

Materials to Land in the Circular Economy

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Every day SEPA works to protect and enhance Scotland's environment, helping communities and businesses thrive within the resources of our planet.



We call this **One Planet Prosperity**

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Introduction

Many industries produce materials which, though not the primary product, have valuable further uses. 'Secondary materials' such as manures and slurries, compost and digestate, sewage sludge and outputs from the whisky and brewing industries may be substituted for virgin raw materials and are commonly used on land to improve agricultural soils, restore landfills and vacant and derelict land and create new places and habitats. Legislative controls may apply to the use of some types of secondary material depending whether it is classed as a production residue (by-product) or waste.

SEPA's Waste to Resources Framework¹ recognises that the most successful countries in the 21st century will be resource efficient, circular economies which keep materials in use for as long as possible and extract maximum value from them.

Recycling nutrients and organic matter in a truly sustainable way, respecting environmental limits and increasing the resilience of Scottish business, is vital to developing a circular economy and SEPA is committed to playing our part in making it a reality.

Such an approach will require new evidence, innovation across supply chains, and a simpler, more outcome-focussed regulatory framework. In re-evaluating current practice, new opportunities and markets will emerge for those willing to innovate. SEPA will use all its influences to support those who want to make the best of Scotland's material resources in land management but we will not shy away from enforcement where necessary to prevent environmental harm and the illegal disposal of waste.

This framework describes SEPA's approach to the application of secondary materials to land. The actions will help us to understand the needs of Scotland's land managers, the materials available in the market and their uses, the environmental benefits and impacts of land application and inform the development of a modern, integrated regulatory framework.

This framework applies to the use of secondary materials on agricultural and non-agricultural land for benefit, including land restoration such as former open cast coal sites and landfills. It does not apply to the use of soils in construction.

¹ <https://www.sepa.org.uk/media/219528/one-planet-prosperity-a-waste-to-resources-framework.pdf>

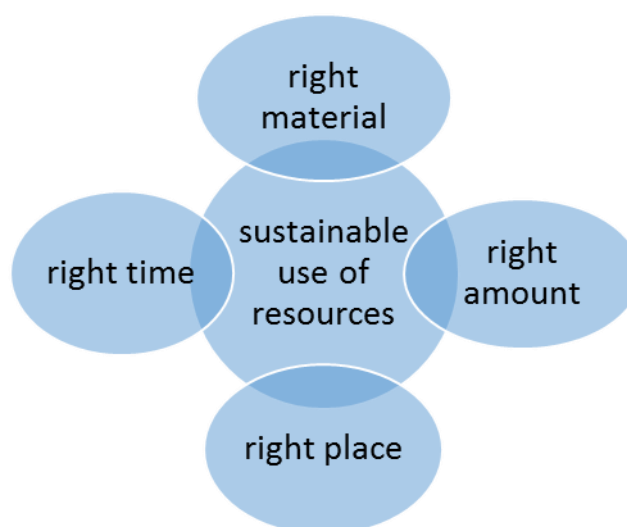
Explore all options

Successful, resilient companies are those who use both primary and secondary materials in the most economically and environmentally beneficial way as a resource. Businesses who produce secondary materials that are currently applied to land should regularly review all the options available to them and consider which is the best in terms of identifying and maximising the value inherent in the material. Although land application may have been the historical “best” option there is evidence to suggest that land application of certain materials in its current form may present risk of environmental harm, e.g. through accumulation of metals or plastics in soil. Businesses need to take more responsibility for the material they produce or apply to land in terms of quality and quantity. Going forward there may be a better way of using the material:

- as a raw material in a manufacturing process, e.g. new technology may allow the creation of biofuel from pot ale
- by extracting value from the material, e.g. phosphorus from sewage sludge

If the assessment determines that the best environmental and economical use of the material is application to land then it should be the best quality possible and used in a way that maximises this value. The provision of high quality nutrients and organic matter in materials should be matched with a low risk of contamination by physical, chemical and biological agents.

Materials to Land- Four Key Criteria



SEPA considers that the use of materials on land is sustainable when the right material is used in the right place, at the right amount and at the right time. This applies across all materials, i.e. virgin

fertilisers, not just secondary materials. It includes manures and slurries, compost and digestate, sewage sludge and outputs from the whisky and brewing industries. SEPA has a regulatory role where the material being applied to land is waste or where its application, if uncontrolled, could cause pollution of the water environment.

Right material: Upstream opportunities and innovations have been explored to help decide that land application is the best use for the secondary material. It is high quality - physically, chemically and biologically. It provides valuable nutrients and organic matter for growing crops or vegetation and/or improves the properties of soil. It does not harm soil or human health or transfer harmful substances into the water environment or the atmosphere. It is valued by end users.

What does success look like? Some secondary materials are no longer spread to land and instead are directed to higher value uses. At the same time, high quality organic-derived materials are used instead of inorganic fertilisers where possible. The intended future use of the land is clearly defined, whether a succession of crops in a rotation or restoration of land for new habitat and materials are chosen specifically to meet the needs of the receiving land. Up-to-date information on nutrient content and any contamination risk is available to land managers so they can make informed decisions. Research is being undertaken to understand emerging risks from contaminants in secondary materials spread to land (e.g. antimicrobial resistance, persistent organic pollutants).

Right amount: The right amount is enough to provide the necessary benefit while respecting legal and environmental limits and adhering to good agricultural and land management practices. It is determined through the development of soil and nutrient management plans. Where environmental impact outweighs benefit, the material is not applied to land. Producers and users understand how much is required and do not over apply materials “just in case” or as a means of “getting rid of it”.

What does success look like: Land managers carry out soil testing and understand the needs for their planned land use of their soil, the composition of the materials and how much to apply. Land managers have well developed soil and nutrient management plans identifying where each material can play a part and the safe and sustainable application rates. The chain of management is transparent, with waste producers, consultants, spreading contractors and analytical service providers all clearly identified and fully complying with their duties. Where necessary, individuals involved in spreading have appropriate training, qualifications and experience. Following research into nutrient availability, land managers are more confident of how much of each major nutrient each

material delivers. Land managers consider the cumulative impact of all the materials being applied to land.

Effective, practical and user friendly soil and nutrient management plans are beneficial to business and not just seen as something produced to meet a regulatory requirement. The plan is a living document, which informs and guides decision making efficiency, profitability and environmental gains.

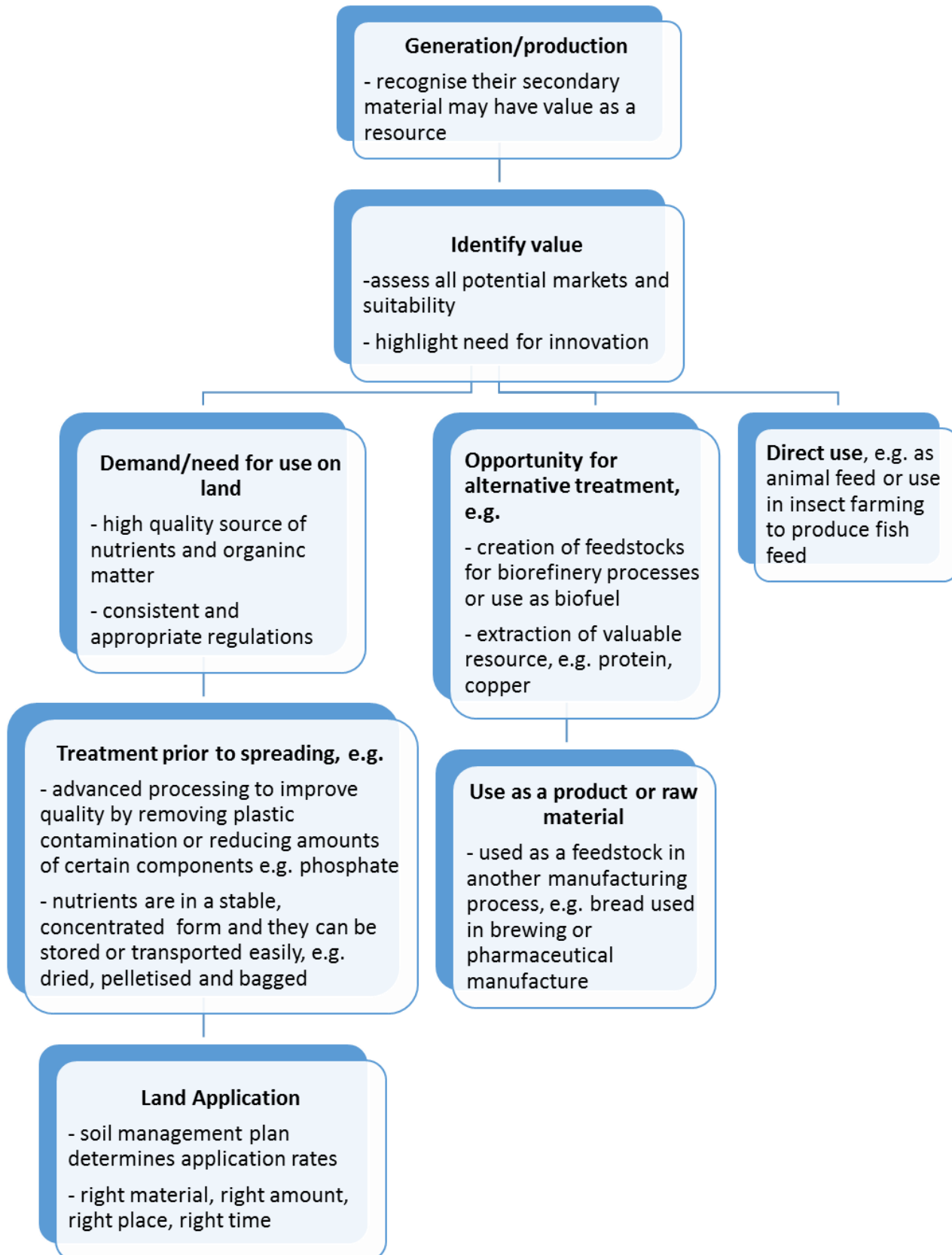
Right place: Material is not stored or applied where it will adversely affect sensitive receptors and in accordance with diffuse pollution rules. Storage facilities are located, designed and constructed to a high standard to protect the environment. Secondary material is applied where there is an established need for it and the benefits it provides.

What does success look like? Land applications are carried out in line with legal requirements and best practice and do not cause pollution. Communities are not affected by odour or other nuisance from storage and spreading. Analyses of soils and materials applied demonstrate a need for the material at the locations and no spreading is carried out in locations with unsuitable soil properties.

Right time: material is applied when the most benefit can be gained from the application. This is when there is a vegetation need and is not when the ground is wet or frozen.

What does success look like? Materials are treated so that they are easier to store, transport and handle, meaning that they can be applied when needed - for example, wet sludges are dewatered, ash is pelletised etc. Properly designed and constructed facilities are in place to ensure there is enough capacity to store materials until they are needed. All land managers are aware of suitable conditions for spreading materials to land.

Supply Chain



How will success be achieved?

This framework will be delivered through relevant sector plans. Sector planning will highlight geographic areas competing for the same landbank, where sectors closely linked to land management are geographically co-located and where an output of one sector could be a useful input for another.

This framework will be reviewed annually to assess progress.

Outcome	Action
Innovation drives best resource utilisation	<p>We will work with industry, partner agencies and R&D resources to research, develop and promote efficient and sustainable alternative uses of material.</p> <p>We will look at the end of waste status for alternative uses and processed materials to encourage uptake.</p>
Legal controls: get the legislation right	<p>Short term: we will improve the way we assess materials to land activities currently, considering the sustainable use of resources through right material, right amount, right place, and right time criteria.</p> <p>Appropriate action is taken on operators that don't comply with the regulations.</p> <hr/> <p>Long term:</p> <ul style="list-style-type: none"> • Redesign materials to land regime as part of SG-SEPA's joint programme for regulatory reform. • The regulatory regime is joined up across all media and materials and is a more proportionate approach to the use of material on land. The new system delivers better protection for the environment while supporting sustainable use of resources, providing a clear role for all parts of SEPA to assist in the delivery of One Planet Prosperity.
Legal controls: clearly explained and consistently applied so that	Examine existing guidance and training available to ensure it is fit for purpose and applied consistently.

producers, operators and end users know what they must do and what to expect from SEPA.	Ensure the waste duty of care obligations are complied with throughout the supply chain.
Quality controls: material producers will regularly assess the quantity and quality of what they produce. This information is used by land managers to control when and where it is applied to land.	We will develop guidance on what the “right material” looks like in terms of physical, biological and chemical characteristics for materials most applied to land and identify potential risks to the environment and human health from the use of this material.
	We will audit compliance with end of waste specifications for compost and digestate.
Science and evidence: <ul style="list-style-type: none"> • Increased knowledge of the balance between material generated and the landbank available to receive it. Knowledge used to highlight potential over- supply of certain materials. • The evidence and data used to control the use of materials on land (e.g. soil and material analysis) is robust and supports regulatory decision making. 	SEPA will carry out a landbank assessment to quantify and locate the national and regional capacity of agricultural (and other) land to accept organic materials and to identify the potential shortage or surplus of available land for recycling organic materials.
	Develop a SEPA database of material and soil (quality, production, application, amount, place from/to, hazards) which detects changes before the benefit to the land is affected.
	We will engage with research bodies and specific sectors/materials to support research into emerging issues, e.g. antimicrobial resistance, pharmaceuticals, persistent organic pollutants, plastics, etc.
	We will continue to audit operator sampling and analysis of waste materials spread to land and the soils that these materials are applied to. This will help us to establish the level of accuracy of the data we are receiving and, where this is unsatisfactory, take action to resolve this.
We will engage with research bodies to establish to establish what percentage of nutrients in the different materials is actually available to the crop in the first and second year, so that farmers can properly take account of	

	this and determine the crop/vegetation requirement so these can be matched.
Management controls: materials are valorised in terms of the benefits they provide and information is available on how to maximise the benefits when applied to land.	Work with producers and research bodies in key sectors to identify value and opportunities for specific material streams.
	Support the development and implementation of quality assurance schemes such as the Biosolids Assurance Scheme (BAS), the Compost Certification Scheme and the Biofertiliser Certification Scheme.

