MOTT MACDONALD

Mapping Impacts on Nature

An Interactive Toolkit for ESA Members

2023

environmental services association

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Introduction

Why be Nature Positive?

Nature is being degraded faster than at any other time in our history and this is having devastating consequences for economies and society. Businesses are often seen as part of the problem but, by becoming Nature Positive, can instead be part of the solution. This not only enables businesses to demonstrate a holistic approach to sustainability, but also safeguards their commercial future because industries depend on natural resources. The Waste and Recycling Industry has a key role in securing a Nature Positive future. There are immediate opportunities to improve nature on and around sites, opportunities to avoid and reduce impacts on nature through operations and activities, for example, the choice of transport, as well as opportunities to prevent and reduce the production of waste and to innovate solutions that contribute to a wider Circular Economy approach.

What is Nature Positive?

A Nature Positive organisation has an overall measurable net positive impact on nature that contributes towards local and national conservation targets. This regards impacts within the organisation's control, for example from its operations, offices and sites. For impacts on nature that are outside of its control, the organisation proactively encourages and promotes a Nature Positive approach to those who can control those impacts, as well as promoting Nature Positive to others.

When to use this toolkit?

This toolkit is part of the "Supporting a Nature Positive Future: a process for ESA members". It is for ESA members to map their activities on a Waste Value Chain to help establish their impacts on nature, as part of their baseline. By using this toolkit, ESA members can assess impacts on nature from their organisation's activities, such as direct on-site impacts and wider impacts from transport emissions. After using this toolkit, ESA members go to the Nature Positive Process to assess any remaining impacts on nature (e.g. from facilities) and to follow the steps to become Nature Positive.

The Waste Value Chain in this toolkit represents core activities by ESA members. Its purpose is to enable ESA members to map their impacts on nature, and it is not intended to represent all activities by ESA members.

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This toolkit includes clickable links to help navigate through it.
Look out for these links to easily and quickly go to these pages:

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Please follow these steps to use the toolkit:

1. Review each activity of the Waste Value Chain and identify the activities that your organisation undertakes.
2. Complete the Waste Value Chain Matrix by ranking each activity according to the level of effort:
   - **0** = We do not undertake this activity
   - **1** = We undertake minor levels of this activity
   - **2** = We undertake moderate levels of this activity
   - **3** = This is our main activity
3. Click on each stage of the Waste Value Chain that your organisation undertakes, to view the possible impacts on nature. Please note that some stages have multiple pages of impacts, so if you see this icon ⬇ please keep scrolling to view all possible impacts on nature. Each page has a button that links back to the Matrix.
4. Complete the Aggregator Pressure Score Matrix to gain an understanding of the potentially greatest impacts on nature from your organisation's activities.

Note that if your organisation is more progressed in becoming Nature Positive, the Advanced Waste Value Chain* and Advanced Aggregator Pressure Score Matrix may be more appropriate.

*The Advanced Waste Value Chain is used to map impacts on nature in more detail. It indicates which business activities, and which waste streams, have the greatest impact on nature.

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Waste Value Chain:

an illustration of the main activities by ESA members

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Waste Value Chain for ESA Members

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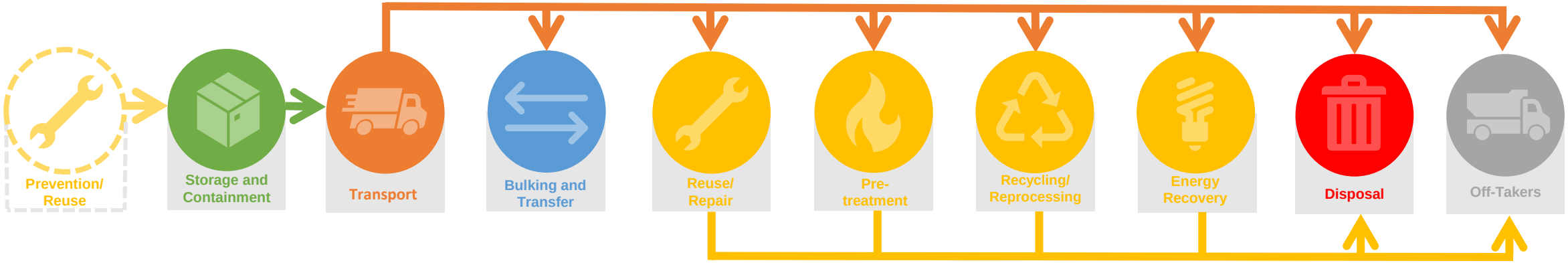

Prevention/ Reuse	Storage & Containment	Transport	Bulking and Transfer	Repair and Reuse	Pre-treatment	Recycling / Reprocessing	Energy Recovery	Disposal	Off-takers
First stage of the waste hierarchy to prevent waste entering the waste value chain. Examples could include: - Product redesign/waste prevention through elimination of avoidable wastes e.g. single use plastics. - Waste prevention through sustainable/green procurement or reverse logistics. - Reuse of products through return scheme or reuse marketplaces.	Temporary placement of waste in a suitable container, receptacle, storage area, location or dedicated facility prior to onward transport for treatment.	Take or carry material or people from one place to another. Transport to or between transfer and treatment (repair/reuse, recycling, reprocessing, energy recovery and disposal) facilities does not happen in a set order and can be carried out interchangeably between stages in the waste value chain subject to flow of waste and material types.	Consolidation and aggregation of waste. This usually occurs at dedicated transfer facilities, where material is unloaded, compacted (where appropriate) and reloaded into larger bulk haulage vehicles.	The action or practice of preparing or using an item or material again in it's existing or original form, whether for its original purpose (conventional reuse) or to fulfil a different function. Examples could include: - Repair of waste electrical and electronic equipment (WEEE) for resale) - Repair of furniture for resale	Activities to remove contaminants/ hazardous components prior to subsequent treatment (disposal or further processing). May include the recovery or extraction of recyclables or commodities from a mixed feedstock. Examples could include: - Dirty/Clean/C&D Materials Recovery Facility (MRF), including those which separate co-mingled waste into separate streams. - Mechanical Biological Treatment facilities.	The process of breaking down materials and converting into new products in a dedicated facility. Examples could include: - Reprocessing of separated recyclables such as paper, glass and metals. - Production of refuse derived fuels (RDF) or solid recovered fuels (SRF)	The process or act of conserving, extracting or recovering energy (electricity and/or heat) from materials or waste. Examples could include: - Energy from Waste activities - Anaerobic Digestion activities - Landfill gas extraction and utilisation	Removing, destroying or storing indefinitely end of life material or residues. Examples could include: - Non-hazardous / Hazardous / Inert Landfill - Incineration without Energy Recovery.	Organisations that receive and transport waste or secondary products, recovered materials or commodities recovered from waste treatment and recycling processes. May include waste brokers and exporters.

**Segregation on the basis that ESA membership does not typically include waste producers or organisations involved in segregation practices at the point of waste production*

Waste Value Chain Matrix

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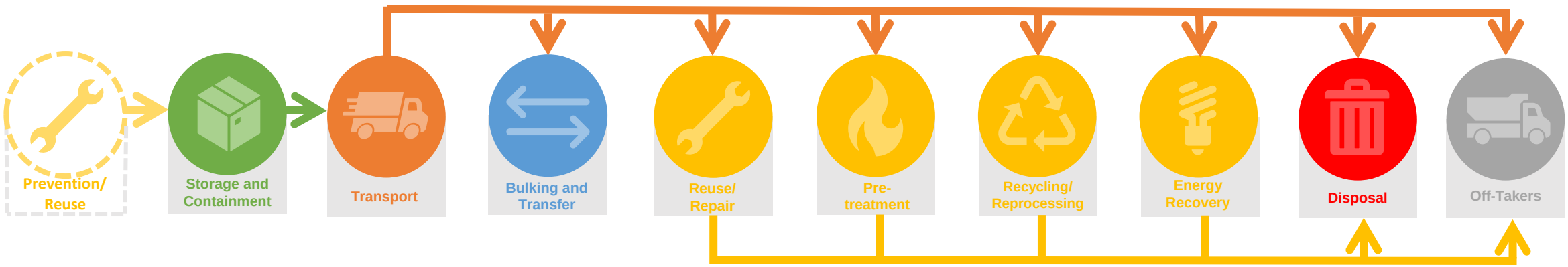
Pressure Score (based on level of effort)
0 = we do not undertake this activity
1 = we undertake minor levels of this activity
2 = we undertake moderate levels of this activity
3 = this is our main activity



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Impacts on Nature

The following slides describe broad types of impacts on nature that could occur from each activity of the Waste Value Chain. The intention is to enable ESA members to understand the potential impacts on nature from their activities. ESA members can then use this information to establish their baseline of impacts on nature.

Establishing baselines and taking steps to become Nature Positive are set out in the Nature Positive Process for ESA members.

When establishing baselines, the impacts on nature must be specific in order to lead to measurable change. The following slides contain broad types of impacts so that these apply to the variety of ESA member organisation and their activities. More information could be required to quantify the impact, such as the example in the next slide.

After reviewing the impacts, please click this link to go to the: Aggregate Pressure Score Matrix.

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Impacts on Nature: Example

As part of a recycling company's wider Nature Positive strategy it completes this toolkit and finds that a worsening of habitat caused by dust and odour at its site is the greatest potential impact on nature from its activities.

It engages an Ecologist who assesses the condition of the habitat nearby the site using the Natural England habitat condition assessment and could identify habitat condition indicators that site-based staff could identify. In practice, an Ecologist could conduct an initial desk-based assessment of all sites and then select the priority sites for the site-based assessments, for example sites with likely the greatest degradation of habitats. A site that is 99% concrete with no habitat nearby at risk of degradation could be ruled out. From this, the Ecologist establishes a score of the current habitat condition and recommends improvement measures. These include reducing the impact of dust and odour.

Based on these recommendations, the Ecologist sets targets for measurable improvements in habitat condition within two, five and ten years. The recycling company improves its dust and odour suppression measures. It also implements other recommendations by the Ecologist. Every year the Ecologist undertakes the same habitat condition assessment to monitor change in condition, and track improvements in scores. The recycling company and Ecologist use the monitoring data to evaluate the effectiveness of the measures and identify extra improvements to further reduce dust and odour, and enhance the habitat condition.

Storage and Containment (1/1)

Activity - continuous or temporary waste storage (internally and externally).

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Cause	Broad Impact	Direct & Indirect Impacts on Nature	Scale of Impact
Dust 	Air Pollution	**Direct Impacts** - Dust accumulation on habitats leading to habitat degradation, for example degradation in condition, diversity or abundance of habitats - Increased long term particulate matter (PM10) concentrations suspended in the atmosphere leading to habitat degradation - Harm to native species from air pollution	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Litter 	Contamination of land and water	**Direct Impacts** - Habitat degradation from contamination, for example degradation in condition, diversity or abundance of habitats - Harm/death of native marine and terrestrial organisms e.g. from the contamination and/or ingestion of litter	Local
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Odour 	Air Pollution	**Direct Impact** - Harm to native species from toxic odours - Displacement of native species from habitats that are sub-optimal or inhospitable	Local
		Indirect Impacts - Increased vulnerability of native species from displacement	Local and regional
Vermin 	Decline/Loss of native species	**Direct Impacts** - Predation on native species - Spread of diseases to native species causing harm or mortality - Out-compete native species for resources leading to the displacement of native species	Local
		Indirect Impacts - Decline in native wildlife populations from predation and diseases - Increased vulnerability of native species from displacement potentially leading to decline in native wildlife populations	Local and regional

Transport (1/2)

Activity - movement of waste in between different stages of the waste value chain.

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Cause	Broad Impact	Direct & Indirect Impacts on Nature	Scale of Impact
Dust 	Air Pollution	**Direct Impacts** - Dust accumulation on habitats leading to habitat degradation for example degradation in condition, diversity or abundance of habitats - Increased long term particulate matter (PM10) concentrations suspended in the atmosphere leading to habitat degradation - Harm to native species from air pollution	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Litter 	Contamination of land and water	**Direct Impacts** - Habitat degradation from contamination for example degradation in condition, diversity or abundance of habitats - Harm/death of native marine and terrestrial organisms e.g. from the contamination and/or ingestion of litter	Local
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Odour 	Air Pollution	**Direct Impact** - Harm to native species from toxic odours - Displacement of native species from habitats that are sub-optimal or inhospitable	Local
		Indirect Impacts - Increased vulnerability of native species from displacement	Local and regional
Vermin 	Decline/Loss of native species	**Direct Impacts** - Predation on native species - Spread of diseases to native species causing harm or mortality - Out-compete native species for resources leading to the displacement of native species	Local
		Indirect Impacts - Decline in native wildlife populations from predation and diseases - Increased vulnerability of native species from displacement potentially leading to decline in native wildlife populations	Local and regional

Transport (2/2)

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Cause	Broad Impact	Direct & Indirect Impacts on Nature	Scale of Impact
Fire 	Fire and the Air Pollution it causes: release of toxic chemicals, harmful gases and particulates in the fire plume zone	**Direct Impacts** - Degradation of habitats for example degradation in condition, diversity or abundance of habitats - Loss of habitats - Harm or mortality of native species through burns or ingestion of toxic fumes. - Displacement of native species from loss of habitat and/or resources	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss, from displacement, and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Liquids and leachate 	Pollution of the environment (e.g. release of lead and mercury)	**Direct Impacts** - Habitat degradation from pollution - Harm or mortality of native species from pollution	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Chemical Usage 	Pollution of the environment (e.g. release of lead and mercury)	**Direct Impacts** - Habitat degradation from pollution for example degradation in condition, diversity or abundance of habitats - Harm or mortality of native species from pollution.	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Vehicle / transport emissions 	Air Pollution	**Direct Impacts** - Habitat degradation from air pollution for example degradation in condition, diversity or abundance of habitats - Harm or mortality to wildlife from air pollution	Local, regional.
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations - Contributing towards climate change from the release of greenhouse gases through fuel combustion from vehicles e.g. nitrogen oxides, particulate matter PM10 and PM2.5, carbon monoxide and hydrocarbons	Local, regional and global.

Bulking and Transfer (1/2)

Activity - consolidation and aggregation of waste.

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Cause	Broad Impact	Direct & Indirect Impacts on Nature	Scale of Impact
Dust 	Air Pollution	**Direct Impacts** - Dust accumulation on habitats leading to habitat degradation for example degradation in condition, diversity or abundance of habitats - Increased long term particulate matter (PM10) concentrations suspended in the atmosphere leading to habitat degradation - Harm to native species from air pollution	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Litter 	Contamination of land and water	**Direct Impacts** - Habitat degradation from contamination for example degradation in condition, diversity or abundance of habitats - Harm/death of native marine and terrestrial organisms e.g. from the contamination and/or ingestion of litter	Local
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Odour 	Air Pollution	**Direct Impact** - Harm to native species from toxic odours - Displacement of native species from habitats that are sub-optimal or inhospitable	Local
		Indirect Impacts - Increased vulnerability of native species from displacement	Local and regional
Vermin 	Decline/Loss of native species	**Direct Impacts** - Predation on native species - Spread of diseases to native species causing harm or mortality - Out-compete native species for resources leading to the displacement of native species	Local
		Indirect Impacts - Decline in native wildlife populations from predation and diseases - Increased vulnerability of native species from displacement potentially leading to decline in native wildlife populations	Local and regional

Bulking and Transfer (2/2)

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Cause	Broad Impact	Direct & Indirect Impacts on Nature	Scale of Impact
Fire 	Fire and the Air Pollution it causes: release of toxic chemicals, harmful gases and particulates in the fire plume zone	**Direct Impacts** - Degradation of habitats for example degradation in condition, diversity or abundance of habitats - Loss of habitats - Harm or mortality of native species through burns or ingestion of toxic fumes. - Displacement of native species from loss of habitat and/or resources	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss, from displacement, and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Liquids and leachate 	Pollution of the environment (e.g. release of lead and mercury)	**Direct Impacts** - Habitat degradation from pollution for example degradation in condition, diversity or abundance of habitats - Harm or mortality of native species from pollution	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional

Repair and Reuse (1/1)

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Activity - the action or practice of preparing or using an item or material again in its existing or original form.

Cause	Broad Impact	Direct & Indirect Impacts on Nature	Scale of Impact
Litter 	Contamination of land and water	**Direct Impacts** - Habitat degradation from contamination for example degradation in condition, diversity or abundance of habitats - Harm/death of native marine and terrestrial organisms e.g. from the contamination and/or ingestion of litter	Local
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Liquids and Leachate 	Pollution of the environment (e.g. release of lead and mercury)	**Direct Impacts** - Habitat degradation from pollution for example degradation in condition, diversity or abundance of habitats - Harm or mortality of native species from pollution	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Odour 	Air Pollution	**Direct Impact** - Harm to native species from toxic odours - Displacement of native species from habitats that are sub-optimal or inhospitable	Local
		Indirect Impacts - Increased vulnerability of native species from displacement	Local and regional
Fire 	Fire and the Air Pollution it causes: release of toxic chemicals, harmful gases and particulates in the fire plume zone	**Direct Impacts** - Degradation of habitats for example degradation in condition, diversity or abundance of habitats - Loss of habitats - Harm or mortality of native species through burns or ingestion of toxic fumes. - Displacement of native species from loss of habitat and/or resources	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss, from displacement, and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional

Pre-Treatment (1/2)

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Activity - to remove contaminants/ hazardous components before disposal or further processing.

Cause	Broad Impact	Direct/Indirect Impact on Nature	Scale of Impact
Dust 	Air Pollution	**Direct Impacts** - Dust accumulation on habitats leading to habitat degradation for example degradation in condition, diversity or abundance of habitats - Increased long term particulate matter (PM10) concentrations suspended in the atmosphere leading to habitat degradation - Harm to native species from air pollution	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Litter 	Contamination of land and water	**Direct Impacts** - Habitat degradation from contamination for example degradation in condition, diversity or abundance of habitats - Harm/death of native marine and terrestrial organisms e.g. from the contamination and/or ingestion of litter	Local
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Odour 	Air Pollution	**Direct Impact** - Harm to native species from toxic odours - Displacement of native species from habitats that are sub-optimal or inhospitable	Local
		Indirect Impacts - Increased vulnerability of native species from displacement	Local and regional
Vermin 	Decline/Loss of native species	**Direct Impacts** - Predation on native species - Spread of diseases to native species causing harm or mortality - Out-compete native species for resources leading to the displacement of native species	Local
		Indirect Impacts - Decline in native wildlife populations from predation and diseases - Increased vulnerability of native species from displacement potentially leading to decline in native wildlife populations	Local and regional

Pre-Treatment (2/2)

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Cause	Broad Impact	Direct & Indirect Impacts on Nature	Scale of Impact
Fire 	Fire and the Air Pollution it causes: release of toxic chemicals, harmful gases and particulates in the fire plume zone	**Direct Impacts** - Degradation of habitats for example degradation in condition, diversity or abundance of habitats - Loss of habitats - Harm or mortality of native species through burns or ingestion of toxic fumes. - Displacement of native species from loss of habitat and/or resources	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss, from displacement, and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Liquids and leachate 	Pollution of the environment (e.g. release of lead and mercury)	**Direct Impacts** - Habitat degradation from pollution for example degradation in condition, diversity or abundance of habitats - Harm or mortality of native species from pollution	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Chemical Usage 	Pollution of the environment (e.g. release of lead and mercury)	**Direct Impacts** - Habitat degradation from pollution for example degradation in condition, diversity or abundance of habitats - Harm or mortality of native species from pollution.	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional

Recycling and Reprocessing (1/2)

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Activity - the process of breaking down materials and converting into new products in a dedicated facility.

Cause	Broad Impact	Direct/Indirect Impact on Nature	Scale of Impact
Dust 	Air Pollution	**Direct Impacts** - Dust accumulation on habitats leading to habitat degradation for example degradation in condition, diversity or abundance of habitats - Increased long term particulate matter (PM10) concentrations suspended in the atmosphere leading to habitat degradation - Harm to native species from air pollution	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Litter 	Contamination of land and water	**Direct Impacts** - Habitat degradation from contamination for example degradation in condition, diversity or abundance of habitats - Harm/death of native marine and terrestrial organisms e.g. from the contamination and/or ingestion of litter	Local
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Odour 	Air Pollution	**Direct Impact** - Harm to native species from toxic odours - Displacement of native species from habitats that are sub-optimal or inhospitable	Local
		Indirect Impacts - Increased vulnerability of native species from displacement	Local and regional
Vermin 	Decline/Loss of native species	**Direct Impacts** - Predation on native species - Spread of diseases to native species causing harm or mortality - Out-compete native species for resources leading to the displacement of native species	Local
		Indirect Impacts - Decline in native wildlife populations from predation and diseases - Increased vulnerability of native species from displacement potentially leading to decline in native wildlife populations	Local and regional

Recycling and Reprocessing (2/2)

back to matrix

Cause	Broad Impact	Direct & Indirect Impacts on Nature	Scale of Impact
Fire 	Fire and the Air Pollution it causes: release of toxic chemicals, harmful gases and particulates in the fire plume zone	**Direct Impacts** - Degradation of habitats - Loss of habitats - Harm or mortality of native species through burns or ingestion of toxic fumes. - Displacement of native species from loss of habitat and/or resources	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss, from displacement, and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional

Energy Recovery (1/3)

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Activity - the process or act of conserving, extracting or recovering energy and/or heat from materials or waste.

Cause	Broad Impact	Direct & Indirect Impacts on Nature	Scale of Impact
Dust 	Air Pollution	**Direct Impacts** - Dust accumulation on habitats leading to habitat degradation for example degradation in condition, diversity or abundance of habitats - Increased long term particulate matter (PM10) concentrations suspended in the atmosphere leading to habitat degradation - Harm to native species from air pollution - Release of CO_2, No_x and SO_x	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Litter 	Contamination of land and water	**Direct Impacts** - Habitat degradation from contamination for example degradation in condition, diversity or abundance of habitats - Harm/death of native marine and terrestrial organisms e.g. from the contamination and/or ingestion of litter	Local
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Odour 	Air Pollution	**Direct Impact** - Harm to native species from toxic odours - Displacement of native species from habitats that are sub-optimal or inhospitable	Local
		Indirect Impacts - Increased vulnerability of native species from displacement	Local and regional
Vermin 	Decline/Loss of native species	**Direct Impacts** - Predation on native species - Spread of diseases to native species causing harm or mortality - Out-compete native species for resources leading to the displacement of native species	Local
		Indirect Impacts - Decline in native wildlife populations from predation and diseases - Increased vulnerability of native species from displacement potentially leading to decline in native wildlife populations	Local and regional

Energy Recovery (2/3)

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Cause	Broad Impact	Direct & Indirect Impacts on Nature	Scale of Impact
Chemical Usage 	Pollution of the environment (e.g. release of lead and mercury)	**Direct Impacts** - Habitat degradation from pollution for example degradation in condition, diversity or abundance of habitats - Harm or mortality of native species from pollution.	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Vehicle / transport emissions 	Air Pollution	**Direct Impacts** - Habitat degradation from air pollution for example degradation in condition, diversity or abundance of habitats - Harm or mortality to wildlife from air pollution	Local, regional.
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations - Contributing towards climate change from the release of greenhouse gases through fuel combustion from vehicles e.g. nitrogen oxides, particulate matter PM10 and PM2.5, carbon monoxide and hydrocarbons	Local, regional and global.
Landfill 	Air Pollution	**Direct Impacts** - Harm to native species from air pollution, including greenhouse gases - Displacement of native species from habitats that are sub-optimal or inhospitable	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Liquids and Leachate 	Pollution of the environment (e.g. release of lead and mercury)	**Direct Impacts** - Habitat degradation from pollution for example degradation in condition, diversity or abundance of habitats - Harm or mortality of native species from pollution.	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional

Energy Recovery (3/3)

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Cause	Broad Impact	Direct & Indirect Impacts on Nature	Scale of Impact
Fire 	Fire and the Air Pollution it causes: release of toxic chemicals, harmful gases and particulates in the fire plume zone	**Direct Impacts** - Degradation of habitats for example degradation in condition, diversity or abundance of habitats - Loss of habitats - Harm or mortality of native species through burns or ingestion of toxic fumes. - Displacement of native species from loss of habitat and/or resources	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss, from displacement, and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional

Disposal (1/2)

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Activity – removing, destroying or storing indefinitely end-of-life material or residues.

Cause	Broad Impact	Direct & Indirect Impacts on Nature	Scale of Impact
Litter 	Contamination of land and water	**Direct Impacts** - Habitat degradation from contamination for example degradation in condition, diversity or abundance of habitats - Harm/death of native marine and terrestrial organisms e.g. from the contamination and/or ingestion of litter	Local
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Odour 	Air Pollution	**Direct Impact** - Harm to native species from toxic odours - Displacement of native species from habitats that are sub-optimal or inhospitable	Local
		Indirect Impacts - Increased vulnerability of native species from displacement	Local and regional
Vermin 	Decline/Loss of native species	**Direct Impacts** - Predation on native species - Spread of diseases to native species causing harm or mortality - Out-compete native species for resources leading to the displacement of native species	Local
		Indirect Impacts - Decline in native wildlife populations from predation and diseases - Increased vulnerability of native species from displacement potentially leading to decline in native wildlife populations	Local and regional
Liquids and Leachate 	Pollution of the environment (e.g. release of lead and mercury)	**Direct Impacts** - Habitat degradation from pollution for example degradation in condition, diversity or abundance of habitats - Harm or mortality of native species from pollution	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional

Disposal (2/2)

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Cause	Broad Impact	Direct & Indirect Impact on Nature	Scale of Impact
Fire 	Fire and the Air Pollution it causes: release of toxic chemicals, harmful gases and particulates in the fire plume zone	**Direct Impacts** - Degradation of habitats for example degradation in condition, diversity or abundance of habitats - Loss of habitats - Harm or mortality of native species through burns or ingestion of toxic fumes. - Displacement of native species from loss of habitat and/or resources	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss, from displacement, and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Landfill 	Air Pollution	**Direct Impacts** - Harm to native species from air pollution, including greenhouse gases - Displacement of native species from habitats that are sub-optimal or inhospitable	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional

Off-Taker (1/2)

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Activity – organisations that pay for or sell secondary products, recovered materials or commodities recovered from waste treatment and recycling.

Cause	Broad Impact	Direct & Indirect Impacts on Nature	Scale of Impact
Dust 	Air Pollution	**Direct Impacts** - Dust accumulation on habitats leading to habitat degradation for example degradation in condition, diversity or abundance of habitats - Increased long term particulate matter (PM10) concentrations suspended in the atmosphere leading to habitat degradation - Harm to native species from air pollution	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Litter 	Contamination of land and water	**Direct Impacts** - Habitat degradation from contamination for example degradation in condition, diversity or abundance of habitats - Harm/death of native marine and terrestrial organisms e.g. from the contamination and/or ingestion of litter	Local
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Odour 	Air Pollution	**Direct Impact** - Harm to native species from toxic odours - Displacement of native species from habitats that are sub-optimal or inhospitable	Local
		Indirect Impacts - Increased vulnerability of native species from displacement	Local and regional
Vermin 	Decline/Loss of native species	**Direct Impacts** - Predation on native species - Spread of diseases to native species causing harm or mortality - Out-compete native species for resources leading to the displacement of native species	Local
		Indirect Impacts - Decline in native wildlife populations from predation and diseases - Increased vulnerability of native species from displacement potentially leading to decline in native wildlife populations	Local and regional

Off-Taker (2/2)

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Cause	Broad Impact	Direct & Indirect Impacts on Nature	Scale of Impact
Fire 	Fire and the Air Pollution it causes: release of toxic chemicals, harmful gases and particulates in the fire plume zone	**Direct Impacts** - Degradation of habitats for example degradation in condition, diversity or abundance of habitats - Loss of habitats - Harm or mortality of native species through burns or ingestion of toxic fumes. - Displacement of native species from loss of habitat and/or resources	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss, from displacement, and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Liquids and leachate 	Pollution of the environment (e.g. release of lead and mercury)	**Direct Impacts** - Habitat degradation from pollution for example degradation in condition, diversity or abundance of habitats - Harm or mortality of native species from pollution	Local and regional
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations	Local and regional
Vehicle / transport emissions 	Air Pollution	**Direct Impacts** - Habitat degradation from air pollution for example degradation in condition, diversity or abundance of habitats - Harm or mortality to wildlife from air pollution	Local, regional.
		Indirect Impacts - Decline in the conservation value of habitats - Loss of habitat cover - Increased vulnerability of native species from habitat degradation and loss and from competition from non-native species for reduced availability of resources, potentially leading to decline in native wildlife populations - Contributing towards climate change from the release of greenhouse gases through fuel combustion from vehicles e.g. nitrogen oxides, particulate matter PM10 and PM2.5, carbon monoxide and hydrocarbons	Local, regional and global.

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Aggregate Pressure Score Matrix

2023

Aggregate Pressure Score Matrix

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When you have completed the Waste Value Chain mapping, use this table to tally the number of times each broad type of impact on nature could occur. This provides an indication of the most frequent and possibly greatest impacts on nature that result from your organisation's activities. Then click on the 'Impact Drivers' to view recommended actions to address these impacts, and go back to the Nature Positive Process to follow the next steps to become Nature Positive.

Impact Driver	Aggregate Number of Occurrences
Dust	
Chemicals	
Fire	
Vehicle/Transport Emissions	
Litter	
Liquid and Leachate	
Odour	
Vermin	
Landfill	

For organisations more advanced in Becoming Nature Positive, the impact mapping can be undertaken in more detail by breaking it down by waste type. This can be completed using the Advanced Waste Value Chain on the next slide.

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Advanced Stages

2023

Advanced Waste Value Chain Matrix

Pressure Score (based on level of effort)
N/A: this category is not applicable
0 = we do not undertake this activity
1 = we undertake minor levels of this activity
2 = we undertake moderate levels of this activity
3 = this is our main activity

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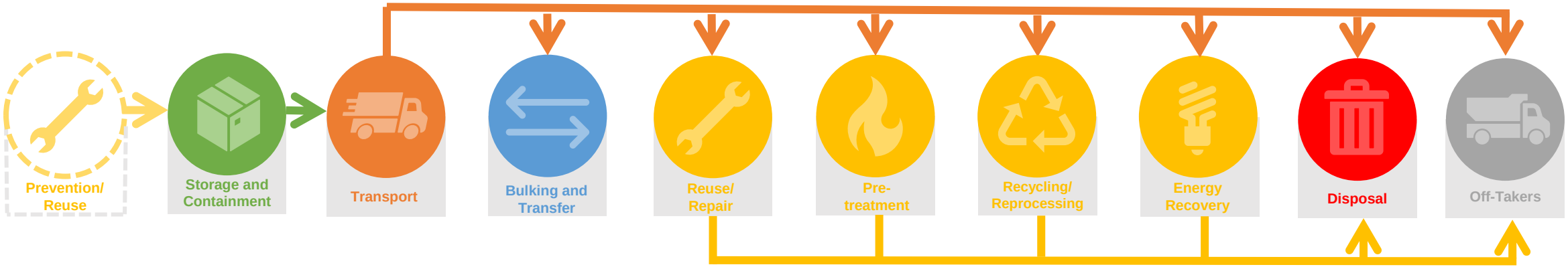

Residual										
Garden/Food										
Bulky										
Recyclables										
WEEE & Batteries										
Clinical/Healthcare										
Other Hazardous										

Advanced Aggregate Pressure Score Matrix

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When the Advanced Waste Value Chain mapping has been completed, use this table to tally the number of times each broad type of impact on nature could occur based on waste type. This provides an indication of the most frequent and possibly greatest impacts on nature that result from your organisation's activities. Then go back to the 'Nature Positive Process' to follow the next steps to become Nature Positive. Click on the 'Impact Drivers' to view recommended actions.

Impact Driver	Waste Type (Y/N)							Aggregate Number of Occurrences
	Residual	Garden/ food	Bulky	Recyclables	WEEE/ batteries	Clinical/ healthcare	Other hazardous	
Dust								
Chemical Usage								
Fire								
General								
Litter								
Liquid/Leachate								
Odour								
Vermin								
Landfill								

Note: This may not be an exhaustive list of waste types, but can be used as a baseline/template to map all key activities. The listed waste categories may not be applicable in some cases.

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Recommended Actions

The following slides describe activities to address impacts on nature from activities of the Waste Value Chain. Many of these are good-practice environmental housekeeping.

The intention is to enable ESA members to identify practical actions to take as part of all measures to become Nature Positive.

Litter

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Recommended Actions to Reduce and Eliminate the Impact
A high boundary fence (e.g. 2m high) installed on the boundaries of sites and waste facilities can help to mitigate the impacts of litter on the local environment. Standard and roller shutter doors within internal buildings should be closed at all times when not in use to prevent the escape of litter and debris into the wider site and beyond.
Physical site boundary checks should be undertaken frequently (daily is recommended) where the responsible personnel walk around the site facility perimeter to determine if litter has escaped the boundary into the local surroundings. Upon identification of any area with litter, mitigation and rectification steps should be applied. This may include litter picking on the other side of the boundary using site staff or hiring a local third party contractor. These checks should be documented using a checklist of similar and retained on-site.
Specific training should be provided to all relevant site staff on Standard Operating Procedures (SOPs). All SOPs should be included as part of an environmental management system e.g. certified to ISO 14001 and/or a site environmental plan/working plan. The Site Manager and/or other relevant staff should be identified as the key point of contact, and the messaging within the SOP should be disseminated to all site staff. Frequent communication should be maintained on the importance of litter prevention. This may be during staff meetings and internal company publications.
Relevant legislation such as the Environmental Permitting Regulations England and Wales (2016) should be met in regard to all material storage.

Fire

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Recommended Actions to Reduce and Eliminate the Impact
A designated smoking area for operators and site staff should be available on-site away from waste storage and other site activities. Alternatively, the smoking area may be off-site. Designated smoking areas should be marked and clearly signposted and should have strict controls on disposal of cigarette butts.
Appropriate fire detection and suppression systems should be in place and should include fire extinguishers and water sprinklers as a general approach. Flammable materials e.g. chemicals, WEEE and gas cylinders should not be stored together. WEEE should not be stored without a weatherproof covering and should be stored inside where possible. Regular checks of the fire detection, suppression and emergency equipment should be undertaken and documented using a checklist or similar. The checklists should be retained on-site.
Specific training should be provided to all relevant site staff on Standard Operating Procedures (SOPs). The SOPs should be included as part of an environmental management system e.g. ISO 14001 Certified Environmental Management System (EMS) and/or a local site environmental plan/working plan. The Site Manager and/or other relevant staff should be identified as the key point of contact and the importance of the effects identified within the SOP should be disseminated to all staff. Frequent communication should be maintained on the importance of fire prevention through staff meetings, internal company publications etc.
Relevant legislation such as the Environmental Permitting Regulations England and Wales (2016) should be met in regard to all material storage.

Dust

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Recommended Actions to Reduce and Eliminate the Impact
Doors and windows in the internal site facilities should be closed at all times when not in use to prevent the escape of dust into the wider site areas. All activities that produce dust should be confined internally.
Dust suppression systems should be in place where site activities and processes create dust e.g. wet dust suppression systems, airborne dust capture systems and extraction systems (directly from the process) for activities such as shredding, grinding and sorting, where applicable.
General housekeeping should be followed e.g. daily sweeping of internal and external surfaces, wheel washers for vehicles before leaving the facility, daily hosing-down of the external site. All environmental housekeeping measures should be documented using a checklist or similar. The checklist should be retained on-site.
Specific training should be provided to all relevant site staff on Standard Operating Procedures (SOPs). The SOPs should be included as part of an environmental management system e.g. certified to ISO 14001 and/or a site environmental plan/working plan. The Site Manager and/or other relevant staff should be identified as the key point of contact, and the messaging within the SOP should be disseminated to all site staff. Frequent communication should be maintained on the importance of dust prevention. This may be during staff meetings and internal company publications.
Relevant legislation such as the Environmental Permitting Regulations England and Wales (2016) should be met in regard to all material storage.

Vermin

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Recommended Actions to Reduce and Eliminate the Impact
General housekeeping should be followed e.g. daily sweeping for internal and external surfaces, wheel washers for vehicles that leave the facility, safe and appropriate storage of materials and waste. This may include covering skips and containers to prevent egress. Particular focus should be given to controlling waste/debris that could attract vermin.
Regular pest control should be in place, including the presence of rat traps. Pest control may be undertaken in-house, although this is typically contracted to a third party who will conduct regular site checks. At landfill, vermin is likely to include birds, of which management may include bird scaring techniques such as the use of hawks as deterrence. This activity would need to be undertaken by a specialist third party contractor. These measures should be documented using a checklist or similar and the documents retained on-site.
Waste should be removed from site in an appropriate timeframe to avoid attracting vermin.
Specific training should be provided to all relevant site staff on Standard Operating Procedures (SOPs). All the SOPs should be included as part of an environmental management system e.g. certified to ISO 14001 and/or a site environmental plan/working plan. The Site Manager and/or other relevant staff should be identified as the key point of contact, and the messaging within the SOP should be disseminated to all site staff. Frequent communication should be maintained on the importance of vermin prevention. This may be during staff meetings and internal company publications.
Relevant legislation such as the Environmental Permitting Regulations England and Wales (2016) should be met in regard to all material storage.

Odour

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Recommended Actions to Reduce and Eliminate the Impact
Standard and roller shutter doors on internal buildings should be closed at all times when not in use to prevent the escape of odour into the wider site, which could arise from various sources including processing activities and debris. All activities that produce odour should be confined internally. Storage of odorous materials should be kept away from the site boundary fencing where possible, especially if the site is located near to natural habitats.
Environmental housekeeping should be followed to avoid and minimise odours e.g. daily sweeping of internal and external surfaces, wheel washers for vehicles before leaving the facility, and daily hosing down of the external site to minimise the number of potential odours sources.
Physical olfactory checks should be undertaken frequently (daily or weekly dependent on the site risk) where identified staff members walk around the site facility perimeter to determine if odour is present at the site boundary, which may be also present in the local environment. Upon identification of areas with odours, mitigation and rectification steps should be applied. This may include installing odour management equipment that extract odour using carbon filters and wet scrubber technology. This could also include chemical odour control systems (the release of synthetic odours) to improve the odour detected where applicable. The olfactory checks should be undertaken and documented using a checklist or similar. These checklists should be retained on-site.
Specific training should be provided to all relevant site staff on Standard Operating Procedures (SOPs). All the SOPs should be included as part of an environmental management system e.g. certified to ISO 14001 and/or a site environmental plan/working plan. The Site Manager and/or other relevant staff should be identified as the key point of contact, and the messaging within the SOP should be disseminated to all site staff. Frequent communication should be maintained on the importance of odour prevention and management. This may be during staff meetings and internal company publications.
Relevant legislation such as the Environmental Permitting Regulations England and Wales (2016) should be met in regard to all material storage.

Liquids and Leachate

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Recommended Actions to Reduce and Eliminate the Impact
Environmental Permitting Regulations 2016 should be met in regard to draining and bunding. Areas of material storage should have draining lines to ensure there is no escape of liquids and leachate outside the site boundary.
Spill kits should be present on-site. These may be wheelie bins filled with absorbent socks, absorbent cushions, absorbent pads and sawdust for oil-related spillages. The spill kits should be stored close to material storage areas and key process areas and should be easily accessible. It is important that spill kits are not blocked by doors, furniture or vehicles or other items.
Specific training should be provided to all relevant site staff on Standard Operating Procedures (SOPs) and all the SOPs should be included as part of a good environmental management system e.g. certified to ISO 14001 and/or a site environmental plan/working plan. The Site Manager and/or any other relevant staff should be identified as the key point of contact, and the messaging within the SOP should be disseminated across all site staff. Frequent communication should be maintained on the importance of liquid and leachate management. This may be during staff meetings and internal company publications.
All landfill sites should have a Leachate Management System that captures leachate from all landfill cells and sets out its safe collection and discharge.
All facilities should have an appropriate drainage system which complied with the Environmental Permitting Regulations (2016). This is likely to include bunding which surround waste storage areas and a drainage system which can be sealed in the event of an emergency, accident or spillage.

Chemicals

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Recommended Actions to Reduce and Eliminate the Impact
Classification, Labelling and Packaging of Substances Regulations (CLP) 2016 should be met.
Spill kits should be present on-site. These may be wheelie bins filled with absorbent socks, absorbent cushions, absorbent pads and sawdust for oil-related spillages. The spill kits should be stored close to material storage areas and key process areas and should be easily accessible. It is important that spill kits are not blocked by doors, furniture or vehicles or other items.
Specific training should be provided to all relevant site staff on Standard Operating Procedures (SOPs) and all the SOPs should be included as part of a good environmental management system e.g. certified to ISO 14001 and/or a site environmental plan/working plan. The Site Manager and/or any other relevant staff should be identified as the key point of contact, and the messaging within the SOP should be disseminated across all site staff. Frequent communication should be maintained on the importance of chemical management. This may be during staff meetings and internal company publications.
An appropriate off-taker route should be used. Any off-taker should be appropriately permitted and licenced to accept the waste material. Waste should be managed and transported in line with the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations (2009) and comply with ADR where applicable.

Vehicle Transport Emissions

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Recommended Actions to Reduce and Eliminate the Impact
Vehicles should strive to use alternative fuels e.g. biofuels, biomethane (that can be produced from the raw landfill gas or is a by-product of waste treatment processes such as Anaerobic Digestion). Consideration should be given towards the use of electric vehicles (EVs).
Route planning software and other digital software should be used to plan vehicles routes and ensure transport of waste is undertaken on the most efficient and economical routes.
Vehicles should be loaded to full capacity or as close to full capacity as possible to minimise the number of journeys required. Vehicles should be turned off when not in use.
Vehicle size/type should be selected which is appropriate to the waste type and volume which needs to be moved.
The use of electric forklift trucks for on-site transport and waste movements should be considered and implemented where possible.
Material off-takers should be selected based on the proximity principle to prevent unnecessary transportation.

Landfill

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Recommended Actions to Reduce and Eliminate the Impact
All landfill gas should be managed and contained in accordance with the relevant legislation and regulatory framework. This could be through the use of liners and pipework which is considered during landfill design or redevelopment.
All landfill sites should have a Leachate Management System that captures leachate from all landfill cells and sets out its safe collection and discharge.
Specific training should be provided to all relevant site staff on Standard Operating Procedures (SOPs) and all the SOPs should be included as part of a good environmental management system e.g. certified to ISO 14001 and/or a site environmental plan/working plan. The Site Manager and/or any other relevant staff should be identified as the key point of contact, and the messaging within the SOP should be disseminated across all site staff.
Relevant legislation such as The Landfill Regulations (2002) should be met in regard to landfill construction and management.
Consider the use of landfill gas upgrading technologies to convert waste raw biogas into a source of fuel or energy.

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