Springfield Feedlot

Draft Operation Environmental Management Plan

"Springfield"
2513 Getta Getta Road
North Star NSW 2408

Doolin Farming Pty Ltd
"Glenhoma"
3202 Getta Getta Road
NORTH STAR NSW 2408

[February 2025]

RDC ENGINEERS
AGRICULTURAL ENVIRONMENTAL PROJECT MANAGEMENT

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V1R1	Doolin Farming Pty Ltd	Electronic	-
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Definitions

Term or Acronym	Meaning
ANZECC	The Australian and New Zealand Environment Conservation Council
AR	Annual Return
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
AS	Australian Standard
AWS	Automatic weather station
CoA	Conditions of Approval means conditions listed in the Gwydir Shire Council Notice of Determination or Environmental Protection Licence under the Protection of the Environment Operations Act 1997.
CDA	Controlled Drainage Area
Compliance audit	Verification of how implementation is proceeding with respect to an operation environmental management plan (OEMP) (which incorporates the relevant approval conditions).
DoE	Commonwealth Department of the Environment
EIS	Environmental Impact Assessment
Effluent	Effluent means: Stormwater runoff from the controlled drainage areas that is collected in a holding pond/s pending sustainable utilisation to land by means of an irrigation system. Effluent is high in nutrients because it has been in contact with manure and has the potential to pollute surface water and groundwater.
Environmental aspect	Defined by AS/NZS ISO 14001:2015 as an element of an organisation's activities, products or services that can interact with the environment.
Environmental impact	Defined by AS/NZS ISO 14001:2015 as any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects.
Environmental incident	An unexpected event that has, or has the potential to, cause harm to the environment and requires some action to minimise the impact or restore the environment.
EMS	Environmental Management System.
Environmental Management Plan (EMP)	Describes how the Project might impact on the natural environment in which it occurs and set out clear commitments from the person taking the action on how those impacts will be avoided, minimised and managed so that they are environmentally acceptable.
Environmental policy	Statement by an organisation of its intention and principles for environmental performance.
EPA	NSW Environment Protection Authority
ES	Environmental Specialist - A suitably qualified and experienced person independent of Project design and operation personnel engaged as required duration operation. The principal point of specialist advice in relation to all questions and complaints concerning environmental performance.
ESC	Erosion and Sediment Control.
ESCP	Erosion and Sediment Control Plan.
Environmental target	Defined by AS/NZS ISO 14001:2015 as a detailed performance requirement, applicable to the organisation or parts thereof, that arises

	from the environmental objectives and that needs to be set and met in order to achieve those objectives.
GHG	Greenhouse gases
Groundwater	Subsurface water contained within the saturated zone
GDE's	Groundwater Dependent Ecosystems.
GSC	Gwydir Shire Council
ISO	International Organization for Standardization
Liquid waste	Liquid waste generated on-site for example: • Domestic wastewater (e.g., sewage); and • Effluent
Manure	Manure is the faeces and urine excreted by the cattle.
MLA	Meat and Livestock Australia
NFAS	National Feedlot Accreditation Scheme. An independently audited quality assurance scheme to develop a Quality System for beef feedlots that impacts positively on product quality and acceptability and for which the lot feeders maintain responsibility.
Non-compliance	Failure to comply with the requirements of the Project approval or any applicable license, permit or legal requirements.
Non-conformance	Failure to conform to the requirements of Project system documentation including this OEMP or supporting documentation.
OEMP	Operation Environmental Management Plan. An Environmental Management Plan that addresses the control, training and monitoring measures to be implemented during the operation phase of a project in order to avoid, minimise or ameliorate potentially adverse impacts identified during environmental assessments.
OAQMP	Operation Air Quality Management Plan. An element of an Operation Environmental Management Plan that addresses the control, training and monitoring measures to be implemented during the operation phase of a project in order to avoid, minimise or ameliorate potentially adverse impacts to air quality identified during environmental assessments
OSWQMP	Operation Soil and Water Quality Management Plan. An element of an Operation Environmental Management Plan that addresses the control, training and monitoring measures to be implemented during the operation phase of a project in order to avoid, minimise or ameliorate potentially adverse impacts to soils and water quality identified during environmental assessments
OSLWMP	Operation Solid and Liquid Waste Management Plan. An element of an Operation Environmental Management Plan that addresses the control, training and monitoring measures to be implemented during the operation phase of a project in order to avoid, minimise or ameliorate potentially adverse impacts from solid and liquid waste identified during environmental assessments.
POEO Act	Protection of the Environment Operations Act 1997 (NSW)
Project	Springfield Feedlot
Project complex	The Project complex includes: • production pens, hospital pens, induction pens; • cattle handling facilities; • catch drains, sedimentation basin and holding pond; • cattle lanes and feed alleys; • solid waste stockpile and composting pad; and • feed mill and feed storage facilities.

	The Project complex does not include solid waste and effluent utilisation areas.
Project site	The Project site is the land on which the Project is located and includes the Project complex and solid waste and effluent utilisation areas.
Riparian zone	The vegetated corridor along streams and rivers.
Solid Waste	Solid wastes generated on-site for example: Controlled Solid (e.g., tyres) General Solid (putrescible) (e.g., domestic general litter and food waste, animal wastes (manure excreted by the cattle, solids that have settled from the stormwater runoff in the sedimentation basin, holding pond sludge, spilt feed and composted mortalities)). Solid wastes derived from beef cattle are valued as a source of nutrients for fertilising crops and are the predominant solid waste generated. General Solid (non-putrescible) (e.g., glass, paper, building demolition waste, concrete).
Stakeholders	Primary stakeholder groups include our workforce, our customers, and the broader community. Other important stakeholders include regulatory bodies, suppliers, industry organisations and peak bodies and environmental groups.
SOP	Environmental Standard Operating Procedure
TAPM	The Air Pollution Model
Water Act	Water Act 1912.
WM Act	Water Management Act 2000

Executive summary

Doolin Farming Pty Ltd own and operate a 10,000 ha mixed farming operation across several properties at North Star including “Glenhoma”, “Glenmodel”, “Springfield”, “Myall Downs” and “Yetman West” some 27 km east of Yetman and 45 km south-southeast of Goondiwindi (QLD) in NSW.

Doolin Farming Pty Ltd primarily engage in dryland and irrigated cropping and beef production. Doolin Farming Pty Ltd produces wheat, barley, oats and chickpeas in winter and cotton and maize in summer under pivot irrigation systems and dryland sorghum cropping.

Central to the beef production enterprise is the breeding, growing and lot-feeding of cattle for the domestic market. Currently the beef supply chain includes breeding and growing of beef cattle on land less suitable for dryland and irrigated cropping and grazing of stubble and lot feeding of cattle within a feedlot on the property ‘Springfield”.

There has been a beef cattle feedlot on “Springfield” for over three years after approval was granted for a 999 head feedlot by the Gwydir Shire Council in 2021 (DA31/2020).

Doolin Farming Pty Ltd is seeking approval to expand the existing beef cattle feedlot up to capacity of up to 3,000 head to supply quality grain fed cattle.

This Operation Environmental Management Plan (OEMP or Plan) is the overarching management plan for a suite of environmental management documents for the operation of the Springfield Feedlot. It provides a structured and systematic approach to environmental management.

1 Background

1.1 Introduction

Doolin Farming Pty Ltd own and operate a 10,000 ha mixed farming operation across several properties at North Star including "Glenhoma", "Glenmodel", "Springfield", "Myall Downs" and "Yetman West" some 27 km east of Yetman and 45 km south-southeast of Goondiwindi (QLD) in NSW.

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"Springfield" comprises some 1,713 ha (~4,231 acres) and currently, a dryland and irrigated cropping business is undertaken on a large proportion of the property with extensive cattle breeding and grazing of beef cattle on the remaining land which is unsuitable for cropping and lot feeding of cattle within a beef cattle feedlot in the north-east of the property.

The feedlot is known as Springfield Feedlot and operates for 12 months of the year and employs approximately 4 full time staff. Casual staff and contractors are engaged as required during busy periods such as planting and harvesting of silage and fodder and to supply various associated services such as plant maintenance and veterinary requirements.

Springfield Feedlot includes one controlled drainage area with associated production pens and drainage system which includes catch drains, sedimentation basin and holding pond. Springfield Feedlot also has auxiliary infrastructure to support the use such as cattle handling and feed storage and processing facilities.

Springfield Feedlot is accredited under the National Feedlot Accreditation Scheme (NFAS) with audits conducted annually.

Under Schedule 1, Part 1, Item 22 of the Protection of the Environment Operations Act 1987, the Project is categorised as cattle, sheep or horse accommodation. The Environmental Impact Statement Assessment (RDC Engineers Pty Ltd 2024) identified the potential for minor impacts on air quality during operation typically associated with odour and dust. However, it concluded any potential impacts could be managed by standard mitigation and management measures.

2 Purpose, scope, and objectives

2.1 Purpose

Doolin Farming Pty Ltd has developed this Operational Environmental Management Plan (OEMP) to describe the Environmental Management System (EMS) for the Springfield Feedlot (the Project). A detailed description of the development is provided in section 4.

The Environmental Management System is a tool for managing the impacts of the Project activities on the environment. It provides a structured approach to planning and implementing environment protection measures and provides the documented policies and procedures that establish the requirements for management of environmental issues on the Project site. The EMS integrates environmental management into all daily operations, long term planning and other quality management systems of the Project.

The Project has not commenced operation. This Plan will be reviewed and updated once operations commence.

2.2 Scope

The OEMP describes how Doolin Farming Pty Ltd proposes to identify and manage the environmental aspects and potential impacts of the Project during its operational phase up to the maximum 3,000 head capacity, in accordance with applicable legislative requirements as described further in section 4.

2.3 Objectives

The key objective of the OEMP is to ensure that impacts on the environment are minimised and within the scope permitted by the CoA. To achieve this objective, Doolin Farming Pty Ltd will:

- Describe the Project in detail including activities to be undertaken and relative timing;
- Provide specific mitigation measures and controls that can be applied on-site to avoid or minimise negative environmental impacts;
- Provide specific mechanisms for compliance with applicable policies, approvals, licences, permits, consultation agreements and legislation;
- Define and implement all obligations contained in the deed (including all environmental obligations relevant to the Project and obligations in the Project's environmental management documents) and other legal and regulatory obligations relevant to the Project;
- Describe the environmental management related roles and responsibilities of personnel;

- Ensure that environmental policies, objectives and targets satisfy the requirements of approval authorities;
- Define processes for formulating, resourcing, and implementing Environmental Management Plans and associated Management Plans;
- State objectives and targets for issues that are important to the environmental performance of the Project;
- Define processes for auditing, recording and monitoring the performance and effectiveness of Environmental Management Plans and associated Management Plans; and
- Outline a monitoring regime to check the adequacy of controls as they are implemented during operation.

3 Project setting

3.1 Location

The Project is in the North Star Region of NSW approximately 367 km south-west of Brisbane and 690 km north of Sydney

The project is located on two land parcels which form the property known as "Springfield" located at 2513 Getta Getta Road approximately 15 km by road east of North Star and some 27 km west-southwest of Yetman in the Gwydir Shire Council.

The Project has primary frontage to Getta Getta Road (unsealed) of approximately 5 km in length. Getta Getta Road intersects with North Star Road some 14 km west of and with Warialda Road which intersects with the Bruxner Way some 25 km east of the site access for the Development site respectively. Road access to the Development is from Getta Getta Road, a council-controlled road.

Figure 1 is a locality plan highlighting the Project to roads and the nearby townships of North Star and Yetman and the main watercourses and drainage lines in the region.

The subject land has been historically used for irrigated agriculture (cereals (maize, barley, oats, cotton) and dryland agriculture (cereals (wheat, barley) and extensive beef cattle grazing and intensive beef cattle feedlot is located in a rural area which encourages agricultural uses.

3.2 Site description

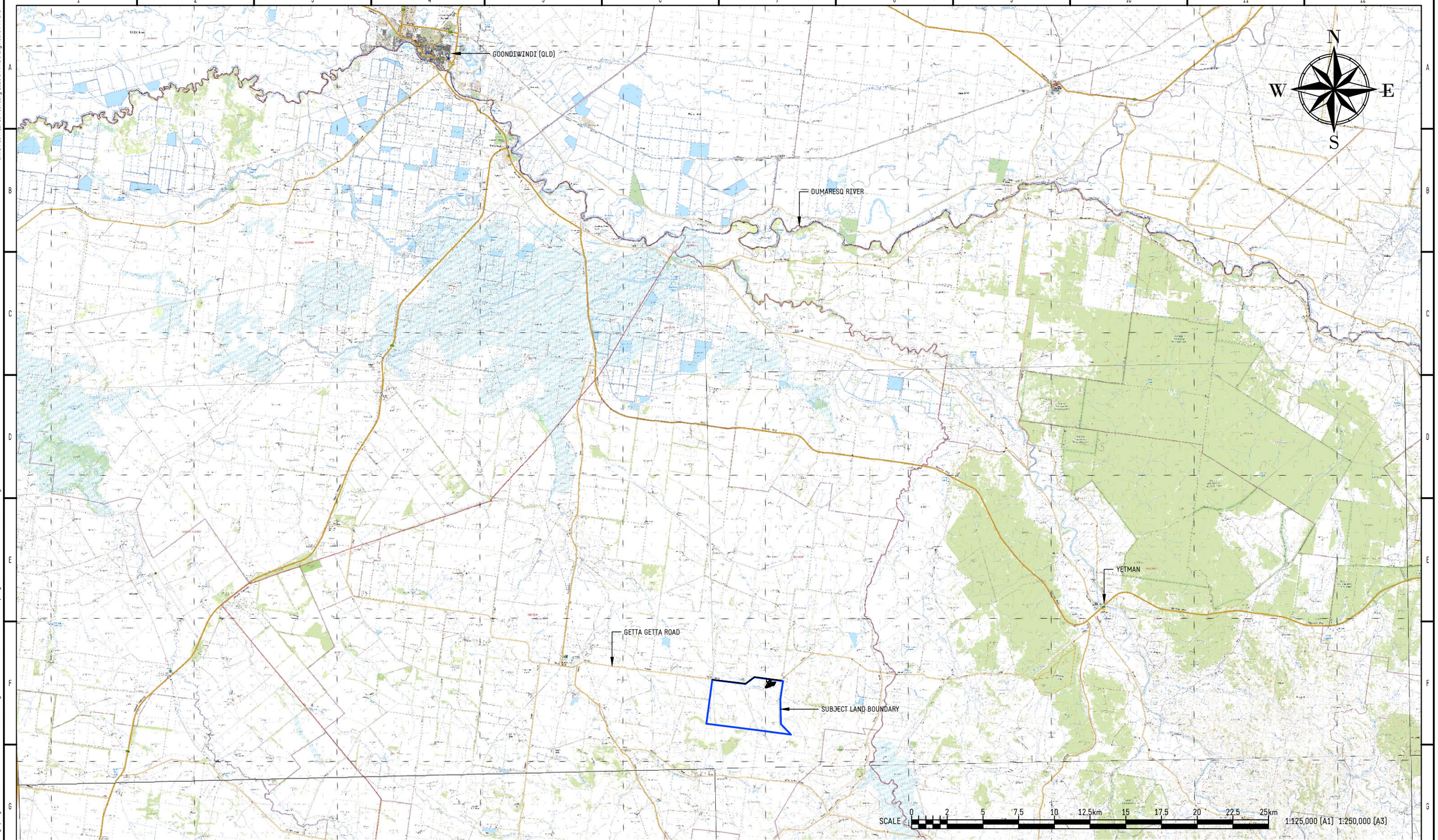
The Project site comprises of two (2) cadastral portions as outlined in Table 1. The total area of the Project site is about 1,713.2 ha (~4,231 acres). Figure 2 is an aerial plan of the Project site.

Table 1 – Project – Real property description

Property name	Lot no.	Plan no.	Easements	Area Ha	Local government area
"Springfield"	8	DP756018	DP1237694	~883.3	Gwydir Shire
"Springfield"	8	DP756018	DP1237694	~792.7	Gwydir Shire
"Springfield"	1	DP1212915	DP1237694	~37.2	Gwydir Shire
Total area				~1,713.2	

DATE PLOTTED: 19 February 2025 BY: - RDC Engineers PTY LTD

FILE PATH: C:\RDC Engineers\RDCE - Projects\E2-103 Doolin Farming Springfield EIS\05 - ACAD MasterPlan\05.1 Drawings - CURRENT FILE NAME: E2-103 DF Springfield MASTERPLAN-00-20250108v8.dwg



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY

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REV.	DATE	REVISION DESCRIPTION	DRAWN	CHECK	APPROVED
A	24/01/25	DRAFT ISSUE TO CLIENT	RJD	RJD	RJD
B	21/02/25	FINAL ISSUE FOR SUBMISSION TO GSC	RJD	RJD	RJD

SCALE	1:250,000 (A3)
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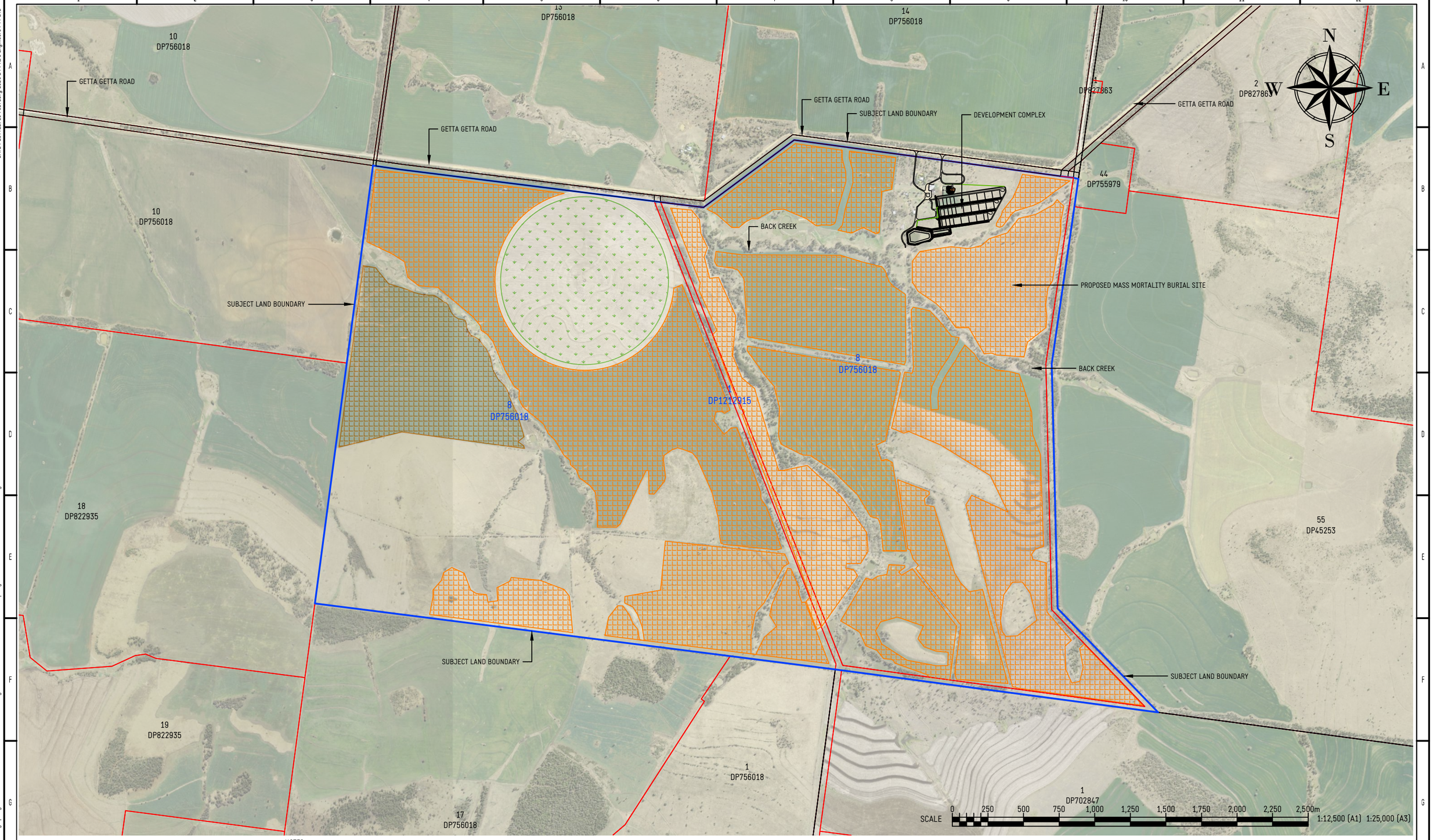
DATE	21/02/2025
CHECKED	RJD
DATE	21/02/2025
APPROVED	RJD
DATE	21/02/2025

CLIENT: DOOLIN FARMING PTY LTD

PROJECT: SPRINGFIELD BEEF CATTLE FEEDLOT

TITLE: DRAFT OPERATION ENVIRONMENTAL MANAGEMENT PLAN
PROJECT - LOCALITY PLAN

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 1		A3	E2-103-400-01	B



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- PROPOSED EFFLUENT UTILISATION AREA
- PROPOSED SOLID WASTE UTILISATION AREA

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APPROVED	RJD
DATE	21/02/2025

CLIENT DOOLIN FARMING PTY LTD
PROJECT SPRINGFIELD BEEF CATTLE FEEDLOT
TITLE DRAFT OPERATION ENVIRONMENTAL MANAGEMENT PLAN
PROJECT SITE - AERIAL PLAN

REPORT REFERENCE FIGURE 2
SUPPLIED DRAWING NUMBER
A3
DRAWING NUMBER E2-103-400-02
REV. B

DATE PLOTTED: 19 February 2025 BY: RDC Engineers PTY LTD
FILE NAME: E2-103 DF Springfield MASTERPLAN-00-20250108v8.dwg
FILE PATH: C:\RDC Engineers\RDCE - Projects\E2-103 Doolin Farming Springfield EIS\05 - ACAD MasterPlan\05.1 Drawings - CURRENT

4 Existing Environment

4.1 Climate

4.1.1 Rainfall

The climate of the region is between the tropical and temperate climatic zones. Under the Köppen-Geiger climate classification system this climate is classified as humid subtropical climate (Cfa), and experiences typical cool to mild dry winters and very warm to hot dry summers.

Rainfall varies with time of year due to the latitude of the region (-28.9^0) and tends to be summer dominant. Rainfall patterns are linked to high pressure systems over northern parts of Australia and rainfall typically occurs as thunderstorms or short and intense storm events during summer with the occasional cold fronts that brings periods of prolonged light rainfall.

Table 2 shows that the average annual rainfall interpolated by SILO for the period 1924 to 2023 is approximately 617 mm/year. The annual evaporation is approximately 1,876 mm/year. Monthly evaporation rates are lowest during the cool winter months and highest in the wet summer months (Table 2). The region has a nett deficit rainfall with rainfall less than the evaporation and transpiration rates.

Table 2 – Climatic data derived for Project site from SILO (1924-2023) (DSITIA, 2024)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Rainfall													
Mean rainfall (mm)	80.0	73.5	59.6	31.8	38.3	37.0	39.1	32.8	34.7	55.3	65.5	69.7	617.2
Median rainfall (mm)	63.9	57.1	49.4	20.6	32.0	28.1	36.2	28.8	26.9	44.6	54.3	65.2	598.6
Lowest rainfall (mm)	2	0	0	0	0	0	0	0	0	1	0.2	1.1	139.4
90% years at least rainfall (mm)	18.5	14.1	5.4	0.7	3.3	8.3	3.5	2.4	3.0	12.3	12.0	13.1	441.6
10% years at least rainfall (mm)	166.2	147.3	142.2	69.6	81.0	76.6	78.7	64.7	72.5	109.2	129.5	127.3	801.0
Highest rainfall (mm)	330.1	329	198.4	263	194.9	175.9	169.4	172.2	132.2	187.1	230.3	255.8	1118.6
Temperature, Humidity and Pan evaporation													
Mean pan evaporation (mm)	247.8	201.3	186.0	130.6	87.8	62.9	69.0	97.7	139.6	187.7	217.9	246.8	1875.7
Mean maximum temperature (deg C)	33.2	32.6	30.4	26.5	22.0	18.5	17.9	19.7	23.4	27.0	30.0	32.2	26.1
Mean minimum temperature (deg C)	18.8	18.5	16.1	11.6	7.4	4.7	3.3	4.5	7.5	11.8	14.9	17.4	11.4
Relative Humidity (%)	43.5	46.3	46.2	46.0	48.0	48.7	45.5	42.1	40.1	40.0	39.8	41.4	44.0

4.1.2 Wind

Wind speed and direction information obtained from The Air Pollution Model (TAPM) (Version 4) modelling is presented in the form of wind roses. Wind roses are a way of presenting a summary of wind speed and directional data for a time and location and show the frequency of occurrence of winds by direction and strength.

Figure 3 show wind roses from TAPM data for the Project site for all years between 2016 and 2020. Each bar shown on the wind rose represents winds blowing from that direction. The length of the bar represents the frequency of occurrence of winds from that direction and the colour and width of the bar sections correspond to wind speed categories as outlined in the legend.

During the year, the 9 am observations are dominated by winds from the east-northeast to east-southeast direction.

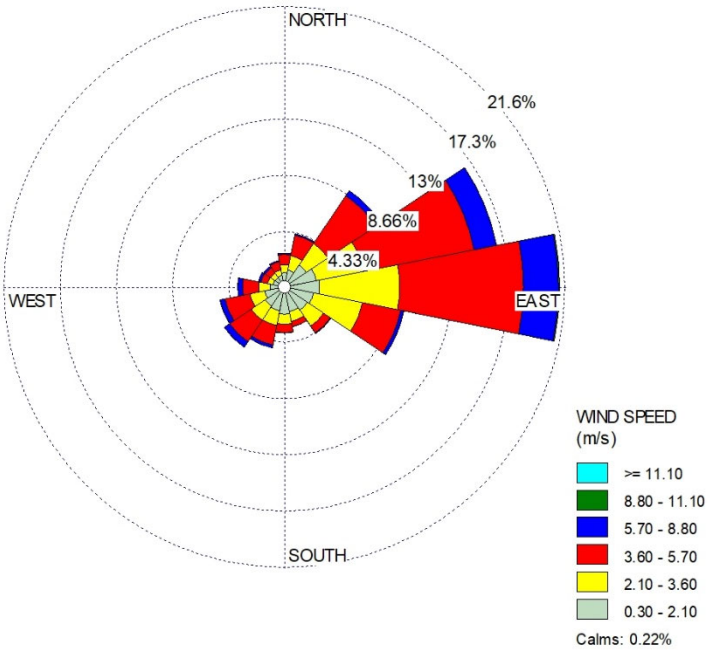


Figure 3 – Project site – Local wind direction (TAPM 2016-2020)

4.2 Sensitive receivers

The Project has been sited and designed to prevent or minimise adverse impacts on the amenity of the surrounding community and environmental values.

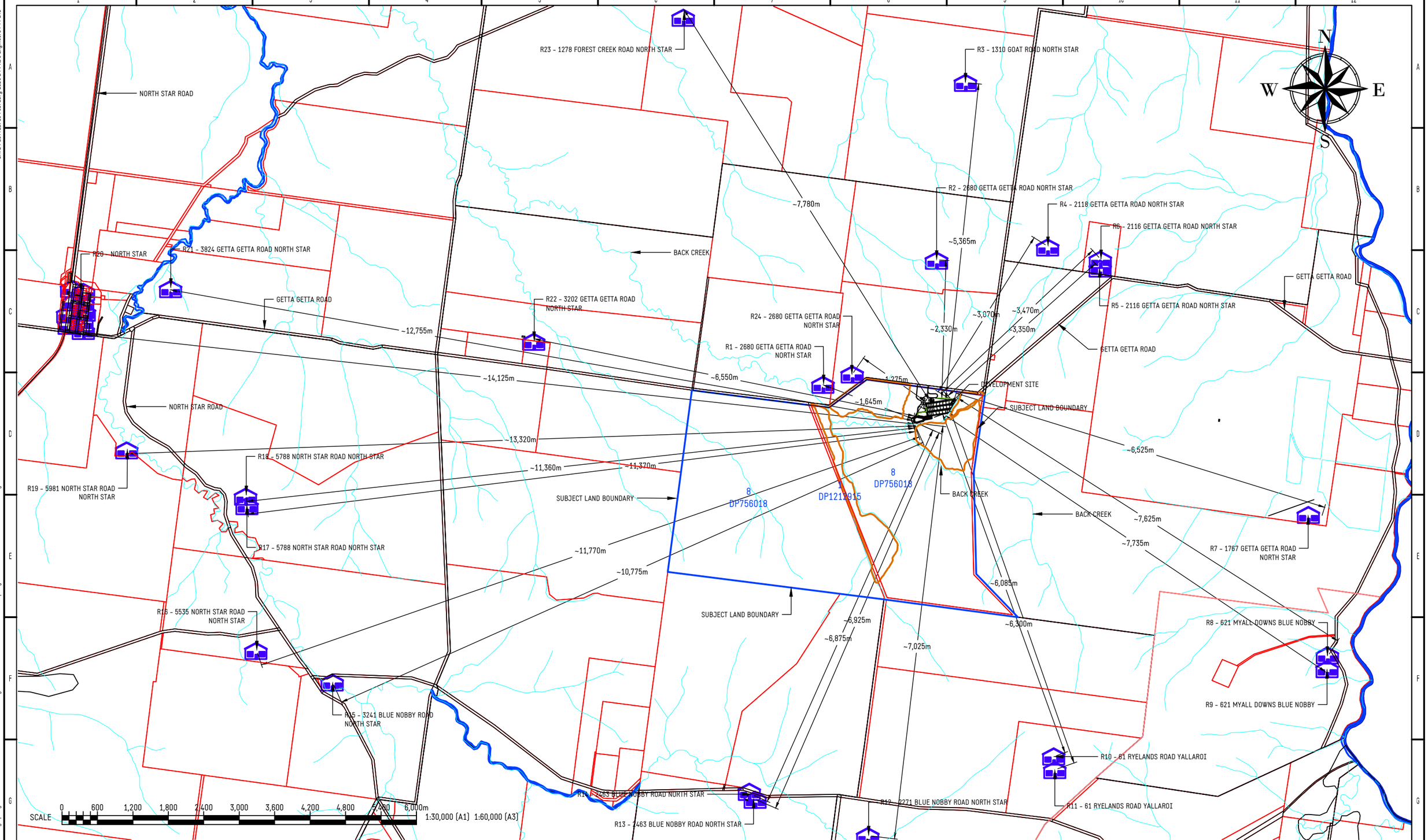
The Project site has a history of past disturbance (clearing) from land-uses associated with rural settlement and agricultural activities including timber cutting, cattle and sheep farming, dryland and irrigated cropping and infrastructure associated with those land uses.

The primary land use types within the subject land include pastoral activities such as beef cattle grazing and dryland and irrigated cropping activities. The majority of the subject land has been cleared of its pre-existing vegetation, and is now dominated by cropping areas, with some small areas of woodland fringing roads, drainage lines and areas less suitable for grazing and cropping as shown on Figure 4. The distribution of remnant vegetation is variable, mainly reflecting part disfavour of certain lands for agriculture such as the gravelly upland areas and riparian areas.

The Project development complex is on an area historically cleared of native vegetation and which currently contains pasture and infrastructure. A small area of native vegetation ecosystem credits have been retired as part of the Project.

Solid waste shall be applied sustainably to cropping land within the Project's solid waste utilisation area. A minimum buffer distance of 25 m between the solid waste utilisation areas and watercourses, drainage lines, native vegetation and public areas has been adopted.

Figure 4 shows the available separation distances for the Project for air quality. The Project is separated by over 1,000 m and 5,000 m to the closest rural residence and residential areas respectively.



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- RURAL RESIDENTIAL RECEPTOR
- SMALL TOWN RECEPTOR
- HYDROLINE

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DATE	21/02/2025
APPROVED	RJD
DATE	21/02/2025

CLIENT: DOOLIN FARMING PTY LTD
PROJECT: SPRINGFIELD BEEF CATTLE FEEDLOT
TITLE: DRAFT OPERATION ENVIRONMENTAL MANAGEMENT PLAN
PROJECT SITE - SENSITIVE RECEPTORS PLAN

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 4		A3	E2-103-400-04	B

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4.3 Topography

The Project site is located within the Yetman (9040) 1:100,000 and Goondiwindi (8940) 1:100,000 topographic map sheets within the north east of the North West slopes and Plains region of NSW. The topography at a regional scale is generally flat to gently undulating, with elevations from 310 m to 360 m AHD. The Project site is on the eastern margins of the plains with slopes in the order of 1-2%.

A topographic plan of the Project site was prepared from topographic data at a scale of 1:20,000 with a 5 m contour interval and is shown in Figure 5. This shows that the Project site has low relief landforms gently rising from the alluvial plains in the north west from approximately 300 m AHD towards the south – southeast to approximately 360 m AHD. There are few topographic highs.

The Project site has retained its historical topography. There has been no modification to the natural landform from mining, quarrying or other groundworks which may have altered its topography through the removal of soil or other materials other than vegetation clearing.

Drainage is confined to a north-north westerly direction towards the alluvial plains and to Back Creek. The higher elevations occur to the south of the Project site resulting in a generally northerly aspect across the Project site. The development complex site is located on a very gently sloping area with a southerly aspect and drains to a tributary of Back Creek.

The development complex is located geographically to the north-east of the Project site where the land is very gently sloping with a southerly aspect and falls towards an unnamed tributary of Back Creek. The site is inherently well drained due to the impermeable, predominantly clay soils and gradients of 2-3%.

The effluent utilisation area is located in the west of the subject land on relatively flat land as shown on Figure 5. The solid waste utilisation areas are located across the subject land where the land is relatively flat to gently sloping as shown on Figure 5.

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GETTA GETTA ROAD

GETTA GETTA ROAD

SUBJECT LAND BOUNDARY

DEVELOPMENT SITE

DP827863
GETTA GETTA ROAD

DP827863

N

W E

S

44
DP755979

018

BACK CREEK

BACK CREEK

UNNAMED TRIBUTARY OF BACK CREEK

BACK CREEK

SUBJECT LAND BOUNDARY

SUBJECT LAND BOUNDARY

300.0

UNNAMED DRAINAGE LINE

8
DP756018

8
DP756018

1
DP1212915

SCRUBBY GULLY

320.0

340.0

360.0

SUBJECT LAND BOUNDARY

SUBJECT LAND BOUNDARY

19
322935

SCALE 0 200 400 600 800 1,000 1,200 1,400 1,600 1,800 2,000m
1:10,000 (A1) 1:20,000 (A3)

LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- EFFLUENT UTILISATION AREA
- SOLID WASTE UTILISATION AREA
- HYDROAREA
- HYDROLINE

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4. SITE SURVEY CONDUCTED BY ANTHONY GRAHAM VERTICAL DATUM AHD DERIVED
5. HORIZONTAL DATUM - MGA 94 (UTM ZONE 56).

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CLIENT DOOLIN FARMING PTY LTD

PROJECT SPRINGFIELD BEEF CATTLE FEEDLOT

TITLE DRAFT OPERATION ENVIRONMENTAL MANAGEMENT PLAN
PROJECT SITE - TOPOGRAPHIC PLAN

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 5		A3	E2-103-400-05	B

4.4 Land resources

4.4.1 Soil-landscape mapping

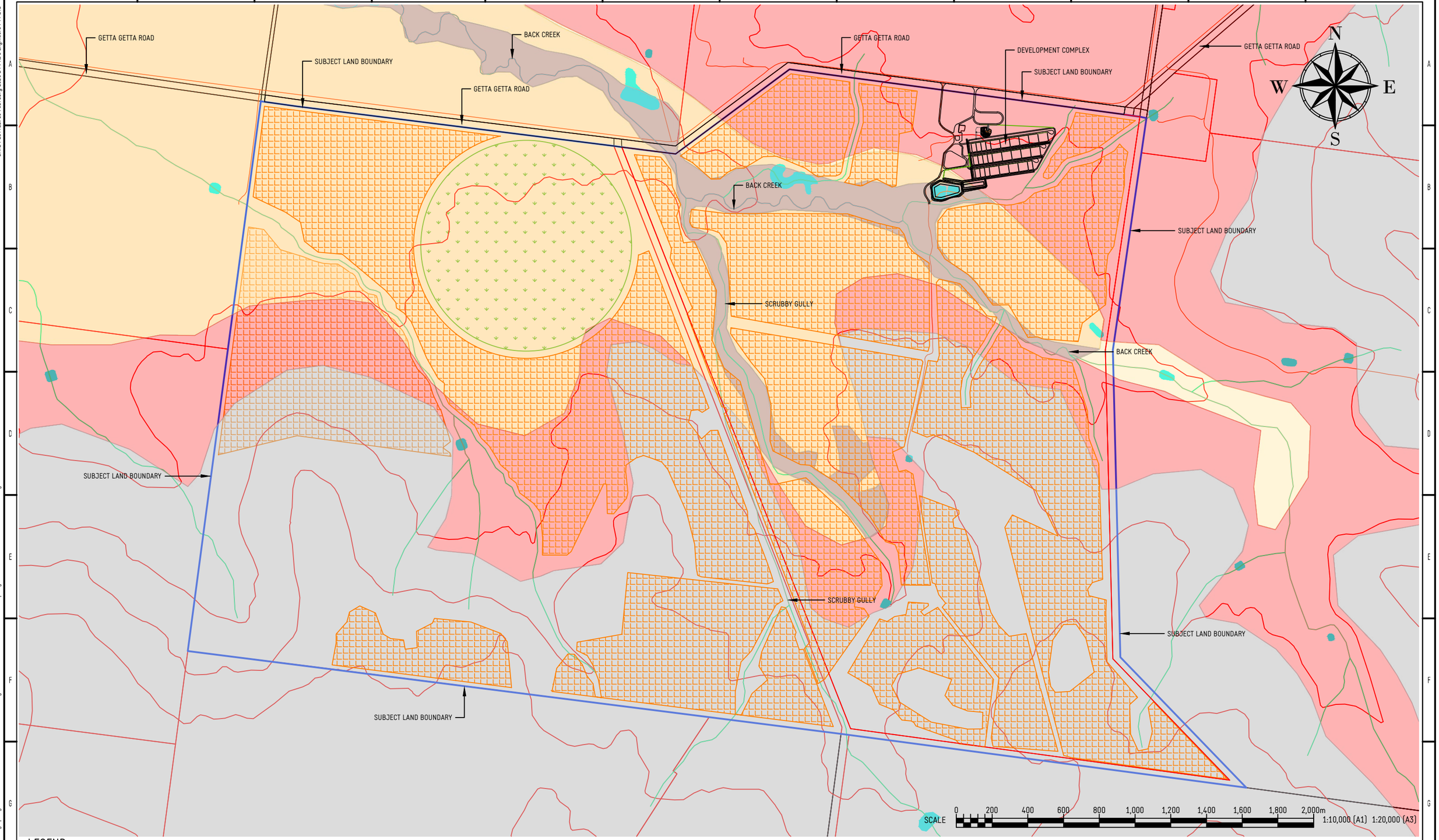
Broad scale soil and land resources of a portion of the subject land have been previously mapped as part of natural resource mapping for the Moree Plains at a scale of 1:250 000 by the Department of Climate Change, Energy, the Environment and Water 2016. The survey by the Office of Environment and Heritage (2015) is considered high data quality, midscale or imprecise mapping. The mapping provides an inventory of soil and landscape properties of the area and identifies major soil and landscape qualities and constraints. It integrates soil and topographic features into single units with relatively uniform land management requirements, allowing major soil and landscape qualities and constraints to be identified. Soils are described using the Australian Soil Classification (Isbell, 2002) and the Great Soil Groups systems (Stace et. al., 1968).

4.4.2 Site-specific soil assessment

A brief soil assessment and sampling was undertaken by JG Environmental Pty Ltd in 2024 in the solid waste and effluent utilisation areas respectively to validate the broadscale soil-landscape mapping information.

The dominant soils observed in the mid and lower slope positions were deep brown Dermosols (some Chromosols). Once again, these soils are currently being utilised for growing irrigated/dryland cotton and various fodder and grain crops. The mid to upper slope positions also contain deep reddish soils similar to the red and brown Ferrosols and Dermosols described in OEH (2015).

In the high crests and upper landscape positions, also observed were shallow to moderately deep soils (Tenosols and Rudosols). These soils are used for grazing only and have not been developed. These unsuitable soils have been excluded from the existing solid waste utilisation areas.



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- EFFLUENT UTILISATION AREA
- SOLID WASTE UTILISATION AREA
- SOIL LANDSCAPE UNIT - MUNDLE (mgh)
- SOIL LANDSCAPE UNIT - MOBBINDRY CREEK (mkt)
- SOIL LANDSCAPE UNIT - VERTOSOLS

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3. LAND RESOURCE UNIT MAPPING FROM THE SOIL AND LAND RESOURCES OF THE MOREE PLAINS (OFFICE OF ENVIRONMENT AND HERITAGE)
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PROJECT: SPRINGFIELD BEEF CATTLE FEEDLOT
TITLE: DRAFT OPERATION ENVIRONMENTAL MANAGEMENT PLAN
PROJECT SITE - SOIL LANDSCAPE OVERLAY

REPORT REFERENCE: FIGURE 6
SUPPLIED DRAWING NUMBER:
A3
DRAWING NUMBER: E2-103-400-06
REV.: B

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4.5 Water resources

4.5.1 Groundwater

The Project site is located within the Great Artesian Basin (GAB) one of the largest groundwater systems in the world. The GAB underlies parts of New South Wales, Queensland, South Australia and the Northern Territory.

The GAB is also acknowledged to have interactions with river systems in NSW which overly the Basin. It is highly likely that 'rejected recharge' water associated with the GAB is providing base-flow to rivers such as the Dumaresq, Macintyre, Castlereagh, Namoi, and Gwydir in their eastern reaches.

Groundwater recharge in NSW takes place chiefly along the eastern fringe of the GAB where the via the Pilliga and Mooga sandstone aquifers are exposed at the surface. In these areas the quality of the water is high and suitable for most purposes.

Groundwater extraction in the GAB is used for towns, stock, domestic use and irrigation. Agriculture is the largest user of GAB groundwater through pastoral (stock) and irrigation agricultural uses. In the past two decades an irrigation industry reliant on GAB water has been developed in the eastern recharge area where water quality is suitable.

In NSW the GAB is managed as five groundwater sources under the *Water Management Act 2000* through the Water Sharing Plan for the NSW Great Artesian Basin Groundwater Sources 2008. Two of these (the Eastern and Southern Recharge Groundwater Sources) are in the non-artesian part of Basin.

The Project site is located at North Star within the Eastern Recharge Groundwater Source. The Eastern Recharge Groundwater Source covers an area of some 5,600 km^2 extending about 150 km south from the Dumaresq River to north of Bingara, east to the Great Dividing Range and west to Boggabilla.

The Eastern Recharge Groundwater Source is characterised by better quality groundwater than other zones. Parts of these areas have been developed for high volume irrigation extraction at two main locations: North Star and Croppa Creek at the northern end of the Eastern Recharge.

Doolin Farming Pty Ltd has a water access licence (WAL 41169; Works approval 90AL834721) for 1,558 unit shares (1.3 ML/unit share) which authorises the use of groundwater on the Project site for any purpose.

4.5.2 Surface water

At a regional scale, the Project site is in the Barwon River catchment from the confluence of Macintyre River and Weir River (Qld) near Mungindi which is part of the NSW Border Rivers catchment. At a local scale, the subject land is in the Back Creek catchment which is a subcatchment of the Mobbindry Creek catchment, Whalan Creek catchment and the Boomi River catchment upstream of the Barwon River.

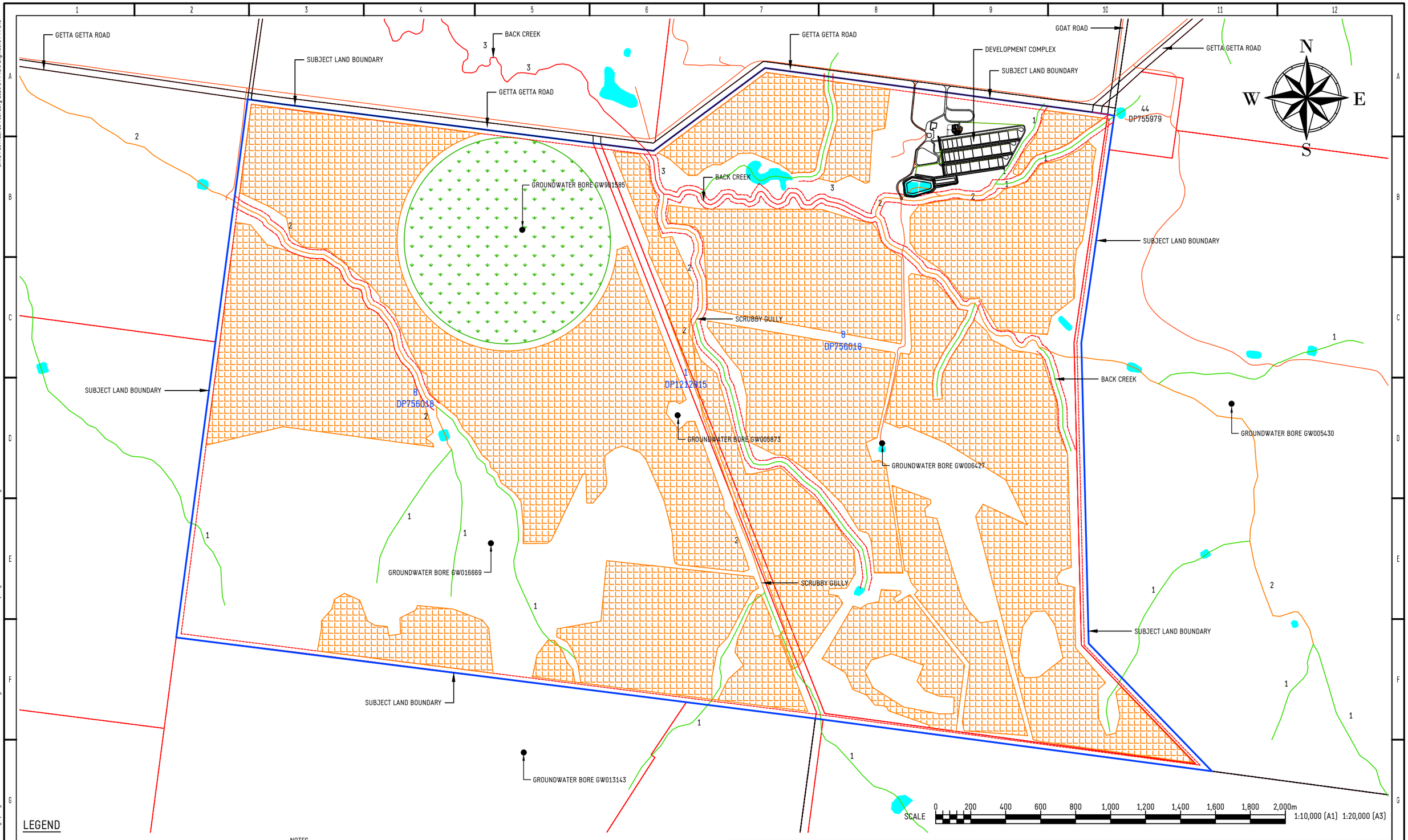
At a local scale, surface water is predominately comprised of ephemeral waterways. This is a resultant of the size of the contributing watercourse catchment area, rainfall pattern experienced in the region and no base flow resulting from groundwater expression.

The majority of smaller watercourses and drainage lines in the area are ephemeral and only flow during periods of prolonged rainfall.

Water planning in the NSW Border Rivers catchment is managed under the *Water Management Act 2000* through the NSW Border Rivers Unregulated and Alluvial Water Sources 2012.

Figure 7 shows that Back Creek flows through the centre of the subject land in a general north-westerly direction. There are various unnamed tributaries of Back Creek originating from the upper slopes of the subject land drain towards the alluvial plains in the north.

The subject land does not have access to surface water and there are no water access licences attached to the subject land.



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- HYDROAREA
- EFFLUENT UTILISATION AREA
- SOLID WASTE UTILISATION AREA
- 25m BUFFER TO HYDROLINE
- STREAM ORDER 1
- STREAM ORDER 2
- STREAM ORDER 3
- STREAM ORDER 4
- STREAM ORDER 5
- STREAM ORDER 6
- STREAM ORDER 7
- STREAM ORDER 8

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PROJECT: SPRINGFIELD BEEF CATTLE FEEDLOT
TITLE: DRAFT OPERATION ENVIRONMENTAL MANAGEMENT PLAN
PROJECT SITE - GROUNDWATER BORES AND SURFACE WATER DRAINAGE

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 7		A3	E2-103-400-07	B

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4.5.3 Flooding

The climate and topography of the region results in some degree of flooding in all streams during heavy or prolonged rain events.

Flooding may be influenced by floods from two sources (or a combination of these sources):

- Riverine flooding caused by high flows in the major river (Macintyre) or its tributaries. These flood events inundate the riverine plains a complex distributary channel system some 50 km to the north west of the subject land. These events only result from rainfall over a significant portion of the respective river basin catchment.

- Local catchment flooding due to rainfall over the local catchment draining to drainage infrastructure (e.g. bridges, culverts, causeways etc) in isolation of regional flooding behaviour.

The Project site does not contain a major watercourse or situated adjacent to or on the riverine plains subject to riverine flooding as shown in Figure 7.

The Project complex has been sited and designed to:

- minimise concentration or restriction of local catchment flows; and
- avoid diversion of flow to adjoining landholders.

5 Project description

5.1 Overview

The Project is a Class One beef cattle feedlot. A Class One feedlot has the highest standard of design, construction, operation, maintenance, pad management and cleaning frequency. The Project shall have a maximum capacity of 3,000 head developed in two or more stages. The Project complex occupies a footprint of approximately 15 ha and includes the following components in a functional configuration:

- Water supply/storage and reticulation infrastructure – A reliable and uninterrupted supply of clean water of the required volume to sustain operations is provided;
- Pens - Fenced areas are required for accommodating beef cattle (production pens), cattle arriving to or being dispatched from the facility (induction/dispatch pens), and sick beef cattle (hospital pens);
- Livestock handling – Infrastructure and facilities are required for the arrival, processing and dispatch of cattle and stabling for horses;
- Feed processing and commodity storage - Feed rations are prepared on-site in a dedicated facility, with associated commodity storage, handling and ration delivery infrastructure;
- Access and internal roads - Access to the site and the layout of internal road systems are critical to the efficient and safe functioning of the proposed development;
- Administrative/maintenance infrastructure - Facilities are required for conducting management, maintenance and administrative functions at the development. This includes office, weighbridge and associated facilities for example;
- Controlled Drainage system - The controlled drainage system includes catch drains, sedimentation system and holding pond(s) for conveying stormwater, allow entrained sediment to 'settle out' and capture and storage of the stormwater from the controlled drainage areas until it can be sustainably utilised; and
- Solid waste and effluent management areas – Solid waste such as manure and mortalities are temporarily stockpiled and processed within the solid waste stockpile and carcass composting area prior to utilisation on-site or removed off-site for utilisation. Effluent is stored in holding ponds pending application to the effluent utilisation area.

The Project also includes an associated 15 ha of cropping land for solid waste and effluent utilisation. Solid waste generated is applied to an on-site utilisation area. Any solid waste not utilised on-site are removed off-site. When available, effluent is applied to land via irrigation within a dedicated effluent utilisation area.

Figure 8 shows the configuration of the Project complex.

LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY

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TITLE: DRAFT OPERATION ENVIRONMENTAL MANAGEMENT PLAN
PROJECT COMPLEX - LAYOUT PLAN

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 8		A3	E2-103-400-08	B

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5.2 Staging

The Project construction would be developed in two or more stages in line with the market demand for beef.

The Project development timeframes provided in Table 3 are indicative only and are no commitment to develop the Project within the timeframes given.

Table 3 – Project staging

Stage	Total capacity	Description	Timeframe
1	2,250 Head	Controlled Drainage Area 1. Production pen area for 1,500 Head with associated drainage system, feed bunks, water troughs, fencing, feed roads, shade structures, internal connection roads, solid waste and carcass composting area, expanded grain storage and processing facility, expended sedimentation basin and holding pond for CDA 1.	After development approvals
2	3,000 Head	Controlled Drainage Area 1. Production pen area for 1,000 Head with associated drainage system, feed bunks, water troughs, fencing, feed roads, shade structures, internal connection roads.	3-5 years

5.3 Operation activities

When fully developed, the Project includes the operation of a 3,000 head feedlot turning off approximately 6,920 head of cattle per year, including management and maintenance of pens, drainage system, and effluent and solid waste (manure, carcass compost, holding pond sludge).

The following activities are undertaken during operations.

5.3.1 Cattle management

The Project accommodates some 3,000 head of beef cattle at the design stocking density of 17.9 m^2/head on-site at any given time when fully constructed. The majority of cattle would be steers of *Bos taurus* cross genotypes. Breed composition is expected to change with time as market signals develop.

Cattle would be transported to the Project site at the entry weight of the target market, typically being an average range between 350-400 kg liveweight.

The cattle would be fed a ration specific to their market type until they reach the target exit weight when they would be transported from the site to the abattoir at Inverell for processing. Depending on the target market, the cattle would be fed for approximately 100 to 150 days to achieve an average of 625 to 650 kg liveweight.

Loaded or unloaded livestock transport vehicles enter the site from Getta Getta Road, travel along the access road, and unload or load cattle at the cattle handling facility. Empty or loaded livestock vehicles then travel along the ingress route to exit the site.

5.3.2 Feed management

The beef cattle are fed a scientifically formulated ration. Rations are prepared on-site in a dedicated facility, with associated commodity storage, handling and ration delivery infrastructure.

The ration contains grain, other high energy feedstuffs, protein meals, roughage (fibre), and minerals. Grain provides energy for weight gain. Roughage is essential in the diet to enable normal rumen activity and shall be provided by silage, hay or straw.

Commercial mineral/vitamin premixes shall also be added to the ration. These may contain calcium, urea, sulphur, salt and various trace minerals and vitamins (or just the trace minerals and vitamins) required for achieving optimal growth rates.

Loaded feed commodity transport vehicles enter the site from Getta Getta Road, travel along the access road and unload at the grain storage or commodity storage facility. Empty feed commodity vehicles then travel along the ingress route to exit the site.

All grain would be processed on-site through a dedicated grain processing facility. The facility consists of storage silos to store grain, a grain movement system and a grain processing system.

The grain processing system will be dry rolling. The grain movement and processing system would be powered by electricity. Hay would be processed during feedout in the tractor drawn feed mixer.

The processed feeds and commodities would be stored in storage bays within the commodity shed. When it is time for them to be used, they are loaded into the feed trucks by front-end loader. The feed trucks have on-board weighing and mixing equipment. The ration is then delivered to each production pen using feed trucks that place the feed directly into open feed bunks for cattle to consume.

5.3.3 Water management

Water is a vital resource for the Project. Most of the water used is for cattle to drink; it is also used for washdown of the cattle handling crush area and other general hygiene practices around the facility and in staff amenities.

Water from the Project is sourced from existing groundwater entitlements and pumped to storage tanks located towards the highest elevation at the Project complex site. Water storage of about 450,000 litres total capacity in three tanks is provided. The water within the storage tanks nest is reticulated around the Project complex via gravity or pressurised systems dependent on the proposed use.

The Project water supply, storage and reticulation is managed to:

- meet the total annual water requirement of the Project;
- provide an unrestricted, reliable supply of water to livestock at all times of the year;
- provide water that is clean, fresh and free from contamination for livestock;
- meet the peak water intake requirement for the cattle, especially during the summer period;
- minimise losses and maximise water use efficiency;
- ensure that the quality of the water (which includes temperature, salinity and impurities) does not affect cattle performance or welfare; and
- provide water that is clean, fresh and free from contamination for people.

Potable water at the Project site is provided by captured rainwater. Potable water will primarily be utilised for domestic purposes. However, it may also be required to supplement water captured and reused on the site where demand requires, and water quality allows. This may include dust suppression, fire protection and washdown activities.

5.3.4 Solid waste management

The Project produces significant amounts of solid wastes. Solid wastes include:

- Manure –the faeces and urine excreted by the cattle and the majority of all solid wastes. Manure accumulates on the pen surface and is deposited in drains and the sedimentation basin after runoff-producing rainfall.

- Waste feed – Very low levels of feed commodities or rations are wasted through spillage or spoilage. Feed in bunks may become wet and unpalatable in rainy weather and cattle may go off their feed. Under these circumstances the ration is spoiled and needs to be removed from the bunk and taken directly to the solid waste storage area.
- Mortalities – Lot fed cattle are vulnerable to sickness and disease. Whilst the Project has a high animal health maintenance and welfare program, periodically cattle deaths are experienced. The average mortality rate is around 0.5% expressed as a percentage of cattle throughput.

The various activities associated with solid waste management are outlined in the following sections.

5.3.4.1 Pen cleaning and maintenance

The pens are regularly cleaned to minimise the depth of manure on the pen surface. Pen cleaning and maintenance is not viewed as a cost, but as a method of minimising potential impacts to the environment and the potential to return income to the Project by the sale or sustainable utilisation of the harvested manure. Consequently, pen cleaning is a major on-going part of operational management.

Ideally, pen cleaning occurs at intervals not exceeding 10 weeks when the manure is moist but not wet, since moist manure is more easily scraped from the surface. However, more frequent cleaning may occur even when conditions are not ideal.

During pen cleaning, manure that has accumulated under fence lines and along the sides or feed bunks and water troughs is also removed and pen maintenance activities such as filling of potholes is undertaken.

The machinery to be used for pen and drain cleaning and maintenance activities includes:

- Skid-steer loader – under fence cleaning and removal of manure from around feed and water troughs
- front-end loader to remove manure out of the pens/drains and stockpile area
- rigid and articulated tip trucks for removing manure from the pens to the solid waste stockpile / carcass composting area, loading manure and compost for transport to the utilisation areas
- front-end loader for mixing and aerating the manure windrows and carcass compost.

5.3.4.2 Drain/Sedimentation basin cleaning

During rainfall runoff events, manure from the pen surface can be entrained in runoff water and deposited in drains rather than flowing to the sedimentation basin. Solids deposited in drains are removed after each rainfall runoff event. Typically, solids are removed using a skid-steer loader or similar equipment.

The sedimentation basin has been designed to separate larger solids in the stormwater runoff from the liquid component. Solids settle in the basin while the liquid drains into the holding pond. Over time, solids build up in the sedimentation basin and, if not removed, will begin to

flow into the holding pond. The sedimentation basin is checked for efficacy after each runoff event.

Where practical, the sedimentation basin is allowed to dry out prior to removal of sediment. Typically, sediment is removed using a front-end loader or similar equipment.

5.3.4.3 Mortality management

Carcasses are removed from the pens on a daily basis and taken directly to the solid waste storage and carcass composting area. Typically, carcasses are lifted and carried using a front-end loader rather than being dragged away, which could result in the discharge of blood and other body fluids.

The majority of carcass mass is moisture and will evaporate, significantly reducing the mass remaining after composting. The mass of carcasses is considered negligible when compared to the mass and nutrient content of manure that will be handled. Carcasses are composted in separate windrows to the bulk manure windrows.

5.3.4.4 Manure stockpile/processing

The manure collected from the pens, drains and sedimentation basin is stockpiled in windrows in a dedicated solid waste storage and carcass composting area. The solid waste storage area is also used to store composting mortalities until the compost is cured.

The solid waste storage and processing area is within the controlled drainage area. Therefore, runoff from the storage area is prevented from flowing uncontrolled into the natural environment.

Providing a solid waste storage area allows for regular pen/drain/sedimentation basin cleaning even though it may not be possible to continually spread the solid waste or remove it from the site.

Solid waste stored in static piles may decompose aerobically or anaerobically, depending on its moisture content. Prior to utilisation, the solid waste would typically undergo a screening process which shall remove any rocks/gravel in the accumulated solids, bones from carcasses and reduce any large particles (including slabs of dry manure).

5.3.4.5 Utilisation

Solid waste (manure, carcass compost, holding pond sludge) is a valuable source of nutrients and organic matter for soil conditioning and growing crops or pastures. Careful management is needed to gain the most benefit from utilisation while also protecting the environment and amenity.

Utilisation of solid wastes (manure, carcass compost, holding pond sludge) substitutes a percentage of the synthetic fertilisers that would otherwise be trucked-in for use in the cropping area on the Project site. Various crops or pastures are grown on the solid waste utilisation area. Crops are harvested for hay, silage and / or grain to use as feed commodities in the ration.

Solid waste from the stockpile area is removed in line with cropping program demands and placed directly onto the available solid waste utilisation area when possible and favourable weather conditions permit. Solid waste is applied using a tractor-drawn manure spreader.

5.3.5 Liquid waste management

Stormwater run-off from the controlled drainage area is described as liquid waste ('effluent'). Because it has been in contact with manure, it has a high nutrient concentration and has the potential to pollute surface water and groundwater. Effluent is valued as a source of nutrients for fertilising crops and therefore shall be applied to land where it can improve soil agronomic properties be sustainably utilised by crops.

Effluent is collected, temporarily held in the sedimentation basin and then stored in the holding pond until it can be utilised.

Effluent from the holding pond is removed in line with cropping program demands and applied to the crops on the effluent utilisation area when favourable weather conditions permit. Effluent is applied using a low-pressure overhead sprinkler irrigation system (centre-pivot).

5.4 Administration and maintenance

The Project includes facilities for maintenance and administrative functions. This includes administration office, general goods, chemical and fuel storage and associated facilities.

The administration building is an existing cottage comprising a single storey structure containing an office, meeting room, general workstation areas, lunchroom, kitchen, first aid room and restrooms for about 6 people (i.e., allowance made for visitors, short term contractors and latent capacity).

The administration area is landscaped with selective tree plantings, gardens and grassed areas in keeping with the rural nature of the activities and location.

5.5 Access and Internal roads

The primary access to the Project is via an entry and exit point on Getta Getta Road as shown on Figure 2. This site access is via an entrance gate. A dedicated internal road connects the entrance to the administration area; the cattle receival/dispatch area and grain and commodity storage infrastructure.

Heavy vehicles larger than B-double configuration when exiting the site will be required to turn left onto Getta Getta Road towards North Star.

6 Legislative and other requirements

6.1 Legal and other requirements

A register of legal and other requirements for the Project is contained in Appendix A1. The relevance of legislation is maintained through the Environmental Management System.

The legal requirements register will be reviewed at regular intervals, such as after management review, and updated with any applicable changes. Any changes made to the legal requirements register will be communicated to the wider team where necessary through toolbox talks, specific training and other methods detailed in section 9.

6.2 Approvals, permits and licences

Several approvals, permits and licences have and/or will be obtained and maintained for the Project under relevant legislation and CoA. For example, these include:

- Development consent under the Environmental Planning and Assessment Act 1979 No 203; and
- Environmental Protection Licence under Chapter 3 of the Protection of the Environment Operations Act 1997.

Appendix A2 contains a register of all relevant environmental approvals, permits and licences. The register will be maintained by the Feedlot Manager and will be reviewed prior to the commencement of operation and at least annually as part of the management review.

6.3 Conditions of Approval

The CoA relevant to this Plan are outlined in Table 4. A cross reference is also included to indicate where the condition is addressed in this Plan or other Project management documents.

Table 4 – Conditions of Approval relevant to this plan

CoA	Condition requirements	Plan reference
Notice of Determination		
	To be completed after Notice of Determination is issued	
EPL		
	To be completed after EPL is issued	

7 Environmental management framework

The Environmental Management System is a tool for managing the impacts of the Project's activities on the environment. It provides a structured approach to planning and implementing environment protection measures and provides the documented procedures that establish the requirements for management of environmental issues on the Project site. The EMS integrates environmental management into all the Projects daily operations, long term planning and other quality management systems.

7.1 Environmental management system documentation

The OEMP is the overarching management plan for a suite of environmental management documents. It provides a structured and systematic approach to environmental management. The Environmental Document Register provided in Appendix A6 lists the environmental management documents that support the OEMP, as well as any other related environmental documentation.

The primary purpose of the system of documentation is to:

- Ensure compliance with all applicable environmental laws, obligations and approvals; and
- To minimise environmental impacts.

The schematic relationship between the OEMP, Project CoA and legislative requirements is shown in Figure 9 and described further in the sections following.

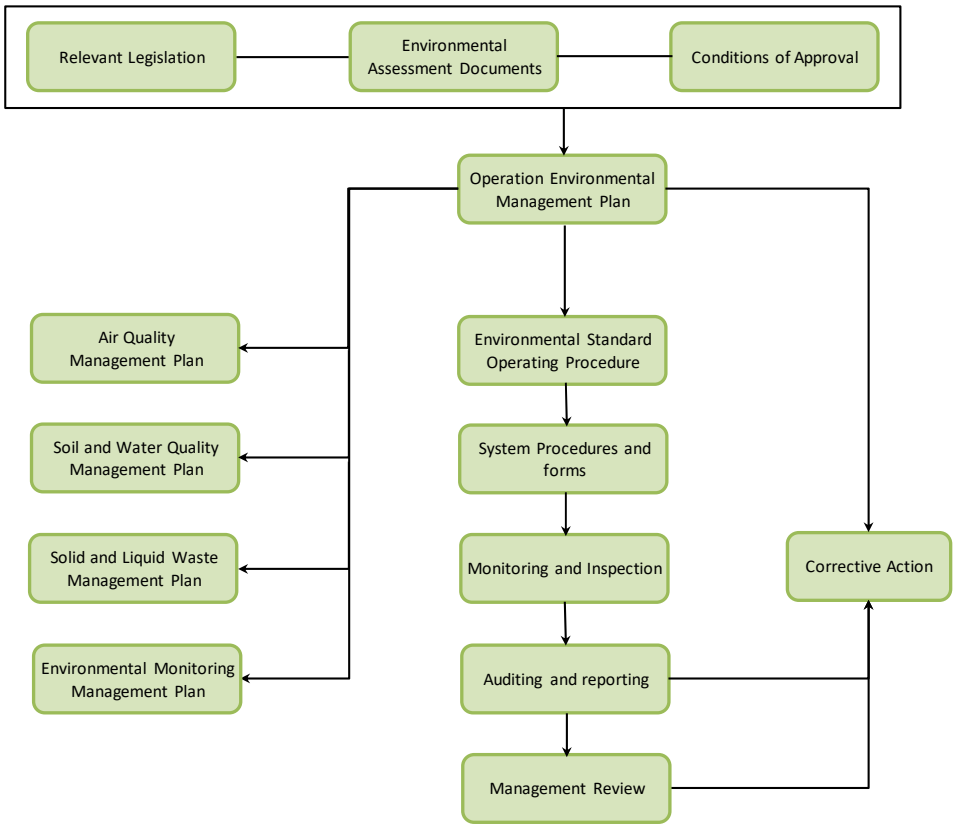

Figure 9 – Environmental management system flowchart

7.1.1 Operational environmental management plan

This OEMP is the overarching document in the environmental management system for the Project. This OEMP provides the system to manage and control the environmental aspects of the Project during operation. It identifies all requirements applicable to activities described in section 5.3. It also provides the overall framework for the system and procedures to ensure environmental impacts are minimised and legislative and other requirements are fulfilled. The strategies defined in this OEMP have been developed with consideration of the Project approval requirement, safeguards and mitigation measures presented in the environmental assessment and approval documents. This OEMP establishes the system for implementation, monitoring and continuous improvement to minimise impacts from the Project on the environment.

This OEMP is consistent with:

- Environmental Management Plan Guideline for Infrastructure Projects 2020;
- AS/NZS ISO14001:2016, 'Environmental management systems - Requirements with guidance for use'.

The OEMP and all associated plans required under CoA have been provided to the Gwydir Shire Council and the NSW EPA as the Department currently administering the *Protection of the Environment Operations Act 1997* for approval.

7.1.2 Supporting environmental management plans and strategies

Several environmental management plans support the OEMP. These documents were prepared to identify requirements and processes applicable to specific impacts or aspects of the activities described in section 4. These management plans have been prepared to meet the requirements of the CoA and mitigation measures and in consultation with stakeholders and regulatory agencies identified in the environment assessment documentation to ensure good practice environmental design and management measures are identified and implemented throughout the Project.

The management plans identify and assess the potential impacts of each significant risk / aspect as it relates to the Project, and outline the management and mitigation measures, responsibilities and monitoring requirements to be implemented to prevent or minimise potential environmental impacts.

Environmental strategies may also be developed as required throughout the Project. These will also guide environmental management of potential impacts on-site.

Relevant specific measures and requirements for the Project are included within the management plans attached to this OEMP. A list of relevant management plans and strategies for the Project, and their approval requirements, is provided in Appendix A6.

All management plans have been developed in accordance with section 6 of this OEMP and all environmental management documents will be regularly reviewed in accordance with section 13. The associated management plans are applicable to all staff and sub-contractors associated with the operation of the Project.

7.1.3 Environmental standard operational procedures

In addition to the overarching OEMP and management plans required by the CoA, a set of environmental procedures will be developed to provide further guidance for managing all activities that have the potential to negatively impact on the environment and to ensure consistency in approach and quality of outcome.

Standard operational procedures (SOPs) will be prepared by relevant members of the Project team progressively in the lead up to and during operational activities on site and will incorporate relevant mitigation measures and controls from management plans. SOPs are specifically designed to communicate requirements, actions, processes and controls to operations personnel using plans, diagrams and simply written instructions.

The SOPs are the main site documents used by Project personnel to identify and manage safety and environmental risks associated with all operational activities.

SOPs for activities likely to be considered high risk include:

- Pen cleaning and maintenance;
- Drain cleaning;
- Sedimentation basin management;
- Solid waste storage and stockpile management;
- Mortality management;
- Solid waste (manure, carcass compost, holding pond sludge) utilisation;
- Managing runoff from CDA;
- Holding pond management;
- Effluent utilisation;
- Soil monitoring;
- Solid waste (manure, carcass compost, holding pond sludge) sampling;
- Effluent sampling; and
- Groundwater and surface water sampling.

SOPs will be approved by the Feedlot Manager prior to works being undertaken. The requirement for approval by environmental personnel provides the opportunity to ensure that relevant controls required by the OEMP, management plans, procedures and relevant legislation have been considered and communicated to all personnel undertaking the associated tasks.

All Project personnel and sub-contractors undertaking a task governed by a SOP will undergo training on the SOP and acknowledge that they have read and understood their obligations prior to commencing work.

Regular monitoring, inspections and auditing against compliance with SOPs will be undertaken by Project management, quality and environmental personnel to ensure that all controls are being followed and that any non-conformances are recorded and corrective actions implemented.

A register of SOPs will be maintained in the Environmental Document Register (Appendix A6).

7.1.4 Forms, checklist and registers

Documents such as guidance notes, SOPs, checklists, forms and registers will be developed to assist in the implementation of processes described in the OEMP or supporting management plans. These types of documents will be further developed and continually improved to ensure consistency in approach and quality of outcome.

A register of relevant environmental forms and registers is maintained in Appendix A8.

7.2 Obligations, roles, responsibilities and authority

All Project personnel are responsible for protecting the environment by ensuring that environmental protection measures identified in the OEMP are planned for, resourced, communicated, installed, maintained and reviewed. All personnel working on the Project have the following general obligations:

- Undertaking work in accordance with relevant Doolin Farming Pty Ltd's policies, approved OEMP, procedures, management protocols and plans, statutory and contract requirements to minimise pollution of land, air and water;
- Implementing appropriate environmental and safety management measures;
- Use pollution control equipment and keep it in proper working order;
- Preserve the natural and cultural heritage environment;
- Minimise the occurrence of offensive odour;
- Minimise the occurrence of offensive noise; and
- Be a good neighbour to surrounding land users.
- Take all feasible and reasonable steps to ensure compliance with the requirements of this OEMP.
- Reporting of actual and potential environmental incidents to their relevant line manager or Feedlot Manager.

The key environmental management roles and responsibilities for the operation phase of the Project are described in Appendix A5.

7.3 Environmental specialists

The Project may also engage the services of technical specialists / consultants to provide advice, undertake monitoring and direct site activities as required. A description of the types of consultants that may be engaged for the Project is detailed in Table 5.

Table 5 – List of Environmental Specialists engaged

Specialist	Services provided
Soil scientist	Soil sampling/results interpretation
Environmental scientist	Groundwater sampling / surface water sampling / solid waste (manure, compost, holding pond sludge) sampling / effluent sampling
Agronomist	Crop sampling, analysis, nutrient budgeting

7.4 Sub-contractor management

Environmental requirements and responsibilities for sub-contractors are specified in their contract documentation.

All sub-contractors are required to attend Project and/or site inductions where the requirements and obligations of the OEMP are communicated. A record of all sub-contractor inductions will be maintained on the Project induction and training register.

During operation, contractors will be responsible for:

- Undertaking work in accordance with relevant Doolin Farming Pty Ltd policies, approved OEMP, procedures, management protocols and plans, statutory and contract requirements;
- Implementing appropriate environmental and safety management measures; and
- Reporting of actual and potential environmental incidents to the Feedlot Manager.

7.5 Certification and approval

The OEMP shall be approved by the Gwydir Shire Council and the NSW EPA as the Department currently administering the *Protection of the Environment Protection Act 1997* prior to the commencement of operation.

7.6 Documentation review

An ongoing informal process of environmental management documentation review ensures that environmental documentation including this OEMP is updated as appropriate for the specific works that are occurring on-site. The document review process is described in section 13.

Revised versions of the OEMP will be made available through the processes described in section 7.7.

7.7 Distribution

This OEMP is available to all personnel and sub-contractors via the Project document control management system.

The document is uncontrolled when printed. One controlled hard copy of the OEMP and supporting documentation will be maintained by the Feedlot Manager at the Project's on-site Administration office.

8 Environmental aspects and impacts

A risk management approach has been used to determine the severity and likelihood of an activity's impact on the environment and to prioritise its significance. This approach considers potential regulatory and legal risks as well as taking into consideration the concerns of community and other key stakeholders.

The objectives of risk assessment are to:

- Identify activities, events or outcomes that have the potential to adversely affect the local environment and/or human health/property;
- Qualitatively evaluate and categorise each risk item;
- Assess whether risk issues can be managed by environmental protection measures; and
- Qualitatively evaluate residual risk with implementation of measures.

The environmental risk assessment was undertaken in accordance with the following standards:

- Australian Standard/New Zealand Standard (AS/NZS) ISO 31000:2009 Risk management – Principles and guidelines; and
- Australian Standard/New Zealand Standard Handbook 203:2012 Managing environment-related risk (Standards Australia/Standards New Zealand 2012).

The main components of the risk assessment methodology include:

Hazard Identification: Identifying potential hazards that are applicable to the Project activities and determining the hazardous events to be evaluated.

Risk Assessment: Determining the possible causes that could lead to the hazardous events identified; the consequences of the hazardous events; and the safeguards and controls currently in place to mitigate the events and/or the consequences.

Risk Evaluation: Evaluating the risks using the Risk Prioritisation Matrix (section 8.1). The risk ranking is determined by a combination of the expected frequency of the hazard occurring (likelihood) and the consequence of its occurrence. Note that when assessing the consequence, no credit is given to the hazard controls. Hazard controls are taken into account in determining the likelihood of the event.

Residual Risk Treatment: Reviewing the proposed management controls for each of the risks identified and proposing additional controls or making recommendations, if required.

8.1 Risk analysis

The risk analysis was conducted using the semi-quantitative approach in the Australian/New Zealand Standard AS/NZS ISO 31000 (2009). Firstly, the 'likelihood' and 'consequence' definitions were defined for the risk analysis . These are presented in Table 6 and Table 7 for 'consequence' and 'likelihood' definitions respectively.

Table 6 – Consequence assessment

CONSEQUENCE	Personal Impact	Environmental Impact	Commercial Impact	Social Impact
Insignificant	No injuries	Low environmental impact within Project site.	Commercial Impact < $5,000.	Internal complaints received
Minor	Minor injuries, first aid treatment required (graze, scratch)	Minor environmental impact within Project site.	Commercial Impact - $5,000-$50,000	Multiple internal complaints received. External complaint received from client
Medium	Medical treatment (Off site)	Contained environmental impact within Project site.	High Commercial Loss - >$50,000	External complaints received from community. Loss of Client revenue.
Major	Permanent human damage, including concussion (amputation, loss of sight)	Major environment damage outside Project site.	Major commercial loss - $500,000	Local media coverage (Newspaper, TV). Loss of client / Contract.
Extreme	Fatality or multiple fatalities	Extensive environmental disaster outside Project site.	Extensive commercial loss >$1M	National media coverage (approached by Media, TV, Paper, Protestors, etc)

Table 7 – Likelihood definitions

Likelihood	Description	Frequency
Almost Certain	Expected to occur in most circumstances	Occur once in a day
Likely	Will probably occur in most circumstances	Occur once in a week
Possible	Might possibly occur at some time	Occur once in a month
Unlikely	Could occur at some time	Occur once in a year
Rare	May occur in exceptional circumstances	Occur once in 5 years

Table 8 – Risk assessment matrix

Likelihood		Consequence				
		Insignificant	Minor	Medium	Major	Extreme
		1	2	3	4	5
Almost certain	5	M8 Moderate	H16 High	H18 High	E23 Extreme	E25 Extreme
Likely	4	M7 Moderate	M10 Moderate	H17 High	H20 High	E24 Extreme
Possible	3	L3 Low	M9 Moderate	M12 Moderate	H19 High	H22 High
Unlikely	2	L2 Low	L5 Low	M11 Moderate	M14 Moderate	H21 High
Rare	1	L1 Low	L4 Low	L6 Low	M13 Moderate	M15 Moderate

8.2 Objectives and targets

Objectives and targets enable projects to meet defined levels of performance against identified criteria. Objectives are statements of intent, while targets define the specific performance requirements that need to be met in order to achieve the objectives. Environmental objectives and targets have been established as a means of assessing environmental performance during operation of the Project. These objectives and targets have been developed with consideration of key issues identified through the environmental assessment and risk assessment process. Environmental objectives and targets for the Project are provided in Table 9. The objectives and targets are consistent with Doolin Farming's Pty Ltd environmental policy (Appendix A4) and will assist in monitoring whether the commitments of the policy are being met.

Objectives and targets have been set to be specific, measurable, achievable, realistic and time bound. The performance of the Project against the objectives and targets will be documented in operation compliance reports, such as Annual return and at least on an annual basis as part of the management review.

The overall environmental objective is to undertake all aspects of the Project in an environmentally responsible manner and effectively manage risks to prevent or mitigate any impacts on the environment or surrounding communities.

Table 9 – Environmental objectives and targets

Objective	Target	Measurement tool
Compliance		
Ensure the Project operates in accordance with all relevant environment related approvals and legislation.	Full compliance with statutory approvals.	Audits, operation compliance reporting, annual return, management view.
	No regulatory infringements (or prosecutions). No formal regulatory warning.	
Quality		
Implement a rigorous and comprehensive EMS.	Address non-conformances and corrective actions within specific timeframes.	Audits, management reviews.
Stakeholder and community relationships		
Engage with the potentially effected and broader community, minimise complaints and respond to any complaints within a suitable timeframe	Disseminate regular Project updates and other information through the Project website and other tools identified in this Plan and relevant sub-plans.	Review complaints, operation compliance reporting, annual return, audits
	Record and response to complaints within the timeframe specified in this Plan and relevant sub-plans.	
Continual improvement		
Continuously improve environmental performance	Implement training and awareness programs that promote compliance, improving environmental performance and skill base of relevant Project staff on the Project and minimise environmental risk	Operation compliance reporting, annual return, audits, management review.
	Capture lessons learnt from environmental incidents to minimise repeat issues.	

9 Competence, training and awareness

The successful training of Project personnel in environmental requirements outlined in this OEMP is a key factor in ensuring compliance with the objectives of this OEMP. Training can be both verbal and written and includes induction, meetings and specific training. The processes for communicating relevant environmental requirements to all project personnel prior to and during construction are outlined in the following sections.

The Feedlot Manager will review and approve the training program and monitor implementation.

9.1 Environmental induction

All personnel (including sub-contractors) are required to undergo a site induction that includes an environmental component which outlines key environmental issues prior to commencement of work on-site. This is done to ensure all personnel involved in the Project are aware of the requirements of the OEMP and to ensure the implementation of environmental management measures.

Short-term visitors on-site for purposes such as deliveries will be required to be accompanied by inducted personnel at all times.

The Feedlot Manager (or delegate) conducts the environmental induction and training to ensure that all personnel and sub-contractors working on the site achieve a level of awareness and competence appropriate to their assigned activities. The environmental induction will be reviewed for adequacy during project environmental management reviews.

The environmental component of the induction will include, but not be limited to, an overview of:

- Site orientation;
- Key issues relating to the Project and existing environment;
- Concepts of due diligence and duty of care;
- Relevant requirements of environmental documents and relevant conditions of environmental licences, permits and approvals;
- Relevant details of the OEMP including purpose and objectives;
- Mitigation measures for the control of environmental issues;
- The roles and responsibilities of those receiving the training in achieving conformance with the environmental policies and requirements, including emergency preparedness and incident response and reporting requirements;
- Environmental personnel and contacts;
- Information relating to the location of environmental constraints;
- Site-specific environmental management requirements and responsibilities, such as:

  - location and protection of environmentally sensitive areas;
  - waste management and minimisation;
  - washing, refuelling and maintenance of vehicles, plant and equipment;
  - efficient use of plant, equipment and materials;
  - minimising potential environmental impacts including air and water quality;
- The potential environmental impacts of their work activities; and
- The potential consequences of non-compliance with relevant statutory requirements and this OEMP.

A record of all environment inductions, including the names and details of those who have been inducted, will be maintained and kept on-site. Amendments may be made to the induction at any time due to Project modifications, legislative changes or amendments to this OEMP or related documentation.

The Feedlot Manager will review and approve the induction program and monitor implementation.

9.2 Toolbox talks, training and awareness

Competency-based environmental awareness training is conducted regularly and is attended by Project staff and contractors. Content may include the points outlined above, as well as familiarisation with specific site environmental controls and community involvement/relation requirements. Employees and permanent full-time contractors also undergo specific training undertaken as tool-box training.

A program of toolbox talks will be used to raise awareness and educate personnel on issues related to all aspects of operation including environmental issues. This type of training is provided on an as-needed basis, for example, following the identification of a new environmental risk, relevant changes in legislation or a change in operation methodologies.

Toolbox talks will be of adequate duration to cover relevant information and structured to encourage full participation by all personnel. Additional toolbox meetings may be called at any time by the Feedlot Manager to discuss or highlight any aspects relating to safety, environment and quality.

The Feedlot Manager (or delegate) will be responsible for preparing and conducting toolbox talks which will focus on issues relating primarily to safety, quality and the environment.

Toolbox talks will include details of SOPs for relevant personnel or activities. Toolbox talks will also be tailored to specific environmental issues relevant to upcoming works in or near sensitive receivers or environmentally sensitive areas, or incidents that have occurred.

Relevant environmental issues may include (but are not limited to):

- Air quality – Odour / dust control;
- Pen, drain sedimentation basin cleaning;

- Solid waste management and utilisation;
- Hours of work;
- Emergency and spill response;
- Weed management;
- Noisy works or works outside of normal working hour;
- Effluent management and utilisation
- Soil and water quality;
- Environment incidents;
- Changes to previously communicated environmental mitigation measures; and
- Environmental procedures;

Toolbox talk attendance is mandatory and attendees of toolbox talks are required to sign an attendance form and the records maintained.

Targeted environmental awareness training will be provided to individuals or groups of workers with a specific authority or responsibility for environmental management or those undertaking an activity with a high risk of environmental impact. Topics covered may include those detailed above, or others deemed necessary during operation.

Operational personnel will also be informed of environmental issues through the development and distribution of awareness notes etc. These will typically take the form of a poster, email or similar.

9.3 Pre-start meetings

The pre-start meeting is a tool for informing the workforce of the day's activities, safe work practices, environmental protection practices, work area restrictions, activities that may affect the works, coordination issues with other trades, hazards and other information that may be relevant to the day's work. This type of training is provided on an as-needed basis.

The Feedlot Manager will conduct a pre-start meeting with the relevant site workforce before the commencement of work each day (or shift) or where changes occur during a shift as needed. Pre-start meetings are generally succinct in nature and take approximately 10-15 minutes.

The environmental component of pre-starts will be determined by the activity's relevant manager and /or environmental personnel and will include any environmental issues that could potentially be impacted by, or impact on, the day's activities. All attendees will be required to sign on to the pre-start and acknowledge their understanding of the issues explained.

Pre-start topics, dates delivered and a register of attendees will be recorded.

10 Consultation and communication

10.1 Consultation

Extensive consultation with relevant stakeholders and regulatory authorities has been undertaken through the development of this OEMP and associated management plans and prior to the submission and approval of the OEMP. Relevant stakeholders consulted are outlined in Table 10.

Table 10 – Relevant Stakeholders consulted

Stakeholder/ Authority consulted	Plan	Issue/Relevance
GSC / EPA	Air Quality Management Plan	Odour, Dust, GHG
GSC / EPA	Soil and Water Quality Management Plan	Water quality, erosion and sediment control, soil degradation
GSC / EPA	Solid and Liquid Waste Management Plan	Solid waste (putrescible, non-putrescible), special waste, liquid waste (effluent, sewage)
GSC / EPA	Environmental Monitoring Management Plan	Environmental monitoring (air quality, soils, groundwater, surface water, effluent and solid waste.

Consultation with relevant stakeholders and government authorities will continue throughout the Project and during subsequent revisions involving significant modifications.

Appropriate communication and notification with relevant stakeholders and regulatory authorities is an essential element in establishing constructive communication channels to ensure the impact of potential or actual issues and incidents are prevented or minimised and dealt with efficiently and amicably.

10.2 Communication

On-going and clear communication throughout all levels and functions (e.g., management, staff and sub-contractors, stakeholders and community) on environmental requirements and progress are key to minimising environmental impacts and achieving continual improvements in environmental performance. Communication is both verbal and written and is managed via various delivery mechanisms (e.g., website, signage, noticeboards, toolbox meetings and pre-start meetings.

Doolin Farming Pty Ltd recognise that environmental issues are important to relevant stakeholders, especially when the project interfaces with the general public. Consultation and communication activities are planned and approved before release to stakeholder groups.

10.2.1 Internal communication

The ongoing communication of environmental requirements and progress to project personnel is a key element in ensuring compliance with the objectives of this OEMP. Communication can be both verbal and written and can include meetings and notifications (e.g., Project alerts, bulletins) in addition to training discussed in section 9.

The Project management team will meet regularly to discuss any issues with environmental management on-site, any amendments to plans that might be required or any new / changes to operational activities.

Regular meetings may also be scheduled with environmental technical specialists and consultants. The purpose of these meetings would be to communicate ongoing environmental performance and to identify any issues to be addressed.

Further internal communications regarding environmental issues and aspects will be through awareness training as described in section 9.2.

10.2.2 External and regulatory authority consultation

The Feedlot Manager is the point of contact for external parties and regulatory authority regarding specific environmental issues.

The ongoing environmental performance of the Project including progress and any key environmental matters will be reported to the NSW EPA as the department currently administering the *Protection of the Environment Operations Act 1997* through an Annual Return.

External communications regarding specific environmental issues will be managed through the Feedlot Manager.

10.3 Stakeholder and community communication

Communication with stakeholders is an important element of any project to ensure all potentially affected stakeholders are made aware of predicted or potential impacts and that an avenue for stakeholder input is made available. A number of groups including our workforce, our customers, regulatory authorities, state agencies, local government, suppliers, industry organisations and peak bodies and residences nearby to the Project have been identified as stakeholders in relation to the operation phase of the Project.

10.3.1 Stakeholder communication strategy

Appropriate communication and notification with the relevant stakeholders are an essential element in establishing constructive communication channels to ensure the impact of potential or actual issues and incidents are prevented / minimised or dealt with efficiently and amicably.

Relevant stakeholders are outlined in section 10.3.

10.3.2 Community communication strategy

The community communications strategy includes a range of consultation and communication tools that are used for providing information and consulting with the community and stakeholders to inform the community of Project issues and receive comments and complaints during the operation phase of the Project. Key elements include:

- A phone number established and communicated to community and stakeholders for registering a comment / complaint and triggering the appropriate response procedure;
- Signage on Project boundary and entrance;
- Project website with a contact number, email and postal address;
- A postal address to which written complaints and enquiries might be sent;
- An email address to which electronic complaints and enquiries may be transmitted; and
- Advertisement with the number, email and postal address prior to commencement of operation.

10.3.3 Enquiries and complaints response

A Complaints and Enquiries Procedure consistent with AS/NZS 10002:2014 Guidelines for complaint management in organisations and will be developed prior to commencement of operational activities and maintained for the duration of operations.

Doolin Farming Pty Ltd has established a telephone number, postal address and email address for community complaints and enquiries. All community inquiries and complaints related to the operational activities will be referred to the community information line.

The telephone number, the postal address and the email address were published in newspapers circulating in the local area prior to the commencement of operation. The community is regularly informed of the phone, email and postal addresses via the Project website, newsletters and signage adjacent to the Project site.

Enquiries and complaints contact details are provided in Table 11.

Table 11 – Enquiries and complaints contact details

Contact method	Details
Postal	2513 Getta Getta Road, North Star NSW 2408
Email	TBA
Phone	TBA

In responding to enquiries or complaints, Doolin Farming Pty Ltd will:

- Record details of all complaints received in the Complaints Register, including how they were addressed, whether resolution was reached and whether mediation was required or used. The information contained within the register will be made available to the regulatory authorities on request.
- Investigate the complaint – site investigation to identify potential causes, researching any previous issues, checking whether any requirement has been breached, what corrective action, if appropriate, will be undertaken, a time frame for this action and the appropriate feedback/response to the complainant.
- Provide at least an initial response to the complainant regarding what has been found and what corrective and / or preventative action is proposed as soon as possible and within a maximum of 48 hours from the time of the complaint.
- Where appropriate, provide a detailed written response to the complainant within ten (10) days, outlining (but not limited to) whether a problem has been found, the reason for the problem and, if appropriate, corrective and preventative actions that have been implemented to resolve the issue. A signed electronic and hard copy of the written response will be kept in the Project's document control and data management system at the Project's on-site administration office.
- Complaints and enquiries feedback will be evaluated quarterly as part of the review process in order to assess and adjust communication methods if required.

Corrective actions will be applied in consultation with the appropriate operational staff to allow modifications and improvements in the management of any environmental issues resulting in community complaints.

10.3.4 Record of consultation and communication

External consultation via email will be undertaken using the Project's email system, which automatically records all email correspondence.

The uploading and management of documents is discussed further in section 14. In addition, any records of consultation including letters, review comments or the issue of approvals will be kept on-site in the relevant folder in the Project's on-site administration office.

Verbal consultation with stakeholders will be recorded using hard or soft diary notes or file notes and saved on-site in the filing system at the Project's on-site administration office.

Where relevant, verbal correspondence will also be entered in the community and stakeholder consultation register, as described in the section 14.

11 Incident and emergency management

All emergency and incident situations on the Project including actual or potential (near miss) for injury, or damage to equipment, property or the environment will be reported to the Facilities Manager or immediate supervisor as soon as practicable after the occurrence.

An emergency situation is an event that could present significant risk to the environment, personnel or the community, as determined by the Feedlot Manager.

All emergency and incident situations on the Project shall be managed according to the Project's Environmental Complaints, Incidents and Emergencies Procedure (Appendix A9).

All incidents will be investigated, and the appropriate course of action will be taken to address the issues. Environmental incidents that harm or are likely to harm the environment will be reported to the NSW EPA in accordance with Part 5.7 of the *Protection of the Environment Operations Act 1997.*

The Feedlot Manager has the authority and independence to require reasonable actions to avoid or minimise unintended or adverse environmental impacts, and failing the effectiveness of such actions, to instruct that relevant actions be ceased immediately should an adverse impact on the environment be likely to occur.

11.1 Incident investigation, reporting and recording

Environmental incidents do not necessarily comprise a breach of legislation and can involve (but not be limited to) the following:

- spills of fuels, oils, chemicals and other hazardous materials;
- unauthorised discharge from holding pond or other containment devices;
- any adverse health or well-being impacts on persons due to activities causing adverse environmental conditions ;
- an unexpected find of contaminated soils or other potentially hazardous substances;
- unauthorised damage or interference to native vegetation, threatened species, endangered ecological communities or critical habitat;
- potential contamination of waterways or land;
- accidental starting of a fire or a fire breaking out of containment;
- any breach of legislation including development consent conditions; or any government agency permit condition;
- works impacting outside an approved area or undertaken without appropriate approval or assessment under the *POEO Act 1997*; and
- unauthorised dumping of waste.

The incident shall be assessed immediately and action taken promptly to correct any existing danger and to prevent repetition.

Doolin Farming Pty Ltd has developed an Environmental Complaints, Incidents and Emergencies Procedure to classify and report environmental incidents that may occur during the Project's operational activities and to comply with its statutory obligations to report certain incidents. Incidents are reported, investigated and recorded according to this procedure. The procedure provides references to:

- Types of environmental incidents.
- Criteria for classifying of environmental incidents.
- Processes for systematically responding to and managing emergency situations.
- Processes and legal requirements (e.g., Acts, Regulations, EPL), for reporting and notification of an environmental incident.

The procedure is provided in Appendix A9.

Typically, the Feedlot Manager or in his absence the Environmental Specialist, will be immediately notified verbally of major environmental incidents and this will be followed up in writing within two hours of any incident occurring. All efforts will be undertaken immediately to avoid and reduce impacts of incidents and suitable controls put in place. Incidents will be closed out as quickly as possible, taking all required action to resolve each environmental incident.

The NSW EPA as the department currently administering the *POEO Act 1997* will be notified of any environmental incidents or pollution incidents on or around the site via the Environment Line (131 555 in NSW; 02 9995 5555 if outside NSW) in accordance with part 5.7 of the *POEO Act 1997*. The circumstances where this will take place include:

If a discharge of waste –

a) occurs as a result of an emergency, accident or malfunction; or

b) occurs otherwise than in accordance with a works approval or licence or with a requirement contained in an environmental protection notice; or

c) is of a prescribed kind or a kind notified in writing to the occupier concerned, and has caused or is likely to cause pollution, material environmental harm or serious environmental harm.

All records relating to environmental incidents shall be maintained on the Project's document control and data management system to remain legible, identifiable and traceable.

11.2 Environmental emergency

11.2.1 Preparation

Major environmental incidents, natural disasters or adverse weather events may require an emergency response. To ensure that all site personnel know their responsibilities during an emergency, an Emergency Plan (EP) for the Project is in place. The EP covers both WHS and environmental emergencies. The EP needs to be read in conjunction with this OEMP.

The EP is prepared in consultation with relevant Authorities to determine requirements in the event of a Project emergency as well as requirements in the event of an emergency advised by relevant Authorities.

11.2.2 Response

The EP details the preparation for emergency and the actions to be taken in the event of an actual emergency event and reporting requirements. Table 12 lists the key contacts for environmental emergencies.

Table 12 – Environmental emergency contact details

Emergency contact/Organisation	Contact details (Phone)
Police	000
Ambulance	000
Fire and Emergency Services	000
NSW Rural Fire Service	1800 NSW RFS (1800 679 737)
Environmental line	131 555

12 Inspections, monitoring and auditing

12.1 Environmental Inspections

Regular site inspections are an important part of maintaining an environmental presence and reviewing operation activities to ensure compliance with controls described in the OEMP, associated management plans and SOPs.

12.1.1 Site inspections

Typically, site inspections will be performed by the Feedlot Manager and Farm Manager during site attendance and will focus on the protection of environmentally sensitive areas, impact on sensitive receivers and compliance with all applicable environmental documentation and conditions.

Site inspections will be conducted on an on-going basis and prior to 'forecasted' and following heavy rainfall events to evaluate the effectiveness of environmental controls.

Site inspections provide a forum for the Feedlot Manager to liaise directly with operation personnel to ensure satisfactory environmental outcomes during works.

The Feedlot Manager will document any relevant or notable outcomes of site inspections by:

- Diary notes, which will be kept of work locations, activities, times, conversations or other relevant information that may be of environmental interest, both positive and negative;
- Photographs – which will be taken of environmental mitigation measures, operation activities or other areas of interest both positive and negative; and
- Any minor non-conformances and associated control actions required to be undertaken by operational personnel - these will be recorded in the Site Inspection and Non-conformance register (Appendix A8). Records will also include details of any maintenance required and undertaken, the nature of the deficiency, any actions required and an implementation priority.

The process for recording and managing a non-conformance with an SOP or other management document is described in section 12.5.

12.2 Monitoring

Environmental monitoring is important in ensuring that operational activities are not adversely affecting the environment or sensitive receivers and that control measures are working effectively. Monitoring will be undertaken to validate the impacts predicted for the Project, to measure the effectiveness of management plans, environmental controls and implementation of this OEMP, and to address approval requirements.

Environmental monitoring will involve routine collection and interpretation of data to assess operational performance, environmental performance and compliance with requirements.

The monitoring requirements for required aspects are included in the relevant management plans and summarised in Table 13. The program was established and implemented at the commencement of operation. The Feedlot Manager (or delegate) is responsible for the implementation of the operation environmental monitoring program.

Table 13 – Environmental monitoring required by Project approval

CoA	Description	Relevant Management Plan	Reporting requirements
Environmental Protection Licence			
-	Soil and water quality	OSWQMP	Refer Appendix B4 – Environmental monitoring management plan
	Groundwater and surface water	OSWQMP	Refer Appendix B4 – Environmental monitoring management plan

The requirements for environmental monitoring throughout the period of operation are detailed in the relevant management plans (Appendix B). The timing, frequency, methodology, location and responsibilities for the environmental monitoring programs is provided in the management plans and included as separate procedures where further information is required.

Monitoring procedures address how these activities will be undertaken and include:

- Purpose and scope;
- Minimum acceptable frequency and standards listed in CoA and Licence;
- Relevant EPA approved methods, Australian Standards or, in the absence of these, industry acceptable procedures;
- Targets and parameters;
- Processes for response to any exceedances of targets/standards; and
- Processes for recording and reporting results.

All environmental monitoring equipment will be maintained and calibrated according to manufacturer's specifications and appropriate records kept.

The Environmental Specialist will advise the Feedlot Manager of any non-conformances from monitoring and details reported in the Annual Return.

Where a non-conformance is detected or monitoring results are outside of the expected range and are directly attributable to the Project (i.e., are influenced by factors under the direct control of the Project e.g., surface water quality), the process described in section 12.5 will be implemented.

12.3 Auditing

12.3.1 Internal Audits

Internal auditing will be undertaken, generally on a twelve-monthly basis, with the initial audit to occur within six months of the commencement of operation and then at regular intervals thereafter. These internal audits will be timed to provide input into annual compliance tracking, so that the results can be used in annual returns.

The purpose of the internal audits is to:

- Check compliance with the conditions of approval requirements (CoA);
- Check compliance with any relevant legal and other requirements (e.g., Licence, regulations);
- Check compliance with the mitigation measures in the OEMP and management plans;
- Review the OEMP, management plans and all other environmental documentation to ensure relevance to current activities and recommend changes or improvements;
- Review results of monitoring against criteria;
- Review environmental incidents to determine trends or additional controls required;
- Review non-conformance information to determine trends or additional controls required; and
- Review Environment Action Register/s to ensure timely and adequate close-out of actions.

An audit checklist will be developed and amended as necessary to reflect changes to this OEMP, subsequent approvals and changes to Acts, regulations or guidelines.

The outcomes of the internal audit may trigger the requirement to update the OEMP and/or any associated environmental documents. Document revision will be done in accordance with section 13 of this OEMP.

12.3.2 External audits

External auditing may be undertaken by an independent environment auditor in accordance with ISO 19011:2014 - Guidelines for auditing management systems. The scope of an external

audit will, as a minimum focus on compliance with the CoA, OEMP and other approval or management documents.

12.4 Reporting

Prior to and during operation, various reports will be prepared to fulfil reporting needs and requirements under the Project approval. Table 14 sets out the reporting requirement applicable to the Project, timing of the reporting, who is responsible for managing preparation of the reports and the intended recipient(s).

Additional reporting may be necessary as the operation continues. In such a circumstance, Table 14 will be amended to reflect these changes.

Table 14 – Project reporting requirements

Requirement	Timing	Responsibility	Recipient
Annual Return	Yearly	Feedlot Manager	NSW EPA

12.5 Non-conformances, corrective and preventative actions

A non-conformance is the failure or refusal to comply with the requirements of this OEMP and supporting documentation. Environmental non-conformance will be detected through verification processes such as monitoring, inspections, audits, receipt of complaints and Annual Return.

Any member of the Project team may raise a non-conformance /or improvement opportunity. The Environmental Specialist (consultant) or Regulatory Authority may also raise a non-conformance or improvement opportunity using the same process.

Non-conforming activities may be stopped, if necessary, by the Feedlot Manager, Farm Manager, Feedmill Supervisor, Livestock Supervisor or Maintenance Supervisor following consultation with the Feedlot Manager or delegate. The works will not commence until a corrective / preventative action has been closed out. The Environmental Specialist may also stop works in these circumstances.

For each non-conformance identified, a corrective/preventative action (or actions) will be implemented. In addition, any environmental management improvement opportunities can be initiated as a result of incidents or emergencies, monitoring and measurement, audit findings or other reviews. Improvement opportunities may also result in the implementation of corrective/preventative actions. Where a non-conformance is identified, the following process will be followed:

- An analysis of the issue by the Feedlot Manager in more detail with a view of determining possible causes for the non-conformance;

- A site inspection by the Feedlot Manager or delegate;
- Advising relevant personnel of the problem;
- Identifying and agreeing on actions to resolve or mitigate the non-conformance; and
- Implementing actions to rectify or mitigate the non-conformance.

Corrective/preventative actions and improvement opportunities will be entered in a database and include detail of the issue, action required and timing and responsibilities. The record will be updated with date of close out and any necessary notes. The database will be reviewed regularly to ensure actions are closed out as required.

The timing for any improvement will be agreed between the relevant manager and Feedlot Manager based on the level of risk (e.g., a significant risk will require immediate action). Tracking of environmental and associated corrective actions will be the responsibility of the Feedlot Manager.

Non-conformance to the requirements of this Plan is recorded as a non-compliance. Non-compliances are recorded in the Project non-compliance register (Appendix A8).

13 Review and improvement

An ongoing document review process ensures that environmental documentation including this OEMP is updated as appropriate for the specific activities that are occurring on-site.

Review of the OEMP may be undertaken as a result of one or more of the following types of trigger mechanisms:

- Issue of stop-work orders;
- Staff and agency/authority name changes;
- Non-compliance raised as part of the audits, monitoring, inspections; and
- Representations by on-site management staff.

As part of the continual improvement process, environmental management reviews are undertaken at least annually to confirm the continuing suitability and effectiveness of the OEMP to ensure that it meets current contractual and legislative requirements. The management review involves the Project management team including the Feedlot Manager, Livestock Supervisor, Feedmill Supervisor, Maintenance Supervisor, Farm Manager and Environmental Specialist and relevant project team members and stakeholders. The management review covers, but not limited to the following:

- A review of the aspects and impacts register, legal register and environmental induction;
- Communications from agencies, regulators and other external stakeholders;
- Consideration of monitoring, inspection and audit results;
- Consideration of incidents and any lessons learnt;
- Consideration of any new regulatory issues;
- Systemic issues arising from site inspections;
- A review of the effectiveness of environmental controls;
- Training needs;
- Consideration of issues raised by Project management team;
- Status of corrective and preventive actions;
- The extent to which objectives and targets have been met;
- Non-conformances and environmental incidents;
- Consideration of changes in operational needs such as resourcing; and
- Follow-up actions from previous management reviews (as applicable).
- Effectiveness of environmental management documentation implementation;
- Management effectiveness;
- Potential improvements to the environmental management documentation;
- Adequacy of resources;

- Findings of audits;
- Environmental objectives and targets;
- Environmental performance;
- Compliance with legal and other requirements;
- Critical non-conformance or repeated non-conformances;
- Organisation changes; and
- Effectiveness of training and inductions.

The outcomes of the management reviews could include amendments to this OEMP and related documentation, revision to the Project's environmental management system, risk assessment review, re-evaluation of the Project objectives and targets as well as amendments to other management plans.

Should the document review process identify any issues or items within the documents that are either redundant or in need of updating, it is the responsibility of the Facilities Manager (or delegate) to update the relevant management plans.

The revised document(s) will then be issued to the Feedlot Manager and the Environmental Specialist for certification of the changes. The Feedlot Manager can approve minor changes to the OEMP. Minor changes would typically include those that:

- Do not increase the magnitude of impacts on the environment when considered individually or cumulatively;
- Are editorial in nature e.g., staff and agency/authority name changes; and
- Do not compromise the ability of the Project to meet approval or legislative requirements.

Where the Feedlot Manager deems it necessary, the amended OEMP will be forwarded to the NSW EPA as the Department currently administering the *POEO Act 1997* for approval.

Where revisions to environmental management documentation are determined by the Feedlot Manager to be significant, these will be reviewed by relevant stakeholders for approval.

14 Document control and records management

Environmental documents and records will be maintained during the Project through the Doolin Farming Pty Ltd document control management system to remain legible, identifiable and traceable.

14.1 Document control

The Feedlot Manager (or delegate) will coordinate the preparation, review and distribution, as appropriate, of the environmental documents. During the Project, hard copies of all environmental documents will be stored on-site at the Project's administration office.

All environmental management documents are subject to ongoing review and continual improvement. This includes times of change to scheduled activities or to legislative or licensing requirements.

The OEMP, on approval, will be available on-site at the Project's administration office and will be subject to update and revision in accordance with the process described in section 13.

Doolin Farming Pty Ltd will implement a document control procedure to control the flow of documents within and between stakeholders and subcontractors. The procedure will ensure that documentation is:

- Developed, reviewed and approved prior to issue;
- Issued for use;
- Controlled and stored for the legally required timeframe;
- Removed from use when superseded or obsolete; and
- Archived.

A register and distribution list will identify the current revision of particular documents or data. If significant changes to the OEMP are required, a revised copy will be issued to controlled copy holders. The controlled copy will always remain on-site at the Project's on-site administration office. The Feedlot Manager will notify all relevant personnel of any revision of the OEMP or management plans. If any OEMP Appendices are required to be updated at any stage of the Project, a revised copy of the relevant Appendix only will be forwarded to controlled copy holders.

14.2 Environmental records

A range of environmental management records will be retained by the Project. The types of records include but not limited to those outlined in Table 15. The Feedlot Manager is responsible for maintaining all environmental management documents as current at the point of use. The person listed under "Responsibility" in Table 15 ensures that the record is appropriately identified, completed and systematically retained by the Project.

Table 15 – Environmental management records

Record Type	Activity	Responsibility
Induction and Training Records	Project inception / new staff / changed practices	Feedlot Manager
NSW EPA's online waste tracking system	Controlled waste required to be tracked	Feedlot Manager
Environmental Non-conformances, complaints and follow-up actions	Event basis	Feedlot Manager
Environmental monitoring records	Soil, water, air quality analysis results, solid waste stockpiled, effluent and solid waste applied, crop yields	Farm Manager
Annual Return	Yearly report to NSW EPA	Feedlot Manager

The approved OEMP will be maintained in the Project's document control and data management system with a document number and a revision number. At any given time, the latest version can be viewed with the ability to view the historical versions and track changes. All environmental records will be maintained electronically on the Project's document control and data management system. Environmental records are kept as a means of assessing the effectiveness of the Project's management of environmental issues and risks and to demonstrate compliance with Project approvals. Records that will be retained as evidence of environmental management implementation and effectiveness include, but not limited to:

- OEMP and management plans;
- Environmental SOPs, forms, checklists;
- Environmental Risk Register;
- Details of qualifications held by individuals responsible for environmental monitoring;
- Licences and permits;
- Records of environmental training and inductions;
- Environmental incident reports;
- Reports on compliance with CoA;
- Reports from environmental inspections (internal and external);
- Reports from environmental audits (internal and external);
- Details of complaints / non-conformance/ preventative / corrective and preventative actions;
- Monitoring data/assessment of results against compliance (dust, water, soil etc);
- Environmental inspections and reports; and
- Meteorological, soil and water monitoring results.

15 References

Isbell, RF, 2002, The Australian soil classification, Revised edn, CSIRO Publishing, Collingwood, VIC.

Meat and Livestock Australia, 2012a, National Guidelines for Beef Cattle Feedlots in Australia 3rd Edition, Meat & Livestock Australia, North Sydney, NSW.

Meat and Livestock Australia, 2012b, National Beef Cattle Feedlot Environmental Code of Practice 2nd Edition, Meat & Livestock Australia, North Sydney, NSW.

Meat and Livestock Australia, 2015a, Beef Cattle Feedlots: Design and Construction, Meat and Livestock Australia, North Sydney, NSW.

Meat and Livestock Australia, 2015b, Beef cattle feedlots: waste management and utilisation, Meat and Livestock Australia, North Sydney, NSW.

RDC Engineers Pty Ltd, 2025, Proposed Intensive livestock agriculture development (Expansion of beef cattle feedlot from 999 head to 3,000 head) on the property “Springfield”, Development Application and Environmental Impact Statement, V1R2 RDC Engineers Pty Ltd, Toowoomba, QLD, 4350.

Stace, HCT, Hubble, GD, Brewer, R, Northcote, KH, Sleeman, JR, Mulcahy, MJ and Hallsworth, EG (1968). A Handbook of Australian Soils. Rellim Tech. Pubs., Glenside, SA.

Appendix A1 – Legal and other requirements

Legislation/Policy	Relevance
Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	The EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places – defined in the EPBC Act as matters of national environmental significance and environmental impacts on Commonwealth land.
Contaminated Land Management Act 1997	The purpose of this Act is to establish a process for investigating and (where appropriate) remediating land that the EPA considers to be contaminated significantly enough to require regulation. In particular, to ensure that contaminated land is managed with regard to the principles of ecologically sustainable development.
National Greenhouse and Energy Reporting Act 2007	An Act to provide for the reporting and dissemination of information related to greenhouse gas emissions, greenhouse gas projects, energy production and energy consumption, and for other purposes.
NSW Environmental Planning and Assessment Act 1979 (EP&A Act)	The EP&A Act and Regulation include provisions to ensure that proposals which have the potential to impact the environment are subject to detailed assessment, and provide opportunity for public involvement. The EP&A Act requires compliance with the conditions of the project approval granted for the Project under Part 3A of the EP&A Act
Environmental Planning and Assessment Regulation 2000	This Regulation is made under the Environmental Planning and Assessment Act 1979 and plays an important role in the planning provisions of the Environmental Planning and Assessment Act 1979.
Local Government (General) Regulation 2005	This regulation is made under the Local Government Act 1993 and provides regulatory measures for sewage management facilities.
Protection of the Environment Operations Act 1997 (POEO Act)	The purpose of the POEO Act is to control pollution and set up a licensing regime for certain activities. An environmental protection licence will be required for scheduled activities (i.e. Livestock intensive activities - feedlot).
Protection of the Environment Legislation Amendment Act 2011 (POELA Act)	The POELA Act introduces several changes to improve the way pollution incidents are reported, managed and communicated to the general community. The Act includes a new requirement under Part 5.7A of the POEO Act to prepare, keep, test and implement a pollution incident response management plan.
Protection of the Environment Operations (Clean Air) Regulation 2010.	This regulation is made under the PoEO Act and provides regulatory measures to control emissions from wood heaters, open burning, motor vehicles and fuels and industry.
Protection of the Environment Operations Amendment (Illegal Waste disposal) Act 2013	This act amends the Protection of the Environment Operations Act 1997 to more effectively deal with illegal waste disposal and fraud in the waste sector.
Protection of the Environment Operations (Waste) Regulation 2014	This Regulation is made under the Protection of the Environment Operations Act 1997 and sets out provisions covering waste record keeping, tracking, reporting, transportation and miscellaneous topics.
Water Management Act 2000	This Act aims to provide for the sustainable and integrated management of the water sources of the state of NSW in line with ecologically sustainable development principles.
Water Act 1912	The Act came into force at the turn of the century and is being progressively phased out and replaced by the Water Management Act 2000 but some provisions are still in force.

AS/NZS ISO 14001:2016 Environmental management systems	All organisations have some impact on the environment. An EMS is a structured system or management tool designed to help an organisation to reduce its negative impacts on the environment and improve its environmental performance. The system can also provide a methodical approach to planning, implementing and reviewing an organisation's environmental management.
Waste Avoidance and Resource Recovery Act 2001	This Act promotes waste avoidance and resource recovery to achieve a continual reduction in waste generation. The Act provides for the development of a state-wide Waste Strategy and introduces a scheme to promote extended producer responsibility for the life-cycle of a product.

Appendix A2 – Approvals, permits and licences

This section has been left intentionally bank.
Copies of all relevant approvals, permits and licences to be included.

Appendix A3 – Environmental aspects and impacts register

Category	Operation Activities / Aspect	Potential Impacts	Risk level prior to mitigation	Indicative Mitigation Measures	Risk level after mitigation	Relevant Management Document / Training required
Air quality	• Dry commodity storage, handling and processing • High moisture commodity (e.g., silage, oils) storage and handling • Grain handling and processing • Pen, drain and sedimentation basin and holding pond cleaning • Mortality management • Split feed management • Solid waste handling, processing and spreading • Effluent storage • Effluent utilisation • Vehicular movements on unsealed roads • Ration delivery • Exposed bare earth areas • Vehicle emissions	Complaints from neighbours, including loss of amenity and impacts of dust.	**L5 – Low**	• All Development employees and contractors are given adequate training in environmental awareness, legal responsibilities, and air quality control methods. • The air quality and meteorological monitoring network is maintained, and results are routinely analysed, assessed and reported. • Pen cleaning and surface maintenance is undertaken on a planned basis to ensure that pen surfaces dry quickly following rainfall, can drain freely and do not become overly dry and cause excessive dust emissions. • Elimination of wet areas within the pens by repairing potholes, eliminating accumulated manure from under fence lines and fixing leaks from water troughs. • Spilt and spoilt feed and feedstuffs are regularly removed from around feed storage and preparation areas, feed bunks, feed processing equipment, etc. • Sedimentation basin control weirs are maintained in operational order to ensure that complete drainage occurs. • Solids are removed from the sedimentation basins as soon as practical after deposition. • Mortalities are placed within the solid waste stockpile and carcass composting area and covered with high carbon material as soon as practicable after placement. • Wet manure stockpiles are not turned to minimise release of emissions generated from the anaerobic decomposition process. • Controlled aeration of solid waste composting windrows. • Dewatering of the holding ponds by irrigation to crops as soon as possible after rainfall. • Receiving, reporting and responding to any complaints in relation to air quality. • Adapting the cattle stocking density in pens to maintain the moisture content of the manure on the pen surface at 25-35% to minimise dust generation. For example, stocking density may change from lighter rates in winter to heavy rates in summer. • Setting and enforcing speed limits on internal road network. • Dust suppression measures, such as watering access and feed roads and solid waste (manure) stockpiles as required. • Any operations involving the movement of dusty materials such as grain movement, solid waste (manure) turning and spreading shall be timed and managed where possible when materials have adequate moisture content.	**L2 - Low**	NFAS manual Meat and Livestock Australia, 2015b, Beef cattle feedlots: waste management and utilisation, Meat and Livestock Australia, North Sydney, NSW CoA Complaints Register Personnel training and awareness Personnel induction
		Impacts on residential sensitive receivers, including impacts on living areas, swimming pools and general amenities.	**L5 – Low**		**L2 - Low**	
		Potential adverse health effects.	**M11 – Moderate**		**L1 - Low**	
		Impacts on water quality and other aspects of the natural environment.	**L5 – Moderate**		**L1 - Low**	
		Dust on crops including broadacre crops or other agricultural crops.	**L5 – Low**		**L2 - Low**	

				• Ceasing dust generating activities such as pen cleaning, and solid waste (manure, carcass compost, pond sludge) stockpiling, screening and spreading during periods of high wind. • Any grain processing dust-suppression equipment is always well maintained and operational. • The loads on vehicles moving dusty materials (e.g., feedstuffs) onto or off the site are covered during transit. • All visual screens (e.g., vegetative buffers) are kept in good order (including the replanting of gaps in vegetative buffers due to trees failing to establish, the death or loss of established trees or other factors which would cause the buffer not the perform its intended function). • Application of solid (manure, carcass compost, holding pond sludge) and effluent to land when wind conditions and dispersion conditions are favourable. • The best animal production genetics shall be used - Improved production traits, particularly good feed conversion efficiency will contribute significantly to reducing animal emissions intensity. • Sourcing livestock and feed commodities from as close to the Development as practical as well as on-site production to minimise fugitive emissions during transport. • Rations formulated to minimise enteric methane emissions • Use of appropriately sized plant and equipment for respective processes • Where practical, solid wastes (manure, carcass compost, holding pond sludge) incorporated directly into the soil. • Routine service and maintenance of mobile equipment used on-site to ensure efficient operation • Continuous improvement of GHG intensity of production by identifying and controlling energy intensive processes • A suitable buffer is applied where effluent and solid waste (manure, carcass compost, holding pond sludge) applications take place within close proximity to roads, dwellings or other areas likely to be used by the public at that time (the appropriateness of the applied buffer distances is determined having consideration for the qualities of the materials being applied, weather conditions and other environmental factors; as well as the anticipated level of public usage or exposure at those times). • A complaints register is kept, including details of the nature of any complaint received, the response made, and any mitigation measures implemented. • Hazardous materials are stored and used in accordance with relevant guidelines and Australian Standards for the storage of hazardous and dangerous goods and spill management.		

Groundwater – Quantity and quality	• Groundwater use exceeding Subject Land's allocation and entitlements • Leachate of effluent through the liner underlying the controlled drainage area as a result of integrity failure or exceedance of design criteria. • Spills or leaks of hazardous materials stored or used on-site such as fuels, chemicals etc. • Inappropriate storage of solid wastes such as outside of the controlled drainage area. • Inappropriate utilisation of solid wastes (manure, carcass compost, holding pond sludge) and effluent on-site such as high application rates and ponding of effluent.	Potential for localised drawdown of groundwater resources.	**M13 – Moderate**	• Preparation of an environmental management framework for operation of the Development. • Development and implementation of emergency and contingency plans detailing methods to manage spills or other emergencies on site, such as pipe breakages, holding pond overflows, pump failures etc. • Sustainable use of groundwater in accordance with the Development's allocation and entitlements. • Bore extraction managed to ensure sustainable drawdown rates. • Groundwater monitoring (quantity and quantity) is undertaken as prescribed by the Licence to Take Water conditions. • Solid waste stockpiles established within controlled drainage area to prevent contaminated leachate into groundwater resources. • The land application of solid wastes and effluent is made at rates consistent with the ability of soils and crops grown in the on-site utilisation areas to sustainably utilise the applied nutrients, salts and organic matter, under the climatic conditions prevailing at the site. • Application rate of effluent is controlled to ensure that excessive ponding does not occur • Effluent and solid waste only applied to dedicated waste utilisation areas. • Application rate of effluent should not necessitate the routine and specific leaching of salts from the soil profile in order to obtain acceptable crop performance. • The liner of all elements of the controlled drainage area such as drains, sedimentation basin, flow control structures etc is maintained to ensure the integrity and ongoing compliance with specified design criteria • When available, effluent stored, treated and sustainably applied to land on-site by irrigation. • Hazardous materials are stored and used in accordance with relevant guidelines and Australian Standards for the storage of hazardous and dangerous goods and spill management.	**L6 – Low**	NFAS manual Water Access Licence Meat and Livestock Australia, 2015b, Beef cattle feedlots: waste management and utilisation, Meat and Livestock Australia, North Sydney, NSW CoA Personnel training and induction
		Impacts to the quality of groundwater in the vicinity of the Development.	**H19 – High**		**M13 – Moderate**	
Surface water – Quantity and quality	• Surface water use exceeding Development's allocation and entitlements • Uncontrolled release of liquid (effluent) wastes from controlled drainage	Potential for drawdown of surface water resources.	**M13 – Moderate**	• Preparation of environmental management framework for operation of the Development. • Development and implementation of emergency and contingency plans detailing methods to manage spills or other emergencies on site, such as pipe breakages, pond overflows, pump failures etc. • Liquid and solid wastes only applied to dedicated waste utilisation areas.	**L6 – Low**	NFAS manual Meat and Livestock Australia, 2015b, Beef cattle feedlots: waste

	area as a result of overflows, integrity failure or exceedance of design criteria • Spills or leaks of hazardous materials stored or used on-site such as fuels, chemicals etc • Surface runoff from the inappropriate application of liquid wastes (effluent) to land impacting water chemistry, clarity, nutrient and toxicants, for example • Inappropriate storage of solid wastes (manure, carcass compost, holding pond sludge) such as outside of the controlled drainage area • On-site utilisation of solid and liquid wastes	Loss of or damage to aquatic habitat.	**M11 – Moderate**	• Vegetative buffers around drainage lines designed to help protect surface water are maintained in their intended condition. • Solid waste (manure, carcass compost, holding pond sludge) stockpiles would be established within controlled drainage area to prevent contaminated runoff into clean water areas. • Sustainable use of surface water in accordance the Development's allocation and entitlements. • The land application of solid waste and effluent is made at rates consistent with the ability of soils and crops grown in the on-site utilisation areas to sustainably utilise the applied nutrients, salts and organic matter, under the climatic conditions prevailing at the site. • Soil condition is monitored periodically, and soil tests are used where there is potential for deterioration of soil condition • Application rates of effluent are controlled to ensure that excessive runoff does not occur • All elements of the controlled drainage area such as drains, sedimentation basin, flow control structures etc are cleaned and maintained to ensure their integrity and ongoing compliance with specified design criteria. • When available, effluent shall be stored, treated and sustainably applied to land on-site by irrigation. • Design discharge events from the holding ponds shall be directed to a natural grassed discharge area. This grassed area shall filter and disperse the liquid waste whilst allowing some infiltration. As the design discharge events are at a frequency of one in 10 years the concentration of nutrients shall be sustainably adsorbed and utilised by vegetation in between events. • DWER is notified of any overtopping event or similar threats to surface water quality • Hazardous materials are stored and used in accordance with relevant guidelines and Australian Standards for the storage of hazardous and dangerous goods and spill management.	**L6 – Low**	management and utilisation, Meat and Livestock Australia, North Sydney, NSW CoA Personnel training and induction
		Erosion of exposed soils causing sedimentation of waterways and aquatic environments	**M11 – Moderate**		**L6 – Low**	
		Changes to water chemistry, in particular pH values altering aquatic habitats, including threatened species habitats.	**M11 – Moderate**		**L6 – Low**	
		Impact to water quality due to fuels and leaks and inappropriate storage of hazardous material.	**M11 – Moderate**		**L6 – Low**	
Biodiversity	• Access and internal road alignments and traffic movements. • Dry commodity storage, handling and processing • High moisture commodity (e.g., silage, molasses, oils) storage and handling • Grain handling and processing • Mortality management • Split feed management	Loss of or damage to habitat for threatened species	**L5 – Low**	• Any significant flora and fauna habitat areas required to be protected shall be identified and marked. • Clearing restricted to those areas required for Development's operation and firebreaks. • Induct personnel on biodiversity issues and safeguards. • Implement ongoing weed monitoring and management program to remove pest plant species and weeds. Control shall be achieved by regular mowing or herbicide application. Knockdown or residual herbicides (or a combination of the two) shall be used depending on whether the weeds have emerged, the time of year and the weeds present. • Disturbed areas to be rehabilitated will be monitored for effective restoration and rehabilitation. • All habitat trees retained where practicable.	**L4 – Low**	NFAS manual Weed management procedure Vehicle hygiene procedures Personnel induction
		Potential impact on endangered ecological communities	**L5 – Low**		**L4 – Low**	
		Loss and fragmentation of riparian and aquatic habitat	**L5 - Low**		**L4 – Low**	
		Mortality of protected and threatened fauna	**M9 – Moderate**		**L5 – Low**	
		Creation of barriers to fauna movement	**L5 – Low**		**L4 – Low**	

	• Solid waste handling, processing and utilisation.
	• Liquid waste storage, handling and utilisation
	• Vehicular movements on unsealed roads
	• Use of chemicals
	• Noise impacts
	• Uncontrolled fires/bushfires
		Edge effects from road noise and light	**L5 – Low**	• Major drainage lines are to be bridged and loss of riparian vegetation to be minimised.
				• Waterway crossings for fish passage are maintained.
				• Implement vehicle hygiene procedures to prevent the introduction of pest plants, spread of pest plants and disease.
				• Provisions to limit heavy vehicle speeds and for signage along access roads.
				• Methods and communication tools to monitor road strike and mortality of wildlife.
				• Aquatic weeds in water storages shall be controlled via mechanical and/or chemical means. Chemical control shall be undertaken with considerable care, considering the identity of the weed, the effect of herbicides on desirable plants, fish and other aquatic life and the eventual use of the water.
				• Implement a pest management program to control pest animal species already present, using acceptable methods as well as identifying potential pest species, their likely distribution and methods to prevent their spread.
				• Wild dog, fox and vermin pest species populations on the Development site shall be monitored and managed to prevent proliferation and spread.
				• Pest animal control programs shall use the most humane, target specific, cost effective and efficacious techniques available.
				• Mice and rat populations will be mitigated:
				  • by minimising feed wastage and spillage to minimise likelihood of attracting vermin)
				  • implementing a baiting program if the vermin population reaches a nuisance level.
				• Fly breeding sites shall be mitigated using:
				  • Several control methods such as biological, chemical and physical methods following integrated pest management (IPM) principles shall be used.
				  • Best practice sanitation methods such as solid waste management practices (pen cleaning, under-fence cleaning) to minimise fly breeding sites.
				  • Controlling weeds and keeping grass and other vegetation short, particularly around pens, drains, sedimentation systems and holding ponds makes it more difficult for flies to find resting places and reduces the vegetation–manure interface, a preferred breeding substrate for stable flies.
				  • Moist silage provides a suitable substrate for fly breeding. Subsequently, silage spills particularly along the sides of silage pads shall be cleaned up, and the silage pads covered so that the edges are sealed to reduce fly breeding in this area.
				• Composting carcasses shall be covered with manure.
				• Domestic waste shall be managed appropriately and in accordance with any relevant statutory requirements.
					L4 – Low
					L5 – Low	

		Introduction and spread of terrestrial and /or aquatic weeds and pest fauna species	**M9– Moderate**			

Hydrology and flooding	• Waterway and drainage line crossings • Transverse drainage	Restricted flow paths causing localised flooding due to access road infrastructure structures placed on floodplain	**L6 – Low**	• The Development is sited above the height of a 100-year average recurrence interval (Q_{100}) flood level. • Development designed, constructed and operated in accordance with the conditions of approval of the Development. • Evacuation and access assessed in consultation with landowners. • Monitor rain radar and flooding forecasts and ensure response preparedness. • Prepare site for flood and severe rainfall events (where forecast) to minimise inundation impacts. • Waterway and drainage crossings maintained to ensure the integrity and ongoing compliance with specified design criteria. • Solid waste and effluent application infrastructure sited so that they do not pose an unacceptable risk to flood afflux levels. • Solid waste and effluent are not applied to on-site utilisation areas where and when there is a reasonable probability that the applied materials will cause pollution of surface water (e.g., on land directly abutting a watercourse or when a flood event is imminent).	**L6 – Low**	NFAS manual National Guidelines for Beef Cattle Feedlots in Australia 3rd Edition, MLA, 2012a) Personnel induction and training
		Changes to flood afflux levels during flood events – increased impact to receivers	**L6 – Low**		**L6 – Low**	
		Flood damage to plant, equipment or infrastructure	**L6 – Low**		**L6 – Low**	
		Erosion of access road during large flood events	**L6 - Low**		**L6 – Low**	
		Change to flood regime due to topographical changes and modification of catchments	**L6 - Low**		**L6 – Low**	
		Impacts to flood evacuation and access movements	**L6 - Low**		**L6 – Low**	
Noise and vibration	• Livestock handling and movement • Feed processing and preparation equipment (electric motors, conveyors, roller mills) • Feed delivery mobile plant (feed trucks) • Solid waste management (front-end loaders, haulage trucks, screening equipment, tractors etc) • Effluent management (pumping and generators) • Water supply and reticulation (pumping) • Farming plant and equipment (tractors, front-end loaders etc)	Noise impacts on sensitive receivers during operation	**M11 – Moderate**	• Low-stress cattle handling techniques employed to manage cattle to ensure they are handled quietly and efficiently. • Adherence to working hours in conditions of approval unless otherwise approved. • Minimising heavy vehicles' entry to site and departure from site outside the nominated operational hours. • Respite periods for noisy activities (in accordance with regulatory guidelines). • Operation equipment selected, operated and maintained to minimise noise impacts and where necessary fitted with silencers and "smart" reversing safety devices. • Managing operation vehicle routes and speed of vehicles. • Establish and maintain complaints management system. • Awareness training for staff and contractors in environmental noise issues. • Minimising the use of horn signals and consideration of alternative methods of communication. • Switching off any equipment not in use for extended periods. • All plant and equipment required would be well maintained and regularly serviced. • Community consultation with local residents to assist in the alleviation of community concerns.	**L4 - Low**	NFAS manual Complaints Register Personnel induction and training
		Noise exceeding regulatory criteria levels	**M11 – Moderate**		**L4 - Low**	
		Vibration impacts on sensitive receptors during operation	**L6 - Low**		**L4 - Low**	

				• Selection of machines that are inherently free of or have low vibration. • Vibration-producing machinery shall be supported on stiff structural components and be provided with efficient vibration isolation systems. • Maintenance of plant and equipment machinery – ensuring rotating parts are balanced, vibration isolators are functioning as intended etc.		
Traffic and transport	• Light vehicle travel to / from site – staff, visitors etc • Heavy vehicle travel to and from site - livestock, commodities and general deliveries etc • Operation vehicle movements – feed trucks, solid waste management etc	Temporary disruptions / delays to local traffic	**L5 – Low**	• Identify and assess roads likely to be affected by Development's operation and develop methods to minimise traffic impacts. • Compliance with conditions of Development Approval. • All vehicles carrying materials to be adequately covered (using a tarpaulin) as required to prevent any loss of material, which may cause driver safety issues. • Maintain principal haulage route, advance and position intersection signage. • Monitoring of any traffic delays.	**L4 - Low**	NFAS manual CoA Complaints Register Personnel induction
		Temporary restrictions to private access roads	**L5 – Low**		**L4 – Low**	
		Permanent adjustment to some private property access roads and local/regional roads	**L5 – Low**		**L4 – Low**	
		Changed traffic patterns	**M11 – Moderate**		**L4 – Low**	
		Accidents - Safety of commuters, pedestrians, contractors and subcontractors.	**H22 – High**		**M15 – Moderate**	
Aboriginal heritage	• Routine maintenance activity • Excavation of soils	Impact to undiscovered or undocumented aboriginal sites, artefacts and cultural places	**L5 – Low**	• Induct personnel on heritage issues, safeguards, and the location of indigenous heritage items. • If design changes or operation activities impact on areas outside of those identified in the Development Consent, relevant stakeholders will be consulted. • Protect identified heritage items with protective fencing or flagging from being disturbed during operation. • Regular inspection of heritage protection fencing.	**L4 – Low**	NFAS manual Personnel induction
		Finding / disturbing burials or human remains	**L5 - Low**		**L4 – Low**	
Resource and waste management	• Water usage • Energy usage • Generation of general waste during operation activities including building materials, excess unsuitable spoil material, vegetation material • Generation of solid waste • Generation of liquid wastes (effluent/sewage)	Improper disposal of waste material	**M12 – Moderate**	• Sustainable use of groundwater and surface water in accordance with the subject Land's licence to take water. • Waste materials contained in waste bins or other suitable containers, and collected for recycling, reuse or disposal by the licensed waste contractor. • Use recycled products where possible. • Separate, contain, manage and dispose contaminated waste to prevent migration and further contamination whilst maintaining compliance with regulatory requirements. • Label and store all liquid waste containers in a bunded area prior to removal off-site. • Undertake inspections of the worksite and waste storage areas to ensure litter / debris is regularly cleaned up and contained on site.	**L6 – Low**	NFAS manual Nutrient and Irrigation Management Plan Meat and Livestock Australia, 2015b, Beef cattle feedlots: waste management and utilisation, Meat and Livestock Australia, North Sydney, NSW
		Direct impacts to land, groundwater or surface waters.	**M12 – Moderate**		**L6 – Low**	
		Depletion or sterilisation of non-renewable resources, including water and energy	**M11 – Moderate**		**L6 – Low**	
		Difficult disposal of waste material including hazardous waste.	**M13 – Moderate**		**L6 – Low**	

	• Handling of chemicals, waste and hazardous goods. • Fuel storage and distribution and waste oil disposal	Potential leaks and spills of fuels and/or hazardous materials.	**M12 – Moderate**	• Bunding of areas used for fuel, oil and chemical storage in accordance with Australian Standards and regulatory guidelines. • Locate appropriate waste removal contractor and/or appropriately licenced waste facilities in the area. • Sustainable on-site utilisation of effluent and solid waste. • Modern and well-maintained equipment is to be used to encourage fuel efficiency • Stormwater from roof structures captured for incidental uses. • Water recycling measures are implemented where practical.	**L6 – Low**	Personnel induction and training
		Impact to water quality due to inappropriate solid and/or liquid waste management.	**M12 – Moderate**		**L6 – Low**	
Visual amenity and landscaping	• Revegetation /landscaping • Solid waste management • Rehabilitation of disturbed land • Removal of visually prominent native vegetation • Evening / night activities	Change to landscape character and visual environment as a result of large embankments, disturbed areas, night activities, removal of vegetation, and access road.	**L5 – Low**	• Landscape revegetation will incorporate the surrounding landscape types and vegetation patterns and in accordance with conditions of Development Approval. • Embankments will be stabilised using appropriate landscape treatments. • The use of night-lighting will be minimised and directed away from rural residences where possible. • Site facilities and areas surrounding them will be kept tidy and be regularly mowed, cleaned and maintained. • Solid waste management in accordance with conditions of Works Approval. • Monitoring, evaluation and management of landscape revegetation areas including treatment of weeds.	**L2 – Low**	NFAS manual CoA Meat and Livestock Australia, 2015b, Beef cattle feedlots: waste management and utilisation, Meat and Livestock Australia, North Sydney, NSW Obtrusive Effects of Outdoor Lighting, Sydney, Australia. Personnel induction
		Visual impacts as a result of solid waste management	**L5 – Low**		**L2 – Low**	
		Poor management of revegetation	**L5 – Low**		**L2 – Low**	
		Visual impacts as a result of obtrusive lighting	**L5 – Low**		**L4 - Low**	
Fire	• Handling of hazardous materials. • Fuel storage and distribution • Hot works • Materials handling and storage e.g., hay storage, grain dust	Fire damage to plant, equipment or infrastructure	**M9 – Moderate**	• Establish fuel free zones around materials which are adjacent to bush fire hazard areas. • Provide fuel reduced zones in areas of high ignition potential (e.g., along roads, refuelling areas, infrastructure etc) to slow the development of fires. • Access tracks maintained on the site. • Ensure any hot works have been approved by site management beforehand and adequate controls are in place e.g., fire extinguishers • Hazardous materials are stored and used in accordance with relevant state guidelines and Australian Standards for the storage of hazardous and dangerous goods and spill management. • Fire-fighting equipment will be held on-site to respond to any fires that may occur during operation.	**L5 – Low**	NFAS manual Personnel induction and training
		Impacts to surrounding properties.	**M11 – Moderate**		**L6 – Low**	
Soils and sediments	• Rehabilitation of disturbed land • Solid waste handling, processing and utilisation.	Erosion of exposed soils causing sedimentation of waterways and aquatic environments	**M11 – Moderate**	• Clean and dirty water runoff will be adequately separated to avoid mixing where possible through the use of diversions, clean water drains, and the installation of permanent drainage infrastructure. • Exposed areas will be progressively rehabilitated. Methods will include permanent vegetation, or temporary protection with cover crops.	**L6 – Low**	NFAS manual IECA (2008) Best Practice Erosion and Sediment Control
		Impacts to the quality of soils in the solid	**M12 – Moderate**		**M11 – Moderate**	

	• Liquid waste storage, handling and utilisation • Handling of chemicals, waste and hazardous goods. • Fuel storage and distribution and waste oil disposal • Maintenance of plant and equipment, servicing and refuelling • Holding pond / sediment basin management • Noxious weed treatment	waste and effluent utilisation areas Contamination of soils due to spills and leaks and inappropriate storage of hazardous material	**M9 – Moderate**	• Exposed batter slopes and embankments, and other areas exposed but not worked, will be protected from erosion through implementation of permanent stabilisation measures e.g., seeding, revegetation. • A rumble grid will be provided at the access exit point from the Development site onto public roads to minimise the tracking of soil and particulates onto public roads. • Vehicle movements from site will be minimised during wet weather if the tracking of mud becomes an issue. • Hazardous materials storage meets regulatory requirements for bunding/storage and spill kits available. • Solid waste will be stored in designated solid waste stockpile and carcass composting area in accordance with conditions of Works Approval. • Solid waste will be sustainably applied to land within the solid waste utilisation area. • When available, effluent from the holding pond will be sustainably applied to land within the effluent utilisation area. • Domestic sewage shall be treated and disposed on-site by absorption within a dedicated land area adjacent to the respective source facility. • The land application of solid waste and effluent is made at rates consistent with the ability of soils and crops grown in the on-site utilisation areas to sustainably utilise the applied nutrients, salts and organic matter, under the climatic conditions prevailing at the site.	**L4 – Low**	Meat and Livestock Australia, 2015b, Beef cattle feedlots: waste management and utilisation, Meat and Livestock Australia Personnel induction and training

Appendix A4 – Obligations, roles, responsibilities and authority

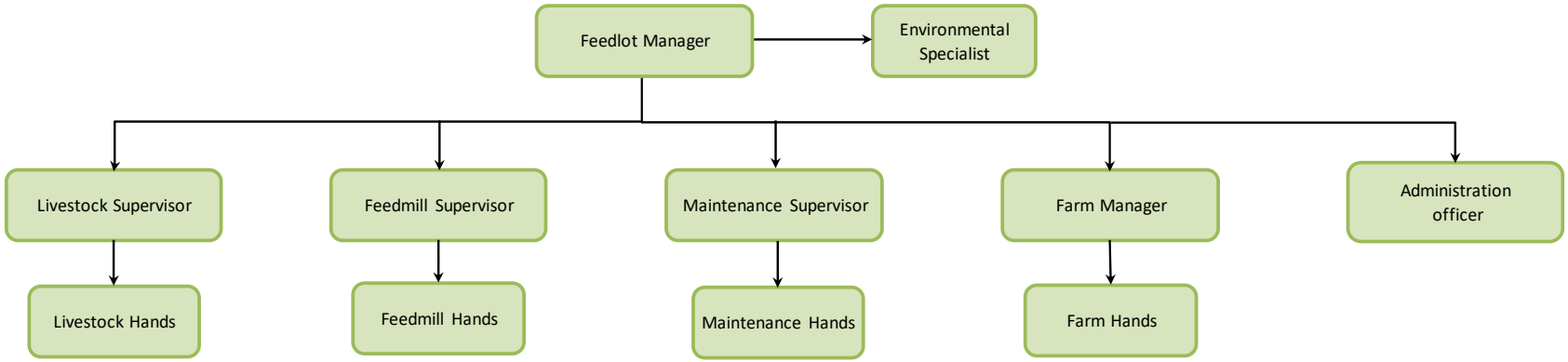

Figure A6.1 – Project management structure

Table A6.1 – Project personnel key environmental responsibilities

Roles	Responsibilities	Authority	Accountability
Feedlot Manager	Manage the Project to achieve an optimal return on funds invested. Ensure all activities comply with relevant regulatory and Project requirements. Ensure the requirements of the OEMP are fully implemented, and that environmental requirements are not secondary to other operation requirements. Liaise with relevant stakeholders as required. Participate and provide guidance in the regular review of this OEMP and supporting documentation. Provide adequate resources (personnel, financial and technological) to ensure effective development, implementation and maintenance of the OEMP. Ensure that all personnel receive appropriate induction training, including details of the environmental requirements. Ensure that complaints are investigated to ensure effective resolution. Stop any activity immediately if an unacceptable impact on the environment is likely to occur. Manage all of the day to day operations such as livestock, maintenance, feeding, administration. Communicate with all feedyard personnel and sub-contractors regarding compliance with the OEMP and site-specific environmental issues relating to feedyard activities. Ensure all feedyard workers attend an environmental induction prior to the commencement of works. Ensure feedyard personnel manage operation activities in accordance with statutory and approval requirements. Ensure environmental management procedures and protection measures are implemented within the feedyard and associated activities. Identify resources required for implementation of the OEMP and relevant associated sub-plans.	Stop work within the immediate vicinity of a major environmental incident or significant non-compliance with the CoA or EPL.	Doolin Farming Pty Ltd

Livestock Supervisor	Report any feedyard activity that has resulted, or has the potential to result, in an environmental incident immediately to the Directors of Doolin Farming Pty Ltd. Undertake regular task observations to check compliance with SOPs. Coordinate action in emergency situations and allocate required resources. Supervise the receival, processing, handling, animal health and dispatch of all cattle in the feedyard. Communicate with all feedyard personnel and sub-contractors regarding compliance with the OEMP and site-specific environmental issues relating to feedyard activities. Supervise staff involved with receival, processing, handling, animal health and dispatch of cattle in the feedyard. Ensure all feedyard workers attend an environmental induction prior to the commencement of works. Plan and direct feedyard activities in a manner that avoids or minimises impact to environment. Ensure feedyard personnel manage operation activities in accordance with statutory and approval requirements. Ensure environmental management procedures and protection measures are implemented within the feedyard and associated activities. Identify resources required for implementation of the OEMP and relevant associated sub-plans. Report any feedyard activity that has resulted, or has the potential to result, in an environmental incident immediately to the Feedlot Manager. Undertake regular task observations to check compliance with SOPs. Coordinate action in emergency situations and allocate required resources.	Stop activities where there is an actual or immediate risk of harm to the environment and advise the Feedlot Manager. Direct implementation of environmental protection measures within the feedyard.	Feedlot Manager
Feedmill Supervisor	Manage the procurement, delivery, receivals and storage of all feed commodities required by the feeding facility. Supervise the operation of the grain processing plant and formulate rations and supervise their preparation and feeding to the cattle. Communicate with all feedmill personnel and sub-contractors regarding compliance with the OEMP and site-specific environmental issues relating to feed processing, preparation and delivery activities. Ensure all feedmill personnel attend an environmental induction prior to the commencement of works.	Stop activities where there is an actual or immediate risk of harm to the environment and advise the Feedlot Manager. Direct implementation of environmental protection measures within feed	Feedlot Manager

	Ensure feed processing, preparation and delivery personnel manage operation activities in accordance with statutory and approval requirements. Ensure environmental management procedures and protection measures are implemented within the feed processing and preparation facility and associated activities. Identify resources required for implementation of the OEMP and relevant associated sub-plans. Identify and implement opportunities to reduce water and energy usage in feed preparation and storage. Report any feed processing, preparation or ration delivery activity that has resulted, or has the potential to result, in an environmental incident immediately to the Operations Manager. Undertake regular task observations to check compliance with SOPs. Coordinate action in emergency situations and allocate required resources.	storage, processing and preparation areas.	
Maintenance Supervisor	Supervise staff involved with cleaning and maintenance activities of feedyard pens, troughs, roads, water supply and plant and equipment. Plan and direct maintenance activities in a manner that avoids or minimises impact to environment. Identify resources required for implementation of the OEMP and relevant associated sub-plans. Report any maintenance activity that has resulted, or has the potential to result, in an environmental incident immediately to the Feedlot Manager. Identify and implement opportunities to reduce water and energy usage in the feedyard and recycling opportunities for solid wastes. Undertake regular task observations to check compliance with SOPs. Coordinate action in emergency situations and allocate required resources	Stop activities where there is an actual or immediate risk of harm to the environment and advise the Feedlot Manager. Direct implementation of environmental protection measures within workshop, pens or around the development complex.	Feedlot Manager
Farm Manager	Manage the Koojan Downs property to optimise returns to the company through activities that are complementary to the company's feeding facility operations. Ensure the environmentally sustainable use of effluent and solid waste from feeding facility operations in accordance with statutory and approval requirements. Supervise staff involved with farming operations and gardens.	Stop activities where there is an actual or immediate risk of harm to the environment and advise the Feedlot Manager.	Feedlot Manager

	Communicate with all farm personnel and sub-contractors regarding compliance with the OEMP and site-specific environmental issues relating to farming activities. Ensure all farming personnel attend an environmental induction prior to the commencement of works. Plan and direct farming activities in a manner that avoids or minimises impact to environment. Ensure farm personnel manage operation activities in accordance with statutory and approval requirements. Ensure environmental management procedures and protection measures are implemented for farming activities. Identify resources required for implementation of the OEMP and relevant associated sub-plans. Report any farming activity that has resulted, or has the potential to result, in an environmental incident immediately to the Feedlot Manager. Undertake regular task observations to check compliance with SOP. Coordinate action in emergency situations and allocate required resources.	Direct implementation of environmental protection measures on the farm.	
Administration Officer	Oversee all administration operations to ensure compliance with relevant regulatory and Project requirements.	No specific environmental authority	Feedlot Manager
Environmental Specialist	Assist in preparing the OEMP (including revisions) in accordance with all relevant requirements. Undertake site inspections and carry out monitoring activities. Ensure monitoring records are appropriately maintained, reviewed and non-compliance issues addressed. Record and provide written reports to the Feedlot Manager of non-conformances or corrective actions with the OEMP. This may include the need to implement additional, or revise existing, mitigation measures. Assist in identifying environmental risks. Advise the Feedlot Manager of the need to stop work immediately if an unacceptable impact on the environment is likely to occur or to require other reasonable steps to be taken by the relevant Manager or personnel to avoid or minimise impacts. Provide reports to the Feedlot Manager on any major issues resulting from the Project. Assist all site staff with issues concerning Project environmental matters.	Stop activities where there is an actual or immediate risk of harm to the environment and advise the Feedlot Manager and relevant manager.	Feedlot Manager

	Assist in developing training programs regarding environmental requirements and deliver where required, including delivery of the environmental component of toolbox talks if required.		
Other Project Personnel including sub-contractors	Comply with the relevant requirements of the OEMP, or other environmental management guidance as instructed by a member of the Project's management. Participate in the mandatory Project/site induction program. Report any environmental incidents to the line manager immediately or as soon as practicable if reasonable steps can be adopted to control the incident. Undertake remedial action as required to ensure environmental controls are maintained in good working order. Stop activities where there is an actual or immediate risk of harm to the environment and advise their line manager or Feedlot Manager.	Report any activity that has resulted, or has the potential to result, in an environmental incident immediately to their line manager or Feedlot Manager.	Livestock Supervisor, Feedmill Supervisor, Maintenance Supervisor, Farm Manager

Appendix A5 – Environmental document register

Document name	Document number	Approval pathway
Operation Air Quality Management Plan (Appendix B1)	Springfield Feedlot OAQMP – E2-103EA	GSC / NSW EPA
Operation Soil and Water Quality (Appendix B2)	Springfield Feedlot OSWMP E2-103EB	GSC / NSW EPA
Operation Solid and Liquid Waste (Appendix B3)	Springfield Feedlot OSLWMP E2-103EC	GSC / NSW EPA
Environmental monitoring and Management Plan (Appendix B5)	Springfield Feedlot OEMMP E2-103ED	GSC / NSW EPA
NFAS Manual	Springfield Feedlot NFAS Manual	Aus-Meat

Appendix A6 – Environmental complaints, incidents and emergencies

This section has been left intentionally bank.
Copies of any complaints or incident reports to be included.

Appendix A7 – Environmental forms, checklists and registers

Form 1 – Induction and Training Record

Date	Induction and/or training content	Trainer name	Signature	Attendee name	Signature

Form 2 – Complaints Register

Time / Date	Method of communication and complainant name	Complainant contact details	Details of complaint	Action taken	Responsible person	Signature	Statutory authority notified (Y/N)

Form 3 – Site Inspection Record

Time / Date	Inspection person	Problem description	Action taken	Requirement/ Recommendation for changes to OEMP	Signature of responsible person

Form 4 – Non-Compliance Record

Time / Date	Inspection Officer	Compliance Problem Description	Corrective Actions Taken	Recommendation for Changes to OEMP	Signature

Form 5 – Incident reporting form

Date: _____

Reported by: _____

Site location: _____

Incident description: _____

What happened: _____

_____

_____

Why: _____

_____

Incident date and time: _____

Where: _____

Actual and/or potential impact on off-site people and environment: _____

_____

Authorities informed: _____

Manager informed and when: _____

Action taken / planned: _____

_____

_____

Name: _____

Signature: _____

Manager comment: _____

_____

_____

Manager signature: _____

Form 6 – Hazardous Material Register

Name of material and identification code	Other common names	Maximum quantity stored	Storage requirements and location	Purpose for which the material is used

Form 7 – Corrective action record

Corrective Action CAR No.	Originator:	Responsible Person:	
	Position:	Position:	
	Issue date of CAR:		
1. Non-conformance			**References**
1) Non-conformity:			
2) Reference ☐ Non-compliance: ☐ Audit report: ☐ Others:			
2. Planning and Implementation of Corrective Action			**References**
1) Cause of Non-conformity:			
2) Action taken to prevent reoccurrence:			
3) Controls to ensure that action is effective:			
4) Due Date:	Completion Date:		
3. Review of Corrective Action			**References**
1) Evaluation of effectiveness of action: ☐ Action Completed ☐ Not Completed Date of Evaluation:			
2) When the action is completed a) Revision to Project SOP ☐ No ☐ Yes b) If yes, name of SOP:			
3) Follow up action when corrective action is not completed:			

Appendix A8 – Environmental procedures

OEMP SOP 1 – Staff environmental induction, training and awareness

Aspect	Staff environmental induction, training and awareness
Objectives	To implement a staff environmental induction, training and awareness to ensure that new and existing personnel are adequately trained to perform the tasks assigned to them without leading to environmental or personal harm.
Potential Impacts	Occupational health and safety of employees and contractors. Animal health and performance. Receiving environment such as surface water and aquatic and terrestrial ecosystems affected by pollution events. Community amenity and health.
Control Actions	Training of employees to enable them to fulfil their duties in a competent manner and consistent with the aims of the environmental policy and environmental management system. Ensure that all staff are aware of their responsibilities in general environmental management. Provide staff training as required internally and allow for appropriate external environmental courses, seminars or workshops are available. Ensure that sub-contractors working on site have the necessary experience and competence with regard to environment and health & safety issues.
Relevant Standards, Management Plans, Records	Personnel induction, training and awareness record. Non-compliance record. Incident
Responsibility	As required by the specific requirements outlined in section 7.2.
Performance Indicators	Ensure all personnel are adequately trained with respect to the environmental management system and emergency preparedness. No non-compliances with CoA. No adverse impacts to environmental values.
Monitoring	As required by the specific requirements outlined in section 12.
Reporting	As required by the specific requirements outlined in section 12.
Corrective Actions	Review staff training program.

OEMP SOP 2 – Feedlot cattle numbers

Aspect	Feedlot cattle numbers
Objectives	To ensure that the number of cattle on feed does not exceed CoA.
Potential Impacts	Occupational health and safety of employees and contractors. Animal health and performance. Receiving environment such as surface water and aquatic and terrestrial ecosystems affected by pollution events. Community amenity and health.
Control Actions	The number of beef cattle-on-feed is checked on a daily basis and correlated with expected incoming and outgoing cattle numbers. Ensure beef cattle numbers on feed do not exceed CoA. Details of all cattle introduced to and removed from the site, including: • Number and actual or average live weight of cattle; • Date of introduction/removal; and • Sickness or deaths of animals.
Relevant Standards, Management Plans, Records	Personnel induction, training and awareness record. Non-compliance record. Incident
Responsibility	As required by the specific requirements outlined in section 7.2.
Performance Indicators	No non-compliances with CoA. No adverse impacts to environmental values.
Monitoring	As required by the specific requirements outlined in section 12.
Reporting	As required by the specific requirements outlined in section 12.
Corrective Actions	Review livestock management system.

OEMP SOP 3 – Environmental emergency preparedness and response

Aspect	Environmental emergency preparedness and response
Objectives	To implement a mechanism to contain and control an emergency incident to minimise the effects on personnel, livestock, facilities and the environment.
Potential Impacts	Occupational health and safety of employees and contractors. Animal health and performance. Receiving environment such as groundwater, surface water and aquatic and terrestrial ecosystems affected by pollution events. Community amenity and health.
Control Actions	All emergency scenarios relating to the Project will be identified and documented through the emergency response instruction. All significant emergency scenarios will be assessed in consultation with employees in the environmental induction and toolbox meeting. **Medical Emergency** • First Aid Officer to initiate usual first aid procedures. • Make sure the injured person is as comfortable as possible without moving them until the ambulance arrives. • The First Aid Officer is in charge of the casualty until the emergency services arrive. **Fire Emergency** • Contact the emergency services on "000" if required. • Use fire extinguisher to contain fire only if safe to do so. • Move all site personal to a safe area and await fire brigade. **Environmental Emergency Response** • In the event of a Spill or contamination of product causing reaction. • Assess damage/injury……contain spill if safe to do so. • Evacuate the area if necessary and await emergency services. **Emergency Service Contacts** • Emergency services contacts will be displayed near all phones. **Material/Product Spill** Hazardous material/dangerous good spills may occur on sites. • In the event that a hazardous material/dangerous good is spilt the Development Manager must be contacted immediately. • Attempt to clean up spill with spill kit, only if safe to do so.
Relevant Standards, Management Plans, Records	Personnel induction, training and awareness. Non-compliance Record. Corrective Action Report.
Responsibility	As required by the specific requirements outlined in section 7.2.

Performance Indicators	No adverse impacts to environmental values.
Monitoring	As required by the specific requirements outlined in section 12.
Reporting	As required by the specific requirements outlined in section 12.4.
Corrective Actions	Recommendations for safety improvements and changes to the emergency response instruction will be actioned via the specific requirements outlined in section 12.5.

OEMP SOP 4 – Environmental compliance monitoring

Aspect	Environmental compliance monitoring
Objectives	To implement a defined monitoring programme to obtain data for verification of environmental performance in accordance with the CoA.
Potential Impacts	Occupational health and safety of employees and contractors. Animal health and performance. Receiving environment such as groundwater, surface water and aquatic and terrestrial ecosystems affected by pollution events. Community amenity and health.
Control Actions	Develop and implement an appropriate monitoring program for environmental parameters in accordance with this Plan and sub-plans as a verification measure for preventive controls. Undertake routine environmental monitoring from the relevant monitoring points in accordance with the CoA. Collect, analyse and interpret environmental monitoring data in a standardised and technically sound manner. Review and evaluate the environmental monitoring program and results for compliance with CoA. Regular liaison with the NSW EPA on efficacy of the monitoring program and sustainability indicators. Develop and implement a corrective action plan before impacts to the receiving environment.
Relevant Standards, Management Plans, Records	CoA Personnel induction, training and awareness. Environmental data records
Responsibility	As required by the specific requirements outlined in section 7.2.
Performance Indicators	Ensure all personnel responsible for monitoring are adequately trained. No non-compliances with CoA. No adverse impacts to environmental values.
Monitoring	As required by the specific requirements outlined in section 12.
Reporting	As required by the specific requirements outlined in section 12.4.
Corrective Actions	Review environmental monitoring program. Seek specialist advice where a significant level of environmental risk or impact is identified with environmental indicators of sustainability.

OEMP SOP 5 – Environmental compliance reporting

Aspect	Environmental compliance reporting
Objectives	To implement a routine reporting system that provides accurate, reliable and timely environmental information in accordance with the CoA.
Potential Impacts	Non-compliance with CoA.
Control Actions	Develop and implement an appropriate reporting program for the assessment of the environmental management of the Project. Prepare and submit to the NSW EPA an Annual Return on the anniversary date every year. No false or misleading environmental monitoring data in a material respect is reported.
Relevant Standards, Management Plans, Records	CoA Annual Return Personnel induction, training and awareness Non-compliance Record Corrective Action Report
Responsibility	As required by the specific requirements outlined in section 7.2.
Performance Indicators	An Annual Audit Compliance Report is submitted each year.
Monitoring	As required by the specific requirements outlined in section 12.
Reporting	As required by the specific requirements outlined in section 12.4.
Corrective Actions	Review environmental reporting program.

OEMP SOP 6 – Environmental records management

Aspect	Environmental management records
Objectives	To implement an environmental records management system that meets minimum requirements for CoA.
Potential Impacts	Non-compliance with CoA.
Control Actions	Establish and maintain an effective and efficient environmental records management system to ensure the creation and capture of environmental records. To ensure sensitive information is managed appropriately. Apply sound records management practices including an appropriate governance framework to assist in effectively managing records.
Relevant Standards, Management Plans, Records	CoA Personnel induction, training and awareness
Responsibility	As required by the specific requirements outlined in section 7.2.
Performance Indicators	No non-compliances with CoA.
Monitoring	As required by the specific requirements outlined in section 12.3.
Reporting	As required by the specific requirements outlined in section 12.4.
Corrective Actions	Review environmental records management system.

Appendix B1 – Air quality management plan

Springfield Feedlot

Draft Operation Air Quality Management Plan

"Springfield"
2513 Getta Getta Road
North Star NSW 2408

Doolin Farming Pty Ltd
"Glenhoma"
3202 Getta Getta Road
NORTH STAR NSW 2408

[February 2025]

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V1R1	Doolin Farming Pty Ltd	Electronic	-
V1R2	Doolin Farming Pty Ltd / Gwydir Shire Council (GSC)	Electronic	-

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1 Background

1.1 Introduction

Doolin Farming Pty Ltd own and operate a 10,000 ha mixed farming operation across several properties at North Star including "Glenhoma", "Glenmodel", "Springfield", "Myall Downs" and "Yetman West" some 27 km east of Yetman and 45 km south-southeast of Goondiwindi (QLD) in NSW.

Doolin Farming Pty Ltd primarily engage in dryland and irrigated cropping and beef production. Doolin Farming Pty Ltd produces wheat, barley, oats and chickpeas in winter and cotton and maize in summer under pivot irrigation systems and dryland sorghum cropping.

Central to the beef production enterprise is the breeding, growing and lot-feeding of cattle for the domestic market. The beef supply chain includes breeding and growing of beef cattle on land less suitable for dryland and irrigated cropping and grazing of stubble and lot feeding of cattle within a feedlot on the property 'Springfield".

"Springfield" comprises some 1,713 ha (~4,231 acres) and currently, a dryland and irrigated cropping business is undertaken on a large proportion of the property with extensive cattle breeding and grazing of beef cattle on the remaining land which is unsuitable for cropping and lot feeding of cattle within a beef cattle feedlot in the north-east of the property.

The feedlot is known as Springfield Feedlot and operates for 12 months of the year and employs approximately 4 full time staff. Casual staff and contractors are engaged as required during busy periods such as planting and harvesting of silage and fodder and to supply various associated services such as plant maintenance and veterinary requirements.

Springfield Feedlot includes one controlled drainage area with associated production pens and drainage system which includes catch drains, sedimentation basin and holding pond. Springfield Feedlot also has auxiliary infrastructure to support the use such as cattle handling and feed storage and processing facilities.

Springfield Feedlot is accredited under the National Feedlot Accreditation Scheme (NFAS) with audits conducted annually.

1.2 Environmental management systems overview

The overall Environmental Management System for the Project is described in the Operation Environmental Management Plan (OEMP).

The OAQMP is part of Doolin Farming Pty Ltd's environmental management framework for the Project, as described in section 4.2 of the OEMP. Management measures identified in this Plan will be incorporated into site or activity specific Environmental Standard Work Instruction (ESWIs).

ESWIs will be developed and signed off by Feedlot Manager or environment management representatives prior to associated works and operation personnel will be required to undertake works in accordance with the identified mitigation and management measures.

Used together, the OEMP, strategies, procedures and ESWIs form management guides that clearly identify required environmental management actions for reference by Doolin Farming Pty Ltd's personnel and contractors.

The review and document control processes for this Plan are described in Chapter 10 of the OEMP.

2 Purpose, scope, and objectives

2.1 Purpose

This Operation Air Quality Management Plan (OAQMP or Plan) forms part of the Operation Environmental Management Plan (OEMP) for the Springfield Feedlot (the Project).

This Plan has been prepared to address the Department of Planning and Environment (DPIE), Gwydir Shire Council (GSC) and the NSW Environment Protection Authority (NSWEPA) requirements of the Conditions of Approval (CoA) and the mitigation measures listed in the Springfield Feedlot EIS (RDC Engineers Pty Ltd, 2024) and all applicable legislation.

The Project has not commenced operation. This Plan will be reviewed and updated once operations commence.

2.2 Scope

This Operation Air Quality Management Plan (OAQMP) describes how Doolin Farming Pty Ltd will manage and control dust, odour and greenhouse emissions during operation of the Project.

2.3 Objectives

The key objective of the OAQMP is to ensure that impacts on air quality are minimised and kept within the scope permitted by the Development Consent and Environmental Protection Licence (EPL). To achieve this objective, Doolin Farming Pty Ltd will:

- ensure all CoA and Doolin Farming Pty Ltd Operations Policies and Standards are met in relation to air quality;
- ensure appropriate controls and procedures are implemented during operation activities to avoid or minimise air quality impacts and potential adverse impacts to sensitive receivers within the vicinity of the Project.
- ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in section 5 of this Plan.
- implement applicable best practice air quality tools to manage and minimise the impact of dust from Project operations on the environment and nearby residences;
- maintain the highest practicable levels of amenity for surrounding residents; and
- maintain an effective response mechanism to deal with issues and complaints.

3 Legislative and other requirements

3.1 Legal requirements

Legislation relevant to air quality management includes:

- Environmental Planning and Assessment Act 1979 (EP&A Act);
- Protection of the Environment Operations Act 1997 (POEO Act);
- Protection of the Environment Legislation Amendment Act 2011 (POELA Act);
- Protection of the Environment Operations (Clean Air) Regulation 2021; and
- National Greenhouse and Energy Reporting Act 2007.

Relevant provisions of the above legislation are explained in the register of legal and other requirements included in Appendix A1 of the OEMP.

3.2 Guidelines and standards

The main guidelines, specifications and policy documents relevant to this OAQMP are outlined in Table 1.

Table 1 – Relevant guidelines and standards

Guideline/Standard	Relevance
NSW Clean Air Strategy 2021-30	The NSW Clean Air Strategy outlines the integrated approach to improving air quality and protecting communities by the NSW Government. There are 5 priority action areas including better preparedness for pollution events; cleaner industry; cleaner transport; healthier households and better planning and design.
NSW Environment Protection Authority, 2016, Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales, Environment Protection Authority, Sydney, NSW.	This document provides information on the statutory methods to be used for modelling and assessing emissions of air pollutants in NSW. The document contains information on how to prepare emissions inventory data and meteorological data; methods for accounting for and dealing with background concentrations; dispersion modelling methodology and interpretation; impact assessment criteria for common pollutants; procedures for developing site-specific emission limits, including those for hydrogen sulfide and worked examples.
NSW Dust Strategy 2020-2022	The NSW Dust Strategy 2020-2022 coordinates SafeWork NSW's dust exposure prevention activities, ensuring consistent application of best practice principles and controls relevant to different dust types.
AS 3580.1.1:2007 Methods for sampling and analysis of ambient air: Part 1.1: Guide to siting air monitoring equipment	This Standard sets out general guidelines for the siting of ambient air monitoring equipment and specifies a number of siting parameters for individual air pollutants.
AS 3580.10.1:2003 (R2014) Methods for sampling and analysis of ambient air: Method 10.1: Determination of particulate matter – Deposited matter – Gravimetric method	This Standard sets out a method for the sampling of particulate matter that is deposited from the atmosphere, and procedures for the gravimetric determination of the mass deposition rate of insoluble solids, ash, combustible matter, soluble solids and total solids from ambient air.
AS 3580.14:2014 Methods for sampling and analysis of ambient air - Meteorological monitoring for ambient air quality monitoring applications	This Standard sets out methods for the collection of meteorological data for use in ambient air quality monitoring and modelling applications. Requirements and guidance are provided for the in-situ monitoring of primary meteorological variables.
Environmental Health Risk Assessment (enHealth, 2012)	This enHealth document provides a national approach to environmental health risk assessment.

3.3 Conditions of approval

The Conditions of Approval (CoA) relevant to this Plan are listed in Table 2. A cross reference is also included to indicate where the condition is addressed in this Plan or other Project management documents.

Table 2 – Conditions of Approval relevant to this plan

CoA	Condition requirements	Plan reference
Notice of Determination		
	To be completed after Notice of Determination is issued	
EPL		
	To be completed after EPL is issued	

4 Air quality management strategy

4.1 Aspects and impacts

4.1.1 Risk analysis

A risk management approach was used to determine the severity and likelihood of the Project's operations impacting on air quality and to prioritise the significance of potential impacts. This process considered potential regulatory and legal risks as well the concerns of the community and other key stakeholders.

The objectives of the risk assessment were to:

- Identify activities, events or outcomes that have the potential to adversely affect the local environment and/or human health/property
- Qualitatively evaluate and categorise each risk item
- Assess whether risk issues can be managed by environmental protection measures
- Qualitatively evaluate residual risk with implementation of measures.

Appendix A3 of the OEMP contains a list of issues, related to air quality aspects and corresponding risks associated with the Project. Measures to mitigate the identified environmental risks are also provided.

4.2 Operation activities

Emissions to the atmosphere during operation that could result in adverse impacts to air quality are typically divided into two categories:

- Dust and particulates; and
- Gaseous.

Key aspects of the Project that could result in dust emissions include:

- Feed preparation including material handling of dry commodities, commodity processing such as grain milling;
- the movement of cattle within the pens etc;
- Solid waste material handling including pen cleaning, stockpiling, material loading, material haulage and material utilisation;
- Vehicular movements over unpaved surfaces (including unsealed access and internal roads); and
- Wind erosion of exposed areas such as vehicle parking and laydown areas, access and internal roads, commodity storage areas, pen surfaces, sedimentation basin and solid waste stockpiles.

Air emissions, other than dust, which may be generated by operation activities include:

- Vehicle and plant exhaust noise emissions, which may be excessive if vehicles and plant are poorly maintained.

Odours/gases released during:

- Decomposition of organic materials such as manure on pen surfaces, solid and liquid waste storage, handling and utilisation and feed commodities such as silage, spoilt feed etc; and
- livestock emissions (belching).

4.3 Factors likely to affect air quality and impacts

In addition to the inherent risks of specific operation activities creating the potential to generate odour and dust, several other environment factors also affect the likelihood of odour and dust emissions. These include:

- Wind direction – determines whether dust and suspended particles are transported in the direction of the sensitive receivers;
- Wind speed – governs the potential suspension and drift resistance of particles;
- Soil type – more erodible soil types have an increased soil or dust erosion potential;
- Soil moisture – increased soil moisture reduces soil or dust erosion potential;
- Rainfall or dew – rainfall or heavy dew that wets the manure and surface of exposed surfaces and reduces the risk of dust generation but increases odour generation;
- Stocking density – Impacts the rate at which moisture is added to the pen surface by manure. Stocking densities are managed so that they do not cause undue dust emissions in dry weather;
- Solid waste management – pen, drain and sedimentation basin cleaning frequency, stockpile management; and
- Effluent management – storage duration and application.

4.4 Impacts

The potential for impacts on air quality will depend on several factors. Primarily impacts will depend on the nature, extent and magnitude of operation activities and their interaction with the natural environment. Potential impacts attributable to operation might include:

- Deposition of dust on surfaces where it may cause damage and/or lead to a need for increased cleaning or repair;
- Aesthetic effects that arise from visible airborne dust plumes and from deposits of dust on surfaces;
- Need for increased maintenance of air filtering systems (e.g., air conditioners etc);

- Potential adverse human health effects including eye, nose and throat irritation from excessive inhalation of fine particles;
- Impacts on water quality and/or vegetation health from dust deposition;
- Impacts on residential sensitive receivers, including impacts on living areas, swimming pools and general amenities;
- Complaints from the public relating to dust or odours; and
- Dust deposition impacts on sensitive agricultural receivers, including cropping farms.

Some impacts on air quality attributable to the Project are anticipated and have been described in the Project's Environmental Impact Statement (RDC Engineers Pty Ltd, 2024).

Section 4.5 provides a suite of mitigation measures that will be implemented to avoid or minimise dust and odour impacts.

4.5 Mitigation measures

Table 3 describes the air quality mitigation measures for sources of wind-blown and activity-generated dust and odour due to Project operations and summarises the responsibilities that have been documented within this Plan.

A major management tool in all instances will be daily on-site visual inspections and the implementation of an on-site AWS with real-time observations and recording and web based display. This system will allow relevant staff access to current on-site data so that operational activities can be adjusted in line with weather conditions.

Table 3 – Air quality management and mitigation measures

Source	Mitigation measure	Responsibility	Timing	Reference
General				
	Training will be provided to all Project personnel, including relevant sub-contractors on air quality control practices and the requirements from this plan through inductions and targeted training.	Feedlot Manager /Farm Manager	Induction	OEMP
	An air quality specialist will be engaged and regularly consulted throughout operation to provide advice on air quality monitoring design, installation and maintenance.	Feedlot Manager	As required	Environmental Management System, Best practice
	An Environmental Protection Licence will be obtained for the Project. All relevant conditions relating to air quality management will be implemented as required by the EPL.	Feedlot Manager	Prior to Operation	*POEO Act 1997,* CoA
	During activities that have the potential to generate dust and/or during adverse weather conditions, visual observations of downwind dust emissions to the community or local residents will be undertaken. Further, the wind speed and direction sensors may be used, to verify when adverse weather conditions are occurring (i.e., where there are severe wind gusts or an hourly average wind of over 30km/hr). A temporary halt to dust generating activities will occur during adverse weather conditions and/or where visual dust emissions are sighted and/or when sensitive receptors are likely to be affected by dust emissions. Appropriate measures will be taken to mitigate/manage the potential for adverse air quality impacts.	Feedlot Manager/ Farm Manager	Operation	Environmental Management System, Best practice
Procedures and Plans				
	Procedures will be prepared and implemented for solid and liquid waste management to manage any adverse environmental impacts. Refer to OSLWMP and OSWMP.	Feedlot Manager	Operation - As required	Environmental Management System, Best practice
Roads				
	Internal roads shall be watered down as required to minimise nuisance dust, particularly during unfavourable weather conditions (e.g., > 30km/hr hourly average or in severe wind gust conditions, dry weather).	Feedlot Manager	Operation	Environmental Management System, Best practice

	Vehicles will only travel on designated roads to the maximum extent possible. The speed will be limited to 60 km/hr on on-site roads and 40 km/hr in off-road areas or otherwise as signed.	Feedlot Manager / Farm Manager	Operation	Environmental Management System, Best practice
	Setting and enforcing speed limits on internal road network.	Feedlot Manager / Farm Manager	Operation	Environmental Management System, Best practice
Plant and Equipment				
	All plant will be maintained and operated in line with the manufacturer's specifications in order to minimise the emission of air pollutants. Plant and operation vehicles will be turned off when not in use.	Feedlot Manager / Farm Manager	Operation	Best practice
	Routine service and maintenance of mobile equipment used on-site to ensure efficient operation.	Feedlot Manager	Operation	Best practice
	Use of appropriately sized plant and equipment for respective processes.	Feedlot Manager / Farm Manager	Operation	Best practice
Commodity Delivery/ Feed Processing and Delivery				
	Growing feed commodities on-site or on neighbouring farms to minimise fugitive emissions during transport.	Feedmill Supervisor / Farm Manager	Operation	Best practice
	All dry commodities entering the Project site will be covered and all tailgates will be securely fastened. Vehicles will not be loaded higher than the sides and tailboard.	Feedmill Supervisor / Farm Manager	Operation	Best practice
	Any operations involving the movement/processing of dusty materials such as grains, roughages shall be timed and managed where possible to minimise dust emissions. For example, adding moisture to grain prior to movement and/or low wind conditions.	Feedmill Supervisor	Operation	Best practice
	A temporary halt to dust generating activities such as hay processing and/or grain processing will occur during adverse weather conditions and/or where visual dust emissions are sighted and/or when sensitive receptors are likely to be affected by dust emissions.	Feedmill Supervisor	Operation	Best practice
Livestock				

	Sourcing livestock from as close to the development as practical as well as on-site production to minimise fugitive emissions during transport.	Feedlot Manager / Livestock Buyer / Farm Manager	Operation	Good practice
	Utilising the best animal production genetics - Improved production traits such as growth rate and carcass weight will contribute significantly to reducing emissions intensity.	Feedlot Manager / Livestock Buyer / Farm Manager	Operation	Best practice
	Rations formulated to minimise enteric methane emissions.	Feedlot Manager / Feedmill Supervisor	Operation	Best practice
	Maximise feed energy by eliminating parasites and nutrient deficiencies.	Livestock Supervisor	Operation	Best practice
Pen Area				
	Minimisation of wet areas in pens by fixing leaks from water troughs, filling potholes etc.	Maintenance Manager	Operation	Environmental Management System, Best practice
	Frequent removal of manure from the pens/drains and under-fences.	Maintenance Manager	Operation	Environmental Management System, Best practice
	Adapting the cattle stocking density in pens to maintain manure on pen surface at 25-35% moisture content to minimise dust nuisance. For example, stocking density may change from lighter rates in winter to heavy rates in summer.	Livestock Supervisor	Operation	Environmental Management System, Best practice
	Daily application of small amounts (<5mm) of water to the pen surface during the early evening hours during excessively dry periods to reduce dust nuisance if required.	Maintenance Manager	Operation	Environmental Management System, Best practice
Solid waste management				
	Minimising the accumulation of manure in pens/drains, under-fences and cattle lanes by cleaning more frequently than Class 1 requirements.	Maintenance Supervisor	Operation	Environmental Management System, Best practice
	All solid waste loads leaving the Project site will be covered and all tailgates will be securely fastened. Vehicles will not be loaded higher than the sides and tailboard.	Maintenance Supervisor	Operation	Environmental Management System, Best practice

	Generating and maintaining best practice management for solid waste storage, processing and utilisation.	Maintenance Supervisor / Farm Manager	Operation	Environmental Management System, Best practice
	Remove solids from the sedimentation basin as soon as practical.	Maintenance Supervisor	Operation	Environmental Management System, Best practice
	Potential dust generating handling/processing activities such as screening or spreading will be minimised during high wind events (i.e., > 30km/hr hourly average or in severe wind gust conditions).	Farm Manager	Operation	Environmental Management System, CoA
	Any operations involving the movement/processing of solid waste such as screening or spreading, shall be timed and managed where possible when materials have adequate moisture content.	Farm Manager	Operation	Environmental Management System, Best practice
	Application of solid wastes to land when wind conditions and dispersion conditions are favourable.	Farm Manager	Operation	Environmental Management System, Best practice
	Where practical, solid wastes incorporated directly into the soil.	Farm Manager	Operation	Environmental Management System, Best practice
Effluent management				
	Sedimentation basin control weir maintained in good operational order to ensure that complete drainage occurs allowing settled solids to dry out.	Maintenance Supervisor	Operation	Environmental Management System, Best Practice
	Dewatering of the holding pond by irrigation to crops or pastures as soon as practical after rainfall.	Farm Manager	Operation	Environmental Management System, CoA
	Application of effluent to crops when wind conditions and dispersion conditions are favourable.	Farm Manager	Operation	Environmental Management System, CoA
	Utilisation of effluent to crops on-site to minimise inorganic fertiliser requirements.	Farm Manager	Operation	Environmental Management System, CoA
Monitoring and Reporting				

	All air quality monitoring requirements will be undertaken in accordance with Licence requirements.	Feedlot Manager	Operation – As-required	AS3580.1.1-2016 AS3580.14-2014
	The on-site real time automatic weather station will operate throughout the operation works for wind direction and speed, temperature and humidity and rainfall (refer to Figure 1 for location).	Feedlot Manager	Operation – As-required	Environmental Management System, CoA
	Rainfall forecasts will be monitored daily, and the site managed to minimise air quality impacts from rainfall events.	Feedlot Manager / Farm Manager	Operation – Event basis	Environmental Management System, CoA
	A 24-hour community response telephone line shall be maintained.	Feedlot Manager	Operation – Daily	Environmental Management System, CoA
	In the event of an air quality complaint, records shall be kept in the complaints register and investigations will be undertaken to confirm the source of the issue. Additional mitigation measures will be investigated and implemented. In the event of ongoing air quality issues, operational activities will be reviewed and, if necessary, the activity stopped until suitable measures can be employed to manage this issue.	Facilities Manager / Operations Manager	Operation – Annually	Environmental Management System, CoA
	Pollution incidents posing material harm to the environment shall be notified to each 'relevant authority' as defined in section 148(8) of the POEO Act.	Feedlot Manager	Operation – Event basis	Environmental Management System, *POEO Act 1997*, CoA
Review and Improvement				
	In line with the Complaints and Enquiries Procedure, following a complaint and its subsequent investigation, feedback regarding the source and nature of the issue and corrective and / or preventative measures taken will be provided to the affected stakeholders and/or community members (refer also to section 5.5).	Facilities Manager	Operation – Event basis	Environmental Management System, CoA

5 Implementation

5.1 Roles and responsibilities

The organisational structure and overall roles and responsibilities of the Project team are outlined in section 6.3 of the OEMP. Specific responsibilities for the implementation of environmental controls are details in Table 3 of this OAQMP.

5.2 Induction

The Project has a site induction program that all contractors and employees are required to complete prior to undertaking any work on the Project site in accordance with section 8.1 of the OEMP.

Prior to their commencement of work on the Project site, all employees and subcontractors will undergo site induction relating to air quality management issues, including:

- Requirements of this Plan;
- Relevant legislation;
- Roles and responsibilities for air quality management; and
- Air quality mitigation measures

5.3 Training

Targeted training in the form of toolbox talks or specific training will be provided to all employees with a key role in air quality management. Examples of training topics include:

- Planning and preparedness for strong wind events / dust risk periods;
- Lessons learnt from dusty periods, incidents and other events e.g., strong wind (in excess of 40 km/hr); and
- Planning and preparedness for rainfall events.

Further details regarding employee training are outlined in section 8.2 of the OEMP.

5.4 Incident management

Doolin Farming Pty Ltd will continue to implement its existing incident management procedures, including response to, investigation and reporting of incidents.

A comprehensive Incident Management System is currently implemented at the Project site, with associated response and safety equipment held on-site in the event of an incident causing environmental harm occurs during operation. Key personnel are trained to support the implementation of the system.

Further details regarding environmental incident management are outlined in section 9 of the OEMP.

5.5 Complaints management

The investigation, response and reporting of complaints shall be undertaken in accordance with section 9.3 the OEMP.

All community complaints shall also be managed in accordance with the requirements of the CoA for the Project, including:

- Reporting complaints in the Annual Return;
- Keeping a legible record of all complaints made, including:
    - The date and time of the complaint;
    - The method by which the complaint was made;
    - Any personal details of the complainant which were provided or, if no such details were provided, a note to that effect;
    - The nature of the complaint;
    - The action taken in relation to the complaint, including any follow-up contact with the complainant; and
    - If no action was taken, the reasons why no action was taken.

Any feedback and complaint records will be logged in the Complaints Register, tracked and where relevant, responded to. Responses to complaints will be made, where reasonably possible, within 48 hours of receiving the complaint.

6 Performance evaluation

6.1 Performance indicators

The extent to which this Plan complies with CoA will be measured by the following performance indicators:

- Compliance with relevant air quality standards at monitoring locations, in particular those representative of sensitive receptor locations;
- Minimisation of air quality (odour, dust) complaints as evidenced by trends in the frequency and number of complaints; and
- Compliance with this plan, as indicated by internal and statutory reporting.

6.2 Monitoring

Regular monitoring and inspections will be undertaken during operation in accordance with Table 4. The proposed number of monitoring locations, frequency of monitoring and relevant monitoring methods are detailed in the Operation Environmental Monitoring and Management Plan in Appendix B5 of the OEMP.

Additional requirements and responsibilities in relation to inspections and monitoring are documented in sections 10.1 and 10.2 of the OEMP.

Table 4 – Air quality – Monitoring and Inspection

Monitoring details	Location	Responsibility	Frequency	Record	KPI
Weather data including daily rainfall, wind (direction and speed), temperature, relative humidity, barometric pressure	Development complex	Feedlot Manager	Daily	Daily rainfall record	N/A
Visual observations during site inspections, including activities outside of the Project that may impact on dust/odour levels near sensitive receivers	Project site	Feedlot Manager / Farm Manager	Daily	Complaints record	Number of dust and/or odour complaints

6.3 Reporting

Air quality management reporting is designed to comply with the CoA and provide stakeholder access to relevant air quality information and data.

Key stakeholders requiring access to this information include Doolin Farming Pty Ltd, state and local government agencies and the local community. Reporting will be undertaken in accordance with section 11.4 of the OEMP. Annual reporting will be undertaken in accordance with CoA and the Annual Return requirements detailed in the EPL.

Doolin Farming Pty Ltd will report on the performance of the Air Quality Monitoring Program and management of air quality in the Annual Return for the EPL.

The Annual Return for the EPL will include an air quality monitoring component covering the following items relating to air quality:

- Air quality monitoring results and comparison to performance criteria;
- An explanation for any missing air quality monitoring results;
- Air quality related complaints and management/mitigation measures undertaken;
- Management/mitigation measures undertaken in the event of any confirmed exceedance of performance criteria; and
- Review of the performance of management/mitigation measures and the monitoring program.

Doolin Farming Pty Ltd is required to report pollution incidents immediately and without delay in accordance with the requirements of the *POEO Act 1997*.

6.4 Auditing

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental mitigation measures, compliance with this OAQMP, CoA and other relevant approvals, licences and guidelines. Audit requirements are detailed in section 11.4 of the OEMP.

The audit process will generally be designed to examine the status of the key components of the OAQMP, review air quality concerns management and evaluate the overall performance of air quality management for the Project.

The strategy for Doolin Farming Pty Ltd audit processes is to ensure compliance and promote continuous improvement as part of the Project's air quality management regime.

In addition, the Plan may be subject to audit by the Gwydir Shire Council or the Department administering the *Protection of the Environment Operations Act 1997* (currently EPA) during compliance inspections and other site inspections and as a possible component of a formal air quality concern investigation process.

7 Review and Improvement

7.1 Non-conformances and corrective actions

Any non-conformances related to air quality will be dealt with and documented in accordance with section 11.5 of the OEMP.

7.2 Continual improvement

This Plan and associated monitoring program will be reviewed and if necessary revised to the satisfaction of the NSW EPA, the Department administering the *Protection of the Environment Operations Act 1997* (in consultation with the Gwydir Shire Council) in accordance with section 12 of the OEMP:

- where a risk assessment identifies the requirement to alter the Plan;
- following changes to project approval or licence conditions relating to air quality management or monitoring;
- following any significant air quality related incident;
- where there is a relevant change in technology or legislation; or
- for necessary or any unforeseen changes to air quality monitoring locations.

8 References

NSW Environment Protection Authority, 2016, Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales, Environment Protection Authority, Sydney, NSW.

RDC Engineers Pty Ltd, 2024, Development Application and Environmental Impact Statement – Expansion of Beef Cattle Feedlot from 999 to 3,000 Head, "Springfield", North Star", E2-103/V1R1 RDC Engineers Pty Ltd, Toowoomba, QLD, 4350.

Standards Australia ,2007, AS 3580.1.1:2007: Methods for sampling and analysis of ambient air - Guide to siting air monitoring equipment, Sydney, NSW

Standards Australia, 2011, AS 3580.14-2011: Methods for sampling and analysis of ambient air – Meteorological monitoring for ambient air quality monitoring applications, Sydney NSW.

Standards Australia, 2015, AS/NZS 3580.9.3:2015, Methods for sampling and analysis of ambient air: Determination of suspended particulate matter - Total suspended particulate matter (TSP) - High volume sampler gravimetric method, Sydney, NSW.

Standards Australia, 2014, AS/NZS 3580.14:2014, Methods for sampling and analysis of ambient air: Meteorological monitoring for ambient air quality monitoring applications, Sydney, NSW.

Standards Australia, 2016, AS/NZS 3580.1.1:2016, Methods for sampling and analysis of ambient air: Guide to siting air monitoring equipment, Sydney, NSW.

Appendix A – Standard Operational Procedures

AQMP SOP 1 – Air Quality – Dust management

Aspect	Air quality – Dust
Objectives	To manage dust emissions such that impacts on community amenity, occupational health and the environment are minimised.
Potential Impacts	Occupational health and safety of employees and contractors. Animal health and performance. Receiving environment such as surface water and aquatic and terrestrial ecosystems affected by dust deposition. Community amenity and health including impacts on living areas, swimming pools and general amenities etc. Receiving environment such as agricultural crops impacted by dust deposition.
Control Actions	All development employees including relevant contractors are given adequate training in environmental awareness, legal responsibilities and air quality control methods through inductions and targeted training. Maintain vegetative cover over the site where practicable. Establish a tree break around the populated boundaries of the site. The air quality and meteorological monitoring network is maintained, and results are routinely analysed, assessed and reported. Seal access roads, vehicle manoeuvring surfaces and car parks as required. Limit cattle movement in high wind conditions. Pen cleaning and surface maintenance is undertaken on a planned basis to ensure that pen surfaces dry quickly following rainfall, can drain freely and do not become overly dry and cause excessive dust emissions. Receiving, reporting and responding to any complaints in relation to dust nuisance. Adapting the cattle stocking density in pens to maintain the moisture content of the manure on the pen surface at 25-35% to minimise dust generation. For example, stocking density may change from lighter rates in winter to heavy rates in summer. Setting and enforcing speed limits on internal road network. To the extent practical, vehicles will only travel on designated roads. Implement dust suppression measures, such as watering internal roads and solid waste (manure) stockpiles as required particularly in unfavourable weather conditions (e.g., > 30km/hr hourly average winds or in severe wind gust conditions, extended periods of dry weather). Dust suppression measures, such as watering access and feed roads and solid waste (manure) stockpiles as required. Operations involving the movement or processing of dusty materials such as hay processing, grain movement shall be timed and managed where possible when materials have adequate moisture content and/or low wind conditions.

	Operations involving the movement of dusty materials such as grain movement, solid waste (manure) turning and spreading shall be timed and managed where possible when materials have adequate moisture content. Ceasing dust generating activities such as hay processing, grain movement, pen cleaning, and solid waste (manure, carcass compost, pond sludge) stockpiling, screening and spreading during adverse weather conditions and/or when sensitive receptors are likely to be affected by dust emissions. Any grain processing dust-suppression equipment is always well maintained and operational. The loads on vehicles moving dry commodities or dusty materials (e.g., solid waste) onto or off the site are covered and all tailgates securely fastened during transit. Vehicles will not be loaded higher than the sides and tailboard. Operations involving the movement/processing of solid waste, such as screening or spreading, shall be timed and managed where possible when materials have adequate moisture content and when wind conditions are favourable (low speed and non-gusty). A suitable buffer is applied where solid waste (manure, carcass compost, holding pond sludge) applications take place within close proximity to roads, dwellings or other areas likely to be used by the public at that time (the appropriateness of the applied buffer distances is determined having consideration for the qualities of the materials being applied, weather conditions and other environmental factors; as well as the anticipated level of public usage or exposure at those times).
Relevant Standards, Management Plans, Records	CoA EPL conditions NFAS manual Complaints Register Personnel induction, training and awareness AS 3580 Methods of sampling and analysis of ambient air
Responsibility	As required by the OEMP and specific requirements outlined in section 5.1.
Performance Indicators	Ensure all personnel operating on the site are adequately trained. Personnel shall receive training in air quality control methods. No complaints relating to dust are received by the development.
Monitoring	As required by the OEMP and specific requirements outlined in section 6.2.
Reporting	As required by the OEMP and specific requirements outlined in section 6.3.
Corrective Actions	Review management of dust generating activities and dust control methods. Increase dust suppression activities. Seek specialist advice if high dust levels persist.

AQMP SOP 2 – Air Quality – Odour management

Aspect	Air quality – Odour
Objectives	To manage odour emissions such that impacts on community amenity, occupational health and the environment are minimised.
Potential Impacts	Occupational health and safety of employees and contractors from offensive odours. Community amenity and health impacts from offensive odours.
Control Actions	All development employees including relevant contractors are given adequate training in environmental awareness, legal responsibilities and air quality control methods through inductions and targeted training. Maintain vegetative cover over the site where practicable. Establish a vegetative buffer around the populated boundaries of the site. The air quality and meteorological monitoring network is maintained, and results are routinely analysed, assessed and reported. Ensuring cattle numbers do not exceed EPL conditions and proper management and regular maintenance of pens. Pen maintenance routines and registers kept. Pen cleaning and surface maintenance is undertaken on a planned basis to ensure that pen surfaces dry quickly following rainfall, can drain freely and dry rapidly. Odour generating activities, such as pen cleaning should not be undertaken when atmospheric conditions will cause strong odours to remain undiluted. Bright sunny mornings are the best time to undertake these activities. Minimise the accumulation of manure in pens, catch drains, under-fences and cattle lanes by cleaning in accordance with Class 1 requirements. (Refer OSLWMP SOP 1 – Solid waste (Putrescible) – Pen and sedimentation basin cleaning procedure). Elimination of wet areas within the pens by repairing potholes, eliminating accumulated manure from under fence lines and fixing leaks from water troughs. (Refer OSLWMP SOP 1 – Solid waste (Putrescible) – Pen and sedimentation basin cleaning procedure). Spilt and spoilt feed and feedstuffs are regularly removed from around feed storage and preparation areas, feed bunks, feed processing equipment, etc. Sedimentation basin control weir is maintained in operational order to ensure that complete drainage occurs allowing settled solids to dry out, thus reducing the potential for odour emissions. (Refer OSLWMP SOP 1 – Solid waste (Putrescible) – Pen and sedimentation basin cleaning procedure). Solids are removed from the sedimentation basins as soon as practical after deposition. Mortalities are placed within the solid waste stockpile and carcass composting area and covered with high carbon material as soon as practicable after placement. Controlled aeration of solid waste composting windrows. Wet solid waste composting windrows are not turned to minimise release of emissions generated from the anaerobic decomposition process.

	Moisture and temperature levels of solid waste composting windrows are monitored and kept at optimal levels to reduce odour. Dewatering of the holding pond by irrigation to crops or pastures in accordance OSLWMP SOP 6 – Liquid waste (Effluent) – Holding pond management. Receiving, reporting and responding to any complaints in relation to odour nuisance. Maintaining best practice management for effluent and solid waste storage, processing and utilisation (Refer OSLWMP SOP 6; SOP 7; SOP 8). A suitable buffer is applied where effluent and solid waste (manure, carcass compost, holding pond sludge) applications take place within close proximity to roads, dwellings or other areas likely to be used by the public at that time (the appropriateness of the applied buffer distances is determined having consideration for the qualities of the materials being applied, weather conditions and other environmental factors; as well as the anticipated level of public usage or exposure at those times).
Relevant Standards, Management Plans, Records	CoA EPL conditions NFAS manual Complaints Register Personnel induction, training and awareness AS 3580:2014 Methods of sampling and analysis of ambient air AS/NZS 3580.1.1:2016, Methods for sampling and analysis of ambient air: Guide to siting air monitoring equipment
Responsibility	As required by the OEMP and specific requirements outlined in section 5.1.
Performance Indicators	Ensure all personnel operating on the site are adequately trained. Personnel shall receive training in air quality control methods. No complaints relating to dust are received by the Project.
Monitoring	As required by the OEMP and specific requirements outlined in section 6.2.
Reporting	As required by the OEMP and specific requirements outlined in section 6.3.
Corrective Actions	Review management of odour generating activities and control actions. Seek specialist advice if high odour levels persist.

AQMP SOP 3 – Air Quality – GHG management

Aspect	Air quality – GHG
Objectives	To mitigate GHG emissions such that impacts on community amenity, occupational health and environment values are minimised.
Potential Impacts	Occupational health and safety of employees and contractors from the release of toxic air pollutants. Community amenity and health impacts from the release of toxic air pollutants. Contribution to atmospheric greenhouse gas emissions and the risk of environmental harm from man-made climate change
Control Actions	Adopting reasonable and practicable best practice design, technology and management measures appropriate to mitigate GHG emissions, having regard to the hierarchy to avoid, reduce and offset emissions. Commitment in supporting greenhouse gas emission reduction within the beef production industry. Map carbon emissions across the entire supply chain to identify opportunities for reducing emissions. All plant will be maintained and operated in line with the manufacturer's specifications to minimise emissions of air pollutants. Plant, mobile machinery and vehicles will be turned off when not in use. Routine service and maintenance of mobile equipment used on-site to ensure efficient operation. Investigate and implement renewable energy options such as small-scale options for renewable energy supply to offices and buildings. Investigate and implement water and energy efficiency measures. Sourcing livestock and feed commodities from on-farm or as close to the Project as practical to minimise fugitive emissions during transport. Utilising the best animal production genetics - Improved production traits such as growth rate and carcass weight will contribute significantly to reducing emissions intensity. Rations formulated to minimise enteric methane emissions and reduce nutrient excretion. Implement measures to reduce urinary nitrogen (e.g., using forages with a higher energy-to-protein ratio). Implement measures to reducing greenhouse gas emissions from manure management. Controlled aeration of solid waste stockpiles and composting windrows to reduce methane emissions. Increase soil organic carbon levels of soils in waste utilisation areas through management shifts such as management for increased yields; tillage and stubble management; crop rotation; pasture and grazing management; and organic matter additions.
Relevant Standards,	CoA NFAS manual

Management Plans, Records	Complaints Register Personnel induction, training and awareness
Responsibility	As required by the OEMP and specific requirements outlined in section 5.1.
Performance Indicators	Ensure all personnel operating on the site are adequately trained. Net reduction in greenhouse emissions in line with its adaptive management approach.
Monitoring	Monitor all Scope 1 GHG emissions.
Reporting	As required by the OEMP and specific requirements outlined in section 6.3.
Corrective Actions	Avoiding emissions through best practice design and benchmarking. Review management of GHG generating activities and control actions. Offsetting emissions (carbon offsets).

AQMP SOP 4 – Air Quality – Compliance monitoring

Aspect	Air quality – Compliance Monitoring
Objectives	To record site-specific weather data.
Potential Impacts	Non-compliance with CoA. Poor management of effluent and solid waste resulting in odour or dust nuisance Locating point sources of nuisance odour and dust emissions.
Control Actions	Implement and maintain a permanently located automatic weather station (AWS) on-site to continuously record weather data. A suitably trained person will perform the inspection of the AWS and download recorded data. Each day, data for each parameter shown on the real-time display system will be reviewed against existing meteorological conditions. Download meteorological data weekly and store in data management system. Review weekly the weather data for continuity / missing records and advise the Environmental Specialist of any spurious data as required. Inspect the AWS every week. At each inspection the following actions shall be performed: • Check the AWS is energised from power source; • Inspect the tipping bucket rain gauge and clean settled dust and/or clear blockages if required; • Inspect the wind speed and direction sensors for damage and clear any cobwebs if required; • Report any equipment damage to the Environmental Specialist.
Relevant Standards, Management Plans, Records	CoA Personnel induction, training and awareness AS 3580 Methods of sampling and analysis of ambient air
Responsibility	As required by the OEMP and specific requirements outlined in section 5.1.
Performance Indicators	Ensure all personnel responsible for the management of the meteorological station and metrological methods are adequately trained. The meteorological station provides long-term high quality, continuous meteorological data.
Monitoring	As required by the OEMP and specific requirements outlined in section 6.2.
Reporting	As required by the OEMP and specific requirements outlined in section 6.3.
Corrective Actions	Review weather data and management of the meteorological station. Seek specialist advice if inconsistent or spurious data is identified.

Appendix B2 – Soil and water quality management plan

Springfield Feedlot

Draft Operation Soil and Water Quality Management Plan

"Springfield"
2513 Getta Getta Road
North Star NSW 2408

Doolin Farming Pty Ltd
"Glenhoma"
3202 Getta Getta Road
NORTH STAR NSW 2408

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1 Background

1.1 Introduction

Doolin Farming Pty Ltd own and operate a 10,000 ha mixed farming operation across several properties at North Star including "Glenhoma", "Glenmodel", "Springfield", "Myall Downs" and "Yetman West" some 27 km east of Yetman and 45 km south-southeast of Goondiwindi (QLD) in NSW.

Doolin Farming Pty Ltd primarily engage in dryland and irrigated cropping and beef production. Doolin Farming Pty Ltd produces wheat, barley, oats and chickpeas in winter and cotton and maize in summer under pivot irrigation systems and dryland sorghum cropping.

Central to the beef production enterprise is the breeding, growing and lot-feeding of cattle for the domestic market. The beef supply chain includes breeding and growing of beef cattle on land less suitable for dryland and irrigated cropping and grazing of stubble and lot feeding of cattle within a feedlot on the property 'Springfield".

"Springfield" comprises some 1,713 ha (~4,231 acres) and currently, a dryland and irrigated cropping business is undertaken on a large proportion of the property with extensive cattle breeding and grazing of beef cattle on the remaining land which is unsuitable for cropping and lot feeding of cattle within a beef cattle feedlot in the north-east of the property.

The feedlot is known as Springfield Feedlot and operates for 12 months of the year and employs approximately 4 full time staff. Casual staff and contractors are engaged as required during busy periods such as planting and harvesting of silage and fodder and to supply various associated services such as plant maintenance and veterinary requirements.

Springfield Feedlot includes one controlled drainage area with associated production pens and drainage system which includes catch drains, sedimentation basin and holding pond. Springfield Feedlot also has auxiliary infrastructure to support the use such as cattle handling and feed storage and processing facilities.

Springfield Feedlot is accredited under the National Feedlot Accreditation Scheme (NFAS) with audits conducted annually.

1.2 Environmental management systems overview

The overall Environmental Management System for the Project is described in the Operation Environmental Management Plan (OEMP).

The OAQMP is part of Doolin Farming Pty Ltd's environmental management framework for the Project, as described in section 4.2 of the OEMP. Management measures identified in this

Plan will be incorporated into site or activity specific Environmental Standard Work Instruction (ESWIs).

ESWIs will be developed and signed off by Feedlot Manager or environment management representatives prior to associated works and operation personnel will be required to undertake works in accordance with the identified mitigation and management measures.

Used together, the OEMP, strategies, procedures and ESWIs form management guides that clearly identify required environmental management actions for reference by Doolin Farming Pty Ltd's personnel and contractors.

The review and document control processes for this Plan are described in Chapter 10 of the OEMP.

2 Purpose, scope, and objectives

2.1 Purpose

This Operation Soil and Water Quality Management Plan (OSWQMP or Plan) forms part of the Operation Environmental Management Plan (OEMP) for the Springfield Feedlot (the Project).

This Plan has been prepared to address the Department of Planning and Environment (DPIE), Gwydir Shire Council (GSC) and the NSW Environment Protection Authority (NSWEPA) requirements of the Conditions of Approval (CoA) and the mitigation measures listed in the Springfield Feedlot EIS (2025) and all applicable legislation.

The Project has not commenced operation. This Plan will be reviewed and updated once operations commence.

2.2 Scope

This Operation Soil and Water Quality Management Plan (OSWQMP) describes how Doolin Farming Pty Ltd proposes to assess and manage soil and water quality impacts during operation of the Project.

2.3 Objectives

The key objective of the OSWQMP is to ensure that impacts on soil and water quality are minimised and within the scope permitted by the CoA. To achieve this objective, Doolin Farming Pty Ltd will:

- ensure all CoA and Doolin Farming Pty Ltd's Operations Policies and Standards are met in relation to soil and water quality;
- ensure appropriate controls and procedures are implemented during operation activities to avoid or minimise adverse impacts to soil quality and potential adverse impacts to groundwater and surface water quality within the vicinity of the Project.
- ensure measures are implemented to comply with all relevant legislation and other requirements as described in section 5 of this Plan.
- implement measures to minimise any adverse impacts of waste management and utilisation practices on soil, groundwater and surface water quality within the vicinity of the Project; and
- maintain an effective response mechanism to deal with issues and complaints

3 Legislative and other requirements

3.1 Legal requirements

Legislation relevant to soil and water quality management includes:

- Environmental Planning and Assessment Act 1979 (EP&A Act);
- Protection of the Environment Operations Act 1997 (POEO Act);
- Protection of the Environment Legislation Amendment Act 2011 (POELA Act);
- Water Management Act 2000;
- Water Act 1912; and
- Contaminated Land Management Act 1997.

Relevant provisions of the above legislation are explained in the register of legal and other requirements included in Appendix A1 of the OEMP.

3.2 Guidelines and standards

The main guidelines, specifications and policy documents relevant to this Plan are outlined in Table 1.

Table 1 – Relevant guidelines and standards

Guideline/Standard	Relevance
Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ 2000)	Provides a framework for recognising and protecting water quality for the full range of existing environmental values.
AS/NZS 5667.1—1998: Water Quality—Sampling— Part 1: Guidance on the Design of Sampling Programs, Sampling Techniques and the Preservation and Handling of Samples. Standards Association of Australia, Sydney	This Standard provides general principles to be applied in sampling for the physical, chemical, microbiological or radiological analysis of waters and waste waters, including bottom sediment and sludges, for the purposes of process control, quality characterization, identification of sources of pollution and the monitoring of background levels.
AS 5667.4-1998: Water quality - Sampling, Part 4: Guidance on sampling from lakes, natural and man-made, Sydney NSW.	This part of AS5667 sets out the principles to be applied to the design of sampling programmes, sampling techniques and the handling of water samples from lakes, natural and man-made for physical, chemical and microbiological assessment.
AS/NZS 5667.6—1998: Water Quality—Sampling—Guidance on sampling of rivers and streams. Standards Association of Australia, Sydney	This part of AS5667 sets out the principles to be applied to the design of sampling programmes, sampling techniques and the handling of water samples from rivers and streams for physical, chemical and microbiological assessment.
AS/NZS 5667.10—1998: Water Quality—Sampling—Guidance on sampling of waste waters. Standards Association of Australia, Sydney	This part of AS5667 contains details on the sampling of domestic and industrial waste water, i.e. the design of sampling programmes and techniques for the collection of samples. It covers waste water in all its forms, i.e. industrial waste water, and crude and treated domestic waste water.
EPA, 2004, Approved Methods for the Sampling and Analysis of Water Pollutants in NSW.	Lists the sampling and analysis methods to be used when complying with a requirement by, or under, the environment protection legislation, or a licence or notice under that legislation, to test for the presence or concentration of matter in water and the volume, depth and flow of water or wastewater.
Department of Environment and Conservation (NSW), 2004, Effluent Guidelines, Use of Effluent by Irrigation	Provides guidelines for planning, designing, installing, operating and monitoring effluent irrigation systems to diminish risks to public health, the environment and agricultural resources and outlines the statutory requirements that may be needed for an effluent irrigation system in NSW.
Landcom, 2004, The Blue Book – Managing Urban Stormwater: Soils and Construction Volume 1, 4th Edition, March 2004 (reprinted 2006) (the "Blue Book"). Volume 1 and Volume 2.	Provides guidance for the design, construction and implementation of measures to improve stormwater management, soil erosion risks and sediment control from disturbed sites.
International Erosion and Sediment Control (IECA) (Australasia) 2008. Best practice erosion and sediment control. International Erosion Control Association (Australasia), Picton, NSW.	Provides guidance for the design, construction and implementation of measures to improve stormwater management, soil erosion risks and sediment control from disturbed sites.
Resource manual of development of Indicators of sustainability for effluent	Provides readily available data and analysis techniques for evaluating the sustainability of effluent and manure and

reuse in the intensive livestock industries: Piggeries and Cattle Feedlots, Project No 1816, Australian Pork Limited, Canberra, Australia, May 2003.	carcass compost reuse for piggeries and cattle feedlots and suggested sustainability indicators for these intensive livestock industries.
Redding, MR (2003), Sampling Manual for environmental monitoring by intensive livestock industries. Agency for Food and Fibre Sciences, Department of Primary Industries, Toowoomba, Queensland.	This manual sets out the sample collection and preparation techniques needed to fulfil the monitoring requirements of intensive livestock licences (under the QLD EP Act) for soil, effluent, manure, sludge, surface water and groundwater samples.
Rayment, G.E. and Lyons, D.J. (2010). Soil Chemical Methods -Australasia, CSIRO Publishing, ISBN: 9780643067684.	This handbook describes laboratory and field chemical tests and guidance on soil sampling and choice and application of analytical methods from soil sampling through to the reporting of results.
Standards Australia, 2017, AS 1940:2017: The storage and handling of flammable and combustible liquids	This Standard provides general principles and requirements to be applied for bunding, placarding, safe operations, emergency management and fire protection for flammable and combustible liquids.
Standards Australia, 1998, AS 2507-1998: The storage and handling of agricultural and veterinary chemicals	This Standard provides requirements and recommendations for the storage and handling of agricultural and veterinary chemicals, which may be classified as dangerous goods under the Australian Dangerous Goods Code (ADG Code) or as scheduled poisons by the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).
Meat and Livestock Australia, 2012a, National Beef Cattle Feedlot Environmental Code of Practice 2nd Edition, Meat & Livestock Australia, North Sydney, NSW.	The *Code* is designed to be a companion document to the *National Guidelines for Beef Cattle Feedlots in Australia*. The *Code* is intended to provide requirements for the environmentally relevant aspects of the establishment and operation of beef cattle feedlots.
MLA, 2012b, National Guidelines for Beef Cattle Feedlots in Australia 3rd Edition, Meat & Livestock Australia, North Sydney, NSW	The *National Guidelines for Beef Cattle Feedlots in Australia* is designed to provide 'guidance' on how the *Code* requirements regarding the establishment and operation of beef cattle feedlots may be achieved
Meat and Livestock Australia, 2015a, Beef Cattle Feedlots: Design and Construction, Meat and Livestock Australia, North Sydney, NSW.	This manual outlines the stages of selecting a suitable site, designing the feedlot and its facilities, their construction and the overall management of the project.
Meat and Livestock Australia, 2015b, Beef cattle feedlots: waste management and utilisation, Meat and Livestock Australia, North Sydney, NSW.	This manual provides best-practice guidelines for waste management in beef cattle feedlots.
Standards Australia, 2008, AS 4897-2008: The design, installation and operation of underground petroleum storage systems	This Standard provides general principles and requirements for the safe, environmentally sound and efficient underground storage of petroleum products.

3.3 Conditions of approval

The CoA relevant to this Plan are listed in Table 2. A cross reference is also included to indicate where the condition is addressed in this Plan or other Project management documents.

Table 2 – Conditions of Approval relevant to this plan

CoA	Condition requirements	Plan reference
Notice of Determination		
	To be completed after Notice of Determination is issued	
EPL		
	To be completed after EPL is issued	

4 Soil and water quality management strategy

4.1 Aspects and impacts

4.1.1 Risk analysis

A risk management approach was used to determine the severity and likelihood of impacts from the operation's activities on soil and water quality and to prioritise its significance. This process considered potential regulatory and legal risks as well as the concerns of the community and other key stakeholders.

The objectives of the risk assessment were to:

- Identify activities, events or outcomes that have the potential to adversely affect the local environment and/or human health/property
- Qualitatively evaluate and categorise each risk item
- Assess whether risk issues can be managed by environmental protection measures
- Qualitatively evaluate residual risk with implementation of measures.

Appendix A3 of the OEMP contains a list of issues, related to soil and water quality aspects and corresponding risks associated with the Project. Measures to mitigate the identified environmental risks are also provided.

4.2 Operation activities

Key aspects of the Project that could result in impacts to soil and water quality include:

- solid waste (manure, mortalities, holding pond sludge) management including pen cleaning, storage and processing;
- poor maintenance and management of the low-permeability barrier (e.g. clay lining) in the controlled drainage area resulting in contamination of groundwater and/or surface waters;
- land application of solid waste at rates exceeding the ability of the soils and crops to sustainably utilise applied nutrients, salts and organic matter;
- impacts of improper management of liquid waste storage structures leading to uncontrolled releases of contaminants;
- poor maintenance and repair of effluent storage infrastructure and pumping and distribution equipment leading to uncontrolled releases of contaminants (including domestic sewage infrastructure);
- poor management of timing of effluent irrigation events and/or sludge accumulation leading to uncontrolled releases of contaminants;

- solid waste and/or effluent applied to land other than the nominated waste utilisation areas;
- land application of solid waste and or effluent at rates exceeding the ability of the soils and crops to sustainably utilise applied nutrients, salts and organic matter
- land application of effluent at rates exceeding the hydraulic capacity of the soils leading to ponding on the soil surface and/or runoff from the utilisation areas to drainage lines or watercourses;
- erosion and sedimentation of exposed areas; and
- storage and handling of fuel and chemicals resulting in accidental spills or leaks, failure of a control or inappropriate storage and handling.

4.3 Factors likely to affect soil and water quality and impacts

In addition to the inherent risks of specific operation activities creating potential impacts to soil and water quality, a number of other environment factors also affect the likelihood of soil and water quality impacts. These include:

- Wind direction – determines whether dust and suspended particles are transported in the direction of surface waters;
- Wind speed – governs the potential suspension and drift of particles;
- Soil type – more erodible soil types have an increased soil or dust erosion potential;
- Soil moisture – increased soil moisture reduces soil or dust erosion potential;
- Temperature – governs the growth rates of crops,
- Rainfall (intensity, frequency, duration)/flooding – extended periods of rainfall increase the risk of overtopping of holding liquid waste storages, deep drainage of nutrients within utilisation areas, offsite movement of contaminants, failure of low permeability barrier underlying pen surfaces, failure of crops and reduces dust from exposed surfaces. Intensity of rainfall increases erosion risk and sediment movement.

4.4 Impacts

The potential for impacts on soil and water quality will depend on a number of factors. Primarily impacts will be dependent on the nature, extent and magnitude of operation activities and their interaction with the natural environment. Potential impacts attributable to operation might include:

- Exposed soils, creating the potential for offsite transport of eroded sediments and pollutants.
- Impacts to soils and/or water quality and/or sensitive area damage from inappropriate storage, handling and utilisation of effluent and solid waste.

- Alteration of surface and subsurface flows that could cause disturbances to hydrology and hydraulics.
- Contamination of soils and surface and groundwater from accidental spills or oil leaks. This might include grease or fuel from machinery and vehicles, or spills of other materials that may be used during the course of operation.
- Contamination of soils, and surface and groundwater from compromise / loss of integrity of the low-permeability barrier within the controlled drainage area of the Project complex.
- Impacts to groundwater and surface water quantity from unsustainable use of these resources.

Some impacts to soil and water quality attributable to the Project are anticipated and have been described in the Project's Environmental Impact Statement (RDC Engineers Pty Ltd, 2025).

Section 4.5 provides a suite of mitigation measures that will be implemented to avoid or minimise impacts to soil and water quality.

4.5 Mitigation measures

Table 3 describes the mitigation measures for soil and water quality impacts due to facility operations and summarises the responsibilities that have been documented within this plan.

A major management tool in all instances will be on-site visual inspections and the regular soil and water quality monitoring. The soil and water quality monitoring results provides factual data that enables operational activities to be adjusted to avoid exceedances of regulatory soil and water quality criteria.

Table 3 – Soil and water quality management and mitigation measures

Source	Mitigation measure	Responsibility	Timing	Reference
General				
	Training will be provided to all Project personnel, including relevant sub-contractors, on soil and water quality control practices and the requirements from this plan through inductions and targeted training.	Feedlot Manager /Farm Manager	Operation - Induction	OEMP
	An environmental specialist will be engaged and regularly consulted throughout operation to provide advice on soil and water quality monitoring.	Feedlot Manager	Operation - As required	Best practice
	An Environmental Protection Licence will be obtained for the Project. All relevant conditions relating to soil and water quality management will be implemented as required by the EPL.	Feedlot Manager	Prior to Operation	*POEO Act 1997,* CoA
Procedures and Plans				
	Erosion and sediment control plans (ESCPs) will be prepared and implemented in advance of any significant earthworks being undertaken outside of the controlled drainage area during operations.	Maintenance Supervisor	Operation - As required	Best practice
	Procedures will be prepared and implemented for solid and liquid waste management to manage any adverse environmental impacts. Refer Appendix A.	Operations Manager / Maintenance Supervisor	Operation - As required	Best practice
Erosion and Sediment Control				
	Clean and dirty water runoff will be adequately separated to avoid mixing where possible through the use of diversions, clean water drains and the installation of permanent drainage infrastructure.	Feedlot Manager / Maintenance Supervisor	Pre-Operation	CoA, Best practice
	Exposed areas will be progressively rehabilitated. Methods will include permanent vegetation, or temporary protection with cover crops.	Feedlot Manager / Maintenance Supervisor / Farm Manager	Operation – ongoing	Good practice
	Exposed batter slopes and embankments and other areas exposed but not worked, will be protected from erosion through implementation of permanent stabilisation measures e.g. seeding, revegetation.	Feedlot Manager / Maintenance Supervisor	Pre-operation and Operation	Good practice

	Pen areas, catch drains, contour and diversion drains will be maintained and shaped with an even gradient to facilitate drainage.	Maintenance Supervisor	Operation – Repairs and maintenance	Environmental Management System; CoA
	Waste water or "dirty" water generated during operation will, wherever possible, be collected, treated and disposed of by appropriate means.	Feedlot Manager / Maintenance Supervisor	Operation	Environmental Management System
	Flow discharge points will be designed with erosion controls to manage the flow velocities.	Feedlot Manager / Maintenance Supervisor / Farm Manager	Operation	Environmental Management System, Best practice
Roads				
	A rumble grid will be provided at the access / exit point from the Project site onto public roads to minimise the tracking of soil and particulates onto public roads.	Feedlot Manager	Pre-Operation	Good practice
	Vehicle movements from site will be minimised during wet weather if the tracking of mud may become an issue.	Feedlot Manager / Farm Manager	Operation	Good practice
	Loose rock, soil, debris etc will be removed from public road surfaces (including sweeping of the road).	Feedlot Manager / Maintenance Supervisor / Farm Manager	Operation – As-required	Good practice
Material Storage and Management				
	Where refuelling on-site is required, the following management practices will be implemented: • Refuelling will be undertaken on level ground and at least 40 metres from drainage lines, waterways and/or environmentally sensitive areas. • Refuelling will be undertaken within the designated refuelling areas, with appropriate bunding and/or absorbent material beneath the vehicle. • Will not be undertaken on or in the vicinity of vegetated areas (included roadside grasses). • Will be attended at all times. • Spill kits will be readily available and personnel trained in their use. A spill kit will be kept on the refuelling truck/ at all times. • Hand tools will be refuelled within lined trays of site vehicles wherever possible.	Feedlot / Feedmill Supervisor / Farm Manager	Operation	Good practice

	Washout of livestock and feed delivery trucks and cleaning of other vehicles, plant or equipment shall be undertaken on the designated impervious bunded vehicle washdown facility.	Livestock Supervisor / Feedmill Supervisor / Farm Manager	Operation	Best practice
	All oils, chemicals, toxic substances and combustible liquids associated with the operation will be stored in roofed and bunded areas. Spill kits will be provided at all chemical storage facilities.	Feedlot Manager / Feedmill Supervisor / Farm Manager	Operation	Best practice
	An emergency spill response plan will be developed. This plan will detail measures for the prevention, containment and clean-up of accidental spills of fuels and chemicals.	Feedlot Manager	Operation	Environmental Management System, Best practice
	The storage, handling and use of chemicals and fuels will be in accordance with the Occupational Safety and Health Regulations 1996 and relevant Australia Standards.	Feedlot Manager / Feedmill Supervisor / Farm Manager	Operation	AS1940; AS2507; AS4897
Controlled Drainage Area – Production Pens/Cattle handling/Hospital pens/Cattle Lanes / Drains				
	The low-permeability barrier forming the base of the pens (production, hospital, induction), cattle lanes and drains shall be checked after removal of manure to ensure its structure and integrity has not been damaged or compromised and ongoing compliance with specified design criteria. Any damage to the barrier will be repaired.	Maintenance Supervisor	Operation	CoA, Environmental Management System, Good practice
	Pen areas, cattle lanes/drains will be maintained and shaped with an even gradient to facilitate drainage.	Maintenance Supervisor	Operation	Environmental Management System, Good practice
	Manure, spoilt feed, carcasses and holding pond sludge will be stored in the designated solid waste stockpile/carcass composting area in accordance with relevant guidelines.	Maintenance Supervisor	Operation	CoA, Environmental Management System
Controlled Drainage Area – Sedimentation Basin / Holding Pond				
	The sedimentation basin and holding pond will be inspected at regular intervals and following rainfall events to assess available water storage capacity, water quality, structural integrity and solids levels.	Maintenance Supervisor / Farm Manager	Operation	Environmental Management System, Good practice

The low-permeability barrier shall be checked after removal of solids to ensure its structure and integrity has not been damaged or compromised and ongoing compliance with specified design criteria. Any damage to the low-permeability barrier will be repaired before waste water is reintroduced into the sedimentation basin/holding pond.	Maintenance Supervisor	Operation	Environmental Management System, Good practice
All inlet and outlet pipework, structures and pumps shall be checked regularly to ensure adequate functioning, e.g. flow rates, leaks.	Maintenance Supervisor / Farm Manager	Operation	Environmental Management System, Good practice
Solid waste from the sedimentation basin will be removed to the solid waste / carcass composting area and sustainably applied to land within the solid waste utilisation area.	Maintenance Supervisor / Farm Manager	Operation	Environmental Management System, CoA
Liquid waste from the holding pond will be sustainably applied to land within the liquid waste utilisation area.	Farm Manager	Operation	Environmental Management System, CoA
Design discharge events from the holding pond shall be directed to a natural grassed discharge area. This grassed area shall filter and disperse the liquid waste whilst allowing some infiltration. As the design discharge events are at a frequency of one in 10 years, the concentration of nutrients shall be sustainably adsorbed and utilised by vegetation in between events.	Farm Manager	Operation	Environmental Management System, CoA
Water quality and Use			
Groundwater drawdown and impacts on existing users will be minimised by: • Sustainable use of groundwater in accordance with the allocation and entitlements attached to the land on which the Project is located; • Monitoring groundwater levels; and • Monitoring groundwater quality.	Feedlot Manager / Farm Manager	Operation	Environmental Management System, CoA
Surface water use and impacts on existing users will be minimised by: • Sustainable use of surface water in accordance with the allocation and entitlements attached to the land on which the Project is located; and • Monitoring surface water quality.	Feedlot Manager / Farm Manager	Operation	Environmental Management System, CoA
Solid waste and effluent are only applied to designated solid waste and effluent utilisation areas.	Feedlot Manager / Farm Manager	Operation	Environmental Management System, CoA

Solid waste and effluent are applied to utilisation areas at rates that avoid runoff and excessive leaching.	Farm Manager	Operation	Environmental Management System, CoA
The land application of solid waste and effluent is made at rates consistent with the ability of soils and crops grown in the on-site utilisation areas to sustainably utilise the applied nutrients, salts and organic matter, under the climatic conditions prevailing at the site.	Farm Manager	Operation	Environmental Management System, CoA
Vegetative buffers around drainage lines designed to help protect surface water are maintained in their intended condition.	Farm Manager	Operation	Environmental Management System, Good Practice
Monitoring and Reporting			
All soil and water quality monitoring requirements will be undertaken in accordance with the following guidelines: • Environmental Guidelines: Use of Effluent By Irrigation (NSW DEC 2004) • Sampling Manual for environmental monitoring by intensive livestock industries (Redding (2003)	Feedlot Manager	Operation – As-required	Environmental Guidelines: Use of Effluent By Irrigation (NSW DEC 2004); Sampling Manual for environmental monitoring by intensive livestock industries (Redding 2003)
Monitoring of soil and water quality will be undertaken in accordance with EPL requirements.	Feedlot Manager	Operation – As-required	CoA, Environmental Management System
Records of soil and water quality monitoring will be maintained. Details will include: • Date, time and location of each sample. • Soil and/or water quality test results for each sample. • The personnel undertaking the sampling.	Feedlot Manager	Operation – Event basis	CoA, Environmental Management System
Rainfall forecasts will be monitored daily and the site managed to minimise soil and water quality impacts from rainfall events.	Farm Manager	Operation – Daily	Best practice
Ensure the soil and water quality results are routinely analysed, assessed and reported in accordance with the conditions of the EPL.	Farm Manager	Operation – Annually	CoA, Environmental Management System

A 24-hour community response telephone line shall be maintained.	Facilities Manager	Operation – On-going	*CoA,* Environmental Management System
In the event of a soil and/or water quality complaint, records shall be kept in the complaints register and investigations will be undertaken to confirm the source of the issue. Additional mitigation measures will be investigated and implemented. In the event of ongoing soil and water quality issues, operational activities will be reviewed and if necessary the activity stopped, until suitable measures can be employed to manage this issue.	Facilities Manager	Operation – Event basis	CoA, Environmental Management System
Pollution incidents posing material harm to the environment shall be notified to each 'relevant authority' as defined in section 148(8) of the *POEO Act 1997*.	Feedlot Manager	Operation – Event basis	Environmental Management System, *POEO Act 1997*, CoA
Review and Improvement			
In line with the Complaints and Enquiries Procedure, following a complaint and its subsequent investigation, feedback regarding the source and nature of the complaint will be provided to the affected stakeholders and/or community members (section 7).	Feedlot Manager	Operation – Event basis	Environmental Management System, CoA

5 Implementation

5.1 Roles and Responsibilities

The organisational structure of the Project and overall roles and responsibilities are outlined in Section 7.3 of the OEMP. Specific responsibilities for the implementation of environmental controls are details in Table 3 of this Plan.

5.2 Induction

Doolin Farming Pty Ltd has a site induction program that all contractors and employees are required to complete prior to undertaking any work on the Project site in accordance with section 9.1 of the OEMP.

5.3 Training

Doolin Farming Pty Ltd has a targeted training program for Project staff and contractors in accordance with section 9.2 of the OEMP.

Examples of training topics for employees and contractors with a key role in soil and water quality management include:

- Approved solid waste and effluent utilisation areas;
- Determination of sustainable application rates of solid waste and effluent to land;
- Planning and preparedness for adverse environment factors – e.g. high rainfall;
- Changes to operation activities that may impact soil and water quality; and
- Lessons learnt from incidents and other events e.g. high rainfall.

5.4 Incident management

A comprehensive Incident Management System is currently implemented at the Project site as outlined in section 12 of the OEMP.

5.5 Complaints management

The investigation, response and reporting of complaints shall be undertaken in accordance with section 10.3.3 of the OEMP.

6 Performance Evaluation

6.1 Performance Indicators

The extent to which this Plan complies with CoA will be measured by the following performance indicators:

- Compliance with relevant baseline standards at monitoring locations; and
- Compliance with this plan, as indicated by internal and statutory reporting.

6.2 Monitoring

Regular monitoring and inspections will be undertaken during operation in accordance with Table 4. The proposed number of monitoring locations, frequency of monitoring and relevant monitoring methods are detailed in the Operation Environmental Monitoring and Management Plan (OEMMP) in Appendix B5 of the OEMP.

Additional requirements and responsibilities in relation to inspections and monitoring are documented in sections 10.1 and 10.2 of the OEMP.

Table 4 – Soil and water quality monitoring details summary

Monitoring details	Location	Responsibility	Frequency	Record	KPI
Soil nutrient levels (Effluent utilisation areas)	Refer to OEMMP	Farm Manager	As outlined in OEMMP	AACR	No adverse impacts to soils
Soil nutrient levels (Solid waste utilisation areas)	Refer to OEMMP	Farm Manager	As outlined in OEMMP	AACR	No adverse impacts to soils
Surface water quality	Refer to OEMMP	Farm Manager	As outlined in OEMMP	AACR	No adverse impacts to surface waters
Groundwater quality	Refer to OEMMP	Farm Manager	As outlined in OEMMP	AACR	No adverse impacts to groundwater

6.3 Reporting

Soil and water quality management reporting is designed to comply with the CoA and provide stakeholder access to relevant soil and water quality information and data.

Key stakeholders requiring access to this information include Doolin Farming Pty Ltd, state and local government agencies and the local community. Reporting will be undertaken in accordance with section 9.4 of the OEMP and Table 5. Annual reporting will be undertaken in accordance with CoA and the Annual Return requirements detailed in the EPL.

Table 5 – Project reporting requirements

Instrument	Authority	Requirement	Frequency	Report
EPL	EPA	Management of soil and water quality	Every 12 months	Annual Return
EPL	EPA	Soil and water quality monitoring results	Every 12 months	Annual Return
EPL	EPA	Groundwater Monitoring Summary	Every 12 months	Annual Return
EPL	EPA	Surface water Monitoring Summary	Every 12 months	Annual Return
POEO Act 1997	EPA	Pollution incidents	Event basis	Notification

Doolin Farming Pty Ltd will report soil and water quality monitoring results in the Annual Return to EPA for the EPL.

Doolin Farming Pty Ltd will report on the management of soil and water quality in the Annual Return to EPA for the EPL.

The Annual Return for the EPL will include a soil and water quality monitoring component covering the following items:

- Soil and water quality monitoring results and comparison to baseline levels;
- An explanation for any missing soil and water quality monitoring results;
- Soil and water quality related complaints and management/mitigation measures undertaken;
- Management/mitigation measures undertaken in the event of any confirmed exceedance of performance criteria; and
- Review of the performance of management/mitigation measures and the monitoring program.

Doolin Farming Pty Ltd is required to report pollution incidents immediately and without delay in accordance with the requirements of the *POEO Act 1997*.

6.4 Auditing

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental mitigation measures, compliance with this Plan, CoA and other relevant approvals, licences and guidelines. Audit requirements are detailed in section 11.4 of the OEMP.

The audit process will generally be designed to examine the status of the key components of this Plan, review soil and water quality concerns management and evaluate the overall performance of soil and water quality management for the Project.

The strategy for Doolin Farming Pty Ltd audit processes is to ensure compliance and promote continuous improvement as part of the Project's soil and water quality management regime.

In addition, the Plan may be subject to audit by the Gwydir Shire Council or the Department administering the *Protection of the Environment Operations Act 1997* (currently EPA) during compliance inspections and other site inspections and as a possible component of a formal soil and water quality concerns investigation process.

7 Review and Improvement

7.1 Non-conformances and corrective actions

Any non-conformances related to soil and water quality will be dealt with and documented in accordance with section 11.5 of the OEMP.

7.2 Continual improvement

This Plan and associated monitoring program will be reviewed, and if necessary revised to the satisfaction of the NSW EPA as the Department currently administering the *Protection of the Environment Operations Act 1997* in accordance with section 12 of the OEMP:

- where a risk assessment identifies the requirement to alter the Plan;
- following changes to project approval or licence conditions relating to soil and water quality management or monitoring;
- following any significant soil and/or water quality related incident;
- where there is a relevant change in technology or legislation; or
- for necessary or any unforeseen changes to soil and water quality monitoring locations.

8 References

Department of Environment and Conservation (NSW), 2004, Effluent Guidelines, Use of Effluent by Irrigation, Department of Environment and Conservation (NSW), Sydney, NSW.

Department of Environment and Conservation (NSW), 2004, Approved Methods for the Sampling and Analysis of Water Pollutants in New South Wales, Department of Environment and Conservation (NSW) Sydney South.

McGahan and Tucker, 2003, Resource manual of development of indicators of sustainability for effluent reuse in the intensive livestock industries: Piggeries and Cattle Feedlots, Project No 1816, Australian Pork Limited, Canberra, Australia, May 2003.

Meat and Livestock Australia, 2012a, National Guidelines for Beef Cattle Feedlots in Australia 3rd Edition, Meat & Livestock Australia, North Sydney, NSW.

Meat and Livestock Australia, 2012b, National Beef Cattle Feedlot Environmental Code of Practice 2nd Edition, Meat & Livestock Australia, North Sydney, NSW.

RDC Engineers Pty Ltd, 2025, Proposed Intensive livestock agriculture development (Expansion of beef cattle feedlot from 999 head to 3,000 head) on the property "Springfield", Development Application and Environmental Impact Statement, V1R2 RDC Engineers Pty Ltd, Toowoomba, QLD, 4350.

Redding, MR, 2003, Sampling Manual for environmental monitoring by intensive livestock industries. Agency for Food and Fibre Sciences, Department of Primary Industries, Toowoomba, Queensland.

Standards Australia, 2017, AS 1940:2017: The storage and handling of flammable and combustible liquids, Sydney, NSW.

Standards Australia, 1998, AS 2507-1998: The storage and handling of agricultural and veterinary chemicals, Sydney NSW.

Standards Australia, 1998, AS 5667.4-1998: Water quality - Sampling, Part 4: Guidance on sampling from lakes, natural and man-made, Sydney NSW.

Standards Australia, 1998, AS 5667.11-1998: Water quality - Sampling - Guidance on sampling of groundwaters, Sydney NSW.

Standards Australia, 2008, AS 4897-2008: The design, installation and operation of underground petroleum storage systems, Sydney NSW.

Appendix A – Standard Operational Procedures

OSWQMP SOP 1 - Soil and Water Quality – Soil quality monitoring procedure

Aspect	Soil and water quality – Soil quality monitoring
Objectives	To implement a soil quality monitoring program to monitor the quality of soils in the effluent and solid waste utilisation areas such that impacts on community amenity, occupational health and the environment are minimised.
Potential Impacts	Occupational health and safety of employees and contractors. Animal health and performance. Receiving environment such as groundwater or terrestrial ecosystems affected by pollution events. Receiving environment such as agricultural crops impacted by pollution events.
Control Actions	Implement a soil quality monitoring program for the effluent and solid waste utilisation areas in accordance with this Plan. Undertake soil quality monitoring from the relevant monitoring points in accordance with the EPL. Identify the location of monitoring points within the effluent and solid waste application areas using GPS. Prepare chain of custody form and sample bags for each sample. Identify parameters to be tested and outline on the relevant chain of custody form. Refer section 8.2 for requirements. Collect representative soil sample(s) and store in appropriate sample bags as per relevant monitoring and sampling guidelines. Samples are to be sent as soon as possible after collection to a NATA-accredited laboratory for the parameters to be analysed with the relevant chain of custody forms.
Relevant Standards, Management Plans, Records	CoA Non-compliance record Personnel induction, training and awareness Redding (2003) Sampling Manual for environmental monitoring by intensive livestock industries Annual Return
Responsibility	As required by the OEMP and specific requirements outlined in section 5.1.
Performance Indicators	Ensure all personnel responsible for monitoring are adequately trained. No non-compliances with CoA. No adverse impacts to environmental values.
Monitoring	As required by the OEMP and specific requirements outlined in section 6.2.
Reporting	As required by the OEMP and specific requirements outlined in section 6.3.
Corrective Actions	Review soil quality monitoring program. Seek specialist advice where a significant level of environmental risk or impact is identified with soil quality parameters.

OSWQMP SOP 2 – Soil and Water Quality – Water quality monitoring procedure

Aspect	Soil and water quality – Water quality monitoring
Objectives	To implement a water quality monitoring program to monitor and report on the quality of water from various sources such that impacts on community amenity, occupational health and the environment are minimised.
Potential Impacts	Occupational health and safety of employees and contractors. Animal health and performance. Receiving environment such as surface water and aquatic and terrestrial ecosystems affected by pollution events. Community amenity and health from impacts on water sources. Receiving environment such as agricultural crops impacted by pollution events.
Control Actions	Implement a water quality monitoring program for groundwater and surface water in accordance with this Plan. Undertake groundwater and surface water quality monitoring from the relevant monitoring points in accordance with the EPL. Prepare chain of custody form and sample bottle for each sample. Identify parameters to be tested and outline on the relevant chain of custody form. Refer section 8.2 for requirements. Collect representative water sample(s) and store in appropriate sample bottle as per relevant monitoring and sampling guidelines. Samples are to be sent as soon as possible after collection to a NATA-accredited laboratory for the parameters to be analysed with the relevant chain of custody forms.
Relevant Standards, Management Plans, Records	CoA Non-compliance record Personnel induction, training and awareness Redding (2003) Sampling Manual for environmental monitoring by intensive livestock industries Annual Return
Responsibility	As required by the OEMP and specific requirements outlined in section 5.1.
Performance Indicators	Ensure all personnel responsible for monitoring are adequately trained. No non-compliances with CoA. No adverse impacts to environmental values.
Monitoring	As required by the OEMP and specific requirements outlined in section 6.2.
Reporting	As required by the OEMP and specific requirements outlined in section 6.3.
Corrective Actions	Review water quality monitoring program. Seek specialist advice where a significant level of environmental risk or impact is identified with water quality parameters.

Appendix B3 – Solid and liquid waste management plan

Springfield Feedlot

Draft Operation Solid and Liquid Waste Management Plan

"Springfield"
2513 Getta Getta Road
North Star NSW 2408

Doolin Farming Pty Ltd
"Glenhoma"
3202 Getta Getta Road
NORTH STAR NSW 2408

[February 2025]

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DOCUMENT INFORMATION RECORD

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Project:	Proposed expansion of Springfield Feedlot
Project No:	E2-103

Document control

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Author:	Rod Davis	**Position:**	Director
Signature:		**Date:**	21/02/2025
Reviewed by:	Rod Davis	**Position:**	Director
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Approved by:	Rod Davis	**Position:**	Director
Signature:		**Date:**	21/02/2025

Revision history

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V1R1	24/01/2025	Draft for client review	Rod Davis	Rod Davis	Rod Davis
V1R2	21/02/2025	Final for lodgement to GSC	Rod Davis	Rod Davis	Rod Davis

Distribution

Version	Recipient	Lodgement	Copies
V1R1	Doolin Farming Pty Ltd	Electronic	-
V1R2	Doolin Farming Pty Ltd / Gwydir Shire Council (GSC)	Electronic	-

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1 Background

1.1 Introduction

Doolin Farming Pty Ltd own and operate a 10,000 ha mixed farming operation across several properties at North Star including "Glenhoma", "Glenmodel", "Springfield", "Myall Downs" and "Yetman West" some 27 km east of Yetman and 45 km south-southeast of Goondiwindi (QLD) in NSW.

Doolin Farming Pty Ltd primarily engage in dryland and irrigated cropping and beef production. Doolin Farming Pty Ltd produces wheat, barley, oats and chickpeas in winter and cotton and maize in summer under pivot irrigation systems and dryland sorghum cropping.

Central to the beef production enterprise is the breeding, growing and lot-feeding of cattle for the domestic market. The beef supply chain includes breeding and growing of beef cattle on land less suitable for dryland and irrigated cropping and grazing of stubble and lot feeding of cattle within a feedlot on the property 'Springfield".

"Springfield" comprises some 1,713 ha (~4,231 acres) and currently, a dryland and irrigated cropping business is undertaken on a large proportion of the property with extensive cattle breeding and grazing of beef cattle on the remaining land which is unsuitable for cropping and lot feeding of cattle within a beef cattle feedlot in the north-east of the property.

The feedlot is known as Springfield Feedlot and operates for 12 months of the year and employs approximately 4 full time staff. Casual staff and contractors are engaged as required during busy periods such as planting and harvesting of silage and fodder and to supply various associated services such as plant maintenance and veterinary requirements.

Springfield Feedlot includes one controlled drainage area with associated production pens and drainage system which includes catch drains, sedimentation basin and holding pond. Springfield Feedlot also has auxiliary infrastructure to support the use such as cattle handling and feed storage and processing facilities.

Springfield Feedlot is accredited under the National Feedlot Accreditation Scheme (NFAS) with audits conducted annually.

1.2 Environmental management systems overview

The overall Environmental Management System for the Project is described in the Operation Environmental Management Plan (OEMP).

The Operation Solid and Liquid Waste Management Plan (OSLWMP or Plan) is part of Doolin Farming Pty Ltd's environmental management framework for the Project, as described in section 4.2 of the OEMP. Management measures identified in this Plan will be incorporated into site or activity specific Environmental Standard Work Instruction (ESWIs).

ESWIs will be developed and signed off by Feedlot Manager or environment management representatives prior to associated works and operation personnel will be required to undertake works in accordance with the identified mitigation and management measures.

Used together, the OEMP, strategies, procedures and ESWIs form management guides that clearly identify required environmental management actions for reference by Doolin Farming Pty Ltd's personnel and contractors.

The review and document control processes for this Plan are described in Chapter 10 of the OEMP.

2 Purpose, scope, and objectives

2.1 Purpose

This Operation Solid and Liquid Waste Management Plan (OSLWMP or Plan) forms part of the Operation Environmental Management Plan (OEMP) for the Springfield Feedlot (the Project).

This Plan has been prepared to address the Department of Planning and Environment (DPIE), Gwydir Shire Council (GSC) and the NSW Environment Protection Authority (NSWEPA) requirements of the Conditions of Approval (CoA) and the mitigation measures listed in the Springfield Feedlot EIS (RDC Engineers Pty Ltd, 2025) and all applicable legislation.

The Project has not commenced operation. This Plan will be reviewed and updated once operations commence.

2.2 Scope

This Operation Solid and Liquid Waste Management Plan (OSLWMP) describes how Doolin Farming Pty Ltd will manage solid and liquid waste during operation of the Project.

Waste streams identified to be generated during the operations phase are outlined in Table 1.

Table 1 – Operations phase solid and liquid waste streams

Waste Type	Typical streams	Classification	Proposed Reuse/Recycling /Disposal Method
Solid			
	Tyres	Special waste	On-site reuse e.g., silage cover weight. Any surplus will be sent to an off-site recycler.
	Batteries	Hazardous waste	Off-site disposal at an approved facility
	Drained oil filters, oil drums and other drums	General solid waste (non-putrescible)	Off-site recycling
	Oil rags, oil-absorbent materials	General solid waste (non-putrescible)	Off-site disposal at an approved facility
	Animal wastes (manure/carcasses/spoilt feed)	General solid waste (putrescible)	Beneficial reuse on-site to designated land areas
	Domestic waste generated by workers	General solid waste (putrescible)	Beneficial reuse on-site to designated land areas
	Glass bottles and aluminium cans	General solid waste (non-putrescible)	Off-site recycling
	Paper, plastic and cardboard	General solid waste (non-putrescible)	Off-site recycling
Liquid			
	Wastewater from controlled drainage area	Effluent	Beneficial reuse on-site to designated land areas
	Sewage	Sewage	On-site disposal via approved treatment and disposal.
	Used motor oils, grease	Liquid waste	Off-site disposal at an approved facility

2.3 Objectives

The key objective of this Plan is to ensure that impacts on the environment from solid and liquid waste are minimised and within the scope permitted by the CoA.

To achieve this objective, Doolin Farming Pty Ltd will:

- ensuring all CoA and Doolin Farming Pty Ltd Operation Policies and Standards are met in relation to solid waste management;
- ensure appropriate controls and procedures are implemented during operation activities to avoid or minimise environmental impacts from solid and liquid waste and potential adverse impacts to sensitive receivers within the vicinity of the Project;
- ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in section 3 of this Plan;
- implementing applicable best practice management to minimise the impact of solid waste utilisation from facility operations on the environment and nearby sensitive receivers;
- identifying and implementing reasonable and feasible measures to minimise the release of contaminants in solid and liquid waste to groundwater and surface waters; and
- maintaining an effective response mechanism to deal with incidents and complaints.

3 Legislative and other requirements

3.1 Legal requirements

Legislation relevant to waste management includes:

- Environmental Planning and Assessment Act 1979 (EP&A Act);
- Protection of the Environment Operations Act 1997 (POEO Act);
- Waste Avoidance and Resource Recovery Act 2001 No 58;
- Protection of the Environment Operations Amendment (Illegal Waste Disposal) Act 2013 No 60;
- Protection of the Environment Operations (Waste) Regulation 2014;
- Local Government (General) Regulation 2005.

Relevant provisions of the above legislation are explained in the register of legal and other requirements included in Appendix A1 of the OEMP.

3.2 Guidelines and standards

The main guidelines, specifications and policy documents relevant to this Plan are outlined in Table 2.

Table 2 – Relevant guidelines and standards

Guideline/Standard	Relevance
Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ 2000)	Provides a framework for recognising and protecting water quality for the full range of existing environmental values.
AS 4454 –2012 - Australian Standard for Composts, Soil Conditioners and Mulches Standards Association of Australia, Sydney	This Standard specifies physical, chemical, biological and labelling requirements for composts, mulches, soil conditioners and related products that have been derived largely from compostable organic materials and which meet the minimum requirements as set out in this Standard.
Department of Environment and Conservation (NSW), 2004, Effluent Guidelines, Use of Effluent by Irrigation	Provides guidelines for planning, designing, installing, operating and monitoring effluent irrigation systems to diminish risks to public health, the environment and agricultural resources and outlines the statutory requirements that may be needed for an effluent irrigation system in NSW.
International Erosion and Sediment Control (IECA) (Australasia) 2008. Best practice erosion and sediment control. International Erosion Control Association (Australasia), Picton, NSW.	Provides guidance for the design, construction and implementation of measures to improve stormwater management, soil erosion risks and sediment control from disturbed sites.
Landcom, 2004, The Blue Book – Managing Urban Stormwater: Soils and Construction Volume 1, 4th Edition, March 2004 (reprinted 2006) (the "Blue Book"). Volume 1 and Volume 2.	Provides guidance for the design, construction and implementation of measures to improve stormwater management, soil erosion risks and sediment control from disturbed sites.
NSW Department of Primary Industries, 2004, Landform and soil requirements for biosolids and effluent reuse, Agnote DPI-493, NSW Government.	Outlines the landform and soil physical and chemical characteristic requirements for the reuse of biosolids and effluent.
McGahan EJ and Tucker RW, 2003, Resource manual of development of Indicators of sustainability for effluent reuse in the intensive livestock industries: Piggeries and Cattle Feedlots, Project No 1816, Australian Pork Limited, Canberra, Australia, May 2003.	Provides readily available data and analysis techniques for evaluating the sustainability of effluent and solid by-product reuse for piggeries and cattle feedlots and suggested sustainability indicators for these intensive livestock industries.
Meat and Livestock Australia, 2012a, National Beef Cattle Feedlot Environmental Code of Practice 2nd Edition, Meat & Livestock Australia, North Sydney, NSW.	The *Code* is designed to be a companion document to the *National Guidelines for Beef Cattle Feedlots in Australia*. The *Code* is intended to provide requirements for the environmentally relevant aspects of the establishment and operation of beef cattle feedlots.
MLA, 2012b, National Guidelines for Beef Cattle Feedlots in Australia 3rd Edition, Meat & Livestock Australia, North Sydney, NSW	The *National Guidelines for Beef Cattle Feedlots in Australia* is designed to provide 'guidance' on how the *Code* requirements regarding the establishment and operation of beef cattle feedlots may be achieved
Meat and Livestock Australia, 2015a, Beef Cattle Feedlots: Design and Construction, Meat and Livestock Australia, North Sydney, NSW.	This manual outlines the stages of selecting a suitable site, designing the feedlot and its facilities, their construction and the overall management of the project.

Meat and Livestock Australia, 2015b, Beef cattle feedlots: waste management and utilisation, Meat and Livestock Australia, North Sydney, NSW.	This manual provides best-practice guidelines for waste management in beef cattle feedlots.
Redding, MR (2003), Sampling Manual for environmental monitoring by intensive livestock industries. Agency for Food and Fibre Sciences, Department of Primary Industries, Toowoomba, Queensland.	This manual sets out the sample collection and preparation techniques needed to fulfil the monitoring requirements of intensive livestock licences (under the QLD EP Act) for soil, effluent, manure, sludge, surface water and groundwater samples.
Rayment, G.E. and Lyons, D.J. (2010). Soil Chemical Methods -Australasia, CSIRO Publishing, ISBN: 9780643067684.	This handbook describes laboratory and field chemical tests and guidance on soil sampling and choice and application of analytical methods from soil sampling through to the reporting of results.

3.3 Conditions of approval

The CoA relevant to this Plan are listed in Table 3. A cross reference is also included to indicate where the condition is addressed in this Plan or other Project management documents.

Table 3 – Conditions of Approval relevant to this plan

CoA	Condition requirements	Plan reference
Notice of Determination		
	To be completed after Notice of Determination is issued	
EPL		
	To be completed after EPL is issued	

4 Waste management strategy

All waste generated during operation and maintenance of the site shall be dealt with in an environmentally sensitive manner and in accordance with relevant legislation. Waste management shall consider the waste hierarchy of reduction, reuse and recycling of wastes prior to disposal.

Where activities are likely to generate waste, appropriate procedures shall be implemented to ensure responsible disposal of waste is undertaken or, where possible, appropriate recycling of waste. Likely and expected waste streams for the site include putrescible and non-putrescible general solid waste as outlined in Table 1.

4.1 Waste streams

Waste streams identified to be generated during the operation phase of the Project are outlined in Table 1. Waste streams shall be identified in accordance with NSW Environment Protection Authority (EPA) Waste Classification Guidelines (NSW EPA, 2014).

4.2 Waste management hierarchy

Waste management shall be accomplished through hierarchical application of the practices of source reduction, re-use, recycling/recovery, treatment and responsible disposal. Elements of these practices are detailed below.

Reduction at source: Eliminate or decrease where practicable, the volume, concentration, or toxicity of a waste stream through:

- Process optimisation and proper maintenance;
- Substitution;
- Material elimination;
- Management and control of inventories; and
- Improved housekeeping.

Where wastes cannot be reduced at source, the next preferred waste stream options are reuse or recycle/recovery if they are correctly segregated.

Re-use: Use materials or products more than once, in their original form.

Recycle/Recovery: Convert wastes into usable materials and/or extract energy or materials from wastes

The least preferred waste management options are treatment and responsible disposal.

Treatment: destroy, detoxify, and/or neutralise residues through processing.

Responsible disposal: Use appropriate methods to responsibly dispose of any waste streams that remain after all practicable source reduction, re-use, recycle/recovery and treatment options have been implemented

4.3 Waste management processes

Figure 1 broadly summarises the stages of waste management for the Project associated with the scope of this Plan. For further detail on individual waste streams and treatment methods refer to section 4.4.

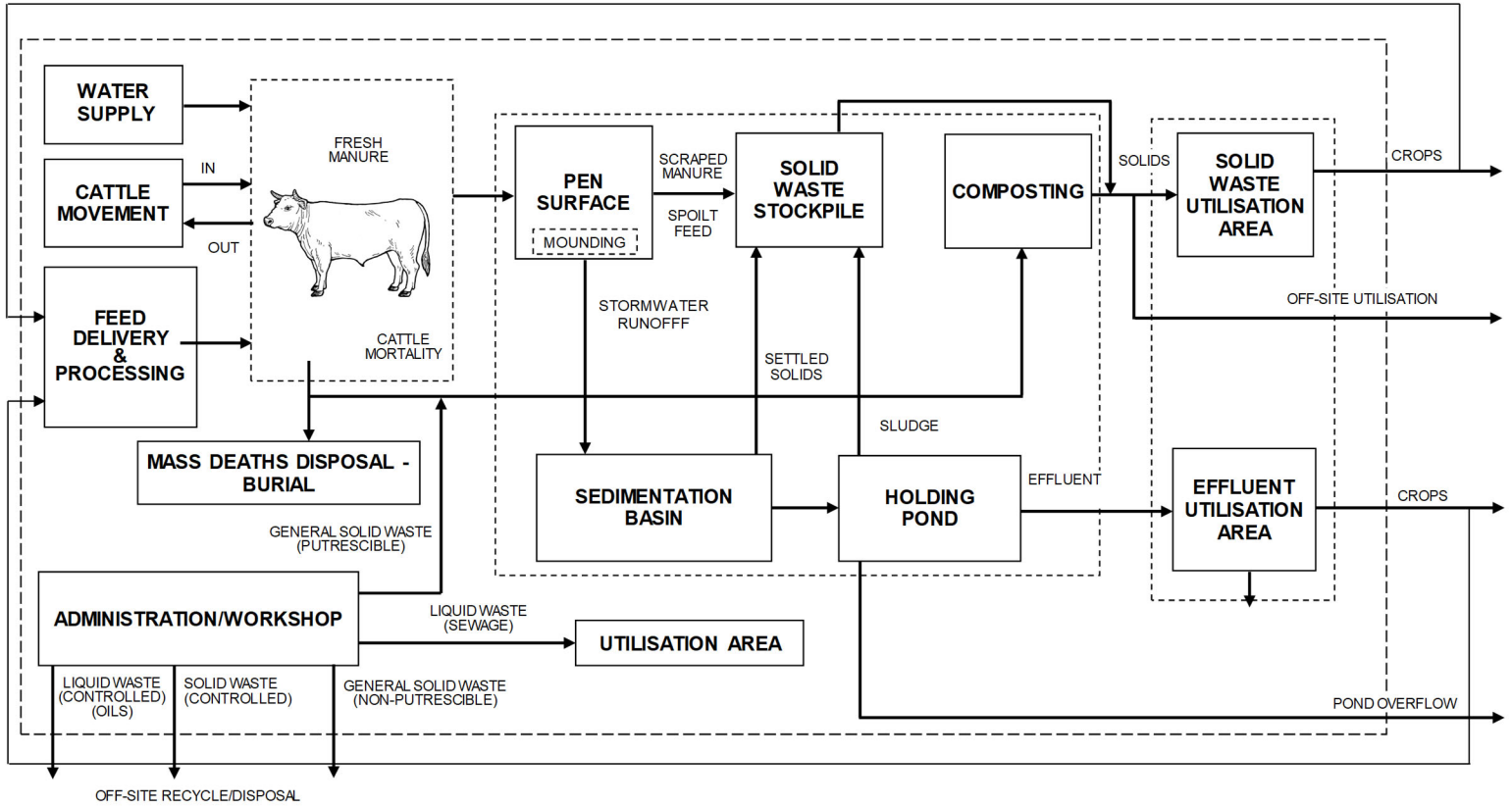


Figure 1 – Waste management process summary

4.4 Waste management facilities and activities

4.4.1 Overview

The following waste management facilities will be provided on-site for the storage, treatment, and utilisation of wastes from the Project. Waste management and monitoring requirements for these facilities are detailed in section 6.2.

4.4.2 Waste storage and handling

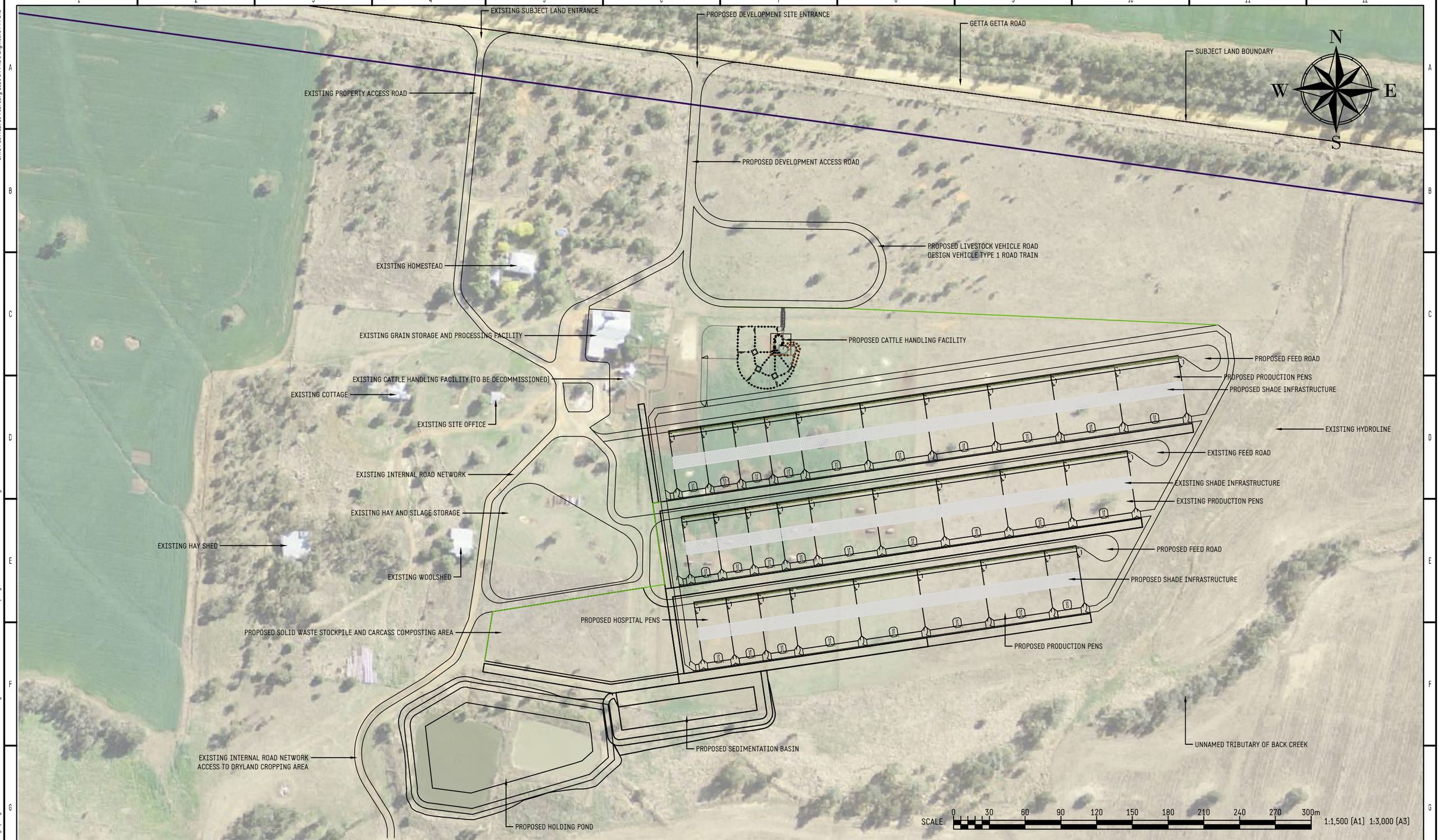
4.4.2.1 General

The principal waste management activity for the Project will be storage and handling of generated solid (putrescible) waste from manure and composted mortalities, prior to utilisation on the Project site.

Waste storage facilities on the Project site will be appropriate in size for the expected volumes of waste. The location of waste storage and handling facilities at the site are shown on Figure 2.

The following storage and handling facilities shall be used:

- solid waste storage areas – manure/carcass compost/spoilt feed, general waste etc.
- liquid waste storage areas – sewage, waste oils etc.



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY

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A	24/01/25	DRAFT ISSUE TO CLIENT	RJD	RJD	RJD
B	21/02/25	FINAL ISSUE FOR SUBMISSION TO GSC	RJD	RJD	RJD

SCALE	1:3,000 (A3)
DRAWN	RJD
DATE	21/02/2025
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DATE	21/02/2025
APPROVED	RJD
DATE	21/02/2025

CLIENT: DOOLIN FARMING PTY LTD
PROJECT: SPRINGFIELD BEEF CATTLE FEEDLOT
TITLE: DRAFT OPERATION SOLID AND LIQUID WASTE MANAGEMENT PLAN
PROJECT SITE - WASTE STORAGE AND HANDLING FACILITIES LOCATION

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 2		A3	E2-103-450-02	B

DATE PLOTTED: 19 February 2025 BY: RDC Engineers PTY LTD
FILE PATH: C:\RDC Engineers\RDCE - Projects\E2-103 Doolin Farming Springfield EIS\05 - ACAD MasterPlan\05.1 Drawings - CURRENT FILE NAME: E2-103 DF Springfield MASTERPLAN-00-20250108v8.dwg

4.4.3 Waste treatment

Domestic greywater and blackwater (sewage) will be treated via an on-site domestic wastewater treatment plant (WWTP). Sewage will be treated to ensure that it meets the required specifications for on-site application to land.

Solid waste shall be stockpiled in the solid waste storage and processing area within the controlled drainage area. Solid waste shall be stockpiled and passively composted pending application to the land within the solid waste utilisation area.

Effluent will be temporarily stored in the holding pond pending application to the land within the effluent utilisation area. Effluent shall be pre-treated through a passive sedimentation system where the majority of suspended solids shall settle. After drying the settled solids shall be removed from the sedimentation basin and added to the solid waste stockpiles in the solid waste stockpile and carcass composting area.

4.4.4 Waste removal

Solid and liquid waste streams that are not re-used, recycled or utilised on-site as described in sections 4.4.2 and 4.4.3 will be sent to approved facilities for recycling, treatment, or disposal.

Section 143 of the *POEO 1997* requires waste to be transported to a place that can lawfully accept it. Any waste sent to landfill will only be disposed of to a relevant licensed facility.

Additionally, all transport and disposal of ‘controlled’ or ‘trackable’ wastes will be undertaken in compliance with the *POEO 1997.*

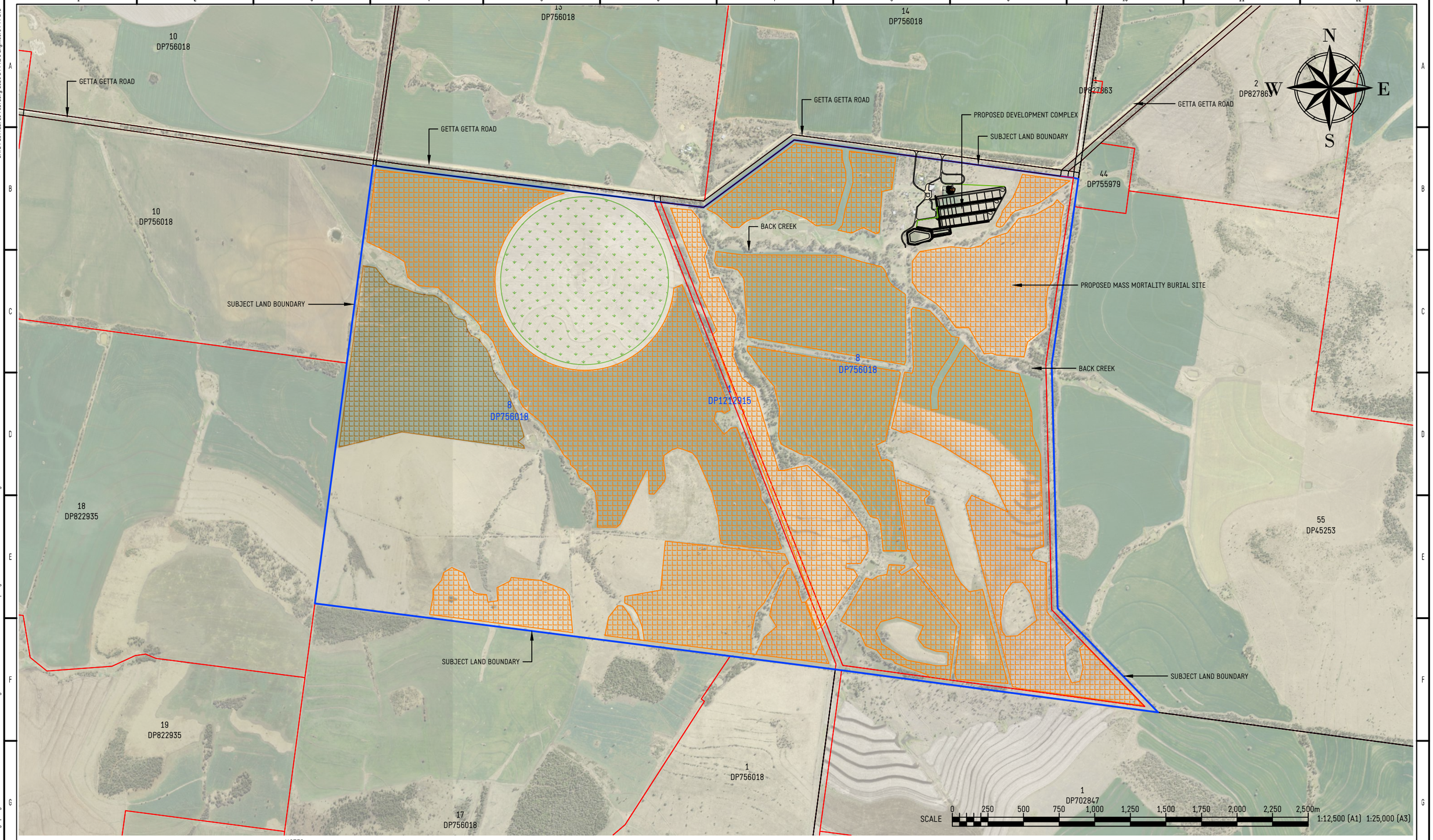
4.4.5 Waste utilisation

Animal solid waste and effluent is valued as a source of nutrients for fertilising crops or pasture and therefore, shall be applied to land where it can be sustainably utilised by crops, pasture and soil. Land is required for the long term application of water, nutrients, salts and organic loads in the effluent and solid wastes.

The solid waste and effluent utilisation areas have been selected and sized to be ecologically sustainable to prevent environmental harm, especially to soils, groundwater and surface water.

The effluent utilisation system is a full utilisation system. In this system, the effluent is fully used (thereby no discharge to surface water), with the area required for irrigation determined by calculating the limiting land area using a water and nutrient balance.

The solid waste and effluent utilisation areas are shown in Figure 3.



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- PROPOSED EFFLUENT UTILISATION AREA
- PROPOSED SOLID WASTE UTILISATION AREA

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APPROVED	RJD
DATE	21/02/2025

CLIENT DOOLIN FARMING PTY LTD
PROJECT SPRINGFIELD BEEF CATTLE FEEDLOT
TITLE DRAFT OPERATION AND ENVIRONMENTAL MANAGEMENT PLAN
PROJECT SITE - EFFLUENT AND SOLID WASTE UTILISATION AREA

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 3		A3	E2-103-450-03	B

DATE PLOTTED: 19 February 2025 BY: RDC Engineers PTY LTD
FILE NAME: E2-103 DF Springfield MASTERPLAN-00-20250108v8.dwg
FILE PATH: C:\RDC Engineers\RDCE - Projects\E2-103 Doolin Farming Springfield EIS\05 - ACAD MasterPlan\05.1 Drawings - CURRENT

4.5 Aspects and impacts

4.5.1 Risk analysis

A risk management approach was used to determine the severity and likelihood of the operation's solid waste management on the environment and to prioritise its significance. This process considered potential regulatory and legal risks as well as the concerns of the community and other key stakeholders.

The objectives of the risk assessment were to:

- Identify activities, events or outcomes that have the potential to adversely affect the local environment and/or human health/property;
- Qualitatively evaluate and categorise each risk item;
- Assess whether risk issues can be managed by environmental protection measures; and
- Qualitatively evaluate residual risk with implementation of measures.

Appendix A3 of the OEMP contains a list of aspects upon which solid waste management may impact and corresponding risks associated with the Project. Measures to mitigate the identified environmental risks are also provided.

4.6 Operation activities

4.6.1 Solid waste management

Key aspects of solid waste management that could result in environmental impacts include:

- poor maintenance and management of the low-permeability barrier (e.g., clay lining) in the controlled drainage area resulting in contamination of groundwater and/or surface water;
- poor management (storage and handling) of non-putrescible solid waste on-site leading to uncontrolled releases of contaminants (batteries, tyres, oil rags/drums, paper, bottles);
- poor management of timing of sludge removal from the holding pond leading to air quality (odour) impacts;
- animal solid waste applied to land other than the nominated solid waste utilisation area;
- land application of animal solid waste at rates exceeding the ability of the soils and crops to sustainably utilise applied nutrients, salts and organic matter; and

- poorly timed and managed animal solid waste application practices resulting in air quality (odour and aerosol) impacts to sensitive receivers.

4.6.2 Liquid waste management

Key aspects of liquid waste management that could result in environmental impacts include:

- poor maintenance and management of the low-permeability barrier (e.g., clay lining) in the controlled drainage area resulting in contamination of groundwater and/or surface water;
- poor maintenance and repair of effluent storage infrastructure and pumping and distribution equipment leading to uncontrolled releases of contaminants (including domestic sewage infrastructure);
- poor management of timing of irrigation events and/or sludge accumulation leading to uncontrolled releases of effluent and/or air quality (odour) impacts;
- effluent applied to land other than the nominated effluent utilisation area;
- land application of effluent at rates exceeding the ability of the soils and crops to sustainably utilise applied nutrients, salts and organic matter;
- poorly timed and managed effluent application practices resulting in air quality (odour and aerosol) impacts to sensitive receivers; and
- land application of effluent at rates exceeding the hydraulic capacity of the soils leading to ponding on the soil surface and/or runoff from the utilisation areas to drainage lines or watercourses.

4.7 Factors likely to affect solid and liquid waste management and impacts

In addition to the inherent risks of specific operation activities creating potential environmental impacts from solid waste management, a number of other environment factors also influence the management of solid waste. These include:

- Wind direction – determines whether solid waste particles, liquid waste aerosols or odours are transported in the direction of the sensitive receivers;
- Wind speed – governs the potential suspension and drift resistance of particles;
- Soil type – physical and chemical properties govern the uptake of nutrients, leaching of contaminants;
- Soil moisture – increased soil moisture reduces soil or dust erosion potential;
- Temperature – governs the growth rates of crops;
- Rainfall (intensity, frequency, duration)/ flooding – extended periods of rainfall increase the risk of overtopping of liquid waste storages, deep drainage of nutrients within utilisation areas, offsite movement of contaminants, failure of low permeability

barrier underlying pen surfaces, failure of crops and reduces dust from solid waste stockpiles/spreading.

4.7.1 Impacts

The potential for environmental impacts will depend on several factors. Primarily impacts will be dependent on the nature, extent and magnitude of operation activities and their interaction with the natural environment. Potential impacts attributable to operation might include:

- Excessive waste being directed to landfill;
- Various wastes being inappropriately disposed or handled on-site resulting in possible contamination of land, groundwater or surface water;
- Aesthetic effects that arise from visible airborne dust plumes and from deposits of dust on surfaces;
- Potential adverse health effects including eye, nose and throat irritation from excessive inhalation of fine particles, nitrogenous aerosols;
- Runoff of solid waste to the surface water, resulting in a reduction of water quality;
- Contaminants from solid waste leaching into the groundwater, resulting in a reduction of water quality;
- Impacts to flora and fauna from improper storage, handling and utilisation of solid waste;
- Complaints from the public relating to odours from solid waste management; and
- Dust deposition impacts on residential sensitive receivers, including impacts on living areas, swimming pools and general amenities.

Some impacts from solid and liquid waste management are anticipated and have been described in the Project's Environmental Impact Statement (RDC Engineers Pty Ltd, 2024).

Section 4.5 provides a suite of mitigation measures that will be implemented to avoid or minimise environmental impacts from liquid waste management.

4.8 Mitigation measures

Table 4 describes the solid waste mitigation measures due to Project operations and summarises the responsibilities that have been documented within this Plan.

Table 4 – Solid and liquid waste management and mitigation measures

Source	Mitigation measure	Responsibility	Timing	Reference
General				
	Training will be provided to all Project personnel, including relevant sub-contractors on solid and liquid waste management practices and the requirements from this plan through inductions and targeted training.	Feedlot Manager /Farm Manager	Operation - Induction	OEMP
	An environmental specialist will be engaged and consulted throughout operation to provide advice on solid and liquid waste management.	Feedlot Manager	Operation - As required	Best practice
	An EPL will be obtained for the Project. All relevant conditions relating to solid and liquid waste management will be implemented as required by the EPL.	Feedlot Manager	Prior to Operation	*POEO Act 1997,* CoA
	Develop waste management strategies for each waste stream based on the waste management hierarchy (see section 4.2).	Feedlot Manager	Operation	*POEO Act 1997,* CoA
	Ensure worksites are kept free of litter and that any litter is cleaned up immediately.	Feedlot Manager / Feedmill Supervisor / Farm Manager	Operation	*POEO Act 1997,* CoA
	Manage controlled wastes as required by the *POEO Act 1997.*	Feedlot Manager	Operation	*POEO Act 1997,* CoA
Procedures and Plans				
	Procedures will be prepared and implemented for solid and liquid waste management to manage any adverse environmental impacts. Refer Appendix A.	Feedlot Manager	Operation - As required	CoA, Best practice
	Pollution Incident Management Response plan (PIMRP) will be prepared and implemented for the on-site application of effluent to land.	Feedlot Manager	Operation - As required	CoA, *POEO Act 1997*
	An emergency spill response plan will be developed. This plan will detail measures for the prevention, containment and clean-up of accidental spills of solid and liquid wastes.	Feedlot Manager	Operation	OEMP
Storage and Handling – Controlled / General solid waste (non-putrescible) / General liquid waste (non-putrescible)				
	Comply with applicable regulatory requirements and standards regarding the design and operation of all solid and liquid waste storage areas.	Feedlot Manager	Operation	*POEO Act 1997, CoA*

	Quantities of waste stored onsite will be kept to a minimum. Maximum volume of each waste stored will be consistent with regulations and guidelines.	Feedlot Manager/ Farm Manager	Operation	*POEO Act 1997, CoA*
	Segregate all waste streams at source, where practicable.	Feedlot Manager / Operation Manager / Farm Manager	Operation – ongoing	Best practice
	Store all solid and liquid waste in appropriately designed and clearly labelled receptacles.	Feedlot Manager	Operation	Best practice
	Securely store hazardous waste within contained storage areas with closed drainage systems.	Feedlot Manager / Feedmill Supervisor / Farm Manager	Operation	*POEO Act 1997, CoA*
	Separate combustible waste from ignition sources to minimise fire hazards.	Feedlot Manager / Farm Manager	Operation	OEMP, Best practice
	Ensure that only compatible wastes are stored together	Feedlot Manager / Feedmill Supervisor / Farm Manager	Operation	OEMP, Best practice
	Locate spill kits at hazardous liquid waste storage areas.	Feedlot Manager / Feedmill Supervisor / Farm Manager	Operation	OEMP, Best practice
	All waste oils, chemicals, toxic substances and combustible liquids associated with operation will be stored in roofed and bunded areas. Spill kits will be provided at all chemical storage facilities.	Feedlot Manager / Feedmill Supervisor / Farm Manager	Operation	Best practice
Storage and Handling – General solid waste (putrescible) / General liquid waste (putrescible)				
	Comply with applicable regulatory requirements and standards regarding the design and operation of all solid and liquid waste storage areas.	Feedlot Manager	Operation	OEMP, Best practice
	Solid waste will be stored in designated solid waste stockpile/carcass composting area in accordance with relevant guidelines.	Feedlot Manager	Operation	CoA, Best practice

	Cover or close putrescible waste receptacles that may present an issue for fauna attraction and rainfall.	Feedlot Manager/ Feedmill Supervisor	Operation – Repairs and maintenance	Environmental Management System, Best practice
	Regular removal of accumulated manure from pens, under fence-lines, cattle lanes and drains in accordance with Class 1 specifications.	Maintenance Supervisor	Operation	CoA, Environmental Management System, Best practice
	Manure will be scraped from the pen surface by a suitably trained employee, ensuring not to disturb the interface layer or the low-permeability barrier.	Maintenance Supervisor	Operation	Environmental Management System, Best practice
	Under-fence cleaning will be undertaken on an as required basis not exceeding 4 weeks or as soon as practically possible after accumulated manure obstructs pen drainage.	Maintenance Supervisor	Operation	Environmental Management System, Best practice
	Material is removed from any pot holes and gravel/clay placed and compacted in and around the affected areas.	Maintenance Supervisor	Operation	Environmental Management System, Best practice
	Manure is removed to the solid waste stockpile area located within the controlled drainage area.	Maintenance Supervisor	Operation	CoA, Environmental Management System, Best practice
	Spoilt or wet feed is removed from the feed bunks using a shovel on a daily basis. The material is thrown into the pen area and removed during pen cleaning.	Maintenance Supervisor	Operation	Environmental Management System, Best practice
	Manure stockpiles are to be constructed with the long axes perpendicular to the contours within the stockpile to ensure free drainage.	Maintenance Supervisor	Operation	Environmental Management System, Best practice
	Silage, solid (manure, spoilt feed, mortalities) and effluent storage shall be located within the controlled drainage area.	Maintenance Supervisor / Feedmill Manager	Operation	CoA, Environmental Management System, Best practice
	The low-permeability barrier shall be checked after removal of manure to ensure its structure and integrity has not been damaged or compromised and ongoing compliance with specified design criteria. Any damage to the barrier will be repaired.	Maintenance Supervisor	Operation	CoA, Environmental Management System, Best practice

	Pen areas, cattle lanes/drains will be maintained and shaped with an even gradient to facilitate drainage.	Maintenance Supervisor	Operation	Environmental Management System, Best practice
	All carcasses from normal mortality losses are taken to the solid waste stockpile and carcass compost area on the day of death if practical.	Maintenance Supervisor	Operation	Environmental Management System, Best practice
	Wet manure or sludge will not be placed in the main stockpile until it is sufficiently dry.	Maintenance Supervisor	Operation	Environmental Management System, Best practice
	The carcass is placed on a straw or sawdust bed and covered with at least 500 mm of manure on all sides.	Maintenance Supervisor	Operation	Environmental Management System, Best practice
	The carcass windrow shall be no more than two levels of carcasses high. The second level of carcasses shall be placed on top of 50 mm of manure covering the first level of carcasses and covered with at least 500 mm of manure.	Maintenance Supervisor	Operation	Environmental Management System, Best practice
	Carcass compost windrows shall be periodically inspected, and any exposed carcasses recovered to facilitate the composting process.	Maintenance Supervisor	Operation	Environmental Management System, Best practice
	The carcass composting area shall be monitored from scavenging animals.	Maintenance Supervisor	Operation	Environmental Management System, Best practice
	If mass mortalities are suspected to be caused by an emergency/infectious disease AUSVETPLAN procedures shall be implemented and disposal managed under the AUSVETPLAN.	Maintenance Supervisor	Operation	Environmental Management System, Best practice
	A suitable site for mass burial of mortalities shall be identified and established on the subject property in low permeability soils on a site well removed from surface waters, drainage lines, gullies, groundwater bores and the Project complex.	Maintenance Supervisor	Operation	Environmental Management System, Best practice
	After rainfall, the solid waste storage and carcass compost area shall be checked to ensure no runoff is retained and that no pooling of liquid waste occurs. When conditions permit, re-configure the stockpile if free drainage is not occurring.	Maintenance Supervisor	Operation	Environmental Management System, Best practice

	The sedimentation basin and holding pond will be inspected at regular intervals and following rainfall events to assess available water storage capacity, water quality, structural integrity and solids levels.	Maintenance Supervisor / Farm Manager	Operation	Environmental Management System, Best practice
	The low-permeability barrier shall be checked after removal of settled solids to ensure its structure and integrity has not been damaged or compromised and ongoing compliance with specified design criteria. Any damage to the low-permeability barrier will be repaired before wastewater is reintroduced into the sedimentation basin/holding pond.	Maintenance Supervisor	Operation	Environmental Management System, Best practice
	All inlet and outlet pipework, structures and pumps shall be checked regularly to ensure adequate functioning, e.g., flow rates, leaks.	Maintenance Supervisor / Farm Manager	Operation	Environmental Management System, Best practice
	Solid waste from the sedimentation basin will be removed to the solid waste / carcass composting area and sustainably applied to land within the solid waste utilisation area.	Maintenance Supervisor / Farm Manager	Operation	CoA, Environmental Management System, Best practice
	The floor of the sedimentation basin will be maintained and shaped with a smooth, even gradient to the outlet weir to facilitate drainage.	Maintenance Supervisor	Operation	Environmental Management System, Best practice
	The sedimentation basin outlet weir shall be regularly cleaned by removing, cleaning and then replacing timber slats to retain efficacy.	Maintenance Supervisor	Operation	Environmental Management System, Best practice
	Effluent from the holding pond will be sustainably applied to land within the effluent utilisation area.	Feedlot Manager / Farm Manager	Operation	CoA, Environmental Management System, Best practice
	The holding pond shall be kept at a low level. At the start of the May (winter rainfall period), the holding pond shall be pumped out in readiness for anticipated inflows, although at least 500 mm of effluent shall be retained in the pond to maintain its biological function. Irrigation will reduce the volume of effluent in the pond, thereby maximising the capacity available to store further inflows while reducing the risk of pond spills.	Farm Manager	Operation	CoA, Environmental Management System, Best practice
	If the holding pond fills during wet weather and an overflow is imminent or spills, it is generally preferable to irrigate effluent onto a wet effluent utilisation area rather than allow the pond to further spill. Irrigation will assist in dispersing the effluent over a large area and provide a greater opportunity for filtering by vegetation and dilution from stormwater.	Farm Manager	Operation	CoA, Environmental Management System, Best practice

	At least 500 mm of effluent shall be retained in the holding pond after irrigation to maintain its biological function. When effluent accumulates to be within 1500 mm of the embankment crest, irrigations shall be planned, and the storage level decreased. The water level should not come within 500 mm of the bywash level as far as practical.	Farm Manager	Operation	Environmental Management System, Best practice
	As an emergency procedure, if extended wet periods prevent emptying of the holding pond, then off - site disposal to local farms or a waste facility capable of accepting effluent of this nature may be initiated as required.	Farm Manager	Operation	Environmental Management System, Best practice
	The sludge level within the holding pond shall be monitored and the holding pond de-sludged once the accumulated sludge takes up a maximum of 10% of the design capacity of the holding pond.	Farm Manager	Operation	Environmental Management System, Best practice
	Design discharge events from the holding pond shall be directed to a natural grassed discharge area. This grassed area shall filter and disperse the effluent whilst allowing some infiltration. As the design discharge events are at a frequency of one in 10 years the concentration of nutrients shall be sustainably adsorbed and utilised by vegetation in between events.	Farm Manager	Operation	CoA, Environmental Management System, Best practice
	The domestic liquid waste (sewage) system shall be regularly inspected for potential spills and overflows of untreated wastewater.	Maintenance Supervisor / Feedmill Supervisor	Operation	CoA, Environmental Management System, Best practice
Recycling/Reuse or Disposal on-site				
	Solid waste (animal) and effluent only applied to designated solid waste and effluent utilisation areas.	Feedlot Manager / Farm Manager	Operation	CoA, Environmental Management System, Best practice
	Solid waste and effluent are applied to utilisation areas at rates that avoid runoff and excessive leaching.	Farm Manager	Operation	CoA, Environmental Management System, Best practice
	The land application of solid waste and effluent is made at rates consistent with the ability of soils and crops grown in the on-site utilisation areas to sustainably utilise the applied nutrients, salts and organic matter, under the climatic conditions prevailing at the site.	Farm Manager	Operation	CoA, Environmental Management System, Best practice
	Vegetative buffers around drainage lines designed to help protect surface water are maintained in their intended condition.	Farm Manager	Operation	Environmental Management System, Best practice

	No on-site disposal or burying of waste relating to operations with the exception of unexpected mass deaths of beef cattle if required.	Feedlot Manager / Farm Manager	Operation	CoA, Environmental Management System, Best practice
	No on-site incineration of waste shall be undertaken.	Feedlot Manager / Farm Manager	Operation	Environmental Management System, Best practice
	Application rate of liquid waste is controlled to ensure that excessive ponding does not occur.	Farm Manager	Operation	Environmental Management System, Best practice
	The domestic liquid waste (sewage) system shall be regularly checked for potential spills and overflows of untreated wastewater.	Maintenance Supervisor / Feedmill supervisor	Operation	Environmental Management System, Best practice
Recycling/Reuse or Disposal (Off-site)				
	All solid waste that cannot be sustainable utilised on-site shall be taken off-site by an operator licensed to remove that waste and transported to a suitably licensed facility for recycling, reuse or disposal.	Feedlot Manager / Farm Manager	Operation	CoA, Environmental Management System, Best practice
	All solid waste to be transported off-site shall be assessed to determine whether the waste requires tracking under the Protection of the *Environment Operations (Waste) Regulation 2014.*	Feedlot Manager / Farm Manager	Operation	*POEO Act 1997*, Environmental Management System, Best practice
	All waste requiring tracking shall only be transported after all necessary documentation such as consignment authorisation and transport certificates have been obtained from the relevant authorities.	Feedlot Manager / Farm Manager	Operation	*POEO Act 1997*, Environmental Management System, Best practice
	All loads of waste removed from the site will be covered to prevent spillage.	Operations Manager	Operation	Environmental Management System, Best practice
Monitoring and Reporting				
	All solid waste and effluent monitoring requirements will be undertaken in accordance with the following guidelines: • Sampling Manual for environmental monitoring by intensive livestock industries. (Redding, MR, 2003)	Farm Manager	Operation – As-required	Sampling Manual for environmental monitoring by intensive livestock

				industries. (Redding, MR, 2003)
	Monitoring of solid waste and effluent will be undertaken in accordance with Licence requirements.	Farm Manager	Operation – As-required	CoA, Environmental Management System
	Records of solid waste and effluent management monitoring will be maintained. Details will include: • Date, time and location of each sample. • Solid waste and/or effluent quality test results for each sample. • The personnel undertaking the sampling.	Feedlot Manager	Operation – Event basis	CoA, Environmental Management System,
	Rainfall forecasts will be monitored daily and the site managed to minimise impacts from solid waste and effluent management from rainfall events.	Farm Manager	Operation – Daily	Environmental Management System, Best practice
	Ensure the solid waste and effluent management results are routinely analysed, assessed and reported in accordance with the conditions of the Licence.	Farm Manager	Operation – Annually	CoA, Environmental Management System
	Records or a material register shall be retained detailing the quantity, classification method of transport of waste material removed from the site. The register will record the waste type, quantity, classification, contractor, licence details and details of the licensed receiving facility.	Feedlot Manager	Operation – Annually	POEO Act 1997, CoA, Environmental Management System
	A 24-hour community response telephone line shall be maintained.	Feedlot Manager	Operation – Daily	Environmental Management System, *CoA*
	In the event of an air quality complaint, records shall be kept in the complaints register and investigations will be undertaken to confirm the source of the issue. Additional mitigation measures will be investigated and implemented. In the event of ongoing air quality issues, operational activities will be reviewed and, if necessary, the activity stopped until suitable measures can be employed to manage this issue.	Feedlot Manager	Operation – Event basis	Environmental Management System, CoA
	Pollution incidents posing material harm to the environment shall be notified to each 'relevant authority' as defined in section 148(8) of the *POEO Act 1997*.	Feedlot Manager	Operation – Event basis	Environmental Management System, POEO Act 1997, CoA
Review and Improvement				

	In line with the Complaints and Enquiries Procedure, following a complaint and its subsequent investigation, feedback regarding the source and nature of the complaint will be provided to the affected stakeholders and/or community members (section 7).	Feedlot Manager	Operation – Event basis	Environmental Management System, CoA

5 Implementation

5.1 Roles and Responsibilities

The organisational structure and overall roles and responsibilities of the Project team are outlined in section 7.3 of the OEMP. Specific responsibilities for the implementation of environmental controls are details in Table 4 of this Plan.

5.2 Induction

Doolin Farming Pty Ltd has a site induction program that all contractors and employees are required to complete prior to undertaking any work in accordance with section 9.1 of the OEMP.

5.3 Training

Doolin Farming Pty Ltd has a targeted training program for Project staff and contractors in accordance with section 9.2 of the OEMP.

Examples of training topics for employees and contractors with a key role in solid waste management include:

- Pen cleaning and stockpile management;
- Management of carcasses;
- Approved solid waste utilisation areas;
- Sustainable application rates for solid waste;
- Planning and preparedness for emergency/environment events; and
- Lessons learnt from incidents and other events e.g., high rainfall, mass mortalities.

5.4 Incident management

A comprehensive Incident Management System is currently implemented at the Project site as outlined in section 12 of the OEMP.

5.5 Complaints management

The investigation, response and reporting of complaints shall be undertaken in accordance with section 10.3.3 of the OEMP.

6 Performance Evaluation

6.1 Performance Indicators

The extent to which this Plan complies with CoA will be measured by the following performance indicators:

- Compliance with relevant baseline standards at monitoring locations;
- Minimisation of complaints relating to solid waste management such as air (odour) and water quality, as evidenced by trends in the frequency and extent of complaints;
- Compliance with this plan, as indicated by internal and statutory reporting.

6.2 Monitoring

Regular monitoring and inspections will be undertaken during operation in accordance with Table 5. The proposed number of monitoring locations, frequency of monitoring and relevant monitoring methods are detailed in the Operation Environmental Monitoring and Management Plan (OEMMP) in Appendix B5 of the OEMP.

Additional requirements and responsibilities in relation to inspections and monitoring are documented in sections 11.1 and 11.2 of the OEMP.

Table 5 – Solid and liquid waste – Monitoring details

Monitoring details	Location	Responsibility	Frequency	Record	KPI
Solid waste quality	Refer to OEMMP	Farm Manager	As outlined in OEMMP	Annual Return	No adverse impacts to soils
Mass of solid waste utilised on-site	Refer to OEMMP	Farm Manager	As outlined in OEMMP	Annual Return	No adverse impacts to soils and/or sensitive receivers
Mass of solid waste removed off-site	Refer to OEMMP	Farm Manager	As outlined in OEMMP	Annual Return	Sustainable accumulation of solid waste in solid waste storage and processing area
Volume of sludge accumulating in holding pond(s)	Refer to OEMMP	Farm Manager	As outlined in OEMMP	Annual Return	Wet weather storage capacity of holding pond is maintained
Effluent quality	Refer to OEMMP	Farm Manager	As outlined in OEMMP	Annual Return	No adverse impacts to soils
Effluent applied to utilisation area	Refer to OEMMP	Farm Manager	As outlined in OEMMP	Annual Return	No adverse impacts to soils, groundwater, surface water and/or sensitive receivers
Holding pond(s) overflow volume	Refer to OEMMP	Farm Manager	Each overflow event	Annual Return	No adverse impacts to surface water
Holding pond(s) overflow effluent quality	Refer to OEMMP	Farm Manager	As outlined in OEMMP	Annual Return	No adverse impacts to surface water

6.3 Reporting

Effluent and solid waste management reporting is designed to comply with the CoA and provide stakeholder access to relevant effluent and solid waste information and data.

Key stakeholders requiring access to this information include Doolin Farming Pty Ltd, state and local government agencies, and the local community. Reporting will be undertaken in accordance with section 9.4 of the OEMP. Annual reporting will be undertaken in accordance with CoA and the Annual Return requirements detailed in the EPL.

Doolin Farming Pty Ltd will report soil and water quality monitoring results in the Annual Return for the EPL.

The Annual Return will include an effluent and solid waste monitoring component covering the following items relating to effluent and solid waste management:

- Effluent and solid waste monitoring results and comparison with previous monitoring results;
- An explanation for any missing soil and liquid waste monitoring results;
- Effluent and/or solid waste management related complaints and management/mitigation measures undertaken;
- Management/mitigation measures undertaken in the event of any confirmed exceedance of performance criteria; and
- Review of the performance of management/mitigation measures and the monitoring program.

Doolin Farming Pty Ltd is required to report pollution incidents immediately and without delay in accordance with the requirements of the *POEO Act 1997*.

6.3.1 Nutrient Balance

To ensure the long-term sustainability of a solid waste utilisation area, a nutrient balance should be calculated regularly. Ideally, the amount of nutrients applied through solid waste should match the amount of nutrients removed by the crop. The two most important nutrients to consider are nitrogen and phosphorus. Once the monitoring results are known, the amounts of these nutrients applied and removed can be estimated quite easily. If different solid waste utilisation areas receive significantly different application rates, a separate nutrient balance should be calculated for each area. Also, for the nutrient balance concept to work, only the crop harvested from the fields which had solid waste applied should be included in the calculation (i.e., additional crop which may be cut from other areas should not be considered in the nutrient balance).

6.3.1.1 Nutrients applied

6.3.1.1.1 Nitrogen

6.3.1.1.1.1 Effluent

To estimate the mass of nitrogen proposed to be applied to the crop via irrigation, the following equation can be used:

Nitrogen applied (kg/ha) = Total Nitrogen (mg/L) – (Volatilistion loss % x Ammonia Nitrogen (mg/L)) x Volume irrigated (ML/ha)

where: Total Nitrogen (mg/L) and Ammonia Nitrogen (mg/L) are taken from the results of the effluent analysis for that period (Table 5); and

Volume irrigated (ML/ha) is measured from the irrigation records for that period (Table 5).

6.3.1.1.1.2 Solid waste

To calculate the mass of nitrogen proposed to be applied to the crop via solid waste, the following equation can be used:

Nitrogen applied (kg/ha) = Total Nitrogen (mg/kg) x Quantity applied (kg/ha)

where: Total Nitrogen (mg/kg) are taken from the results of the aged solid waste analysis for that period (Table 5); and

Quantity applied (kg/ha) is quantity of aged solid waste available from the solid waste stockpile proposed to be applied (Table 5).

6.3.1.1.2 Phosphorus

6.3.1.1.2.1 Effluent

The mass of phosphorus applied can be calculated by:

Phosphorus applied (kg/ha) = Total Phosphorus (mg/L) x Volume irrigated (ML/ha)

where: Total Phosphorus (mg/L) are taken from the results of the effluent analysis for that period (Table 5); and

Volume irrigated (ML/ha) is measured from the irrigation records for that period (Table 5).

6.3.1.1.2.2 Solid waste

The mass of phosphorus proposed to be applied to the crop via aged solid waste, the following equation can be used:

Phosphorus applied (kg/ha) = Phosphorus (mg/kg) x Quantity applied (kg/ha)

where: Total Nitrogen (mg/kg) are taken from the results of the aged solid waste analysis for that period (Table 5); and

Quantity applied (kg/ha) is quantity of aged solid waste available from the solid waste stockpile proposed to be applied. (Table 5).

Solid waste contains organic and inorganic phosphate compounds. The inorganic phosphorus is initially quite soluble and available; however, when it comes in contact with soil, various reactions begin to take place. The adsorbed phosphate and the newly formed compounds are only slowly available to plants.

NB These equations only work if the quantities are in the correct units.

6.3.1.2 Nutrients removed

To calculate the mass of nitrogen removed by the crop, the following equation can be used:

Mass of N removed (kg) = Plant nitrogen content (%) x Plant mass harvested (kg)

where: Plant Nitrogen Content (%) is the amount of nitrogen present in the harvested crop. For accurate determination of the nutrient balance, tissue analysis should be performed on the harvested crop. It is recommended that this be undertaken initially and if results appear to be consistent, then the average results can be used for future calculations. As a guide, typical values for the nutrient content of most crops range between 3-5% for nitrogen, and 0.2-0.4% for phosphorus.

Plant Mass Harvested (kg) can be calculated from the harvest records for that period e.g., if 20 bales of hay are harvested from the dryland or irrigated area, and each bale weighs around 250 kg, then the plant mass harvested is 5,000 kg (5 t). NB If the plant nutrient analysis is given on a dry matter basis, the plant yield harvested needs to be converted to a dry matter basis before performing this calculation.

6.3.1.3 Mass balance

The mass balance principle is to be adopted when determining appropriate application rates for effluent and solid waste.

The mass balance principle is:

Applied nutrient ≤ (Nutrient removed in crop + Nutrient safely stored in soil + Acceptable nutrient losses to external environment)

Acceptable nutrient losses to external environment include nitrogen gas to the air and safe soil storage (phosphorus storage in the root zone).

The mass balance is used to identify whether there is an excess or deficit of nutrients within each management unit of the waste utilisation area and shall be used for planning the management strategy for each individual unit.

The aim of calculating the nutrient balance is to ensure that the amount of nutrients applied over the long term closely matches the amount of nutrients removed.

Application rates shall follow the 'Fertcare' guidelines for application only to crop phosphorus requirement as phosphorus is most likely to be the limiting factor in calculations and not nitrogen.

6.3.2 Assessment of performance indicators

The results of the nutrient balance should be considered in conjunction with regular solid waste and soil quality monitoring to properly assess the performance of the solid waste utilisation area. If the solid waste utilisation is managed in such a way that the nutrient balance is maintained, then the soil nutrient status should remain fairly constant from one sampling period to the next. These parameters should be graphed to compare results from year to year.

The results of the any groundwater monitoring should also be graphed to ensure that the groundwater below the solid waste utilisation area is not showing signs of contamination. Refer to the OSWQMP.

6.4 Auditing

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental mitigation measures, compliance with this Plan, CoA and other relevant approvals, licences and guidelines. Audit requirements are detailed in section 9.4 of the OEMP.

The audit process will generally be designed to examine the status of the key components of this Plan, review solid and/or liquid waste management concerns, and evaluate the overall performance of solid and liquid waste management for the Project.

The strategy for Doolin Farming Pty Ltd audit processes is to ensure compliance and promote continuous improvement as part of the Project's solid and liquid waste management regime.

In addition, the Plan will potentially be subject to audit by the Gwydir Shire Council or the Department administering the *Protection of the Environment Operations Act 1997* (currently EPA) during compliance inspections and other site inspections and as a possible component of a formal solid waste and/or liquid waste management concerns investigation process.

7 Review and Improvement

7.1 Non-conformances and corrective actions

Any non-conformances related to solid and liquid waste management will be dealt with and documented in accordance with section 11.5 of the OEMP.

7.2 Continual improvement

This Plan and associated monitoring program will be reviewed, and if necessary revised to the satisfaction of the NSW EPA as the Department currently administering the *Protection of the Environment Operations Act 1997* in accordance with section 12 of the OEMP:

- where a risk assessment identifies the requirement to alter the plan;
- following changes to project approval or licence conditions relating to solid and/or liquid waste management or monitoring;
- following any significant solid and/or liquid waste management related incident;
- where there is a relevant change in technology or legislation; or
- for necessary or any unforeseen changes to solid and/or liquid waste monitoring locations.

8 References

Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ 2000).

Department of Environment and Conservation (NSW), 2004, Effluent guidelines, Use of effluent by irrigation, Department of Environment and Conservation (NSW), Sydney, NSW.

Department of Environment and Conservation (NSW), 2004, Approved methods for the sampling and analysis of water pollutants in New South Wales, Department of Environment and Conservation (NSW), Sydney, NSW.

International Erosion and Sediment Control (IECA) (Australasia) 2008. Best practice erosion and sediment control. International Erosion Control Association (Australasia), Picton, NSW.

NSW Environment Protection Authority (EPA), 2014, Waste Classification Guidelines, Sydney NSW.

Landcom, 2004, The Blue Book – Managing Urban Stormwater: Soils and Construction Volume 1, 4th Edition, March 2004 (reprinted 2006) (the "Blue Book"). Volume 1 and Volume 2, Sydney NSW.

Meat and Livestock Australia, 2012a, National Guidelines for Beef Cattle Feedlots in Australia 3rd Edition, Meat & Livestock Australia, North Sydney, NSW.

Meat and Livestock Australia, 2012b, National Beef Cattle Feedlot Environmental Code of Practice 2nd Edition, Meat & Livestock Australia, North Sydney, NSW.

Meat and Livestock Australia, 2015a, Beef Cattle Feedlots: Design and Construction, Meat and Livestock Australia, North Sydney, NSW

Meat and Livestock Australia, 2015b, Beef cattle feedlots: waste management and utilisation, Meat and Livestock Australia, North Sydney, NSW

RDC Engineers Pty Ltd, 2025, Proposed Intensive livestock agriculture development (Expansion of beef cattle feedlot from 999 head to 3,000 head) on the property "Springfield", Development Application and Environmental Impact Statement, V1R2 RDC Engineers Pty Ltd, Toowoomba, QLD, 4350.

Rayment, GE and Lyons, DJ 2010, Soil Chemical Methods - Australasia, CSIRO Publishing, ISBN: 9780643067684.

Redding, MR, 2003, Sampling Manual for environmental monitoring by intensive livestock industries. Agency for Food and Fibre Sciences, Department of Primary Industries, Toowoomba, Queensland.

Standards Australia 1998, AS/NZS 5667.1—1998: Water quality—Sampling— Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples. Standards Association of Australia, Sydney.

Standards Australia 1998, AS/NZS 5667.6—1998: Water quality—Sampling—Guidance on sampling of rivers and streams. Standards Association of Australia, Sydney.

Standards Australia 1998, AS/NZS 5667.10—1998: Water quality—Sampling—Guidance on sampling of waste waters. Standards Association of Australia, Sydney.

Standards Australia 2012, AS 4454 –2012 - Australian Standard for Composts, Soil Conditioners and Mulches Standards Association of Australia, Sydney.

Appendix A – Standard Operational Procedures

OSLWMP SOP 1 - Solid waste (Putrescible) - Pen and sedimentation basin cleaning

Aspect	Solid waste (Putrescible) – Pen and sedimentation basin cleaning
Objectives	To manage the cleaning of pens and sedimentation basins such that impacts on community amenity, occupational health and the environment are minimised.
Potential Impacts	Occupational health and safety of employees and contractors. Animal health and performance. Community amenity and health impacts from offensive odours. Community amenity and health impacts from dust. Receiving environment impacts from dust, leaching of contaminants in solid wastes.
Control Actions	All development employees including relevant contractors are given adequate training in environmental awareness, legal responsibilities and solid waste management through inductions and targeted training. Pen cleaning and surface maintenance is undertaken on a planned basis to ensure that pen surfaces dry quickly following rainfall, can drain freely and do not become overly dry and cause excessive dust emissions. Weather permitting, pen cleaning will be undertaken at an interval not exceeding 8 weeks as per Class 1 specifications. Material is removed from potholes and gravel/clay placed and compacted in and around the affected areas. Pen cleaning operations should ensure that the highly dense, plastic, manure-soil interface layer remains intact. Manure will be scraped from the pen surface down to the manure interface layer by a suitably trained employee, ensuring not to disturb the interface layer. Manure is removed to the stockpile area located within the controlled drainage area of the Project site. Under-fence cleaning will be undertaken on an as required basis not exceeding 4 weeks or as soon as practically possible after accumulated manure obstructs pen drainage, as per Class 1 specifications. Manure is pushed from under the fence lines and collected during pen cleaning operations. The sedimentation basin shall be inspected after runoff producing rainfall or at intervals not exceeding 8 weeks. At each inspection the following actions shall be performed: Estimate the depth of sedimentation accumulation to assess is sediment accumulation is substantially reducing active volume and whether cleaning needs to be performed. Inspect embankment batters and crest for scouring/dispersive failure.

	Inspect of inlet and outlet points to identify any areas of scour, sediment build up and blockages. Remove any blockages from the outlet structure. Any potential structural integrity issues are to be reported to the Maintenance Supervisor. If the sedimentation basin requires cleaning, the operations shall be applied: • Allow the accumulated sediment to dry as wet sludge is difficult to handle, store and will not dry out. • Remove the accumulated sediment from the basin to the solid waste stockpile and carcass composting area. • Ensure the sedimentation basin surface retains a smooth uniform slope to the outlet structure. • Backfill and compact any potholes or low areas in the sedimentation basin surface. If the sedimentation basin requires maintenance, the operations that apply are: Schedule repairs to embankments, inlet / outlet structures as soon as practically possible. The low-permeability clay lining in the pens and sedimentation basin shall be checked after removal of manure to ensure its structure and integrity has not been damaged or compromised and ongoing compliance with specified design criteria. Any damage to the barrier will be repaired.
Relevant Standards, Management Plans, Records	CoA NFAS manual Complaints Register Personnel induction, training and awareness Pen cleaning record
Responsibility	As required by the OEMP and specific requirements outlined in section 5.1.
Performance Indicators	Ensure all personnel operating on the site are adequately trained. Personnel shall receive training in pen and sedimentation basin cleaning. No complaints relating to pen cleaning are received by the Project.
Monitoring	As required by the OEMP and specific requirements outlined in section 6.2.
Reporting	As required by the OEMP and specific requirements outlined in section 6.3.
Corrective Actions	Review management of pen and sedimentation basin cleaning methods. Seek specialist advice from an environmental specialist on solid and liquid waste management.

OSLWMP SOP 2 – Solid waste (Putrescible) – Stockpiling and stockpile management

Aspect	Solid waste (Putrescible) – Stockpiling and stockpile management
Objectives	To manage stockpiling of solid waste (Putrescible) such that impacts on community amenity, occupational health and the environment are minimised.
Potential Impacts	Occupational health and safety of employees and contractors. Animal health and performance. Community amenity and health impacts from offensive odours. Community amenity and health impacts from offensive odours. Community amenity and health impacts from dust. Receiving environment impacts from dust, uncontrolled runoff of stormwater with high organic matter, soil leachate with high organic pollutant concentrations etc.
Control Actions	All development employees including relevant contractors are given adequate training in environmental awareness, legal responsibilities and air quality control methods through inductions and targeted training. Solid waste (manure) shall only be stockpiled within the solid waste stockpile and carcass composting area and/or temporarily within pens (mounding) prior to removal to the solid waste stockpile and carcass composting area. These areas are within the controlled drainage area of the Project complex. Solid waste stockpiles are to be constructed with the long axes perpendicular to the contours within the stockpile to ensure free drainage. Solid waste stockpiles will be shaped to avoid ponding of rain or runoff water. As layers of solid waste are placed in the stockpile they will be compacted. Wet solid waste or sludge will not be placed in the main stockpile until it is sufficiently dry. Check the base of the stockpile and carcass composting area for potholes and areas of shallow gravel cover. If inadequate, repair the base when conditions permit. The stockpile and carcass composting area shall be inspected daily and after rainfall events. When conditions permit, re-configure the stockpile(s) if free drainage is not occurring. If a solid waste stockpile has ignited the following actions shall be taken: • Remove the ignited particles from the stockpile with appropriate machinery. • Extinguish the ignited particles. • Record the event and actions taken on the Non Compliance Record. • Record any maintenance procedures performed on the solid waste storage and processing area.

Relevant Standards, Management Plans, Records	CoA NFAS manual Complaints Register Personnel induction, training and awareness
Responsibility	As required by the OEMP and specific requirements outlined in section 5.1.
Performance Indicators	Ensure all personnel operating on the site are adequately trained. Personnel shall receive training in solid waste stockpiling and stockpile management. No complaints relating to solid waste stockpiling are received by the Project. No non-compliances with CoA.
Monitoring	As required by the OEMP and specific requirements outlined in section 6.2.
Reporting	As required by the OEMP and specific requirements outlined in section 6.3.
Corrective Actions	Review management of solid waste stockpiling and stockpile management.

OSLWMP SOP 3 - Solid waste (Putrescible) – Mortality management

Aspect	Solid waste (Putrescible) – Mortality management
Objectives	To manage livestock mortalities such that impacts on community amenity, occupational health and the environment are minimised.
Potential Impacts	Occupational health and safety of employees and contractors. Community amenity and health impacts from offensive odours. Receiving environment impacts from uncontrolled runoff of stormwater with high organic matter, high organic matter soil leachate etc.
Control Actions	All development employees including relevant contractors are given adequate training in environmental awareness, legal responsibilities and mortality management through inductions and targeted training. **<u>Typical mortalities</u>** Mortalities shall only be stockpiled within the solid waste stockpile and carcass composting area and/or temporarily within pens (mounding) prior to removal to the solid waste stockpile and carcass composting area. These areas are within the controlled drainage area of the Project complex. Carcasses are removed from the pens on a daily basis and taken to the hospital area for post-mortem or directly to the solid waste stockpile and carcass composting area for composting. Following autopsy, the carcass is taken to the solid waste stockpile and carcass composting area for composting. A bed of at least 300 mm of the material being used as the carbon source (e.g., sawdust or straw) is placed on the base of the composting area. This bed of material absorbs leachate from the carcasses. A carcass is placed on the straw or sawdust bed and covered with at least 500 mm of manure on all sides. The carcass windrow shall be no more than two levels of carcasses high. The second level of carcasses shall be placed on top of 50 mm of manure covering the first level of carcasses and covered with at least 500 mm of manure. The top of the windrow shall be shaped to an apex to shed rainfall. The carcass composting area will be checked on a weekly basis to ensure carcasses are sufficiently covered with manure. Any exposed carcases shall be recovered with solid waste. Composting can be carried out in an intensively managed way (which will rapidly break down the carcasses) or with low management input which is a slower process. Low input management can still effectively decompose the carcasses if there is adequate time for the process to occur (usually 12-18 months). The carcasses are allowed to decompose for around 12 weeks before turning or 12 months if the windrows are not going to be turned. The. Typically, a front-end loader shall be used for turning carcass compost. Active composting may last for up to 4-8 months. The windrow shall be turned every 2-3 months.

	After active composting the composted windrow is left to mature for at least 3-4 months. The carcass composting area shall be monitored from scavenging animals and livestock. If any carcasses have become uncovered, recover them with approximately 500 mm of manure. **<u>Mass mortality events</u>** Where the mortalities are suspected to be caused by an emergency/infectious disease AUSVETPLAN procedures shall be implemented and disposal managed under the AUSVETPLAN. A suitable site for mass burial of mortalities shall be identified on the Project site. The burial pits shall be established in low permeability soils on a site well removed from surface waters, drainage lines, gullies, groundwater bores and the Project complex. The pit shall be located so that all water runoff is directed away from the pit. Use of diversion bunds or trenches may be required. Pits shall be deep but relatively narrow and excavated using an excavator. The carcass of each animal shall be opened at the time of placing in the pit and the carcass immediately covered by at least 500 mm of soil to reduce odour and exclude flies and vermin. Each pit shall be progressively filled with carcasses until sufficient pit capacity remains for the pit to be sealed with clay and compacted to a minimum depth of 1 m. Soil shall be mounded over the top and replenished should the pit subside to below ground level. The site where mass mortalities are buried shall be recorded for future reference.
Relevant Standards, Management Plans, Records	CoA NFAS manual Complaints Register Personnel induction, training and awareness
Responsibility	As required by the OEMP and specific requirements outlined in section 5.1.
Performance Indicators	Ensure all personnel operating on the site are adequately trained. Personnel shall receive training in solid waste stockpiling and stockpile management. No complaints relating to solid waste stockpiling are received by the Project. No non-compliances with CoA.
Monitoring	As required by the OEMP and specific requirements outlined in section 6.2.
Reporting	As required by the OEMP and specific requirements outlined in section 6.3.
Corrective Actions	Review management of mortalities. Review composting management, increase or decrease watering and turning of the windrow.

OSLWMP SOP 4 – Solid Waste (Putrescible) – On-site utilisation

Aspect	Solid waste (Putrescible) – On-site utilisation
Objectives	To manage the on-site utilisation of solid wastes such that impacts on community amenity, occupational health and the environment are minimised.
Potential Impacts	Occupational health and safety of employees and contractors. Community amenity and health impacts from offensive odours. Receiving environment impacts from uncontrolled runoff of stormwater with high organic matter, high organic matter soil leachate etc.
Control Actions	All development employees including relevant contractors are given adequate training in environmental awareness, legal responsibilities, and solid waste utilisation through inductions and targeted training. Solid waste shall only be applied to the approved solid waste utilisation area. When solid waste utilisation is necessary, select an appropriate area for application. Do not select an area that has already had sufficient nutrients applied through solid waste or areas that are showing elevated nutrient levels. Review weather forecasts and on-site meteorological conditions including wind speed and direction, rain forecasts etc. Do not select an area where the prevailing wind direction will carry any odours towards dwellings or other areas likely to be used by the public at that time. Do not spread solid waste when heavy rain is predicted. Do not spread solid waste too soon after heavy rain has been received (less than 48 hours). Solid waste shall be incorporated if applied to cultivated areas. The land application of solid waste is made at rates consistent with the ability of soils and crops grown in the on-site utilisation areas to sustainably utilise the applied nutrients, salts and organic matter, under the climatic conditions prevailing at the site. Review soil monitoring results prior to applications to ensure that over application of solid waste does not occur. Ensure solid waste is not applied to vegetative buffers around sensitive receivers (e.g., drainage lines / watercourses / property boundaries / native vegetation). Do not apply solid waste after heavy rain until soil moisture conditions allow the ability to traffic and work the soil to incorporate the solid waste.
Relevant Standards, Management Plans, Records	CoA NFAS manual Complaints Register Personnel induction, training and awareness
Responsibility	As required by the OEMP and specific requirements outlined in section 5.1.
Performance Indicators	Ensure all personnel operating on the site are adequately trained.

	Personnel shall receive training in solid waste utilisation. No complaints relating to solid waste utilisation are received by the Project. No non-compliances with CoA.
Monitoring	As required by the OEMP and specific requirements outlined in section 6.2.
Reporting	As required by the OEMP and specific requirements outlined in section 6.3.
Corrective Actions	Review management of solid waste utilisation. Seek specialist advice where a significant level of environmental risk or impact is identified for solid waste utilisation in indicators of sustainability.

OSLWMP SOP 5 – Solid and Liquid Waste (Non-putrescible) – Storage and handling

Aspect	Solid and liquid waste (Non-Putrescible) management – Storage and handling
Objectives	To manage the storage and handling of non-putrescible solid waste and liquid waste (Controlled/General) such that impacts on community amenity, occupational health and the environment are minimised.
Potential Impacts	Occupational health and safety of employees and contractors. Animal health and performance. Receiving environment impacts from uncontrolled runoff of hazardous materials, soil leachate with inorganic pollutant concentrations etc.
Control Actions	All development employees including relevant contractors are given adequate training in environmental awareness, legal responsibilities and storage and handling of solid waste and liquid waste (Non-Putrescible) methods through inductions and targeted training. Comply with applicable regulatory requirements and standards regarding the design and operation of all solid and liquid waste storage areas Quantities of waste stored onsite will be kept to a minimum. Maximum volume of each waste stored will be consistent with regulations and guidelines. Segregate all waste streams at source, where practicable. Store all solid and liquid waste in appropriately designed and clearly labelled receptacles. Securely store hazardous wastes within contained storage areas with closed drainage systems. Separate combustible wastes from ignition sources to minimise fire hazards. Ensure that only compatible wastes are stored together. Locate spill kits at hazardous liquid waste storage areas. All waste oils, chemicals, toxic substances and combustible liquids associated with operation will be stored in roofed and bunded areas. Spill kits will be provided at all hazardous materials storage facilities. All waste oils, chemicals, toxic substances and combustible liquids associated with operation will be stored in roofed and bunded areas. Spill kits will be provided at all chemical storage facilities.
Relevant Standards, Management Plans, Records	CoA POEO Act 1997 OEMP Personnel induction, training and awareness
Responsibility	As required by the OEMP and specific requirements outlined in section 5.1.

Performance Indicators	Ensure all personnel operating on the site are adequately trained in hazardous material storage and handling. No complaints relating to solid waste and liquid waste (Controlled / General) are received by the Project. No non-compliances with CoA.
Monitoring	As required by the OEMP and specific requirements outlined in section 6.2.
Reporting	As required by the OEMP and specific requirements outlined in section 6.3.
Corrective Actions	Review management of solid waste and liquid waste (Controlled/ General) storage and handling.

OSLWMP SOP 6 – Liquid waste (Effluent) – Holding pond management

Aspect	Liquid waste (Effluent) – Holding pond management
Objectives	To manage the holding ponds such that impacts on community amenity, occupational health and the environment are minimised.
Potential Impacts	Occupational health and safety of employees and contractors. Community amenity and health impacts from offensive odours. Receiving environment impacts from uncontrolled releases of effluent via overflows or leachate etc.
Control Actions	All relevant development employees including relevant contractors are given adequate training in environmental awareness, legal responsibilities and holding pond management through inductions and targeted training. The holding pond shall be inspected prior to rainfall events, after runoff producing rainfall and at each irrigation event or at intervals not exceeding 1 week. At each inspection the following actions shall be performed: • Estimate the volume of liquid waste in the holding pond and compare with future irrigation demands. • Schedule irrigation events when liquid waste accumulates to be within 1500 mm of the embankment crest and the liquid waste level decreased. • The holding pond should be kept at a low level. The pond will never be completely emptied during irrigation. Always leave at least 500 mm of effluent in the pond. The effluent level should not come within 500 mm of the bywash level as far as practical. • Inspect embankment batters, crest, bywash and inlet areas for scouring and structural integrity. • Assess structural stability and any other conditions that constitute or could constitute a hazard to the integrity of the structure. • Ensure outlet structures are operating satisfactorily. • Estimate the volume of liquid waste in the holding pond and compare with future irrigation demands. • Any potential structural integrity issues are to be reported to the Facilities Manager. If the holding pond fills during wet weather and an overflow is imminent or spills, it is generally preferable to irrigate liquid waste onto a wet irrigation area rather than allow the pond to further spill. Irrigation will assist in dispersing the liquid waste over a large area and provide a greater opportunity for filtering by vegetation and dilution from stormwater. Vegetation and floating debris (emergent or otherwise) are prevented from encroaching onto pond surfaces or inner pond embankments The low-permeability clay lining in the holding pond shall be checked after removal of sludge to ensure its structure and integrity has not been damaged or compromised and ongoing compliance with specified design criteria.
Relevant Standards, Management Plans, Records	CoA Complaints Register Personnel induction, training and awareness

Responsibility	As required by the OEMP and specific requirements outlined in section 5.1.
Performance Indicators	Ensure all personnel operating on the site are adequately trained. Personnel shall receive training in holding pond cleaning and maintenance. No non-compliances with CoA.
Monitoring	As required by the OEMP and specific requirements outlined in section 6.2.
Reporting	As required by the OEMP and specific requirements outlined in section 6.3.
Corrective Actions	Schedule repairs to embankments, inlet / outlet structures as soon as practically possible. De-sludge the holding pond once the accumulated sludge takes up a maximum of 10% of the design capacity of the holding pond. Seek specialist advice if the low-permeability clay lining in the holding pond is compromised. Repair any damage to the low-permeability clay lining in the holding pond.

OSLWMP SOP 7 - Solid waste management – Holding pond sludge management

Aspect	Solid waste management – Holding pond sludge management
Objectives	To manage sludge accumulation in holding ponds such that impacts on community amenity, occupational health and the environment are minimised.
Potential Impacts	Occupational health and safety of employees and contractors. Community amenity and health impacts from offensive odours. Receiving environment impacts from leaching of contaminants in holding pond sludge.
Control Actions	Relevant development employees including contractors are given adequate training in environmental awareness, legal responsibilities and holding pond sludge management through inductions and targeted training. Sludge level monitoring is an important part of holding pond management to ensure that the wet-weather capacity of the pond is maintained. The depth and spatial variability of sludge in the holding pond can vary widely depending on loading rates and the position of the inflow and outflow points. The sludge level shall be measured annually by: • Probing at a number of points within the holding pond – points close to the inlet weir from the sedimentation basin and irrigation take-off pipes shall assessed. • Somewhere between 8 and 40 depth measurements shall be taken using the measuring apparatus in a grid pattern across the pond. The measuring apparatus shall be a clear PVC pipe with a GPS receiver attached to the top. The length of the pipe to the GPS shall be recorded. • The measuring apparatus shall be, passed through the water column until the sludge layer is identified by feel. The relative level (RL) at each location shall be recorded on the GPS. • On completion of the assessment, the GPS data shall be reduced. • The RL of the sludge shall be incorporated into the as-constructed 3D model of the holding pond. • Using the difference in RL of the sludge height and the as-constructed holding pond bed and embankments RL the sludge volume shall be calculated. • The sludge volume shall be compared with the wet-weather storage capacity of the holding pond. • The holding pond shall be de-sludged once the accumulated sludge takes up a maximum of 10% of the design capacity of the holding pond. As this method is subjective, possessing an element of "feel," and requiring the opinion of the operator, the Environmental Specialist shall oversee the measurement and where possible the same person shall be used to measure the sludge layer year to year.
Relevant Standards, Management Plans, Records	CoA Complaints Register Personnel induction, training and awareness

Responsibility	As required by the OEMP and specific requirements outlined in section 5.1.
Performance Indicators	Ensure all personnel operating on the site are adequately trained. Personnel shall receive training in holding pond sludge management. No complaints relating to holding pond sludge management are received by the Project. No non-compliances with the CoA.
Monitoring	As required by the OEMP and specific requirements outlined in section 6.2.
Reporting	As required by the OEMP and specific requirements outlined in section 6.3.
Corrective Actions	Review management of holding pond sludge management methods. Review efficacy of sedimentation basin if sludge is accumulating rapidly.

OSLWMP SOP 8 – Liquid waste (Effluent) and solid waste – On-site utilisation

Aspect	Solid waste and Effluent – On-site utilisation
Objectives	To manage the on-site utilisation of solid waste and effluent such that impacts on community amenity, occupational health and the environment are minimised.
Potential Impacts	Occupational health and safety of employees and contractors. Community amenity and health impacts from offensive odours. Receiving environment impacts from uncontrolled runoff of effluent, leaching of effluent below the root zone etc.
Control Actions	All development employees including relevant contractors are given adequate training in environmental awareness, legal responsibilities and solid waste utilisation through inductions and targeted training. Solid waste and effluent shall only be applied to the approved respective utilisation areas. When solid waste and/or effluent utilisation is necessary, select an appropriate area for application. Do not select an area that has already had sufficient nutrients applied through solid waste or effluent or areas that are showing elevate nutrient levels. Review weather forecasts and on-site meteorological conditions including wind speed and direction, rain forecasts etc. Do not select an area where the prevailing wind direction will carry any odours towards dwellings or other areas likely to be used by the public at that time. Do not irrigate effluent when heavy rain is predicted. Do not spread solid waste too soon after heavy rain has been received (less than 48 hours). Solid waste shall be incorporated if applied to cultivated areas. The land application of solid waste is made at rates consistent with the ability of soils and crops grown in the on-site utilisation areas to sustainably utilise the applied nutrients, salts and organic matter, under the climatic conditions prevailing at the site. Review soil monitoring results prior to applications to ensure that over application of solid waste does not occur. Ensure effluent is not applied to vegetative buffers around sensitive receivers (e.g., drainage lines / watercourses / property boundaries / native vegetation). Do not apply effluent until soil moisture conditions permit irrigation e.g., not allow surface runoff.
Relevant Standards, Management Plans, Records	CoA Complaints Register Personnel induction, training and awareness
Responsibility	As required by the OEMP and specific requirements outlined in section 5.1.
Performance Indicators	Ensure all personnel involved with effluent utilisation are adequately trained. Personnel shall receive training in effluent utilisation.

	No complaints relating to effluent utilisation are received by the Project. No non-compliances with CoA. No adverse impacts to environmental values from effluent utilisation.
Monitoring	As required by the OEMP and specific requirements outlined in section 6.2.
Reporting	As required by the OEMP and specific requirements outlined in section 6.3.
Corrective Actions	Review management of effluent utilisation. Seek specialist advice where a significant level of environmental risk or impact is identified with effluent utilisation in indicators of sustainability.

Appendix B4 – Environmental monitoring management plan

Springfield Feedlot

Draft Operation Environmental Monitoring Management Plan

"Springfield"
2513 Getta Getta Road
North Star NSW 2408

Doolin Farming Pty Ltd
"Glenhoma"
3202 Getta Getta Road
NORTH STAR NSW 2408

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1 Background

1.1 Introduction

Doolin Farming Pty Ltd own and operate a 10,000 ha mixed farming operation across several properties at North Star including “Glenhoma”, “Glenmodel”, “Springfield”, “Myall Downs” and “Yetman West” some 27 km east of Yetman and 45 km south-southeast of Goondiwindi (QLD) in NSW.

Doolin Farming Pty Ltd primarily engage in dryland and irrigated cropping and beef production. Doolin Farming Pty Ltd produces wheat, barley, oats and chickpeas in winter and cotton and maize in summer under pivot irrigation systems and dryland sorghum cropping.

Central to the beef production enterprise is the breeding, growing and lot-feeding of cattle for the domestic market. The beef supply chain includes breeding and growing of beef cattle on land less suitable for dryland and irrigated cropping and grazing of stubble and lot feeding of cattle within a feedlot on the property ‘Springfield”.

“Springfield” comprises some 1,713 ha (~4,231 acres) and currently, a dryland and irrigated cropping business is undertaken on a large proportion of the property with extensive cattle breeding and grazing of beef cattle on the remaining land which is unsuitable for cropping and lot feeding of cattle within a beef cattle feedlot in the north-east of the property.

The feedlot is known as Springfield Feedlot and operates for 12 months of the year and employs approximately 4 full time staff. Casual staff and contractors are engaged as required during busy periods such as planting and harvesting of silage and fodder and to supply various associated services such as plant maintenance and veterinary requirements.

Springfield Feedlot includes one controlled drainage area with associated production pens and drainage system which includes catch drains, sedimentation basin and holding pond. Springfield Feedlot also has auxiliary infrastructure to support the use such as cattle handling and feed storage and processing facilities.

Springfield Feedlot is accredited under the National Feedlot Accreditation Scheme (NFAS) with audits conducted annually.

2 Purpose, scope, and objectives

2.1 Purpose

This Operation Environmental Monitoring Management Plan (OEMMP or Plan) forms part of the Operation Environmental Management Plan (OEMP) for the Springfield Feedlot (the Project).

This Plan has been prepared to address the Department of Planning and Environment (DPIE), Gwydir Shire Council (GSC) and the NSW Environment Protection Authority (NSWEPA) requirements of the Conditions of Approval (CoA) and the mitigation measures listed in the Springfield Feedlot EIS (2025) and all applicable legislation.

The Project has not commenced operation. This Plan will be reviewed and updated once operations commence.

2.2 Scope

This OEMMP outlines the environmental monitoring requirements and how Dolin Farming Pty Ltd will manage and control environmental monitoring during operation of the Project.

2.3 Objectives

The key objective of the OAQMP is to ensure that environmental impacts are minimised and kept within the scope permitted by CoA. To achieve this objective, Doolin Farming Pty Ltd will:

- ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in section 5 of this Plan.
- ensure all CoA and Doolin Farming Pty Ltd's Operations Policies and Standards are met in relation to environmental monitoring;
- ensure appropriate controls and procedures are implemented during operation activities to avoid or minimise air quality, soil and water quality, and groundwater and surface water impacts and potential adverse impacts to sensitive receivers within the vicinity of the Project.
- implement applicable best practice environmental monitoring techniques and procedures to manage and minimise adverse environmental impacts; and
- maintain an effective response mechanism to deal with issues and complaints.

3 Legislative and other requirements

3.1 Legal requirements

Legislation relevant to environmental monitoring and management includes:

- Environmental Planning and Assessment Act 1979 (EP&A Act);
- Protection of the Environment Operations Act 1997 (POEO Act);
- Protection of the Environment Legislation Amendment Act 2011 (POELA Act);
- Water Management Act 2000;
- Water Act 1912; and
- Contaminated Land Management Act 1997.

Relevant provisions of the above legislation are explained in the register of legal and other requirements included in Appendix A1 of the OEMP.

3.2 Guidelines and standards

The main guidelines, specifications and policy documents relevant to this OEMMP include:

Table 1 – Air quality – Relevant guidelines and standards

Guideline/Standard	Relevance
NSW Clean Air Strategy 2021-30	The NSW Clean Air Strategy outlines the integrated approach to improving air quality and protecting communities by the NSW Government. There are 5 priority action areas including better preparedness for pollution events; cleaner industry; cleaner transport; healthier households and better planning and design.
NSW Environment Protection Authority, 2016, Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales, Environment Protection Authority, Sydney, NSW.	This document provides information on the statutory methods to be used for modelling and assessing emissions of air pollutants in NSW. The document contains information on how to prepare emissions inventory data and meteorological data; methods for accounting for and dealing with background concentrations; dispersion modelling methodology and interpretation; impact assessment criteria for common pollutants; procedures for developing site-specific emission limits, including those for hydrogen sulfide and worked examples.
NSW Dust Strategy 2020-2022	The NSW Dust Strategy 2020-2022 coordinates SafeWork NSW's dust exposure prevention activities, ensuring consistent application of best practice principles and controls relevant to different dust types.
AS 3580.1.1:2007 Methods for sampling and analysis of ambient air: Part 1.1: Guide to siting air monitoring equipment	This Standard sets out general guidelines for the siting of ambient air monitoring equipment and specifies a number of siting parameters for individual air pollutants.
AS 3580.10.1:2003 (R2014) Methods for sampling and analysis of ambient air: Method 10.1: Determination of particulate matter – Deposited matter – Gravimetric method	This Standard sets out a method for the sampling of particulate matter that is deposited from the atmosphere, and procedures for the gravimetric determination of the mass deposition rate of insoluble solids, ash, combustible matter, soluble solids and total solids from ambient air.
AS 3580.14:2014 Methods for sampling and analysis of ambient air - Meteorological monitoring for ambient air quality monitoring applications	This Standard sets out methods for the collection of meteorological data for use in ambient air quality monitoring and modelling applications. Requirements and guidance are provided for the in-situ monitoring of primary meteorological variables.
Environmental Health Risk Assessment (enHealth, 2012)	This enHealth document provides a national approach to environmental health risk assessment.

Table 2 – Soil and water quality – Relevant guidelines and standards

Guideline/Standard	Relevance
Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ 2000)	Provides a framework for recognising and protecting water quality for the full range of existing environmental values.
AS/NZS 5667.1—1998: Water Quality—Sampling— Part 1: Guidance on the Design of Sampling Programs, Sampling Techniques and the Preservation and Handling of Samples. Standards Association of Australia, Sydney	This Standard provides general principles to be applied in sampling for the physical, chemical, microbiological or radiological analysis of waters and waste waters, including bottom sediment and sludges, for the purposes of process control, quality characterization, identification of sources of pollution and the monitoring of background levels.
AS 5667.4-1998: Water quality - Sampling, Part 4: Guidance on sampling from lakes, natural and man-made, Sydney NSW.	This part of AS5667 sets out the principles to be applied to the design of sampling programmes, sampling techniques and the handling of water samples from lakes, natural and man-made for physical, chemical and microbiological assessment.
AS/NZS 5667.6—1998: Water Quality—Sampling—Guidance on sampling of rivers and streams. Standards Association of Australia, Sydney	This part of AS5667 sets out the principles to be applied to the design of sampling programmes, sampling techniques and the handling of water samples from rivers and streams for physical, chemical and microbiological assessment.
AS/NZS 5667.10—1998: Water Quality—Sampling—Guidance on sampling of waste waters. Standards Association of Australia, Sydney	This part of AS5667 contains details on the sampling of domestic and industrial waste water, i.e. the design of sampling programmes and techniques for the collection of samples. It covers waste water in all its forms, i.e. industrial waste water, and crude and treated domestic waste water.
EPA, 2004, Approved Methods for the Sampling and Analysis of Water Pollutants in NSW.	Lists the sampling and analysis methods to be used when complying with a requirement by, or under, the environment protection legislation, or a licence or notice under that legislation, to test for the presence or concentration of matter in water and the volume, depth and flow of water or wastewater.
Department of Environment and Conservation (NSW), 2004, Effluent Guidelines, Use of Effluent by Irrigation	Provides guidelines for planning, designing, installing, operating and monitoring effluent irrigation systems to diminish risks to public health, the environment and agricultural resources and outlines the statutory requirements that may be needed for an effluent irrigation system in NSW.
Landcom, 2004, The Blue Book – Managing Urban Stormwater: Soils and Construction Volume 1, 4th Edition, March 2004 (reprinted 2006) (the "Blue Book"). Volume 1 and Volume 2.	Provides guidance for the design, construction and implementation of measures to improve stormwater management, soil erosion risks and sediment control from disturbed sites.
International Erosion and Sediment Control (IECA) (Australasia) 2008. Best practice erosion and sediment control. International Erosion Control Association (Australasia), Picton, NSW.	Provides guidance for the design, construction and implementation of measures to improve stormwater management, soil erosion risks and sediment control from disturbed sites.
Resource manual of development of Indicators of sustainability for effluent reuse in the intensive livestock industries: Piggeries and Cattle Feedlots,	Provides readily available data and analysis techniques for evaluating the sustainability of effluent and manure and carcass compost reuse for piggeries and cattle feedlots and suggested sustainability indicators for these intensive livestock industries.

Project No 1816, Australian Pork Limited, Canberra, Australia, May 2003.	
Redding, MR (2003), Sampling Manual for environmental monitoring by intensive livestock industries. Agency for Food and Fibre Sciences, Department of Primary Industries, Toowoomba, Queensland.	This manual sets out the sample collection and preparation techniques needed to fulfil the monitoring requirements of intensive livestock licences (under the QLD EP Act) for soil, effluent, manure, sludge, surface water and groundwater samples.
Rayment, G.E. and Lyons, D.J. (2010). Soil Chemical Methods -Australasia, CSIRO Publishing, ISBN: 9780643067684.	This handbook describes laboratory and field chemical tests and guidance on soil sampling and choice and application of analytical methods from soil sampling through to the reporting of results.
Standards Australia, 2017, AS 1940:2017: The storage and handling of flammable and combustible liquids	This Standard provides general principles and requirements to be applied for bunding, placarding, safe operations, emergency management and fire protection for flammable and combustible liquids.
Standards Australia, 1998, AS 2507-1998: The storage and handling of agricultural and veterinary chemicals	This Standard provides requirements and recommendations for the storage and handling of agricultural and veterinary chemicals, which may be classified as dangerous goods under the Australian Dangerous Goods Code (ADG Code) or as scheduled poisons by the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).
Meat and Livestock Australia, 2012a, National Beef Cattle Feedlot Environmental Code of Practice 2nd Edition, Meat & Livestock Australia, North Sydney, NSW.	The *Code* is designed to be a companion document to the *National Guidelines for Beef Cattle Feedlots in Australia*. The *Code* is intended to provide requirements for the environmentally relevant aspects of the establishment and operation of beef cattle feedlots.
MLA, 2012b, National Guidelines for Beef Cattle Feedlots in Australia 3rd Edition, Meat & Livestock Australia, North Sydney, NSW	The *National Guidelines for Beef Cattle Feedlots in Australia* is designed to provide 'guidance' on how the *Code* requirements regarding the establishment and operation of beef cattle feedlots may be achieved
Meat and Livestock Australia, 2015a, Beef Cattle Feedlots: Design and Construction, Meat and Livestock Australia, North Sydney, NSW.	This manual outlines the stages of selecting a suitable site, designing the feedlot and its facilities, their construction and the overall management of the project.
Meat and Livestock Australia, 2015b, Beef cattle feedlots: waste management and utilisation, Meat and Livestock Australia, North Sydney, NSW.	This manual provides best-practice guidelines for waste management in beef cattle feedlots.
Standards Australia, 2008, AS 4897-2008: The design, installation and operation of underground petroleum storage systems	This Standard provides general principles and requirements for the safe, environmentally sound and efficient underground storage of petroleum products.

Table 3 – Solid and liquid waste quality – Relevant guidelines and standards

Guideline/Standard	Relevance
Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ 2000)	Provides a framework for recognising and protecting water quality for the full range of existing environmental values.
AS 4454 –2012 - Australian Standard for Composts, Soil Conditioners and Mulches Standards Association of Australia, Sydney	This Standard specifies physical, chemical, biological and labelling requirements for composts, mulches, soil conditioners and related products that have been derived largely from compostable organic materials and which meet the minimum requirements as set out in this Standard.
Department of Environment and Conservation (NSW), 2004, Effluent Guidelines, Use of Effluent by Irrigation	Provides guidelines for planning, designing, installing, operating and monitoring effluent irrigation systems to diminish risks to public health, the environment and agricultural resources and outlines the statutory requirements that may be needed for an effluent irrigation system in NSW.
International Erosion and Sediment Control (IECA) (Australasia) 2008. Best practice erosion and sediment control. International Erosion Control Association (Australasia), Picton, NSW.	Provides guidance for the design, construction and implementation of measures to improve stormwater management, soil erosion risks and sediment control from disturbed sites.
Landcom, 2004, The Blue Book – Managing Urban Stormwater: Soils and Construction Volume 1, 4th Edition, March 2004 (reprinted 2006) (the "Blue Book"). Volume 1 and Volume 2.	Provides guidance for the design, construction and implementation of measures to improve stormwater management, soil erosion risks and sediment control from disturbed sites.
NSW Department of Primary Industries, 2004, Landform and soil requirements for biosolids and effluent reuse, Agnote DPI-493, NSW Government.	Outlines the landform and soil physical and chemical characteristic requirements for the reuse of biosolids and effluent.
McGahan EJ and Tucker RW, 2003, Resource manual of development of Indicators of sustainability for effluent reuse in the intensive livestock industries: Piggeries and Cattle Feedlots, Project No 1816, Australian Pork Limited, Canberra, Australia, May 2003.	Provides readily available data and analysis techniques for evaluating the sustainability of effluent and solid by-product reuse for piggeries and cattle feedlots and suggested sustainability indicators for these intensive livestock industries.
Meat and Livestock Australia, 2012a, National Beef Cattle Feedlot Environmental Code of Practice 2nd Edition, Meat & Livestock Australia, North Sydney, NSW.	The *Code* is designed to be a companion document to the *National Guidelines for Beef Cattle Feedlots in Australia*. The *Code* is intended to provide requirements for the environmentally relevant aspects of the establishment and operation of beef cattle feedlots.
MLA, 2012b, National Guidelines for Beef Cattle Feedlots in Australia 3rd Edition, Meat & Livestock Australia, North Sydney, NSW	The *National Guidelines for Beef Cattle Feedlots in Australia* is designed to provide 'guidance' on how the *Code* requirements regarding the establishment and operation of beef cattle feedlots may be achieved
Meat and Livestock Australia, 2015a, Beef Cattle Feedlots: Design and Construction, Meat and Livestock Australia, North Sydney, NSW.	This manual outlines the stages of selecting a suitable site, designing the feedlot and its facilities, their construction and the overall management of the project.

Meat and Livestock Australia, 2015b, Beef cattle feedlots: waste management and utilisation, Meat and Livestock Australia, North Sydney, NSW.	This manual provides best-practice guidelines for waste management in beef cattle feedlots.
Redding, MR (2003), Sampling Manual for environmental monitoring by intensive livestock industries. Agency for Food and Fibre Sciences, Department of Primary Industries, Toowoomba, Queensland.	This manual sets out the sample collection and preparation techniques needed to fulfil the monitoring requirements of intensive livestock licences (under the QLD EP Act) for soil, effluent, manure, sludge, surface water and groundwater samples.
Rayment, G.E. and Lyons, D.J. (2010). Soil Chemical Methods -Australasia, CSIRO Publishing, ISBN: 9780643067684.	This handbook describes laboratory and field chemical tests and guidance on soil sampling and choice and application of analytical methods from soil sampling through to the reporting of results.

3.3 Conditions of approval

The Conditions of Approval (CoA) relevant to this Plan are listed in Table 4. A cross reference is also included to indicate where the condition is addressed in this Plan or other Project management documents.

Table 4 – Conditions of Approval relevant to this plan

CoA	Condition requirements	Plan reference
Notice of Determination		
	To be completed after Notice of Determination is issued	
EPL		
	To be completed after EPL is issued	

4 Monitoring requirements

4.1 Air quality

Regular monitoring and inspections will be undertaken during operation in accordance with Table 4. Additional requirements and responsibilities in relation to inspections and monitoring are documented in sections 10.1 and 10.2 of the OEMP.

The proposed locations of air quality monitoring equipment for the Project are presented in Figure 1. The final locations of the air quality monitoring sites are subject to agreement with NSW EPA and final development design.

The proposed monitoring equipment, frequency of monitoring and relevant monitoring standards are summarised in Table 6. The siting and installation of air quality monitoring instruments will be in accordance with the requirements of AS/NZS 3580.1.1:2007 Methods for sampling and analysis of ambient air. Part 1.1: Guide to siting air monitoring equipment.

Table 5 – Project site – Air quality monitoring and inspection requirements

Monitoring details	Location	Responsibility	Frequency	Record	KPI
Weather data including daily rainfall, wind (direction and speed), temperature, relative humidity, barometric pressure	Automatic Weather Station (Figure 1) Manual rain gauges	Feedlot Manager	Daily	Daily rainfall record	N/A
Visual observations during site inspections, including activities outside of the Project that may impact on dust/odour levels near sensitive receivers	All	Feedlot Manager / Farm Manager	Daily	Complaints record	Number of dust and/or odour complaints

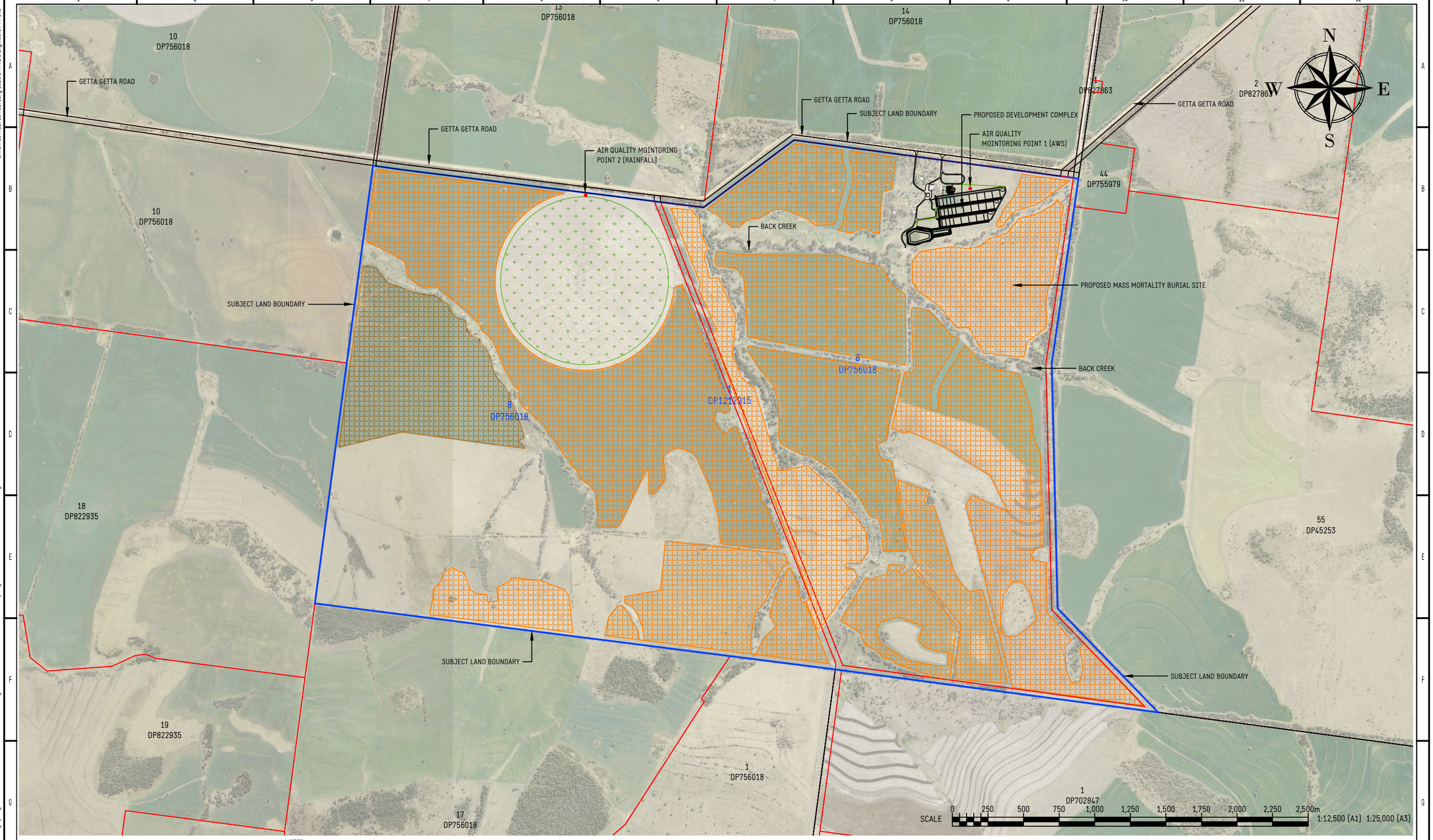
Table 6 – Project site – Air quality meteorological parameters monitoring

Instrument	Parameter	Frequency	Period	Relevant Standard / Method
Automatic Weather Station	Air temperature	Continuous	1 hour	AS 3580.14:2011
Automatic Weather Station	Wind direction	Continuous	15 minute	AS 3580.14:2011
Automatic Weather Station	Sigma theta	Continuous	15 minute	AS 3580.14:2011
Automatic Weather Station	Wind speed	Continuous	15 minute	AS 3580.14:2011
Automatic Weather Station	Rainfall	Continuous	24 hour	AS 3580.14:2011
Automatic Weather Station	Relative humidity	Continuous	1 hour	AS 3580.14:2011
Automatic Weather Station	Solar radiation	Continuous	1 hour	AS 3580.14:2011
Automatic Weather Station	Barometric pressure	Continuous	1 hour	AS 3580.14:2011
Automatic Weather Station	Black globe	Continuous	1 hour	AS 3580.14:2011

The justification for monitoring equipment and location are summarised in Table 7.

Table 7 – Project site – Air quality monitoring justification

Monitoring details	Location	Reference	Justification
Weather data including daily rainfall, wind (direction and speed), temperature, relative humidity, barometric pressure	Representative area within the Development Complex	Refer to Figure 2	Reviewed to assess climatic conditions - wind speed & direction, rainfall, temperature for dust, odour and cropping management, livestock heat load management, solid waste and effluent management
Visual observations during site inspections, including activities outside of the Project that may impact on dust/odour levels near sensitive receivers	Development Complex, solid waste and effluent utilisation areas and adjoining sensitive receivers	Refer to Figure 1	Level of risk presented by air emissions to sensitive receivers.



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- PROPOSED EFFLUENT UTILISATION AREA
- PROPOSED SOLID WASTE UTILISATION AREA

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REV.	DATE	REVISION DESCRIPTION	DRAWN	CHECK	APPROVED
A	24/01/25	DRAFT ISSUE TO CLIENT	RJD	RJD	RJD
B	21/02/25	FINAL ISSUE FOR SUBMISSION TO GSC	RJD	RJD	RJD

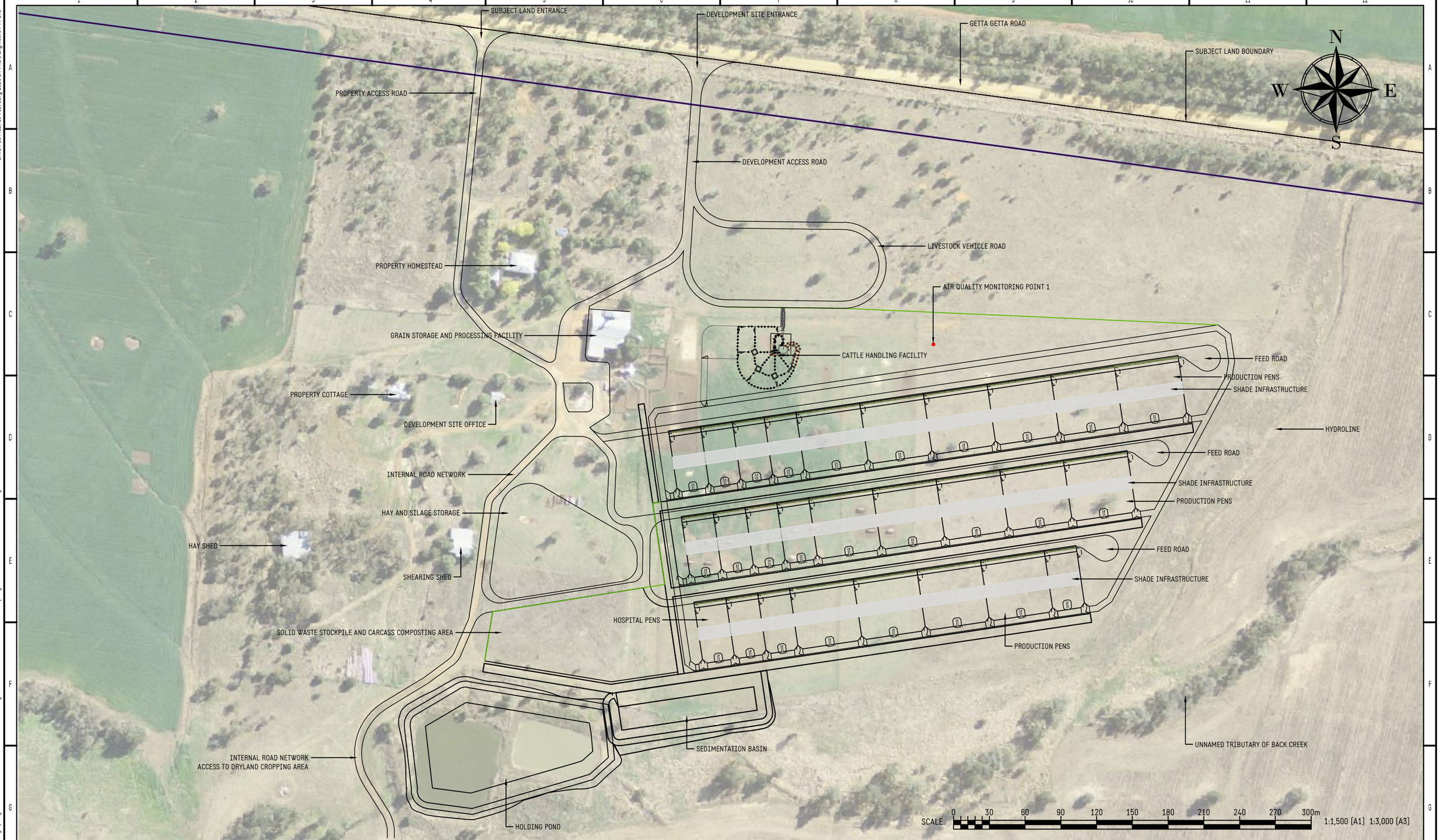
SCALE	1:25,000 (A3)
DRAWN	RJD
DATE	21/02/2025
CHECKED	RJD
DATE	21/02/2025
APPROVED	RJD
DATE	21/02/2025

CLIENT DOOLIN FARMING PTY LTD
PROJECT SPRINGFIELD BEEF CATTLE FEEDLOT
TITLE DRAFT OPERATION ENVIRONMENTAL MONITORING MANAGEMENT PLAN
PROJECT SITE - AIR QUALITY MONITORING POINTS

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 1		A3	E2-103-425-01	B

DATE PLOTTED: 19 February 2025 BY: - RDC Engineers PTY LTD
FILE NAME: E2-103 DF Springfield MASTERPLAN-00-20250108v8.dwg
FILE PATH: C:\RDC Engineers\RDCE - Projects\E2-103 Doolin Farming Springfield EIS\05 - ACAD MasterPlan\05.1 Drawings - CURRENT

DATE PLOTTED: 19 February 2025 BY: RDC Engineers PTY LTD



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY

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REV.	DATE	REVISION DESCRIPTION	DRAWN	CHECK	APPROVED
A	24/01/25	DRAFT ISSUE TO CLIENT	RJD	RJD	RJD
B	21/02/25	FINAL ISSUE FOR SUBMISSION TO GSC	RJD	RJD	RJD

SCALE	1:3,000 (A3)
DRAWN	RJD
DATE	21/02/2025
CHECKED	RJD
DATE	21/02/2025
APPROVED	RJD
DATE	21/02/2025

CLIENT: DOOLIN FARMING PTY LTD
PROJECT: SPRINGFIELD BEEF CATTLE FEEDLOT
TITLE: DRAFT OPERATION ENVIRONMENTAL MONITORING MANAGEMENT PLAN
PROJECT COMPLEX - AIR QUALITY MONITORING POINTS

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 2		A3	E2-103-425-02	B

FILE PATH: C:\RDC Engineers\RDCE - Projects\E2-103 Doolin Farming Springfield EIS\05 - ACAD MasterPlan\05.1 Drawings - CURRENT FILE NAME: E2-103 DF Springfield MASTERPLAN-00-20250108v8.dwg

4.2 Soil and water quality

Regular monitoring and inspections will be undertaken during operation in accordance with Table 8. Additional requirements and responsibilities in relation to inspections and monitoring are documented in sections 10.1 and 10.2 of the OEMP.

In lieu of NSW specific guidelines, the Gourley and Weaver (2019) guidelines "*A guide for 'fit for purpose' soil sampling*" shall be used to design a soil sample collection plan to fulfil the monitoring requirements for soils in the effluent and solid waste utilisation area.

In lieu of NSW specific guidelines, the QLD sampling manual for environmental monitoring by intensive livestock industries by Redding (2003) shall be used for sample collection and preparation techniques needed to fulfil the monitoring requirements for surface water and groundwater samples.

The proposed locations of soil and water quality monitoring sites for the Project are presented in Figure 3 to Figure 6 inclusive. The final locations of the soil and water quality monitoring sites are subject to agreement with NSW EPA.

The proposed number of monitoring sites, frequency of monitoring and relevant monitoring methods are summarised in Table 8 to Table 13. The soil and water sampling methods will be in accordance with the respective guidelines and standards detailed in Table 1.

Table 8 – Project site – Soil and water quality monitoring details summary

Monitoring details	Location	Responsibility	Frequency	Record	KPI
Soil nutrient levels (Effluent utilisation areas)	Refer to Figure 3	Farm Manager	As outlined in Table 15	Annual Return	No adverse impacts to soils from nutrient leaching or accumulation of nutrients in the soil profile
Soil nutrient levels (Solid waste utilisation areas)	Refer to Figure 3	Farm Manager	As outlined in Table 16	Annual Return	No adverse impacts to soils from nutrient leaching or accumulation of nutrients in the soil profile
Surface water quality	Refer to Figure 5	Farm Manager	As outlined in Table 10	Annual Return	No adverse impacts to surface waters from salts, nutrients or sediment deposition
Groundwater quality	Refer to Figure 6	Farm Manager	As outlined in Table 11	Annual Return	No adverse impacts to groundwater quality from high levels of nutrients.
Groundwater level	Refer to Figure 6	Farm Manager	As outlined in Table 13	Annual Return	Groundwater levels not within 2m of ground level

4.2.1 Surface and groundwater

4.2.1.1 Water quality

Water quality monitoring locations are outlined in Table 9.

Table 9 – Project site – Water quality monitoring locations

Monitoring details	Location	Reference	Justification
Surface water quality	SFSWMP1 – Back Creek	Refer to Figure 5	Upstream of utilisation area – surface water quality baseline
Surface water quality	SFSWMP2 – Back Creek	Refer to Figure 5	Downstream of Development complex / Solid utilisation areas - impacts to surface waters
Surface water quality	SFSWMP3 – Back Creek	Refer to Figure 5	Downstream of Development complex/ Effluent and Solid waste utilisation areas - impacts to surface water quality
Groundwater quality	SFMB 1	Refer to Figure 6	Effluent utilisation areas - impacts to groundwater
Groundwater quality	SFMB 2	Refer to Figure 6	Assess any potential seepage from effluent containment structures - impacts to groundwater

Table 10 – Project site – Surface water quality monitoring

Instrument	Parameter	Frequency	Location	Sampling Method
Manual	pH	Special Frequency 2	Figure 5	Representative sample
Manual	Total Suspended Solids	Special Frequency 2	Figure 5	Representative sample
Manual	Total Kjeldahl Nitrogen	Special Frequency 2	Figure 5	Representative sample
Manual	Nitrogen (ammonia)	Special Frequency 2	Figure 5	Representative sample
Manual	Nitrate (NO_3)	Special Frequency 2	Figure 5	Representative sample
Manual	Nitrate-nitrogen (NO_3-N)	Special Frequency 2	Figure 5	Representative sample
Manual	Total Phosphorus	Special Frequency 2	Figure 5	Representative sample
Manual	Reactive Phosphorus	Special Frequency 2	Figure 5	Representative sample
Manual	Potassium	Special Frequency 2	Figure 5	Representative sample
Manual	Electrical Conductivity	Special Frequency 2	Figure 5	Representative sample
Manual	Chloride	Special Frequency 2	Figure 5	Representative sample
Manual	Sodium Adsorption Ratio	Special Frequency 2	Figure 5	Representative sample
Manual	Sodium	Special Frequency 2	Figure 5	Representative sample
Manual	Magnesium	Special Frequency 2	Figure 5	Representative sample
Manual	Calcium	Special Frequency 2	Figure 5	Representative sample

For the purposes of Table 10, Special Frequency 2 means the collection of samples shall occur:

1) after every overflow event from the holding pond(s); and
2) at least every six (6) months.

A groundwater quality and standing water level monitoring program as shown in Table 10 is recommended to ensure any groundwater protection measures incorporated within the Project adequately protect groundwater beneath the site from pollution.

Table 11 – Project site – Groundwater quality monitoring

Instrument	Parameter	Frequency	Location	Sampling method
Manual	pH	6 months	Figure 6	Representative sample
Manual	Total Dissolved Solids	6 months	Figure 6	Representative sample
Manual	Nitrogen (total)	6 months	Figure 6	Representative sample
Manual	Nitrogen (ammonia)	6 months	Figure 6	Representative sample
Manual	Nitrate (NO_3)	6 months	Figure 6	Representative sample
Manual	Nitrate-nitrogen (NO_3-N)	6 months	Figure 6	Representative sample
Manual	Total Phosphorus	6 months	Figure 6	Representative sample
Manual	Electrical Conductivity	6 months	Figure 6	Representative sample
Manual	Sodium (Na)	6 months	Figure 6	Representative sample
Manual	Potassium (K)	6 months	Figure 6	Representative sample
Manual	Calcium (Ca)	6 months	Figure 6	Representative sample
Manual	Magnesium (Mg)	6 months	Figure 6	Representative sample
Manual	Chlorine (Cl)	6 months	Figure 6	Representative sample
Manual	Sulphate (SO_4)	6 months	Figure 6	Representative sample
Manual	Bicarbonate (HCO_3)	6 months	Figure 6	Representative sample
Manual	Arsenic (As)	6 months	Figure 6	Representative sample
Manual	BOD	6 months	Figure 6	Representative sample
Manual	Standing water level	6 months	Figure 6	In-situ

An irrigation water quality monitoring program as shown in Table 12 is recommended to ensure groundwater is suitable for irrigation.

Table 12 – Project site – Irrigation water quality monitoring

Instrument	Parameter	Frequency	Location	Sampling method
Manual	pH	12 months	Figure 6	Representative sample
Manual	Total Dissolved Solids	12 months	Figure 6	Representative sample
Manual	Nitrogen (total)	12 months	Figure 6	Representative sample
Manual	Nitrogen (ammonia)	12 months	Figure 6	Representative sample
Manual	Nitrate (NO_3)	12 months	Figure 6	Representative sample
Manual	Nitrate-nitrogen (NO_3-N)	12 months	Figure 6	Representative sample
Manual	Total Phosphorus	12 months	Figure 6	Representative sample
Manual	Electrical Conductivity	12 months	Figure 6	Representative sample
Manual	Sodium (Na)	12 months	Figure 6	Representative sample
Manual	Potassium (K)	12 months	Figure 6	Representative sample
Manual	Calcium (Ca)	12 months	Figure 6	Representative sample
Manual	Magnesium (Mg)	12 months	Figure 6	Representative sample
Manual	Chlorine (Cl)	12 months	Figure 6	Representative sample
Manual	Sulphate (SO_4)	12 months	Figure 6	Representative sample
Manual	Bicarbonate (HCO_3)	12 months	Figure 6	Representative sample
Manual	Arsenic (As)	12 months	Figure 6	Representative sample
Manual	BOD	12 months	Figure 6	Representative sample

4.2.1.2 Groundwater level

Monitoring of groundwater level shall be undertaken within the Development site for environmental purposes as outlined in Table 13.

Table 13 – Project site – Groundwater level monitoring locations

Monitoring details	Location	Reference	Justification
Groundwater level	SFMB 1	Refer to Figure 6	Assess any potential seepage from effluent containment structures - impacts to groundwater.
Groundwater level	SFMB 2	Refer to Figure 6	Assess any potential seepage from effluent containment structures - impacts to groundwater.

4.2.2 Soils monitoring

Soil quality monitoring shall be undertaken within the effluent utilisation and solid waste utilisation areas for environmental and agronomic purposes as outlined in Table 14. Land suitable for effluent n and solid waste utilisation has been identified on the Project site as shown in Figure 3 and Figure 4.

Table 14 – Project site – Soil quality monitoring locations

Monitoring details	Location	Reference	Justification
Soil nutrient levels (Effluent utilisation)	Effluent utilisation area	Refer to Figure 3	Measured impacts to soils and assessment of system sustainability and sustainable application rates.
Soil nutrient levels (Solid waste utilisation)	Solid waste utilisation area	Refer to Figure 4	Measured impacts to soils and assessment of system sustainability and sustainable application rates.

4.2.2.1 Environmental monitoring

The proposed waste utilisation areas are relatively large. Consequently, to ensure a representative sample is obtained within each management unit, a representative, GPS located, sampling program shall be developed.

The sampling program shall be developed in accordance with the methodology determined by Gourley & Weaver (2019) based on the diameter of the sampler and the number of cores.

The proposed parameters to be measured, frequency of monitoring and relevant monitoring methods are summarised in Table 15 and Table 16.

Table 15 – Project site – Effluent utilisation area – Soils monitoring

Instrument	Parameter	Frequency	Location	Sampling method
Manual	Moisture content	Special Frequency 1	Refer to Figure 3	Special Method 1
Manual	pH	Special Frequency 1	Refer to Figure 3	Special Method 1
Manual	Nitrogen (total)	Special Frequency 1	Refer to Figure 3	Special Method 1
Manual	Nitrate (NO_3)	Special Frequency 1	Refer to Figure 3	Special Method 1
Manual	Nitrate-nitrogen (NO_3-N)	Special Frequency 1	Refer to Figure 3	Special Method 1
Manual	Organic Carbon	Special Frequency 1	Refer to Figure 3	Special Method 1
Manual	Electrical conductivity	Special Frequency 1	Refer to Figure 3	Special Method 1
Manual	Chloride	Special Frequency 1	Refer to Figure 3	Special Method 1
Manual	Cation exchange capacity	Special Frequency 1	Refer to Figure 3	Special Method 1
Manual	Exchangeable calcium	Special Frequency 1	Refer to Figure 3	Special Method 1
Manual	Exchangeable magnesium	Special Frequency 1	Refer to Figure 3	Special Method 1
Manual	Exchangeable potassium	Special Frequency 1	Refer to Figure 3	Special Method 1
Manual	Exchangeable sodium	Special Frequency 1	Refer to Figure 3	Special Method 1
Manual	Exchangeable sodium percentage	Special Frequency 1	Refer to Figure 3	Special Method 1
Manual	Total Phosphorus	Special Frequency 1	Refer to Figure 3	Special Method 1
Manual	Available Phosphorus (Colwell)	Special Frequency 2	Refer to Figure 3	Special Method 1
Manual	Phosphorus sorption capacity	Special Frequency 2	Refer to Figure 3	Special Method 1

For the purposes of Table 16, Special Frequency 1 means the collection of samples shall occur:

- prior to effluent application; and
- at least once every two (2) years.

For the purposes of Table 16, Special Frequency 2 means the collection of samples shall occur:

- prior to effluent application; and
- at least once every three (3) years.

For the purposes of environmental monitoring, Table 16, Special Method 1 means that, for each management unit within the effluent utilisation area representative composite samples

must be taken of the: (a) top soils 0-10 cm; 10-20cm and (b) sub soils at 20-30 cm, 50-60 cm, 90-100 cm.

For the purposes of agronomic soil testing, Table 16, Special Method 1 means that, for each management unit within the effluent utilisation area representative composite samples must be taken of the: (a) top soils 0-10 cm.

Table 16 – Project site – Solid waste utilisation area – Soils monitoring

Instrument	Parameter	Frequency	Location	Sampling Method
Manual	Moisture content	Special Frequency 1	Refer to Figure 4	Special Method 1
Manual	pH	Special Frequency 1	Refer to Figure 4	Special Method 1
Manual	Nitrogen (total)	Special Frequency 1	Refer to Figure 4	Special Method 1
Manual	Nitrate (NO_3)	Special Frequency 1	Refer to Figure 4	Special Method 1
Manual	Nitrate-nitrogen (NO_3-N)	Special Frequency 1	Refer to Figure 4	Special Method 1
Manual	Organic Carbon	Special Frequency 1	Refer to Figure 4	Special Method 1
Manual	Electrical conductivity	Special Frequency 1	Refer to Figure 4	Special Method 1
Manual	Chloride	Special Frequency 1	Refer to Figure 4	Special Method 1
Manual	Cation exchange capacity	Special Frequency 1	Refer to Figure 4	Special Method 1
Manual	Exchangeable calcium	Special Frequency 1	Refer to Figure 4	Special Method 1
Manual	Exchangeable magnesium	Special Frequency 1	Refer to Figure 4	Special Method 1
Manual	Exchangeable potassium	Special Frequency 1	Refer to Figure 4	Special Method 1
Manual	Exchangeable sodium	Special Frequency 1	Refer to Figure 4	Special Method 1
Manual	Exchangeable sodium percentage	Special Frequency 1	Refer to Figure 4	Special Method 1
Manual	Total Phosphorus	Special Frequency 2	Refer to Figure 4	Special Method 1
Manual	Available Phosphorus (Colwell)	Special Frequency 2	Refer to Figure 4	Special Method 1
Manual	Phosphorus sorption capacity	Special Frequency 2	Refer to Figure 3	Special Method 1

For the purposes of Table 16, Special Frequency 1 means the collection of samples shall occur:

1) prior to solid waste application; and
2) at least once every two (2) years.

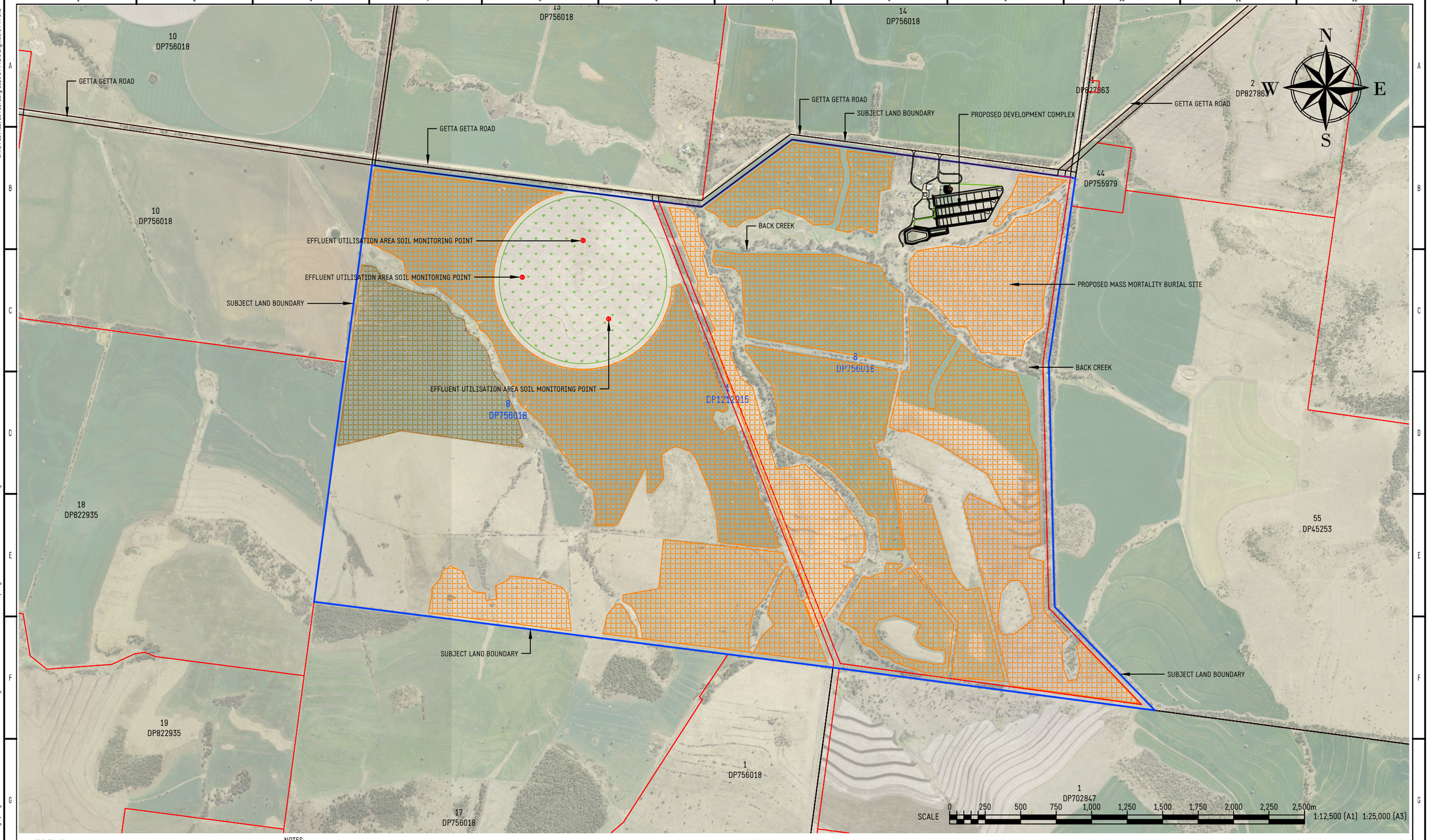
For the purposes of Table 16, Special Frequency 2 means the collection of samples shall occur:

1) prior to solid waste application; and

2) at least once every three (3) years.

For the purposes of environmental monitoring, Table 16, Special Method 1 means that, for each management unit within the effluent utilisation area representative composite samples must be taken of the: (a) top soils 0-10 cm; 10-20cm and (b) sub soils at 20-30 cm, 50-60 cm.

For the purposes of agronomic soil testing, Table 16, Special Method 1 means that, for each management unit within the effluent utilisation area representative composite samples must be taken of the: (a) top soils 0-10 cm.



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- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
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CLIENT: DOOLIN FARMING PTY LTD
PROJECT: SPRINGFIELD BEEF CATTLE FEEDLOT
TITLE: DRAFT OPERATION ENVIRONMENTAL MONITORING MANAGEMENT PLAN
PROJECT SITE - EFFLUENT UTILISATION AREA SOIL MONITORING POINTS

REPORT REFERENCE: FIGURE 3
SUPPLIED DRAWING NUMBER:
A3
DRAWING NUMBER: E2-103-425-03
REV.: B

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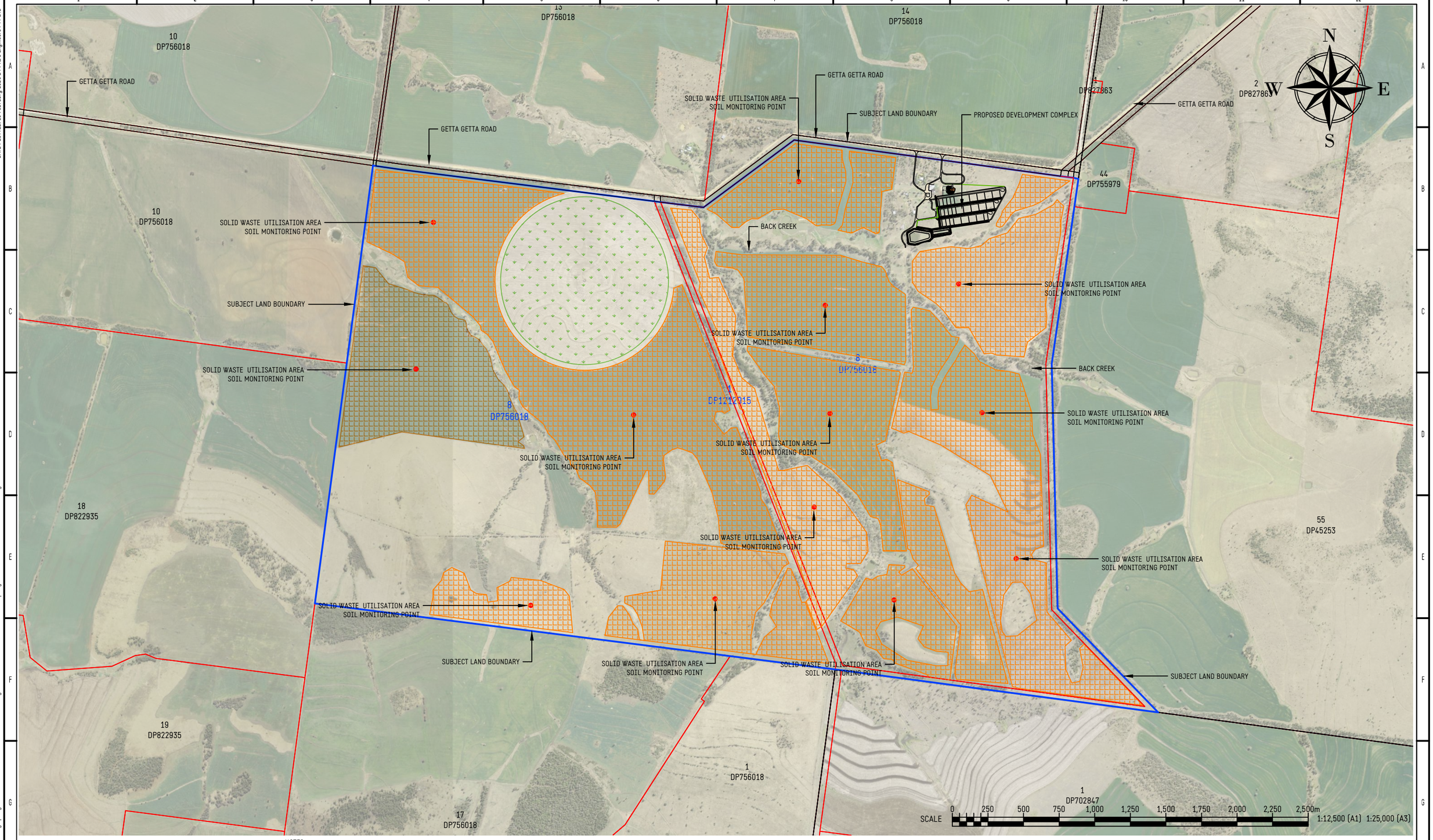

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PROJECT SPRINGFIELD BEEF CATTLE FEEDLOT
TITLE DRAFT OPERATION ENVIRONMENTAL MONITORING MANAGEMENT PLAN
PROJECT SITE - SOLID WASTE UTILISATION AREA SOIL MONITORING POINTS

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FIGURE 4			E2-103-425-04	B

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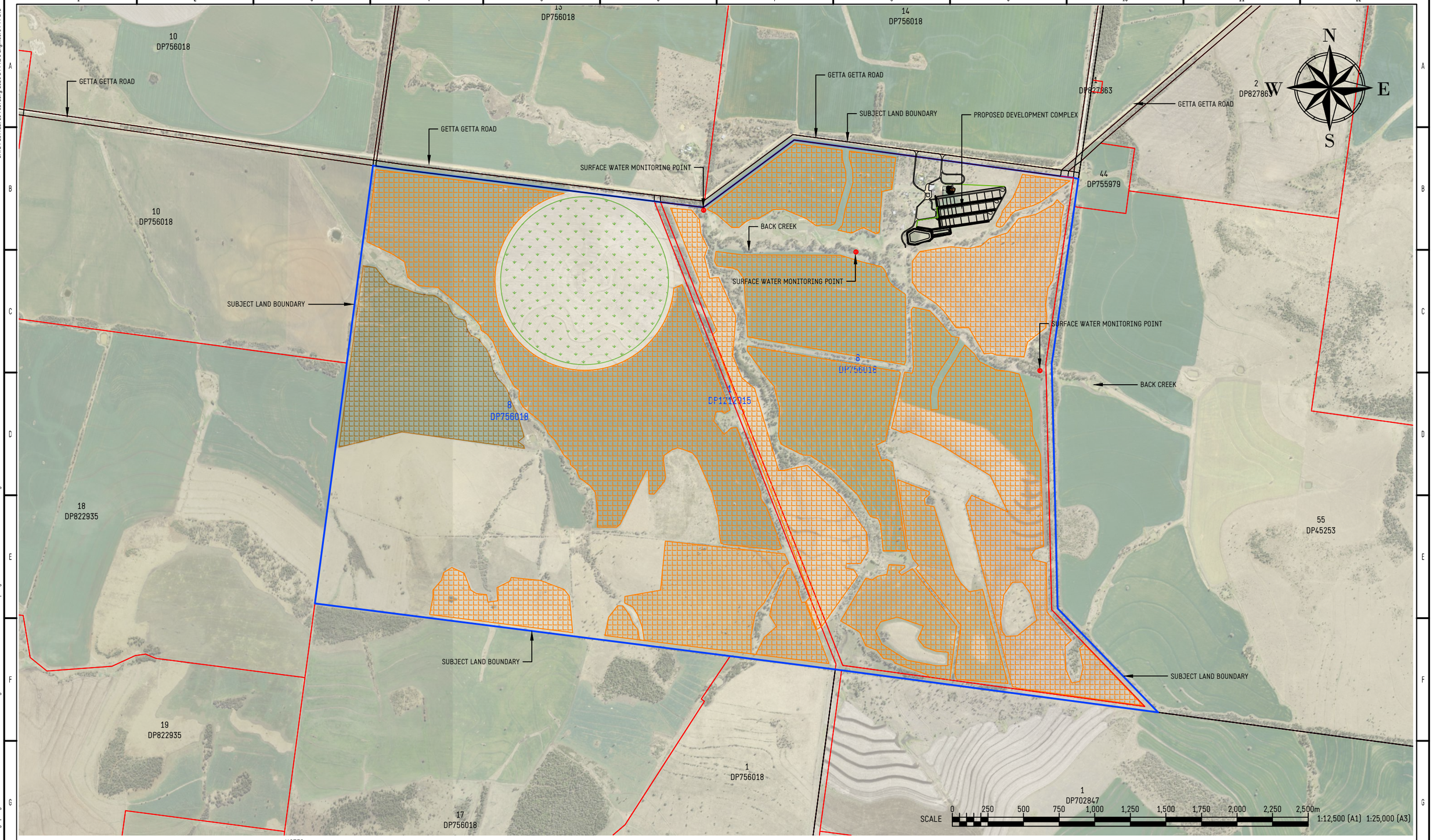

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PROJECT SPRINGFIELD BEEF CATTLE FEEDLOT
TITLE DRAFT OPERATION ENVIRONMENTAL MONITORING MANAGEMENT PLAN
PROJECT SITE - SURFACE WATER MONITORING POINTS

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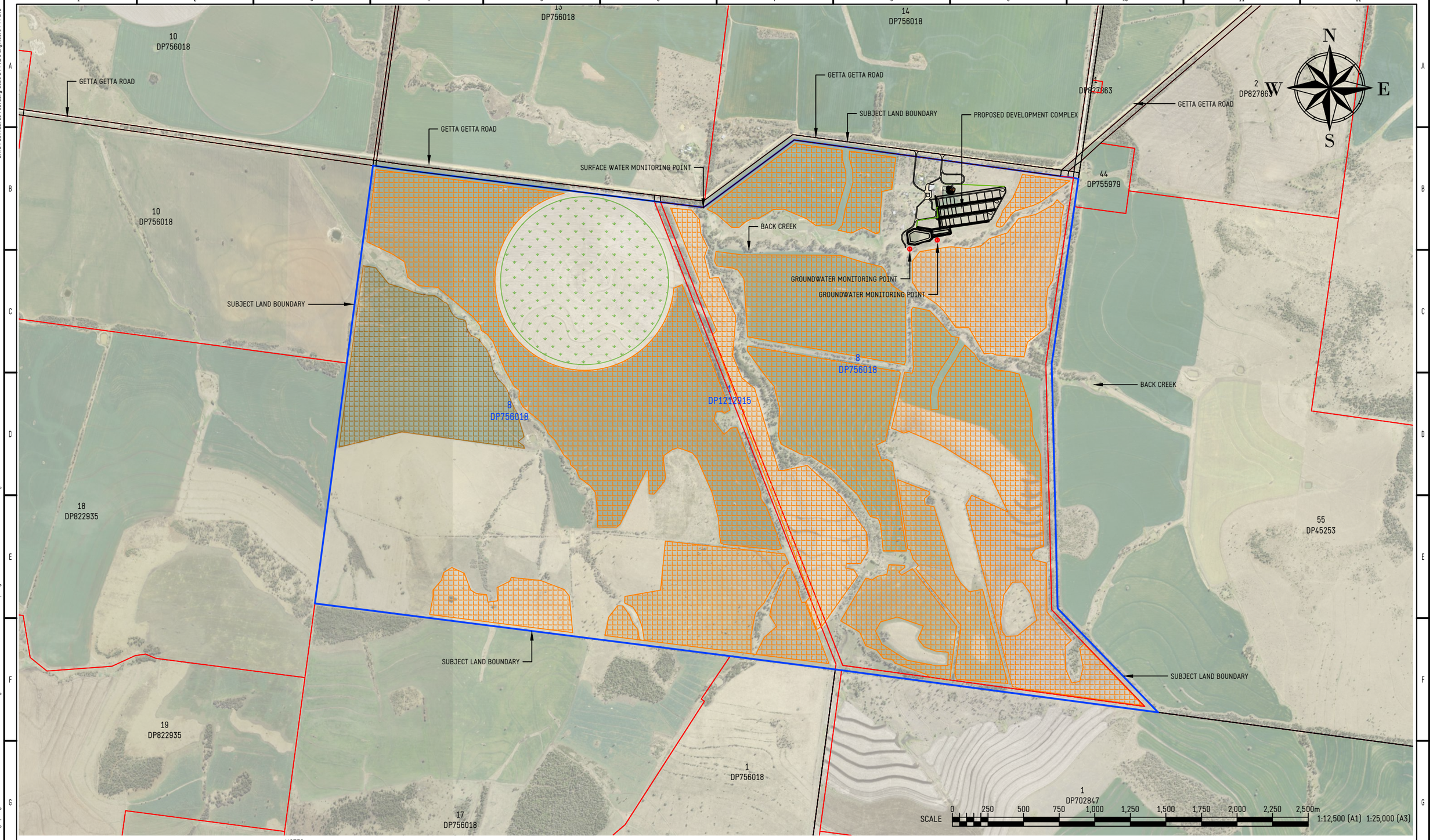

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CLIENT: DOOLIN FARMING PTY LTD
PROJECT: SPRINGFIELD BEEF CATTLE FEEDLOT
TITLE: DRAFT OPERATION ENVIRONMENTAL MONITORING MANAGEMENT PLAN
PROJECT SITE - GROUNDWATER MONITORING POINTS

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 6		A3	E2-103-425-06	B

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4.3 Solid and effluent waste quality

Regular monitoring and inspections will be undertaken during operation in accordance with Table 17. Additional requirements and responsibilities in relation to inspections and monitoring are documented in sections 11.1 and 11.2 of the OEMP.

The proposed locations of solid waste monitoring sites for the Project are presented in Figure 7 and Figure 8. The final locations of the solid waste monitoring sites are subject to agreement with NSW EPA.

The proposed number of monitoring locations, frequency of monitoring and relevant monitoring standards are summarised in Table 17. The solid waste sampling methods will be in accordance with the respective guidelines and standards detailed in Table 1.

The justification for the locations of solid and effluent monitoring sites are provided in Table 17.

Table 17 – Project site – Effluent and solid waste monitoring details

Monitoring details	Location	Responsibility	Frequency	Record	KPI
Solid waste quality	Refer to Figure 7	Farm Manager	As outlined in Table 19	Annual Return	No adverse impacts to soils
Mass of solid waste utilised on-site	Refer to Figure 8	Farm Manager	As outlined in Table 20	Annual Return	No adverse impacts to soils and/or sensitive receivers
Mass of solid waste removed off-site	Refer to Figure 7	Farm Manager	As outlined in Table 20	Annual Return	Sustainable accumulation of solid waste in solid waste storage and processing area
Volume of sludge accumulating in holding pond(s)	Refer to Figure 7	Farm Manager	As outlined in Table 20	Annual Return	Wet weather storage capacity of holding pond is maintained
Effluent quality	Refer to Figure 7	Farm Manager	As outlined in Table 22	Annual Return	No adverse impacts to soils
Effluent applied to utilisation area	Refer to Figure 8	Farm Manager	As outlined in Table 21	Annual Return	No adverse impacts to soils, groundwater, surface water and/or sensitive receivers
Holding pond(s) overflow volume	Refer to Figure 7	Farm Manager	Each overflow event	Annual Return	No adverse impacts to surface water
Holding pond(s) overflow effluent quality	Refer to Figure 7	Farm Manager	As outlined in Table 22	Annual Return	No adverse impacts to surface water

Table 18 – Project site – Effluent and solid waste monitoring justification

Monitoring details	Location	Reference	Justification
Solid waste quality	Solid waste stockpile	Refer to Table 19	Analysed for nutrient levels to calculate nutrient applied
Mass of solid waste utilised on-site	Loader scales / Truck numbers	Refer to Table 20	Dry matter by nutrient level to calculate nutrient applied
Mass of solid waste removed off-site	Loader scales / Truck numbers	Refer to Table 20	To calculate solid waste removed off-site
Volume of sludge accumulating in holding pond	Holding pond(s)	Refer to Table 20	Measured to ensure storage capacity of holding pond is maintained
Effluent quality	Holding pond(s)	Refer to Table 22	Analysed for nutrient levels to calculate nutrient applied
Effluent applied to utilisation area	Pumping time / pump capacity / Flow meter	Refer to Table 21	Volume by nutrient level to calculate nutrient applied
Holding pond(s) overflow volume	Holding pond bywash - overflow event	Refer to Table 21	Overflow volume estimated level of risk presented by overflow to downstream receivers
Holding pond(s) overflow effluent quality	Holding pond bywash – overflow event	Refer to Table 22	Overflow quality estimated level of risk presented by overflow to downstream receivers

Table 19 – Project site – Solid waste quality monitoring

Instrument	Parameter	Frequency	Location	Sampling method
Manual	Calcium	Every 12 months	Figure 7	Representative sample
Manual	Chloride	Every 12 months	Figure 7	Representative sample
Manual	Electrical conductivity	Every 12 months	Figure 7	Representative sample
Manual	Magnesium	Every 12 months	Figure 7	Representative sample
Manual	Moisture content	Every 12 months	Figure 7	Representative sample
Manual	Nitrate-nitrogen	Every 12 months	Figure 7	Representative sample
Manual	Nitrogen (total)	Every 12 months	Figure 7	Representative sample
Manual	Organic carbon	Every 12 months	Figure 7	Representative sample
Manual	pH	Every 12 months	Figure 7	Representative sample
Manual	Phosphorus(total)	Every 12 months	Figure 7	Representative sample
Manual	Potassium	Every 12 months	Figure 7	Representative sample
Manual	Sodium	Every 12 months	Figure 7	Representative sample
Manual	Sulfur	Every 12 months	Figure 7	Representative sample

Table 20 – Project site – Solid waste mass monitoring

Location	Frequency	Units of Measure	Sampling method
Mass of solid waste utilised on-site	Yearly	kg / ha	Special Method 1
Mass of solid waste removed off-site	Yearly	tonnes	Special Method 2
Sludge accumulation	Every 3 years	m^3	Special Method 3

For the purposes of Table 20 above Special Method 1 means that the mass of:

1. Solid waste (dry matter) and nutrient (Total Phosphorus, Total Nitrogen and Potassium) applied to each management unit of the solid waste utilisation area; and

2. Crop yield (dry matter) and nutrients removed (Total Phosphorus, Total Nitrogen and Potassium) for each management unit of the solid waste utilisation area;

For the purposes of Table 20 above Special Method 2 means that

a) the quantity of solids taken from the solid waste stockpile and removed off-site.
b) Date / Identity of person removing solids and destination

For the purposes of Table 20 above Special Method 3 means that

a) the volume of sludge accumulating in the holding pond as determined by the measurement method outlined in Appendix A.
b) Date / Identity of person removing sludge from the holding pond and destination.

Table 21 – Project site – Effluent volume monitoring

Location	Frequency	Units of Measure	Sampling Method
Volume of effluent applied to utilisation area	Yearly	ML, kg /ha	Special Method 3

For the purposes of Table 21 above Special Method 3 means that:

1. Volume data is calculated by volume flow rate or pump capacity multiplied by operating time;

2. Mass of nutrients (Total Phosphorus, Total Nitrogen and Potassium) applied to each the effluent utilisation area; and

3. Crop yield (dry matter) and nutrients removed (Total Phosphorus, Total Nitrogen and Potassium) from the effluent utilisation area;

Table 22 – Project site – Effluent quality monitoring (Holding Pond)

Instrument	Parameter	Frequency	Location	Sampling method
Manual	Calcium	12 months	Figure 7	Representative sample
Manual	Chloride	12 months	Figure 7	Representative sample
Manual	Electrical conductivity	Special Frequency 1	Figure 7	Representative sample
Manual	Magnesium	12 months	Figure 7	Representative sample
Manual	Nitrate-nitrogen	Special Frequency 1	Figure 7	Representative sample
Manual	Nitrogen (ammonia)	Special Frequency 1	Figure 7	Representative sample
Manual	pH	Special Frequency 1	Figure 7	Representative sample
Manual	Phosphorus(total)	Special Frequency 1	Figure 7	Representative sample
Manual	Phosphorus (reactive)	Special Frequency 1	Figure 7	Representative sample
Manual	Potassium	12 months	Figure 7	Representative sample
Manual	Sodium	12 months	Figure 7	Representative sample
Manual	Sodium adsorption ratio	12 months	Figure 7	Representative sample
Manual	Total Kjeldahl Nitrogen	12 months	Figure 7	Representative sample
Manual	Total suspended solids	Special Frequency 1	Figure 7	Representative sample

For the purposes of Table 22 above Special Frequency 1 means that the collection of samples shall occur at

a) Each overflow event; and
b) Every 12 months

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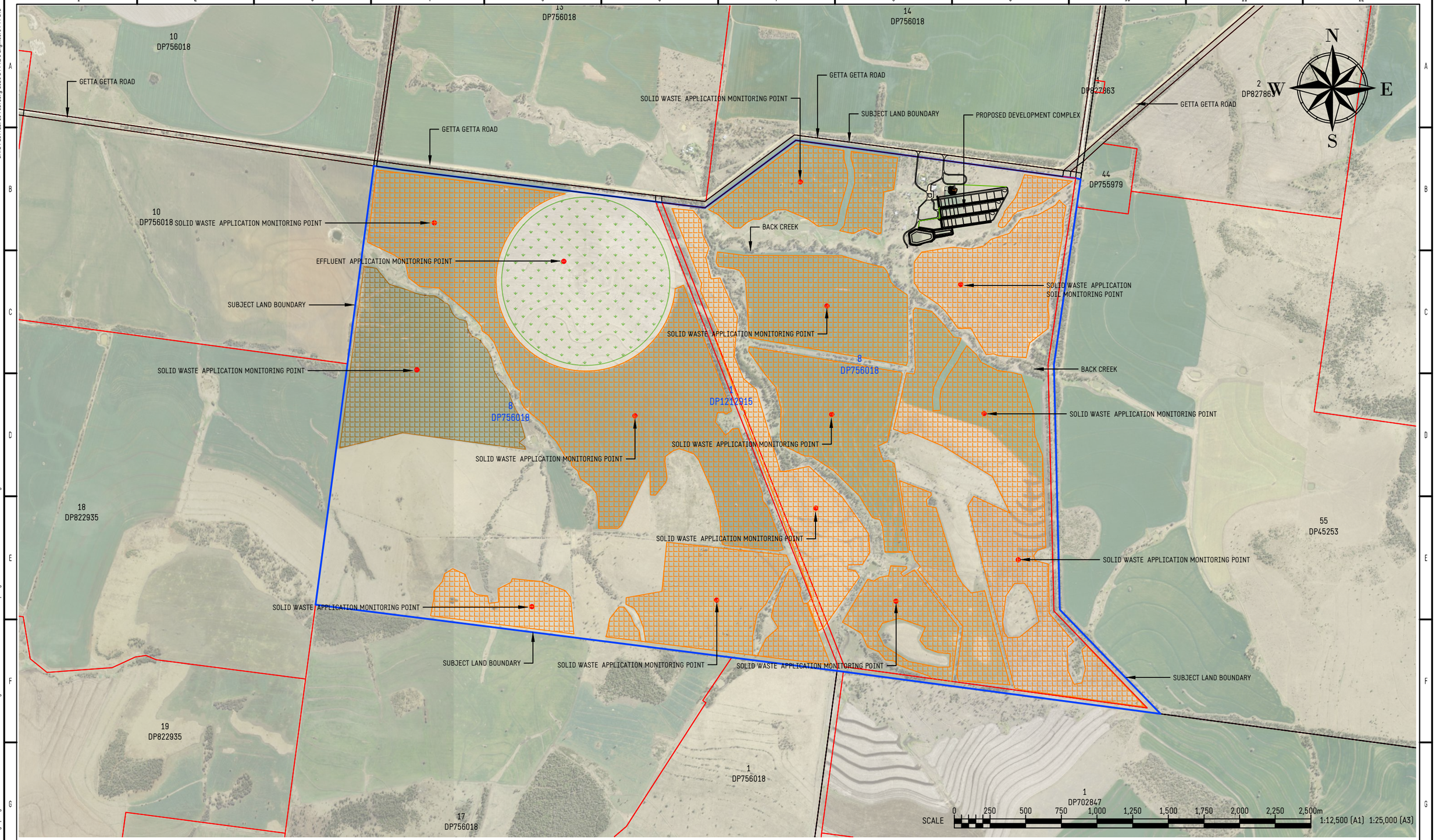
SCALE	1:3,000 (A3)
DRAWN	RJD
DATE	21/02/2025
CHECKED	RJD
DATE	21/02/2025
APPROVED	RJD
DATE	21/02/2025

CLIENT: DOOLIN FARMING PTY LTD
PROJECT: SPRINGFIELD BEEF CATTLE FEEDLOT
TITLE: DRAFT OPERATION ENVIRONMENTAL MONITORING MANAGEMENT PLAN
PROJECT COMPLEX - SOLID AND LIQUID WASTE MONITORING POINTS

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 7		A3	E2-103-425-07	B

FILE PATH: C:\RDC Engineers\RDCE - Projects\E2-103 Doolin Farming Springfield EIS\05 - ACAD MasterPlan\05.1 Drawings - CURRENT FILE NAME: E2-103 DF Springfield MASTERPLAN-00-20250108v8.dwg

DATE PLOTTED: 19 February 2025 BY: RDC Engineers PTY LTD
FILE NAME: E2-103 DF SpringfieLd MASTERPLAN-00-20250108v8.dwg
FILE PATH: C:\RDC Engineers\RDCE - Projects\E2-103 DooLin Farming SpringfieLd EIS\05 - ACAD MasterPlan\05.1 Drawings - CURRENT



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- PROPOSED EFFLUENT UTILISATION AREA
- PROPOSED SOLID WASTE UTILISATION AREA

NOTES:

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REV.	DATE	REVISION DESCRIPTION	DRAWN	CHECK	APPROVED	SCALE	1:25,000 (A3)
A	24/01/25	DRAFT ISSUE TO CLIENT	RJD	RJD	RJD	DRAWN	RJD
B	21/02/25	FINAL ISSUE FOR SUBMISSION TO GSC	RJD	RJD	RJD	DATE	21/02/2025
						CHECKED	RJD
						DATE	21/02/2025
						APPROVED	RJD
						DATE	21/02/2025

CLIENT: DOOLIN FARMING PTY LTD
PROJECT: SPRINGFIELD BEEF CATTLE FEEDLOT
TITLE: DRAFT OPERATION ENVIRONMENTAL MONITORING MANAGEMENT PLAN
PROJECT SITE - EFFLUENT AND SOLID WASTE
APPLICATION MONITORING POINTS

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 8		A3	E2-103-425-08	B

5 Implementation

5.1 Roles and responsibilities

The organisational structure and overall roles and responsibilities of the Project team are outlined in section 6.3 of the OEMP. Specific responsibilities for the implementation of environmental controls are detailed in Table 5, Table 8 and Table 17.

5.2 Induction

The Project has a site induction program that all contractors and employees are required to complete prior to undertaking any work on the Project site in accordance with section 8.1 of the OEMP.

Prior to conducting environmental monitoring for the Project, all employees and/or subcontractors will undergo site induction relating to environmental monitoring and management issues, including:

- Requirements of this Plan;
- Relevant legislation; and
- Roles and responsibilities for environmental monitoring.

5.3 Training

All employees and/or subcontractors that undertake environmental monitoring shall be suitably qualified and experienced.

Further details regarding employee training are outlined in section 8.2 of the OEMP.

6 Performance evaluation

6.1 Performance indicators

The extent to which this Plan complies with CoA will be measured by the following performance indicators:

- Compliance with relevant air quality standards at monitoring locations, in particular those representative of sensitive receptor locations;
- Minimisation of air quality (odour, dust) complaints as evidenced by trends in the frequency and number of complaints;
- Compliance with relevant baseline standards at monitoring locations; and
- Compliance with this plan, as indicated by internal and statutory reporting.

6.2 Reporting

Environmental monitoring reporting is designed to comply with the CoA and provide stakeholder access to relevant quality information and data.

Key stakeholders requiring access to this information include Doolin Farming Pty Ltd, state and local government agencies and the local community. Annual reporting will be undertaken in accordance with CoA and the Annual Return requirements detailed in the EPL.

Doolin Farming Pty Ltd will report on the performance of the environmental monitoring program in the Annual Return for the EPL.

Doolin Farming Pty Ltd is required to report pollution incidents immediately and without delay in accordance with the requirements of the *POEO Act 1997*.

6.3 Auditing

The auditing requirements of environmental monitoring are outlined in section 6.3 of the OEMP.

7 Review and Improvement

7.1 Non-conformances and corrective actions

Any non-conformances related to environmental monitoring will be dealt with and documented in accordance with section 11.5 of the OEMP.

7.2 Continual improvement

This Plan and associated monitoring program will be reviewed and if necessary revised to the satisfaction of the NSW EPA as the Department currently administering the *Protection of the Environment Operations Act 1997*) in accordance with section 12 of the OEMP:

- where a risk assessment identifies the requirement to alter the plan;
- following changes to project approval or EPL conditions relating to environmental monitoring;
- following any significant air quality, soil or water quality related incident;
- where there is a relevant change in technology or legislation; or
- for necessary or any unforeseen changes to environmental monitoring locations.

8 References

Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ 2000).

Department of Environment and Conservation (NSW), 2004, Effluent guidelines, Use of effluent by irrigation, Department of Environment and Conservation (NSW), Sydney, NSW.

Department of Environment and Conservation (NSW), 2004, Approved methods for the sampling and analysis of water pollutants in New South Wales, Department of Environment and Conservation (NSW), Sydney, NSW.

Gourley CJP, Weaver DM, 2019, A guide for 'fit for purpose' soil sampling. Fertilizer Australia, Canberra, Australia.

International Erosion and Sediment Control (IECA) (Australasia) 2008. Best practice erosion and sediment control. International Erosion Control Association (Australasia), Picton, NSW.

McGahan and Tucker, 2003, Resource manual of development of indicators of sustainability for effluent reuse in the intensive livestock industries: Piggeries and Cattle Feedlots, Project No 1816, Australian Pork Limited, Canberra, Australia, May 2003.

Rayment, GE and Lyons, DJ 2010, Soil Chemical Methods - Australasia, CSIRO Publishing, ISBN: 9780643067684.

Redding, MR, 2003, Sampling Manual for environmental monitoring by intensive livestock industries. Agency for Food and Fibre Sciences, Department of Primary Industries, Toowoomba, Queensland.

Standards Australia 1998, AS/NZS 5667.1—1998: Water quality—Sampling— Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples. Standards Association of Australia, Sydney.

Standards Australia 1998, AS/NZS 5667.6—1998: Water quality—Sampling—Guidance on sampling of rivers and streams. Standards Association of Australia, Sydney.

Standards Australia 1998, AS/NZS 5667.10—1998: Water quality—Sampling—Guidance on sampling of waste waters. Standards Association of Australia, Sydney.

Standards Australia, 2007, AS 3580.1.1:2007: Methods for sampling and analysis of ambient air - Guide to siting air monitoring equipment, Sydney, NSW

Standards Australia, 2011, AS 3580.14-2011: Methods for sampling and analysis of ambient air – Meteorological monitoring for ambient air quality monitoring applications, Sydney NSW.

Standards Australia 2012, AS 4454 –2012 - Australian Standard for Composts, Soil Conditioners and Mulches Standards Association of Australia, Sydney.

Standards Australia, 2015, AS/NZS 3580.9.3:2015, Methods for sampling and analysis of ambient air: Determination of suspended particulate matter - Total suspended particulate matter (TSP) - High volume sampler gravimetric method, Sydney, NSW.

Standards Australia, 2014, AS/NZS 3580.14:2014, Methods for sampling and analysis of ambient air: Meteorological monitoring for ambient air quality monitoring applications, Sydney, NSW.

Standards Australia, 2016, AS/NZS 3580.1.1:2016, Methods for sampling and analysis of ambient air: Guide to siting air monitoring equipment, Sydney, NSW.

Appendix A – Standard Operational Procedures

OEMMP SOP 1 – Air Quality – Compliance monitoring

Aspect	Air quality – Compliance Monitoring
Objectives	To record site-specific weather data.
Potential Impacts	Non-compliance with CoA. Poor management of effluent and solid waste resulting in odour or dust nuisance Locating point sources of nuisance odour and dust emissions.
Control Actions	Implement and maintain a permanently located automatic weather station (AWS) on-site to continuously record weather data. A suitably trained person will perform the inspection of the AWS and download recorded data. Each day, data for each parameter shown on the real-time display system will be reviewed against existing meteorological conditions. Download meteorological data weekly and store in data management system. Review weekly the weather data for continuity / missing records and advise the Environmental Specialist of any spurious data as required. Inspect the AWS every week. At each inspection the following actions shall be performed: • Check the AWS is energised from power source; • Inspect the tipping bucket rain gauge and clean settled dust and/or clear blockages if required; • Inspect the wind speed and direction sensors for damage and clear any cobwebs if required; • Report any equipment damage to the Environmental Specialist.
Relevant Standards, Management Plans, Records	CoA Personnel induction, training and awareness AS 3580 Methods of sampling and analysis of ambient air
Responsibility	As required by the OEMP and specific requirements outlined in section 5.1.
Performance Indicators	Ensure all personnel responsible for the management of the meteorological station and metrological methods are adequately trained. The meteorological station provides long-term high quality, continuous meteorological data.
Monitoring	As required by the OEMP and specific requirements outlined in section 4.1.
Reporting	As required by the OEMP and specific requirements outlined in section 6.2.
Corrective Actions	Review weather data and management of the meteorological station. Seek specialist advice if inconsistent or spurious data is identified.

OEMMP SOP 2 - Soil and Water Quality – Soil quality monitoring procedure

Aspect	Soil and water quality – Soil quality monitoring
Objectives	To implement a soil quality monitoring program to monitor the quality of soils in the effluent and solid waste utilisation areas such that impacts on community amenity, occupational health and the environment are minimised.
Potential Impacts	Occupational health and safety of employees and contractors. Animal health and performance. Receiving environment such as groundwater or terrestrial ecosystems affected by pollution events. Receiving environment such as agricultural crops impacted by pollution events.
Control Actions	Implement a soil quality monitoring program for the effluent and solid waste utilisation areas in accordance with this Plan. Undertake soil quality monitoring from the relevant monitoring points in accordance with the EPL. Identify the location of monitoring points within the effluent and solid waste application areas using GPS. Prepare chain of custody form and sample bags for each sample. Identify parameters to be tested and outline on the relevant chain of custody form. Refer section 8.2 for requirements. Collect representative soil sample(s) and store in appropriate sample bags as per relevant monitoring and sampling guidelines. Samples are to be sent as soon as possible after collection to a NATA-accredited laboratory for the parameters to be analysed with the relevant chain of custody forms.
Relevant Standards, Management Plans, Records	CoA Non-compliance record Personnel induction, training and awareness Redding (2003) Sampling Manual for environmental monitoring by intensive livestock industries Annual Return
Responsibility	As required by the OEMP and specific requirements outlined in section 4.2.
Performance Indicators	Ensure all personnel responsible for monitoring are adequately trained. No non-compliances with CoA. No adverse impacts to environmental values.
Monitoring	As required by the OEMP and specific requirements outlined in section 4.2.
Reporting	As required by the OEMP and specific requirements outlined in section 6.2.
Corrective Actions	Review soil quality monitoring program. Seek specialist advice where a significant level of environmental risk or impact is identified with soil quality parameters.

OEMMP SOP 3 – Soil and Water Quality – Water quality monitoring procedure

Aspect	Soil and water quality – Water quality monitoring
Objectives	To implement a water quality monitoring program to monitor and report on the quality of water from various sources such that impacts on community amenity, occupational health and the environment are minimised.
Potential Impacts	Occupational health and safety of employees and contractors. Animal health and performance. Receiving environment such as surface water and aquatic and terrestrial ecosystems affected by pollution events. Community amenity and health from impacts on water sources. Receiving environment such as agricultural crops impacted by pollution events.
Control Actions	Implement a water quality monitoring program for groundwater and surface water in accordance with this Plan. Undertake groundwater and surface water quality monitoring from the relevant monitoring points in accordance with the EPL. Prepare chain of custody form and sample bottle for each sample. Identify parameters to be tested and outline on the relevant chain of custody form. Refer section 8.2 for requirements. Collect representative water sample(s) and store in appropriate sample bottle as per relevant monitoring and sampling guidelines. Samples are to be sent as soon as possible after collection to a NATA-accredited laboratory for the parameters to be analysed with the relevant chain of custody forms.
Relevant Standards, Management Plans, Records	CoA Non-compliance record Personnel induction, training and awareness Redding (2003) Sampling Manual for environmental monitoring by intensive livestock industries Annual Return
Responsibility	As required by the OEMP and specific requirements outlined in section 4.2.
Performance Indicators	Ensure all personnel responsible for monitoring are adequately trained. No non-compliances with CoA. No adverse impacts to environmental values.
Monitoring	As required by the OEMP and specific requirements outlined in section 4.2.
Reporting	As required by the OEMP and specific requirements outlined in section 6.2.
Corrective Actions	Review water quality monitoring program. Seek specialist advice where a significant level of environmental risk or impact is identified with water quality parameters.

OEMMP SOP 4 - Solid waste and effluent – Compliance monitoring

Aspect	Solid waste and effluent management – Compliance monitoring
Objectives	To implement a solid waste and effluent monitoring program to monitor and report on solid waste and effluent such that impacts on community amenity, occupational health and the environment are minimised.
Potential Impacts	Occupational health and safety of employees and contractors. Animal health and performance. Receiving environment such as groundwater, surface water and aquatic and terrestrial ecosystems affected by pollution events. Community amenity and health from impacts on water sources. Receiving environment such as agricultural crops impacted by pollution events. Non-compliance with CoA.
Control Actions	Implement an effluent and solid waste monitoring program in accordance with this Plan. Undertake solid waste and effluent monitoring from the relevant monitoring points in accordance with the EPL. Prepare chain of custody form and sample bottle/bag for each sample. Identify parameters to be tested and outline on the relevant chain of custody form. Refer section 8.2 for requirements. Collect representative solid waste / effluent sample(s) and store in appropriate sample bag/bottle as per relevant monitoring and sampling guidelines. Samples are to be sent as soon as possible after collection to a NATA-accredited laboratory for the parameters to be analysed with the relevant chain of custody forms. Review and evaluate the solid waste and effluent monitoring program and results for compliance with CoA. Regular liaison with the NSW EPA on efficacy of monitoring program and sustainability indicators.
Relevant Standards, Management Plans, Records	CoA Redding (2003) Sampling Manual for environmental monitoring by intensive livestock industries Personnel induction, training and awareness Annual Return
Responsibility	As required by the OEMP and specific requirements outlined in section 4.3.
Performance Indicators	Ensure all personnel responsible for monitoring are adequately trained. No non-compliances with CoA. No adverse impacts to environmental values.

Monitoring	As required by the OEMP and specific requirements outlined in section 4.3.
Reporting	As required by the OEMP and specific requirements outlined in section 6.2.
Corrective Actions	Review solid waste and effluent monitoring program. Seek specialist advice where a significant level of environmental risk or impact is identified with solid waste and effluent utilisation in indicators of sustainability.