



# Guidance note: Assessing the application of residue wastes to land

## Overview

This document provides an overview of the criteria used by the Department of Environment and Conservation NSW (DEC) to assess requests for exemption from the prohibition on applying residue wastes to land.

DEC and the NSW Department of Primary Industries (DPI) have jointly developed the 'Residue Wastes Regulation' as a precautionary approach to the application of certain wastes to land for the purpose of growing plants. The new regulatory requirements commence on 1 December 2005, and form part of the Protection of the Environment Operations (Waste) Regulation.

NSW Government policies on sustainability include encouraging beneficial uses for wastes rather than simply disposing of them. However, this is only appropriate where the waste materials can be safely reused or recycled and where such use would not cause harm to agriculture, the environment or human health.

The Residue Wastes Regulation aims to clearly distinguish the beneficial use of wastes from practices which may be harmful. The Regulation prohibits the application to land of certain industrial by-product wastes for the purpose of growing plants. Where it can be shown that those wastes will not cause harm to agriculture, the environment and human health, and will be of benefit to agriculture, DEC will grant an exemption from the prohibition.

DEC may grant specific or general exemptions. Exemptions may be granted with conditions, including limits on contaminants, time, place, method and rate of application, waste source and so on.

The criteria used by DEC to assess an application for exemption are described in Part 1 of this document. The information that must be provided in support of an application for exemption is provided in Part 2.

Exemptions granted by DEC will be listed on the DEC website, including any conditions that must be complied with.

## What activities are covered under this proposal?

The Residue Wastes Regulation prescribes certain materials as 'residue wastes' and makes it an offence to apply those wastes to land for a purpose related to the growing of vegetation, including but not limited to land used for agricultural, horticultural, silvicultural, pastoral or environmental rehabilitation purposes. In the regulation, 'apply to land' is defined as including, but is not limited to:

- spraying, spreading or depositing on land, or
- ploughing, injecting or mixing into land.

## List of prohibited wastes

The following substances have been identified as residue wastes and are prohibited from being applied to land for growing plants:

- residues from any industrial or manufacturing process that involves the refining or processing of metals or metallic products
- fly ash or bottom ash from any furnace
- lime or gypsum residues from any industrial or manufacturing process
- residues from any industrial or manufacturing process that involves the processing of mineral sand
- substances that have been used as catalysts in any oil refining or other chemical process
- foundry sands and foundry filter bag residues
- any other waste that is defined as hazardous, industrial or Group A in the Interpretative Provisions of the *Protection of the Environment Operations Act*.

Any substance which incorporates, is mixed with or made from any residue waste is also prohibited from being applied to land. For example, if a residue waste has been used as an input to a compost or horticultural product, those composts or horticultural products are prohibited from being applied to land unless an exemption has been granted to allow such use.

Prohibited substances are to be regulated as wastes and cannot be applied to land until DEC has issued an exemption from the regulation.

A key exemption from the regulation applies to lawfully sold fertilisers, liming materials and trace element products that are regulated under the *Fertilisers Act 1985*. These remain subject to the requirements of that Act, including any labelling requirements and compositional standards.

## Timeframe and assessment process

DEC would seek to make a determination on a proposal (i.e. approve or reject an application for exemption) within three months of receipt of all the information needed to complete the assessment. This would include consultation with DPI on agricultural benefits and impacts.

There will be no fee charged for the assessment of exemption applications prior to the 1 December 2005 commencement date. After that time, a cost recovery fee may be charged.

Applications for exemption should be sent to:

Manager Waste Management Section  
Department of Environment and Conservation  
PO Box A290  
Sydney South NSW 1232

For any inquiries, please telephone the Waste Management Section on (02) 9995 5622.

# Part 1: Criteria for considering an application for exemption

DEC encourages the application of waste materials to land for the purpose of growing plants where such use is of benefit to agriculture<sup>1</sup> and does not cause harm to the environment, agriculture or human health. The Regulation prohibits the de facto disposal of residue wastes to land under the guise of beneficial use.

Where a residue waste or a substance made from, mixed or blended with a residue waste is proposed to be applied to land, DEC uses the following criteria to assess whether this comprises a genuine beneficial reuse opportunity.

## 1 Is application of the material to land beneficial to growing plants?

Where it is proposed that a residue waste be applied to land for the purposes of growing plants, the proponent must clearly describe the beneficial nature of the material. For example, the proponent would need to show that the material provides desirable nutrients to growing plants or beneficial changes to the physical, chemical or biological characteristics of the soil.

## 2 What contaminants are likely to be present and will they or other attributes of the material cause harm?

Depending on the nature of the process generating the residue waste, there is the potential for a range of contaminants to be present. Before DEC can consider whether a residue waste (or a substance incorporating residue waste) can be safely applied to land, the proponent will need to have identified all likely contaminants (including their likely concentration range in the material) or other limiting attributes (such as adverse effects on pH, salinity or soil structure). The proponent must provide information that shows that any such contaminants or limiting attributes will not cause harm to agriculture, human or animal health or the environment. This would take into account the proposed method of application, suitability of the receiving environments and recommended maximum rate of application or any other relevant factor.

In some instances, the ingredients of a residue waste which provide benefit to plant growth may also cause harm at certain concentrations or rates of application. For example, soils may be deficient in certain micronutrients, but only small amounts may be needed to mitigate that deficiency. Excessive application of the micronutrients could in some circumstances lead to degradation of the environment or adversely affect agriculture, rather than provide a benefit. Application rates of the material to supply micronutrients should therefore be based on plant or soil requirements to avoid any adverse effects on crop growth or the environment.

Consideration of this criterion must therefore address the issue of contaminants in a broad sense, noting whether maximum concentrations or application rates are proposed, even for desirable components of the material.

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<sup>1</sup> Agriculture in this context includes the production and management of soil, crops, vegetation and livestock.

### **3 Has a specification, standard or agreement between the producer and users of the material been developed (and presented to DEC) to ensure the material is 'fit for purpose'?**

DEC does not generally support the application of one-off batches of waste to land.

DEC strongly encourages proponents or industry associations to develop specifications and quality assurance / quality control (QA/QC) programs for the material they wish to apply to land, including parameters for its appropriate use. These help ensure that the materials to be used are well-characterised and of a consistent quality. Where this information is not provided, it will be difficult for the proponent to establish that the material will provide ongoing benefits and not cause harm through its application to land.

### **4 Has the application of the residue waste to land been permitted in another Australian jurisdiction?**

DEC will consider exemptions or approvals which have been issued by other Australian jurisdictions where comparable assessment has been undertaken and relevant factors have been addressed to the Department's satisfaction. DEC will generally provide exemptions that facilitate uses of materials already approved in other Australian jurisdictions.

#### **Additional matters to consider**

In addition to the above assessment criteria, information must be provided by the proponent on the following:

- a) Whether and how the application of an exempted residue waste to agricultural land will conform with good agricultural practice. This includes, but is not limited to:
  - o ensuring application rates are consistent with agronomic and soil requirements
  - o demonstrating that the proposed application rates will not adversely affect soil health
  - o minimising the potential for beneficial components of the material to be lost or rendered unavailable in the soil prior to utilisation by plants. This is particularly true for nitrogen which can be volatilised or denitrified under particular environmental conditions; phosphorus also has the potential to be fixed in the soil
  - o accounting for soil moisture status when incorporating the material to minimise the potential for soil structural degradation
  - o considering any risk to grazing animals in terms of exposure to or ingesting residue waste materials. Where a risk to animal health has been identified, the proponent will need to show how this risk will be reduced to an acceptable level (e.g. withholding periods).
- b) Where an exemption has been issued with conditions, how all parties using the substance will be made aware of those conditions and how the proponent will ensure that the relevant conditions are complied with.

#### **Outcome of DEC assessment**

To be considered appropriate for an exemption, criteria 1 to 3 must be met and satisfactory information must be provided on the additional matters. Dilution of residue wastes to reduce contaminant levels to meet relevant specifications, standards or conditions is not acceptable. It

is also unacceptable to stockpile material for prolonged periods at the site prior to its land application.

Where these requirements are met and an exemption is granted (with or without conditions), the substance would not be regulated as a waste once it is received at the land application site. The land application site would not need to be licensed and the waste levy would not be applicable.

Where any of the first three criteria or other requirements are not met, and an exemption is not granted, the substance is a waste for regulatory purposes and may not be applied to land.

## **Part 2: Information required to support an application for exemption**

The following advice is provided to guide proponents in their preparation of submissions to apply residue wastes to land for the purposes of growing plants. DEC will not be able to consider an application for exemption from the prohibition unless complete and accurate information is provided.

### **General background information**

- Proponent's details
- Outline of the proposal
- Details on the generation, sources and origins of the substance
- Details on the transfer, storage, processing/treatment of the substance (where applicable)
- Details of the physical and chemical composition of the material (including contaminants, where applicable)
- Details of the predicted volume and consistency of supply of the substance
- Details on the quality control of the substance
- Details of any existing industry guidelines or standards and how these are to be applied
- Any other information supporting consideration of the material as 'fit for purpose'.

### **Specific information relevant to the assessment criteria**

#### **1 Is application of the material to land beneficial to growing plants?**

- Details of how the proposed use will deliver improved plant growth (e.g. quantified changes to soil nutrient status, nutrient availability, structure, water holding capacity, or acidity etc.). Include supporting soil and/or plant yield or composition data where it is available.
- Details on the proposed method of application, including recommended and maximum quantities and rates of application.
- Information on the vegetation proposed to be grown on the land treated with the substance, including type of vegetation (e.g. salt tolerant species, wheat crop, tableland pasture grasses, plantation eucalypts) and information on the end use of those plants (e.g. whether

they are to be harvested and removed from site, for human or animal consumption, to be sold for ornamental purposes, etc.).

## **2 What contaminants are likely to be present and will these contaminants cause harm?**

- Representative characterisation and quantification of the concentration ranges of chemical and physical contaminants contained in the material. Identifying a maximum concentration for contaminants is essential.
- Details of any pre-treatment the material will undergo to remove contaminants.
- Indicative concentrations of pollutants that will be produced when the material is applied to land (e.g. via leaching of contaminants, odour and other air emissions).
- Description of any proposed measures to mitigate potential impacts, such as any restrictions to ensure the proposed use is not likely to result in unacceptable risk of harm to the environment, human or animal health or agriculture.
- Any history of similar material causing longer-term effects.

The following information would be needed where the material is proposed for application in specific receiving environments or, for general exemptions, where it is likely to be harmful in certain receiving environments:

- The suitability of the proposed sites for receiving the material, by providing information on factors such as:
  - maximum slope
  - areas of undesirable drainage
  - depth to bedrock
  - surface rock outcrops
  - vegetation
  - buffer zones
- Information on the following soil characteristics (as appropriate):
  - soil profile description—including texture profile
  - pH
  - electrical conductivity (saturation extract)
  - organic carbon content
  - exchangeable cations ( $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{Al}^{3+}$ ) and CEC (cation exchange capacity)
  - nutrient status (N, P, K)
  - concentrations of trace elements and contaminant metals
  - soil water regime (e.g.  $K_{\text{sat}}$  and water holding capacity)
  - mineralogy
  - structural stability
  - lime requirement.

For an agricultural application, information will also be needed to address:

- the relationship between contaminants in the soils and contaminant levels in the associated crops and grazing animals, as appropriate
- an estimate of the additional consumer intake of the contaminants as contributed by the land application of the substance over an identified time period
- an estimate of the anticipated contaminant concentration in the root zone or ploughing zone of soils for the period the material is intended to be used; this can be calculated by estimating the likely depth of the ploughing or root zone (metres), bulk density of the soil (kilograms per cubic metre) and the likely application rate of contaminant in the material (kilograms per hectare)
- an estimate of any risk to grazing animals in terms of exposure to or ingesting the material. If a risk is present, the proponent will need to describe steps to mitigate the risk.

The NSW Biosolids Guidelines (*Environmental Guidelines: Use and Disposal of Biosolids Products*) provides an approach for calculating nitrogen and contaminant limiting application rates which may provide some assistance.

Material Safety Data Sheets for all inputs used in the process which has generated the residue waste may provide useful information on the likely contaminants. To ensure that testing is focused on potential contaminants of concern, rather than requiring more broadscale testing, applicants may like to contact the Head, Waste Technical and Data Unit before finalising testing and analysis requirements (call 02 9995 5000).

Depending on the nature of the process and proposed application of the residue waste, DEC may require additional contaminants to be tested for or may reduce contaminant testing where previous work is already available. Where an assessment of likely contaminants has not been undertaken, DEC will not assess an application for exemption.

The validity of all data delivered to DEC must be either signed off or certified by the party or parties undertaking the testing and sampling. Where appropriate, data should be sourced from a laboratory accredited by the National Association of Testing Authorities, Australia (NATA) or an equivalently accredited body.

All testing must provide representative data and deliver information which is appropriate for assessing the identified contaminants. Further guidance on sampling to obtain representative results can be obtained from DEC's Waste Management Section (general waste sampling, see Technical Appendix 1 of *Environmental Guidelines: Assessment, Classification & Management of Liquid and Non-liquid Wastes*; Environment Protection Authority 1999) or the Australian Standards that address bulk material sampling.

If the material is to be obtained from a number of different sources or if there is potential for variability in the makeup of the proposed material, representative samples from each source will need to be obtained and analysed. When assessing the results of the analysis, potential contaminants will need to be within agreed parameters for each batch.

### **3 Has a specification, standard or agreement between the producer and user of the material been developed (and presented to DEC) to ensure the material is 'fit for purpose'?**

- Any existing and recognised or proposed specifications or standards with which the activity will comply or according to which the substance will be reused, processed or treated to ensure the substance is 'fit for purpose'.
- Quality assurance / quality control (QA/QC) systems in place (at the production end of the waste) to ensure consistency of contaminant levels, quality and quantity of supply over time.

- Other parameters as relevant to demonstrating that the material is ‘fit for purpose’.
  - A material specification sheet.
  - Any monitoring proposed to ensure the material delivers ‘fit for purpose’ outcomes over time. Note, where there is uncertainty surrounding a proposed use or where a substance may only be used within restricted circumstances, DEC may impose monitoring requirements to ensure that the proposal delivers appropriate outcomes.
  - Check that suitable analytical and test methods are available to measure contaminants with acceptable accuracy at the proposed standard, guideline or specification levels.
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Published by:  
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DEC 2005/229  
ISBN 1 74137 379 4  
June 2005  
Printed on recycled paper