 m setback from native vegetation ▪ Do not apply lime amended biosolids in this paddock
Riffle Range West	22.1	48	1061	▪ 20 m setback from drainage line ▪ 10 m setback from native vegetation ▪ Do not apply lime amended biosolids in this paddock

ZONE	APPLICATION AREA (HA)	APPLICATION RATES (WET T/HA)	TOTAL BIOSOLIDS (T)	NOTES/SETBACKS
River Burnt Stack	17.5	42	728	▪ 100 m setback from Clyde River ▪ Avoid all areas mapped by the Waterway and coastal protection area
Road Burnt Stack	13.7	49	669	▪ 100 m setback from road
Road East	22.1	38	849	▪ 100 m setback from road ▪ Avoid steeply sloped areas (>15%) ▪ Avoid rocky areas
Road West	18.8	36	677	▪ Avoid steeply sloped areas (>15%) ▪ Avoid rocky areas ▪ 50 m. setback from Abyssinia Creek
Rocky	20.3	49	991	▪ Avoid all areas mapped by the Waterway and coastal protection area ▪ 20 m setback from small dams ▪ 100 m setback from road
Rocky South	21.8	40	872	▪ 50 m setback from property boundaries ▪ 50 m setback from Abyssinia Creek ▪ 10 m setback from drainage lines
Round Hill Circle	8.6	55	475	▪ 100 m setback from road ▪ Do not apply lime amended biosolids in this paddock due to nearby stock yards
Round Hill Large	19.7	49	961	▪ 100 m setback from road ▪ 50 m setback from Grass Hut Rivulet ▪ Do not apply biosolids to the south of Grass Hut Rivulet ▪ Do not apply lime amended biosolids in this paddock
Southern Towers East	11.5	42	488	▪ 100 m setback from road ▪ Avoid southern area where there is a drainage line, associated wet area and is mapped by the Waterway and coastal protection area
Southern	11.4	50	565	▪ 50 m setback from property boundary ▪ 20m setback from drainage lines

ZONE	APPLICATION AREA (HA)	APPLICATION RATES (WET T/HA)	TOTAL BIOSOLIDS (T)	NOTES/SETBACKS
Southern Towers West	17.6	30	535	▪ Avoid southern area where there is a drainage line, associated wet area and is mapped by the Waterway and coastal protection area ▪ 20 m setback from drainage line and small dam in north western section ▪ 50 m setback from Abyssinia Creek
Two Halves Cut	7.1	43	307	▪ 10 m setback from drainage line
Two Halves East	14.6	56	818	▪ 10 m setback from drainage line
Two Halves West	14.0	58	818	
Woolshed Creek	17.0	41	694	▪ 50 m setback from Grass Hut Rivulet
Woolshed Hill Back	17.2	38	647	▪ Avoid occasional rocky areas ▪ Avoid steeply sloped areas (>15%) ▪ 100 m setback from road
Woolshed Hill Front	15.2	44	669	▪ 100 m setback from road
Total	**776.4**		**33,757**	

7 Biosolids management actions

This section details management actions that will be undertaken as part of the biosolids application program to minimise the risk to nearby sensitive receptors and the environment.

7.1 ODOUR MANAGEMENT

Only Grade A and Grade B biosolids are permitted to be reused at the application site. By definition, Grade A and Grade B biosolids should not exhibit offensive odours. TasWater, as the resource producer, is responsible for producing and classifying biosolids and play the primary role in preventing offsite odours from biosolid reuse activities.

All treatment plants producing biosolids that will be delivered to the site are required to meet the approved processes for producing stabilisation Grade B product and must also meet multiple process verification requirements (TBRG Section 8). TasWater must be able to provide the following information to regulators to demonstrate that appropriate stabilisation has occurred (TBRG Section 8.4.1):

1. Evidence that the process achieves vector attraction reduction requirements (TBRG Table 8.1);
2. Test results from a suitably accredited laboratory (such as NATA or ASPAC) showing compliance with maximum pathogen levels for Stabilisation Grade A or Stabilisation Grade B (results shown in this BMP in Table 4-6); and
3. Measurements of relevant process criteria (e.g. retention times/reaction times/temperature/pH/moisture/other process controls) to ensure compliance with designated stabilisation process.

With the approved process criteria being met, all biosolids delivered to the site can be considered Grade B and therefore all management methods and buffer zones detailed in the TBRG and in this Management Plan will be effective in preventing offsite odours. The TBRG is informed by significant modelling and assessment of the odour generation potential of Grade B biosolids produced in Australia and advises that “adequately stabilised biosolids should not exhibit strong, offensive odour”.

The TBRG does not provide guidance on how to manage biosolids produced by STPs that have had the stabilisation process temporarily compromised other than stating “biosolids giving off strong, offensive odour should not be sent for beneficial reuse”.

For an odour to be considered offensive an overall judgement is required that considers frequency, intensity, duration, offensiveness/character, and location of the odour event (New Zealand Government 2016). These assessment criteria are shown in Table 7-1.

Table 7-1: Description of factors used to characterise odour

FACTOR	DESCRIPTION
Frequency	How often an individual is exposed to the odour
Intensity	The strength of the odour
Duration	The length of the exposure
Offensiveness/character	The character relates to the ‘hedonic tone’ of the odour, which may be pleasant, neutral or unpleasant
Location	The type of land use and nature of human activities in the vicinity of an odour source

In practical terms, odour assessment of biosolids at treatment plants is difficult due to the inability to separate biosolid odour from other treatment plant smells. Additionally, many plants have been upgraded with fully enclosed biosolid bins with negative pressure odour capture systems connected, limiting the ability of operators to assess the biosolids for odour before collection. These difficulties mean that land spreading sites may be the first opportunity to detect biosolids that are exhibiting offensive odour.

TasWater and Spectran (contracted spreading company) utilise a comprehensive document produced by the New Zealand Ministry for Environment (2016) titled *Good Practice Guide for Assessing and Managing Odour* to help understand, define, assess, monitor, measure and manage odour emissions. Stakeholders are encouraged to consult this document.

In order to mitigate the risks associated with managing odorous biosolids delivered to site through failed detection of odour at the STP, the following measures are to be followed (Table 7-2):

Table 7-2: Managing odorous biosolids

METHOD	DESCRIPTION
1.	All deliveries are to be unloaded in an area that is separated at least 100m from all property boundaries (Table 7-4).
2.	The unloading area is to be designed as a bund to limit the surface area of biosolids exposed to air (Figure 7-1).
3.	Both delivery drivers and the land spreading operator(s) are to be trained in detecting and reporting biosolid loads that exhibit an offensive odour. Every instance shall be reported to TasWater for investigation.
4.	The material that has been identified as odorous is to be reloaded and sent for composting. Whist it is feasible to spread odorous biosolids in a remote part of the property without incident (i.e. changing the Location (Table 7-1)) the odour may be indicative of non-compliance for stabilisation and this may present unacceptable risks to public health, surface and groundwater and may attract vermin and vectors.
5.	All further collections from the same STP are to be diverted to an approved compost facility until it can be demonstrated that the biosolids meet the minimum criteria for stabilisation and have ceased producing nuisance odour. Monitoring of loads for odour at the compost site may assist with this process.
6.	As much as reasonably practicable, the land spreading operator shall be present when deliveries occur to ensure loads that are found to be odorous are kept isolated in the unloading bund.
7.	Should offensive odour be detected after land application for any reason, the following guidance applies: The detection of the offensive odour shall be recorded and an incident raised. Investigation into the root cause shall occur. Stakeholders who may be impacted by the offensive odour shall be consulted. Following land application, odour generation rapidly reduces as biosolids are exposed to air and sunlight. Moist and cloudy conditions will reduce this rate of odour reduction. The reduction of biosolid particle size on the spread area shall be considered to increase the rate of desiccation, exposure to sunlight and incorporation into the soil surface. A set of harrows turned upside down is the most effective implement for this purpose. Cultivation of spread areas shall be considered to stop odour generation. The prevailing wind direction shall be considered (Section 7.5.1) in determining the most appropriate corrective action.
8.	Complaints shall be investigated (Section 7.5.44) and records kept (Section 7.6).

7.1.1 LIME STABILISED BIOSOLIDS

The addition of lime to biosolids is an approved method for reducing Vector Attraction (option 7, Table 8.1 TBRG). The lime increases the pH of biosolids to ≥12 and (a) kills any existing pathogens and odour generating organisms and (b) prevents attraction of flies and other vermin due to the hostile alkaline nature of the material.

Lime stabilised biosolids are produced at very few treatment plants in Australia. Of the five plants identified by TasWater to use lime stabilisation, four of those occur in Southern Tasmania, and three are potential sources of biosolids to the subject site (Table 4-6). Given the rarity of the use of this stabilisation methodology, there is concern that the data used to develop the management controls in the TBRG may not be fully representative of the characteristics of lime stabilised biosolids.

Unlike other approved methods (e.g. aerobic and anaerobic digestion, heat dried biosolids etc), lime stabilisation of biosolids does not reduce volatile solids. Volatile solids are a measure of the proportion of a material (other than water) that volatilises when exposed to heat. Lime stabilised biosolids are theoretically likely to produce more odour emissions than biosolids where alternative Vector Attraction Reduction strategies are used. Therefore, a conservative approach should be chosen when selecting suitable spread areas for lime stabilised biosolids.

7.2 BUFFER ZONES AND PHYSICAL SITE RESTRICTIONS

As a minimum, buffer and physical site restrictions must consider all elements identified in Table 11.1 of the TBRG. These requirements are detailed below in Table 7-3.

Table 7-3: Buffer zones and physical site restrictions (TBRG Table 11.1)

SITE CHARACTERISTICS	RESTRICTION		ADDITIONAL INFORMATION
Slope	<15% (<1:7 ratio)		To prevent run-off and erosion. Forestry and site rehabilitation are possible exceptions; with management controls this can be increased to <25%.
Buffer Distances	Open watercourse downslope	>100m	Buffer zones are used to reduce the likelihood of run-off, dust, or odour affecting adjacent land or watercourses.
	Open watercourse flat	>50m	
	Open watercourse upslope	>10m	
	Occupied dwellings	>100m	
	Residential zones	>250m	
	Public roads and adjoining properties	>50m	
	Water bores	>50m (>250m if drinking water bore)	
	Native forests or significant vegetation	>10m	
	Property access roads	>5m	
Soil pH	>4.5		This restriction does not apply to lime amended biosolids.
	<7.5		<7 applies to lime amended biosolids only.
Undesirable Drainage	Waterlogged, flood-prone or extremely permeable soils		To prevent run-off or groundwater contamination.
Shallow Groundwater	>1.5m to groundwater		To prevent run-off or groundwater contamination.
	Average Clay % (0-100cm)	Minimum depth to groundwater	
	>35%	1.5m	
	25-35%	2m	
	15-25%	3m	
	10-15%	4m	
	5-10%	5m	
	<5%	8m	
Rocky Ground	Untillable land		Forestry and site rehabilitation are possible exceptions with management controls in place.

In addition to the above specified site requirements, TasWater, Spectran and RMCG have identified that it will be appropriate to increase offsets to nearby sensitive uses to more than the minimum required by the TBRG. The offsets will be at a minimum:

- >250 m for spreading 'normal' biosolids.
- >500 m for spreading lime amended biosolids
- >1000 m for stockpiles.

In this instance, sensitive uses have been considered to be adjacent dwellings. A 100m setback will also be implemented to the Hollow Tree Road, this is greater than the minimum setback of 50 m to roads and adjacent property boundaries. See maps in Appendix 1 for application areas that incorporates the above setback requirements.

7.3 TRANSPORT AND DELIVERY OF BIOSOLIDS

The transport of biosolids to the property will be undertaken by a contractor, Spectran, who is registered to transport K130 categorised controlled wastes. All delivered weights are to be recorded and retained in a suitable database by the contractor. Validation of full-load weights via a weighbridge is recommended for sites without scales and it is recommended that all trucks carting biosolids be equipped with accurate weighing systems. Where weighing equipment is not available the full-load weight must be estimated by an approved weight estimation method[12].

The contractor and the property owner shall allocate suitable unloading areas where safe stockpiling can occur (Section 7.5). Short-term stockpiling of de-watered biosolids prior to spreading is discussed in Section 11.2 "Management Controls" of the TBRG. Stockpiling may be undertaken providing that several management controls are put in place:

- Stockpile areas should be located on the minimum slope possible within the application area but away from any area subject to flooding
- Stockpiles are to be located at least 100m from the nearest property boundary
- Stockpiles must not be accessible to livestock
- Stockpiles must not be subject to erosion by wind or rain – if this is found to be occurring, biosolids must be applied or the erosion addressed
- Stockpiling is limited to the day of application for biosolids specifically requiring incorporation to meet vector attraction reduction requirements
- Biosolids to be stored on site for more than 24 hours must either be:
  - Retained within a bunded storage area constructed and maintained to contain the first hour of a 1 in 20-year rainfall event: or
  - On a site where it can be reasonably demonstrated that surface runoff or contaminants leaching into the groundwater will not be problematic.

Consideration will need to be given to accommodate delivery and unloading during wet weather. Should the roads and unloading areas be unsuitable, deliveries should be postponed.

Provision of washdown equipment for use on trucks and bins must be made available to ensure compliance with the hygiene requirements of the Controlled Waste Transporter permit. Washdown water should be added to either biosolid stockpiles or planned spreading areas and not run off into drains or streams.

[12] Data Recording & Reporting for Resource Recovery Facilities Guideline, 2022. Available at: https://nre.tas.gov.au/Documents/Guideline%20-%20Data%20Recording%20and%20Reporting%20-%20Resource%20Recovery%20Facilities.pdf

Figure 7-1: Biosolid stockpiling bund. Trucks unload on the right-hand side and the excavator loads the spreader on the left. A small berm on the loading site is added (not shown in picture) to prevent surface water entering and to provide a stop for the back wheels of the trucks (photo provided by Spectran).

7.4 BIOSOLIDS APPLICATION METHOD

The biosolids will be spread within 24 hours of delivery, unless express permission is granted by the landowner to stockpile them for longer and potential run off can be contained.

Weather predictions will be considered when making decisions about transport, unloading and spreading.

The trained operator shall calibrate the spreader for the identified application rate using GPS equipment

. Ongoing calibration checks and adjustments need to be made as required. Records of calibrations, ground speed and overall operations to maintain the target application rates must be kept. It must be considered that wetter material may have a larger spread width and as such vehicle speed will need to be reduced. It is the responsibility of spreading contractor to ensure all operators are adequately trained and follow specific work safety measures when operating spreading machinery. Training records must be kept for each operator.

The spreading equipment cannot operate on steep slopes (>15%) or waterlogged (saturated) or rocky terrain.

Figure 7-2: Spectran biosolids spreader (photo provided by Spectran)

7.5 BIOSOLIDS STOCKPILING AND APPLICATION CONTROLS

Management of biosolids once delivered to site are to be consistent with the requirements of the Biosolid Application Controls detailed in the TBRG (Table 11.2). Relevant sections are reproduced in Table 7-4 below. Where additional controls are to be employed, or if further detail is provided in this BMP, this is referenced.

It is noted that the first preference is for biosolids to be stored on a biosolids production or processing site in the first instance, rather than the application site.

Table 7-4: Biosolids application controls (TBRG Table 11.2)

PRACTICE	MANAGEMENT
Signage	Any area used for stockpiling or biosolids application must have adequate signage installed on appropriate gates and fence lines to ensure the public is aware of the risk and prevent public accessing the area. Advice on appropriate signage may be obtained from Public and Environmental Health Services. See Section 7.5.2 for identified signage.
Stockpiling dewatered biosolids on application sites	▪ Stockpile areas should be located on the minimum slope possible within the application area but away from any area subject to flooding ▪ Stockpile must be located at least 100 m from the nearest property boundary ▪ Stockpiling and/or unloading areas shall not be located within 1000 m of an off-farm residence ▪ Stockpile must not be accessible to livestock ▪ Stockpile must not be subject to erosion by wind or rain – if this is found to be occurring, biosolids must be applied or erosion addressed

PRACTICE	MANAGEMENT
	– Stockpiling is limited to the day of application for biosolids specifically requiring incorporation to meet vector attraction reduction requirements (TRBG Table 8.1) ▪ Biosolids to be stored on-site for more than 24 hours must either be: – Retained within a bunded storage area constructed and maintained to contain the first hour in a 1 in 20-year rainfall event; or – On a site where it can be reasonably demonstrated that surface run-off or groundwater will not be problematic ▪ To ensure excessive quantities of biosolids do not accumulate on an application site, biosolids should not be stored for more than 90 days. An exception may be made during winter months on the proviso that the biosolids are stored within a bund and those biosolids must be used in the upcoming growing season. ▪ For bunded storage areas: – Surface water diversion is required to prevent the entry of overland flow into the bunded area, and – A drainage collection point should be located within the bund, but separated from the stored biosolids, and collected drainages should be applied to the application site.
Incorporation of biosolids	Biosolids should be incorporated wherever possible (e.g. applied to land about to be cultivated or direct injected as a liquid). However, many forms of biosolids (e.g. dried, lime amended) are suited to surface application without incorporation, and management practices (e.g. biosolids treatment, withholding periods, buffer zones) can be used to minimise the risk of off-site impacts and vector attraction. In all cases, reasonable judgement should be exercised with respect to the appropriate application and incorporation requirements for the biosolids and site in question.
Repeat application and soil pH adjustment	Following application, soil pH should be maintained above pH 5.5 to minimise migration of nutrients and contaminants into groundwater. Prior to repeat biosolids application, soil sampling must be completed to verify soil pH.
Weather patterns and seasonality	All biosolids application should be scheduled to preceding, present, and forecast weather conditions, with particular emphasis on avoiding likely rainfall events. Consideration should be given to whether wind conditions will increase the likelihood of dust and odour being carried beyond buffer zones. Winter application of biosolids should be avoided where possible due to low nutrient uptake.

7.5.1 WIND STRENGTHS AND DIRECTION

Wind has the potential to move odours offsite. The spreading contractor, in conjunction with the property owner / manager, shall consider meteorological data of prevailing winds with local knowledge of terrain effects to exclude stockpiling and spread areas from certain areas of the property and increase the buffer zones in Table 7-3 where required.

Prevailing winds are from the west and north, see Figure 7-3. Hence this will be taken into consideration when identifying stockpile locations.

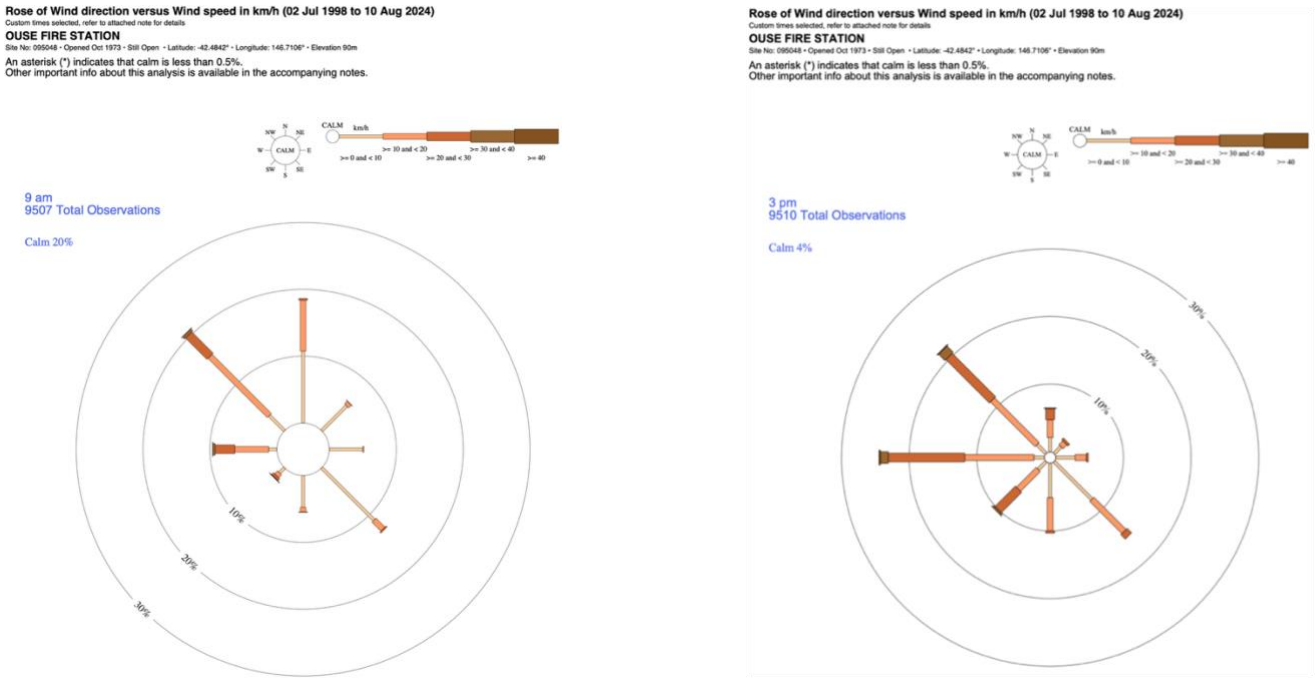

Figure 7-3: Annual mean wind rose for Ouse Fire Station (BoM site number 095045), 1998 to 2024

7.5.2 SIGNAGE

Appendix 2 provides a visual of the signage that will be used on site. Signage is in line with regulatory requirements.

7.5.3 OCCUPATIONAL HEALTH AND SAFETY

Biosolids can contain pathogens. Personnel involved with reuse activities shall be trained and:

- Always wash hands before eating, drinking, or smoking
- Cover cuts and abrasions with waterproof dressings. If an infection occurs, see a doctor immediately.
- Do not eat or drink while working with biosolids
- Protective clothing, including eye and dust protection (masks where appropriate), must be worn when working with biosolids
- Promptly clean body areas that become in contact with biosolids.

All site visitors and contractors are to be informed of the above and have access to appropriate safety equipment and washing facilities.

Signage shall be used to inform the public on the risks of entry (see Section 7.5.2).

7.5.4 COMPLAINTS

All complaints by the public are to be investigated immediately by TasWater and recorded in both TasWater and the spreading contractor's incident recording system. All investigations shall address the following questions at a minimum:

- What is the nature of the complaint?
  - Odour, noise, environmental, visual?
- What are the times and duration of the activity causing concern?
  - Is it a one off or has it been constant?
- Have there been environmental or weather conditions that may be contributing?

  - Hot / cold weather, wind direction, rainfall
- Are there any non-compliance events that may be contributing?
  - Have buffer zones been observed?
  - Are all biosolids delivered to site verified as Grade B?
  - Is stock being excluded from spread areas?
  - Are delivery vehicles being operated safely?
- Is the complaint potentially vexatious or are there vested interests at play?
- Has the complainant been consulted previously?
  - Do they understand the activity, the duration, location, and management measures?
- Are others affected?
  - If so, what is their experience?
- What mitigation measures can be employed?
  - Cultivation of spread areas
  - Cease spreading in a particular area
  - Dust suppression on access roads.
- What corrective actions were performed?
- Have the corrective actions been effective?
  - Is the original complainant satisfied with the outcomes?
  - Have internal inspections and audits indicated the situation is resolved?
- Do management methods need changing to prevent a recurrence and what should be changed?

7.5.5 WITHHOLDING PERIODS FOR BIOSOLIDS APPLICATION

Table 7-5 details the minimum crop withholding periods for biosolids as per the TBRG.

Table 7-5: Minimum crop restrictions for class 2 biosolids application (TBRG Table 10.1)

PRACTICE	MANAGEMENT
Human food crop	For crops which may be eaten raw, and where harvested parts are close to the soil surface (e.g. lettuce, beetroot, cauliflower, cabbage), planting must be delayed for 18 months after biosolids application. For crops which may be eaten raw, and where harvested parts are below the soil surface (e.g. carrots, potatoes), planting must be delayed for 5 years after biosolids application. In all other cases (i.e. food crops where the harvested product is not in contact with the ground such as apples and wheat), the crop must not be harvested for 30 days after biosolids application. Windfalls (e.g. orchards) must not be collected for 12 months after the biosolids application, unless further processing involving pasteurisation (e.g. canned fruit) occurs.
Animal feed and fibre crops	Must not harvest for 30 days after biosolids application.
Pasture and fodder crops	Animals must not have access to stockpiles of biosolids. Animals must not have access to or be grazed on the site for at least 30 days after biosolids application. Poultry, pigs and other rooting livestock must not be grazed on biosolids application or storage areas as feeding habits of these animals can result in high levels of soil ingestion. Exclusion is preferable but a withholding period of 3 years applies. The Producer must maintain a register of all properties which receive biosolids to grazing land or produce animal fodder for cattle or pigs and make this register available to the Chief Veterinary Officer on request.
Turf	Turf grown on land to which biosolids has been applied must not be harvested for 12 months after biosolids application.

In addition to the above restrictions, it is the landowner's responsibility to ensure that where biosolids are utilised ahead of saleable crops being grown, this practice is acceptable to the purchaser of the crop and adheres to current Food Safety Standards (https://www.foodstandards.gov.au/).

Livestock Withholding

Table 7-5 details restrictions for animals grazing on pasture. The restrictions are consistent with other requirements for managing pathogen risks to livestock such as Bovine Spongiform Encephalopathy (BSE) and scrapie. *The Australian Ruminant Feed Ban guidelines* (2018) give additional guidance on acceptable measures to minimise the risk of ruminant ingestion of Restricted Animal Material (RAM). In practice this generally means that there shall be no visible biosolids remaining on the pasture in the grazing area prior to re-entry of stock; in extended dry periods or low-growth periods, this requirement may lengthen the minimum 30-day withholding period duration shown in Table 7-5.

Biosolids may remain visible on the surface (and accessible to stock) for longer than 30 days after application in circumstances such as the following:

- Spreading equipment or physical characteristics of the biosolids have led to uneven distribution of material during spreading (e.g. biosolids are in 'clumps');
- Cold and / or dry weather has reduced the growth of pasture; and
- Dry conditions have prevented weathering and infiltration of the biosolids into the soil.

Before stock are allowed entry into a paddock where biosolids have been spread a visual inspection must be carried out to ensure no clumps or streaks of biosolids remain and the field appears uniform and clean.

Visual check method:

- Divide the paddock into a grid
- Take photos after spreading has occurred and then photos when doing the visual inspection to document the change
- Walk or drive paddock slowly before the end of the withholding period and visually inspect for any remining biosolids residue inspecting each section of the grid systematically
- If incorporated, check biosolids were incorporated into the soil within 48 hours.

In circumstances where there is still residual biosolids, a longer re-entry period would be required until no biosolids are visible on the pasture's surface. TasWater is the responsibility entity for the biosolids, it therefore is their responsibility to ensure the landholder is aware of their requirements around withholding periods after biosolids application to limit the risk of livestock being exposed to RAM.

Cysticercosis (Beef Measles)

Cysticercosis can occur in cattle due to infection from the *Taenia saginata* parasite.

There is currently an unquantified link associated with cattle grazing on land spread with biosolids and the transmission of Cysticercosis. Whilst the risk is believed to be low, the Tasmanian Chief Veterinary Officer (CVO) has been considering the reporting requirements for cattle grazed on land that has had biosolids applied. This assessment has been occurring for several years. Should any formal advice be provided by the Tasmanian Chief Veterinary Officer, consideration would have to be given to changes in biosolid applications in response to this advice.

7.5.6 GENERAL BIOSECURITY DUTY

Biosecurity is a set of measures designed to protect a property, the health of crops (including forestry), animals and their environment from the entry and spread of pests, diseases, pathogens, and weeds, as well as harmful

contaminants. Biosecurity is the landholder's responsibility, and that of every person visiting or working on a property.

Tasmania has a comprehensive biosecurity protection system, underpinned by the *Biosecurity Act 2019*. This Act introduced a legal obligation known as the **General Biosecurity Duty** – or GBD in Tasmania. The underlying principle with the new GBD is that it is relatively easy to prove a breach of duty. For example, if a contractor doesn't wash down their vehicle prior to entering a property (or there is no record of actions) and weeds turn up in that location, then the contractor can be shown to have breached their duty. The GBD provides a legal framework to ensure that companies and individuals are reducing the biosecurity risks with the activities they are undertaking.

Breaches of biosecurity and the subsequent introduction or spread of weeds, pests, diseases, or contaminants can have significant economic impact on individual farmers and on yields, produce quality and marketability (at a regional, State, and national scale). Some farms which already have endemic biosecurity risks will have containment and management responsibilities, to prevent spread across their own farm, or on to others.

If the farm has a biosecurity plan in place, all persons involved in the biosolids spreading activity coming onto site must follow the biosecurity plan. If there is no official plan in place, then general biosecurity practices as identified on the Biosecurity Tasmania website must be followed.

7.6 RECORD KEEPING

TasWater, the spreading contractor, and the landowner/manager are required to maintain accurate records that capture:

- Origin and quantities of biosolids and dates delivered and spread
- Land areas where the biosolids were applied including evidence that buffer distances have been adhered to
- Application rates
- All information necessary to verify application rates and compliance with the AMM or alternate approvals
- Details of any incidents
- Details of any complaints and corrective action undertaken
- Incorporation date, if applicable.

All records are to be kept for a minimum of 5 years (Section 3.5 of the AMM).

References

Commonwealth of Australia (2025). PFAS National Environmental Management Plan (NEMP) 3.0. Australian Government, Canberra, Australian Capital Territory

Environment Protection Authority (2020). *Tasmanian Biosolids Reuse Guidelines*, Environment Protection Authority, Hobart, Tasmania.

Environment Protection Authority (2020). *Approved Management Method for the Reuse of Biosolids*, Environment Protection Authority, Hobart, Tasmania.

Central Highlands Council (2023). *Tasmanian Planning Scheme – Central Highlands*.

New Zealand Ministry for the Environment (2016). *Good Practice Guide for Assessing and Managing Odour*. Wellington: Ministry for the Environment.

Appendix 1: Maps

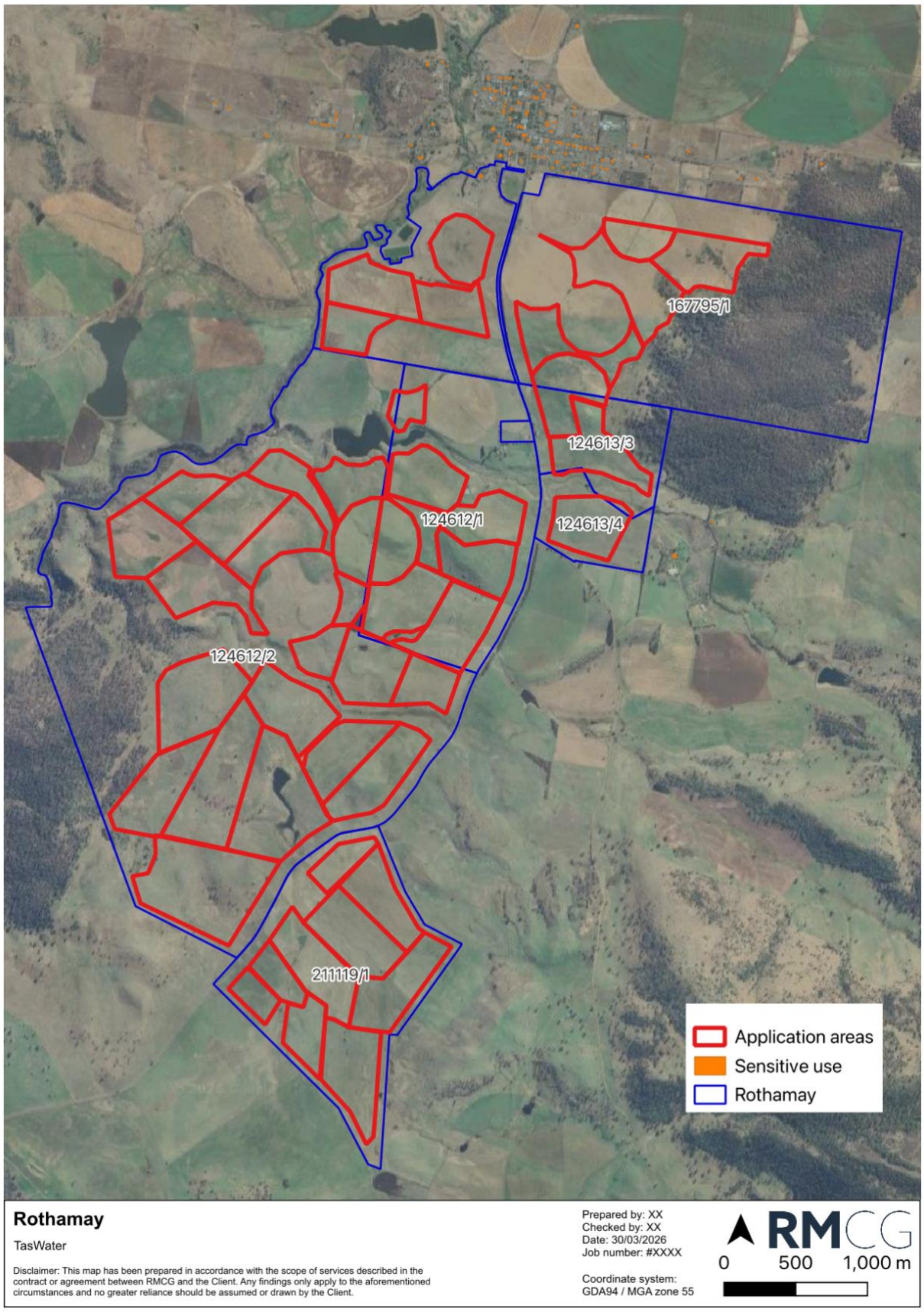

Figure A1-1: Rothamay Titles and application areas

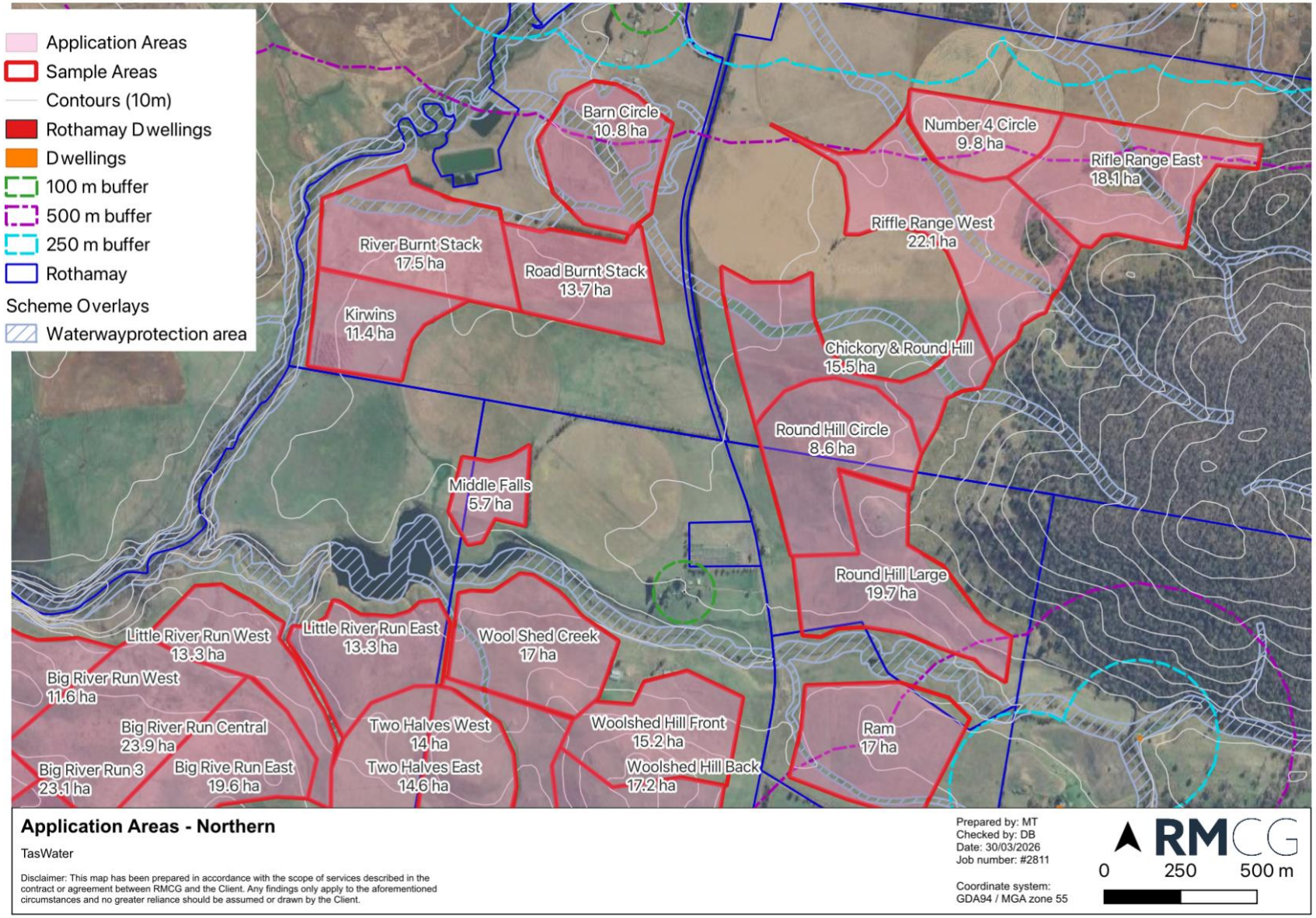

Figure A1-2: Northern application areas

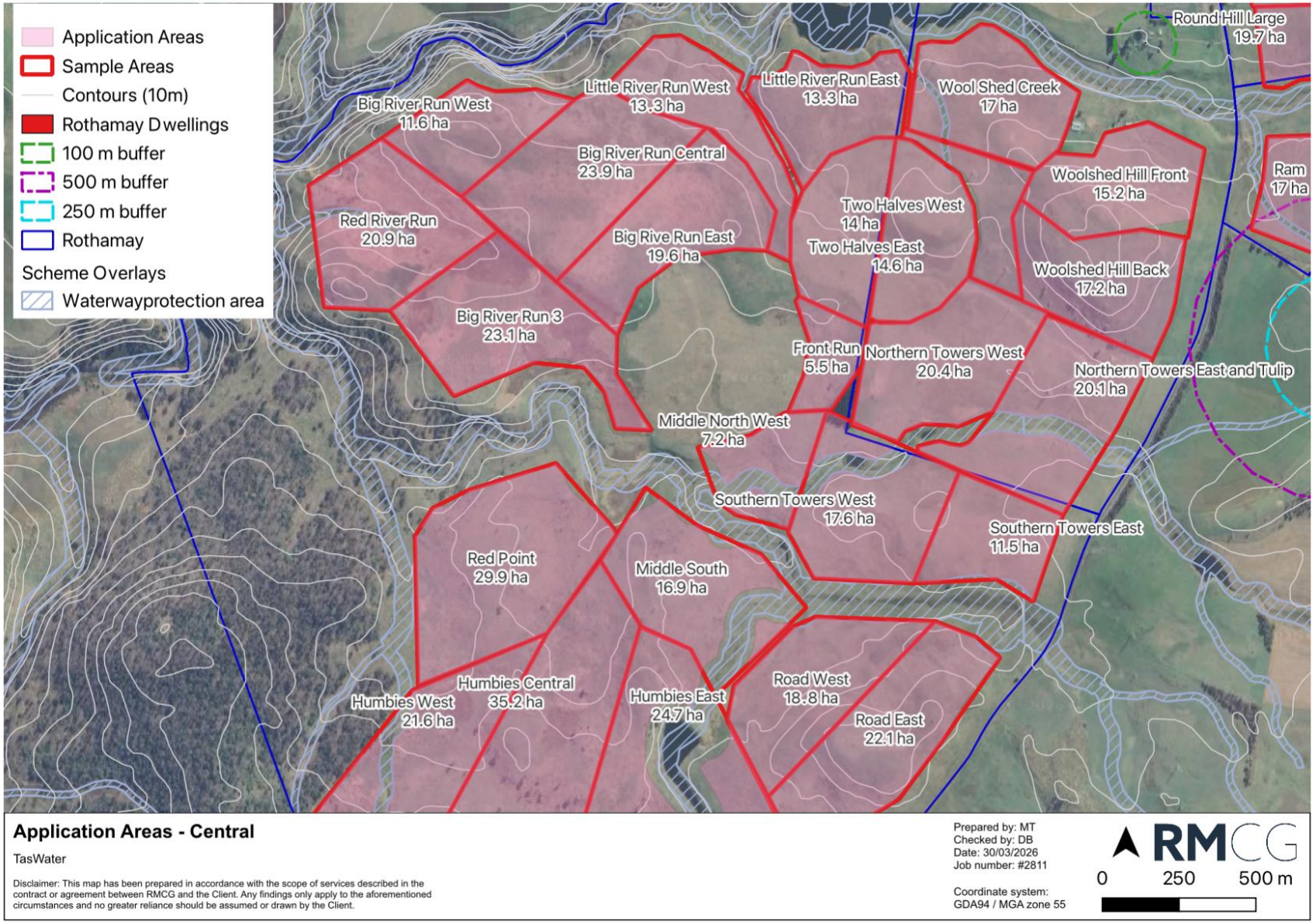

Figure A1-3: Central application areas

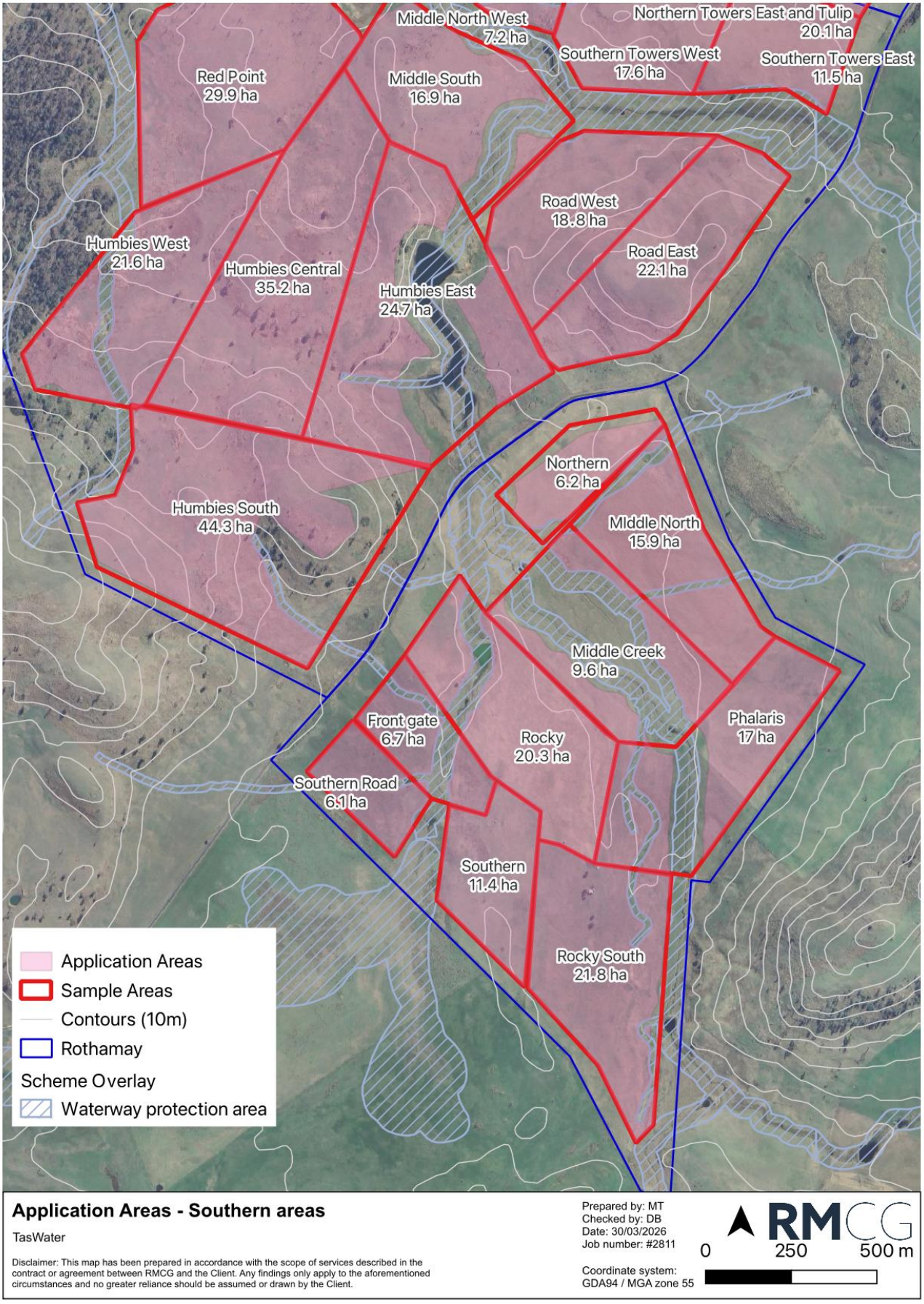

Figure A1-4: Southern application areas

Appendix 2: Biosolids application signage

Figure A2-1: A4 Biosolids signage example

Figure A2-2: A3 Biosolids signage example

Appendix 3: Further soil results

Table A3-1: Potassium (Available)

ZONE	AVAILABLE K (MG/KG)	RATING
LOR	10	
LOR		
Barn Circle	660	Very high
Big River Run 3	480	Very high
Big River Run Central	410	Very high
Big River Run East	380	Very high
Big River Run West	610	Very high
Chickory & Round Hill	430	Very high
Front Gate & Southern Road	350	Very high
Front Run	520	Very high
Humbies Central	160	Low
Humbies East	380	Very high
Humbies South	510	Very high
Humbies West	230	Optimum
Kirwins	230	Optimum
Little River Run East	370	Very high
Little River Run West	430	Very high
Middle Creek	280	High
Middle Falls	420	Very high
Middle North	280	High
Middle North west	280	High
Middle South	540	Very high
Northern	500	Very high
Northern Tower East Tulip	260	High
Northern Tower West	550	Very high
Number 4 Circle	360	Very high
Phalaris	230	Optimum
Ram	340	Very high
Red Point	480	Very high
Red River Run	250	Optimum
Riffle Range East	210	Optimum
Riffle Range West	260	High

ZONE	AVAILABLE K (MG/KG)	RATING
River Burnt Stack	500	Very high
Road Burnt Stack	140	Low
Road East	630	Very high
Road West	580	Very high
Rocky	250	Optimum
Rocky South	390	Very high
Round Hill Circle	350	Very high
Round Hill Large	180	Optimum
Southern Towers East	320	Very high
Southern	310	High
Southern Towers West	590	Very high
Two Halves Cut	390	Very high
Two Halves East	410	Very high
Two Halves West	260	High
Woolshed Creek	530	Very high
Woolshed Hill Back	900	Very high

Table A3-2: Potassium (Exchangeable)

ZONE	EXCHANGEABLE K (CMOL/KG)	RATING
LOR	0	
Barn Circle	1.60	High
Big River Run 3	1.20	High
Big River Run Central	0.98	High
Big River Run East	1.00	High
Big River Run West	1.50	High
Chickory & Round Hill	0.69	Moderate
Front Gate & Southern Road	0.71	High
Front Run	0.99	High
Humbies Central	0.41	Moderate
Humbies East	0.82	High
Humbies South	1.20	High
Humbies West	0.49	Moderate
Kirwins	0.60	Moderate
Little River Run East	0.75	High
Little River Run West	1.00	High
Middle Creek	0.56	Moderate
Middle Falls	0.91	High
Middle North	0.51	Moderate
Middle North west	0.51	Moderate
Middle South	0.95	High
Northern	0.99	High
Northern Tower East Tulip	0.72	High
Northern Tower West	1.20	High
Number 4 Circle	0.74	High
Phalaris	0.49	Moderate
Ram	0.87	High
Red Point	1.20	High
Red River Run	0.57	Moderate
Riffle Range East	0.43	Moderate
Riffle Range West	0.61	Moderate
River Burnt Stack	1.30	High
Road Burnt Stack	0.38	Moderate
Road East	1.40	High
Road West	1.40	High

ZONE	EXCHANGEABLE K (CMOL/KG)	RATING
Rocky	0.68	Moderate
Rocky South	0.89	High
Round Hill Circle	0.84	High
Round Hill Large	0.36	Moderate
Southern Towers East	0.78	High
Southern	0.65	Moderate
Southern Towers West	1.40	High
Two Halves Cut	0.90	High
Two Halves East	0.95	High
Two Halves West	0.59	Moderate
Woolshed Creek	1.20	High
Woolshed Hill Back	1.80	High
Woolshed Hill Front	0.71	High

Table A3-3: Calcium (Exchangeable)

ZONE	EXCHANGEABLE CA (CMOL/KG)	RATING
LOR	0	
Barn Circle	9.3	Moderate
Big River Run 3	9.5	Moderate
Big River Run Central	9.8	Moderate
Big River Run East	12.0	High
Big River Run West	11.0	High
Chickory & Round Hill	4.9	Low
Front Gate & Southern Road	4.7	Low
Front Run	9.2	Moderate
Humbies Central	5.6	Moderate
Humbies East	6.1	Moderate
Humbies South	7.1	Moderate
Humbies West	6.1	Moderate
Kirwins	7.6	Moderate
Little River Run East	10.0	High
Little River Run West	9.0	Moderate
Middle Creek	9.3	Moderate
Middle Falls	7.0	Moderate
Middle North	2.1	Low
Middle North west	6.8	Moderate
Middle South	7.1	Moderate
Northern	5.9	Moderate
Northern Tower East Tulip	6.1	Moderate
Northern Tower West	7.8	Moderate
Number 4 Circle	8.1	Moderate
Phalaris	4.1	Low
Ram	9.0	Moderate
Red Point	9.9	Moderate
Red River Run	9.0	Moderate
Riffle Range East	6.5	Moderate
Riffle Range West	5.5	Moderate
River Burnt Stack	7.4	Moderate
Road Burnt Stack	5.0	Moderate
Road East	11.0	High
Road West	12.0	High

ZONE	EXCHANGEABLE CA (CMOL/KG)	RATING
Rocky	4.8	Low
Rocky South	7.8	Moderate
Round Hill Circle	9.0	Moderate
Round Hill Large	5.8	Moderate
Southern Towers East	7.1	Moderate
Southern	5.2	Moderate
Southern Towers West	8.0	Moderate
Two Halves Cut	7.9	Moderate
Two Halves East	9.3	Moderate
Two Halves West	10.0	High
Woolshed Creek	8.8	Moderate
Woolshed Hill Back	11.0	High
Woolshed Hill Front	9.7	Moderate

Table A3-4: Magnesium (Exchangeable)

ZONE	EXCHANGEABLE MG (CMOL/KG)	RATING
LOR	0	
Barn Circle	2.3	Moderate
Big River Run 3	3.2	High
Big River Run Central	2.7	Moderate
Big River Run East	3.0	High
Big River Run West	3.8	High
Chickory & Round Hill	1.5	Moderate
Front Gate & Southern Road	2.5	Moderate
Front Run	3.4	High
Humbies Central	1.5	Moderate
Humbies East	2.6	Moderate
Humbies South	2.0	Moderate
Humbies West	1.8	Moderate
Kirwins	4.9	High
Little River Run East	3.0	High
Little River Run West	4.0	High
Middle Creek	5.0	High
Middle Falls	4.2	High
Middle North	0.9	Low
Middle North west	2.5	Moderate
Middle South	2.9	Moderate
Northern	3.0	High
Northern Tower East Tulip	2.7	Moderate
Northern Tower West	3.4	High
Number 4 Circle	2.5	Moderate
Phalaris	1.7	Moderate
Ram	3.0	High
Red Point	3.9	High
Red River Run	3.1	High
Riffle Range East	2.6	Moderate
Riffle Range West	2.0	Moderate
River Burnt Stack	3.2	High
Road Burnt Stack	1.6	Moderate

ZONE	EXCHANGEABLE MG (CMOL/KG)	RATING
Road East	4.3	High
Road West	3.9	High
Rocky	2.3	Moderate
Rocky South	3.4	High
Round Hill Circle	4.4	High
Round Hill Large	2.1	Moderate
Southern Towers East	2.9	Moderate
Southern	1.6	Moderate
Southern Towers West	2.8	Moderate
Two Halves Cut	2.8	Moderate
Two Halves East	3.8	High
Two Halves West	4.6	High
Woolshed Creek	3.0	High
Woolshed Hill Back	3.1	High
Woolshed Hill Front	3.4	High

Table A3-5: Sodium (Exchangeable)

ZONE	EXCHANGEABLE NA (CMOL/KG)	RATING
LOR	0	
Barn Circle	0.27	Low
Big River Run 3	0.22	Low
Big River Run Central	0.24	Low
Big River Run East	0.28	Low
Big River Run West	0.27	Low
Chickory & Round Hill	0.20	Low
Front Gate & Southern Road	0.71	High
Front Run	0.28	Low
Humbies Central	0.25	Low
Humbies East	0.19	Low
Humbies South	0.21	Low
Humbies West	0.26	Low
Kirwins	0.58	Moderate
Little River Run East	0.27	Low
Little River Run West	0.46	Moderate
Middle Creek	0.47	Moderate
Middle Falls	0.47	Moderate
Middle North	0.14	Low
Middle North west	0.34	Moderate
Middle South	0.35	Moderate
Northern	0.41	Moderate
Northern Tower East Tulip	0.37	Moderate
Northern Tower West	0.47	Moderate
Number 4 Circle	0.44	Moderate
Phalaris	0.39	Moderate
Ram	0.29	Low
Red Point	0.26	Low
Red River Run	0.37	Moderate
Riffle Range East	0.30	Moderate
Riffle Range West	0.29	Low
River Burnt Stack	0.28	Low
Road Burnt Stack	0.24	Low
Road East	0.39	Moderate

ZONE	EXCHANGEABLE NA (CMOL/KG)	RATING
Road West	0.42	Moderate
Rocky	0.43	Moderate
Rocky South	0.39	Moderate
Round Hill Circle	0.58	Moderate
Round Hill Large	0.27	Low
Southern Towers East	0.49	Moderate
Southern	0.21	Low
Southern Towers West	0.38	Moderate
Two Halves Cut	0.30	Moderate
Two Halves East	0.68	Moderate
Two Halves West	0.77	High
Woolshed Creek	0.38	Moderate
Woolshed Hill Back	0.24	Low
Woolshed Hill Front	0.27	Low

Table A3-6: Exchangeable potassium & calcium (%)

ZONE	POTASSIUM (%)	RATING	CALCIUM (%)	RATING
LOR	0		0	
Barn Circle	12.0	Not Ideal	70	Ideal
Big River Run 3	8.5	Not Ideal	67	Ideal
Big River Run Central	7.1	Not Ideal	71	Ideal
Big River Run East	6.1	Not Ideal	74	Ideal
Big River Run West	9.1	Not Ideal	66	Ideal
Chickory & Round Hill	9.3	Not Ideal	66	Ideal
Front Gate & Southern Road	8.2	Not Ideal	55	Not Ideal
Front Run	7.1	Not Ideal	66	Ideal
Humbies Central	5.2	Not Ideal	71	Ideal
Humbies East	8.3	Not Ideal	62	Not Ideal
Humbies South	11.0	Not Ideal	68	Ideal
Humbies West	5.5	Not Ideal	70	Ideal
Kirwins	4.4	Ideal	55	Not Ideal
Little River Run East	5.4	Not Ideal	71	Ideal
Little River Run West	6.8	Not Ideal	62	Not Ideal
Middle Creek	3.7	Ideal	61	Not Ideal
Middle Falls	7.2	Not Ideal	56	Not Ideal
Middle North	13.0	Not Ideal	56	Not Ideal
Middle North west	5.0	Not Ideal	67	Ideal
Middle South	8.4	Not Ideal	63	Not Ideal
Northern	9.6	Not Ideal	57	Not Ideal
Northern Tower East Tulip	7.2	Not Ideal	61	Not Ideal
Northern Tower West	9.6	Not Ideal	61	Not Ideal
Number 4 Circle	6.3	Not Ideal	69	Ideal
Phalaris	7.2	Not Ideal	61	Not Ideal
Ram	6.6	Not Ideal	68	Ideal
Red Point	7.7	Not Ideal	65	Ideal
Red River Run	4.4	Ideal	69	Ideal
Riffle Range East	4.4	Ideal	66	Ideal
Riffle Range West	7.3	Not Ideal	65	Ideal
River Burnt Stack	10.0	Not Ideal	60	Not Ideal
Road Burnt Stack	5.4	Not Ideal	70	Ideal
Road East	8.3	Not Ideal	64	Not Ideal

ZONE	POTASSIUM (%)	RATING	CALCIUM (%)	RATING
Road West	7.7	Not Ideal	68	Ideal
Rocky	8.3	Not Ideal	58	Not Ideal
Rocky South	7.1	Not Ideal	62	Not Ideal
Round Hill Circle	5.7	Not Ideal	61	Not Ideal
Round Hill Large	4.2	Ideal	67	Ideal
Southern Towers East	6.9	Not Ideal	63	Not Ideal
Southern	8.5	Not Ideal	67	Ideal
Southern Towers West	11.0	Not Ideal	64	Not Ideal
Two Halves Cut	7.6	Not Ideal	66	Ideal
Two Halves East	6.4	Not Ideal	64	Not Ideal
Two Halves West	3.7	Ideal	63	Not Ideal
Woolshed Creek	8.7	Not Ideal	65	Ideal
Woolshed Hill Back	11.0	Not Ideal	69	Ideal
Woolshed Hill Front	5.0	Not Ideal	68	Ideal

Table A3-7: Exchangeable magnesium & sodium (%)

ZONE	MAGNESIUM %	RATING	SODIUM %	RATING
LOR	0		0	
Barn Circle	17	Not Ideal	2.00	Not Ideal
Big River Run 3	23	Not Ideal	1.60	Not Ideal
Big River Run Central	20	Not Ideal	1.70	Not Ideal
Big River Run East	18	Not Ideal	1.70	Not Ideal
Big River Run West	22	Not Ideal	1.60	Not Ideal
Chickory & Round Hill	21	Not Ideal	2.70	Not Ideal
Front Gate & Southern Road	29	Not Ideal	8.30	Not Ideal
Front Run	25	Not Ideal	2.00	Not Ideal
Humbies Central	19	Not Ideal	3.20	Not Ideal
Humbies East	26	Not Ideal	1.90	Not Ideal
Humbies South	19	Not Ideal	2.00	Not Ideal
Humbies West	21	Not Ideal	3.00	Not Ideal
Kirwins	36	Not Ideal	4.20	Not Ideal
Little River Run East	21	Not Ideal	1.90	Not Ideal
Little River Run West	28	Not Ideal	3.10	Not Ideal
Middle Creek	33	Not Ideal	3.10	Not Ideal
Middle Falls	33	Not Ideal	3.70	Not Ideal
Middle North	23	Not Ideal	3.70	Not Ideal
Middle North west	24	Not Ideal	3.40	Not Ideal
Middle South	26	Not Ideal	3.10	Not Ideal
Northern	29	Not Ideal	4.00	Not Ideal
Northern Tower East Tulip	27	Not Ideal	3.80	Not Ideal
Northern Tower West	26	Not Ideal	3.70	Not Ideal
Number 4 Circle	21	Not Ideal	3.70	Not Ideal
Phalaris	26	Not Ideal	5.80	Not Ideal
Ram	22	Not Ideal	2.20	Not Ideal
Red Point	26	Not Ideal	1.70	Not Ideal
Red River Run	24	Not Ideal	2.80	Not Ideal
Riffle Range East	26	Not Ideal	3.00	Not Ideal
Riffle Range West	23	Not Ideal	3.50	Not Ideal
River Burnt Stack	26	Not Ideal	2.30	Not Ideal
Road Burnt Stack	22	Not Ideal	3.30	Not Ideal
Road East	24	Not Ideal	2.20	Not Ideal

ZONE	MAGNESIUM %	RATING	SODIUM %	RATING
Road West	21	Not Ideal	2.30	Not Ideal
Rocky	28	Not Ideal	5.20	Not Ideal
Rocky South	27	Not Ideal	3.10	Not Ideal
Round Hill Circle	30	Not Ideal	3.90	Not Ideal
Round Hill Large	24	Not Ideal	3.20	Not Ideal
Southern Towers East	26	Not Ideal	4.40	Not Ideal
Southern	20	Not Ideal	2.80	Not Ideal
Southern Towers West	22	Not Ideal	3.00	Not Ideal
Two Halves Cut	23	Not Ideal	2.60	Not Ideal
Two Halves East	26	Not Ideal	4.60	Not Ideal
Two Halves West	28	Not Ideal	4.80	Not Ideal
Woolshed Creek	22	Not Ideal	2.90	Not Ideal
Woolshed Hill Back	19	Not Ideal	1.50	Not Ideal
Woolshed Hill Front	24	Not Ideal	1.90	Not Ideal

Table A3-8: Exchangeable cations (Cations Exchange Capacity, CECe)

ZONE	CECE (CMOL/KG)	RATING
LOR	0	
Barn Circle	13.4	Moderate
Big River Run 3	14.1	Moderate
Big River Run Central	13.8	Moderate
Big River Run East	16.3	Moderate
Big River Run West	17.0	Moderate
Chickory & Round Hill	7.4	Low
Front Gate & Southern Road	8.7	Low
Front Run	13.9	Moderate
Humbies Central	7.9	Low
Humbies East	9.9	Low
Humbies South	10.5	Low
Humbies West	8.8	Low
Kirwins	13.7	Moderate
Little River Run East	14.0	Moderate
Little River Run West	14.6	Moderate
Middle Creek	15.3	Moderate
Middle Falls	12.6	Moderate
Middle North	3.8	Very low
Middle North west	10.2	Low
Middle South	11.3	Low
Northern	10.3	Low
Northern Tower East Tulip	10.0	Low
Northern Tower West	12.9	Moderate
Number 4 Circle	11.8	Low
Phalaris	6.7	Low
Ram	13.2	Moderate
Red Point	15.2	Moderate
Red River Run	13.0	Moderate
Riffle Range East	9.8	Low
Riffle Range West	8.4	Low
River Burnt Stack	12.3	Moderate
Road Burnt Stack	7.2	Low
Road East	17.5	Moderate
Road West	18.0	Moderate

ZONE	CECE (CMOL/KG)	RATING
Rocky	8.2	Low
Rocky South	12.5	Moderate
Round Hill Circle	14.8	Moderate
Round Hill Large	8.6	Low
Southern Towers East	11.3	Low
Southern	7.7	Low
Southern Towers West	12.5	Moderate
Two Halves Cut	11.9	Low
Two Halves East	14.7	Moderate
Two Halves West	16.1	Moderate
Woolshed Creek	13.4	Moderate
Woolshed Hill Back	16.5	Moderate
Woolshed Hill Front	14.2	Moderate

Table A3-9: Ca/Mg ratio

ZONE	CA/MG (CMOL/KG)	RATING
LOR	0	
Barn Circle	4.00	Balanced
Big River Run 3	3.00	Ca Low
Big River Run Central	3.60	Ca Low
Big River Run East	4.00	Balanced
Big River Run West	2.90	Ca Low
Chickory & Round Hill	3.30	Ca Low
Front Gate & Southern Road	1.90	Ca Low
Front Run	2.70	Ca Low
Humbies Central	3.70	Ca Low
Humbies East	2.30	Ca Low
Humbies South	3.60	Ca Low
Humbies West	3.40	Ca Low
Kirwins	1.60	Ca Low
Little River Run East	3.30	Ca Low
Little River Run West	2.30	Ca Low
Middle Creek	1.90	Ca Low
Middle Falls	1.70	Ca Low
Middle North	2.40	Ca Low
Middle North west	2.70	Ca Low
Middle South	2.40	Ca Low
Northern	2.00	Ca Low
Northern Tower East Tulip	2.30	Ca Low
Northern Tower West	2.30	Ca Low
Number 4 Circle	3.20	Ca Low
Phalaris	2.40	Ca Low
Ram	3.00	Ca Low
Red Point	2.50	Ca Low
Red River Run	2.90	Ca Low
Riffle Range East	2.50	Ca Low
Riffle Range West	2.80	Ca Low
River Burnt Stack	2.30	Ca Low
Road Burnt Stack	3.10	Ca Low
Road East	2.60	Ca Low
Road West	3.10	Ca Low

ZONE	CA/MG (CMOL/KG)	RATING
Rocky	2.10	Ca Low
Rocky South	2.30	Ca Low
Round Hill Circle	2.00	Ca Low
Round Hill Large	2.80	Ca Low
Southern Towers East	2.40	Ca Low
Southern	3.30	Ca Low
Southern Towers West	2.90	Ca Low
Two Halves Cut	2.80	Ca Low
Two Halves East	2.40	Ca Low
Two Halves West	2.20	Ca Low
Woolshed Creek	2.90	Ca Low
Woolshed Hill Back	3.50	Ca Low
Woolshed Hill Front	2.90	Ca Low

Table A3-10: K/Mg ratio

ZONE	K/MG (CMOL/KG)	RATING
LOR	0	
Barn Circle	0.70	Ideal
Big River Run 3	0.38	Ideal
Big River Run Central	0.36	Ideal
Big River Run East	0.33	Ideal
Big River Run West	0.39	Ideal
Chickory & Round Hill	0.46	Ideal
Front Gate & Southern Road	0.28	Ideal
Front Run	0.29	Ideal
Humbies Central	0.27	Ideal
Humbies East	0.32	Ideal
Humbies South	0.60	Ideal
Humbies West	0.27	Ideal
Kirwins	0.12	Ideal
Little River Run East	0.25	Ideal
Little River Run West	0.25	Ideal
Middle Creek	0.11	Ideal
Middle Falls	0.22	Ideal
Middle North	0.59	Ideal
Middle North west	0.20	Ideal
Middle South	0.33	Ideal
Northern	0.33	Ideal
Northern Tower East Tulip	0.27	Ideal
Northern Tower West	0.35	Ideal
Number 4 Circle	0.30	Ideal
Phalaris	0.29	Ideal
Ram	0.29	Ideal
Red Point	0.31	Ideal
Red River Run	0.18	Ideal
Riffle Range East	0.17	Ideal
Riffle Range West	0.31	Ideal
River Burnt Stack	0.41	Ideal
Road Burnt Stack	0.24	Ideal
Road East	0.33	Ideal
Road West	0.36	Ideal

ZONE	K/MG (CMOL/KG)	RATING
Rocky	0.30	Ideal
Rocky South	0.26	Ideal
Round Hill Circle	0.19	Ideal
Round Hill Large	0.17	Ideal
Southern Towers East	0.27	Ideal
Southern	0.41	Ideal
Southern Towers West	0.50	Ideal
Two Halves Cut	0.32	Ideal
Two Halves East	0.25	Ideal
Two Halves West	0.13	Ideal
Woolshed Creek	0.40	Ideal
Woolshed Hill Back	0.58	Ideal
Woolshed Hill Front	0.21	Ideal

Table A3-11: Extractable trace metals (DTPA)

ZONE	EXTRACTABLE COPPER (MG/KG)	EXTRACTABLE ZINC (MG/KG)	EXTRACTABLE MANGANESE (MG/KG)	EXTRACTABLE IRON (MG/KG)
LOR	2.30	1.7	13	110
Barn Circle	2.30	3.8	25	94
Big River Run 3	0.96	2.8	65	270
Big River Run Central	1.10	2.0	76	280
Big River Run East	1.10	2.3	58	310
Big River Run West	1.00	2.0	71	220
Chickory & Round Hill	0.76	3.9	75	260
Front Gate & Southern Road	0.88	8.3	75	270
Front Run	0.93	4.1	69	250
Humbies Central	0.45	2.6	50	230
Humbies East	0.48	2.3	63	230
Humbies South	1.00	3.8	70	290
Humbies West	0.72	2.2	77	240
Kirwins	0.98	3.5	25	260
Little River Run East	1.30	2.3	65	170
Little River Run West	0.95	2.5	57	210
Middle Creek	0.92	2.3	28	180
Middle Falls	1.00	5.1	66	210
Middle North	0.42	3.3	61	190
Middle North west	0.67	4.6	66	190
Middle South	0.82	3.7	68	230
Northern	0.51	3.9	59	280
Northern Tower East Tulip	0.61	4.0	53	360
Northern Tower West	1.30	3.7	56	270
Number 4 Circle	0.58	5.2	14	150
Phalaris	0.54	3.3	67	250
Ram	0.80	2.6	47	200
Red Point	0.86	4.7	73	220

ZONE	EXTRACTABLE COPPER (MG/KG)	EXTRACTABLE ZINC (MG/KG)	EXTRACTABLE MANGANESE (MG/KG)	EXTRACTABLE IRON (MG/KG)
Red River Run	1.40	4.4	58	220
Riffle Range East	1.30	3.1	36	140
Riffle Range West	0.69	3.7	52	280
River Burnt Stack	1.20	3.1	58	290
Road Burnt Stack	1.50	9.2	58	290
Road East	1.30	6.3	91	230
Road West	1.30	8.0	130	170
Rocky	0.54	7.8	71	340
Rocky South	2.10	14.0	73	300
Round Hill Circle	1.40	3.3	24	160
Round Hill Large	0.78	2.9	46	250
Southern Towers East	0.79	3.8	80	290
Southern	0.45	4.8	57	290
Southern Towers West	0.76	3.4	85	270
Two Halves Cut	0.89	6.5	72	250
Two Halves East	0.77	3.7	25	95
Two Halves West	0.67	4.0	18	76
Woolshed Creek	1.10	5.0	110	160
Woolshed Hill Back	1.50	5.7	110	190
Woolshed Hill Front	1.10	5.1	88	130

This report has been prepared by:

RM Consulting Group Pty Ltd trading as RMCG

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Offices in Victoria, Tasmania, NSW and Queensland

Key RMCG contact

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0467 452 155 — michaelt@rmcg.com.au

Document review and authorisation

Project Number: #2811

Doc Version	Final/Draft	Date	Author	Project Director review	BST QA review	Release approved by	Issued to
1.0	Final	01/04/2026	M. Tempest	D. Blaesing	L. McKenzie	D. Blaesing	TasWater

Subject: FW: DA 2026/27 - Spreading of Biosolids
Attachments: BMP_Rothamay_20250401.pdf; Rothamay_dwelling_buffers.jpeg

Sent: Friday, 8 May 2026 2:55 PM

Subject: Re: DA 2026/27 - Spreading of Biosolids

Please find information below, which includes our written response to the attenuation code.
Please note this draws from the information contained within the Biosolids Management Plan, which was provided to Council by Michael Tempest (colleague - no longer working for RMCG) in his initial email (2nd April 2026). I have included this for reference.
I have also included an additional map for reference, which maps the sensitive uses on Franklin St, Bothwell, and shows the minimum 250m buffers from actual biosolids application areas. This aligns with the Tasmanian Biosolids Reuse Guidelines to ensure no unreasonable impacts on adjacent landholders.

Attenuation code

C9.5 Use Standards

C9.5.1 Activities with potential to cause emissions

Objective:	That an activity with potential to cause emissions is located so that it does not cause an unreasonable impact on an existing sensitive use.
Acceptable Solutions	**Performance Criteria**
A1 The attenuation area of an activity listed in Tables C9.1 or C9.2 must not include: (a) a site used for a sensitive use which is existing; (b) a site that has a planning permit for a sensitive use; or (c) land within the General Residential Zone, Inner Residential Zone, Low Density Residential Zone, Rural Living Zone A, Rural Living Zone B, Village Zone or Urban Mixed Use Zone.	**P1** An activity listed in Tables C9.1 or C9.2 must not cause: (a) an unreasonable loss of amenity or unreasonable impacts on health and safety of a sensitive use which is existing, or has a planning permit; or (b) unreasonable impacts on land within the relevant attenuation area that is in the General Residential Zone, Inner Residential Zone, Low Density Residential Zone, Rural Living Zone A, Rural Living Zone B, Village Zone or Urban Mixed Use Zone, having regard to: (i) operational characteristics of the activity; (ii) scale and intensity of the activity; (iii) degree of hazard or pollution that may be emitted from the activity; (iv) hours of operation of the activity; (v) nature of likely emissions such as noise, odour, gases, dust, particulates, radiation, vibrations or waste; (vi) existing emissions such as noise, odour, gases, dust, particulates, radiation, vibrations or waste; and (vii) measures to eliminate, mitigate or manage emissions from the activity.

Written response to attenuation code (from the Rothamay Biosolids Management Plan)

CODE	CODE REQUIREMENT	COMPLIANCE MEASURE
C1 Signage	Biosolids Reuse requires erection of Regulatory Signage (as per definition in Table C1.3 of the Planning Scheme).	Regulatory signs are exempt from specific requirements of the Code, as per Table C1.4. It is noted that areas that will receive biosolids have suitable signage as per Section 11 of the TBRG. Proposed signage is further detailed in Section 7.5.2 of this document.
C7 Natural Assets	Biosolid reuse must minimise impacts on water quality, native riparian vegetation, river condition, and ecological function of watercourses.	Managed via compliance with the TBRG and additional measures identified in this Biosolids Management Plan (Section 7). It is noted that all titles that are proposed to receive biosolids are zoned Agriculture, hence the Natural Assets Code generally does not apply, except for Waterway and coastal Protection Areas. Biosolids application will not occur within the areas mapped as Waterway and Coastal Protections Areas of the Natural Assets Code.

C9 Attenuation	Biosolids application is listed as an activity likely to cause emissions under Table C9.1 of the Code, which requires a 100 m buffer from sensitive uses. Hence, spreading activities must comply with either the Acceptable Solutions or the Performance Criteria of C9.5.1.	Managed via compliance with the Tasmanian Biosolids Reuse Guidelines and additional measures identified in this Biosolids Management Plan (Section 7.2). All sensitive uses on adjacent titles (dwellings), particularly on Franklin Rd, Bothwell, have been considered in developing the application areas. There is a distance of at least 250m between biosolids application areas and sensitive uses, as detailed in the attached map. CT 167795/1 has an existing dwelling located on it and also has adjacent dwellings within 100m of its boundary. Spreading will not occur within 100m of the dwelling located on the site and will not occur within at least 250m of any dwellings on adjacent titles (see Section 7.2). CT 124612/1 has an existing dwelling located on it. Spreading will not occur within 100m of this dwelling. This title also wraps around CT 132633/1, which has commercial stockyards located on it. As an additional measure biosolids will not be spread within 100m of this property boundary. There is an adjacent dwelling to the east of CT 124613/4 that is within 100m of the property boundary. As per Section 7.2 no biosolids will be spread within at least 250m of this dwelling. None of the other three titles associated with the property have an existing dwelling located on them or within 100m of their boundary.

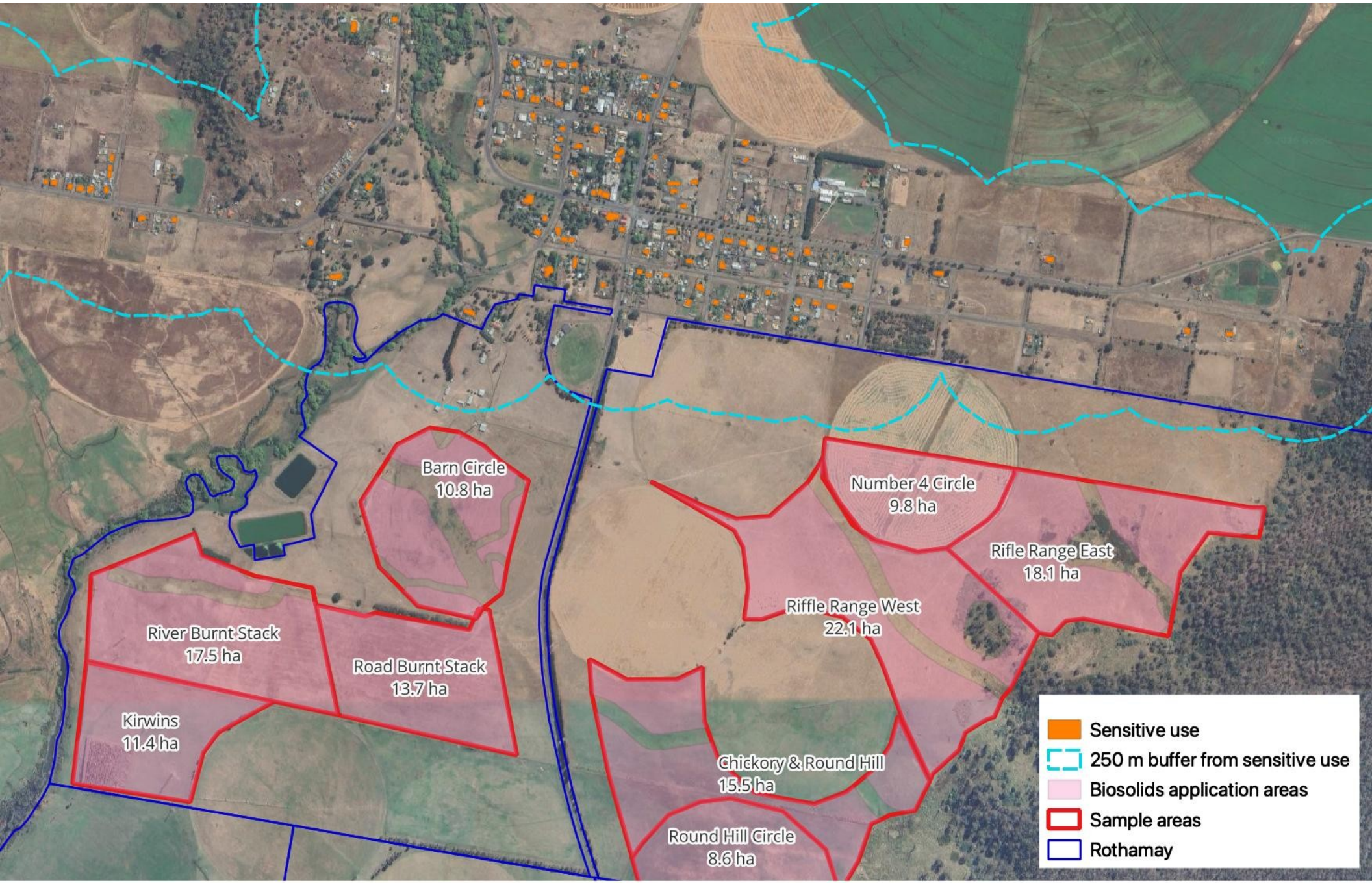
Further information regarding statutory requirements can be found within Section 3 of the BMP. Section 7 also includes detailed management actions, which demonstrate compliance to the performance criteria in the attenuation code.

If you have any further questions please let me know.

Thanks,
Jake

Jake Gaudion (He / Him)
CONSULTANT

RMCG



Map Name: Rothamay Application Areas
Project: Biosolids Application
Client: TasWater
Date: 08/05/2026

BaseMap image by Google Earth
Cadastre from LIST

0 500 1,000 m

RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
124612	1
EDITION	DATE OF ISSUE
5	23-Feb-2026

SEARCH DATE : 02-Apr-2026
SEARCH TIME : 08.15 am

DESCRIPTION OF LAND

Parish of GRANTHAM, Land District of MONMOUTH
Parish of VINCENT, Land District of MONMOUTH
Lot 1 on Plan 124612
Being the land firstly described in Conveyance 42/7995
Excepting thereout Conveyance 48/0865 (99/86 Deeds Office) 3. 278hs.
Derivation : For grantees see plan
Derived from W4750

SCHEDULE 1

PROSPECT PTY LTD

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
E146980 BURDENING EASEMENT: an access easement in favour of Tasmanian Irrigation Pty Ltd over the land marked Right of Way 5.00 wide on Plan 124612
E146980 BURDENING INFRASTRUCTURE EASEMENT with the benefit of a restriction as to user of land in favour of Tasmanian Irrigation Pty Ltd over the land marked Irrigation Infrastructure Easement Plan 124612 Registered 23-July-2020 at noon
C660377 NOTICE of Notified Corridor under Section 15 of the Major Infrastructure Development Approvals Act 1999 affecting the land therein described Registered 25-July-2005 at noon
C836860 MORTGAGE to Australia and New Zealand Banking Group Limited Registered 25-Feb-2008 at noon
C834696 BURDENING ELECTRICITY EASEMENT with the benefit of a restriction as to user of land in favour of Transend Networks Pty Ltd over the Electricity Easement shown passing through the said land within described. Registered 29-May-2008 at noon

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

FILE NUMBER W4750

GRANTEE
PART OF 1239-0-0 GTD TO E.S.P. BEDFORD & WILLIAM DeGILLERN, PART OF 1202-0-0 GTD TO PATRICK WOOD. PART OF 1200-0-0 GTD TO PATRICK WOOD & PART OF LOT 48 (1847-0-34) GTD TO JAMES SCOTT

CONVERSION PLAN

LOCATION
MONMOUTH / VINCENT - GRANTHAM

CONVERTED FROM 42/7995 (1stly & 2ndly DESC.)

NOT TO SCALE LENGTHS IN METRES

Registered Number
P.124612

APPROVED 20 JUNE 1996
Recorder of Titles

MAPSHEET MUNICIPAL CODE No. 105

LAST UPI No. 1100250 1100253

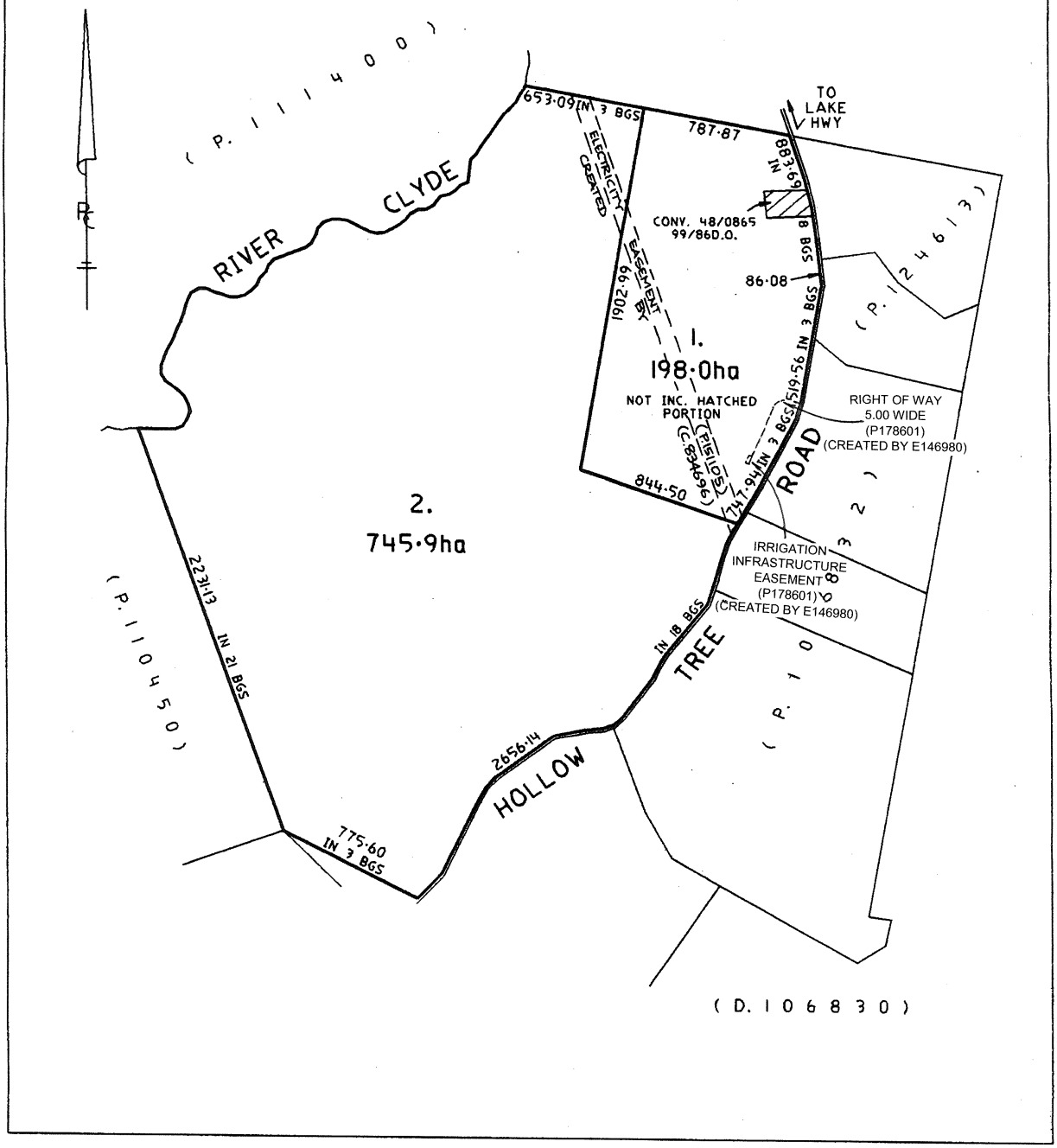
ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN

DRAWN R.T.C.

SKETCH BY WAY OF ILLUSTRATION ONLY

"EXCEPTED LANDS"

CONV. 48/0865 (99/86D.O.) 3·238ha



RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
124612	2
EDITION	DATE OF ISSUE
3	29-May-2008

SEARCH DATE : 02-Apr-2026
SEARCH TIME : 08.15 am

DESCRIPTION OF LAND

Parish of GRANTHAM, Land District of MONMOUTH
Parish of VINCENT, Land District of MONMOUTH
Lot 2 on Plan 124612
Being the land secondly described in Conveyance 42/7995
Derivation : For grantees see plan
Derived from W4750

SCHEDULE 1

PROSPECT PTY LTD

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
C660377 NOTICE of Notified Corridor under Section 15 of the Major Infrastructure Development Approvals Act 1999 affecting the land therein described Registered 25-July-2005 at noon
C836860 MORTGAGE to Australia and New Zealand Banking Group Limited Registered 25-Feb-2008 at noon
C834696 BURDENING ELECTRICITY EASEMENT with the benefit of a restriction as to user of land in favour of Transend Networks Pty Ltd over the Electricity Easement shown on P.124612. Registered 29-May-2008 at noon

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

FILE NUMBER W4750

GRANTEE
PART OF 1239-0-0 GTD TO E.S.P. BEDFORD & WILLIAM DeGILLERN, PART OF 1202-0-0 GTD TO PATRICK WOOD. PART OF 1200-0-0 GTD TO PATRICK WOOD & PART OF LOT 48 (1847-0-34) GTD TO JAMES SCOTT

CONVERSION PLAN

LOCATION
MONMOUTH / VINCENT - GRANTHAM

CONVERTED FROM 42/7995 (1stly & 2ndly DESC.)

NOT TO SCALE LENGTHS IN METRES

Registered Number
P.124612

APPROVED 20 JUNE 1996
Recorder of Titles

MAPSHEET MUNICIPAL CODE No. 105

LAST UPI No. 1100250 1100253

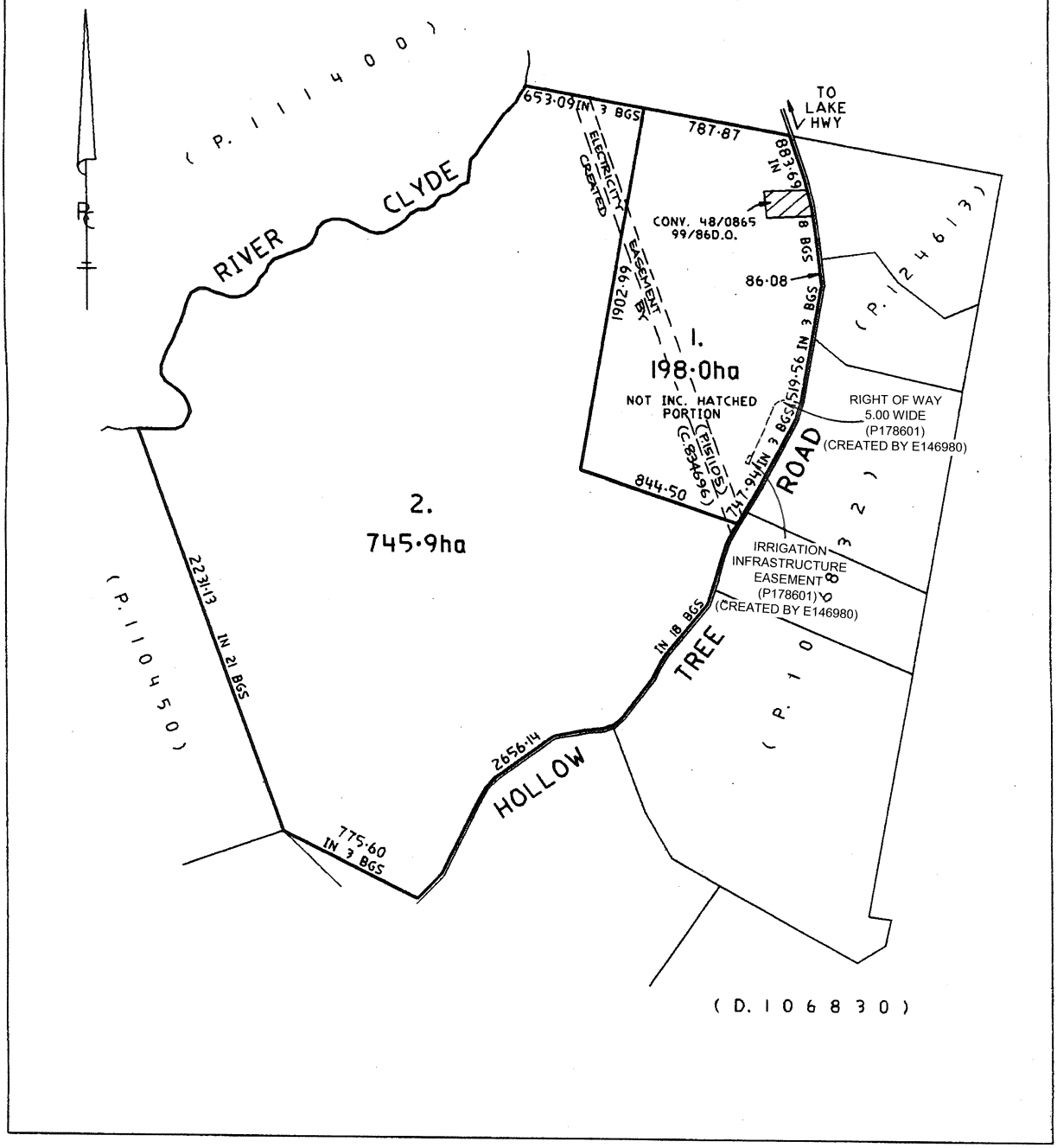
ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN

DRAWN R.T.C.

SKETCH BY WAY OF ILLUSTRATION ONLY

"EXCEPTED LANDS"

CONV. 48/0865 (99/86D.O.) 3·238ha



RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
124613	3
EDITION	DATE OF ISSUE
3	23-Feb-2026

SEARCH DATE : 02-Apr-2026
SEARCH TIME : 08.15 am

DESCRIPTION OF LAND

Parish of GRANTHAM, Land District of MONMOUTH
Parish of VINCENT, Land District of MONMOUTH
Lot 3 on Plan 124613
Being the land thirdly described in Conveyance 42/7995
Derivation : For grantees see plan
Derived from W4750

SCHEDULE 1

PROSPECT PTY LTD

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
C836860 MORTGAGE to Australia and New Zealand Banking Group Limited Registered 25-Feb-2008 at noon

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

FILE NUMBER W4750

GRANTEE
PART OF 1239-0-0 GTD TO E.S.P. BEDFORD &WILLIAM DeGILLERN & PART OF 1202-0-0 GTD TO PATRICK WOOD

CONVERSION PLAN

LOCATION
MONMOUTH / VINCENT - GRANTHAM

CONVERTED FROM 42/7995 (3rdly &4thly DESC.)

NOT TO SCALE LENGTHS IN METRES

Registered Number
P.124613

APPROVED 20 JUNE 1996
Recorder of Titles

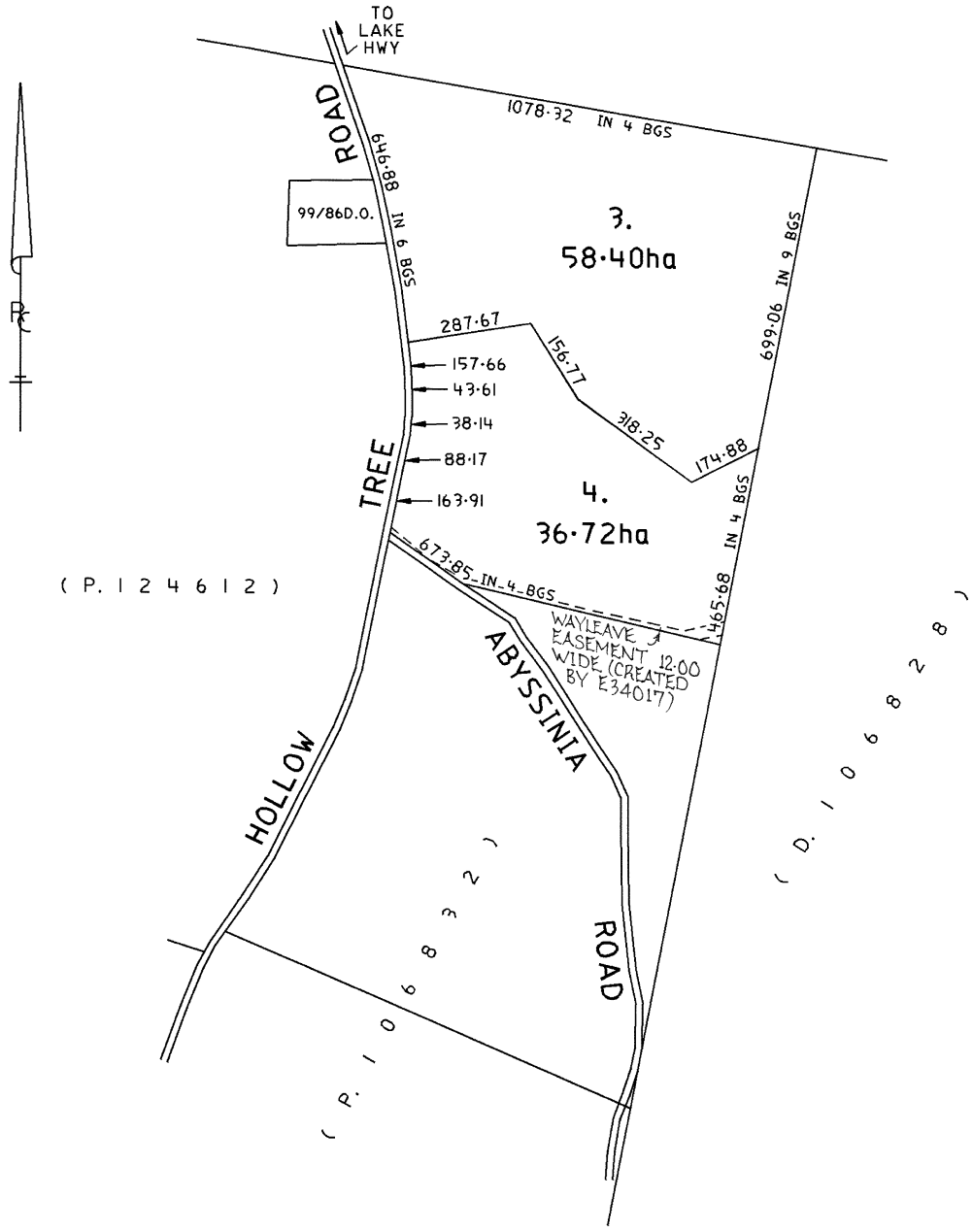
MAPSHEET MUNICIPAL CODE No. 105

LAST UPI No. 1100251 1101505

ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN

DRAWN R.T.C.

SKETCH BY WAY OF ILLUSTRATION ONLY
"EXCEPTED LANDS"



RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
124613	4
EDITION	DATE OF ISSUE
4	23-Feb-2026

SEARCH DATE : 02-Apr-2026
SEARCH TIME : 08.16 am

DESCRIPTION OF LAND

Parish of GRANTHAM, Land District of MONMOUTH
Parish of VINCENT, Land District of MONMOUTH
Lot 4 on Plan 124613
Being the land firstly described in Conveyance 42/7995
Derivation : For grantees see plan
Derived from W4750

SCHEDULE 1

PROSPECT PTY LTD

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
E34017 BURDENING WAYLEAVE EASEMENT with the benefit of a restriction as to user of land in favour of Tasmanian Networks Pty Ltd over the land marked Wayleave Easement 12.00 wide on Plan 124613 Registered 05-Sept-2016 at noon
C836860 MORTGAGE to Australia and New Zealand Banking Group Limited Registered 25-Feb-2008 at noon

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

FILE NUMBER W4750

GRANTEE
PART OF 1239-0-0 GTD TO E.S.P. BEDFORD &WILLIAM DeGILLERN & PART OF 1202-0-0 GTD TO PATRICK WOOD

CONVERSION PLAN

LOCATION
MONMOUTH / VINCENT - GRANTHAM

CONVERTED FROM 42/7995 (3rdly &4thly DESC.)

NOT TO SCALE LENGTHS IN METRES

Registered Number
P.124613

APPROVED 20 JUNE 1996
Recorder of Titles

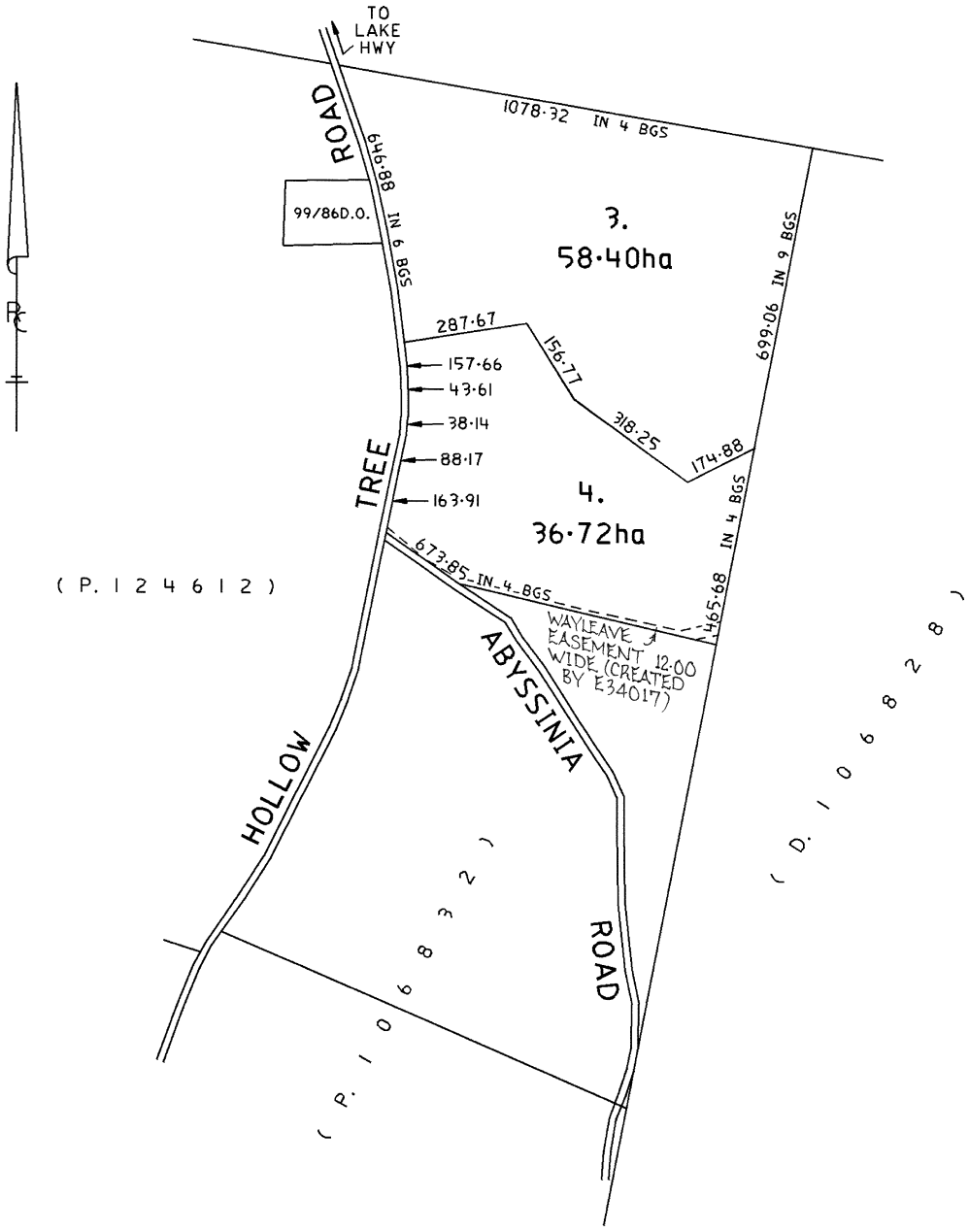
MAPSHEET MUNICIPAL CODE No. 105

LAST UPI No. 1100251 1101505

ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN

DRAWN R.T.C.

SKETCH BY WAY OF ILLUSTRATION ONLY
"EXCEPTED LANDS"



SEARCH OF TORRENS TITLE

VOLUME	FOLIO
167795	1
EDITION	DATE OF ISSUE
4	05-Sept-2016

SEARCH DATE : 02-Apr-2026
SEARCH TIME : 08.14 am

DESCRIPTION OF LAND

Town of BOTHWELL
Parish of GRANTHAM Land District of MONMOUTH
Lot 1 on Plan 167795
Being in part the land formerly described in Conveyance No 40/2565
Excepting thereout Lot 1 on SP.26648, Lot 2 on D.18585 & Part of Lot 1 on SP.126980, Lot 1 2,023ha (P124600), Lot 1 3,082ha (P161435) and Lot 1, 5.278ha (P167794)
Derivation : Part of Lot 8 Section G (1A-3R-16P) Gtd to Muriel Amy Ellis, Part of 2A-0R-35P (Section G) Gtd to Edward Bowden and Part of 1340 Acres Gtd to Patrick Wood
Prior CT 161436/1

SCHEDULE 1

B976856 C559965 TRANSFER to ROTHAMAY PASTORAL COMPANY PTY LTD Registered 29-Apr-2005 at 12.02 pm

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
SP126980 BENEFITING EASEMENT: a right of drainage over the Drainage Easement 3.00 Wide on Plan 167795
SP126980 BURDENING EASEMENT: a right of carriageway (appurtenant to Lot 1 on Sealed Plan No. 126980) over the Right of Way 'B' 6.00 Wide on Plan 167795
C245109 BURDENING EASEMENT: pipeline rights (fully defined therein) in favour of the Central Highlands Council over the land marked Pipeline Easement 5.00 Wide on Plan 167795 (subject to provisions) Registered 13-Sept-2000 at 12.01 pm
D129844 BURDENING EASEMENT: a pipeline easement in favour of Tasmanian Water & Sewerage Coporation Pty Ltd over the land marked Pipeline Easement 'Z' 3.00 Wide on Plan 167795 (Subject to provisions)
D129844 BURDENING EASEMENT: a right of way in favour of Tasmanian Water & Sewerage Coporation Pty Ltd over the land marked Right of Way 'A' 6.00 Wide on Plan

167795 (Subject to provisions)

D129844 BURDENING EASEMENT: a drainage easement in favour of Tasmanian Water & Sewerage Coporation Pty Ltd over the land marked Drainage Easement 1.00 Wide on Plan 167795 (Subject to provisions)

D129844 BURDENING EASEMENT: a pipeline easement in favour of Tasmanian Water & Sewerage Coporation Pty Ltd over the land marked Pipeline Easement 'A' 3.00 Wide on Plan 167795 (Subject to provisions)

C521972 ADHESION ORDER under Section 110 of the Local Government (Building and Miscellaneous Provisions) Act 1993 Registered 29-Apr-2005 at noon

C514673 INSTRUMENT creating Restrictive Covenants pursuant to section 34 Nature Conservation Act 2002 (affecting part of the said land within described) Registered 29-Apr-2005 at 12.01 pm

C834695 BURDENING ELECTRICITY EASEMENT with the benefit of a restriction as to user of land in favour of Transend Networks Pty Ltd over the Electricity Easement shown on Plan 167795 Registered 29-May-2008 at noon

C956724 LEASE to OPTUS MOBILE PTY LIMITED of a leasehold estate for the term of 10 years from 01-June-2009 of that part of the said land within described shown hatched on Annexure Plan "B" attached to the said Lease Registered 29-Mar-2010 at noon

C956725 LEASE to OPTUS MOBILE PTY LIMITED of a leasehold estate for the term of 10 years from 01-June-2019 of that part of the said land within described shown hatched on Annexure Plan "B" attached to the said Lease Registered 29-Mar-2010 at noon

E34828 LEASE to NBN CO LIMITED of a leasehold estate for the term of 10 years from 1-Feb-2016 (of that part of the said land within described as Lot 1 on Annexure B on the plan attached said lease) Registered 25-Jan-2016 at noon

E34829 LEASE to NBN CO LIMITED of a leasehold estate for the term of 10 years from 1-Feb-2026 (of that part of the said land within described as Lot 1 on Annexure B on the plan attached said lease) Registered 25-Jan-2016 at 12.01 pm

E62819 LEASE to VODAFONE NETWORK PTY LTD of a leasehold estate for the term of 10 years from 16-May-2016 (of that part of the said land within described as Lot 1 on Annexure A on the plan attached to the said lease) Registered 05-Sept-2016 at noon

E62820 LEASE to VODAFONE NETWORK PTY LTD of a leasehold estate for the term of 10 years from 16-May-2026 (of that part of the said land within described as Lot 1 on Annexure A on the plan attached to the said lease) Registered 05-Sept-2016 at noon

E195944 TRANSFER of LEASE C956725 to AUSTRALIA TOWER NETWORK

PTY LIMITED Registered 04-Apr-2023 at noon

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

OWNER ROTHAMAY PASTORAL COMPANY PTY LTD

FOLIO REFERENCE 161436-1

GRANTEE
PART OF LOT 8 (1A-3R-16P) GTD TO MURIEL AMY ELLIS, PART OF 2A-0R-35P GTD TO EDWARD BOWDEN & PART OF 1340 ACRES GTD TO PATRICK WOOD.

PLAN OF TITLE

LOCATION J.B. MEDBURY P/L., SURVEYORS OF 224 CAMPBELL ST., HOBART
TOWN OF BOTHWELL (SEC. G)
MONMOUTH – GRANTHAM

CONVERTED BY PLAN No.

COMPILED BY J.B. MEDBURY

NOT TO SCALE LENGTHS IN METRES

Registered Number
P 167795

APPROVED 22 JAN 2015
Recorder of Titles

MAPSHEET MUNICIPAL CODE No. 105 (4830) (5030-21)

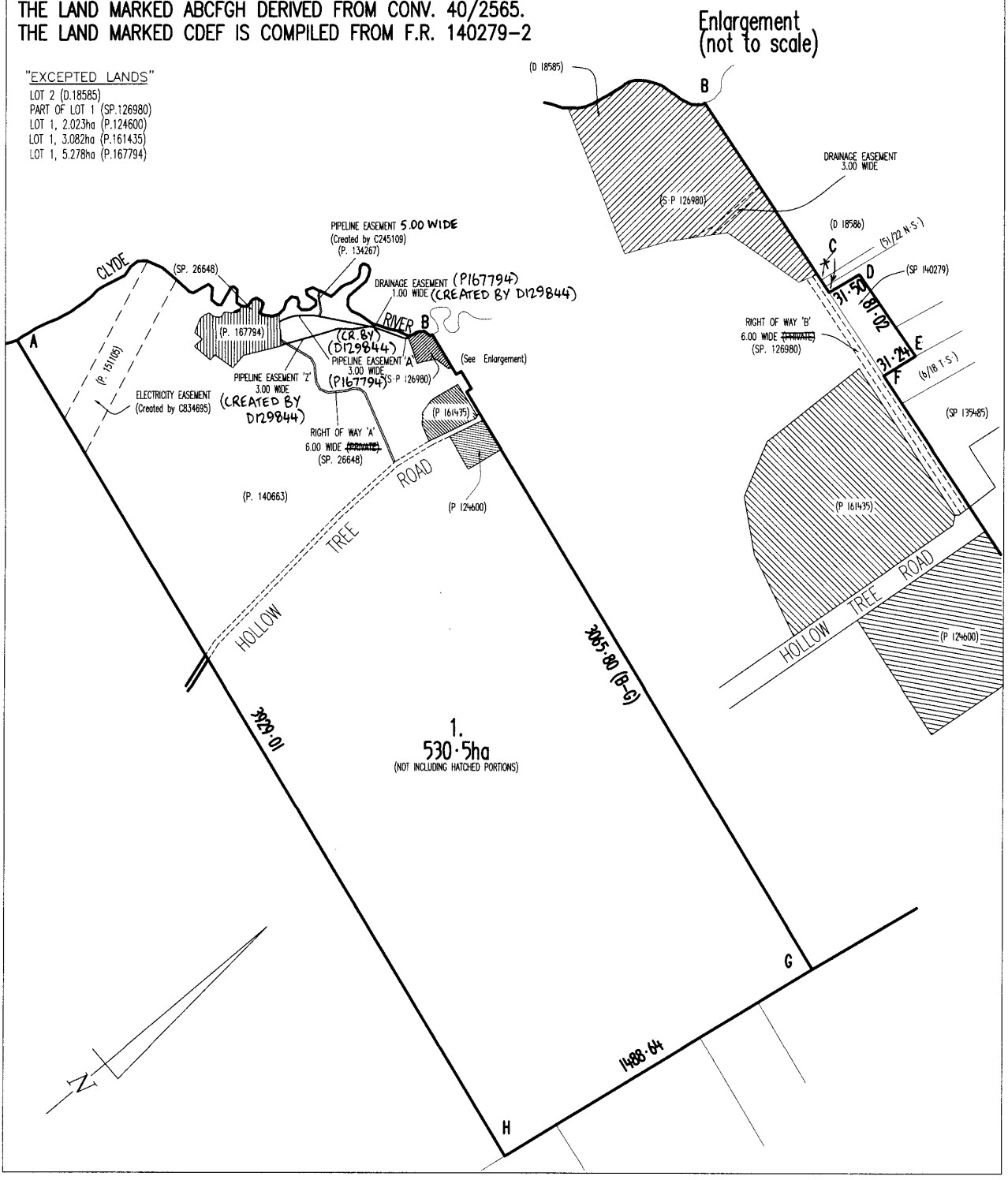
LAST UPI No

LAST PLAN No. P161436

ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN

SKETCH BY WAY OF ILLUSTRATION ONLY AS RELATES TO THE LAND MARKED ABCFGH DERIVED FROM CONV. 40/2565. THE LAND MARKED CDEF IS COMPILED FROM F.R. 140279-2

"EXCEPTED LANDS"
LOT 2 (D.18585)
PART OF LOT 1 (SP.126980)
LOT 1, 2.023ha (P.124600)
LOT 1, 3.082ha (P.161435)
LOT 1, 5.278ha (P.167794)



RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
211119	1
EDITION	DATE OF ISSUE
4	17-June-2011

SEARCH DATE : 02-Apr-2026
SEARCH TIME : 08.16 am

DESCRIPTION OF LAND

Parish of VINCENT, Land District of MONMOUTH
Lot 1 on Plan 211119
Derivation : Whole of Lot 32166 Gtd. to H.P.Jones
Prior CT 2495/52

SCHEDULE 1

C813576 TRANSFER to ROTHAMAY PASTORAL COMPANY PTY LTD
Registered 25-Jan-2008 at 12.01 pm

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
D12792 BURDENING WAYLEAVE EASEMENT with the benefit of a restriction as to user of land in favour of Aurora Energy Pty Ltd over the Wayleave Easement 5.50 wide shown on P.211119 (Subject to Provisions) Registered 17-June-2011 at noon

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

OWNER FOLIO REFERENCE 2495/52 GRANTEE WHOLE OF LOT 32166 (465A-2R-0P) GTD TO HENRY PERCY JONES	PLAN OF TITLE LOCATION MONMOUTH - VINCENT FIRST SURVEY PLAN No. 42/31 LO. COMPILED BY LDRB SCALE 1: 12500 LENGTHS IN METRES	Registered Number P.211119 APPROVED 16 JUNE 2011 Alice Kawa Recorder of Titles

MAPSHEET MUNICIPAL CODE No. 105 (4830)	LAST UPI No JVY39	LAST PLAN No.	ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN

NEW PLAN
REDRAWN FOR
OFFICE CONVENIENCE