TODOROSKI AIR SCIENCES

GREENHOUSE GAS ASSESSMENT

MIDCOAST REGIONAL ORGANICS PROCESSING SOLUTION

MRA Consulting Group

12 January 2026

Job Number 25021846A

Prepared by
Todoroski Air Sciences Pty Ltd
Suite 2B, 14 Glen Street
Eastwood, NSW 2122
Phone: (02) 9874 2123
Email: info@airsciences.com.au

Greenhouse Gas Assessment
MidCoast Regional Organics Processing Solution

DOCUMENT CONTROL

Report Version	Prepared by	Reviewed by
FINAL – 002	PH	EA

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1 INTRODUCTION

Todoroski Air Sciences has prepared this report for MRA Consulting Group on behalf of NALG in collaboration with Kanadevia Inova (KVI), for MidCoast Council (MCC). It presents an assessment of the potential greenhouse gas (GHG) emissions associated with the proposed MidCoast Regional Organics Processing Solution (MC ROPS) at 48 Midge Orchid Road, Darawank, New South Wales (NSW) (hereafter referred to as the Project).

The Project seeks to allow the receival and processing of up to 146,000 tonnes per annum (tpa) of food organics and garden organics (FOGO) at the facility. Composting of the FOGO material would occur utilising in-tunnel composting, a dry anaerobic digestion system and be able to produce green energy.

This GHG assessment has been prepared in general accordance with the New South Wales (NSW) Environment Protection Authority (EPA) document *Guide for Large Emitters* (**NSW EPA, 2024**).

This report comprises:

- A background to the Project and description of the proposed site and operations;
- An assessment of GHG emissions associated with the Project; and,
- An outline of proposed GHG mitigation and management measures.

2 PROJECT BACKGROUND

2.1 Local setting

The Project is located at Midge Orchid Rd, Darawank, (Lot 5 DP 1089990), within the MidCoast Council Local Government Area. It is approximately 8.7 kilometres (km) northwest of Hawks Nest and approximately 4.5km north of Tuncurry.

Surrounding land use is predominantly bushland with isolated residences and the Tuncurry Waste Management Facility located immediately to the east of the site. The site has an area of approximately 5.82 hectares (ha).

Figure 2-1 presents the location of the Project and the nearest residential receptor locations

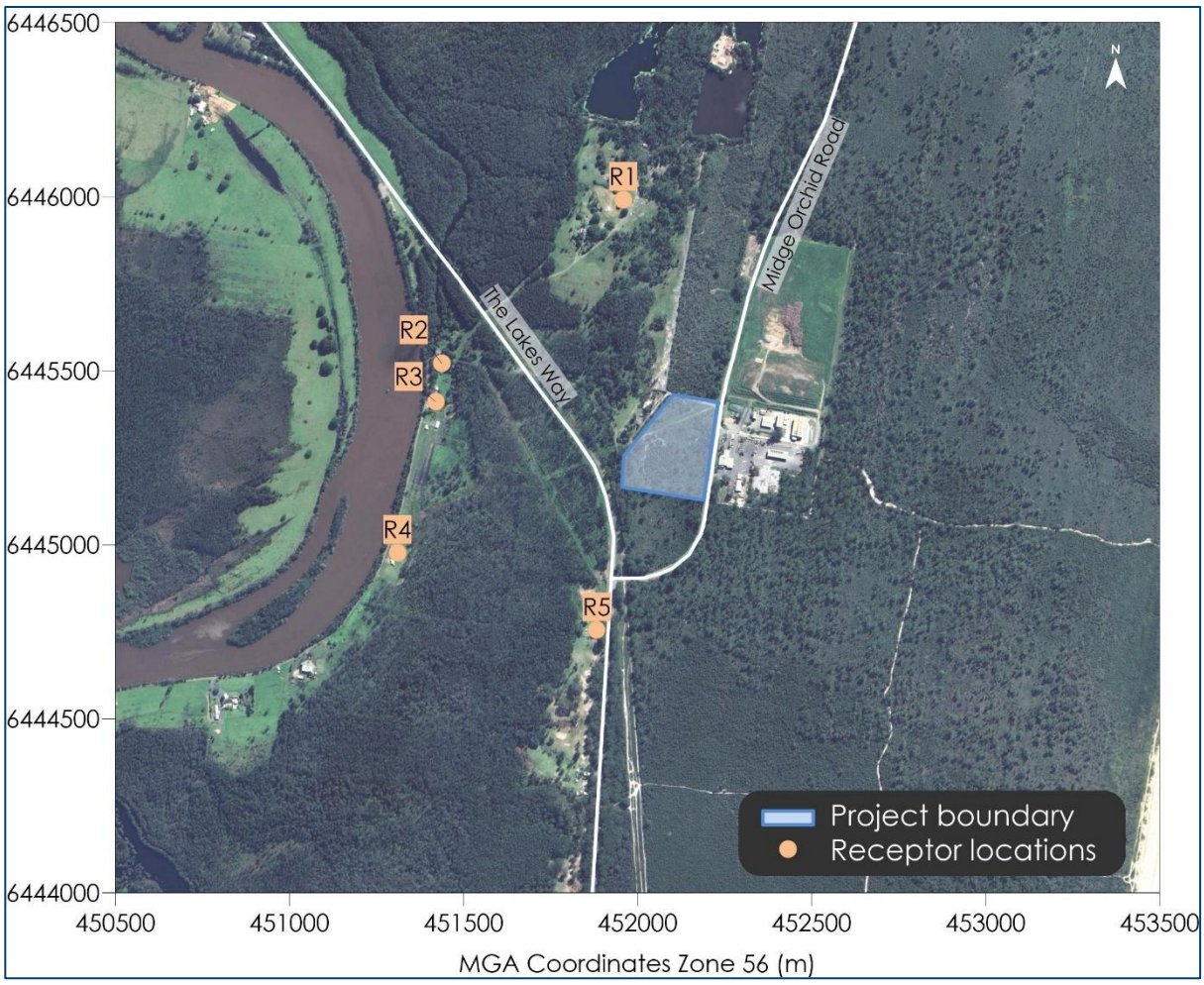

Figure 2-1: Project location

2.2 Project description

The MC ROPS is an organics processing facility that incorporates NALG In-vessel Composting (IVC) tunnels, KVI's Kompogas® Dry Anaerobic Digestion (AD) system, an enclosed maturation area, and a comprehensive air handling system comprising extraction, scrubbing, and biofiltration to manage odours.

It is initially proposed to have an operational capacity of 146,000tpa. The facility is designed to process organics from MidCoast Council's FOGO collection, self-hauled materials, and additional organic waste from commercial and industrial sources.

Figure 2-2 presents a high-level process flow chart of the process.

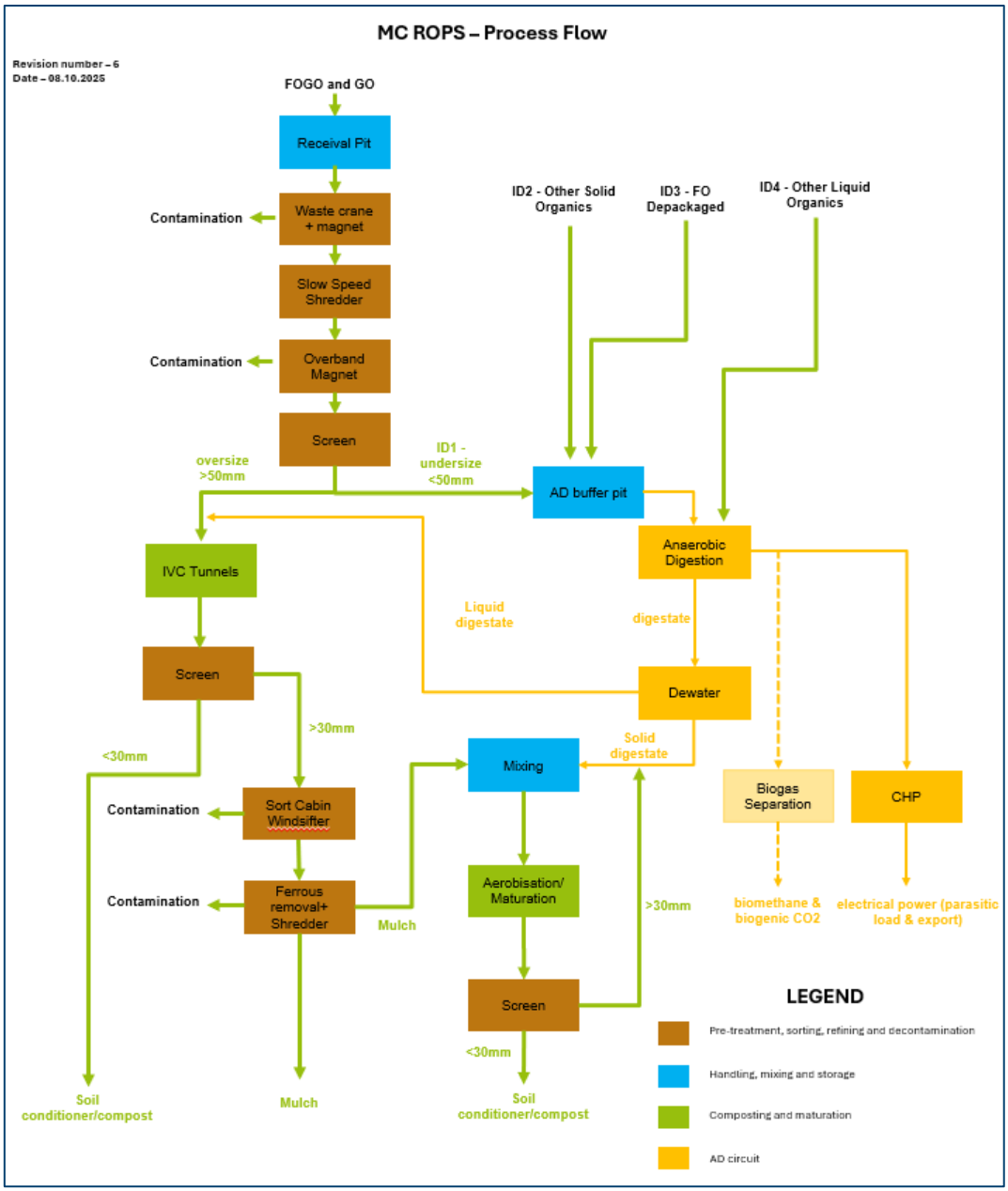

Figure 2-2: Process flow chart

Incoming material is received at the site within a collection bunker located inside the fully enclosed receival building under negative pressure with point extraction at odour generating sources. The building is equipped with pressure sensors and centrifugal fans, which extract air via overhead ducts. The extracted odorous air from point extraction (collection bunker, shredder, screen and other waste storage area(s)) is routed to the IVC tunnel system as an air supply, which is exhausted and sent to the odour control system. This includes a two-stage scrubber and biofilter, additional air from the receival

building from non-odorous areas bypasses the IVC tunnels directly to the odour control system. The extraction system is designed to deliver approximately three air exchanges per hour, ensuring containment and treatment of odorous emissions.

The incoming material is visually inspected in the receival building. An overhead gantry crane loads the material into a feed hopper for shredding and screening. The undersized fraction (<50 millimetre [mm], this is predominately food and other odour contributing materials) is sent to the dry AD system, this is an enclosed processing system. The oversize fraction (>50mm) is mixed with liquid digestate/leachate to moisturise feedstock targeting 56-60 percent (%) moisture then loaded into the IVC tunnels.

The NALG IVC tunnels feature forced aeration floor with nozzles that inject air into the organic material. Leachate is collected in a leachate management system which can be utilised to provide moisture to the tunnels. Following pasteurisation in the tunnels at >55 degrees Celsius (°C) for 72 hours, pasteurised material is screened, and the undersized fraction is sold as a soil conditioner/compost. Oversize fraction is decontaminated via a sorting cabin/wind shifter then decontaminated material is shredded and sold either as mulch or used as a reflow material to provide structure to solid digestate. The mixture of solid digestate and shredded oversize is place on aerated maturation floor for drying. After drying material is screened, <30mm is sold as soil conditioner/composted, >30mm is used as reflow material.

The Dry AD system operates in thermophilic conditions (>55°C) with a retention time of 21 days, where microorganisms break down organic matter to produce nutrient-rich digestate and biogas. The digester is a steel structure; organic material is fed directly via a plug screw conveyer. Pasteurised digestate from the AD system is dewatered by a screw press with the solid digestate sent to the Mixing Bunker and combined with oversize material to improve the structure. The mixture is piled in aerated bays for further maturation and later screened to produce a soil conditioner/compost product.

The AD process generates biogas, which is used to produce renewable energy in a Combined Heat and Power (CHP) unit. The top of the digester serves as a storage buffer for biogas, enabling consistent supply to the biogas utilisation systems. The biogas is extracted from the digester via stainless steel pipes and directed to the desulphurisation system (activated carbon filter), the biogas storage bladder or the emergency flare as needed.

An emergency gas flaring system ensures any excess biogas is safely released. The CHP plant includes a combustion control system to ensure an optimal air/fuel ratio under all operating conditions, minimising exhaust emissions and ensuring stable operation.

Safety devices on the digester include a biogas overpressure valve connected directly to the digester and is used for the over-and-under pressure protection of the digester. The safety valve consists of a diaphragm valve which is opened according to set pressure. The valve is divided into an inner and outer chamber for the over-and under-set pressure. The safety valve is set at an opening pressure of 55 millibar (mbar). In addition, the gas exhaust line is equipped with a lockable bypass flap valve allowing a manual digester pressure relief through a blow-out pipe. The pressure measurement and flow measurement are installed in-pipe leading to the gas utilisation unit.

The digester structure is safeguarded by a bursting disc to a pressure of 100 ± 20 mbar. In case all other safety equipment would fail, this membrane ruptures, and the biogas escapes into the open air in

a controlled way. The bursting disc is also used as overflow protection. If all measuring instruments fail and the feeding of the digester continues, then the organic substrate can escape at this point.

All process air and dust from the receival building and digestate press area is captured and treated before being vented. The air handling system includes a two-stage chemical scrubber that removes particulates and pre-treats odorous air, which is then directed to a specially engineered biofilter. The biofilter is equipped with an inflatable roof to enhance treatment efficiency.

Figure 2-3 presents an indicative layout of the Project.

The hours of operation for the Project are 24 hours per day, 7 days per week.

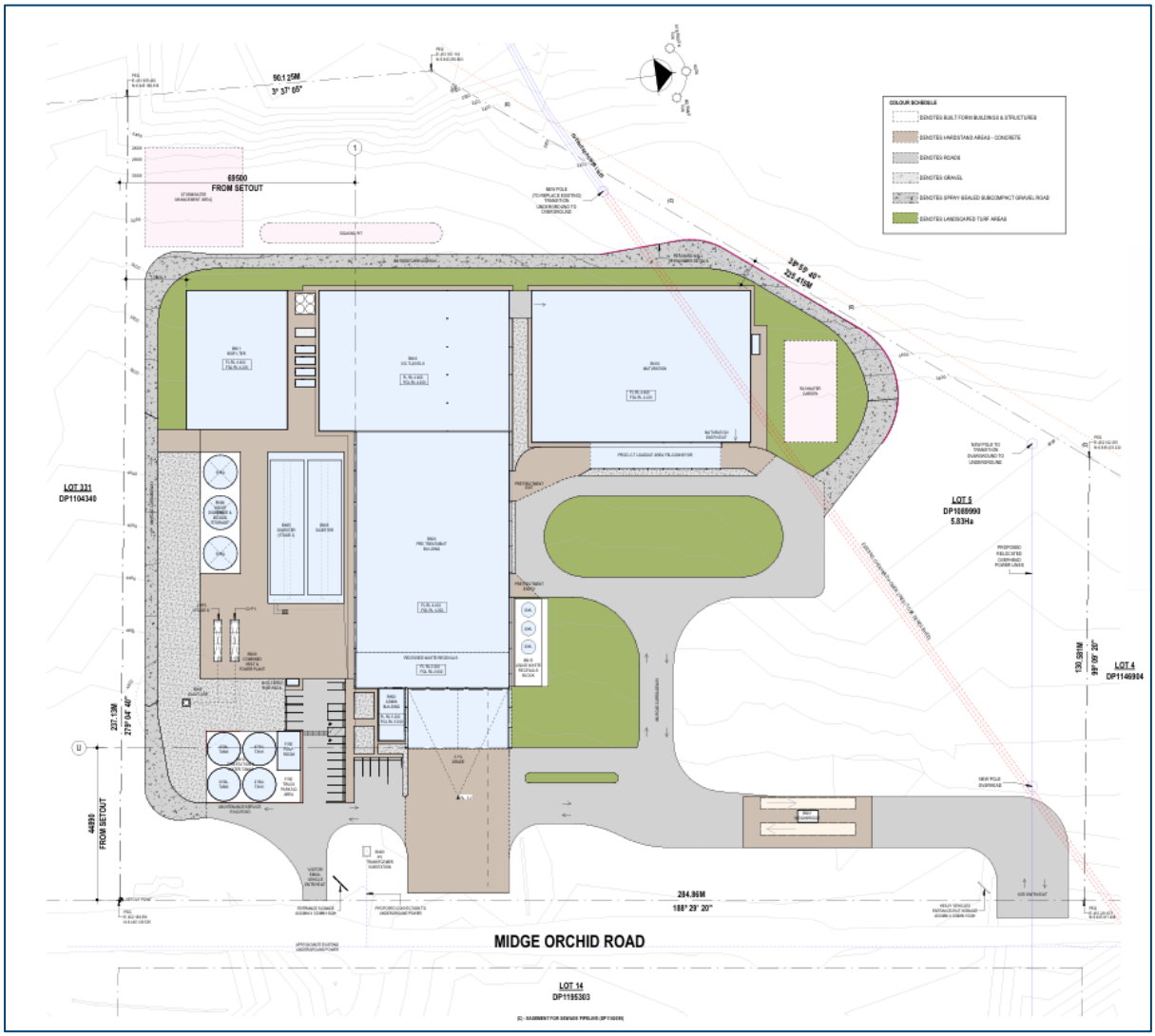

Figure 2-3: Indicative site layout

3 LEGISLATIVE AND POLICY CONTEXT

3.1 International Policy

The United Nations Framework Convention on Climate Change (UNFCCC) remains the primary global forum for climate change negotiations, aiming to stabilise GHG concentrations in the atmosphere to prevent adverse climate impacts.

The Kyoto Protocol, an international agreement under the UNFCCC, committed developed countries to setting internationally binding GHG reduction targets. The first commitment period of the Kyoto Protocol spanned from 2008 to 2012, during which participating countries pledged to reduce GHG emissions by an average of 5% below 1990 levels. The second commitment period extended from 2013 to 2020, with a goal of reducing GHG emissions by at least 18% below the 1990 levels.

The Paris Agreement was adopted at the 21st Conference of the Parties (COP21) in Paris in December 2015. The Paris Agreement established a framework for all countries, to take action against climate change starting in 2020.

Key aspects of the Paris Agreement include:

- A global goal to limit average temperature increase to well below 2 degrees Celsius (ºC), with efforts to keep warming below 1.5ºC above pre-industrial levels.
- A requirement for all countries to set mitigation targets (Nationally Determined Contributions, or NDCs) and review and strengthen these targets every five years, informed by a global stocktake.
- Robust transparency and accountability mechanisms to ensure confidence in countries' actions and track progress towards targets.
- Promotion of action to adapt and build resilience to climate impacts.
- Provision of financial, technological, and capacity-building support to assist developing countries in implementing the Paris Agreement.

Developments at the 26th Conference of the Parties (COP26) in Glasgow in 2021 and subsequent Conference of the Parties (COPs) have focused on accelerating action, closing the emissions gap, and delivering on climate finance.

The Global Stocktake was initiated at COP28 in 2023, highlighting the need for stronger action to meet the Paris Agreement targets. Countries are now being urged to submit enhanced NDCs to align with the 1.5ºC target and to transition away from fossil fuels by mid-century.

3.2 Australian Policy

Australia plays an active role in global efforts to reduce GHG emissions and adapt to the impacts of climate change through coordinated international action. Australia is a party to the UNFCCC, a signatory to the Kyoto Protocol, and a committed participant of the Paris Agreement.

In 2022, the Australian Government updated its NDC, which was submitted to the UNFCCC secretariat. The updated NDC:

- Commits Australia to a more ambitious 2030 target of 43% below 2005 levels;
- Reaffirms Australia's commitment to achieving net zero emissions by 2050;
- Requires the government to provide an annual statement to parliament on progress towards these targets; and,
- Restores the Climate Change Authority as an independent source of policy advice.

Australia has also passed the Climate Change Act 2022, which legislates the 43% emissions reduction target for 2030 and the net zero target for 2050, strengthening accountability and transparency in meeting these commitments.

3.3 New South Wales Policy

The NSW Climate Change Policy Framework (NCCPF), introduced in 2016, initially set an aspirational long-term objective of achieving net-zero emissions by 2050 and outlined broad policy directions to reduce emissions, manage climate risks, and promote climate change adaptation. The framework emphasised the NSW Government's leadership role in delivering government services, managing assets, and advocating for national reforms in energy markets, building standards, and climate modelling.

Since 2016, NSW has transitioned to a more comprehensive and binding policy framework to meet its climate objective. The NCCPF has been superseded by updated commitments and legislation that set legally binding targets and establish clear mechanisms for achieving emissions reduction and adaptation goals.

The current NSW Climate Policy Framework comprises:

- NSW Net Zero Plan Stage 1: 2020-2030
  - Commits NSW to reducing GHG emissions by 50% below 2005 levels by 2030, exceeding Australia's national target of 43%.
  - Focuses on accelerating renewable energy deployment, improving energy efficiency, reducing emissions from hard-to-abate sectors, and enhancing carbon sequestration in the land sector.
  - Supports the transition to net zero emissions by 2050 while encouraging investment in clean technologies and creating new opportunities for regional NSW.
- Electricity Infrastructure Roadmap
  - Aims to deliver 12 gigawatts (GW) of new renewable energy capacity and 2 GW of long-duration storage by 2030.
  - Establishes Renewable Energy Zones (REZs) to attract private investment and facilitate the development of large-scale renewable energy projects to replace retiring coal-fired power stations.
- Net Zero Industry and Innovation Program

- Provides funding and technical support to reduce emissions in hard-to-abate sectors, including manufacturing, mining, and agriculture.
- Promotes the adoption of low-carbon technologies and drives innovation in areas such as hydrogen, carbon capture, and storage.

- NSW Climate Change (Net Zero Future) Act 2023
  - Legislates NSW's commitment to achieving net zero emissions by 2050 and requires the government to provide regular progress reports to the NSW Parliament.
  - Establishes clear governance and accountability mechanisms to track emissions reductions and climate adaptation progress.
  - Mandates the inclusion of climate considerations in government decision-making processes.

The current NSW climate policy framework aims to create a stable policy environment that supports private investment in renewable energy, transport, carbon farming, and environmental services while boosting energy productivity and reducing rising energy costs for households and businesses. It seeks to capture benefits and manage any unintended impacts of external policies, including national energy market reforms. Additionally, the framework promotes opportunities to grow new industries in NSW linked to the transition to a low-carbon economy and focuses on reducing climate risks to assets, communities, and ecosystems by enhancing climate resilience and adaptation strategies.

3.3.1 NSW Legislation

The *Protection of the Environment Administration Act 1991* and the *Protection of the Environment Operations Act 1997* are part of the NSW legislative framework governing environmental protection and management, and they empower the NSW EPA to regulate and promote actions that align with the state's climate and sustainability goals.

The *Protection of the Environment Administration Act 1991* provides the legislative framework for the operations of the NSW EPA and supports climate action by incorporating the principles of Ecologically Sustainable Development (ESD), including the precautionary principle and intergenerational equity.

While it does not set specific targets for GHG emissions, it empowers the NSW EPA to regulate industries contributing to emissions through environmental licensing and encourages best practices in managing climate-related risks. It also enables the NSW EPA to implement policies and initiatives that promote emissions reduction and climate resilience, aligning with NSW's broader climate objectives.

The *Protection of the Environment Operations Act 1997* provides the regulatory framework for pollution control and environmental management in NSW and indirectly supports the state's climate objectives. Similarly, it does not explicitly regulate GHG emissions, however, empowers the NSW EPA to manage air pollution and regulate industries through the Environment Protection Licence (EPL) system, which can include conditions to limit emissions and improve operational efficiency.

It enables the NSW EPA to implement Pollution Reduction Programs (PRPs) and enforce compliance through penalties, encouraging industries to adopt cleaner technologies. Additionally, it supports

climate-related actions through environmental impact assessments (EIAs) and waste management initiatives that contribute to emissions reductions.

The NSW EPA's Climate Change Action Plan 2023–2025 leverages the powers of both Acts to embed climate considerations into regulatory decisions, encourage innovation in emissions reduction, integrate climate considerations into licensing and compliance, and reinforce the state's commitment to achieving net zero emissions by 2050.

3.3.2 NSW EPA Guide for Large Emitters (2025)

The *NSW Guide for Large Emitters* (**NSW EPA, 2025**) establishes updated regulatory expectations for proponents of major projects with significant GHG emissions in NSW. It applies to developments or modifications that constitute a scheduled activity under the *Protection of the Environment Operations Act 1997* and are expected to generate more than 25,000t CO_2-e in scope 1 and 2 emissions per financial year.

It supports the implementation of the NSW Climate Change (Net Zero Future) Act 2023 and complements broader climate policies by embedding clear requirements into the development assessment and regulatory approval process for large-emitting industries, including those in the mining, energy, waste, and heavy manufacturing sectors.

The Guide provides a standardised structure for preparing GHG Assessment Reports and Mitigation Plans to ensure consistency and rigour in the evaluation of major project proposals. It is intended to reduce assessment delays and support informed decision-making by regulatory agencies and the community. In practice, it enhances the accountability of large emitters and integrates climate considerations directly into environmental planning approvals, including the application of enforceable conditions through Environment Protection Licences and related regulatory tools.

An important aspect of the Guide is the application of mitigation hierarchy, refer to **Figure 3-1**, which requires proponents to make genuine efforts to first avoid then reduce them, followed by substitution to lower emission sources where possible, before finally offsetting any residual emissions. .

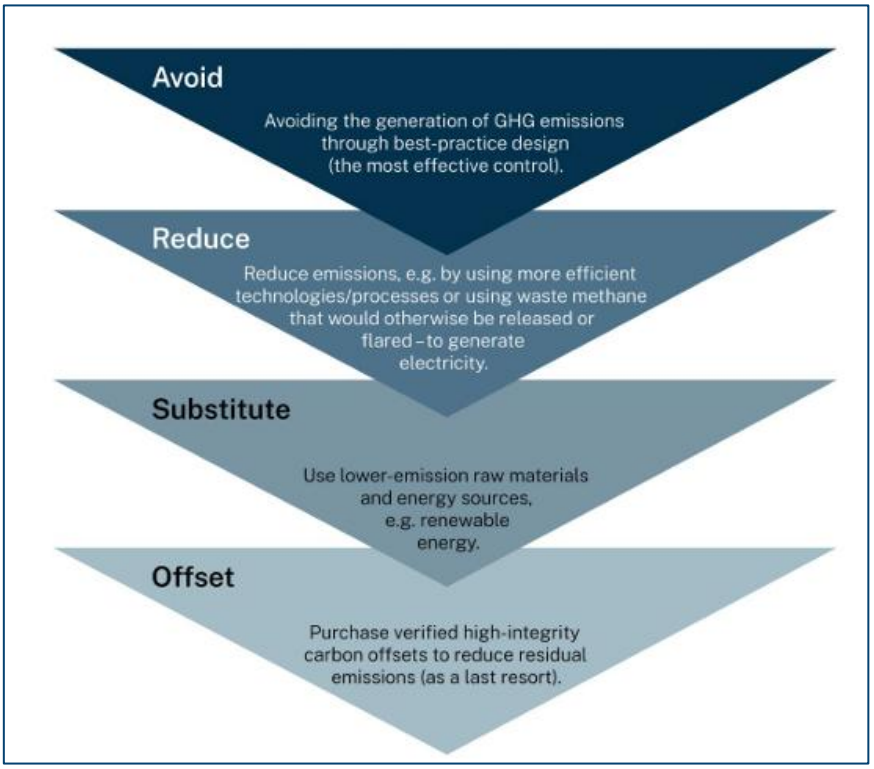

Figure 3-1: GHG emissions mitigation hierarchy

.

3.4 National Greenhouse and Energy Reporting Scheme

The *National Greenhouse and Energy Reporting Act 2007* (NGER Act) established a single national framework for reporting and disseminating company information about GHG emissions, energy production, and energy consumption via the NGER scheme. The primary objectives of the NGER scheme are to inform government policy and the public, support the development of Australia's climate change policies, and help meet Australia's international reporting obligations under the Paris Agreement and other frameworks.

The National Greenhouse Accounts (NGA) Factors are designed to assist companies and individuals in estimating GHG emissions from their operations. These factors apply default emission factors to ensure consistency between GHG inventories at the facility and company levels and those reported to the NGA. The NGA factors are updated annually, incorporating the latest data from Australian facilities reporting under the NGER scheme and undergoing review by international experts to ensure consistency with global best practices.

3.5 Safeguard Mechanism

The *Safeguard Mechanism*, established under the *National Greenhouse and Energy Reporting Act 2007*, is a key element of Australia's climate change policy framework.

The mechanism applies to facilities that emit more than 100,000t CO_2-e of Scope 1 emissions per year and includes operations in sectors such as mining, manufacturing, transport, and energy production. Under the Safeguard Mechanism, these facilities are required to keep their net emissions at or below a set baseline. If a facility exceeds its baseline, it must take corrective action, such as reducing emissions

on-site, purchasing Safeguard Mechanism Credits (SMCs), or surrendering Australian Carbon Credit Units (ACCUs).

Significant reforms to the Safeguard Mechanism came into effect on 1 July 2023, aimed at aligning the scheme with Australia's national emissions reduction targets under the Climate Change Act 2022, including:

- A declining baseline trajectory for covered facilities, reducing on average by 4.9% per year to 2030;
- New sectoral guidance for emissions estimation and mitigation;`
- The introduction of Safeguard Mechanism Credits (SMCs) to enable trade of surplus emissions reductions between facilities;
- Expanded use of ACCUs to offset emissions above baseline levels;
- Provisions to accommodate trade-exposed emissions-intensive facilities through tailored treatment under the Powering the Regions Fund and other support mechanisms.

The Safeguard Mechanism complements the National Greenhouse and Energy Reporting (NGER) Scheme, under which facilities already report their emissions and energy data. Together, these systems provide a comprehensive national framework for monitoring, managing, and reducing GHG emissions from Australia's largest industrial sources.

In the context of environmental planning and assessment in NSW, the Safeguard Mechanism provides a federal compliance layer that interacts with state-based requirements, such as the *NSW Guide for Large Emitters* (**NSW EPA, 2025**), to ensure that high-emitting projects contribute meaningfully to Australia's emission reduction goals. Projects subject to the Safeguard Mechanism are expected to incorporate this into their GHG assessments and demonstrate consistency with their federal obligations.

4 GREENHOUSE GAS ASSESSMENT

The Australian *National Greenhouse Accounts Factors* (NGA Factors) document published by the Commonwealth Department of Climate Change, Energy, the Environment and Water (Cth DCCEEW) (**2024a**) defines three scopes (Scope 1, 2 and 3) for different emission categories based on whether the emissions are from "direct" or "indirect" sources.

Scope 1 emissions encompass the direct sources from the Modification defined as:

> "*...produced from sources within the boundary of an organisation and as a result of that organisation's activities*" (**Cth DCCEEW, 2024a**).

Scope 2 emissions are produced by the burning of fossil fuels to generate electricity and defined as:

> "*...indirect emissions which occur as a result of activities that generate electricity, heating, cooling or stream that is consumed by an organisation but which is generated outside that organisation's boundaries*" (**Cth DCCEEW, 2024a**).

Scope 3 emissions are other indirect emissions which:

> "*...occur outside of the boundary of an organisation as a result of actions by the organisation*" (**Cth DCCEEW, 2024a**).

For the purpose of this assessment, emissions generated in all three scopes defined above provide a suitable approximation of the total GHG emissions generated from the Project (in terms of Scope 1 emissions) and the key GHG emissions indirectly associated with the Project that are generated by third parties (in terms of Scope 2 and 3 emissions).

Other Scope 3 emissions also arise from a number of other sources indirectly associated with the operation of the Project such as emissions generated by employees travelling to and from the site. These relatively minor individual contributions are difficult to accurately quantify due to the diversity and nature of the sources and have not been considered further in this assessment.

4.1 Assessment boundary

Scope 1 GHG emission sources identified for the Project operations are from the composting of material on-site and the combustion of biomethane in the CHP to generate electricity. Scope 2 GHG emissions arise from the power requirements for the facility which would be offset by the electricity generation from the CHP and also supplemented with solar power generated from panels installed on the roof the facility. Scope 3 emissions have been identified as resulting transport of product composted materials to various customers.

Estimated quantities of materials and variables used to calculate the potential GHG emissions associated with Scope 1, 2 and 3 emissions for the Project, have been described for the operational phase. These estimates are based on the planned operations and peak production and would provide a reasonable worst-case approximation of the potential GHG emissions for the purpose of this assessment.

4.2 Emission scenario

The Project is proposed to have an operational capacity of 146,000tpa of material, accounting for approximately 3% contamination (4,380tpa), the material is divided approximately 40% is processed in-vessel composting (56,635tpa) and 60% processed using anaerobic digestion (84,985tpa) with the biogas generated captured and utilised to power the CHP. It is estimated for the anaerobic digestion process, approximately 9,000,000 cubic metres (m^3) of biogas would be generated per annum.

Electricity requirements for the facility are estimated at 7,500,000 kilowatt hours (kWh) per year. The CHP is expected to generate approximately 19,000,000kWh, with the surplus of electricity exported to the grid.

Transport of the compost product would be primarily to customers in the Hunter Valley, Tamworth or Greater Sydney regions, with delivery distances of 157km, 250km and 294km, respectively. Estimated daily trips comprise 5, 2 and 10 trips to these regions, resulting in a total daily travel distance of approximately 8,450km. Assuming deliveries occurs 355 days per year, this equates to approximately 2,999,750km per annum. Based on an average truck fuel consumption rate of 53.1L/100km (**ABS, 2025**), this represents an annual diesel demand of approximately 1,593kL/year. For the purposes of this assessment, it is assumed that renewable diesel would be used in these vehicles.

Table 4-1 presents the estimated annual quantities of materials used to assess GHG emissions for the Project.

Table 4-1: Estimated quantities of materials used to assess GHG emissions for the Project

Material	Quantity	Unit
Composting	56,635	tpa
Biogas generated	9,000,000	m^3
Electricity - required	7,500,000	kWh
Electricity - generated	19,000,000	kWh
–Transport of compost product	1,593	kL

4.3 Emission factors

To quantify the amount of carbon dioxide equivalent (CO_2-e) material generated, emission factors were obtained from the latest *National Greenhouse Accounts Factors* (NGA Factors) document (**Cth DCCEEW, 2024a**).

Table 4-2 summarises the emission factors applied.

Table 4-2: Summary of emission factors

Type	Energy content factor	Units	Emission factor			Units	Scope
			CO_2	CH_4	N_2O		
Composting	-		0	0.021-	0.025	t CO_2-e/t	1
Biogas that is captured for combustion	0.037	GJ/m^3	0	6.4	0.03	kg CO_2-e/GJ	1
Electricity	-	-	0.66	-	-	kg CO_2-e/kWh	2
	-	-	0.04			kg CO_2-e/kWh	3

Type	Energy content factor	Units	Emission factor			Units	Scope
			CO_2	CH_4	N_2O		
Transport of compost product (Renewable diesel – Euro iv or higher)	38.6	GJ/kL	0	0.07	0.4	kg CO_2-e/GJ	3

Source: **Cth DCCEEW (2024a)**

Note: GJ/kL = gigajoule per kilolitre, CO_2 = carbon dioxide, CH_4 = methane, N_2O = nitrous oxide, t CO_2-e/ t = tonnes of carbon dioxide equivalent per tonne, kg CO_2-e.kWh = kilograms of carbon dioxide equivalent per kilowatt hour, kg CO_2-e/GJ = kilograms of carbon dioxide equivalent per gigajoule

4.4 Summary of estimated GHG emissions

Table 4-3 presents a summary of the estimated annual GHG emissions for the Project.

Table 4-3: Summary of estimated GHG emissions for the Project (t CO_2-e)

Activity	CO_2	CH_4	N_2O	Total	Scope
Composting	-	1,189	1,416	2,605	1
Biogas that is captured for combustion	-	2,131	10	2,141	1
Sub-total Scope 1	**-**	**3,321**	**1,426**	**4,746**	**1**
Electricity - required	4,950	-	-	4,950	2
Electricity - generated	-12,540	-	-	-12,540	2
Sub-total Scope 2	**-7,590**	**-**	**-**	**-7,590**	**2**
Electricity – required	300	-	-	300	3
Transport of compost product	-	3	17	21	3
Sub-total Scope 3	**300**	**3**	**17**	**321**	**3**
Total Scope 1 + 2	**-7,590**	**3,321**	**1,426**	**-2,844**	**1 + 2**
Total Scope 3	**300**	**3**	**17**	**321**	**3**

The Project is expected to produce a maximum annual GHG emission rate of -2,844 t CO_2-e (Scope 1 + 2) during the operational phase, which is below the threshold of 25,000 t CO_2-e in accordance with the *NSW Guide for Large Emitters* (**NSW EPA, 2025**). The net negative emission rate reflects the generation of renewable electricity, which offsets the emissions produced by the facility.

When considering the broader GHG implications of the Project within the MidCoast Council local government area, the overall outcome represents a carbon-neutral, and in fact a carbon-negative position. In the absence of the Project, the food waste currently generated across the MidCoast region would otherwise be disposed to landfill, where it would undergo anaerobic decomposition and emit methane directly to the atmosphere.

By diverting this food waste from landfill and instead processing through the Project's food waste recovery and treatment technology, the generation of landfill methane is effectively avoided. According to the NSW EPA, the estimated greenhouse gas benefit of food waste diversion from landfill to recovery systems such as anaerobic digestion proposed by the Project is approximately 2.1 t CO_2-e per tonne of food waste processed (**NSW EPA, 2024**).

For the MidCoast Council region, it is estimated that up to 70,000tpa of food waste would be diverted from landfill and directed to the Project. This equates to an annual avoidance of approximately 147,000 t CO_2-e (70,000 t x 2.1 t CO_2-e per t). By comparison, the Project itself is expected to generate approximately -2,844 t CO_2-e (Scope 1 + 2) per year during the operational phase.

Taking into account both the avoided emissions and the Project's operational footprint, the net GHG benefit equates to approximately -149,844 t CO_2-e avoided annually for the MidCoast Council region. This demonstrates that the Project would not only achieve a carbon-neutral outcome but would provide a substantial net reduction in regional greenhouse gas emissions, contributing meaningfully to MidCoast Council's and the NSW Government's broader climate objectives.

4.5 Contribution of greenhouse gas emissions

The estimated annual GHG emissions for Australia in the 12-month period up to June 2024 was 440.6 Mt CO_2-e (**Cth DCCEEW, 2024b**). In comparison, the maximum annual GHG emission rate for the Project during the operational phase is -0.003 Mt CO_2-e (Scope 1 + 2). Therefore, the annual contribution of GHG emissions from the Project in comparison to the Australian GHG emissions for the 2024 period is estimated to be approximately -0.0006%.

At a state level, the estimated GHG emissions for NSW in the July 2021 to June 2022 period were 111.0 Mt CO_2-e (**Cth DCCEEW, 2025**). The annual contribution of GHG emissions from the Project in comparison to the NSW GHG emissions for the 2022 period is estimated to be approximately -0.003%.

Scope 3 emissions occur outside the Project's direct control and represent indirect impacts of its activities, as such have not been compared against state or national GHG inventories.

4.6 Greenhouse gas abatement measures

The Project would minimise GHG emissions where possible using the following mitigation measures:

- Avoiding double handling of materials by optimising conditions for fleet operations;
- Conducting energy awareness programs for staff;
- Investigate and utilise energy efficient plant where appropriate; and,
- Undertake scheduled maintenance of plant and equipment to maintain operational efficiency.

5 SUMMARY AND CONCLUSIONS

This study has assessed the potential GHG emissions associated with the Project. The Project involves the operation of a composting facility with a maximum production rate of 146,000tpa, which will result in GHG emissions. Biogas generated from the composting process will be utilised in a CHP unit to supply electricity for the site, with surplus electricity exported to the grid, thereby offsetting a portion of the emissions.

The estimated annual average GHG emission for the Project are -2,844 t CO_2-e (Scope 1 + 2), which is below the reporting threshold of 25,000 t CO_2-e in *NSW Guide for Large Emitters* (**NSW EPA, 2025**). The net negative emissions results from the displacement of grid electricity by renewable power generated on-site.

When considering the outcomes of the Project for the MidCoast Council area, the diversion of up to 70,000tpa of food waste from landfill to the Project, an estimated 147,000 t CO_2-e of emissions would be avoided annually, offsetting the Project's operational emissions and resulting in a net regional greenhouse gas benefit of about -149,844 t CO_2-e per year

The emissions for the Project equates to approximately -0.0006% of Australia's total GHG emissions for the 12-month period up to June 2024 and approximately -0.003% of NSW GHG emissions for the July 2021 to June 2022 period.

Overall, the Project's GHG contribution is considered negligible to negative relative to national and state totals. A range of mitigation measures will be implemented at the site to further minimise emissions where practicable.

6 REFERENCES

ABS (2025)

Survey of Motor Vehicle Use, Australia, Australian Bureau of Statistics (ABS) website, accessed May 2025. https://www.abs.gov.au/statistics/industry/tourism-and-transport/survey-motor-vehicle-use-australia/latest-release

Commonwealth Department of Climate Change, Energy, the Environment and Water (2024a)

"Australian National Greenhouse Accounts Factors – For individuals and organisations estimating greenhouse gas emissions", Department of Climate Change, Energy, the Environment and Water [DCCEEW], August 2024.

Commonwealth Department of Climate Change, Energy, the Environment and Water (2024b)

"Quarterly Update of Australia's National Greenhouse Gas Inventory: June 2024", Department of Climate Change, Energy, the Environment and Water [DCCEEW], November 2024.

Commonwealth Department of Climate Change, Energy, the Environment and Water (2024c)

"Australia's emissions projections 2024" prepared by the Department of Climate Change, Energy, the Environment and Water [DCCEEW], November 2024.

Commonwealth Department of Climate Change, Energy, the Environment and Water (2025a)

State and Territory greenhouse gas inventories: 2022 emissions - Department of Climate Change, Energy, the Environment and Water [DCCEEW] website, Accessed January 2025. https://www.dcceew.gov.au/climate-change/publications/national-greenhouse-accounts-2022/state-and-territory-greenhouse-gas-inventories-2022-emissions

NSW EPA (2024)

"Emissions impacts of landfilling food waste – Fact sheet", NSW Environmental Protection Authority, March 2024.

NSW EPA (2025)

"NSW Guide for Large Emitters", NSW Environmental Protection Authority, January 2025.