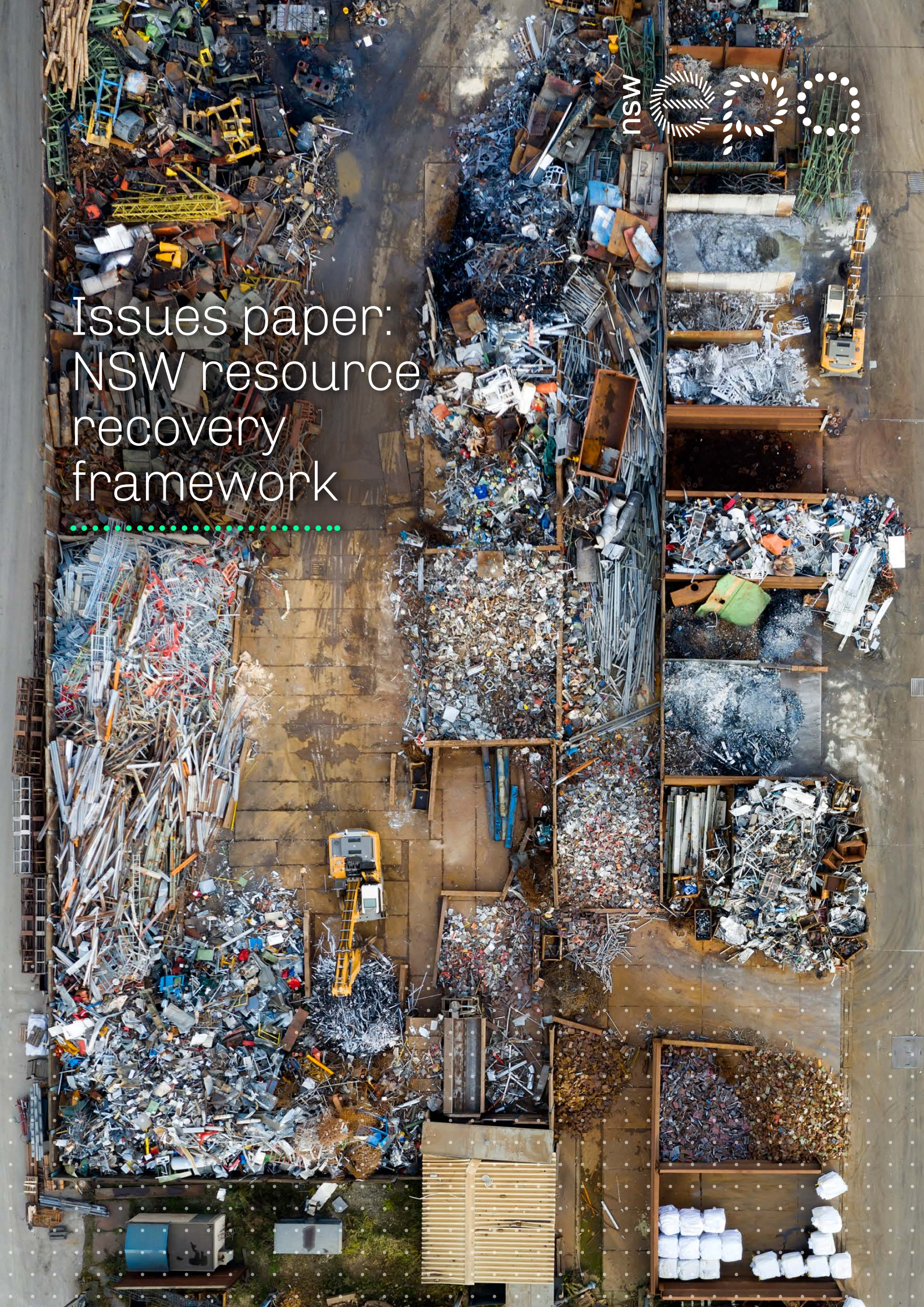


NSW



Issues paper: NSW resource recovery framework



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This document provides an overview of the NSW resource recovery framework. It identifies issues and invites feedback from stakeholders that will contribute to an independent review of the framework.



An aerial photograph of a rugged coastline. A waterfall cascades over dark, wet rocks into a pool of deep blue water. The surrounding land is covered in dense, vibrant green vegetation, including various shrubs and trees. The scene is captured from a high angle, looking down at the water and the rocky shore.

Acknowledgement of Country

.....

The EPA acknowledges the traditional custodians of the land on which we live and work, and pay our respects to Elders past, present and future.

We recognise the connection to their land, their waters and surrounding communities and acknowledge their history here on this land.

We also acknowledge our Aboriginal and Torres Strait Islander employees who are an integral part of our diverse workforce and recognise the knowledge embedded forever in Aboriginal and Torres Strait Islander custodianship of Country and culture.

Dharawal Country, Royal National Park, NSW

Executive summary

The resource recovery framework

The resource recovery framework is the policy, regulatory and compliance framework administered by the EPA to facilitate beneficial resource recovery and circular economy outcomes. The framework aims to divert waste from landfill and to minimise the risks to human health and the environment.

The framework is a key lever for achieving ambitious recovery targets, such as an 80% recovery rate of all waste streams by 2030 – a target endorsed by the NSW Government under the National Waste Policy Action Plan 2019.

Review of the framework

The NSW Government's *Waste and Sustainable Materials Strategy 2041* commits to reviewing and optimising the framework. To fulfil that commitment the EPA has commissioned a comprehensive, impartial and transparent independent review of the framework to capture a broad representation of perspectives. The review reflects the significance of the framework for the circular economy.



Dr Cathy Wilkinson, former Head of EPA Victoria, will lead the independent review of the resource recovery framework.

The independent review is being undertaken by Dr Cathy Wilkinson, former Head of the Victorian EPA and current Professor of Practice at the Monash Sustainable Development Institute.

The EPA will facilitate the review by listening to and working collaboratively with community, government, and industry stakeholders. This is consistent with the EPA's aim to be a world-class regulator.



The EPA and the independent reviewer are seeking feedback on the effectiveness of the current framework and changes that could be made to better protect community and environmental health and support a circular economy. Key questions to stakeholders are raised at the end of each of the report's four main sections:

- environment and human health protection
- resource recovery and circular economy outcomes
- the administration of the resource recovery framework
- enforcement of the resource recovery framework.

The independent review of the framework will consider all feedback arising from this issues paper. You can give feedback through yoursay.epa.gov.au or by sending a submission to resource.recovery@epa.nsw.gov.au.

The independent review is expected to report in mid-2022.

Context

The NSW Environment Protection Authority (EPA) is the primary environmental regulator for NSW. The EPA partners with business, government and the community to reduce pollution and waste, protect human health and prevent degradation of the environment.

The EPA has responsibility for protecting, restoring and enhancing the quality of the environment in NSW, having regard to the need to maintain ecologically sustainable development under the *Protection of the Environment Administration Act 1991* (POEA Act). This includes regulating a broad range of activities and the environmental or human health risks associated with air emissions, noise, waste, water discharges, native forestry, contaminated land, dangerous goods, hazardous wastes, chemicals, radiation, pesticides and coal seam gas.

A key responsibility of the EPA is to regulate waste and administer the NSW resource recovery framework. The framework provides suppliers and users of waste with a streamlined, low-cost pathway to lawfully recover and re-use resources while protecting human health and the environment.

An independent review

The EPA has commissioned an independent review of the NSW resource recovery framework.

The independent review enacts the commitment in the NSW Government's *Waste and Sustainable Materials Strategy 2041* (the Strategy) to 'review and optimise measures to facilitate feasibility and viability testing of innovative business models, technologies or processes for resource recovery'.

In 2021 the EPA canvassed views about the framework from a diverse range of stakeholders, including peak bodies, councils, environmental consultants and industry representatives.

Review objectives

The review's five objectives are to examine the existing NSW waste and resource recovery framework and provide formal recommendations to the EPA on:

1. how well the framework protects the environment and human health from the inappropriate use of waste
2. how well the framework achieves beneficial resource recovery and facilitates circular economy outcomes, including pathways for innovation
3. the EPA's ability to take appropriate regulatory action to protect the environment and human health under the framework
4. the framework's transparency, clarity, and enforceability
5. options to reform and improve, streamline or strengthen the framework that balance the potential risks and benefits of resource recovery.

The independent review does not cover general waste management strategy measures, such as incentives and mechanisms including the waste levy or the energy from waste framework (including biomaterials).

This issues paper

This issues paper is the review's first major output. It gives stakeholders an opportunity to present an even broader range of views and identify more issues that the independent review could consider. Stakeholder views arising from this paper will inform recommendations in the independent review report.

The independent review is expected to report in mid-2022. Additional work programs under the *Waste and Sustainable Materials Strategy 2041* (including improvements to resource recovery policies, regulatory requirements and procedures) will continue after the review.

The NSW resource recovery framework

In 2019–20 NSW reported 21.9 million tonnes of waste generated. Approximately two-thirds of this reported waste was recovered or recycled within the state. Much of this recycling and recovery was done in the construction and demolition sector (Figure 1).

Figure 1: Summary of waste flows



Source: NSW EPA waste and resource reporting portal (WARRP). The self-reported NSW WARRP facility data is subject to error and limited to reporting resource recovery facilities (RRF) only. There may be double counting if waste travels to another RRF for additional processing. The diagram above excludes recovered resources that do not go to an RRF and are therefore not recorded.

The NSW resource recovery framework

The policy and regulatory instruments, levers and tools that enable and facilitate the recovery of resources in NSW are collectively referred to as the resource recovery framework. The core components of the NSW resource recovery framework include the:

- definition of waste and the accompanying waste offences
- NSW waste levy settings (out of scope for this review)¹
- licensing framework and thresholds
- resource recovery orders and exemptions.

This framework determines:

- what is waste in NSW
- the incentives that encourage its re-use
- the regulatory requirements that apply (or do not apply) when it is re-used in the circular economy.

There are different recovery pathways for different resources. Some are recycled into products from which they originated (e.g. paper to paper), others are re-used in engineering resources (e.g. fill materials) or as soil amendments (e.g. compost) and yet others are re-purposed as inputs into manufacturing or industrial processes (e.g. virgin material substitutes). The parts of the resource recovery framework that apply to each recovery pathway may be different depending on the type and amount of waste, the stages of reprocessing required and the end use of the waste.

The framework is supported by programs funded by the NSW Government under the *Waste Less, Recycle More* initiative and the *Waste and Sustainable Materials Strategy 2041* (the Strategy).

Waste and Sustainable Materials Strategy 2041

In June 2021 the NSW Government released the Strategy, outlining a roadmap for the transition to a circular economy (Figure 2) over the next 20 years. A circular economy is an economic system aimed at minimising waste and promoting the continual re-use of resources. A circular economy is based on:

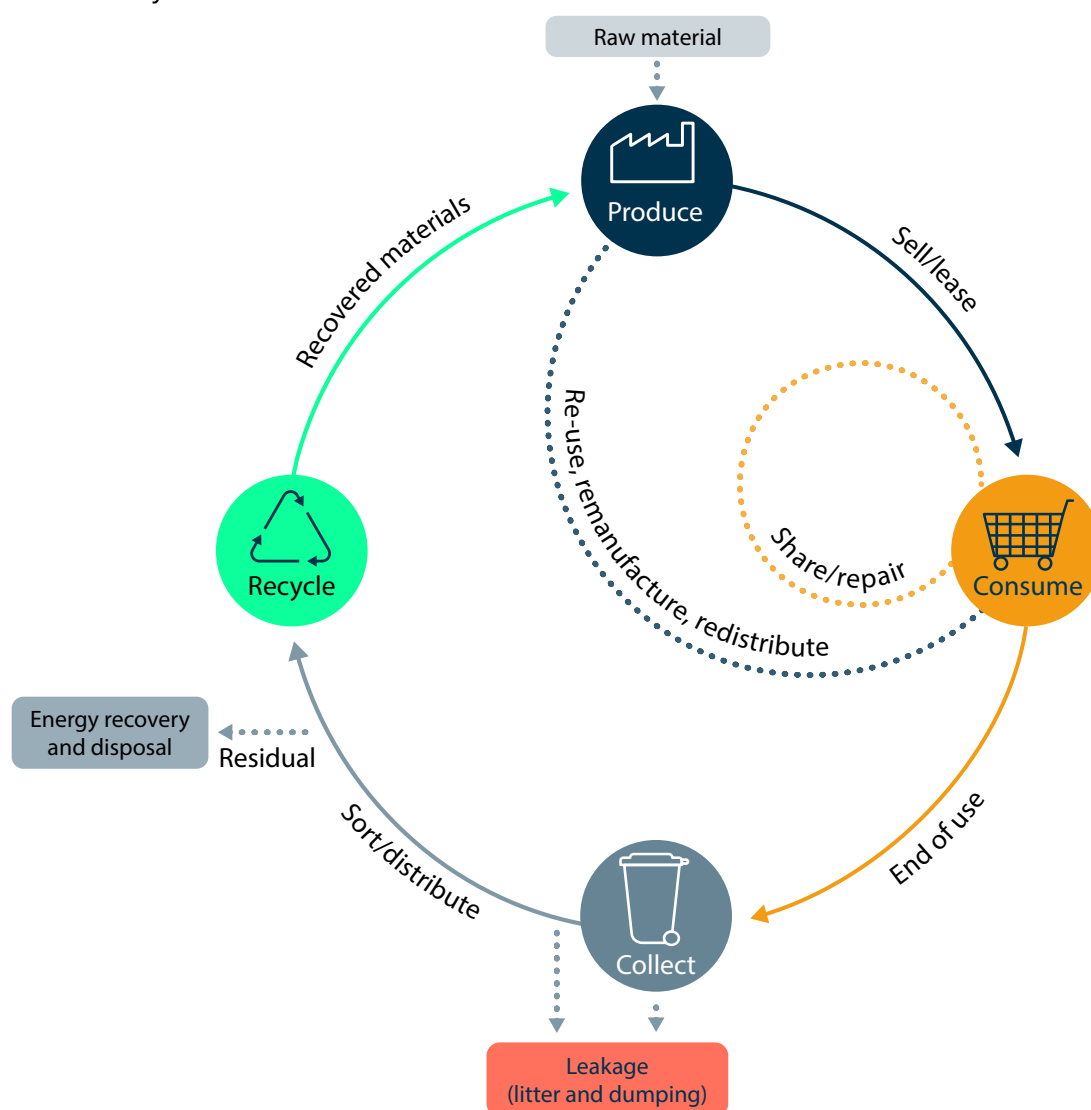
- designing out waste and pollution
- keeping products and materials in use
- regenerating natural systems.



¹ The waste levy and its settings are not included in the scope of this review. The Strategy commits to a 5-yearly review of the waste levy and this RRF review does not seek to change or duplicate that process.

The NSW resource recovery framework

Figure 2: Circular economy



The NSW Government is investing \$356 million in programs and initiatives to tackle plastic waste, support infrastructure investment, reduce carbon emissions through more sustainable material use, and protect from waste pollution.

The Strategy adopts the targets endorsed by the NSW Government under the *National Waste Policy Action Plan 2019*. Most importantly, this includes an 80% recovery rate of all waste streams by 2030. In addition to adopting these targets, the NSW Government has committed to:

- introduce new targets to:
 - reduce litter items by 60% by 2030
 - reduce plastic litter items by 30% by 2025
- set a goal to triple the plastics recycling rate by 2030.

The resource recovery framework is a key lever for achieving the increased recovery targets outlined in the Strategy.

The NSW resource recovery framework

Waste regulatory requirements in NSW

In NSW waste and resource recovery is primarily regulated by the:

- *Protection of the Environment Operations Act 1997* (POEO Act)
- *Waste Avoidance and Resource Recovery Act 2001* (WARR Act)
- *Protection of the Environment Operations (Waste) Regulation 2014* (Waste Regulation).

	Protection of the Environment Operations Act 1997	<ul style="list-style-type: none">▶ defines waste▶ sets licensing thresholds for activities▶ provides powers for regulators▶ specifies offences and maximum court penalties
	Waste Avoidance and Resource Recovery Act 2001	<ul style="list-style-type: none">▶ sets out the waste hierarchy▶ requires development of a statewide waste strategy
	Protection of the Environment Operations (Waste) Regulation 2014	<ul style="list-style-type: none">▶ details waste management requirements▶ includes details for the waste definition▶ empowers the EPA to grant resource recovery orders and exemptions▶ specifies offences and maximum court penalties
	Resource recovery orders and exemptions	<ul style="list-style-type: none">▶ may remove waste levy payment▶ remove some licensing requirements▶ remove some regulatory requirements

Other legislation and regulatory requirements still apply, e.g. for planning approval:

- *Environmental Planning and Assessment Act 1979*
- *Environmental Planning and Assessment Regulation 2000*.

The POEO Act defines ‘waste’, establishes offences for unlawful transport, disposal and use of waste, requires certain activities to be licensed if they meet thresholds (such as disposing of waste by application to land or thermal treatment, recovering energy from waste, processing waste by non-thermal treatment and storing waste), requires occupiers of waste facilities to pay the waste levy and provides for powers of investigation and the issue of environment protection notices.

The Regulation sets out further requirements and details for waste management, storage, disposal, transport and use, and allows the EPA to grant an exemption from certain waste requirements.

The waste regulatory framework established under the POEO Act helps to protect, enhance and restore the environment and human health; facilitates a sustainable waste and resource recovery sector; reduces illegal and distortionary activities in the waste sector; and provides information and data to enable the EPA to better monitor and reduce environmental and human health risks.

The NSW resource recovery framework



What is waste in NSW?

The Protection of the Environment Operations Act 1997 (POEO Act) defines waste as:

- (a) any substance (whether solid, liquid or gaseous) that is discharged, emitted or deposited in the environment in such volume, constituency or manner as to cause an alteration in the environment, or
- (b) any discarded, rejected, unwanted, surplus or abandoned substance, or
- (c) any otherwise discarded, rejected, unwanted, surplus or abandoned substance intended for sale or for recycling, processing, recovery or purification by a separate operation from that which produced the substance, or
- (d) any processed, recycled, re-used or recovered substance produced wholly or partly from waste that is applied to land, or used as fuel, but only in the circumstances prescribed by the regulations, or
- (e) any substance prescribed by the regulations to be waste.

A substance is not precluded from being waste for the purposes of this Act merely because it is or may be processed, recycled, re-used or recovered.

As the definition of waste in the POEO Act is inclusive, the ordinary meaning of waste also applies. Under the definition, material that was waste or was derived from waste applied to land (e.g. as a fill material, engineering material, or compost) or used as a fuel, remains waste. The provisions apply to material that meets any part of the definition unless an exemption applies.

Resource recovery orders and exemptions

Orders and exemptions are a central component of the resource recovery framework.

Orders and exemptions facilitate the processing and re-use of certain waste and waste-derived materials, subject to compliance with conditions and specifications designed to protect human health and the environment. They provide flexibility around legislative controls that would otherwise apply to wastes when applied to land, used as a fuel or in a process of thermal treatment.

Part 9 of the Waste Regulation enables the EPA to exempt a person from certain legislative requirements.

Orders

A resource recovery order contains conditions and specifications that the supplier (generator or processor) of the waste must meet to **supply** a resource recovery waste.

Exemptions

A resource recovery exemption contains conditions that waste users must meet to **use** a resource recovery waste.

A person who wants to apply waste to land, or use waste as a fuel or in connection with a process of thermal treatment, has to fulfil certain legislative requirements. However, under Part 9 of the Waste Regulation the EPA can exempt a person from certain requirements, such as:

- holding an environment protection licence
- paying the waste levy
- keeping certain records.

The NSW resource recovery framework

Who can use orders and exemptions?

Orders and exemptions that are publicly available are referred to as **general**. They can be used by anyone to supply and use resource recovery waste if they comply with the conditions of the order and exemption.

If a general order and exemption is not available, a person can apply to the EPA for one **specific** to their needs.

There are currently 39 general orders and exemptions and about 70 specific orders and exemptions in force in NSW.

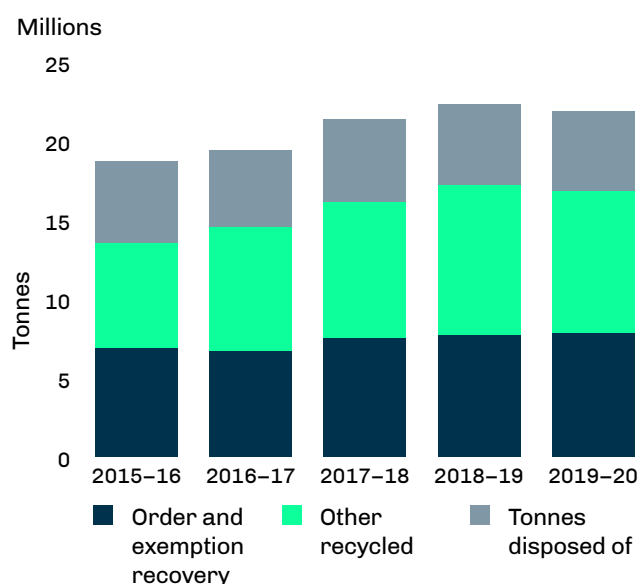
Types of resources recovered

Bulk construction, engineering or landscaping materials are the resources most commonly recovered. Recovered aggregate makes up the largest volume of recovered material by far, followed by excavated natural material (ENM), compost, reclaimed asphalt, recovered fines and pasteurised garden organics.

Regional and non-levied facilities primarily process compost, recovered aggregate, organics and mulch. Regional facilities handle far less material than metropolitan ones.

Appendix A gives a full summary of reported waste claimed under a resource recovery order over the last five years.

Figure 3: Waste recovered in NSW under resource recovery orders and exemptions, recycled and disposed of



Source: NSW EPA waste and resource reporting portal (WARRP). This self-reported facility data is subject to error and limited to reporting resource recovery facilities (RRF) only. There may be double counting if waste travels to another RRF for additional processing. The data excludes potentially large volumes of recovered material that do not go to an RRF and are therefore not recorded.



Protecting the environment and human health

The legislative and regulatory objects of the framework

Stakeholders have raised the issue that environmental protection objectives under the POEO Act are given a greater weight than resource recovery and economic outcomes.

The principal environmental protection legislation for NSW is the POEO Act. The *Waste Avoidance and Resource Recovery Act 2001* (WARR Act) also applies to the framework.

The POEO Act and the WARR Act are aligned. Both contain objectives related to protecting the environment and promoting circular economy outcomes (through increased resource recovery). **Appendix C** gives the relevant objectives of the two Acts.

Risk and the re-use of waste

Certain wastes are hazardous or potentially harmful to human health or the environment. The risk profile of a waste material relates to its chemical, physical and biological characteristics, but also to how it is used and under what conditions. Wastes that are inconsistent in composition, mixed or obtained from a variety of sources are more difficult to characterise and may present greater risk.

One of the key principles of a circular economy is to keep products in use for longer. Robust regulatory and policy frameworks are required to appropriately manage the risks posed by wastes that contain contaminants of concern or can impact the environment or human health. Managing these risks provides confidence and certainty to consumers of recovered resources.

Example pathways for the re-use of wastes back into the productive economy include:

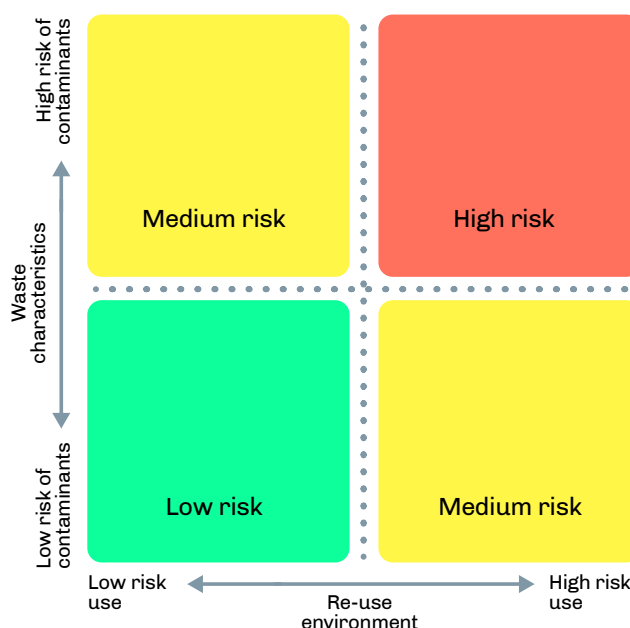
- repairing broken equipment or substances (e.g. sewing machines at a repair café)
- re-sale of unwanted goods (e.g. selling household goods online)

- recycling material in a manufacturing process (e.g. using waste glass in bottles)
- inputs into an industrial process (e.g. raw material substitutes)
- soil amendments (e.g. composts)
- infrastructure resources (e.g. recovered aggregates for roads)
- use as fuel (e.g. waste-derived fuels substituting for coal).

The risks posed by these activities vary significantly and depend on both the characteristics of the waste material and the manner of its re-use.

Wastes re-used without proper controls can have long-term impacts on the environment, human health and consumer confidence in recovered resources. Wastes that are applied to land, used as fuel (e.g. energy from waste) or incorporated into manufacturing processes (e.g. into household bricks or concrete) can have a higher risk profile than landfill and require closer regulatory scrutiny.

Figure 4: Risk as a function of waste characteristics and re-use environment



Protecting the environment and human health



Case Study: Asbestos

Until the mid-1980s asbestos was viewed as a cheap, versatile insulating material and was widely used in Australian homes and buildings. But links were discovered between asbestos exposure and life-threatening illness. Removal programs began in the late 1980s and in 2003 Australia banned all asbestos use. The human health risk associated with asbestos can be managed with correct handling, storage, transport and disposal. However, environment protection agencies and local authorities across Australia are still challenged by the illegal dumping and improper handling and disposal of asbestos.

Section 144AAB of the POEO Act prohibits the re-use or recycling of asbestos waste. The NSW Government has also introduced reforms to the construction and demolition waste recycling sector, including mandated environment protection licence conditions requiring occupiers of construction and demolition waste facilities to comply with the standards for managing construction waste in NSW. The standards aim to increase the quality of recycled construction waste and minimise the risk that asbestos could enter facilities and contaminate recovered resources. The NSW Asbestos Waste Strategy 2019–21 contains further initiatives to improve asbestos waste management in NSW.

Certain wastes should not be re-used. This is the case where applying the waste to land could lead to the accumulation of potentially harmful persistent chemicals, salts or other corrosive components that may adversely affect built structures or contaminate soils and water.

Resource recovery through orders and exemptions

Stakeholders aspire for a pull-based rather than push-based market for recovered resources, where waste is seen as a valuable commodity rather than disposed of at the lowest cost.

The resource recovery framework is structured so that the re-use of all waste for land application, as fuel, or in connection with a thermal treatment process is managed through a single entry point, namely resource recovery orders and exemptions. In NSW, the EPA assess the risk posed by recovering each waste and sets requirements proportionate to the risk. Low-risk wastes usually have fewer requirements; higher-risk wastes face more rigorous assessment and risk-mitigation requirements. This flexible system allows amendments to be made to exemptions or orders as new information becomes available.

The risks posed by re-using waste can be mitigated further by a mature waste industry using best practice to supply developed markets that demand tightly specified inputs and products.

Framework adaptability and cumulative impacts

Stakeholders have identified opportunities for the resource recovery framework to adopt a risk-based approach when setting chemical and attribute regulatory limits in orders.

The resource recovery framework must be adaptable so that it can manage impacts from risks that emerge over time. Once wastes reach the end of their useful life, they need to be handled, stored, treated, and disposed of according to appropriate standards, to minimise risks to human health and protect the environment. The resource recovery framework needs to include measures to manage the risks associated with the long-term impacts of legacy substances.

Protecting the environment and human health

The EPA does not generally support the re-use of irregular, one-off batches of wastes, or of wastes that are blended to reduce the concentration of harmful contaminants. Waste streams need to be of consistent quality to ensure potential contaminants and associated risks will not vary considerably over time. Where it is proposed that waste be blended or mixed with another material, the EPA requires details of how the blended waste provides additional benefits.

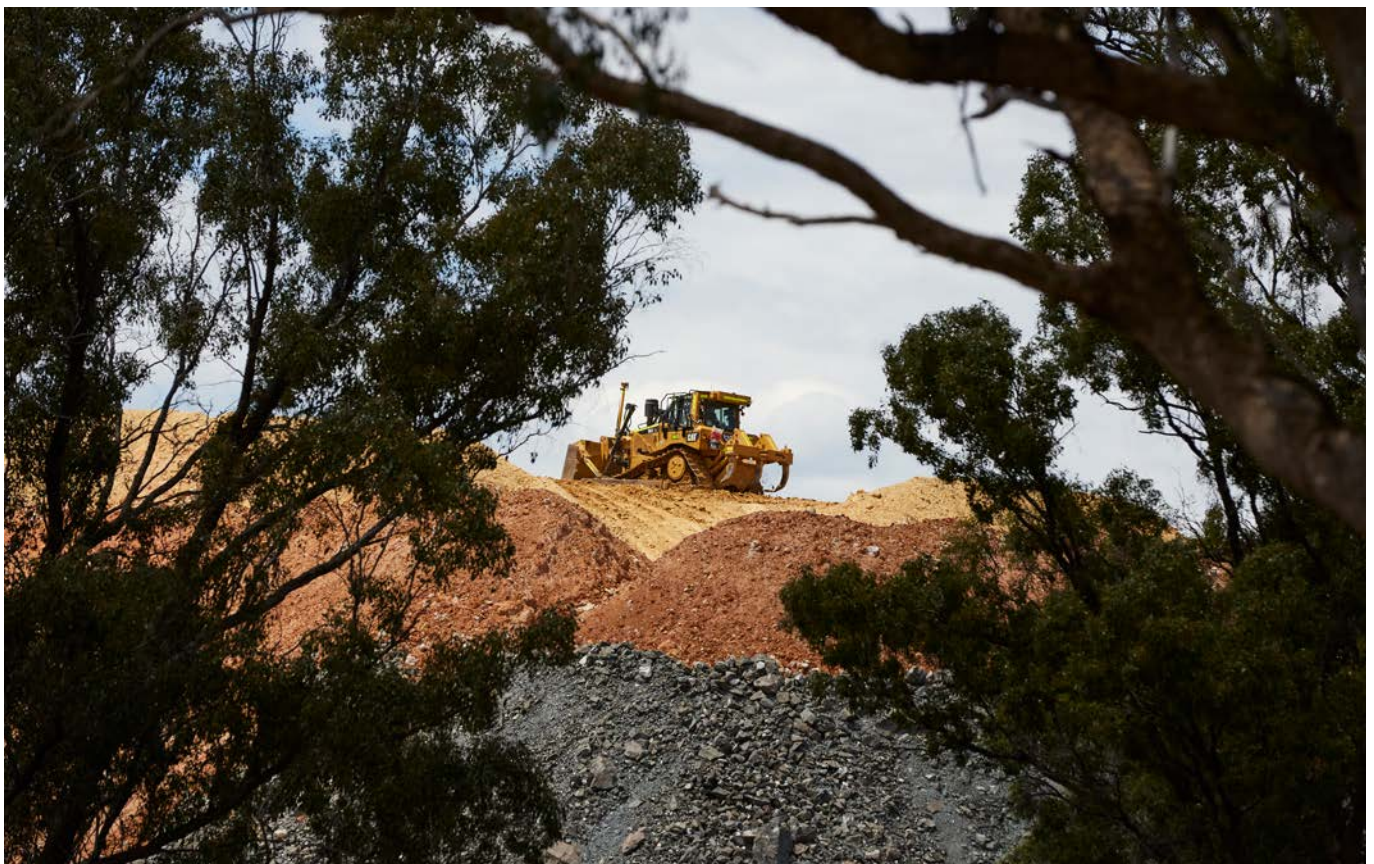
The EPA collects limited information on cumulative load volumes for general, and some specific, orders and exemptions. Several recovered wastes can be applied to a parcel of land under the framework without a cumulative assessment of potential impacts. The EPA controls for this risk by enforcing conservatively

low contaminant requirements while noting that cumulative applications of different products occurring under use of overlapping orders and exemptions can increase the risk of harm.

The pathway of specific orders and exemptions allows proponents to apply novel techniques (with guidance from EPA staff).

Questions

1. What other risk-based approaches, sustainability principles or criteria could be used to assess and manage the environmental and human health risks of resource recovery?
2. How can the framework be structured to deal with new and emerging waste streams and mitigate the risk of cumulative impacts from legacy and emerging contaminants?



Resource recovery and circular economy outcomes

Figure 5: Circular recovery of waste glass in NSW



The circular economy

The circular economy aims to keep products, equipment and infrastructure in use for longer. In a circular economy, waste and energy become inputs for other processes, either as a component or recovered resource for an industrial process, or as regenerative resources for nature. Keeping recovered resources in use for longer minimises our need to use natural resources, lowers landfill demand and helps to reduce greenhouse gas emissions. This transition requires confidence and certainty that policies and regulatory frameworks facilitate positive and sustainable circular economy outcomes for the community, industry and environment.

Additional re-use opportunities

The orders and exemptions gateway currently applies to recovered resources being applied to land, used as a fuel or used in connection with a thermal treatment process. Land application is appropriate in many circumstances (e.g. by using compost); however, the regulatory mechanism may cause some resources to be applied to land rather than being directed to higher-order circular economy activities (such as remanufacturing or as industrial inputs) or designed out of production. Regulatory mechanisms must provide incentives to move towards a circular economy and facilitate that movement – for instance, by targeting additional waste types and streams.

Circularity and the regulatory framework

Stakeholders have identified several barriers to circularity within the current regulatory framework.

The definition of waste

Waste is defined in the POEO Act to provide certainty to regulators, industry and the community. Waste is defined broadly, and a substance is not excluded from being waste because it is or may be processed, recycled, re-used or recovered. The broad definition of waste enables regulators to retain oversight and capacity to regulate the uses of wastes and their potential harms to the environment and human health throughout their life cycle. This is particularly important due to the nature of waste usually being an unwanted, discarded, rejected, surplus or abandoned substance. This can lead to entities within the waste supply chain engaging in practices to avoid the costs associated with lawful waste management and disposal.

Resource recovery and circular economy outcomes



Case Study: Roads

The NSW resource recovery framework facilitates the use of recovered material in road construction under general orders and exemptions. Reclaimed asphalt pavement was the fourth-highest reported recovered material at RRFs in 2019–20 at 665,000 tonnes. Other materials commonly recovered for road construction are recovered aggregate, excavated natural material (ENM), recovered glass sand, slag, coal ash and tyres. These bulk materials are used as road base or applied to land with asphalt and bitumen in road construction.

The range of waste materials proposed for use in roads is increasing. The EPA has received applications for specific exemptions and expressions of interest for the use of wastes such as soft plastics, toner cartridges, street sweepings, pollutant trap waste, paint and coffee cups in roads. While incorporating a range of waste into roads offers a short-term solution for a wide range of materials, it may not be the best, most beneficial re-use of every material type. It may also stifle other, higher uses or solutions for those wastes in the circular economy.

An example is the use of takeaway coffee cups in roads. This may hinder a greater use of reusable coffee cups, remanufacturing takeaway cups into other plastic products, or completely redesigning takeaway coffee cups to make them immediately recyclable. Other state governments have begun consultations on banning single-use coffee cups to encourage the introduction of 'circular' products.

It is also important to consider the legacy of road inputs, given the high recovery rate of reclaimed asphalt pavement and the material's continuing re-use.

While some recovered, processed, or recycled substances meet the definition of waste, many resources are re-used or remanufactured in the circular economy without triggering waste-specific regulatory requirements. This is usually because they are at volumes that do not trigger the need to hold an environment protection licence or other waste regulatory requirements. Examples of such resources would be unwanted clothes given to a charity shop or e-waste taken to a local repair café.

Stakeholders have identified opportunities for the re-use of some waste in the circular economy if there is a pathway to remove its definition as waste.

Some of the identified barriers are market-related. In some instances, stakeholders have advised that continuing a material's status as a waste (regardless of whether it has been made exempt from some regulatory requirements) impairs the ability to market and sell their material and compete against other

commodities. **Appendix B** collates the legislated definition of waste for several Australian and international jurisdictions.

'End of waste' provisions

Some stakeholders have called for 'end of waste' provisions to be implemented in NSW.

'End of waste' allows for a waste to cease being classified as a waste and become regulated as a resource instead. 'End of waste' frameworks aim to avoid imposing regulatory burden and legal risks on actions and sectors that were not the intended target of the waste powers, and which do not pose a genuine risk of environmental harm or waste crime.

In some jurisdictions, a broad definition of waste can be used without an explicit 'end of waste' framework, because regulatory duties related to waste (such as licensing, reporting or specific storage and handling controls) are defined using clear and limited scopes. Consequently, waste

Resource recovery and circular economy outcomes

obligations only arise in specific and identifiable contexts. In other jurisdictions, the regulator specifically lists specifications and requirements that must be met before a material can be deemed a non-waste.

Some stakeholders highlight that shifting to an 'end of waste' framework could provide more certainty in their products for consumers, thus encouraging circular outcomes. Any changes to the legislated waste definition would need to be carefully considered to ensure there are not any unintended consequences that could pose unacceptable risks to the environment, human health or legitimate industry participants.



Case Study: Circular re-use of timber waste

The EPA has been working with a manufacturer of particleboard and medium density fibreboard (MDF) to increase the circularity of their processes.

Traditionally particleboard and MDF have been manufactured using plantation pine. Industry sought approval to use a range of waste timber products as raw material substitutes in its manufacturing process.

To facilitate this re-use opportunity, the EPA has issued a resource recovery exemption that allows industry to use the materials as an 'alternative raw material' in its processes without triggering any waste licensing, levy or reporting requirements.

The inclusion of these wood residues as a raw material reduces the energy needs and costs of making particleboard and reduces the amount of materials that would otherwise be disposed of to landfill.

Operational and licensing issues

Stakeholders have identified that waste storage requirements for resources covered by an order and exemption inhibit their ability to effectively market and sell their product.

Exempted waste materials are included in waste storage limits that are applied to licensed facilities prior to the waste material being used. These limits are in place to avoid stockpiling that create hazards (such as leachate run-off and chemical fires) and to discourage distortionary market activities.

As their resource recovery increases, some manufacturing or remanufacturing facilities may be required to hold an environment protection licence to operate as a waste facility. All substances received by a licensed waste facility are prescribed to be waste if certain criteria are met (waste definition paragraph (e) and clause 6(2) of the Waste Regulation). This can extend regulatory burdens such as the need for weighbridges, and incur waste levy liabilities.

Enabling innovation

Stakeholders have commented that the current framework restricts innovation because it is too inflexible, limiting investment opportunities in NSW.

Transitioning to a circular economy requires innovation in process and product design, and in the development of new business models across a variety of sectors. The waste stream itself is also constantly evolving as new products and technologies are developed. For example, the International Energy Agency has forecast that Australia will have one of the world's largest streams of solar panel waste. A scoping study conducted by University of Technology Sydney Institute of Sustainable Futures has forecast that by 2035 NSW could be generating 34,000–63,000 tonnes of waste solar panels a year.²

² UTS Institute of Sustainable Futures & Equilibrium Consulting (2020), *scoping study for photovoltaic panel and battery system reuse and recycling fund*

Resource recovery and circular economy outcomes



Case Study: Victorian pilot project licence

Pilot project licences are available in Victoria to support the research, development or demonstration of an innovative technology or technique. This licence belongs in the high-risk permissions tier and enables a person to legally engage in a prescribed development, operating or permit activity, providing the activity is:

- for research, development or demonstration of a technology or technique
- of limited scale, dimension and duration
- of an acceptable level of risk to human health and the environment.

One of the key issues identified is that there is no formal avenue to enable trials of recovered waste or processes that could recover waste as a resource.

The EPA has granted specific, time-limited resource recovery exemptions that allow a waste material to be applied to land or used as fuel as part of a pilot program. However, there is no formal innovation pathway for resource recovery applications. The absence of existing technologies makes it challenging for all parties to manage the risks of new products and processes.

The *Waste and Sustainable Materials Strategy 2041* also identified this issue:

As part of this strategy, we will review and optimise legislation or other measures to facilitate feasibility and viability testing of innovative business models, technologies, or processes for resource recovery in NSW. This may include actions to create new time-limited licences for different trial phases, enabling risks to be controlled by using co-designed standard parameters for each phase.

Other jurisdictions have equivalent environment protection licensing or permitting categories that enable small-scale trials and pilots to be undertaken. Similar pathways for NSW that enable asset and process innovations

to be trialled and tested would need to be accompanied by controls proportionate to the level of risk and impact posed.

Delivering certainty

Stakeholders have consistently raised the need for the framework to provide certainty and a level playing field for industry and confidence for consumers.

This stems from the EPA's power to revoke resource recovery orders and exemptions. In stakeholders' experience, the process of revocation is not transparent and may undermine confidence for investment, jeopardise jobs, and reduce recovery rates in resource recovery industries.

The EPA may revoke orders and exemptions to protect the environment and human health. This includes when new information, data or analysis becomes available that changes the understanding of the risk posed by a material and its approved use. The power to revoke orders and exemptions allows the EPA to act quickly to reduce the potential for harm.

Opportunities to review or appeal against a resource recovery revocation

The primary opportunities proposed by stakeholders are:

- requirements for consultation on the proposed revocation of a resource recovery order or exemption, in addition to existing administrative law requirements for procedural fairness
- new processes for merits review or an appeal against revocation decisions.

Queensland has established Technical Advisory Panels to provide additional perspectives and advice to decision-makers in relation to the approval, refusal or revocation of the equivalent of orders and exemptions under its regulatory framework. Queensland also has a legislative process that permits an internal review of decisions.

Resource recovery and circular economy outcomes



Case Study:

Mixed Waste Organic Outputs (MWOO)

MWOO was processed waste from NSW red-lid general waste bins that the EPA allowed to be applied to land as a soil amendment under strict controls.

In October 2018 the EPA revoked the general and specific resource recovery orders and resource recovery exemptions for the application of MWOO to land. The decision was underpinned by rigorous, independent scientific research on the specific risks associated with chemical and physical contaminants of applying MWOO to land. Based on the findings, the EPA undertook targeted consultation with the affected alternative waste treatment (AWT) industry prior to making its decision. Other stakeholders have expressed concern that the process of revoking the MWOO orders and exemptions was not transparent, and undermined confidence for investment in resource recovery industries in NSW.

The EPA has since implemented transition packages for the AWT industry and its contracted councils to support a transition into alternative products and end markets for household general waste. Support included a \$24-million package to improve separation of kerbside food and garden waste and encourage the better use of waste. More than 40 NSW councils are now providing kerbside collections of source-separated FOGO (food organics and garden organics) for households, or food-only collections for multi-unit dwellings.

Encouraging new investment

Stakeholder feedback suggests uncertainty has negatively impacted investment decisions and is limiting the growth of new investment for beneficial resource recovery outcomes.

Flexibility in a regulatory framework can be used to deliver good outcomes for the regulator and the regulated community. However, flexibility within a system can sometimes impact upon certainty. For example, the resource recovery mechanism allows for both general and specific exemptions. Specific exemptions are often granted when a material fails a criterion of a general exemption (e.g. minor exceedances of concentration limits). The EPA can assess the risks of this exceedance and, where appropriate, approve the use of the material that would have otherwise been disposed of.

Stakeholders have advised that some potential consumers of recovered resources have a strong preference for general orders and exemptions. The provision of more symmetrical information to the market may help to better

level the playing field. This could extend to publishing all specific orders and exemptions that have been approved, to provide certainty and transparency.

Questions

3. What options exist to facilitate better circular economy outcomes and improve certainty for innovation, business, investment and participants within the resource recovery framework?
4. What specific benefits would an 'end of waste' provision deliver that aren't already provided by the current framework?
5. Are there resources being recovered or re-used outside the current exemption framework that would benefit from greater regulatory clarity?
6. Does the current waste definition facilitate circular economy outcomes while ensuring the protection of the environment and human health? If not, what changes do you suggest?

The administration of the resource recovery framework

Understanding the framework

Some stakeholders have said that the resource recovery framework is difficult to understand.

Resource recovery orders and exemptions are legal documents that need to contain enforceable requirements and legal information. They also contain technical information on sampling and testing for contaminant levels to help reduce the risk of harm to human health and the environment arising from the use of the waste.

This combination of legal and technical information means that orders and exemptions can be difficult for a layperson to comprehend. A poor understanding of legislative requirements by the regulated community is likely to result in poor compliance and environmental outcomes. A challenge remains for the EPA to maintain a robust regulatory framework, while also ensuring stakeholders can understand their obligations.

Applying for an order or exemption

Stakeholders have raised issues relating to the application and assessment process for specific exemptions or orders, including time frames and transparency.

The EPA issues orders and exemptions either at its own initiative or in response to a submission from a proponent (usually industry or local government) engaged in resource recovery.

The EPA can issue an order and exemption in two ways, either:

- to non-specified persons, by notice published in the *NSW Government Gazette* (also known as a general order or exemption); or
- to specified persons, by written notice given to those persons (also known as a specific order or exemption) or by notice published in the *NSW Government Gazette*.

The EPA may receive applications for specific orders and exemptions for the following reasons:

- the waste material the applicant proposes to re-use does not meet the requirements of a publicly available general order or exemption but is still suitable for re-use (for example, there are minor exceedances of chemical concentration limits);
- there is no general order or exemption that exists for the waste material;
- the applicant wants to protect proprietary information for a waste-derived output; or
- the EPA is permitting a proponent to undertake a time-limited trial to demonstrate the bona fides of a waste-derived material.

Time frames for decisions

Stakeholders applying for orders and exemptions have identified that the time frames taken to submit and assess an application and develop a draft order and exemption are too long and may significantly impact on a site's operations and decisions.

There are no statutory time frames for processing of applications for specific orders and exemptions. The EPA aims to complete a preliminary assessment within four weeks of receipt of an application for an order or exemption, including the development of a draft in simple cases. When assessing an application, the EPA undertakes a rigorous technical analysis to determine whether the waste is suitable for re-use under the order and exemption framework. As part of this process, the EPA may need to consult with different areas within the agency, local government, other government agencies and external experts to make an informed decision on an application. Applicants may also be required to undertake further studies and trials to support their proposal.

Often for simple applications the assessment period for a specific exemption becomes prolonged because proponents do not provide adequate or appropriate information in line with the requirements of the EPA's guidelines on resource recovery orders and exemptions.

The administration of the resource recovery framework

The guidelines require applicants to provide specified scientific and technical evidence as part of their applications. Frequently, applications do not provide any robust supporting data or do not address the assessment criteria set out in the guidelines. This is particularly the case for large infrastructure projects, where engagement with the resource recovery framework is often not considered until there is a need to move and re-use resources from the site within a short time frame. This may result in poorer environmental and resource outcomes, such as the waste needing to be disposed of rather than re-used.

Regardless of the quality of the application submitted, the **time to assess an application** and the **lack of certainty** in the process have been raised as points of frustration for industry.

Transparency around decisions

The application and approval processes have been criticised by some industry members for a lack of transparency.

The EPA processes about 60 applications for specific orders and exemptions per year. This includes new applications and applications to renew an existing order and exemption. Approximately 15% to 20% of applications are reviewed and declined each year. Applications may be declined because of poor application quality, failure to provide required information, failure to meet relevant environmental and human health standards, and other reasons.

Where the EPA proposes to decline an application for a specific order or exemption, the applicant is provided with a formal letter of intent outlining the justification for the decision. The proponent can respond to the issues raised and supply supporting information where applicable.

Some applicants have noted that there was a lack of detail as to why their application was rejected and have commented that the framework does not provide for a specific review or appeal mechanism for rejected applications. Applicants may seek judicial review by the Land and Environment Court of an EPA decision to refuse to grant a resource recovery order and exemption. Stakeholders have

emphasised the importance of having **defined processes, guidance** and **clearly communicated terms**, based on scientific evidence, for the review or revocation of orders and exemptions.

Confidentiality of specific orders and exemptions

Stakeholders have asked if the EPA could publish specific orders and exemptions.

The EPA currently treats specific orders and exemptions as confidential because they may contain commercial-in-confidence information.

Keeping an order and exemption confidential could reduce the volume or scale of resource recovery or product development and uptake. As is common with intellectual property rights, there is a difficult trade-off between encouraging new product development by protecting innovators, and benefits to the broader market and consumers by encouraging the transparent uptake of specific orders and exemptions.

Several proponents have suggested they are happy to share the details of their specific order and exemption. Others have suggested that sharing the name or details of the exemption would provide more confidence for other parties to seek a similar specific exemption for their own products.

The costs of operating under the framework

Some stakeholders have said it is costly to comply with resource recovery orders or exemptions.

Sampling costs

While compliance with an order or exemption can impose an ongoing cost, the cost of sampling is significantly lower than the cost of disposing of the waste to landfill. The testing and sampling requirements set out within the orders and exemptions are also based on the level of risk posed by a waste-derived material proposed for re-use. Samples are tested for a range

The administration of the resource recovery framework

of chemicals such as mercury, lead and total organic carbon, and for physical contaminants. These measures are part of a continuous, risk-based process to ensure recovered resources do not contain contaminants. For example, the *mulch order 2016* does not require any specific sampling and testing to be carried out by a processor who supplies mulch because it is perceived as lower risk than other orders. However, it does include safeguards that require the processor to ensure products do not contain contaminants (including glass or asbestos) and require producers to comply with their risk management protocols.

EPA costs to review applications

The EPA does not charge applicants fees for specific order and exemption applications or for providing guidance on the framework. Some stakeholders raised the potential for 'urgent' fees so that their application could be prioritised and reviewed within a guaranteed time frame.

Information systems monitoring

Better information systems and strengths-based data collection could help to address issues raised by stakeholders.

At present, data on resource recovery orders and exemptions is currently collected only where the exempted material is produced at a licensed RRF. The quantity of waste leaving the facility that has been produced under an order is recorded. The EPA does not release all internal data due to confidentiality and commercial sensitivity. Expanding data collection to all users of a resource recovery order may help to strengthen risk-based approvals, and support industry with data to help create new innovative products, ensure robust waste streams or service new markets.

In Queensland, a producer can supply waste under the equivalent of a resource recovery order provided they have first registered with the Queensland Department of Environment and Science. Queensland scheme participants privately provide details of their entity name, production process, waste use and quantity to register as a waste resource producer.

Increased information systems monitoring may impose a small burden on producers to register their use of an order. This burden could be minimised by creating easy-to-use online forms with minimal requirements. An online system might let the EPA relax the requirements on participating parties to keep paperwork documenting their order and exemption requirements. Similarly, registration may help the EPA to quickly identify badly performing operators, strengthening the credibility of responsible participants and reducing their burden under the EPA's risk-based regulatory approach.

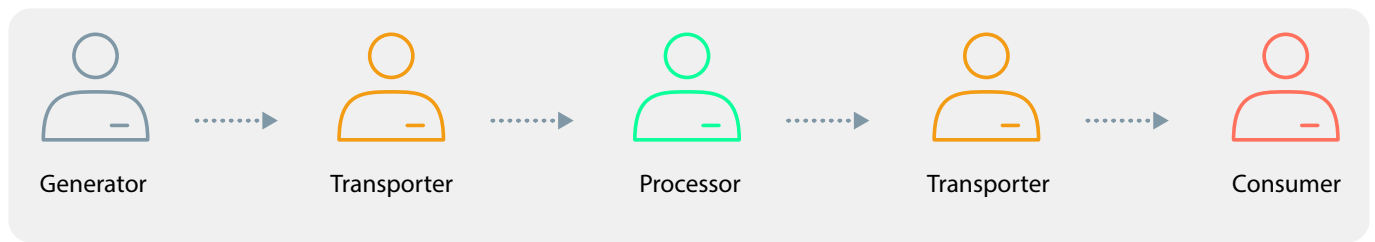
Questions

7. How could the overall transparency and clarity of the resource recovery framework be improved?
8. What tools, systems, data or methods could be used by the EPA to better understand the waste being utilised under the framework?
9. What processes could the EPA put in place when determining whether existing orders and exemptions should be amended or revoked due to environmental or human health risks?



Enforcement of the resource recovery framework

Figure 6: Waste supply chain participants



The waste supply chain

Stakeholders have expressed concern that compliance action is more likely to be borne by the consumers of recovered waste than by others in the supply chain.

It is important that all parties in the supply chain are accountable for the lawful and safe re-use of waste-derived materials. In Victoria, a general environmental duty applies to all businesses that are in control or management of waste as it moves through the supply chain, with specific waste duties (e.g. permissions, determinations and declarations of use) applying that depend on the scale and type of waste. Stakeholders have supported pushing more accountability back up the supply chain (to generators and processors) to improve compliance and circular economy outcomes.

In Victoria, a self-assessed 'declaration of use' tool is used by the producer and receiver to meet their environmental duties. This includes the description of waste, its legitimate uses, risks to human health and the environment, and the suitability of the receival site. However, the tool is not used for resources that fall under Victoria's equivalent of NSW's orders and exemptions.

Many resource recovery orders in NSW do require waste processors to provide a certificate of compliance to consumers. However, wholesalers may purchase recovered wastes and further break them down or even blend them with other products for retail sale. In such cases the consumer often does not receive a compliance certificate.

A common legal requirement across participants in a resource recovery supply chain in both NSW and Victoria is ensuring that the waste is taken to a place that can lawfully receive it. The responsibilities and challenges for entities in the waste supply chain are set out below and in Figure 6.

Waste generator

Waste generators are diverse. Even within the same sector (e.g. building and construction) the scale of operations, types and volume of waste and degree of regulatory oversight can vary significantly (e.g. from a household DIY renovator to a large infrastructure project). Generators are the party in the waste supply chain who have the most control over waste quality. How waste is collected and stored affects how it can be repaired, recycled or re-used. There are few requirements in NSW that prescribe how waste is to be collected or stored by generators to improve its recovery. However, under the *Waste and Sustainable Materials Strategy 2041*, separate collection of food waste from businesses and households will be mandated by 2025.

Generators supplying waste to a processor are sometimes subject to conditions under a resource recovery order or licence conditions. Other exemptions and orders contain no responsibilities for the generators of a waste, particularly where the waste is generated from numerous sources (e.g. green waste collected from householders for compost, or building and demolition waste collected from building sites). As with other entities in the waste supply chain, generators are required to ensure their waste is sent to a place with lawful authority to receive it.

Enforcement of the resource recovery framework

Waste processor

Waste processors must ensure that they are operating lawfully by having appropriate planning approvals such as development consent and an environment protection licence where required. Waste processors must also ensure that they can lawfully receive waste types. For scheduled facilities these wastes are listed on their licence.

Processors face risks associated with receiving contaminated inputs that can affect the quality of resources they produce (e.g. plastics mixed with glass, or asbestos in construction waste). Some of these risks can be managed through gate-price discrimination, contractual arrangements and strict quality assurance and control measures. These risks can be difficult to manage when there are many diverse generators providing waste to a facility (e.g. in the construction and demolition sector). Regulatory tools such as the *Standards for managing construction waste in NSW* provide minimum requirements to ensure waste facilities handling construction waste implement appropriate processes and procedures to minimise risk.

Waste processors must also ensure that the material they produce under a resource recovery order is fully compliant with all the conditions of that order, including any requirements to sample, test, keep records and issue statements of compliance.

Transporter

Waste transporters are obliged to ensure they are transporting waste to a lawful destination. Determining the lawfulness of a facility can be an area of uncertainty for transporters as approval requirements vary depending on the type of material being transported. This can be further complicated by the use of subcontractors, which is a common practice within this industry.

In NSW, only waste transporters that are transporting more than 200 kg of trackable waste in any load are required to hold an environment protection licence.³

Consumer

The exemption framework enables consumers to accept and use recovered resources without meeting certain regulatory requirements that would otherwise apply to the land application or use of waste as a fuel or in connection with a thermal treatment process. For most general exemptions, the conditions applying to consumers are limited. In some cases, the conditions require consumers to keep records of the supplier and volume of material received.

Often regulatory action is focused at the end use of the material (e.g. at the site of land application) because this is often where environmental harm or illegal activity is most evident.

A challenge for consumers is that they may have limited control over the quality of the recovered waste they receive and are reliant on processors to comply with the resource recovery orders. If a consumer receives a certificate of compliance from a processor that states that the recovered waste complies with the requirements of a particular resource recovery order then there may be a reasonable expectation by that consumer that the material is fit for purpose and safe to use.

Compliance with the framework

Industry stakeholders want a level playing field.

Detecting environmental crime and identifying who is responsible is a challenge that the EPA is continually improving its ability to address. The current framework is designed to facilitate the beneficial re-use of waste with reduced regulatory oversight. This allows for wastes to be re-used in the circular economy with minimal regulatory barriers. In 2019–20 there were 121 licensed RRFs using orders and an even greater number of sites in NSW that received resource recovery exempted resources (e.g. compost).

³ Trackable wastes are listed in Schedule 1 of the POEO (Waste) Regulation 2014.

Enforcement of the resource recovery framework

The EPA has undertaken compliance audits on a range of resource recovery orders and exemptions. These audits identified:

- issues with sampling requirements compliance
- issues with volumes exceeding limits set in the orders
- failures to report non-compliances to the EPA
- problems identifying receival sites.

These audit findings align with some of the issues raised by industry and the community.

Waste classification

Processors of waste are seeking improvements to the quality and accuracy of waste classification reports accompanying waste at their facilities.

In NSW the waste classification system is designed to classify wastes into six groups based on the risks they pose to the environment and human health, and to ensure those risks are managed appropriately. The six waste classes are:

- special waste
- liquid waste
- hazardous waste
- restricted solid waste
- general solid waste (putrescible)
- general solid waste (non-putrescible).

Some wastes are 'pre-classified' into one of these six waste classes – for example, food waste is pre-classified as general solid waste (putrescible). All other wastes need to undertake a chemical assessment to determine their classification. Waste classification was developed primarily to group wastes to manage their risks for disposal, but it also plays a role in the receipt of wastes at scheduled resource recovery and waste processing facilities.

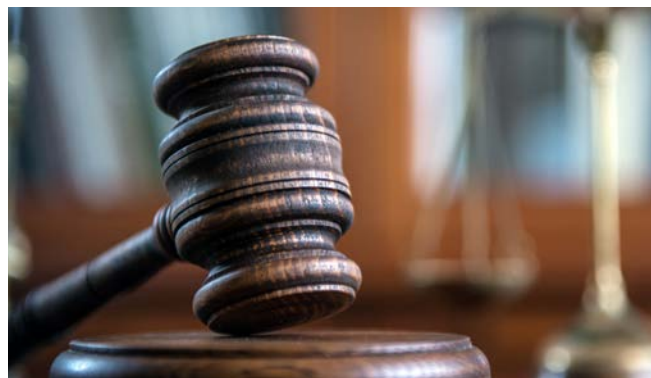
The licences of scheduled waste facilities list the types of waste that a facility can lawfully receive. Some of these licences refer to specific wastes while others list waste classes or pre-classified waste groups (e.g. building and demolition waste). Some issues raised associated with waste classification include:

- unclear requirements (accreditation, professional qualifications etc.) in relation to who can undertake a waste classification report
- limited standardised formats, templates or details on what information must be included in a waste classification report
- limited verification of waste classification reports
- testing requirements for chemical assessment could better reflect risks
- limited incentives or requirements for waste generators to source-separate waste.

The receipt of potentially contaminated waste at a processing or resource recovery facility can lead to non-compliant end products, undermine industry confidence in the use of recycled resources and pose risks to human health and the environment.

Questions

10. How could the framework be strengthened to ensure responsibility along the whole supply chain – waste generator, transporter, processor, transporter and consumer?
11. What are the strengths, weaknesses and challenges of using the waste classification guidelines and definitions in the context of operating within the resource recovery framework?



Have your say

We invite your feedback on the following questions. You can provide it through yoursay.epa.gov.au or by sending a submission to resource.recovery@epa.nsw.gov.au.

Environment and human health protection

1. What other risk-based approaches, sustainability principles or criteria could be used to assess and manage the environmental and human health risks of resource recovery?
2. How can the framework be structured to deal with new and emerging waste streams and mitigate the risk of cumulative impacts from legacy and emerging contaminants?

Resource recovery and the circular economy outcomes

3. What options exist to facilitate better circular economy outcomes and improve certainty for innovation, business, investment and participants within the resource recovery framework?
4. What specific benefits would an 'end of waste' provision deliver that aren't already provided by the current framework?
5. Are there resources being recovered or re-used outside the current exemption framework that would benefit from greater regulatory clarity?
6. Does the current waste definition facilitate circular economy outcomes while ensuring the protection of the environment and human health? If not, what changes do you suggest?



The administration of the resource recovery framework

7. How could the overall transparency and clarity of the resource recovery framework be improved?
8. What tools, systems, data or methods could be used by the EPA to better understand the waste being utilised under the framework?
9. What processes could the EPA put in place when determining whether existing orders and exemptions should be amended or revoked due to environmental or human health risks?

The enforceability of the resource recovery framework

10. How could the framework be strengthened to ensure responsibility along the whole supply chain – waste generator, transporter, processor, transporter and consumer?
11. What are the strengths, weaknesses and challenges of using the waste classification guidelines and definitions in the context of operating within the resource recovery framework?

Appendix A: Waste reported under resource recovery orders

Table 1. Sum of waste reported to the EPA under a resource recovery order, FY2019–20

Waste type	Volume (tonnes)
Recovered aggregate	5,010,006
Excavated natural material	954,680
Compost	701,014
Reclaimed asphalt pavement	665,199
Recovered fines (continuous)	501,205
Specific RRO (total all specifics at an RRF)	457,729
Pasteurised garden organics	300,795
Mulch	91,033
Slag (electric arc furnace)	55,548
Recovered glass sand	51,737
Raw mulch	49,224
Treated drilling mud	46,469
Recovered railway ballast	38,076
Coal washery rejects	16,984
Biosolids	16,849
Slag (electric arc furnace ladle)	16,093
Cement fibre board	8,751
Coal ash	8,284
Recovered fines (batch)	7,224
Food waste (liquid)	1,895
Plasterboard	1,183
Excavated public road material	1,099
Treated grease trap waste	800
Tyres	23
Total	9,001,898

Source: NSW EPA waste and resource reporting portal (WARRP). This self-reported facility data is subject to error and limited to reporting resource recovery facilities (RRF) only. There may be double counting if waste travels to another RRF for additional processing. Data excludes large volumes of recovered material that do not go to an RRF and are therefore not recorded.

Appendix B: Waste definitions

New South Wales

Protection of the Environment Operations Act 1997, Section 4 and the Dictionary

waste includes—

- a) any substance (whether solid, liquid or gaseous) that is discharged, emitted or deposited in the environment in such volume, constituency or manner as to cause an alteration in the environment, or
- b) any discarded, rejected, unwanted, surplus or abandoned substance, or
- c) any otherwise discarded, rejected, unwanted, surplus or abandoned substance intended for sale or for recycling, processing, recovery or purification by a separate operation from that which produced the substance, or
- d) any processed, recycled, re-used or recovered substance produced wholly or partly from waste that is applied to land, or used as fuel, but only in the circumstances prescribed by the regulations, or
- e) any substance prescribed by the regulations to be waste.

A substance is not precluded from being waste for the purposes of this Act merely because it is or may be processed, recycled, re-used or recovered.

Clause 6 of the *Protection of the Environment Operations (Waste) Regulation 2014* prescribes matters for paragraphs (d) and (e) of the above definition as follows:

For the purposes of paragraph (d) of the definition of waste in the Dictionary to the Act, the following circumstances are prescribed—

- a) in relation to substances that are applied to land—the application to land by—
 - (i) spraying, spreading or depositing on the land, or
 - (ii) ploughing, injecting or mixing into the land, or
 - (iii) filling, raising, reclaiming or contouring the land,
- b) in relation to substances that are used as fuel—all circumstances.

For the purposes of paragraph (e) of the definition of waste in the Dictionary to the Act, the following substances are prescribed to be waste—

- a) any substance that is received by a scheduled waste facility (other than any office supplies, or any plant or vehicles, used or intended to be used at the facility) if the occupier of the facility is required to pay contributions to the EPA under section 88 of the Act and the substance is reasonably capable of being applied to land at the facility by—
 - (i) spraying, spreading or depositing on the land, or
 - (ii) ploughing, injecting or mixing into the land, or
 - (iii) filling, raising, reclaiming or contouring the land, and
- b) any processed, recycled, re-used or recovered substance produced wholly or partly from waste that is intended to be applied to land by—
 - (i) spraying, spreading or depositing on the land, or
 - (ii) ploughing, injecting or mixing into the land, or
 - (iii) filling, raising, reclaiming or contouring the land, and
- c) any processed, recycled, re-used or recovered substance produced wholly or partly from waste that is intended to be used as fuel.

Appendix B: Waste definitions

Victoria

Environment Protection Act 2017, Section 3

waste includes any of the following—

- a) matter, including solid, liquid, gaseous or radioactive matter, that is deposited, discharged, emitted or disposed of into the environment in a manner that alters the environment;
- b) a greenhouse gas substance emitted or discharged into the environment;
- c) matter that is discarded, rejected, abandoned, unwanted or surplus, irrespective of any potential use or value;
- d) matter prescribed to be waste;
- e) matter or a greenhouse gas substance referred to in paragraph (a), (b), (c) or (d) that is intended for, or is undergoing, resource recovery;

European Union

EU Waste Framework Directive 2008/98/EC6 and 2018 amendment, Article 3

'waste' means any substance or object which the holder discards or intends or is required to discard.

The EU has also created the European List of Waste (also known as the European Waste catalogue) which is a comprehensive hierarchical list of waste materials, including both single-stream and mixed wastes. The six-digit codes established in the list are used to identify waste types, particularly for permitting and cross-border waste consignment (European Commission, 2014).

Flanders

The Materials Decree of 2011, Article 3

waste: any substance or object which the holder discards or intends or is required to discard.

The following are not considered waste:

- a) gaseous effluents emitted into the atmosphere and carbon dioxide that is captured and transported with a view to geological storage, and that is geologically stored in accordance with the Decree of 8 May 2009 on the deep underground;
- b) animal manure as mentioned in the Decree of 22 December 2006 on the protection of water against nitrate contamination from agricultural sources;
- c) contaminated or uncontaminated water which is discharged into surface water or into the public water treatment infrastructure; in this context in-situ treatment, including dewatering of sludge produced at the site, which is intended to make that water comply with the environmental conditions that apply to discharges, is not considered waste treatment;
- d) household and industrial wastewater which, in accordance with the provisions of the Decree of 24 January 1984 on groundwater management and of the Decree of 28 June 1985 on the environmental licence, is indirectly discharged into the groundwater;
- e) unexcavated soil, including buildings which are permanently connected to the land;
- f) radioactive waste, as far as it is not considered waste released as mentioned in the cooperation agreement between the federal State and the Regions of 17 October 2002 on the management of waste released;

Appendix B: Waste definitions

England

England has transposed the EU WFD legal definition of waste into local legislation (*The Waste (England and Wales) Regulations 2011*):

‘waste’ means any substance or object which the holder discards or intends or is required to discard. (DEFRA and Environment Agency, 2012)

The Environment Agency then provides extensive non-statutory guidance on interpretation of this definition and of the End of Waste test set within the Waste Framework Directive, including self-assessment of End of Waste status and the Environment Authority service to provide advice of the waste status of specific materials and contexts (Environment Agency, 2021).

Singapore

Environmental Public Health Act 2002, Section 2

‘waste’ includes—

- d) a) any substance which constitutes a scrap material or an effluent or other unwanted surplus substance arising from the application of any process; and
- b) any substance or article which requires to be disposed of as being broken, worn out, contaminated or otherwise spoiled, and anything which is discarded or otherwise dealt with as if it were waste shall be presumed to be waste unless the contrary is proved.

San Francisco, California

Public Resources Code (PRC), Division 30

Waste Management, Part 1 Integrated Waste Management [40000 – 40511]

- a) Except as provided in subdivision b), ‘solid waste’ means all putrescible and non-putrescible solid, semisolid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, dewatered, treated, or chemically fixed sewage sludge which is not hazardous waste, manure, vegetable or animal solid and semisolid wastes, and other discarded solid and semisolid wastes.
- b) ‘Solid waste’ does not include any of the following wastes:
 - 1. Hazardous waste, as defined in Section 40141.
 - 2. Radioactive waste regulated pursuant to the Radiation Control Law (Chapter 8 (commencing with Section 114960) of Part 9 of Division 104 of the Health and Safety Code).
 - 3. Medical waste regulated pursuant to the Medical Waste Management Act (Part 14 (commencing with Section 117600) of Division 104 of the Health and Safety Code). Untreated medical waste shall not be disposed of in a solid waste landfill, as defined in Section 40195.1. Medical waste that has been treated and deemed to be solid waste shall be regulated pursuant to this division.



Appendix C: Objects of relevant EPA legislation

Protection of the Environment Operations Act 1997 (POEO Act)

The objects of the POEO Act are:

- a) to protect, restore and enhance the quality of the environment in New South Wales, having regard to the need to maintain ecologically sustainable development. Ecologically sustainable development requires the effective integration of social, economic, and environmental considerations in decision-making processes,
- b) to provide increased opportunities for public involvement and participation in environment protection,
- c) to ensure that the community has access to relevant and meaningful information about pollution,
- d) to reduce risks to human health and prevent the degradation of the environment using mechanisms that promote the following—
 - (i) pollution prevention and cleaner production,
 - (ii) the reduction to harmless levels of the discharge of substances likely to cause harm to the environment,
 - (iia) the elimination of harmful wastes,
 - (iii) the reduction in the use of materials and the re-use, recovery, or recycling of materials,
 - (iv) the making of progressive environmental improvements, including the reduction of pollution at source,
 - (v) the monitoring and reporting of environmental quality on a regular basis,
- e) to rationalise, simplify and strengthen the regulatory framework for environment protection,
- f) to improve the efficiency of administration of the environment protection legislation,
- g) to assist in the achievement of the objectives of the *Waste Avoidance and Resource Recovery Act 2001*.

Waste Avoidance and Resource Recovery Act 2001 (WARR Act)

The objects of the WARR Act are:

- a) to encourage the most efficient use of resources and to reduce environmental harm in accordance with the principles of ecologically sustainable development,
- b) to ensure resource management options are considered against a hierarchy in the following order—
 - (i) avoidance and reduction of waste,
 - (ii) re-use of waste,
 - (iii) recycling, processing or reprocessing waste,
 - (iv) recovery of energy,
 - (v) disposal,
- c) to provide for the continual reduction in waste generation,
- d) to minimise the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the re-use and recycling of waste,
- e) to ensure that industry shares with the community the responsibility for reducing and dealing with waste,
- f) to ensure the efficient funding of waste and resource management planning, programs and service delivery,
- g) to achieve integrated waste and resource management planning, programs and service delivery on a State-wide basis,
- h) to assist in the achievement of the objectives of the *Protection of the Environment Operations Act 1997*.