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Protection of the Environment Operations (General) Regulation 2021

I, Melissa Walsh, Director Major Projects and Initiatives:

Publication of documents

1. Publish the following documents for the purposes of the definition of 'waste' in Part 3A of the *Protection of the Environment Operations (General) Regulation 2021*:
 - (a) *Eligible Waste Fuels Guidelines* (EPA, June 2022) as set out in Appendix A
 - (b) *NSW Energy from Waste Policy Statement* (EPA, June 2021) as set out in Appendix B

Publication of maps

2. Publish the following maps as set out in Appendix C for the purposes of the nominated precincts in clause 128C(1)(b) of the *Protection of the Environment Operations (General) Regulation 2021*:
 - (a) 'Richmond Valley Regional Jobs Precinct', dated 10 June 2022
 - (b) 'Southern Goulburn Mulwaree Precinct', dated 10 June 2022
 - (c) 'West Lithgow Precinct', dated 10 June 2022.

This notice commences on the date it is published in the Gazette.

Melissa Walsh
Director – Major Projects and Initiatives
Environment Protection Authority

Dated: 06.07.2022

Appendix A – Eligible Waste Fuels Guidelines



Environment Protection Authority

Eligible Waste Fuels Guidelines

www.epa.nsw.gov.au



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Introduction

Background

This document should be read in conjunction with the [NSW Energy from Waste Policy Statement](#), which allows for certain low risk wastes or waste-derived materials to be thermally treated. These low risk wastes are referred to in the *NSW Energy from Waste Policy Statement* as *eligible waste fuels*.

This document consists of five parts:

- Part 1 – Eligible waste fuels
- Part 2 – Additional criteria for eligible waste fuels
- Part 3 – Regulatory framework for the use of waste as fuel
- Part 4 – Applying for a resource recovery order and/or exemption
- Part 5 – Characterisation requirements.

Any facility proposing to thermally treat a waste or waste-derived material that is not a listed eligible waste fuel **must** meet the requirements of an Energy Recovery Facility and use current international best practice techniques. In these cases, proponents should refer to Section 4 of the *NSW Energy from Waste Policy Statement* and the [Energy Recovery Facility Guidelines](#).

Scope and application

These guidelines only relate to the list of **eligible waste fuels** outlined in the *NSW Energy from Waste Policy Statement*.

Some eligible waste fuels may also be standard fuels as defined in clause 31 of the Protection of the Environment Operations (Clean Air) Regulation 2010 (Clean Air Regulation). Standard fuels are defined as any unused and uncontaminated solid, liquid or gaseous fuel that is:

- a. a coal or coal-derived fuel (other than any tar or tar residues), or
- b. a liquid or gaseous petroleum-derived fuel, or
- c. a wood or wood-derived fuel, or
- d. bagasse.

Standard fuels that are also eligible waste fuels still require appropriate approvals for their use. The EPA will assess applications for eligible waste fuels that are also standard fuels on a case-by-case basis.

Definitions

Agriculture	Farming, including cultivation of the soil for the growing of crops and the rearing of animals to provide food, wool and other products.
Anaerobic digestion	Anaerobic digestion is a biological process that occurs when organic matter is decomposed by bacteria in the absence of oxygen (i.e. anaerobically). As the bacteria decompose the material, methane and carbon dioxide are produced.
Eligible waste fuel	Waste or waste-derived materials considered by the EPA to pose a low risk of harm to the environment and human health due to their origin, low levels of contaminants and consistency over time.
Processing facility	A facility undertaking bona fide resource recovery operations producing separate output material streams for reuse or recovery. The facility may be separate to or on the same site as an energy from waste facility.
Resource recovery exemption	<p>A resource recovery exemption includes conditions for the use of the exempt waste as a fuel or in a thermal treatment process. The exemption may include specifications of how to use the exempt waste fuel, record-keeping and other requirements.</p> <p>Resource recovery exemptions are issued by the EPA that exempt a person from the various waste regulatory requirements that apply to the use of a waste fuel (e.g. waste disposal licensing, levy payments etc.). The exemptions apply to waste fuels the EPA determines to be fit-for-purpose, bona fide energy recovery opportunities.</p>
Resource recovery order	A resource recovery order is issued to the generator and/or processor of the exempt waste fuel. The resource recovery order includes conditions that the generator/processor must meet to supply the waste as a fuel or in a process of thermal treatment. Orders may include specifications such as record-keeping, reporting and other requirements for the exempt waste.
Thermal treatment	In accordance with Schedule 1 of the <i>Protection of the Environment Operations Act 1997</i> , thermal treatment means the processing of waste by burning, incineration, thermal oxidation, gasification, pyrolysis, plasma or other thermal treatment processes.
Waste	As defined in the Dictionary of the <i>Protection of the Environment Operations Act 1997</i> and the Protection of the Environment Operations (Waste) Regulation 2014.

Part 1 – Eligible waste fuels

Eligible waste fuels are those the EPA considers to pose a low risk of harm to the environment and human health due to their origin, composition and consistency. These are listed in this part and in Section 3 of the *NSW Energy from Waste Policy Statement*. The EPA may update the list of eligible waste fuels from time to time.

Facilities proposing to use eligible waste fuels must meet the following criteria:

1. be able to demonstrate to the EPA that the proposed waste consistently meets the definition of an EPA-approved eligible waste fuel
2. ensure there are no practical, higher order reuse opportunities for the waste
3. fully characterise the waste and/or undertake proof of performance (where required), and
4. meet the relevant emission standards as set out in the Clean Air Regulation.

The listing of a waste or waste-derived material as an eligible waste fuel does not constitute an approval to use that material at a particular facility. Proponents must first apply to the EPA for a resource recovery order and exemption in accordance with Part 4 of these guidelines.

Definitions of eligible waste fuels

Section 3 of the *NSW Energy from Waste Policy Statement* lists the wastes categorised by the EPA as eligible waste fuels. These wastes are defined below.

1. Biomass from agriculture

Definition

Weeds, plant or crop residues that are free of any physical contaminants, produced directly from agricultural practices; for example, non-putrescible natural organic fibrous materials and organic residues from harvest activities. These residues may include fibres, roots, stalks, stubble, leaves, seed pods, nut shells and some waste from agricultural processing such as cotton and cane trash.

Additional information

The EPA notes that this material may contain pesticide or herbicide residues. The risks presented by these residues will be assessed as part of the resource recovery order and exemption application. This definition excludes:

- waste material from processing dairy products or beverages
- waste from the production of food, and
- dead animals, animal parts, pelts, manure and animal bedding, e.g. cage and barn poultry litter.

2. Forestry and sawmilling residues

Definition

Uncontaminated, organic fibrous wood residues and natural wood wastes that result from forestry and sawmilling operations such as, heads, tree thinnings, sawmill sawdust, shavings, chips, bark and other offcuts.

Sawmilling operations are the primary processing of round wood into non-round wood products such as planks, boards, beams and other cut and processed wood products.

Additional information

Forestry and sawmill residue materials must be demonstrated to have no risk of contamination; for example, there must be no presence of treated, preserved, lacquered, glued, laminated or coated timber or wood products.

Native forest biomaterial is specifically prohibited from use for electricity generation in accordance with the Protection of the Environment Operations (General) Regulation 2021.

3. Uncontaminated wood waste

Definition

Wood waste that is generated in primary and secondary manufacturing processes at facilities with demonstrated quality control over the uncontaminated wood waste stream.

Additional information

Uncontaminated wood waste includes pre-consumer manufacturing and processing waste materials such as off-cuts, saw dust, wood shavings, untreated packaging crates, untreated pallets and engineered timbers made with urea formaldehyde or phenol formaldehyde resins only.

Demonstrated control refers to both the generation and collection of the waste material. The facility must have robust quality assurance and/or quality control (QA/QC) procedures, a well-controlled chain of custody for the raw materials, generation of waste and collection systems. Facilities with control of their waste stream must also have comprehensive knowledge and control of the sources of waste, the original input materials, as well as knowledge and control of potential contaminants.

Uncontaminated wood waste excludes:

- post-consumer waste
- wood waste extracted from mixed waste streams, such as construction and demolition waste
- anything defined as a source separated green waste
- treated timber
- painted or coated wood and most engineered wood products.

Uncontaminated wood waste does not include wood waste recovered from highly variable streams, such as mixed municipal solid waste or construction and demolition waste, due to their potential to contain a large number of chemical and physical contaminants over time. Applicants wanting to pursue the use of this material as a fuel should refer to Section 4, Energy recovery facilities, of the *NSW Energy from Waste Policy Statement*.

Treated timber means wood treated with water, solvent and/or oil-borne preservatives. This includes, but is not limited to, copper chromium arsenic (CCA), light organic solvent preservative (LOSP), creosote and envelope treatments for preservation, insecticides and fungal treatments.

4. Recovered waste oil

Definition

Used oil that is recycled back into lower grade oils for combustion as a start-up fuel. This may include vegetable and/or mineral oils.

Additional information

The quality of waste oil, and therefore any potential contaminants present, can vary significantly depending on the original use of the oil, as well as any processing and/or treatment it has undergone.

For a facility to use waste oil, it will need to meet specifications set by the EPA for quality and consistency of the waste oil over time. Risks presented by contaminants will be assessed as part of individual resource recovery order and exemption applications.

5. Organic residues from virgin paper pulp activities

Definition

Solid organic waste such as cellulose fibres, fibre bundles and minor quantities of sand, mud and fine grit from pulping and screening operations.

Additional information

This material will be assessed on a case-by-case basis, and potential requirements or controls for the use of this material will be considered using a risk-based approach. The assessment will take into account the processing techniques, types of treatment and, if applicable, the chemicals used.

This definition excludes any:

- organic residues or any percentage of organic residues from processes using waste cardboard or paper (recycled paper)
- organic residues derived from any processes involving chlorine; this refers to both elemental and total chlorine.

6. Landfill gas and biogas

Definition

Gas generated during anaerobic digestion, either naturally in the decomposition of organic waste materials contained in landfills, or in an anaerobic digester.

Examples of organic waste streams for an anaerobic digester include: municipal wastewater treatment, industrial wastewater treatment, food waste digestion and agricultural waste (e.g. manure, crop).

Additional information

The level of contaminants in these gases can vary significantly depending on the source characteristics. Treatment requirements will depend on the source characteristics and the technologies using the gas/es. Treatment can include physical, chemical and biological processes to remove water, particulates and contaminants from the gas. The EPA will assess these conditions as part of a resource recovery order and exemption application.

7. Source separated green waste

Definition

Garden vegetation and plant materials that are segregated at the point of generation and collected as a separate material stream for processing; for example, garden organics from arborist operations, commercial gardening operations, council garden waste kerbside collections and public drop-off collections. This includes materials such as branches, grass, leaves, plant trimmings, tree stumps and bark.

Additional information

Source separated green waste is an eligible waste fuel only when it is used in a thermal process to produce char (such as pyrolysis) for land application. Char materials produced from mixed waste streams will not be eligible for land application.

Proponents wanting to use source separated green waste in a thermal process must demonstrate robust QA/QC procedures, ensuring that the green waste is uncontaminated with physical contaminants such as plastics and treated, painted or coated timbers.

Source separated green waste does not include:

- green waste extracted from mixed waste streams, such as construction and demolition waste
- material from the clean-up of illegal dumping
- material classified as agricultural biomass or uncontaminated wood waste.

8. Tyres

Definition

Used, rejected or unwanted tyres, including shredded tyres, tyre pieces, or tyre crumb containing at least 98% tyre material.

Additional information

Tyres are an eligible waste fuel only when used as fuel in an approved cement kiln. An approved cement kiln has development consent for use of a non-standard fuel, and an environment protection licence (EPL) with conditions allowing the use of tyres as a fuel source within the kiln.

Notes

1. As information about certain waste and waste-derived streams improves, the EPA will review the eligible waste fuels list from time to time.
2. Chars are not specifically listed in Section 3 as an eligible waste fuel. This is due to the range of contaminants that may be concentrated in char made from waste. Chars are likely to be considered for use as an eligible waste fuel *only* where they are produced *solely* from the listed eligible waste fuels in Section 3. Char made from other waste materials may be considered on a case-by-case basis after analysis of the materials used and produced, demonstration of the process and proof of performance.

Part 2 – Additional criteria for eligible waste fuels

This section outlines the additional criteria that proponents should consider before applying for a resource recovery order and exemption for a waste material listed as an eligible waste fuel in Section 3 of the *NSW Energy from Waste Policy Statement*.

Waste hierarchy

The NSW waste regulatory framework ensures that all resource management options are considered, in accordance to the waste hierarchy, in the following order:

1. avoidance of unnecessary resource consumption
2. reuse and recycling energy recovery
3. treatment of waste
4. disposal.

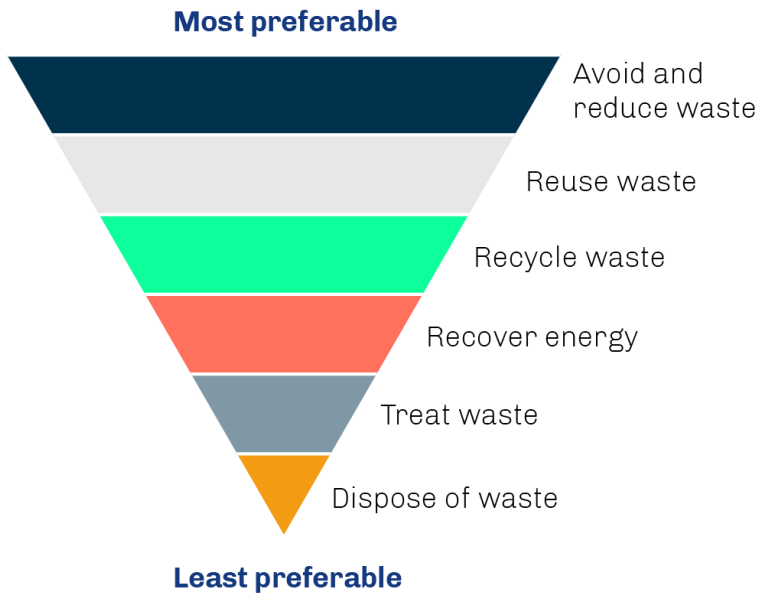


Figure1. Hierarchy of waste management options from most preferable to least preferable.

The thermal treatment of waste provides an opportunity to recover the embodied energy from waste, offset the use of non-renewable energy sources and avoid methane emissions from landfill. Applicants must ensure that the proposed use of an eligible waste fuel for energy recovery is consistent with this hierarchy.

Chemical and physical homogeneity of the waste

The overarching principle of the eligibility of a waste as an eligible waste fuel is that it should pose a minimal risk of harm to the environment and human health due to its origin, low levels of contaminants and consistency over time. The proponent must consider the consistency of the proposed waste fuel to ensure its potential environmental impact will not vary over time.

Quality assurance

The EPA strongly encourages the development of specifications against which the material will be assessed and QA/QC programs to ensure the ongoing consistency and quality of the material over time. Specifications should help ensure that the materials to be used are well characterised and of a consistent quality.

Compliance with emission limits

A facility that proposes to use an eligible waste fuel must currently be meeting all relevant emission standards as required under the facility's EPL and the Clean Air Regulation. The Clean Air Regulation prescribes standards for certain groups of plant and premises to regulate industries' air impurity emissions, as well as monitoring and other measures protecting and maintaining air quality in NSW.

The EPA will not consider applications for a resource recovery order and exemption to use an eligible waste fuel at existing facilities that are not achieving compliance with their relevant emission standards.

Changes to emission standard requirements

A proposal to use eligible waste fuels will trigger a review of a facility's emissions limits and controls. This may result in new emissions groups and limits being applied to the facility using the eligible waste fuel (in accordance with clause 33 of the Clean Air Regulation).

A facility changing fuels, experiencing fuel feedstock variation, or changing procedures for the supply and processing of eligible waste fuels, may result in changes to the facility's emissions limits, planning consent or EPL conditions.

Proponents should consider whether the use of an eligible waste fuel will cause changes in air emissions, potentially triggering more stringent emission standard requirements; that is, moving from a lower group to a higher group. Proponents may be required to demonstrate compliance with EPL conditions and the Clean Air Regulation, as determined by the fuel and thermal treatment processes.

Part 3 – Regulatory framework for the use of waste as fuel

This section outlines the regulatory framework for the use of waste or waste-derived materials as fuel in NSW.

Definition of waste and its application to waste fuels

The *Protection of the Environment Operations Act 1997* and associated Protection of the Environment Operations (Waste) Regulation 2014 (the Waste Regulation) include in their definition of *waste* any processed, recycled, reused or recovered substance produced wholly or partly from waste that is used as fuel.¹

All eligible waste fuels or waste-derived materials to be used as fuel, regardless of the type or amount of processing they have undergone, are captured as waste and must meet relevant waste regulatory requirements, such as the need to hold an EPL or pay the waste levy.

The EPA can exempt a person from certain waste regulatory requirements. These exemptions are known as resource recovery orders and exemptions and provide both significant responsibility and the benefit of being 'excused' from some of the legal obligations relating to energy recovery or the thermal treatment of waste.

Resource recovery orders and exemptions

Under clauses 92 and 93 of the Waste Regulation, orders and exemptions that are issued to allow the use of a waste material as an eligible waste fuel are known as *resource recovery orders and exemptions*.

Resource recovery orders – conditions for generators and processors

Resource recovery orders include conditions which generators and processors of waste must meet to supply the waste for land application, use as fuel or in connection with a process of thermal treatment. They may include specifications, record-keeping, reporting and other requirements. All resource recovery orders are made under clause 93 of the Waste Regulation. Generators and

¹ Refer to the Dictionary in the Act.

processors of exempt waste will be informed of the conditions of an order either in writing or by a notice in the NSW Government Gazette and by publication on the EPA website.

Resource recovery exemptions – conditions for consumers

Resource recovery exemptions contain the conditions which consumers must meet to apply waste to land, or use the waste as fuel or in connection with a process of thermal treatment outside certain requirements of the waste regulatory framework. They may include requirements on how to reuse or apply the waste, and record-keeping, reporting and other requirements. All resource recovery exemptions are made under clauses 91 and 92 of the Waste Regulation. Consumers will be informed of the conditions of an applicable exemption either in writing or by notice in the NSW Government Gazette and by publication on the EPA website.

Part 4 – Applying for a resource recovery order or exemption

Proponents seeking resource recovery orders and exemptions for the use of waste material/s as eligible waste fuel must submit an application in the format required by the EPA as outlined below.

Applications will not be considered unless they provide all the information stipulated in this part. The EPA may request further information from the proponent to inform its decision.

Applications to use **agricultural biomass** must include information regarding sprays and fertilisers applied to the crops or material, and any potential impacts of spray drift.

Applications to use **uncontaminated wood waste** must include information about quality control and assurance processes throughout the supply chain that address contamination and control of the waste stream.

Applications to use **forestry and sawmilling residues** must include information about sprays or treatment that the waste would have been subject to, including fire retardants.

Applications to use **source separated green waste** must include information about the supply pathway of green waste, and quality control and assurance processes in the supply chain that address contamination and control of the waste stream.

All applications should be emailed to: info@epa.nsw.gov.au and titled *Application for an Eligible Waste Fuel Resource Recovery Order and Exemption*.

Notes

1. The EPA will only consider applications where the proponent has consulted with the appropriate consent authority or can demonstrate that the development consent permits the use of these materials as fuel at that facility.
2. Proponents should consult with local government and/or the consent authority regarding development consents and approvals, as modifications to an existing development consent or new consents may be required.
3. The EPA may request further information from the proponent to inform its decision.
4. Proponents are strongly encouraged to discuss their proposal with the EPA prior to commencing work on an application. Proponents are also advised to consult, where necessary, with other relevant consent authorities regarding the proposal prior to submitting an application.

For any queries or to discuss your proposal, please contact the EPA at info@epa.nsw.gov.au or 9995 5555.

Eligible waste fuel application – required format

1. Proponent(s) details

1.1 Applicant's details including: name, address, phone number, the ACN and/or ABN of the proponent.

1.2 If using a representative, the representative or consultant's details.

1.3 If the application is on behalf of another person, please provide the contact details of that person, including an ACN and/or ABN.

Note: This section should identify the person who will be able to provide answers to any enquiries for further general or technical information. This person may be a consultant or representative of the applicant. In this case, the applicant should provide a letter authorising a representative or consultant to act on their behalf, ensuring they have the necessary skills, knowledge and authority to discuss the matters listed in these guidelines with the EPA.

2. Background information on the waste material

2.1 Description of the waste.

2.2 What is the source of the waste or waste-derived material?

2.3 What processes has the material undergone? Including mechanical, chemical and biological description of the process, treatments, storage, transport, and any sample results.

2.4 What is the expected volume and consistency of the material to be supplied over time?

3. Development consent and approvals

3.1 Details of development consent status, whether a request for development consent has been submitted, is in progress or has been obtained.

3.2 Provide all development consent application documents with the application.

4. Site management and quality control

4.1 Where is the facility?

4.2 Is the proposed facility licensed by the EPA?

4.3 What is the facility's environment protection licence (EPL) number?

4.4 What quantity of eligible waste fuel will be stored and used at the facility?

4.5 How is the material going to be stored at the facility?

4.6 What procedures are in place to manage the input and output quality of the material over time?

4.7 What contingency plans exist for the receipt of waste during shutdown or failed delivery?

5. Characterisation of the waste material

5.1 What is the chemical composition of the material?

5.2 What are the typical properties or characteristics of the material?

5.3 What is the calorific value and combustion efficiency of the material?

5.4 What are the properties of the material that make it suitable for its proposed use?

Note: In addition to the analyses listed in Table 1 below, the applicant must outline whether the eligible waste fuel contains or potentially contains specific physical contaminants such as asbestos, pesticides, radioactive substances, plastics, glass, metal or any other physical

contaminants. If these materials are likely to be present, they should be reported with appropriate management protocols or testing results.

6. Higher order reuse opportunities

6.1 How is the material currently being managed (e.g. landfilled, other reuse, recovery option)?

6.2 Demonstrate that there are no practical, higher order reuse opportunities for the waste in the region.

7. Characterisation of residual ash, wastes or by-products

7.1 What is the chemical composition of the material's residual ash, wastes or byproducts?

7.2 What are the typical properties or characteristics of the residual ash wastes or byproducts?

7.3 What is the intended use or disposal avenues for the ash wastes or by-products?

8. Information on potential air impacts

8.1 What is the current concentration of air emissions from the emission unit?

8.2 Do the current air emissions comply with the relevant regulatory requirements in the Protection of the Environment Operations (Clean Air) Regulation 2010 (the Clean Air Regulation)?

8.3 What will be the concentration of air emissions from the emission unit when using the proposed eligible waste fuel and how do they compare to the existing fuel?

8.4 Are principal air toxics present in the waste material or expected in the air emissions?

8.5 Will the emissions comply with all relevant regulatory requirements in the Clean Air Regulation?

8.6 Has an air quality impact assessment for the facility been carried out having regard to potential air pollutants? What were the results?

8.7 What air monitoring is proposed to be carried out?

9. Specifications and standards

9.1 Has a specification been developed for the proposed fuel material?

9.2 Does the material meet, or is it required to meet any existing specifications or standards?

9.3 Are there any agreements between the producer and the user of the waste-derived material to ensure the material is 'fit for purpose'?

9.4 What, if any, quality assurance/quality control (QA/QC) systems are in place to ensure consistency of calorific value, contaminant levels, quality and quantity of supply over time?

Notes

- Standard fuels:** In some cases, if the proposed material meets the definition of a standard fuel (as defined in clause 31 of the Clean Air Regulation) not all eligible waste fuel criteria will apply. The EPA will determine the information required on a case-by-case basis. Proponents are strongly encouraged to discuss their proposal with the EPA prior to commencing work on an application.
- Proof of performance:** As part of the application the EPA may require proponents to undertake proof of performance (POP) trials and emissions monitoring to demonstrate compliance with air emissions standards, before resource recovery orders and/or exemptions are issued.

Part 5 – Characterisation requirements

As part of the application process outlined in Part 4, proponents may be required to undertake a chemical characterisation of their material in order for the EPA to be able to complete an assessment of the waste. Proponents should seek advice from the EPA before undertaking any sampling or testing.

Where the EPA advises that a chemical assessment is required, the proponent must ensure the waste material has undergone testing for the chemical contaminants in Table 1 for a minimum of 20 composite samples.

Samples must be analysed at a laboratory accredited for the relevant tests by the National Association of Testing Authorities Australia (NATA) or an equivalent accreditation body. The test methods used to obtain all data should be specified as part of the chemical characterisation.

Proponents should seek appropriate expertise in the completion of chemical assessments.

Amended sampling and testing requirements

The risk posed by some waste types may vary, so in some instances the EPA may agree to an amended sampling and testing regime rather than that outlined in this part. Proponents should discuss their proposal with the EPA before commencing work on a resource recovery exemption application, to confirm the sampling and testing requirements.

The following chemicals must be measured and assessed. Dry mass means that the samples are dried to a constant weight at ~100 degrees Celsius.

Table 1: Chemical concentrations/material characteristics to be tested

No.	Chemical/attributes	Detection limit	Units for reporting
1	Antimony	~ 2	mg/kg on a dry mass basis
2	Arsenic	~ 2	mg/kg on a dry mass basis
3	Beryllium	~ 0.1	mg/kg on a dry mass basis
4	Boron	~ 5	mg/kg on a dry mass basis
5	Cadmium	~ 0.5	mg/kg on a dry mass basis
6	Cobalt	~ 2	mg/kg on a dry mass basis
7	Copper	~ 2	mg/kg on a dry mass basis
8	Chromium	~ 2	mg/kg on a dry mass basis
9	Lead	~ 2	mg/kg on a dry mass basis
10	Manganese	~ 2	mg/kg on a dry mass basis
11	Molybdenum	~ 1	mg/kg on a dry mass basis
12	Nickel	~ 2	mg/kg on a dry mass basis
13	Selenium	~ 3	mg/kg on a dry mass basis
14	Tin	~ 2	mg/kg on a dry mass basis
15	Vanadium	~ 1	mg/kg on a dry mass basis
16	Zinc	~ 2	mg/kg on a dry mass basis
17	Total organic carbon	~ 0.1	% by weight on a dry mass basis
18	Total nitrogen	~ 0.1	% by weight on a dry mass basis
19	Total chlorine	~ 100	mg/kg on a dry mass basis
20	Total fluorine	~ 100	mg/kg on a dry mass basis
21	Total sulfur	~ 100	mg/kg on a dry mass basis
22	Mercury	~ 0.1	mg/kg on a dry mass basis
23	Volatile organics	Various	mg/kg 'as received' (do not dry)
24	Moisture content	~ 0.1	% by weight
25	Calorific value	~ 0.5	MJ/kg 'as received'
26	Ash content	~ 0.1	% by weight

Test methods

Test methods for measuring **chemicals 1–16** in Table 1 require:

- sample splitting and size reduction (may not be required)
- sample digestion using USEPA 3051A (or an equivalent method)
- analysis using USEPA 6010C (or an equivalent method)
- reporting as mg/kg dry weight.

Test methods for measuring **total organic carbon** (no.17 in Table 1) require analysis using methods 6B2 or 6B3 in Rayment & Lyons (2011), *Soil Chemical Method – Australasia* (or an equivalent method).

Test methods for measuring **total nitrogen** (no.18 in Table 1) require analysis using semimicro Kjeldahl method 7A2 in Rayment & Higginson (1992), *Australian Laboratory Handbook of Soil and Water Chemical Methods* (or an equivalent method).

Test methods for measuring **total chlorine and fluorine** (nos.19–20 in Table 1):

- appropriate sample preparation such as Australian Standard 1038 (or an equivalent method)
- analysis using a method that determines total concentrations such as Australian Standard 1038 (or an equivalent method).

Test methods for measuring **total sulfur** (no.21 in Table 1) require analysis using method 10A1 in Rayment & Higginson (1992), *Australian Laboratory Handbook of Soil and Water Chemical Methods* (or an equivalent method).

Test methods for measuring **mercury** (no.22 in Table 1) require:

- sample pre-treatment (if required) using a separate moisture test so a calculated dry weight can be determined
- cold-vapour atomic absorption spectroscopy (sample preparation and analytical method) using USEPA 7471B (or an equivalent method)
- reporting as mg/kg dry weight.

Test methods for measuring **volatile organics** (no.23 in Table 1) require:

- analysis using method 501 (Volatile Organics) in Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method)
- reporting as mg/kg by individual chemical or 'limit of detection' if not detected.

Test methods for measuring **characteristics 24–26** require:

- appropriate sample preparation as required by Australian Standard 1038 (or equivalent analytical method)
- analysis using a method that determines moisture or ash content and gross calorific values such as Australian Standard 1038 (or equivalent method).

Related documents

Related documents include:

- [NSW Energy from Waste Policy Statement](#)
- [Energy Recovery Facility Guidelines](#).

The EPA website www.epa.nsw.gov.au will have the most recent versions of all relevant policies and guidelines.

Contacts for further advice

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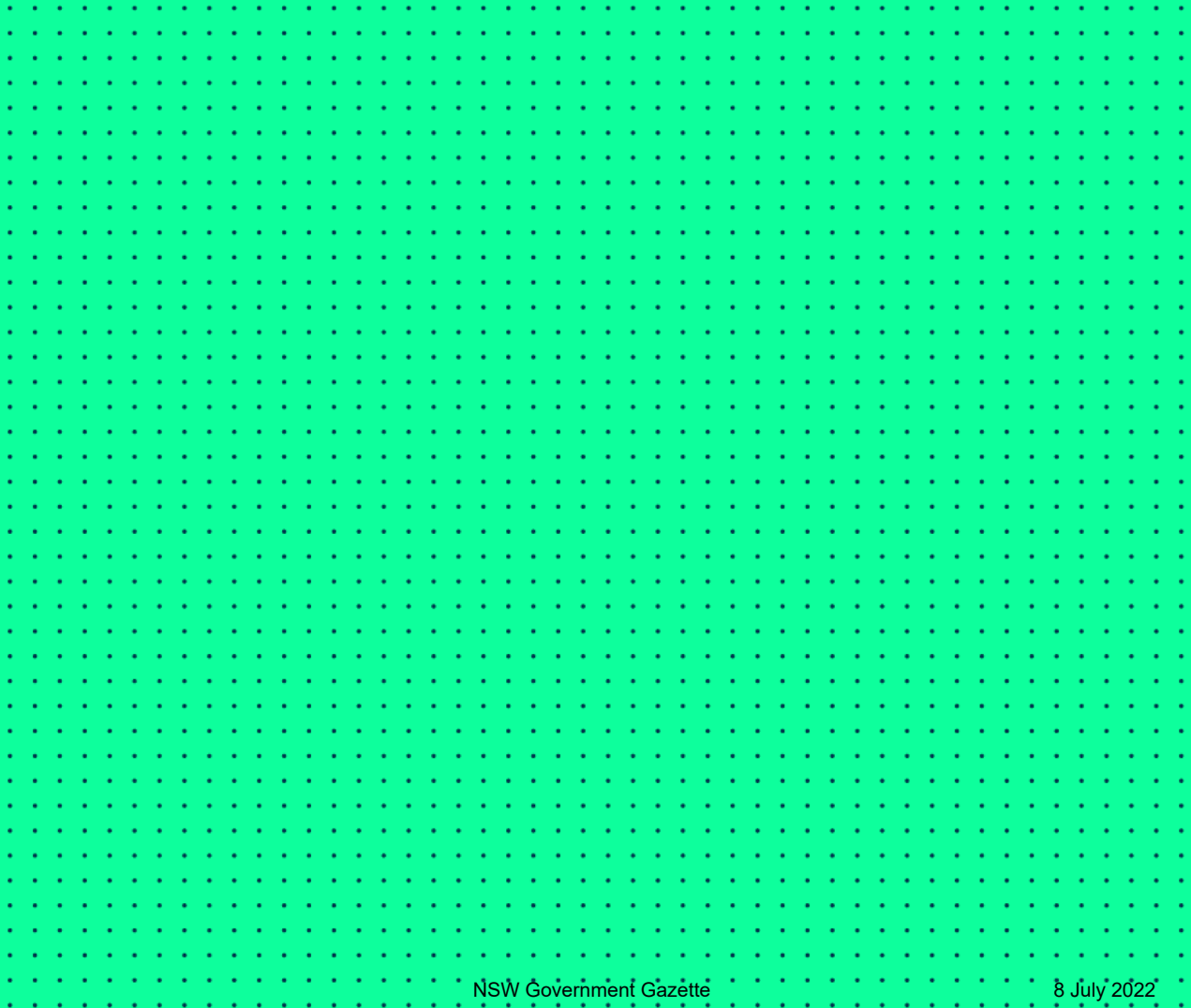
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Appendix B – NSW Energy from Waste Policy Statement



Environment Protection Authority

NSW Energy from Waste Policy Statement



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Definitions

Eligible waste fuels	Waste or waste-derived materials considered by the EPA to pose a low risk of harm to the environment and human health due to their origin, low levels of contaminants and consistency over time.
Energy recovery facility	A facility that thermally treats waste or waste-derived materials that do not meet the definition of an eligible waste fuel. These facilities must be able to demonstrate that they will be using current international best practice techniques.
Processing facility	Facility undertaking genuine resource recovery operations, producing separate output material streams for reuse or recovery. Facility may be separate to, or on the same site as, an energy from waste facility.
Resource recovery order and exemption	Resource recovery orders and exemptions are issued by the EPA under Part 9 of the Protection of the Environment Operations (Waste) Regulation 2014 and exempt a person from the various waste regulatory requirements that apply to the use of a waste fuel (e.g. waste disposal licensing, levy payments, etc.). The exemptions apply to waste fuels determined by the EPA to be fit-for-purpose, genuine energy recovery opportunities.
Thermal treatment	According to Schedule 1 of the <i>Protection of the Environment Operations Act 1997</i> , thermal treatment means the processing of waste by burning, incineration, thermal oxidation, gasification, pyrolysis, plasma or other thermal treatment processes.
Waste	As defined in the dictionary of the <i>Protection of the Environment Operations Act 1997</i> .

1. Introduction

The Environment Protection Authority (EPA) recognises that the recovery of energy and resources from the thermal processing of waste has the potential, as part of an integrated waste management strategy, to deliver positive outcomes for the community and the environment. Energy from waste can be a valid pathway for residual waste where:

- further material recovery through reuse, reprocessing or recycling is not financially sustainable or technically achievable
- community acceptance to operate such a process has been obtained.

In NSW, two key policy objectives are enshrined in the state's waste legislation. Firstly, the Protection of the Environment Operations Act 1997 (POEO Act) sets the framework to ensure that human health and the environment are protected from the inappropriate use of waste. Secondly, the Waste Avoidance and Resource Recovery Act 2001 (WaRR Act) aims to ensure that consideration of resource management options occurs in the following order:

1. avoidance of unnecessary resource consumption
2. resource recovery (including reuse, reprocessing, recycling and energy recovery)
3. disposal.

Where waste cannot be avoided or products reused, various recovery technologies are available to maximise resource efficiencies and increase the sustainability of our communities, businesses and industries.

The EPA has applied the following overarching principles to waste avoidance and recovery:

- higher value resource recovery outcomes are maximised
- air quality and human health are protected
- 'mass burn' disposal outcomes are avoided
- scope is provided for industry innovation.

The thermal treatment of waste provides an opportunity to recover the embodied energy from waste, offset the use of non-renewable energy sources, and avoid methane emissions from landfill.

However, these outcomes depend on ensuring that any energy recovery proposals represent the most efficient use of the resource and the risks of harm to human health or the environment are adequately managed. Clean air is fundamental to everyone's wellbeing: poor air quality can be particularly critical to the health of children and chronically ill and older people, as well as affecting the natural environment and amenity of communities.

To ensure emissions are adequately mitigated, facilities proposing to recover energy from waste will need to meet current international best practice techniques, particularly regarding:

- process design and control
- emission control equipment design and control
- emission monitoring with real-time feedback to the controls of the process.

The NSW Energy from Waste Policy statement sets out the policy framework and overarching criteria that apply to facilities in NSW proposing to thermally treat waste or waste-derived materials for the recovery of energy. In doing so, it provides regulatory clarity to industry and the community.

2. Energy recovery framework and scope

The NSW Energy from Waste Policy statement outlines the policy framework and technical criteria that apply to facilities proposing to recover energy from waste in NSW.

Scope of the policy statement

The scope of the policy statement covers all facilities undertaking the thermal treatment of any waste¹ or waste-derived materials, where thermal treatment means the processing of wastes by combustion, thermal oxidation, thermal or plasma gasification, pyrolysis and torrefaction. Where a thermal process, such as pyrolysis or gasification, produces a gas for subsequent combustion (for example, a syngas), the facility where that gas is combusted will also be subject to this framework.

However, there are some thermal treatment applications that fall outside the scope of this policy statement. The following facilities are excluded as they are not considered to be undertaking genuine energy recovery:

- incineration facilities for the destruction of waste
- facilities for the thermal treatment of contaminated soil
- facilities proposing the thermal treatment of unprocessed mixed waste streams
- facilities proposing the thermal treatment of waste that has been exhumed from landfills
- facilities proposing the thermal treatment of hazardous waste materials.

Other facilities excluded from this policy statement include those that are undertaking a form of thermal treatment to which the technical or resource recovery criteria in the statement are not relevant or for which other regulatory frameworks already apply, namely:

- thermal processes where there is no change in the chemical composition of the waste
- transport fuels produced from waste
- autoclaving processes
- biological processes, such as anaerobic digestion and composting of waste.

Policy framework

The definition of waste covers a range of materials that vary in their origin, composition, contamination and risk profile. The EPA recognises that a framework that facilitates a risk-based approach to the recovery of energy from waste will deliver certainty for industry, the community and the environment.

This policy statement establishes a two-tiered framework, separating the requirements for low-risk wastes proposed for thermal treatment from all other wastes.

Waste or waste-derived materials that pose a minimal risk of harm to human health and the environment due to their origin, low levels of contaminants and consistency over time will be categorised as **eligible waste fuels** and listed in the policy statement. As information about certain waste and waste-derived streams improves, the EPA will review the eligible waste fuels list from

¹ As defined in the *Protection of the Environment Operations Act 1997*

time to time. Further information regarding the requirements to be met by eligible waste fuels is available in Section 3 of this policy statement.

Facilities proposing to thermally treat any waste or waste-derived materials that are **not** listed as an eligible waste fuel must meet the requirements of an energy recovery facility. Further information regarding the requirements for energy recovery facilities is available in Section 4 of this policy statement.

Public consultation and the good neighbour principle

Regardless of whether a facility plans to go ahead with a proposal under Section 3 or 4 of this policy statement, it will be essential that proponents provide effective information and public consultation about energy from waste proposals. As proposals progress from the concept to detailed development assessment stage, proponents should engage in a genuine dialogue with the community and ensure that planning consent and other approval authorities are provided with accurate and reliable information.

The operators of an energy from waste facility will need to be ‘good neighbours’ – particularly if near a residential setting but also where there are workers in other facilities. This would apply to waste deliveries and operating hours, but most importantly with respect to readily available information about emissions and resource recovery outcomes.

3. Eligible waste fuels

Eligible waste fuels are those that are considered by the EPA to pose a low risk of harm to human health and the environment due to their origin, composition and consistency.

The following wastes are categorised by the EPA as eligible waste fuels:

1. biomass from agriculture
2. forestry and sawmilling residues
3. uncontaminated wood waste
4. recovered waste oil
5. organic residues from virgin paper pulp activities
6. landfill gas and biogas
7. source-separated green waste (used only in processes to produce char)
8. tyres (used only in approved cement kilns).

The EPA may update the list of eligible waste fuels from time to time.

Eligible waste fuels may be thermally treated using a range of treatment technologies, provided a resource recovery order and exemption has been granted by the EPA. The origin, composition and consistency of these wastes must ensure that emissions from thermal treatment will be known and consistent over time.

Facilities proposing to use eligible waste fuels must meet the following criteria:

- ability to demonstrate to the EPA that the proposed waste consistently meets the definition of an EPA-approved eligible waste fuel
- confirm there are no practical, higher order reuse opportunities for the waste
- fully characterise the waste and/or undertake proof of performance

meet the relevant emission standards as set out in the Protection of the Environment Operations (Clean Air) Regulation 2010.

Note: Eligible waste fuels that also fall under the definition of a standard fuel as defined in the Protection of the Environment Operations (Clean Air) Regulation 2010 would not need to meet the above criteria but will still require appropriate approval for their use.

Further details are provided in the *EPA's Eligible Waste Fuels Guidelines*. These include how to apply for a resource recovery order and exemption for the use of an eligible waste fuel and definitions for each of the listed eligible waste fuels.

4. Energy recovery facilities

Any facility proposing to thermally treat a waste or waste-derived material that is not a listed eligible waste fuel (Section 3) must meet the requirements to be an energy recovery facility. If the facility is proposing to thermally treat a combination of eligible and other waste fuels, it will be subject to the requirements of an energy recovery facility.

Energy recovery facilities refer to facilities that thermally treat waste-derived materials that fall outside the low-risk 'eligible waste fuels' definition. These facilities must therefore show they will be using current international best practice techniques, particularly regarding:

- process design and control
- emission control equipment design and control
- emission monitoring with real-time feedback to the controls of the process
- arrangements for the receipt of waste
- management of residues from the energy recovery process.

These considerations ensure that air pollution is appropriately mitigated.

Energy recovery facilities must use technologies that are proven, well understood and capable of handling the expected variability and type of waste feedstock. This must be demonstrated through reference to fully operational plants using the same technologies and treating like waste streams in other similar jurisdictions.

As well as using current best practice techniques, energy recovery facilities must ensure that they meet the following technical, thermal efficiency and resource recovery criteria.

Technical criteria

An energy recovery facility processing wastes other than 'eligible waste fuels' must satisfy all the technical requirements below, regardless of whether the facility is existing or purpose-built and the waste input is the sole feedstock or a fuel for co-firing.

Plant design and operation

The gas resulting from the process should be raised, after the last injection of combustion air, in a controlled and homogenous fashion and even under the most unfavourable conditions to a minimum temperature of 850°C for at least two seconds (as measured near the inner wall or at another representative point of the combustion chamber). If the waste fuel fed to the primary (first) combustion chamber has a content of more than 1% of halogenated organic substances, expressed as chlorine, the temperature should be raised to 1,100°C for at least two seconds after the last injection of air.

The total organic carbon (TOC) or loss on ignition (LOI) content of the slag and bottom ashes must not be greater than 3% or 5%, respectively, of the dry weight of the material.

Waste feed interlocks are required to prevent waste from being fed to the facility when the required temperature has not been reached either at start-up or during operation.

The EPA will set operating conditions in environment protection licences for all approved energy recovery facilities.

Emission standards

Energy recovery facilities must achieve emission performance consistent with best practice. Energy recovery facilities must be designed and operated to ensure they achieve air emissions no greater than the standards prescribed in Table 1.

Table 1 Emission standards for energy recovery facilities

Pollutant	Concentration ¹	Averaging period
Solid particles (total)	20 mg/m ³	One hour or the minimum sampling period specified in the relevant test method, whichever is the greater
Type 1 and 2 substances in aggregate ²	0.3 mg/m ³	One hour or the minimum sampling period specified in the relevant test method, whichever is the greater
Mercury	0.04 mg/m ³	One hour or the minimum sampling period specified in the relevant test method, whichever is the greater
Cadmium and thallium (total)	0.02 mg/m ³	One hour or the minimum sampling period specified in the relevant test method, whichever is the greater
Dioxins and furans	0.1 ng/m ³	One hour or the minimum sampling period specified in the relevant test method, whichever is the greater
Sulphur dioxide (SO ₂)	100 mg/m ³	One hour
Oxides of nitrogen (NO _x) (as NO ₂ equivalent)	250 mg/m ³	One hour
Carbon monoxide (CO)	80 mg/m ³	One hour
Hydrogen chloride (HCl)	50 mg/m ³	One hour
Hydrogen fluoride (HF)	4 mg/m ³	One hour
Volatile organic compounds (VOCs)	20 mg/m ³	One hour
Ammonia	5 mg/m ³	24 hours

Notes

- 1) Expressed at dry, 273 K, 101.3 kPa and 11 % oxygen
- 2) As defined in the Protection of the Environment Operations (Clean Air) Regulation 2010

The EPA may set additional emission limits or conditions in the environment protection licence for approved energy recovery facilities. This may include, but is not limited to, limits for additional pollutants or additional and more stringent limits for pollutants in Table 1. Additional limits will be applied to address a project specific risk, and/or promote reduced average emissions and continuous improvement.

Process monitoring

There must be **continuous measurements** of the operational parameters listed in Table 2. This process monitoring data must be held by the proponent for a period of three years.

Table 2 Operational parameter monitoring requirements for energy recovery facilities

Operational parameter	Location	Frequency
Temperature	Representative points in the combustion chamber and the discharge stack	Continuous
Oxygen content	Discharge stack	Continuous
Moisture content	Discharge stack	Continuous
Pressure	Discharge stack	Continuous

Proof of performance (POP)

As part of the environment protection licence conditions of all energy recovery facilities, the EPA will require operators to complete proof of performance (POP) testing to demonstrate compliance with air emissions standards. Proponents must provide a commissioning plan during the environment protection licence application stage, detailing the POP emission testing that will be undertaken.

Emissions monitoring

Following successful plant commissioning, including POP testing, the EPA will require operators to undertake ongoing monitoring to demonstrate compliance with air emission standards. The minimum emissions monitoring requirements are listed in Table 3. The EPA may set more stringent monitoring requirements in conditions of the environment protection licence, including but not limited to continuous monitoring of additional pollutants, where feasible monitoring techniques become available.

Table 3 Minimum emissions monitoring requirements for energy recovery facilities

Pollutant	Unit of measure	Frequency
Oxides of nitrogen (NOx)	mg/m ³	Continuous
Carbon monoxide (CO)	mg/m ³	Continuous
Solid particles (Total)	mg/m ³	Continuous
Total organic compounds	mg/m ³	Continuous
Hydrogen chloride (HCl)	mg/m ³	Continuous
Hydrogen fluoride (HF) ¹	mg/m ³	Continuous
Sulphur dioxide (SO ₂)	mg/m ³	Continuous
Ammonia	mg/m ³	Continuous ²
Type 1 and 2 substances in aggregate	mg/m ³	Every three months
Mercury	mg/m ³	Every three months
Cadmium and Thallium (Total)	mg/m ³	Every three months
Polycyclic aromatic hydrocarbons (PAH)	mg/m ³	Every three months for the first 12 months of operation. Two measurements per year after that.

Pollutant	Unit of measure	Frequency
Dioxins and furans	ng/m ³	Every three months for the first 12 months of operation. Two measurements per year after that.
Carbon dioxide (CO ₂)	mg/m ³	Continuous
Nitrous Oxide (N ₂ O)	mg/m ³	Continuous ²

Notes

- 1) The continuous measurement of HF may not be required if treatment stages for HCl are used which ensure that the emission limit value for HCl is not being exceeded.
- 2) Or as otherwise agreed to by written notice from the EPA

Emissions reporting

To the extent practicable validated emission monitoring data must be made available publicly through an online portal in near real time.

Emission monitoring data must be made available to the EPA in real time graphical publication and a weekly summary of continuous monitoring data and compliance with emissions limits published on the internet.

Air emission modelling assessment

An air quality impact assessment must be completed according to the [Approved Methods for the Modelling and Assessment of Air Pollutants in NSW](#).

Thermal efficiency criteria

This policy statement is restricted in its scope to facilities that are designed to thermally treat waste for the recovery of energy rather than as a means of disposal. The **net** energy produced from thermally treating that waste, including the energy used in applying best practice techniques, must therefore be positive.

To meet the thermal efficiency criteria, facilities must demonstrate that at least 25% of the energy generated from the thermal treatment of the material will be captured as electricity (or an equivalent level of recovery for facilities generating heat alone).

Energy recovery facilities must also demonstrate that any heat generated by the thermal processing of waste is recovered as far as practicable. This includes use of waste heat for steam or electricity generation or for process heating of combined heat and power schemes.

Resource recovery criteria

The EPA considers energy recovery to be a complementary waste management option for the residual waste produced from material recovery processes or source-separated collection systems.

This policy statement's objectives in setting resource recovery criteria are to:

- promote the source separation of waste where technically and economically achievable
- drive the use of best practice material recovery processes
- ensure only the residual from genuine resource recovery operations are eligible for use as a feedstock for an energy recovery facility.

Energy recovery facilities may only receive feedstock from waste processing facilities or collection systems that meet the criteria outlined in Tables 4 and 5.

Proponents wishing to use waste or waste-derived materials for energy recovery that are not defined in Tables 4 or 5 must contact the EPA to discuss their proposal. The EPA will consider these on a case-by-case basis according to the energy from waste considerations outlined in this policy statement and the principles set out in the POEO Act and WaRR Act.

Table 4 Resource recovery criteria for energy recovery facilities – mixed waste streams

Mixed waste stream	Processing facility	% residual waste allowed for energy recovery
Mixed municipal waste (MSW)	Facility processing mixed MSW waste where a council has separate collection systems for dry recyclables and food and garden waste	No limit by weight of the waste stream received at a processing facility
	Facility processing mixed MSW waste where a council has separate collection systems for dry recyclables and garden waste	Up to 40% by weight of the waste stream received at a processing facility
	Facility processing mixed MSW waste where a council has a separate collection system for dry recyclables	Up to 25% by weight of the waste stream received at a processing facility
Mixed commercial and industrial waste (C&I)	Facility processing mixed C&I waste	Up to 50% by weight of the waste stream received at a processing facility
	Facility processing mixed C&I waste where a business has separate collection systems for all relevant waste streams	No limit by weight of the waste stream received at a processing facility
Mixed construction and demolition waste (C&D)	Facility processing mixed C&D waste	Up to 25% by weight of the waste stream received at a processing facility
Residuals from source-separated materials		
Source-separated recyclables from MSW	Facility processing source-separated recyclables from MSW	Up to 10% by weight of the waste stream received at a processing facility
Source-separated garden waste	Facility processing garden waste	Up to 5% by weight of the waste stream received at a processing facility
Source-separated food waste (or food and garden waste)	Facility processing source-separated food or source-separated food and garden waste	Up to 10% by weight of the waste stream received at a processing facility

Table 5 Resource recovery criteria for energy recovery facilities – separated waste streams

Separated waste stream	Feedstock able to be used at an energy recovery facility
Waste wood	Residual wood waste sourced directly from a waste generator e.g. manufacturing facility
Textiles	Residual textiles sourced directly from a waste generator
Waste tyres	End-of-life tyres
Biosolids	Used only in a process to produce a char for land application
Source separated food and garden organics	Used only in a process to produce a char for land application

Notes

The EPA may consider increases to the maximum allowable percentage of residuals from facilities receiving mixed municipal and commercial and industrial waste where a facility intends to use the biomass component from that process for energy recovery, rather than land application. The facility must be able to demonstrate they are using best available technologies for material recovery of that stream.

Waste streams proposed for energy recovery should not contain contaminants such as batteries, light bulbs or other electrical or hazardous wastes.

Bio-char or char materials produced from facilities using mixed waste streams will not be able to be considered for land application as a soil amendment or improvement agent.


The C&I 'no limit' category is likely to apply only to mixed waste collected from single generators of large volumes of waste (e.g. supermarkets) or precinct-based businesses (e.g. shopping centres). Proponents will need to demonstrate that each entity generating waste has effective and operating collection systems for all waste streams they generate that have reuse or recycling opportunities (e.g. paper/cardboard collection; organic collection; and residual waste collection). Proponents wishing to use the C&I 'no limit' category will need to contact the EPA to determine the eligibility of each entity.

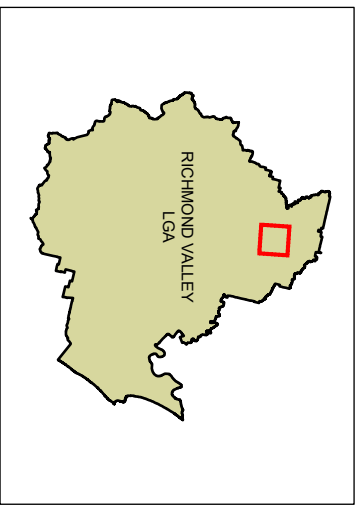
Appendix C – Maps



**Protection of the Environment
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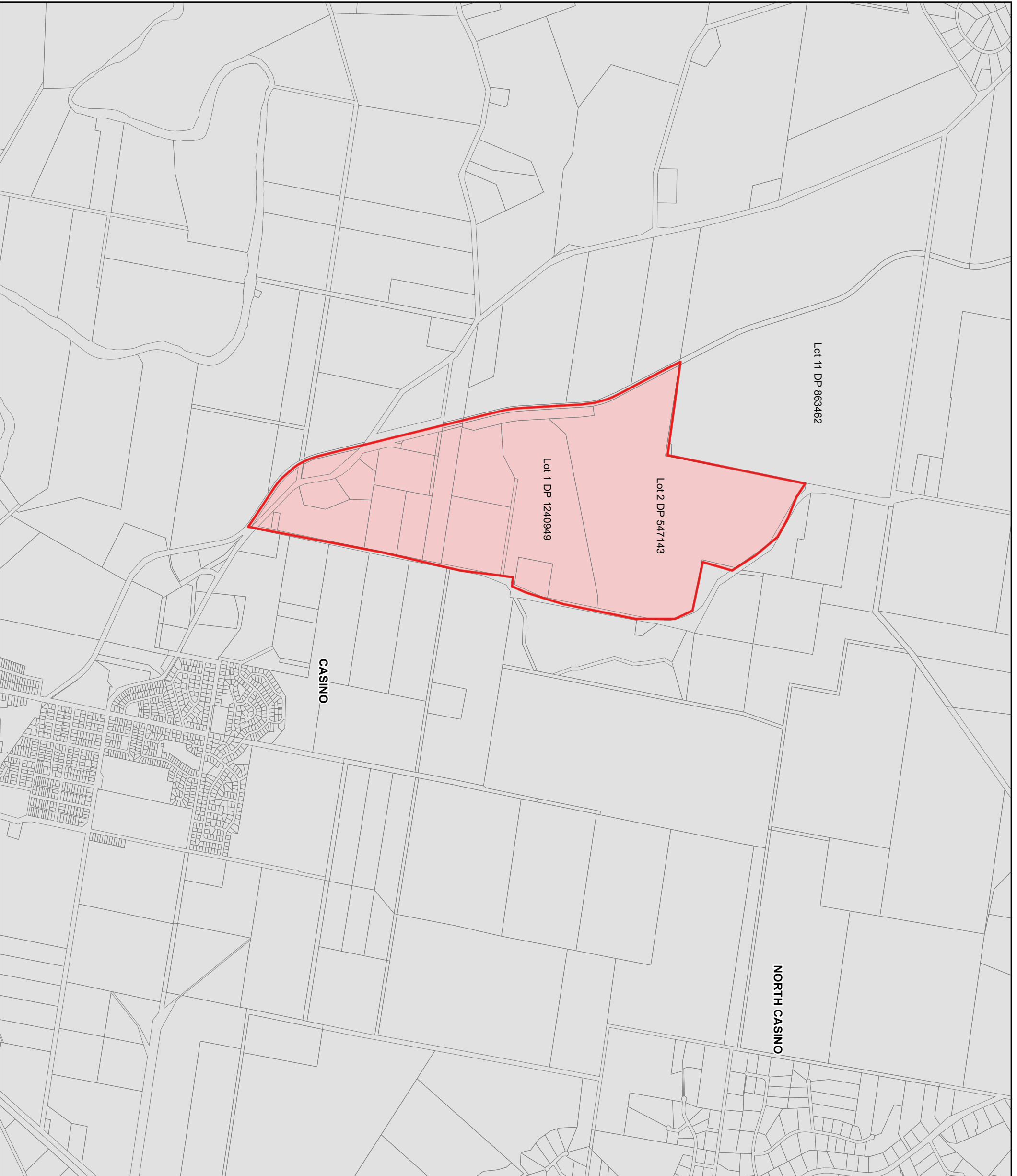
**Richmond Valley Regional Jobs
Precinct**

-  Richmond Valley Regional Jobs Precinct
-  Cadastre



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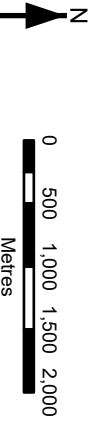
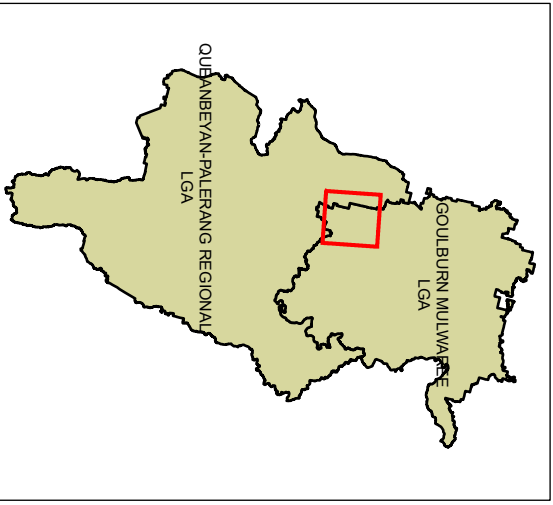




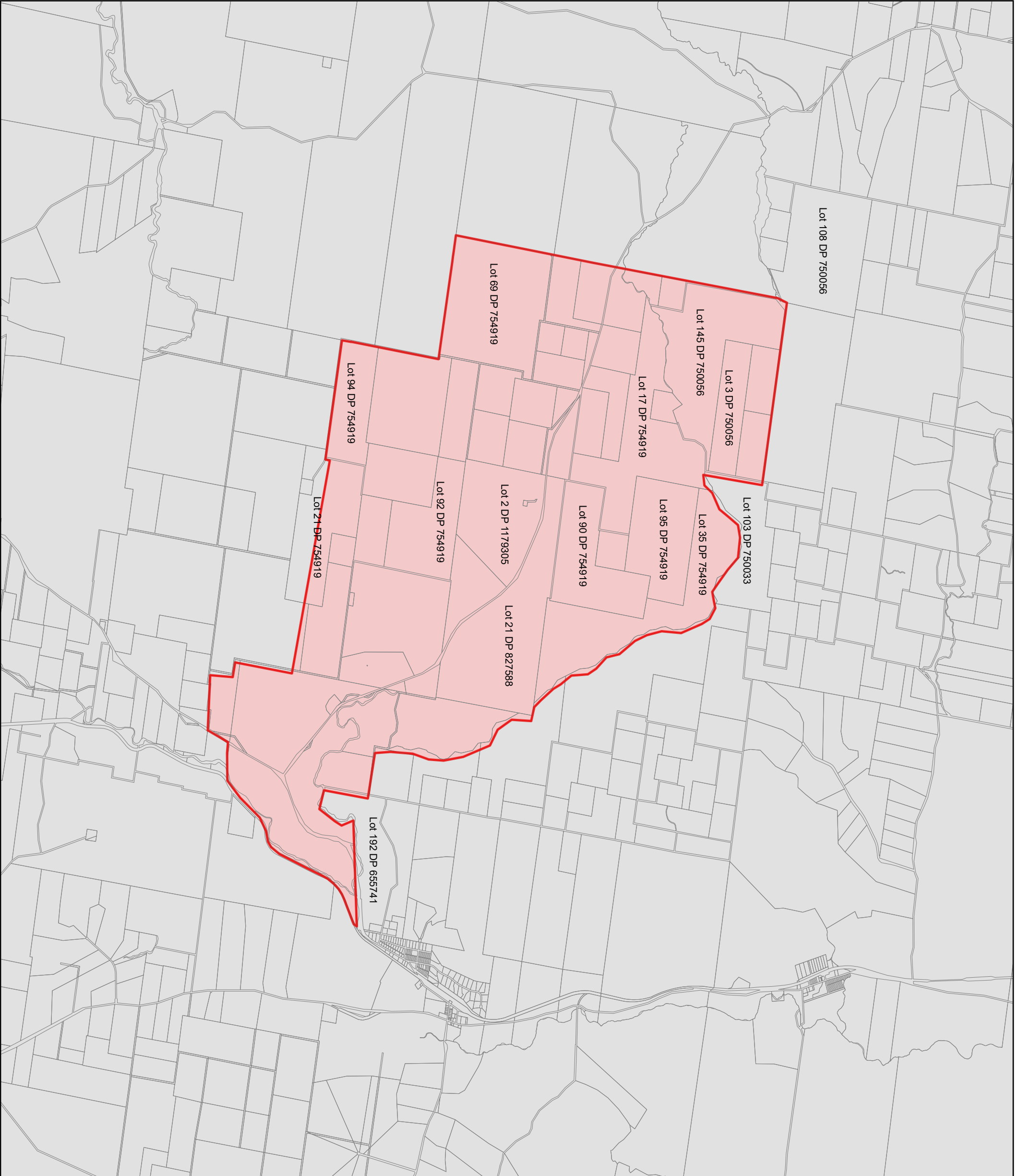
**Protection of the Environment
Operations (General)
Regulation 2021**

**Southern Goulburn Mulwaree
Precinct**

-  Southern Goulburn Mulwaree Precinct
-  Cadastre



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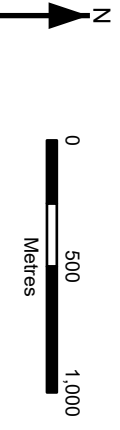




Protection of the Environment Operations (General) Regulation 2021

West Lithgow Precinct

-  West Lithgow Precinct
-  Cadastre



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