

Environment Protection Authority

# Standard for the production and use of Waste Derived Fill

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## **Standard for the production and use of Waste Derived Fill**

For further information please contact:

Information Officer  
Environment Protection Authority  
GPO Box 2607  
Adelaide SA 5001

Telephone: (08) 8204 2004

Facsimile: (08) 8124 4670

Free call (country): 1800 623 445

Website: <[www.epa.sa.gov.au](http://www.epa.sa.gov.au)>

Email: <[epainfo@epa.sa.gov.au](mailto:epainfo@epa.sa.gov.au)>

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# Abbreviations

<b>AQIS</b>	Australian Quarantine and Inspection Service
<b>C&amp;D Waste</b>	Construction and Demolition Waste
<b>CCA</b>	copper chromium arsenic
<b>CoP</b>	Code of Practice
<b>DTEI</b>	Department for Transport Energy and Infrastructure
<b>EP Act</b>	Environment Protection Act 1993
<b>EPA</b>	South Australian Environment Protection Authority
<b>EPP</b>	environment protection policy
<b>LBSC Regulations</b>	Land and Business (Sale and Conveyancing) Regulations 1995
<b>NATA</b>	National Associated of Testing Authorities, Australia
<b>NEPM</b>	National Environment Protection Measure
<b>NRM</b>	Natural Resources Management (SA)
<b>NRM Act</b>	Natural Resources Management Act 2004
<b>OCPs</b>	organochlorine pesticides
<b>PCB</b>	polychlorinated biphenyls
<b>PCA</b>	potentially contaminating activities (prescribed in Environment Protection Regulations 2009)
<b>PIRSA</b>	Department of Primary Industries and Resources SA
<b>QA/QC</b>	quality assurance and quality controls
<b>RPP</b>	recovered products plan
<b>WDF</b>	waste derived fill
<b>W2R EPP</b>	Environment Protection (Waste to Resources) Policy
<b>WQ EPP</b>	Environment Protection (Water Quality) Policy 2003
<b>ZWSA</b>	Zero Waste SA



# Summary

This standard describes the information and processes that are required by the Environment Protection Authority (EPA) to support the beneficial reuse of a range of wastes specifically recovered for use as fill.

This standard will be used to help assess proposals and determine compliance with the *Environment Protection Act 1993* (EP Act) to ensure that the production and use of waste derived fill constitutes a genuine waste resource recovery and reuse activity, as distinct from waste disposal.

The document aims to provide clarity to industry and the broader community on the issues that need to be addressed to demonstrate the suitability of the proposal to use fill taking a balanced risk-based approach. This includes the need for quality assurance measures, demonstration of beneficial properties and minimising the risk of harm.

## **Wastes for use as fill**

Three sources of waste material are described as being potentially suitable for use as a waste derived fill (WDF): waste soil proposed for direct reuse, processed Construction and Demolition Waste (C&D Waste), and an homogenous mineral-based industrial residue.

The scope of waste materials potentially suitable for use as fill is intentionally narrow as the WDF must be similar to virgin solid mineralogical materials naturally present in the soil profile (such as inert soil, rock, sand and silt). The WDF can be used to beneficially supplement or replace the virgin materials provided it does not cause harm to the environment or human health.

Waste soils or industrial residues received at an authorised recycling facility for use in a WDF are subject to the requirements for WDF produced from C&D Waste. Any soil-based material produced from mixed waste recycling [eg material recycling facilities receiving Commercial and Industrial Waste (General)], including secondary or residual by-products, must be assessed as an industrial residue.

If an industry wishes to develop a waste management plan for their sector demonstrating the suitability of a specific waste stream for one or more uses, this may be able to be developed and agreed with the EPA as a Code of Practice (CoP) on a whole-of-industry group basis. A CoP must specify appropriate uses, suitable receiving environments and the controls required for a specific waste type based on rigorous scientific research and risk assessment. This may then reduce the need for site-specific assessments and submissions to EPA to be made on each occasion.

## **Risk-based approach**

The EPA has testing, submission and approval requirements for WDF that apply a risk-based approach with consideration to both the chemicals present within the WDF and the source of the waste.

Default chemical criteria for reuse of these wastes as WDF are provided. The three levels of chemical criteria are:

- 1 WDF that does not exceed the chemical criteria for Waste Fill, as specified in clause 3(1) of the *Environment Protection Regulations 2009*. This WDF is indicative of a low-risk material for use as fill.
- 2 WDF that exceeds this low-risk criteria, but does not exceed an upper level criteria (ie Intermediate Waste Soil criteria). For this WDF, the standard provides a mechanism for a site-specific risk-based approach for the proponent to employ to assess the potential to allow the use waste as a fill product.
- 3 Finally, waste materials that exceed the criteria for Intermediate Waste Soil are not permitted to be used as WDF. This is a policy decision to ensure these higher-risk waste materials are disposed to a specifically authorised and secure landfill.

The nature of sites permitted to receive WDF differs according to the source of the WDF. For example, industrial residues are not permitted for reuse at sensitive sites such as childcare centres and residential properties. This policy decision is

based on the nature of materials that should be expected at such sites. In addition, there are restrictions as to who can certify the use of WDF at sensitive sites. When the WDF is waste soil sourced from a site where a potentially contaminating activity (as defined in regulation 50 and schedule 3 of the Environment Protection Regulations 2009) has or is occurring, only a site contamination auditor (auditor) accredited under Division 4 of Part 10A of the EP Act is permitted to certify its use at a sensitive site. A site contamination consultant can only certify its use at a non sensitive site. This is consistent with the requirements that only an auditor can certify a change in land use to a more sensitive use.

### ***Public disclosure***

The *Land and Business (Sale and Conveyancing) Regulations 1995* (LBSC Regulations) place obligations upon site owners and the EPA in relation to disclosure of information regarding materials present at a site and any relevant environmental assessments conducted. This information is collected to ensure public access to all relevant information for properties they may wish to purchase. This record also assists in ensuring any subsequent site assessment (eg when a site is proposed for rezoning to a sensitive land use) is made with full knowledge of the history of the site.

Section 103P of the EP Act places obligations on the EPA to place certain information, including site contamination audit reports, on the Public Register.

### ***Compliance requirements***

It is the responsibility of the proponents to ensure that they comply with all requirements of this standard.

This standard, along with use of the specific mechanisms of the recovered products plans (RPP) under EPA licence, will enable better management of risks and activities associated with waste recovery and reuse. It clarifies the EPA's position and expectations and the implications of waste reuse, including highlighting those implications related to other legislation such as site contamination in one document. It is designed to minimise the risk of potential harm to the environment and human health and will form an approved standard and specification for the purposes of the Environment Protection (Waste to Resources) Policy (see clause 4).

However, the EPA is not in any way endorsing or guaranteeing that the use of a WDF will confer any benefit stated by the producer. All obligations and responsibilities imposed by the EP Act continue to apply and a proponent may still be liable if harm arises from the use of a WDF. This includes harm that may result from issues that are not specifically addressed by this standard (such as nuisance from dust or noise), or from misuse or lack of compliance with particular requirements of the standard or those imposed by the auditor.

Failure to meet the requirements of this standard may result in the EPA determining that the material being produced or used remains a waste and is subject to regulation under the EP Act.



## **PART ONE**

### **INTRODUCTION**

# 1 Introduction

The Environment Protection Authority (EPA) promotes the sustainable management of waste<sup>1</sup> and recognises that particular waste streams may be suitable for beneficial reuse as fill. For example, waste soil or recovered aggregates could be used for levelling land associated with infrastructure development. However, potential risks to the environment<sup>2</sup> and human health may arise from the use of inappropriate waste materials or the filling of land in inappropriate locations (eg in sensitive areas). Therefore, in order for the EPA to support the sustainable<sup>3</sup> use of waste derived fill (WDF), and ensure it is distinct from waste disposal, proponents are required to address the considerations and comply with the processes outlined in this standard.

This standard has been drafted to support the objects of the *Environment Protection Act 1993* (EP Act)<sup>4</sup> and to complement the *Environment Protection (Waste to Resources) Policy* (W2R EPP)<sup>5</sup>. The EP Act and W2R EPP define waste and set out regulatory requirements for waste management activities. To support the beneficial reuse, recycling and recovery of wastes, the W2R EPP provides a mechanism by which a waste that meets specifications or standards published or approved in writing by the EPA will be considered a product instead of a waste. The EPA will use this standard as a guide to decide whether the material is a WDF product or a waste when determining whether there has been a breach of the general environmental duty<sup>6</sup>, the W2R EPP or other relevant provisions of the EP Act. This will also assist in determining the licensing requirements for activities that include the production of WDF.

In some circumstances, this standard requires the involvement of an auditor and submission of a site management plan and site contamination audit report (audit report) (section 6.1.3). However, this does not replace the regulator's role in ensuring appropriate processes are undertaken or relevant regulatory approvals and licenses are obtained.

This standard, including all of its requirements for submission of information to and approval from the EPA<sup>7</sup>, will form a published standard under the W2R EPP [see clause 4(b) of the W2R EPP]. When the W2R EPP becomes operational, materials that meet the standard, including composition specifications and all handling and approval obligations, will be considered products rather than wastes. This must be demonstrated in full prior to transfer to the reuse site. Until that time, the material remains waste and is subject to relevant regulation.

There will be a transitional period during which the existing processes for proponents to apply for a licence or limited purpose declaration<sup>8</sup> to be able to receive, store, treat or dispose of that waste will remain in place. Facilities which accept waste for the purposes of producing a WDF must be licensed under activity 3(3) Waste or Recycling Depot of Schedule 1 of the EP Act.

Key components of the standard include:

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<sup>1</sup> The term waste is defined under clause 3(1) of the EP Act and is reflected in the Glossary.

<sup>2</sup> The term environment is defined under clause 3(1) of the EP Act and is reflected in the Glossary.

<sup>3</sup> Principles of ecologically sustainable development are described under section 10 of the EP Act.

<sup>4</sup> <[www.austlii.edu.au/au/legis/sa/consol\\_act/epa1993284/](http://www.austlii.edu.au/au/legis/sa/consol_act/epa1993284/)>

<sup>5</sup> The consultation draft *Environment Protection (Waste to Resources) Policy* was open for public comment until 20 February 2009. Following consideration of submissions received, approval and proclamation of the EPP is required.

<sup>6</sup> Refer section 25 of the EP Act.

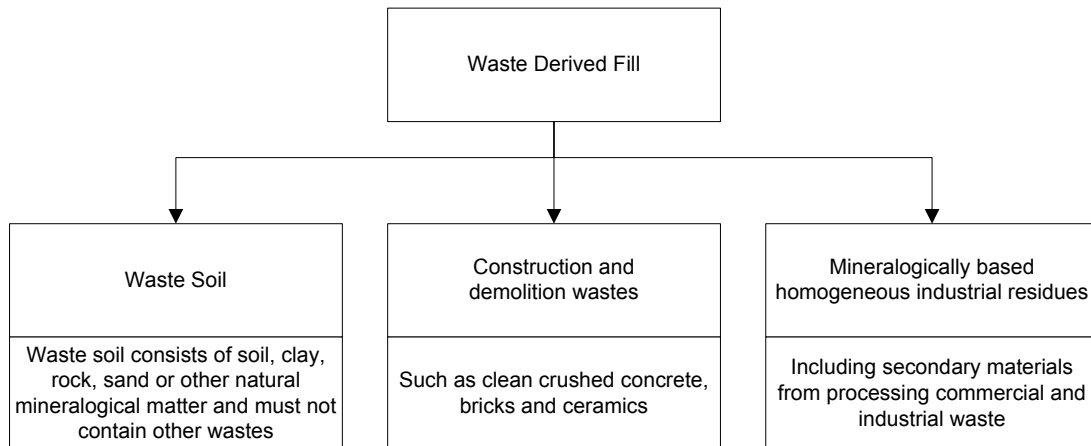
<sup>7</sup> EPA approval means a written response confirming that the requirements of this standard have been met, for example in relation to submission of the recovered products plan or site management plan where required, and that reuse may proceed in accordance with that plan, contingent also upon compliance with the Auditor protocol where applicable.

<sup>8</sup> In accordance with Part 6 and Schedule 1 of the EP Act.

- the need to demonstrate that the use of WDF is for a beneficial purpose rather than a means of convenient disposal and the associated avoidance of regulation and costs (refer section 3)
- the need to ensure that harm to the environment and human health is prevented or the risks minimised to levels acceptable to the EPA<sup>9</sup>
- a requirement for WDF to meet a defined specification that is suitable for the proposed use.

## 1.1 Scope

This standard applies to the beneficial reuse of the waste materials outlined in Figure 1, provided they are of acceptable chemical and physical quality:



**Figure 1 Materials potentially suitable for use as WDF<sup>10</sup>**

The scope of waste materials potentially suitable for use as fill is intentionally narrow as the WDF must be similar to solid mineralogical materials naturally present in the soil profile (such as inert soil, rock, sand and silt). Deposition to land of mixed waste or other wastes not demonstrated as suitable fill does not constitute a use of a WDF as intended by this standard; it is deposition of waste.

Waste soils or industrial residues received at an authorised recycling facility for use in a WDF are subject to the requirements for WDF produced from Construction and Demolition waste (C&D Waste). Any soil based material produced from mixed waste recycling [eg material recycling facilities receiving Commercial and Industrial Waste (General)], including secondary or residual by-products, must be assessed as an industrial residue.

If a proposed reuse application does not fit within this standard then the EPA will need to be contacted to enable an open and cooperative approach to determining whether there is a possibility for reuse or to discuss the most appropriate waste management option. There is also the potential to develop a code of practice (CoP) (refer section 1.1.1).

This standard is consistent with the process currently implemented by the EPA on a case-by-case basis for proposals to use WDF. As such, proponents currently producing or using WDF produced from industrial residues or through the use of waste soil should already have submitted a proposal to the EPA for assessment and endorsement; no further action would then be required. However facilities that do not have an approved recovered products plan (RPP) as detailed in this standard or any reuse occurring that is not in accordance with this standard, will be required to take further action in this regard.

<sup>9</sup> This must also be to the satisfaction of other relevant planning and health authorities.

<sup>10</sup> Minor amounts of naturally occurring inclusions such as wood or other vegetative matter are acceptable in waste soil.

### **1.1.1 Codes of practice for specific industry wastes**

In the circumstance that an industry sector would like to reuse a waste stream as WDF, or other waste derived product that is not addressed by this Standard, there is scope for that industry sector to develop a waste or industry specific CoP for approval by the EPA. The CoP may negate the need for each reuse site to gain individual EPA approval however this need would be replaced by stringent controls applied under that CoP.

The CoP would need to fit under the umbrella of this standard including meeting the principles and being able to provide the following as agreed on an industry basis for implementation:

- a product specification
- product and usage limitations
- a range of specified uses for which thorough risk assessments have been conducted
- specific controls to manage the risks.

Such proposals will need to have substantive research and information to support its development and will need to be developed closely with the EPA and any other relevant body with high level independent review. The CoP is not intended to be used as a reduced standard but is an alternative mechanism for achieving the outcomes addressed within this standard. Any industry sectors interested in developing a CoP should contact the EPA.

## **1.2 Process outline**

The flowchart in Figure 2 sets out the process that proponents need to follow in order to use WDF and gain specific approval where required.

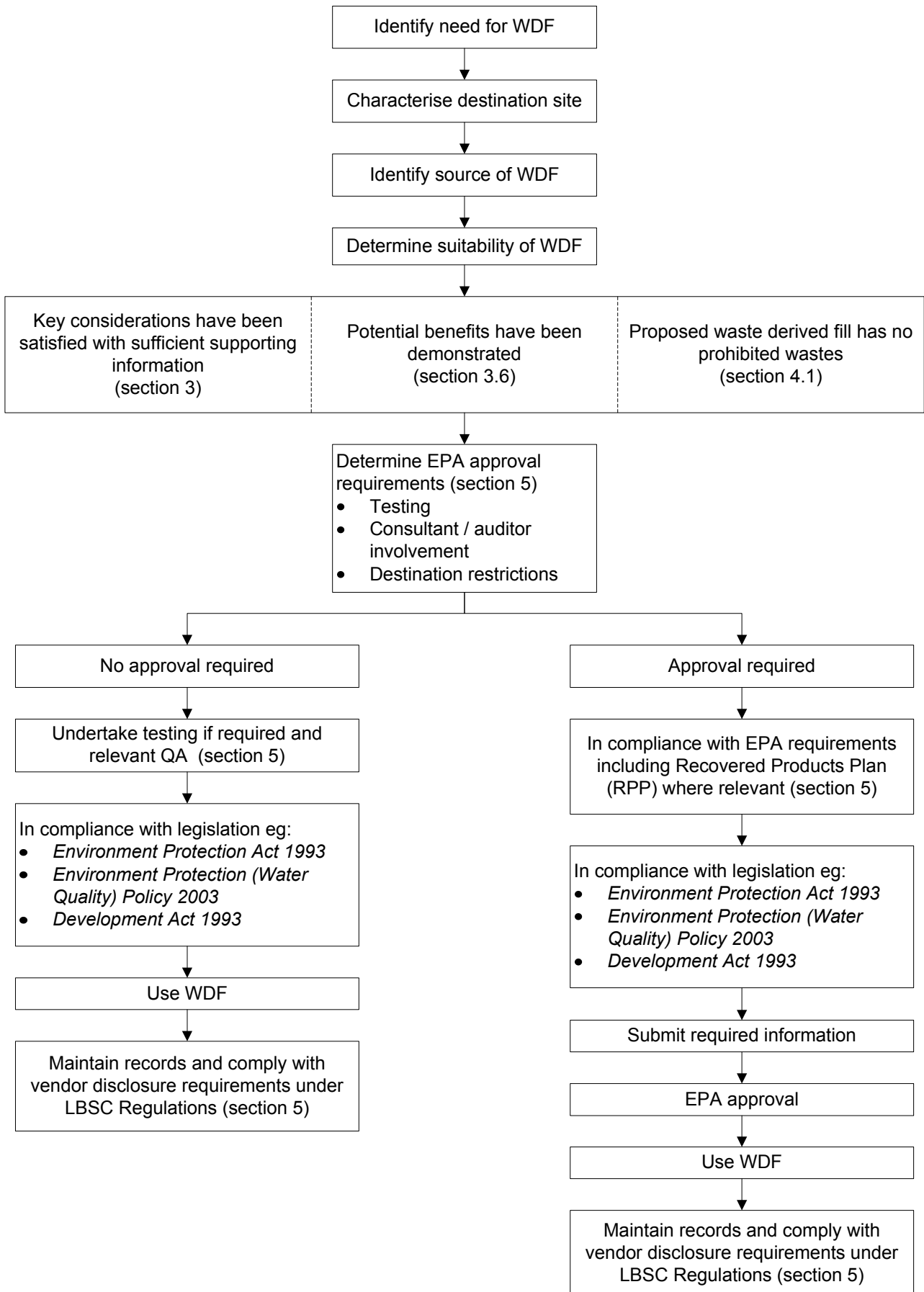


Figure 2 Process for producing and using a WDF

### 1.3 Using this standard

This standard is divided into four parts. Part One (section 1) provides the introductory information.

Part Two (sections 2 and 3) outlines relevant legislation and describes the principles and the factors that need to be addressed for the EPA to support any proposal to produce and use WDF.

Part Three (sections 4 to 6) includes a list of wastes prohibited from use in WDF and outlines the specific testing and approval requirements based on the type of waste used to produce WDF (refer Figure 3). It outlines how the EPA requirements differ, based on potential risk relating to the volume of material and concentration of chemical substances present in the WDF<sup>11</sup> as well as the information that is required to be submitted to the EPA. This standard also specifies responsibilities for the producer of the waste, the producer of the WDF and the user of the WDF.

Part Four (sections 7 and 8) is the reference section and includes sources for further information and a glossary.

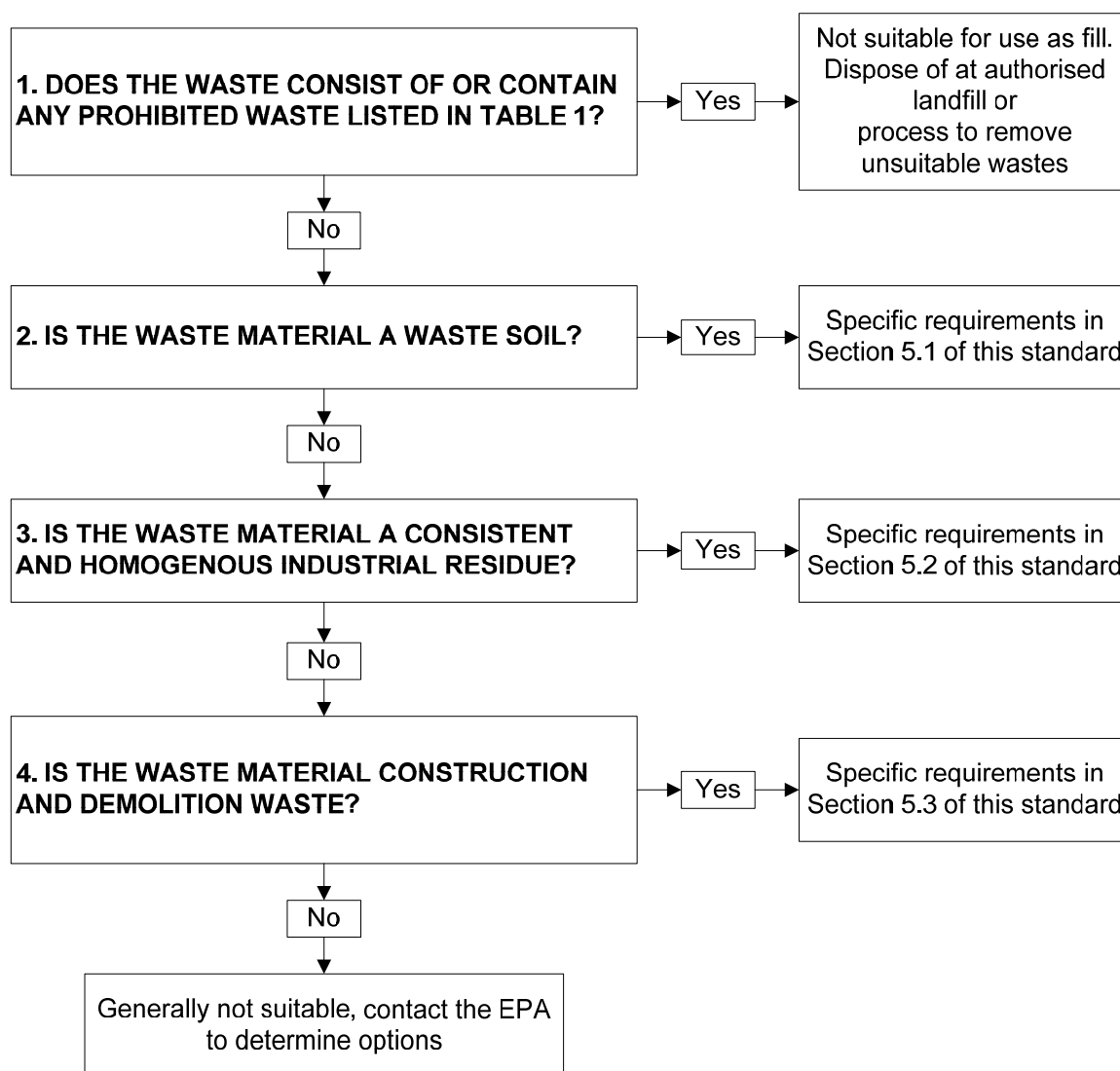


Figure 3 WDF requirements

<sup>11</sup> The chemical criteria are provided in Appendices 1 and 2.

## **PART TWO**

### **EPA POLICY AND BACKGROUND INFORMATION**

## 2 EPA statutory framework

### 2.1 Objects of EP Act and role of the EPA

The objects of the EP Act<sup>12</sup> include the prevention, minimisation and, where practicable, elimination of harm to the environment by regulating activities, products, substances and services that cause environmental harm by pollution or the production of waste<sup>13</sup>. The role of the EPA is to administer the Act and to have regard to and seek to further its objects.

The EPA's key objectives in regulating waste reuse, recycling and recovery<sup>14</sup> are:

- to prevent or minimise the risk of harm to the environmental and human health
- to support the most preferable use of waste through the reasonable and practicable application of the waste management hierarchy (Figure 4).

EPA's Guiding Principles, *Waste management—regulatory framework and objectives* (2008)<sup>15</sup> and *Waste-derived materials—guiding principles for determining approval processes and product standards* (2008)<sup>16</sup> ) outline the regulatory and policy framework and the key principles that need to be considered in addressing waste reuse, recycling and recovery issues to ensure that the objectives are met.

The *EPA Position Statement on the Role of the EPA in Attaining Sustainability* (2005) further outlines EPA's purpose as an environmental regulator and its contribution to achieving state government policy including achieving sustainability.

### 2.2 Regulatory tools provided by the EP Act

The EP Act includes a range of provisions which allow the EPA to further the objects of the Act. These provisions include the general environmental duty<sup>17</sup>:

A person must not undertake an activity that pollutes, or might pollute, the environment unless the person takes all reasonable and practicable measures to prevent or minimise any resulting environmental harm.

The EP Act also specifies that certain activities<sup>18</sup> must only be carried out under licence or other form of environmental authorisation granted by the EPA<sup>19</sup>. These activities include the receipt, storage, treatment or disposal of waste. Waste is defined in Part 1 of the EP Act and includes whether it is of value or not. Facilities which accept waste for the purposes of producing a WDF will require a licence in accordance with activity 3(3) Waste or Recycling Depot of Schedule 1 of the EP Act.

The EP Act provides for the development of environment protection policies (EPPs) which can set out detailed requirements for protecting particular aspects of the environment, or protecting the environment from particular activities.

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<sup>12</sup> Refer section 10 of the EP Act.

<sup>13</sup> The terms environmental harm, environment, activity, pollution/pollute/pollutant and waste are defined under clauses 3(1) and (5) of the EP Act and are reflected in the Glossary.

<sup>14</sup> These objectives were identified by the EPA following a review of its waste regulation activities in 2007.

<sup>15</sup> <[www.epa.sa.gov.au/xstd\\_files/Waste/Information%20sheet/waste\\_objectives.pdf](http://www.epa.sa.gov.au/xstd_files/Waste/Information%20sheet/waste_objectives.pdf)>

<sup>16</sup> <[www.epa.sa.gov.au/xstd\\_files/Waste/Information%20sheet/waste\\_objectives.pdf](http://www.epa.sa.gov.au/xstd_files/Waste/Information%20sheet/waste_objectives.pdf)>

<sup>17</sup> Refer section 25 of the EP Act.

<sup>18</sup> Refer Schedule 1 of the EP Act.

<sup>19</sup> Refer Part 6 of the EP Act.



The EPPs contain penalties for the breach of mandatory provisions, relating to required behaviours or causing certain types of environmental harm.

The W2R EPP provides clarification of the point at which a material resulting from the treatment of waste constitutes a product that is no longer waste. The W2R EPP provides, in effect, that a material resulting from the treatment of waste will not be considered a waste when:

- it is ready and intended for imminent use without the need for further treatment to prevent any environmental harm that might result from such use or
- it meets specifications or standards published or approved in writing by the EPA.

The EPA recognises that there may be acceptable and beneficial reuses for waste including reuse that involves deposition to land. Therefore, for the purposes of the W2R EPP<sup>20</sup>, this will be the standard used by the EPA in determining whether the material is a WDF product and no longer subject to regulation as a waste.

Where WDF is produced or used contrary to this standard, the EPA will consider that it continues to be a waste and regulate it accordingly under the EP Act.

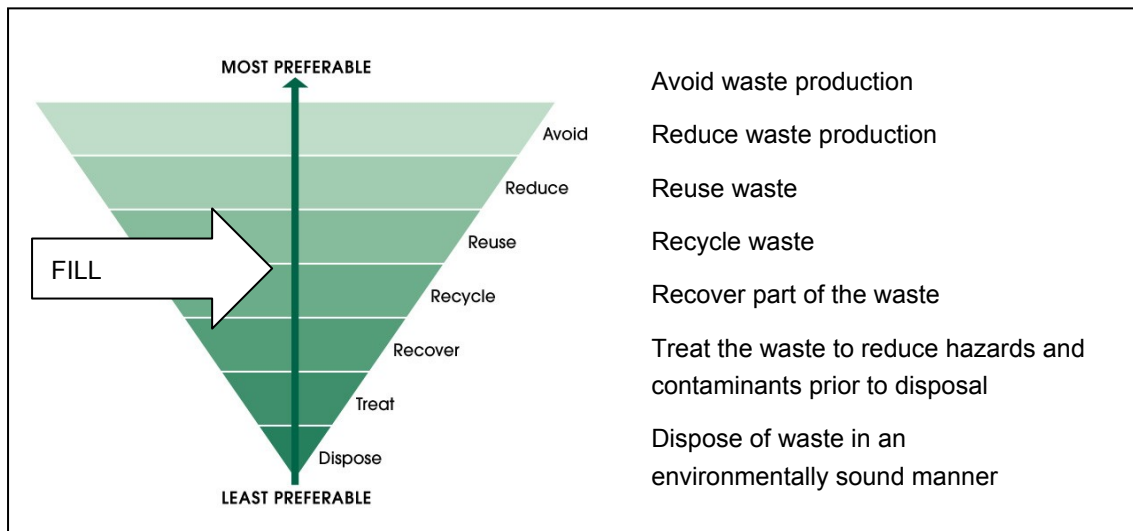
The *Environment Protection (Water Quality) Policy 2003* (WQ EPP) is also relevant to this standard and should be considered in the assessment of suitability of the use of WDF as it relates to protection of waters. Relevant sections of the WQ EPP include the general obligation to avoid the deposit of waste into waters or onto land from which it is reasonable likely to enter any waters and the obligation not to deposit any listed pollutants into waters or onto land from which it is reasonably likely to enter any waters. In addition, there are protected environmental values for any given type of water body and related water quality criteria that must be met to protect those environmental values.

### **2.3 South Australia's Waste Strategy**

*South Australia's Waste Strategy 2005–2010* sets the overall framework and aims for sustainable waste management in the State. It aims for the diversion of waste in accordance with the waste hierarchy (Figure 4) to more sustainable options. This means that the production and use of a WDF should be an alternative to disposal (the least preferable option) but should not be at the expense of more preferable options. However, WDF should only be used where it is safe and sustainable to do so. This protocol therefore describes the requirements for demonstrating the suitability of WDF.

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<sup>20</sup> See clause 4(b) of the W2R EPP.



**Figure 4 WDF and the waste hierarchy**

Some materials, such as soil, may be reused directly as WDF while others need to be recycled prior to use. For simplicity, the term reuse has been adopted throughout this document.

### 3 Key considerations for beneficial production and use of WDF

This section outlines the EPA's position and rationale on key issues relating to the acceptance and management of waste for reuse as WDF. It describes the key considerations which will guide decisions made by the EPA in relation to WDF. The considerations are based on the EPA's Guiding Principles<sup>21</sup> and include the expectation that the reuse of WDF should be such that the need for ongoing management and regulation of a site is minimised and similarly, any constraints on the reasonable and usual use of sites (both current and future) is also minimised or, where possible, prevented.

#### 3.1 Support for the waste hierarchy

- The waste production should first be avoided or minimised.
- Where possible and feasible, segregate the waste at the source or processing facility to maximise the options for reuse or recycling of various components.
- Investigate recycling and reuse opportunities higher up in the waste or site contamination hierarchies as relevant (Figures 4 and 5), in preference to use as fill.
- Ensure the proposed application to land constitutes genuine reuse as fill, rather than disposal of waste.

The EPA supports the reasonable and practicable application of the waste hierarchy and aims to achieve sustainable waste management by applying the waste hierarchy consistently with the principles of ecologically sustainable development<sup>22</sup>. This means that the benefits to the community and the environment as a whole must exceed the cost to the proponent. Proponents should be able to demonstrate that the waste proposed for reuse as a WDF does not have a practical higher-order option according to the waste hierarchy (Figure 4), for example, by avoiding the waste production, managing the waste soil in situ or managing the industrial residue within the same process that produced it.

Production of highly contaminated industrial waste should be minimised and the EPA encourages the adoption of cleaner production and eco-efficiency programmes for waste minimisation<sup>23</sup>. Proponents should also consider, based on risk, if reuse is possible or if treatment and/or disposal (eg to an authorised landfill) is the more appropriate waste management technique.

In addition, for management and remediation of soils in relation to contaminated sites, the site contamination management hierarchy from the *National Environment Protection (Assessment of Site Contamination) Measure* (the Site Contamination NEPM) needs to be considered (Figure 5)<sup>24</sup>.

<sup>21</sup> Waste-derived materials—guiding principles for determining approval processes and product standards (2008), <[www.epa.sa.gov.au/xstd\\_files/Waste/Information%20sheet/waste\\_principles.pdf](http://www.epa.sa.gov.au/xstd_files/Waste/Information%20sheet/waste_principles.pdf)>.

<sup>22</sup> These principles are set out in section 10 of the EP Act.

<sup>23</sup> <[www.epa.sa.gov.au/businesses/eco-efficiency](http://www.epa.sa.gov.au/businesses/eco-efficiency)>.

<sup>24</sup> Further references regarding remediation are provided in Section 7.

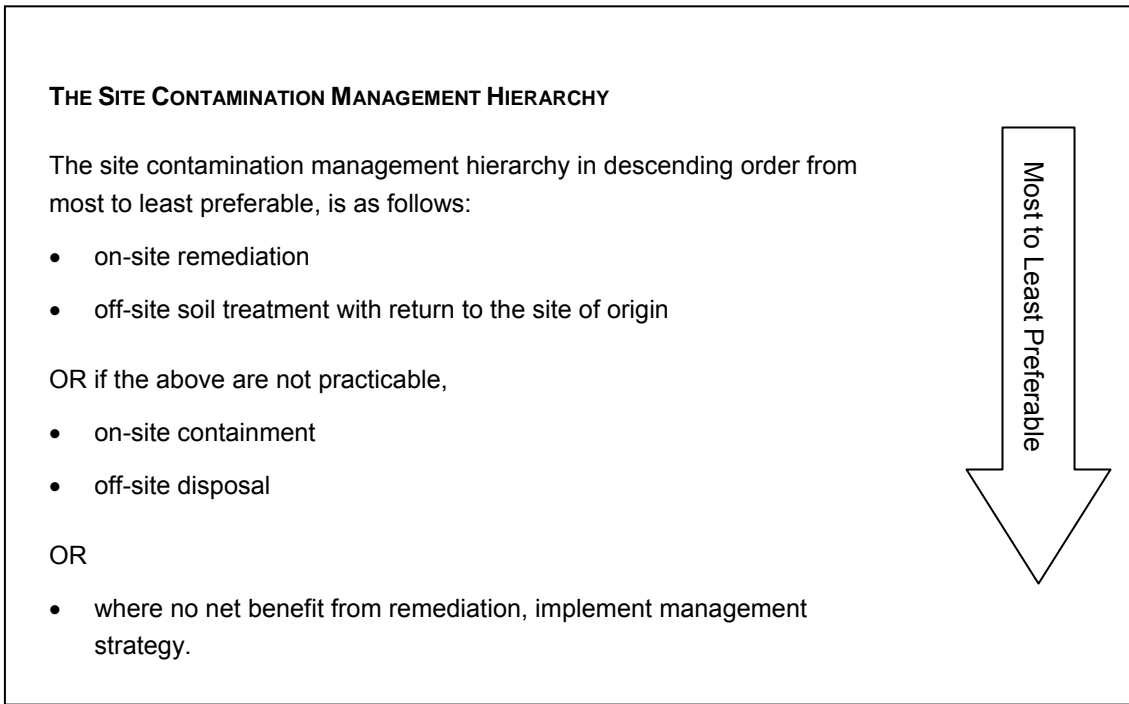


Figure 5 The site contamination management hierarchy<sup>25</sup>

### 3.2 An immediate market

- There must be an immediate market for the WDF.
- There needs to be appropriate materials flow and stockpile management.

The production or storage of WDF, including for sale or supply, must not be speculative and an immediate market must exist. This must be demonstrated prior to moving the waste off site by the existence of a known customer or user with an available, suitable and beneficial use for the WDF. However, the production of WDF should not lead to a demand for wastes such that the market would support a lesser preferred option of the waste or site contamination hierarchies and inhibit more sustainable opportunities for waste avoidance, reduction, remediation, reuse or recycling.

Appropriate materials balance and flow management need to be in place to ensure there is a systematic approach and to demonstrate responsible and sustainable management rather than continuous production and stockpiling.

Where stockpiling is necessary, this should be conducted in accordance with the *EPA Guideline for Stockpile Management – Waste and waste derived products for recycling and reuse (2009)*<sup>26</sup> with specific consideration given to:

- the need for stockpiling to be conducted with materials flow and capacity of the site in mind
- the storage time and market availability to avoid inappropriate and speculative stockpiling of material and to minimise the risk of abandonment.

<sup>25</sup> Adapted from clause 16 of the *National Environment Protection (Assessment of Site Contamination) Measure*.

<sup>26</sup> <[www.epa.sa.gov.au/xstd\\_files/Waste/Guideline/guidelines\\_stockpile.pdf](http://www.epa.sa.gov.au/xstd_files/Waste/Guideline/guidelines_stockpile.pdf)>.

### 3.3 A risk-based approach

- Ensure sound science is used to assess risk.
- Ensure the use of the WDF has acceptable and manageable risks, considering both short and long-term impacts.
- Ensure appropriate quality assurance and quality controls (QA/QC) are proposed to manage the risks.

The EP Act requires that in the assessment of risk, a precautionary approach must be applied to ensure that all aspects of environmental quality affected by pollution and waste, including ecosystem sustainability and valued environmental attributes, are considered.

Therefore, in order to support the use of WDF, the EPA expects relevant parties<sup>27</sup> to apply scientifically sound and robust QA/QC methods, including sufficient sampling, characterisation, risk assessment and monitoring in order to demonstrate the suitability of the proposal. The level of assessment required for WDF will vary depending on the risk associated with the source and type of material (refer section 5).

This standard outlines the expectations, standards and processes in this regard which support the need to apply sound scientific practices. Sound science is 'organised investigations and observations conducted by qualified personnel using documented methods and leading to verifiable results and conclusions<sup>28</sup>'. For more complex or novel proposals, third-party scientific peer review should be considered by proponents and may be specifically required by the EPA to ensure sound scientific methodology has been used in assessments.

Any required risk assessment and sampling must occur prior to the WDF being removed and transferred to the relevant reuse site to ensure that the proposed WDF is of acceptable quality.

Further specific assessment of risks is required if the proposed reuse site is in close proximity to sensitive uses, karst environments, coastal environments, water courses, wetlands, flood plains, potable water supply catchments, water protection areas, prescribed aquifers or other sensitive or protected areas such as those protected for particular environmental values<sup>29</sup>.

The potential for exposing acid sulfate soils<sup>30</sup> should also be considered. Acidity due to exposure of these soils to oxygen causes minerals in soils to dissolve and release colloidal aluminium, iron and other toxic metals, which may potentially impact on human health and the environment and releases the greenhouse gases carbon dioxide (CO<sub>2</sub>) and nitrous oxide (N<sub>2</sub>O). It can also result in damage to infrastructure and adverse odour from generation and release of hydrogen sulfide gas (H<sub>2</sub>S). Refer to section 7 for further information.

<sup>27</sup> Relevant parties include the producer, processor and user of the waste. All relevant parties must be considered in the proposal with responsibilities clearly specified.

<sup>28</sup> Source: US Environmental Protection Agency, 2003–2008 EPA Strategic Plan Direction for the Future September 30, 2003, quoting Society of Environmental Toxicology and Chemistry 1999, Sound Science Technical Issue Paper. Pensacola, Florida.

<sup>29</sup> Refer to Environment Protection (Water Quality) Policy 2003.

<sup>30</sup> Sediment or rock in the environment that contain elevated concentrations of metal sulfides [principally pyrite (FeS<sub>2</sub>) or monosulfides in the form of iron sulfide (FeS)], which generate acidic conditions when exposed to oxygen.

### 3.4 Prevention and minimised potential for harm

- The proposal must not cause harm to human health and/or the environment.
- There must be no increased risk of causing harm as a result of using the WDF as a supplement or replacement for virgin materials<sup>31</sup>.

The application of WDF can have the potential to cause harm<sup>32</sup>, as it is deposited directly into the environment rather than being contained and controlled by disposal to authorised landfill; nor does the material remain within the wider economy as happens with traditional recycled products. Irrespective of land use, the import of WDF should not reduce or compromise the environmental quality of a site nor constrain the reasonable and usual use of sites (both current and future). The proponent must demonstrate that the use of the waste as a WDF will not cause harm prior to transport and reuse at the receiving site.

Management of the removal, storage and reuse of the WDF must be conducted in a manner that minimises harm including nuisance<sup>33</sup>. The EPA Guideline for Stockpile Management and *EPA Guidelines for environmental management of on-site remediation* (2009)<sup>34</sup> contains advice on appropriate storage and materials flow management.

The Site Contamination NEPM provides investigation levels which are for the assessment of existing contamination at a site to determine the suitability for a particular use. It has been developed to make practical determinations to manage the legacy of historic onsite contamination. On-site management of soil during site remediation is also subject to EPA Guidelines for environmental management of on-site remediation. However, if a soil is excavated for removal from a site, then this becomes a waste and therefore the waste soil requires management in accordance with this standard.

However *the investigation levels specified in the Site Contamination NEPM are not chemical criteria for the suitability of WDF proposed to be used. Increasing concentrations of chemical substances at a site up to these levels is not condoned or permitted.* Assessment needs to be conducted to ensure the WDF is suitable for the reuse site, accounting for the physical and chemical quality of the WDF, and background concentrations<sup>35</sup>, to avoid causing site contamination by the use of WDF.

In addition, the *Natural Resources Management Act 2004*<sup>36</sup> (the NRM Act) defines certain offences that may relate to filling of land where that activity may result in unreasonable degradation of and/or an unreasonable risk of degradation of land or may alter a watercourse including in relation to:

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<sup>31</sup> Virgin material is material excavated from a mine site such as a quarry or sand mine specifically for the purpose of being used as fill. The NSW Protection of the Environmental Operations Act 1997 defines virgin excavated natural material as 'natural material (such as clay, gravel, sand, soil or rock fines):

- that has been excavated or quarried from areas that are not contaminated with manufactured chemicals or process residues, as a result of industrial, commercial, mining or agricultural activities
- that does not contain any sulfidic ores or soils or any other waste.

<sup>32</sup> This includes the potential for short- or long-term harm to the environment including to flora, fauna and ecosystem function due to factors such as bioavailability and toxicity of chemical substances. It also includes the potential for chemical substances to mobilise and leach into the environment leading to potential harm to waters and any ecosystem functions that those water perform or support.

<sup>33</sup> As defined in section 82 of the EP Act.

<sup>34</sup> <[www.epa.sa.gov.au/xstd\\_files/Waste/Guideline/guidelines\\_stockpile.pdf](http://www.epa.sa.gov.au/xstd_files/Waste/Guideline/guidelines_stockpile.pdf)>

<sup>35</sup> Refer Glossary.

<sup>36</sup> Refer to sections 122, 127 and 129 of the NRM Act.

- the erection, construction or placement of any building or structure in a watercourse or lake or on the floodplain of a watercourse
- depositing or placing an object or solid material in a watercourse or lake
- obstructing a watercourse or lake in any other manner
- depositing or placing an object or solid materials on the floodplain of a watercourse or near the bank or shore of a lake to control flooding from the watercourse or lake
- destroying vegetation growing in a watercourse or lake or growing on the floodplain of a watercourse.

Thus prior to undertaking any filling of land, the EPA recommends proponents contact Natural Resources Management (NRM)<sup>37</sup> to determine their requirements.

### 3.5 Demonstration of beneficial purposes

- There must be an acceptable and genuine benefit demonstrated by the proposal.

The EPA expects proponents to demonstrate the beneficial aspects of the proposal prior to transport and reuse at the receiving site. Examples of potential beneficial uses include (but are not limited to)<sup>38</sup>:

- Development requiring additional material to be imported to the site for the levelling of land for engineering and construction purposes over and above cut and fill available onsite
- A major infrastructure project of general benefit to the state requiring import of fill
- Mine site or quarry rehabilitation.

When delivered to the user, a WDF must be able to be used without further processing in the same way as a virgin material with which it is comparable. It must be fit for purpose and the source or process producing the WDF, including prior uses or treatment, will need to be assessed in order to determine the WDF's suitability for reuse. It is the responsibility of the producer and user to ensure the WDF is geotechnically suitable for the intended use.

### 3.6 No dilution of waste or chemical substances

- Ensure each waste component used to produce the WDF is demonstrated as suitable and meets the required specification prior to any mixing with other suitable components.
- Ensure the production of WDF does not constitute dilution of waste or chemical substances.<sup>39</sup>

The EPA considers that dilution is the combining of materials for the purpose of reducing contamination levels, for example as a means to avoid disposal costs. Dilution is not a suitable waste management approach and is not supported by the EPA. Components should not be added to WDF for the purpose of diluting the waste or chemical substances where, without dilution, the component would not be suitable for reuse. The EPA's position on dilution aims to support on-site remediation and reuse of soils and prevent disposal by inappropriate means where this is done to avoid relevant regulation.

However, mixing by combining two or more specific components may be suitable in the production of WDF. Such mixing must only occur if it is first demonstrated that each component is a suitable ingredient (refer section 5) as part of a WDF

<sup>37</sup> <[www.nrm.sa.gov.au](http://www.nrm.sa.gov.au)>.

<sup>38</sup> The diversion of waste from landfill in and of itself is not considered to be sufficient grounds for demonstration of a benefit.

<sup>39</sup> The term chemical substance is defined under clause 3(1) of the EP Act and is reflected in the Glossary.

product prior to their mixing. The criteria for demonstrating suitability include not having a higher-order reuse and not containing unacceptable concentrations of chemical substances or wastes.

### 3.7 A consistent approach to regulation

- Ensure that the level of community consultation is suitable given the nature of the project and details are included in the proposal.
- Ensure appropriate approvals have been obtained prior to undertaking the activity.

This standard is designed to provide a consistent approach to the production and use of WDF. Approvals and specific authorisation/s need to be in place prior to undertaking any such activities. In addition, placement of waste derived material for fill for the purposes of development as defined by the *Development Act 1993*, must be conducted with the approvals as required from the planning authorities, prior to undertaking any such activities<sup>40</sup>.

Section 5 describes the expectations for the use of WDF and the circumstances where specific EPA approval will be required. The thresholds listed will be strictly applied as this is the most transparent and consistent option for all proponents and avoids possible variation in interpretation.

Where large-scale projects are concerned, it is particularly important to include a requirement for the proponent to consult appropriately with, and have regard to the views of, the council and community who are potentially affected by the project. The proposal must align with the relevant environment regulatory framework and principles (refer section 2).

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<sup>40</sup> It is noted that DTEI is exempt from the Development Act as it may apply to the construction of roads; however this standard still applies.



## **PART THREE**

# **TECHNICAL INFORMATION AND APPROVAL REQUIREMENTS**

## **4 Wastes and suitability for use as WDF**

This section states those wastes that are prohibited for use as, or in the production of, WDF. Silence on a particular waste stream for use does not imply approval and the EPA will need to be contacted for further advice where a proposed reuse is not specifically addressed by this standard.

### **4.1 Prohibited wastes**

Table 1 describes wastes that must not be reused as fill and need to be managed and treated or disposed of at suitably authorised facilities.

**Table 1 Prohibited wastes**

<b>Waste</b>	<b>Rationale and management requirements</b>
<ul style="list-style-type: none"> <li>Waste soil containing chemical substances at concentrations exceeding the Intermediate Waste Soil criteria (refer Appendix 2)</li> </ul>	<p>For soils that exceed the Intermediate Waste Soil criteria, it is preferred that, if possible, the soil is remediated on site to ensure the site is suitable for its intended use (site contamination management hierarchy under the Site Contamination NEPM). Alternatively, depending on the level and nature of the contamination, it could be stored, treated or disposed at suitably authorised facilities. High-level contaminated waste may not be disposed of to landfill in South Australia. It must be treated prior to disposal or will require storage or consignment authorisation if it is to be removed to a treatment or storage facility outside South Australia. The EPA should be contacted to determine the requirements for managing waste exceeding Intermediate Waste Soil criteria.</p>
<ul style="list-style-type: none"> <li>Industrial residues containing chemical substances at concentrations exceeding Intermediate Waste Soil criteria (refer Appendix 2)</li> </ul>	<p>Solid Industrial residues, or other wastes that exceed Intermediate Waste Soil criteria, must be stored, treated or disposed at suitable authorised facilities, depending on the level and nature of the contamination. High-level contaminated waste may not be disposed of and requires storage or consignment authorisation if it is to be removed to a treatment or storage facility outside South Australia. The EPA should be contacted to determine the requirements for managing waste exceeding Intermediate Waste Soil criteria<sup>Error! Bookmark not defined.</sup>.</p>
<ul style="list-style-type: none"> <li>Commercial or Industrial Wastes (General)</li> </ul>	<p>When unprocessed, these wastes are unsuitable for use as fill due to their variable, mixed and unknown chemical composition and physical properties. Mixed wastes need to be received at an authorised facility and must be processed to recover recyclable materials and the residual waste material must be disposed of at authorised facilities. Processing of this waste to recover the soil component for use as fill may be suitable<sup>41</sup>.</p>
<ul style="list-style-type: none"> <li>Hazardous Wastes</li> </ul>	<p>These wastes must be managed in accordance with the Hazardous Waste Strategy<sup>42</sup> and national legislation. Direct disposal to landfill is not permitted.</p>
<ul style="list-style-type: none"> <li>Liquid or semi-solid wastes or sludges</li> </ul>	<p>These wastes must not be used as fill due to their geotechnical instability and potentially hazardous contaminants.</p>
<ul style="list-style-type: none"> <li>Municipal Solid Waste</li> </ul>	<p>This waste is unsuitable for use as fill due to its mixed and unknown chemical composition and putrescibility. This waste may only be disposed or deposited to authorised waste management facilities.</p>
<ul style="list-style-type: none"> <li>Asbestos</li> </ul>	<p>Asbestos must handled, managed and disposed of to authorised facilities in accordance with relevant guidelines due particularly to</p>

<sup>41</sup> This material would need to be assessed as an industrial residue.

<sup>42</sup> <[www.epa.sa.gov.au/xstd\\_files/Waste/Report/hws.pdf](http://www.epa.sa.gov.au/xstd_files/Waste/Report/hws.pdf)>

Waste	Rationale and management requirements
	health risks (refer section 4.2). Appropriate processes to prevent reception of asbestos, including rejection of loads containing this material at recycling facilities, need to be in place. It is critical to implement management plans to appropriately identify and remove contaminants including asbestos prior to processing and use. Appropriate segregation needs to occur at the point of waste asbestos generation (such as construction and demolition sites) to ensure it is not mixed with other wastes or fill materials but is removed to an appropriately licensed disposal facility.
<ul style="list-style-type: none"> <li>Medical Waste</li> </ul>	Medical waste must be disposed of to authorised incinerators for destruction or disposed of by another method of treatment or disposal approved by the EPA. Due to its potentially hazardous nature, medical waste cannot be used as fill and has specific handling requirements (refer section 7).
<ul style="list-style-type: none"> <li>Quarantine Waste and Waste of Biosecurity Concern</li> </ul>	Quarantine wastes require specific management according to the requirements of relevant agencies including the Australian Quarantine and Inspection Service (AQIS) and Department of Primary Industry and Resources SA (PIRSA).
<ul style="list-style-type: none"> <li>Radioactive Waste</li> </ul>	Radioactive wastes require specific management according to the requirements of the EPA <sup>43</sup> .
<ul style="list-style-type: none"> <li>Scheduled Wastes<sup>44</sup></li> </ul>	These wastes require specific management according to the requirements of the ANZECC <i>National Strategy for the Management of Scheduled Wastes 1992</i> and the associated waste management plans in order to ensure their continued removal from the environment and safe management.

<sup>43</sup> Refer to the Radiation Protection and Control Act 1982.

<sup>44</sup> Organochlorine pesticides (OCPs), Polychlorinated biphenyls (PCBs), Chlorinated hydrocarbons, dioxins or ozone depleting substances.

## 4.2 Asbestos

The EPA supports the removal of asbestos from the environment and expects that, to the maximum extent possible, persons involved in construction, demolition and recycling take specific measures to ensure that no asbestos is incorporated into WDF. This position is based on the precautionary principle for best practice waste management. This approach aims to continue to reduce the overall risk of exposure to asbestos by preventing pollution and continually removing it from the environment and ensuring its secure and safe disposal at authorised facilities. The EPA does not endorse any safe level of asbestos for use in WDF.

Although all reasonable and practicable measures must be taken to prevent its inclusion, if asbestos is found to be in a waste soil or recycled product it is asbestos-containing material (ACM) and does not meet the waste fill criteria as defined in this standard (refer section 5 and Appendix 1). It is still considered a waste, and should be managed and disposed of appropriately at authorised facilities.

Any waste proposed for use as WDF that is derived from materials potentially containing asbestos, must be subject to representative analysis in order to either demonstrate the material is free of asbestos if it is to be considered as meeting the waste fill criteria, or to provide the necessary information to enable its assessment for reuse sites where its use may be permitted in accordance with the Auditor Protocol in section 6.1.3.

If the proponent believes there is a suitable beneficial use that will not pose any risks to human health or the environment, use as fill may be possible at specific sites and under specific conditions. These include:

- remove all asbestos from the fill to the maximum extent possible and achievable
- conduct a thorough, scientifically sound and robust quantitative human health risk assessment (refer to information below)
- submit a site management plan endorsed by a site contamination auditor, engaged for that purpose in accordance with EPA requirements, in which the auditor provides the opinion that, based on the knowledge available at the time including appropriate assessment of the site, the WDF is suitable for use, will not pose an unacceptable risk of causing harm and the land will be suitable for its proposed use at the completion of the project. An audit report for the destination of the WDF containing asbestos (ACM) in this regard must be produced at the completion of the project and must be attached to the title of the land in accordance with questions under Form 1 as required by section 7 of the LBSC Regulations
- adhere to all conditions of the site management plan and audit report
- not use the WDF at a destination with a sensitive use.

Refer section 6.1.3 for further details on the Auditor Protocol for materials not meeting waste fill criteria.

The EPA expects that a quantitative health risk assessment is undertaken in accordance with the Site Contamination NEPM and the enHealth guidelines, *Guidelines for assessing human health risks from environmental hazards* (enHealth 2002) and the *Australian exposure assessment handbook* (enHealth 2003) published by the Department of Health and Ageing and the Health Council. They outline a framework for undertaking a quantitative health risk assessment. The framework provides quantitative estimation of risk and is based on an estimated exposure to a chemical substance (including asbestos) and the likelihood that this will give rise to an adverse effect. It consists of four stages:

- issue identification
- hazard assessment
- exposure assessment
- risk characterisation

The documents *Management of asbestos in the non-occupational environment* (enHealth 2005) and *National Occupational Health and Safety Commission (NOHSC) Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres*<sup>45</sup> also provide some guidance on this issue.

### **Waste soils**

On-site management of soils is, in principle, different to the active production of WDF, as the risks posed by re-excavating and introducing airborne fibres may be unacceptable and the NEPM hierarchy allows for in situ management where it is safe to do so. Where a site with historic contamination by asbestos is known, on-site management may be possible provided an auditor will certify the suitability of the proposed use in an audit report that must be registered on the title of the land.

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<sup>45</sup> <[www.ascc.gov.au/NR/rdonlyres/EBF8D7D0-A461-4A9F-BCA8-9BD70FC77882/0/MFM.pdf](http://www.ascc.gov.au/NR/rdonlyres/EBF8D7D0-A461-4A9F-BCA8-9BD70FC77882/0/MFM.pdf)>

## 5 Approvals and licensing

This section outlines the application and approval<sup>46</sup> requirements for specific waste types to be used as WDF. Irrespective of the need for specific approval from the EPA for use, the responsibility lies with both the producer and the user of WDF to comply with the W2R EPP and the general environmental duty by ensuring that the WDF is suitable for use and will not cause harm to the environment or human health. This must be demonstrated prior to transport and reuse at the receiving site. This standard outlines the EPA's expectations and requirements in order to demonstrate that compliance. This section also outlines the approval requirements that will apply until the W2R EPP becomes operational.

### **Approvals**

The production of WDF will require an EPA licence where that activity involves either the receipt of waste, such as a waste or recycling depot [activity 3(3) of Schedule 1 of the EP Act], or if the waste is produced as a result of another authorised activity. For such activities, conditions may be placed on that licence in relation to the QA/QC procedures for the production of the WDF. Renewal of approvals may need to occur periodically for WDF production activities that are ongoing and may depend on the level of compliance with approved management plans or recovered products plans (RPP) in the conduct of the activity.

If the filling of land occurs that is not in accordance with this standard, it may be deemed that the user is operating a waste or recycling depot without authorisation or may be causing risk of harm to the environment (including site contamination) or human health, and therefore acting outside the law and subject to enforcement under the EP Act.

### **Timing**

Timeframes for gaining approval will depend on the level of detail provided and suitability of the proposal. Timeframes may be extended when insufficient information is provided in an application or when considerations for WDF use and approvals are not factored in until late in the planning stage and may result in delays in the desired commencement date. Early engagement of the EPA, forward planning and supply of comprehensive information are key in meeting anticipated timeframes.

### **Submissions**

This section outlines where submission of information is required in order for the EPA to:

- assess the proposal
- confirm in writing to the proponents that the EPA is satisfied that the requirements of the standard have been met
- confirm that the material does not require regulation as a waste.

Preparation of the submission will require either a suitably qualified consultant<sup>47</sup> or site contamination auditor involvement depending on the level of potential risk posed by the proposal (see overleaf and section 1). Both a site contamination consultant report and an audit report, prepared in relation to the suitability of WDF for use at a specific site or sites, are 'environmental assessments' for the purpose of Section 7 Form 1 questions for the *Land and Business (Sale and Conveyancing) Regulations 1995* (LBSC Regulations).

<sup>46</sup> EPA approval means a written response confirming that the requirements of this standard have been met, for example in relation to submission of the RPP or site management plan where required, and that reuse may proceed in accordance with that plan, contingent also upon compliance with the Auditor protocol where applicable.

<sup>47</sup> If the submission includes the need to consider the impact at the proposed reuse site, this should be conducted by a site contamination consultant.

Specifically, information needs to be submitted for WDF produced from the following types of waste:

- Industrial residues
  - WDF meeting waste fill criteria (RPP)
  - WDF exceeding waste fill criteria (Auditor Protocol)
- Construction and Demolition Waste (C&D Waste)
  - WDF meeting waste fill criteria (RPP)
  - WDF exceeding waste fill criteria (Auditor Protocol)
- Waste soil exceeding waste fill criteria (Auditor Protocol).

### **Criteria and thresholds**

For the purposes of this standard the '**waste fill criteria**' consists of the chemical criteria listed in Table 8 as well as certain physical criteria. The criteria are based on the definition of 'waste fill' as in clause 3 of the Environment Protection Regulations 2009. The physical criteria means that waste for WDF must consist of clay, concrete, rock, sand, soil or other inert mineralogical matter. It may contain bitumen<sup>48</sup> but must not include asbestos or other wastes. The inclusion of the physical criteria aims to ensure that the WDF is similar to materials naturally present in the soil profile. There are no specified size criteria, however particle size distribution and uniformity must be considered when assessing the geotechnical suitability of the WDF, along with properties such as strength and stability to ensure it is fit for purpose.

WDF with higher concentrations of chemical substances than waste fill criteria (up to a maximum of Intermediate Waste Soil criteria) triggers the Auditor Protocol. This WDF may be used provided an auditor has endorsed a site management plan and provides the opinion that, based on the knowledge available at the time including appropriate assessment of the site, the WDF is suitable for use, will not pose an unacceptable risk of causing harm and the land will be suitable for its proposed use at the completion of the project.

As WDF must be similar to materials naturally present in the soil profile, during processing, prohibited wastes and foreign materials must be removed to the maximum extent possible. Any trivial amounts of such wastes that that may remain within the WDF must be assessed to determine whether they will cause harm and must only be present, when unavoidable, to a negligible extent. The auditor must take account of the effect of any such inclusions in providing their opinion (refer section 6.1.3).

The thresholds included in this section will be strictly applied by the EPA as this is the most transparent and consistent option for all proponents and avoids possible variations in interpretation. A robust and valid statistical analysis of the data should be conducted to classify a waste derived material (refer Appendix 3).

### **Testing**

Where it is indicated that testing is required, it will need to be done by a suitably qualified and experienced person. Where the WDF is sourced from a licensed facility, testing will be required and may be specified in licence conditions. Where the WDF is sourced from a facility that is not licensed, testing of the material and meeting the requirements of the standard are needed to ensure that the reuse site is in compliance with its general environmental duty and not operating an illegal

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<sup>48</sup> Bitumen that is known or suspected to be from before the late 1960s cannot be used. Today, asphalt mixes are made with bitumen but in the past, coal tar and other tar distillates were in extensive use (often referred to as Tar Macadam Pavements being a basic macadam road with a tar-bound surface). This has left a troublesome legacy of high polyaromatic hydrocarbons (PAH) content in some asphalt pavements. All such materials must be disposed of to an authorised landfill.



waste depot. Suitable testing and assessment helps reduce the risks associated with the use of WDF by assessing and determining that it is free of contamination.

### ***Ensuring suitability***

Confirmation of suitability, including any required testing, must occur prior to transfer from the place it is produced to the reuse site. This means to ensure that users are not left with the liability of having unsuitable wastes at their premises that could require costly clean up or may leave them liable for having unlawfully received or disposed of waste or caused harm to the environment.

Important: Compliance with this standard is required if a proponent operates an existing facility that produces or receives a WDF. Where the EPA believes the existing facility is not in compliance with this standard, an Environment Improvement Plan or other action or enforcement may be required to achieve improved environmental performance to a level satisfactory to the EPA.

## **5.1 Waste soils (for direct reuse)**

Once a soil is excavated and is not required or managed at that site, for example as part of on-site remediation and management, it becomes waste soil. Rather than disposal to landfill, direct reuse of the waste soil may be possible depending on aspects such as the source, the chemical and physical nature of the material, the geophysical characteristics and risk of harm occurring at the proposed reuse site. This section describes the requirements regarding the direct reuse of waste soil as fill<sup>49</sup>. Waste soil consists of soil, clay, rock, sand or other natural mineralogical matter and must not contain other wastes<sup>50</sup>. Waste soils exceeding Intermediate Waste Soil criteria (refer Appendix 2) are not permitted for reuse.

Note: If waste soil is received at a facility for storage and subsequent sale or supply for reuse then this soil is subject to the requirements for WDF produced from C&D Waste (refer section 5.3). All soils under that circumstance must be subject to QA/QC assessment as documented and approved in a recovered products plan and the facility requires an environmental authorisation for that activity. These controls are regardless of individual load volumes and sources as a suitable duty of care and regulatory expectation for these commercial operations.

The source of the waste soil, particularly if it is from a site where a potentially contaminating activity has occurred, is one of the main factors for determining the assessment requirements for its use as WDF. Potentially contaminating activities (PCA) are prescribed in the Environment Protection Regulations 2009.

The other risk factors contributing to the level of assessment are the volume of waste soil and the concentration of chemical substances present in the waste soil resulting in the following categories:

- **Any volume of waste soil from a single source domestic premises, or less than 100 tonnes (in total) of waste soil from any other single source site where no PCA has occurred, for a once-off reuse at another site<sup>51</sup>**

<sup>49</sup> Direct reuse includes the transfer, usually once off, directly from the generation site to a reuse site. It does not include waste soil received and accumulated or amalgamated via a recycling facility.

<sup>50</sup> Minor amounts of naturally occurring inclusions such as wood or other vegetative matter are acceptable.

<sup>51</sup> This does not apply to the scenario of number of different sources all proposed for reuse at a site even if each load is less than 100 tonnes nor when greater than 100 tonnes from one site being split among multiple destinations, each less than 100 tonnes. In these circumstances, the requirements are the same as for more than 100 tonnes of soil.

Minor excavations on residential properties and other small volumes from sites where no PCA has occurred are deemed low risk and the EPA does not wish to impose undue regulatory requirements on householders for sampling and assessment. As such, only the general obligations in this standard including Table 3 apply. Commercial businesses or developments are not included in this category.

- **More than 100 tonnes of waste soil from a site where no PCA has occurred**

Waste soil generated from excavations at sites where no PCA has occurred are lower risk than waste soil from a site where a PCA has occurred. However the potential risks increase with greater volumes of waste soil and therefore additional care should be taken to ensure the material is not contaminated (refer Table 3) and does not pose a risk of harm to the receiving environment. Such work is usually conducted by commercial operators and thus it is reasonable to expect that an appropriate duty of care is taken when such waste soil is intended for reuse to protect the environment and only supply appropriate materials for reuse under their general environmental duty. Therefore sampling and assessment is recommended to ensure this is the case.

- **All waste soil from a site where a PCA has or is occurring**

Waste soil generated from sites where a PCA has occurred present a higher risk that contamination of soil may have occurred. Therefore the EPA requires specific sampling and assessment and QA/QC as outlined in Table 3. The controls and acceptable use requirements differ based on the level of contamination present in the waste soil and on the person undertaking the work (eg a site contamination consultant versus an auditor).

In all cases the key considerations outlined in section 3 should be taken into account; in particular, that deposition must be for a genuine reuse purpose as fill, rather than deposition on land for convenience, avoidance of regulation or avoidance of disposal costs.

Land holders need to be vigilant in ensuring they only accept fill that is free from contamination and from reliable persons who are able to demonstrate the suitability of the fill. This will help to ensure they are not left with the liability of having unsuitable wastes at their premises that may cause harm, including site contamination, and which may render them having unlawfully received or disposed of waste. Site contamination could then require costly remediation.

Table 2 summarises the responsibilities for the producer of waste soil, the processor of the waste soil and the user of WDF.

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The intent of the less stringent requirements for less than 100 tonnes is to reduce the burden for sampling and testing in the specific circumstance of a once-off reuse of soil produced by a householder at another single site. However, for commercial earth moving operators, recycling businesses or large scale development, it is both reasonable and good business practice to ensure appropriate QA/QC is expected to be in place for all soils being received and reused.

**Table 2 Action required for reuse of waste soil as WDF**

<b>Producer of waste soil</b>	<b>Processor of waste soil</b>	<b>User of WDF</b>	<b>Auditor</b>
<ul style="list-style-type: none"> <li>Utilise appropriate waste management options according to the Site Contamination NEPM hierarchy.</li> <li>Engage qualified personnel where required to assess risk and manage the site.</li> <li>Maintain records and report as required.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure relevant approvals and licences are in place if processing or remediation is required.</li> <li>Ensure waste soil received is suitable for processing congruent with the facility approvals.</li> <li>Implement appropriate QA/QC to ensure suitable chemical and physical quality of waste soil for re-use prior to transfer from the site for reuse.</li> <li>Engage suitable, experienced and qualified persons for independent review, testing and monitoring [as required and using suitably qualified consultant (eg site contamination consultant) or auditor expertise as relevant].</li> <li>Maintain records and report as required.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure where required, EPA approvals are in place.</li> <li>Ensure only use approved and fit-for-purpose WDF.</li> <li>Ensure WDF is geotechnically suitable for the intended use.</li> <li>Ensure WDF is used only under suitable circumstances, including those specified by an auditor where relevant.</li> <li>Ensure relevant notification on the land title is specified for environmental assessment reports (if site contamination consultant report or of the audit report) and if the use of WDF constitutes a PCA.</li> <li>Maintain records and report as required.</li> </ul>	<ul style="list-style-type: none"> <li>Specify acceptance criteria for all waste soil proposed for reuse as WDF, up to but not exceeding Intermediate Waste Soil criteria, and that all chemicals contained in the WDF are suitable for reuse in the environment.</li> <li>Specify appropriate audit criteria.</li> <li>Endorse the relevant site management plan.</li> <li>Ensure all WDF materials produced from waste soil that exceeds waste fill criteria: <ul style="list-style-type: none"> <li>are homogenous, consistent and meets the definition of waste soil</li> <li>are not used at sensitive sites.</li> </ul> </li> <li>Act in accordance with their legislative requirements.</li> <li>Produce and submit an audit report at the completion of the fill project for the reuse site<sup>52</sup>.</li> </ul>

<sup>52</sup> The audit report is for the purpose of determining the nature and extent of any site contamination present or remaining on or below the surface of the site, the suitability of the site for a sensitive use or another use or range of uses and what remediation is or remains necessary for a specified use or range of uses.

**Table 3 Summary of requirements for waste soil being used as WDF**

Obligations and Requirements	General Obligations—sites where no PCA has occurred or is occurring <sup>1</sup>		Specific EPA Requirements—sites where a PCA has or is occurring		
	Single source domestic premises, or <100 tonnes from other non-PCA site	>100 tonnes from non-PCA site	Site with PCA		
General environmental duty <sup>2</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Maintain records <sup>3</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <sup>4</sup>		
Sampling and assessment <sup>5</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <sup>6</sup> (Waste fill chemical criteria plus other analytes as relevant)	<input checked="" type="checkbox"/> (Waste fill chemical criteria plus other analytes as relevant) <sup>7</sup>		
	↓	↓	↓		
Requirements based on sampling results	N/A	Up to maximum waste fill quality	Up to maximum Intermediate Waste Soil chemical quality	Up to maximum waste fill quality	Up to maximum Intermediate Waste Soil chemical quality
Documentation required <sup>8</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Consultant report <sup>9</sup>	<input checked="" type="checkbox"/> Auditor Protocol <sup>10</sup>	<input checked="" type="checkbox"/> Consultant report	<input checked="" type="checkbox"/> Auditor Protocol <sup>10</sup>
Submission of information and approval required <sup>11</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Restriction on destination (Non-sensitive use only)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <sup>9</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <sup>12</sup>	<input checked="" type="checkbox"/>
Receiving fill material is a PCA <sup>13</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
EPA to indicate existence of report <sup>14</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Vendor to indicate existence of report <sup>15</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

**Notes**

- 1 If a PCA has historically occurred on a domestic site then the WDF needs to be dealt with in accordance with the requirements for sites where a PCA is or has occurred.
- 2 This may include ensuring there are no obvious signs of contamination in the soil. If there is known or suspected contamination<sup>53</sup>, reuse may not comply with this standard and may cause harm. Remediation at the source site or disposal to authorised landfill should be considered.
- 3 Both producers and users are advised to maintain records regarding the source, details of parties involved, volume and destination of soil reused, any observations regarding the physical nature of the soil and any laboratory results. Site-specific environmental assessments should be retained in perpetuity.
- 4 These records should include sampling programs, results, risk assessment and details of responsibilities, and must be maintained by all relevant parties. Such records should be available for inspection by EPA upon request and must be included when submission and specific approval is required.
- 5 Sampling and assessment of the waste soil proposed for use as fill to demonstrate it is suitable for reuse must occur at the source of the waste soil prior to its export for reuse. Risk assessment must be conducted in relation to the destination to determine suitability. Sampling and assessment must be undertaken by a suitably qualified consultant (ie site contamination consultant) who is required to prepare a report that will provide a definitive statement that the use of the fill will not cause harm to the environment, including site contamination (refer Appendix 3). Any waste proposed for use as WDF that is derived from materials potentially containing asbestos must be subject to representative analysis in order to either demonstrate the material is free of asbestos if it is to be considered as meeting the waste fill criteria, or to provide the necessary information to enable its assessment for reuse sites where its use may be permitted in accordance with the Auditor Protocol in section 6.1.3.
- 6 These sites are generally of low risk however sampling should be conducted if the source of the soil is such that there are potential or suspected impacts upon the soil, or if there is noticeable discolouration or odour. The soil should be assessed for the chemical substances listed in the waste fill criteria and any other substances suspected of being present. If elevated levels of naturally occurring chemicals are identified at the source site, consideration of its suitability for use at the reuse site should be assessed (see note 4).
- 7 To demonstrate that it is fit for reuse, a robust analysis of the waste soil needs to be conducted including a risk assessment of the chemical substances likely to be present and the risks posed to the proposed destination. In addition to the waste fill criteria, any other substances reasonably expected to be present based on knowledge of activities undertaken on the source site should be tested for. This could be through a broad analysis or a more limited suite of analytes may be determined following a full assessment in accordance with the Site Contamination NEPM. Refer to Appendix 3. It is the responsibility of the producer and user to ensure the WDF is geotechnically suitable for the intended use, including particle size distribution and uniformity, strength and stability.
- 8 All reports must contain certification and sufficient details to demonstrate the suitability of the material. This includes assessment of the site history or process producing the waste, assessment of risks posed due to the physical and chemical nature of material and assessment of appropriate uses with confirmation that reuse will not cause harm. The difference between the requirements for who should must produce the documentation based on the quality of the waste soil, relates to the fact that an audit report is

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<sup>53</sup> For example, presence of other wastes in the soil, stains, odour or discolouration of soil which can be associated with chemical contamination. However it should be noted that some chemicals are colourless and odourless, and qualitative observations alone may be insufficient.

prepared by an accredited auditor that has been engaged in accordance with EPA legislation and auditors have a higher level of responsibility and liability. This greater accountability is why the EPA deems that auditors are suitable for the more complex proposals, in this case when determining the suitability of WDF that exceeds waste fill criteria or the use of soil from a PCA at a sensitive site.

- 9 As described in point 12, a consultant is only able to certify the suitability of a waste soil where there is no change in the sensitivity of land use. If the waste soil is from a commercial or industrial site, only an auditor can certify the suitability of that waste soil at a sensitive site.
- 10 Where an audit report is required, application must be made to the EPA in accordance with the Auditor Protocol in section 6.1.3.
- 11 Where submission is required, EPA approval for the proposal is required prior to proceeding with the use of the WDF. This EPA approval is in the form of a written response confirming that the requirements of this standard have been met and that reuse may proceed, contingent on compliance with of the Auditor Protocol (refer section 6.1.3). For those proposals indicated as not requiring submission, the production and use of fill must be conducted in accordance with all relevant aspects of this standard and the general environmental duty. Additional permissions may be required from other authorities such as planning or natural resource management authorities.  
  
IMPORTANT: Until the W2R EPP becomes operational, any proposals for the movement of waste soil will need EPA approval through the existing mechanisms such as licences, limited purpose or exemptions and including the Auditor Protocol where relevant.
- 12 Reuse is generally not permitted at sites with sensitive uses (see Glossary) due to the risk associated with waste soil from a site where a PCA has or is occurring. *Planning Advisory Notice 20/02 on Site Contamination*<sup>54</sup> states that an auditor is appropriate to assess the suitability of a site for an intended use, particularly where a more sensitive land use is proposed. Consultants are not bound by the stringent requirements that apply to an auditor when preparing an audit report. Hence an auditor, and not a consultant, must be engaged to certify the suitability of a waste soil from a non-sensitive site for use at a sensitive site. This is contingent on the auditor having completed a comprehensive assessment of the material, confirming the waste soil does not exceed waste fill criteria, will not cause harm and is suitable for a sensitive use.  
  
However, the audit report must confirm fulfilment of the above criteria, be submitted to the EPA and be made available via the Public Register.
- 13 As a result of the use of WDF from a site where a PCA has occurred, when the reuse destination site is subject to sale, the vendor will be required to indicate that a PCA occurred at the site, in accordance with questions under Form 1 as required by section 7 of the LBSC Regulations<sup>55</sup>.
- 14 The EPA is required to record audit commencements, terminations and audit reports on the Public Register kept under section 109 of the EP Act. In addition, this information is provided in accordance with questions under Form 1 as required by section 7 of the LBSC Regulations for the sale of land. The EPA also reports the notation of site contamination audit reports against the land as provided by section 103P of the EP Act.
- 15 When the reuse destination site is subject to sale, the vendors will be required to indicate their awareness of an environmental assessment having been carried out on the land (including both a consultant or audit report), in accordance with questions under Form 1 as required by Section 7 of the LBSC Regulations.

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<sup>54</sup> <<http://dataserver.planning.sa.gov.au/publications/715p.pdf>>

<sup>55</sup> Site contamination legislation requires that importation of fill from a site where a PCA occurs in a PCA in itself. This means that the destination is considered to be a site where a PCA has occurred.

**Some important facts to note from this section**

- Waste soil must be demonstrated as suitable in accordance with this standard prior to transport and reuse at the receiving site.
- Only an auditor can certify waste soil from a PCA as suitable for reuse at a sensitive site, even if when assessed by a consultant it meets waste fill criteria.
- Where waste soils are received at an authorised recycling facility, these soils are subject to the requirements for QA/QC requirements as specified under section 5.3 for WDF produced from C&D Waste and that recycling depot requires an environmental authorisation in the form of a licence. All material should be tested to demonstrate it meets the appropriate chemical criteria and waste acceptance procedures need to be in place to ensure no contaminated waste is received.
- Where a soil-based waste material or by-product results from mixed waste processing at a materials recycling facility [including fines from recycling of Commercial and Industrial Waste (General)], and is proposed for reuse, then these are subject to the requirements for QA/QC requirements as specified under section 5.2 for Industrial Residues.
- When a waste soil exceeds waste fill criteria, it must be subject to the Auditor Protocol as specified in section 6.1.3 and may **only contain negligible amounts of foreign material. Some documentation that may be referred to for guidance on inclusions can be found in the NSW exemption for Excavated Natural Material** <[www.environment.nsw.gov.au/waste/RRRecoveryExemptions.htm](http://www.environment.nsw.gov.au/waste/RRRecoveryExemptions.htm)>.
- Where a waste soil reused as WDF is sourced from a site where a PCA is or has occurred, the use of that WDF constitutes a PCA.
- All environmental assessment reports must be reported by the vendor in accordance with the requirements of the LBSC Regulations.
- The EPA records audit information on the Public Register and in response to questions relating to environment particulars under the LBSC Regulations.
- Until the W2R EPP becomes operational, any proposals for the movement of waste soil, including the Auditor Protocol where relevant, will need EPA approval through the existing mechanisms such as licence, limited purpose or exemption.

## 5.2 Wastes or residues from industrial activities (industrial residues)

Industrial activities can produce wastes with many and varied anthropogenic contaminants that differ from those naturally occurring in the environment. The EPA is responsible for ensuring the suitable regulation of activities that produce waste and one of the mechanisms for this is through authorisation of the industrial activities.

Once a waste or residue is produced by an industrial activity and is not able to be reused within the process that produced it, it is a waste that requires disposal or other suitable management. Residual waste (sometimes referred to as by-products or secondary materials) from Commercial and Industrial Waste (General) processing or other waste materials recycling facilities are likely to be of varied composition and need to be assessed as industrial residues. Rather than disposal to landfill of such waste, reuse at non-sensitive use sites may be possible depending on aspects such as the source, the chemical and physical nature and variability of the material, the geophysical characteristics and risk of harm occurring at the proposed reuse site.

Such residues must be proven to be fit for purpose, homogenous soil like mineralogical material, and of suitable and consistent quality such that they will not cause harm, prior to transfer from the source to the reuse site. WDF must not contain mixed or unsuitable wastes. That is, use of residual mixed waste as fill does not constitute a WDF as intended by this standard. Instead it is deposition of waste.

For these reasons, if industrial residues are proposed for reuse, the EPA requires that a recovered products plan (RPP) be prepared (section 6.1.2) and submitted to the EPA for approval, and waste derived materials from these sites must comply with Table 5. A RPP is a document that describes how proponents have or will assess the risk, prove beneficial reuse of the material, assesses and confirms the characteristics of the WDF and specifies the QA/QC processes for the production of the WDF to ensure it will be suitable for reuse prior to transfer from the source to the proposed reuse site.

The main factor contributing to the level of assessment and requirements for use is the concentration of chemical substances and inclusions present in the industrial residues resulting in the following categories:

- below waste fill criteria (Appendix 1)
- exceeding waste fill criteria but not exceeding Intermediate Waste Soil criteria (Appendix 2).

For proposals that involve residues produced at facilities that are not required to be licensed, the EPA will need to be contacted for advice on suitable options. Any reuse must be demonstrated as suitable in line with this standard and approved by the EPA prior to that reuse.

Table 4 summarises the responsibilities for the producer of the industrial waste, the processor of the waste and the user of WDF.



**Table 4 Action required for reuse of industrial residues as WDF**

Producer of waste	Processor of waste (where relevant)	User of WDF	Auditor (where required)
<ul style="list-style-type: none"> <li>• Utilise appropriate waste management options according to the waste management hierarchy.</li> <li>• Engage qualified personnel where required to assess risk.</li> <li>• Submit RPP, including Auditor Protocol where required, to the EPA.</li> <li>• Implement appropriate QA/QC to ensure suitable quality of waste for reuse.</li> <li>• Engage suitable, experienced and qualified persons for independent review, testing and monitoring (where required, consultant or auditor as relevant).</li> <li>• Maintain records and report as required.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure relevant approvals and licences are in place if processing is required.</li> <li>• Ensure only suitable waste is received for processing congruent with the facility approvals.</li> <li>• Implement appropriate QA/QC to ensure suitable chemical and physical quality of waste for reuse prior to transfer from the site for reuse.</li> <li>• Engage suitable, experienced and qualified persons for independent review, testing and monitoring (where required, consultant or auditor as relevant).</li> <li>• Maintain records and report as required.</li> <li>• Ensure WDF is a genuine product and proposed reuse is not actually the disposal of waste.</li> </ul>	<ul style="list-style-type: none"> <li>• Only receive WDF as approved in writing by the EPA.</li> <li>• Ensure only use approved and fit-for-purpose WDF.</li> <li>• Ensure WDF is geotechnically suitable for the intended use.</li> <li>• Ensure WDF is used only under suitable circumstances (including non-sensitive uses only).</li> <li>• Implement all management aspects required under the management plan and by EPA as relevant.</li> <li>• Supply audit report to EPA.</li> <li>• Ensure relevant notification on the land title is specified for environmental assessment reports (if site contamination consultant) or the audit report and if the use of fill constitutes a PCA.</li> <li>• Maintain records and report as required.</li> <li>• Ensure reuse is not actually the disposal of waste.</li> </ul>	<ul style="list-style-type: none"> <li>• Specify acceptance criteria for all waste materials proposed for reuse as WDF (up to but not Intermediate Waste Soil criteria) and that all chemicals contained in the WDF are suitable for reuse in the environment and do not equate to the deposition of waste<sup>56</sup>.</li> <li>• Specify appropriate audit criteria.</li> <li>• Endorse the relevant site management plan.</li> <li>• Ensure all WDF materials produced from industrial residues: <ul style="list-style-type: none"> <li>– are homogeneous mineralogical-based residues that are akin to naturally occurring materials expected to be found in a soil profile</li> <li>– are not used at sensitive sites.</li> </ul> </li> <li>• Act in accordance with their legislative requirements.</li> <li>• Produce and submit an audit report at the completion of the fill project for the reuse site<sup>57</sup>.</li> </ul>

<sup>56</sup> Such reuse must not in essence constitute a landfill and thus disposal of waste by another name.

<sup>57</sup> The audit report is for the purpose of determining the nature and extent of any site contamination present or remaining on or below the surface of the site, the suitability of the site for a sensitive use or another use or range of uses and what remediation is or remains necessary for a specified use or range of uses.

- Ensure application in the form of a RPP is made to the EPA including either consultant report and management plan, or where required, an auditor endorsed site management plan.
- Ensure EPA approval is obtained prior to transport and reuse of WDF.

**Table 5 Requirements for industrial residues used as WDF**

Obligations and Requirements	Up to waste fill quality	Up to Intermediate Waste Soil chemical quality
General environmental duty <sup>1</sup>	☑	☑
Maintain records <sup>2</sup>	☑	☑
Sampling and assessment <sup>3</sup>	☑	☑
Documentation required	☑ RPP	☑ Auditor Protocol
Submission of information and approval required <sup>4</sup>	☑	☑
Restriction on destination (Non-sensitive use only)	☑	☑
Receiving fill material is a PCA <sup>5</sup>	☑	☑
Vendor to indicate existence of report <sup>6</sup>	☑	☑
EPA to indicate existence of report <sup>7</sup>	☑	☑

**Notes**

- 1 This may include ensuring there are no obvious signs of contamination in the waste or residue. If there is known or suspected contamination<sup>58</sup>, reuse may not comply with this standard and may cause harm. Treatment and/or disposal to authorised landfill should be considered.
- 2 Both producers and users must maintain records regarding the source, details of parties involved, volume and destination of industrial residue used, any observations regarding the physical nature of the industrial residue, any laboratory results, risk assessment and details of responsibilities. These records must be available for inspection by EPA upon request.
- 3 Sampling and assessment of the WDF to demonstrate it is suitable for reuse must occur at the source of the industrial residue prior to its exportation for reuse. Risk assessment must be conducted in relation to the destination to determine suitability. Sampling and assessment must be undertaken by a suitably qualified consultant (or auditor where required for WDF exceeding Intermediate Waste Soil criteria) who is required to prepare a report (or audit report) that will provide a definitive statement (or opinion) that the use of the WDF will not cause harm to the environment, including site contamination (refer Appendix 3).  
Assessment of chemical substances must be for all chemical substances reasonably expected to be present in the residue (consideration should be given to the range of analytes listed in Appendix 2). A robust material-specific analysis is required, including relevant physical properties for use as fill. The risks posed by chemical substances

<sup>58</sup> For example, presence of other wastes in the soil, stains, odour or discolouration of soil which can be associated with chemical contamination. However it should be noted that some chemicals are colourless and odourless and qualitative observations alone may be insufficient.

expected to be present that are additional to those specified in the waste fill criteria need to be assessed. It is the responsibility of the producer and user to ensure the WDF is geotechnically suitable for the intended use, including particle size distribution and uniformity, strength and stability.

- 4 Application to the EPA must be made under section 6, including the preparation of a RPP (section 6.1.2) or the Auditor Protocol (section 6.1.3) as appropriate. The RPP must be approved by the EPA and industrial residues must be treated in accordance with the approved RPP for the material to meet the requirements of clause 4(b) of the W2R EPP and constitute a product. EPA approval means a written response confirming that the requirements of this standard have been met in relation to submission of the RPP and that reuse may proceed in accordance with that plan, contingent also upon compliance with the Auditor Protocol where applicable (refer section 6.1.3).

IMPORTANT: Until the W2R EPP becomes operational, any proposals for use of industrial residues as fill will need EPA approval through the existing mechanisms such as licences, limited purpose or exemptions and including the Auditor Protocol where relevant.

- 5 As a result of the use of WDF, regardless of the its quality, from a site where a PCA occurred, when the reuse destination site is subject to sale, the vendor will be required to indicate that a PCA occurred at the site, in accordance with questions under Form 1 as required by section 7 of the LBSC Regulations.
- 6 When the reuse destination site is subject to sale, the vendor will also be required to indicate that an environmental assessment has been carried out on the land (either consultant report or audit report as relevant) in accordance with questions under Form 1 as required by section 7 of the LBSC Regulations.
- 7 The EPA is required to record audit commencements, terminations and audit reports on the Public Register kept under section 109 of the EP Act. In addition, this information is provided in accordance with questions under Form 1 as required by section 7 of the LBSC Regulations for the sale of land. The EPA also reports the notation of site contamination audit reports against land as provided by section 103P of the EP Act

#### **Some important facts to note from this section**

- Industrial residues must be homogenous mineralogical-based residues that are analogous or akin to naturally occurring materials expected to be found in a soil profile and may only contain negligible amounts of foreign material. Some documentation that may be referred to for guidance on inclusions can be found in the NSW exemptions for Resource Recovery <[www.environment.nsw.gov.au/waste/RRecoveryExemptions.htm](http://www.environment.nsw.gov.au/waste/RRecoveryExemptions.htm)>.
- Suitability for reuse must be demonstrated prior to transport and reuse at the receiving site.
- Any soil-based waste material or by-product resulting from mixed waste recycling and proposed for reuse, must be assessed in accordance with the requirements for an industrial residue.
- When a waste industrial residue exceeds waste fill criteria, it must be subject to the Auditor Protocol as specified in section 6.1.3.
- Industrial residues may not be used as WDF at sensitive sites, even if chemically these wastes meet waste fill criteria. This is a policy based decision to ensure that no industrial wastes are used at sensitive sites (childcare centres schools, residential areas, etc. Refer to Glossary).
- The use of an industrial residue as WDF constitutes a PCA.
- All environmental assessment reports must be reported by the vendor in accordance with the requirements of the LBSC Regulations.
- The EPA records audit information on the Public Register and in response to questions relating to environment particulars under the LBSC Regulations.
- Until the W2R EPP becomes operational, any proposals for use of industrial residues as fill will need EPA approval through the existing mechanisms such as licence, limited purpose or exemption and including the Auditor Protocol where relevant.

### 5.3 Construction and Demolition Waste<sup>59</sup>

Once a waste is produced, such as bricks and concrete from construction and demolition activities, it requires appropriate management and consequently falls under the regulatory controls of the EP Act. Rather than disposal of such waste to landfill, recycling and reuse are possible provided the waste is processed into products of suitable and consistent quality that is fit for purpose and will not cause harm. One such use is the production of WDF. Recycling facilities receiving and processing waste into WDF require authorisation from the EPA as a waste or recycling depot [activity 3(3) of Schedule 1 of the EPA Act]. The licence will contain specific conditions; an outline of the requirements is provided in Table 7.

Recycling facilities must ensure that the WDF is fit for purpose and will not cause harm prior to transfer to a reuse site. Appropriate QA/QC testing and assessment must occur at the site at which the WDF is produced to demonstrate suitability. A recovered products plan (RPP) must be submitted to the EPA that describes how the licensee will ensure this occurs. The risks associated with the product and requisite controls will depend on aspects such as the source, the chemical and physical nature and consistency of the material, the geophysical characteristics and risk of harm occurring at the proposed destination.

In order to produce suitable WDF, Construction and Demolition Waste (C&D Waste) received at recycling facilities must not be contaminated. Soils with known or likely contamination must not be received and special caution applied if sourced from a site with a PCA and waste received needs to meet the definitions for C&D waste. WDF produced from C&D Waste may include aggregate, crushed bricks and concrete, recycled bitumen, and inert soils and must not contain other wastes. All foreign materials and prohibited wastes must, as far as possible, be removed from the C&D Waste (both Mixed and Inert) at the beginning of the process or preferably prior to receipt, but should at least occur prior to amalgamation and crushing such that only unavoidable foreign materials, if any, are present and only to a negligible extent. Any fines resulting from the processing may require further processing to again remove any foreign materials. This is to ensure the final WDF will be similar to materials naturally present in the soil profile.

It is the responsibility of the producer and user to ensure the WDF is geotechnically suitable for the intended use, including particle size distribution and uniformity, strength and stability.

Recycling facilities must not receive waste material from sites where site contamination is known to exist as contaminated material needs to be managed in accordance with the site contamination hierarchy (eg managed on-site, remediated, treated off-site or disposed of).

Contaminated soils need to be managed on-site in accordance with the Site Contamination NEPM and *EPA Guidelines for Environmental management of on-site remediation* or only may be received at authorised remediation or treatment facilities. However, in the circumstance where material is inadvertently received and then found to be contaminated, procedures should be in place to appropriately identify and segregate this material from other waste on site. The contaminated waste needs to be removed to a facility authorised to receive it or, if appropriate, assessed in accordance with the Auditor Protocol (section 6.1.3).

Asbestos waste can be a concern in C&D Wastes and therefore action must be taken to avoid its receipt at recycling facilities and inclusion in WDF (refer section 4.2). Relevant guidance on the issue of asbestos management includes:

- EPA guideline, Wastes containing asbestos—removal, transport and disposal
- the draft NSW Guidelines for the receipt of Construction and Demolition Materials at Dedicated recycling facilities which provides guidance regarding on-site management with emphasis on preventing asbestos contamination which may be useful to recyclers

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<sup>59</sup> Where waste soils are received at a recycling facility for storage and subsequent sale or supply for reuse, these soils are subject to the requirements for QA/QC requirements as specified under this section and the facility requires an environmental authorisation for that activity.

- the *Code of Best Practice for Waste Processing in the Construction and Demolition Industries* which may be of use and provides guidance for general site management both at construction and demolition sites and recycling facilities
- Safework SA<sup>60</sup> has information and requirements regarding the handling of asbestos.

Table 6 summarises the responsibilities for the producer of the waste, the processor of the waste and the user of WDF.

**Table 6 Action required for reuse of C&D Waste as WDF**

Producer of waste	Processor of waste (where relevant)	User of WDF	Auditor
<ul style="list-style-type: none"> <li>• Utilise appropriate waste management options according to the waste management hierarchy.</li> <li>• Transport waste to appropriately licensed facilities.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure relevant approvals and licences are in place if processing is required.</li> <li>• Submit a RPP to the EPA including either consultant report and management plan, or where required, an auditor endorsed site management plan.</li> <li>• Ensure only suitable waste is received for processing congruent with the facility approvals.</li> <li>• Implement appropriate QA/QC to ensure suitable chemical and physical quality of waste for reuse (waste fill criteria) prior to transfer from the site for reuse.</li> <li>• Engage suitable, experienced and qualified persons for independent review, testing and monitoring (where required, consultant or auditor as relevant).</li> <li>• Obtain approval prior to removal for reuse of any WDF that exceeds waste fill criteria.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure only fit-for-purpose waste derived product is used.</li> <li>• Ensure WDF is used only under suitable circumstances.</li> <li>• Ensure WDF is geotechnically suitable for the intended use.</li> <li>• Ensure management or reuse minimises risk of harm including nuisance.</li> <li>• If WDF produced does not meet waste fill criteria: <ul style="list-style-type: none"> <li>– supply audit report to EPA</li> <li>– ensure relevant notification on the land title (non-sensitive use only) of environmental assessment report (if site contamination consultant) or audit report is specified.</li> </ul> </li> <li>• maintain records and report as required</li> </ul>	<ul style="list-style-type: none"> <li>• Specify acceptance criteria for all waste materials proposed for reuse as WDF, up to but not exceeding Intermediate Waste Soil criteria and that all chemicals contained in the WDF are suitable for reuse in the environment and do not equate to the deposition of waste<sup>61</sup>.</li> <li>• Specify appropriate audit criteria.</li> <li>• Endorse the relevant site management plan.</li> <li>• Ensure all WDF produced that exceed waste fill criteria: <ul style="list-style-type: none"> <li>– are homogenous, consistent and akin to naturally occurring materials expected to be found in a soil profile</li> <li>– are not used at sensitive sites.</li> </ul> </li> <li>• Act in accordance with their legislative requirements.</li> </ul>

<sup>60</sup> Available at <[www.safework.sa.gov.au/show\\_page.jsp?id=2974](http://www.safework.sa.gov.au/show_page.jsp?id=2974)>.

<sup>61</sup> Such reuse must not in essence constitute a landfill and thus disposal of waste by another name.

Producer of waste	Processor of waste (where relevant)	User of WDF	Auditor
	<ul style="list-style-type: none"> <li>Maintain records and report as required.</li> <li>Ensure WDF is a genuine product and proposed reuse is not actually the disposal of waste.</li> </ul>	<ul style="list-style-type: none"> <li>ensure reuse is not actually the disposal of waste.</li> </ul>	<ul style="list-style-type: none"> <li>Produce and submit an audit report at the completion of the fill project for the reuse site<sup>62</sup>.</li> </ul>

**Table 7 Requirements for C&D Waste being used as WDF**

Obligations and requirements	All recycled fill products
General environmental duty	<input checked="" type="checkbox"/>
Control of wastes received <sup>1</sup>	<input checked="" type="checkbox"/>
Maintain records <sup>2</sup>	<input checked="" type="checkbox"/>
Sampling <sup>3</sup>	<input checked="" type="checkbox"/>
Documentation required	<input checked="" type="checkbox"/> RPP
Submission of information and approval required <sup>4</sup>	<input checked="" type="checkbox"/>
Chemical criteria—WDF meets waste fill <sup>5</sup>	<input checked="" type="checkbox"/> <sup>6</sup>
Restriction on destination	<input checked="" type="checkbox"/> <sup>6</sup>
EPA to indicate existence of report <sup>7</sup>	<input checked="" type="checkbox"/>

- 1 The recycler must ensure that only wastes that are suitable for recycling are received. This may include ensuring there are no known, suspected or obvious signs of contamination. If there is known or suspected contamination<sup>63</sup>, reuse may not comply with this standard and may cause harm. Processes must be in place to reject loads, segregate waste and remove and dispose of contaminants to authorised facilities. Materials from sites known or suspected of having site contamination must not be received; these should be managed in accordance with the site contamination hierarchy (eg on-site management, remediation or off-site treatment or disposal).
- 2 Producers must maintain records regarding the source, details of parties involved, volume and destination of WDF reused, any observations regarding the physical nature of the WDF, any laboratory results, risk assessment and details of responsibilities. These records must be available for inspection by the EPA upon request. Users are advised to ensure they satisfy themselves that use of the product is acceptable and will not cause harm and may wish to keep relevant records or request information from the supplier in this regard.

<sup>62</sup> The audit report is for the purpose of determining the nature and extent of any site contamination present or remaining on or below the surface of the site, the suitability of the site for a sensitive use or another use or range of uses and what remediation is or remains necessary for a specified use or range of uses.

<sup>63</sup> For example, as determined by the source, presence of other wastes, stains, odour or discolouration of soil which can be associated with chemical contamination. However it should be noted that some chemicals are colourless and odourless and qualitative observations alone may be insufficient.

- 3 Sampling and assessment of the WDF must occur at the site where it is generated prior to its export for reuse. Sampling and assessment must be undertaken by a suitably qualified consultant (refer Appendix 3). Assessment must be of chemical substances specified in the waste fill criteria (as specified by the waste fill definition and in Appendix 1) as well as any other chemical substances reasonably expected to be present. This may depend on the source of the material that has been recycled (consideration should be given to the range of analytes listed in Appendix 2).

A robust material-specific analysis is required, including analysis of relevant physical properties for use as fill. The risks posed by chemical substances expected to be present that are additional to those specified in the waste fill criteria needs to be assessed and the fact that the waste is fit for reuse must be demonstrated. Any waste proposed for use as WDF that is derived from materials likely to contain asbestos, must be subject to representative analysis in order to either demonstrate the material is free of asbestos if it is to be considered as meeting the waste fill criteria, or to provide the necessary information to enable its assessment for reuse sites where its use may be permitted in accordance with the Auditor Protocol in section 6.1.3.

It is the responsibility of the producer and user to ensure the WDF is geotechnically suitable for the intended use, including particle size distribution and uniformity, strength and stability.
- 4 While no specific EPA approval is required for the reuse of each load or batch of WDF from authorised facilities, recycling facilities will need to submit a RPP (refer section 6.1.1) to the EPA for approval to demonstrate the processes that will be in place to ensure that each product will be suitable as meeting waste fill criteria prior to export for reuse. The RPP must address the materials acceptance, handling processing and QA/QC testing to demonstrate the suitability of the WDF ensuring it is fit for purpose, will not cause harm and does not contain unacceptable wastes. Input restrictions and quality of product may be controlled through licence conditions of the recycling facility. The RPP must be approved by the EPA and recycled material must be prepared in accordance with the approved RPP for the material to meet the requirements of clause 4(b) of the W2R EPP and constitute a product. EPA approval means a written response confirming that the requirements of this standard have been met in relation to submission of the RPP and that reuse may proceed in accordance with that plan, contingent also upon compliance with the Auditor Protocol where applicable (refer section 6.1.3).
- 5 Products for unrestricted use must not exceed waste fill criteria and must not contain any other wastes or materials that may cause harm to human health or the environment.
- 6 Processes need to be established to ensure only inert wastes and materials are received and processed and therefore there is no specified restriction on destinations. However, if unexpected results show exceedences of the waste fill criteria but not exceeding Intermediate Waste Soil criteria, then this material must be segregated. Reuse may still be permitted for site-specific non-sensitive uses, provided the Auditor Protocol is followed in accordance with section 6.1.3. The vendor of the reuse site will need to flag the existence of the report as will the EPA in response to questions under Form 1 as required by section 7 of the LBSC Regulations. If materials exceed Intermediate Waste Soil criteria or do not have a suitable approved use, then these must be disposed of to authorised facilities.
- 7 The EPA is required to record audit commencements, terminations and audit reports on the Public Register kept under section 109 of the EP Act. In addition, this information is provided in accordance with questions under Form 1 as required by section 7 of the LBSC Regulations for the sale of land. The EPA also reports the notation of site contamination audit reports against land as provided by section 103P of the EP Act.

**Some Important facts to note from this section:**

- WDF must meet waste fill criteria.
- Recycling facilities must not receive contaminated materials including soils from contaminated sites.
- Recycling facilities must have an RPP that details their QA/QC to ensure only appropriate materials are received, appropriate processes are undertaken at the site and that all WDF is fit for purpose and suitable for reuse, prior to transport and reuse at the receiving site. That is:
  - the WDF does not exceed waste fill criteria
  - if QA/QC processes discover non-complying material that may be suitable for site specific reuse, the Auditor Protocol (refer section 6.1.3) is invoked.
- Where waste soils are received at a recycling facility, these soils are subject to the requirements for QA/QC requirements as specified under this section and that recycling depot requires an environmental authorisation in the form of a licence.
- WDF must be homogenous, and consistent such that they are akin to naturally occurring materials expected to be found in a soil profile and may only contain negligible amounts of foreign material. Some further documentation that may be referred to for guidance on inclusions when developing a RPP can be found in the NSW exemptions for Recovered Aggregates, Excavated Natural Material and Recovered Fines from C&D Waste <[www.environment.nsw.gov.au/waste/RRecoveryExemptions.htm](http://www.environment.nsw.gov.au/waste/RRecoveryExemptions.htm)>.
- All environmental assessment reports must be reported by the vendor in accordance with the requirements of the LBSC Regulations.
- The EPA records audit information on the Public Register and in response to questions relating to environment particulars in accordance with the LBSC Regulations.
- Irrespective of the W2R EPP becoming operational, the EPA will require the submission of RPPs, including the Auditor Protocol, through licence conditions.



## 6 EPA submissions for reuse proposals

Where specific EPA approval<sup>64</sup> is required (refer section 5), sufficient details and evidence to demonstrate the suitability of the proposal for reuse of waste needs to be provided. The types of information to be submitted to the EPA specified in section 5 include recovered products plan (RPP), consultant reports and audit reports. Specifically, information needs to be submitted to the EPA for proposed reuse as WDF of:

- Industrial residues
  - WDF meets waste fill criteria (RPP)
  - WDF exceeds waste fill criteria (Auditor Protocol)
- C&D Waste
  - WDF meets waste fill criteria (RPP)
  - WDF exceeds waste fill criteria (Auditor Protocol)
- Waste soil exceeding waste fill criteria (Auditor Protocol).

The purpose of a RPP is for licensees to set out in a document for approval by the EPA:

- 1 a detailed description of the wastes that are received, produced and recycled at the premises
- 2 the QA/QC processes that will ensure no unsuitable wastes are received and that the WDF produced for use as a WDF will be suitable.

The RPP will need to demonstrate how the wastes received and processed into WDF products meet the key considerations (section 3) and wastes suitable for use as fill (section 4) to ensure fit for purpose and minimisation of harm and the specific requirements of section 5.

The level of detail and specific sampling programs that is required will vary depending on the nature of the facility in question, the variability and complexity of processes involved, the specific wastes in question and the variability of the wastes. The EPA will work with licensees and provide advice to assist in the development of RPPs. The EPA may require further information to be submitted, in addition to the information listed below, to be satisfied that a full assessment has been made and sufficient details provided to enable a fully informed decision to be made.

The purpose of site contamination consultant reports and audit reports is to provide a third-party high-level review and endorsement of suitability for a proposal. An audit report is required for higher risk material (up to Intermediate Waste Soil chemical quality) or for reuse of material that complies with waste fill criteria at a sensitive site but which was sourced from a PCA.

The information contained in this section should also be considered by those proponents not requiring specific approval, in order to ensure they have considered all the issues and undertaken a suitable level of due diligence.

### 6.1 Information to be submitted to the EPA

The following information will need to be provided where specific EPA written approval is required<sup>65</sup>.

<sup>64</sup> EPA approval means a written response confirming that the requirements of this standard have been met, for example in relation to submission of the RPP or site management plan where required, and that reuse may proceed in accordance with that plan, contingent also upon compliance with the Auditor Protocol where applicable.

<sup>65</sup> Proponents may contact the EPA for an initial discussion of the potential of any reuse providing an outline of the proposal in order to determine the suitability of proceeding to a full application.

### **6.1.1 Recovered products plan—recycled construction and demolition waste products meeting waste fill criteria**

#### ***For WDF from C&D Waste meeting waste fill criteria***

The producer is responsible for submitting a RPP to the EPA for approval that addresses the following required information:

- 1 Details of WDF producer including full legal name, registered address and authorised contact personnel
- 2 Details of the specific wastes received at the facility
- 3 Details of the waste processing undertaken on-site (receipt, segregation, sorting, processing and storage)
- 4 Details of the chemical and physical product specifications for WDF produced at the facility, including:
  - a total dry weight and leachable concentrations of chemical substances (including assessment for presence of chemical substances and wastes other than those listed in the waste fill criteria that are likely to be present; broad suite and/or specific targeted analysis may be suitable depending on knowledge of the source)
  - b physical nature of the material and any inclusions.
- 5 Details of the representative sampling program and chemical analysis including responsible parties
- 6 Details of any restriction on reuse applications
- 7 Details of the methodologies for QA/QC processes to be implemented for:
  - a wastes to be received for processing
  - b processing procedures
  - c procedures to ensure no unacceptable waste are included in final product
  - d sampling and assessment to confirm physical and chemical quality of the product meets waste fill criteria<sup>66</sup> including:
    - i responsible parties
    - ii procedure for assessment of any other chemical substance<sup>67</sup> that is not listed in Appendix 1 but present in the WDF, in order to demonstrate that the substance will not cause harm to the environment or human health when supplied as an inert product for unrestricted use.
- 8 A contingency plan should unsuitable wastes or products be identified
- 9 How the Auditor Protocol will be triggered, ie where:
  - a there are any other chemical substances or wastes present in the proposed WDF that are not listed in Appendix 1 or
  - b the concentrations of chemical substances exceed the criteria in Appendix 1.

### **6.1.2 Recovered products plan—Industrial Residues meeting waste fill criteria**

#### ***For WDF from industrial residues meeting waste fill criteria (chemical and physical)***

The producer is responsible for submitting a RPP to the EPA for approval that addresses the following:

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<sup>66</sup> Refer to Appendix 1 for further details.

<sup>67</sup> Refer Glossary.

- 1 Full details of WDF producer and user, including full legal names, registered addresses and authorised contact personnel
- 2 Information as listed in section 6.1.1 (3 to 8 inclusive);
- 3 Purpose and details of the proposal:
  - a reason for fill and details of net benefit
  - b fill volume(s) required and destination location(s) (non-sensitive sites only)
  - c proposed timeframe for the activity.
- 4 A site management plan for the destination location which addresses all operational and environmental management issues of the project. The site management plan must be complied with at all times including any requirements from the EPA for the acceptance or management of the material at the project site. The site management plan should include:
  - a details of proposed consultation
  - b a requirement for the proponent to appoint and maintain a project manager to ensure that the site management plan is implemented for the duration of the project
  - c details of proposed consultation, appointment of the project manager and a clear identification process for the land that is the subject of the proposal (system of certificates of title administered by the Lands Titles Office or similar). This identification must be managed in perpetuity and independently from the project proponent by the Lands Titles Office or other suitable enduring body if the land is not subject to Title.
- 5 A definitive statement from a site contamination consultant regarding the suitability of the proposal and the risk of harm. The statement must be based on their assessment of representative sampling and testing and should include:
  - a a statement specifying and confirming the suitability for use
  - b confirmation that the WDF does not exceed waste fill criteria
  - c confirmation the WDF does not consist of or contain any prohibited wastes
  - d sufficient justification, rationale and evidence for the statement
- 6 How the Auditor Protocol will be triggered, ie where:
  - a there are any other chemical substances or wastes present in the proposed WDF (as defined in the Glossary) that are not listed in Appendix 1 or
  - b the concentrations of chemical substances exceed the criteria in Appendix 1.

### 6.1.3 Auditor Protocol—materials exceeding waste fill criteria

#### ***For Industrial Residues, C&D Waste or soils exceeding waste fill criteria, including presence of asbestos***

A site contamination auditor, accredited under the Division 4 of Part 10A of the EP Act, must be engaged by the proponent<sup>68</sup>.

The role of the auditor is to provide the high level of expertise required for assessing higher risk materials proposed for reuse and addressing the relevant controls needed in that regard. EPA approval is based upon the auditor's endorsement of the site management plan provided that the auditor has acted according to the EP Act, regulations and relevant guidelines issued by the EPA. However, any regulatory issues remain the responsibility of the EPA and where

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<sup>68</sup> Site contamination auditors are persons accredited under Division 4 of Part 10A of the EP Act as a Site Contamination Auditor. Refer to EPA Publication, *Site Contamination—using an environmental auditor* to assist in the considerations when selecting an auditor.

submission is required, the EPA retains the role of permitting the reuse to proceed. Regulatory issues include ensuring that appropriate authorisations are in place while material remains waste.

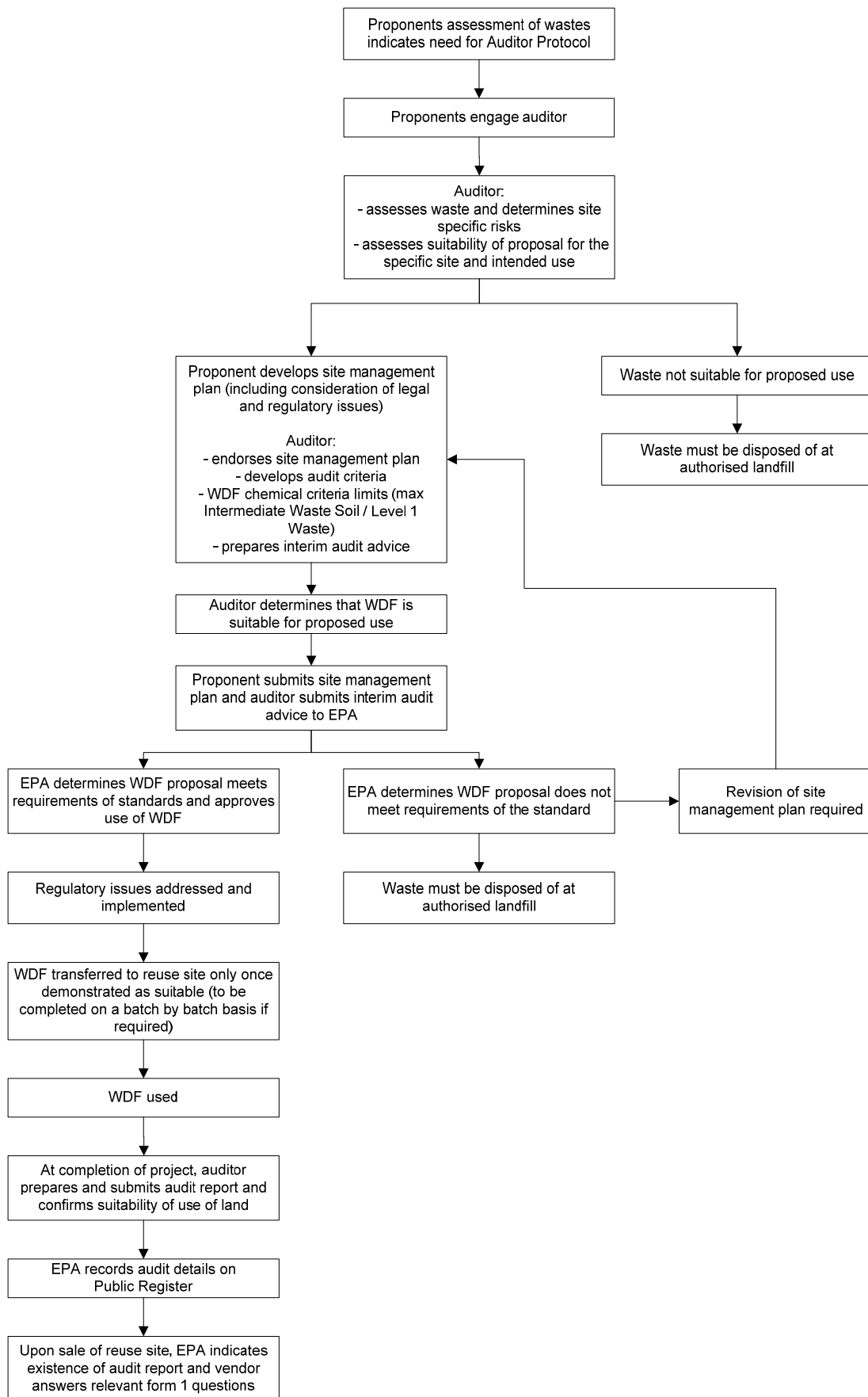


Figure 6 Auditor Protocol

Prior to the use of the WDF, the proponent must submit an application to the EPA for approval. The application must include a site management plan endorsed by an auditor. All other requirements of this standard apply and must be addressed in the application along with an individual site risk assessment. Although the auditor can recommend suitability of WDF for a site, if the reuse requires significant environmental controls (ie as would be required at a landfill site) to proceed or if the WDF contains significant foreign materials, the EPA does not consider this as beneficial and would not support the proposal.

WDF must be similar to materials naturally present in the soil profile. During processing, prohibited wastes and foreign materials must be removed to the maximum extent possible. Any trivial amounts of such wastes that may remain within the WDF must be assessed to determine whether they will cause harm and must only be present, when unavoidable, to a negligible extent. The auditor must take account of the effect of any such inclusions in their assessment of suitability<sup>69</sup>.

At the completion of the project an audit report will be required to be submitted to the EPA. The report sets out the findings, determinations and outcomes of the audit and is prepared and provided by an auditor in accordance with legislative requirements and guidelines issued by the EPA.

Failure to implement the requirements of an audit condition may result in land no longer being suitable for its current or intended use, and potentially posing a threat of harm or causing site contamination. For further information, refer to section 7 of this document.

The steps of the Auditor Protocol are outlined in **Figure 6**.

NOTE: The maximum criteria specified by the EPA for Intermediate Waste Soil are waste disposal criteria. There is no guarantee that material meeting this criteria will not cause harm in other situations. As such, these maximum criteria that EPA has set are for consideration by the auditor who may decide to set lower limits. The auditor must then determine the precise criteria for the specific site, up to these maxima (total dry weight and leachable), as well as any requisite physical criteria that deems the material fit for the specific site purpose such that harm to human health and the environment will not be caused. Liability for any harm remains with the proponent (producer and/or the owner of the land where WDF is used). To comply with their accreditation, an auditor is required to ensure they comply with the EP Act, regulations and relevant guidelines issued by the EPA.

The details that must be included in the application according to the Auditor Protocol are:

- 1 Full details of WDF product producer and user, including full legal name, registered addresses and authorised contact personnel
- 2 Purpose and details of the proposal:
  - a purpose for WDF and details of net benefit
  - b WDF volume/s required, sources and reuse location/s.
- 3 Confirmation that the wastes meet the key considerations (section 3) and wastes suitable for use as fill (section 4) to ensure fit for purpose and minimisation of harm and relevant information as specified in section 5
- 4 The proposed timeframe for the activity and timeframe for submission of the audit report
- 5 A site management plan which addresses all operational and environmental management issues for the project. The plan must be reviewed and endorsed by the auditor prior to submission. The site management plan must be complied with at all times, including compliance with any conditions imposed by the auditor for the acceptance or management of the material at the project site. The site management plan must include:

<sup>69</sup> Some further documentation that may be referred to for guidance on inclusions can be found in the NSW resource recovery exemptions <[www.environment.nsw.gov.au/waste/RRecoveryExemptions.htm](http://www.environment.nsw.gov.au/waste/RRecoveryExemptions.htm)>.

- a a requirement for the proponent to consult appropriately with, and have regard to the views of, the community and council adjacent to/within the area with a potential to be affected by the project
- b audit criteria prepared by the auditor specifying the type and characterisation of WDF which will be deemed to be suitable to be accepted for use at the project site. This will take into account chemical, aesthetic and geotechnical criteria that will be suitable for the proposed use and which will not cause harm to the environment or human health
- c specific auditor approval of all materials by demonstration that they are suitable for reuse and will not cause harm, prior to acceptance at the reuse project site. Any waste materials that are proposed to be stored at the reuse site proposed for use as WDF, but which still require confirmation of suitability, remain classified as waste and are subject to regulation as waste until that confirmation is made. No transfer of waste should occur from the production site prior to this confirmation, unless the receiving site has an environmental authorisation to receive and store waste
- d a requirement for the proponent to appoint and maintain, for the duration of the project, a project manager who will be responsible for ensuring that the site management plan is implemented for the duration of the project, and that any conditions of the audit report are implemented according to the auditor's recommendations following completion of the project
- e a clear identification process for the land that is the subject of the proposal (system of certificates of title administered by the Lands Titles Office or similar). This identification must be managed in perpetuity and independently from the project proponent by the Lands Titles Office or other suitable enduring body if the land is not subject to Title
- f a requirement to implement and maintain the conditions of the audit report, that takes OHS&W requirements into account with respect to maintenance and use of the material received at the site and any ongoing requirements after completion of the filling of the subject land
- g clear endorsement of the site management plan by the auditor. In endorsing the plan the auditor needs to provide interim audit advice<sup>70</sup> based on the requirements outlined in the *Guidelines for the Site Contamination audit system*. In doing so, the auditor provides an opinion that, based on the knowledge available at the time including appropriate assessment of the site, the WDF is suitable for use, will not pose an unacceptable risk of causing harm and the land will be suitable for its proposed use at the completion of the project. In documenting this opinion, the auditor must include details of their considerations to support making that statement including the following:
  - i chemical and physical characteristics of WDF (chemical concentrations must not exceed Intermediate Waste Soil chemical criteria and must not contain unsuitable or prohibited wastes):
    - for waste soils—site history and assessment of any prescribed PCAs occurring at the site
    - for industrial residues—process generating the waste
    - for C&D Waste—nature of the waste and recycling processes.
  - ii reuse site assessment
  - iii assessment methodologies and QA/QC.

It must be noted that the auditor may decide not to endorse the site management plan if issues of *existing* site contamination are found. In this case additional action may be needed to remediate the site.

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<sup>70</sup> Interim audit advice form available at <[www.epa.sa.gov.au/xstd\\_files/Site%20contamination/Form/sc\\_audit\\_advice.pdf](http://www.epa.sa.gov.au/xstd_files/Site%20contamination/Form/sc_audit_advice.pdf)>.

**Site contamination audit report**

At the completion of the project, an audit report and site contamination audit statement must be prepared by the auditor in accordance with Part 10A of the EP Act, section 103, the Environment Protection Regulations 2009 and guidelines (refer Section 7).

The site contamination audit (audit) [as defined in section 3(1) of the EP Act] is a review that is carried out by a person that:

- 1 examines assessments or remediation carried out by another person in respect of known or suspected site contamination on or below the surface of a site; and
- 2 is for the purpose of determining the following matters:
  - a the nature and extent of any site contamination present or remaining on or below the surface of the site;
  - b the suitability of the site for a sensitive use or another use or range of uses; and
  - c what remediation is or remains necessary for a specified use or range of uses.

It must be noted that the auditor may decide not to provide the audit report confirming suitability for use if site contamination is caused or if the site management plan is not complied with. In these circumstances action may need to be taken to remediate the site. This may include removal of the WDF to an authorised landfill.

There is a requirement for the EPA and the vendor to indicate the existence of an audit report on the certificate of title for the subject land. This is to ensure that any ongoing site management requirements, including the need to obtain permission to dig prior to commencing any excavation works, are maintained in perpetuity in order to provide assurance to any future owners or persons interacting with the land.

**6.2 General responsibilities*****Producer—the person producing WDF is required to:***

- obtain approvals where required
- implement appropriate QA/QC procedures and management plans (including Auditor Protocol where required)
- ensure only suitable wastes are used to produce WDF
- ensure that WDF is consistently produced to the approved specification prior to removal for reuse
- ensure that WDF is only transported to suitable sites, with specific approval where required
- responsibly manage residual waste by transporting it to an authorised waste management facility for disposal
- maintain and be able to provide records to demonstrate the points above including relevant sampling, testing and monitoring of the process and the WDF produced:
  - to the user prior to transport of the WDF
  - upon request from the EPA.

***Transporter—the person engaged to transport WDF is recommended to:***

- obtain approvals where required
- ensure the vehicle is suitable for transport of WDF
- only receive and transport WDF that has been demonstrated as suitable and where required, approved for use
- transport the WDF only to premises that have been demonstrated and approved as suitable (where required) to receive that WDF

- maintain and provide records of transport to the producer and user of the WDF and EPA as required or on request to demonstrate the above.

***User—the person receiving and using WDF is required to:***

- obtain approvals where required
- implement appropriate QA/QC procedures and management plans (including complying with audit conditions where required)
- ensure WDF is only received from appropriate sources
- conduct any requisite QA/QC procedures to ensure they are receiving and using a suitable WDF
- ensure records are maintained to demonstrate the above points and make these records available to the EPA where required or upon request
- ensure full disclosure where required when answering questions in relation to the sale of land or a business in accordance with the LBSC Regulations.

It is the responsibility of the proponents to ensure that they comply with all requirements of this standard.

This standard is designed to minimise the risk of potential harm to the environment, human health or agriculture. The EPA is not in any way guarantee that the use of these recycled materials will confer the proposed benefit stated by the producer. The liability for any harm rests with the persons who produce and use the recycled material.



## **PART FOUR**

## **REFERENCES**

## 7 Further information

### EPA guidelines

*Air quality impact assessment using design ground level pollutant concentrations (DGLCs)*, publication 386/06,  
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*Guidelines for separation distances*, publication 714/07,  
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<[www.epa.sa.gov.au/xstd\\_files/Corporate/Other/position\\_statement\\_sustainability.pdf](http://www.epa.sa.gov.au/xstd_files/Corporate/Other/position_statement_sustainability.pdf)>.

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- *Waste management—regulatory framework and objectives*,  
<[www.epa.sa.gov.au/xstd\\_files/Waste/Information%20sheet/waste\\_objectives.pdf](http://www.epa.sa.gov.au/xstd_files/Waste/Information%20sheet/waste_objectives.pdf)>.
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### **Codes of Practice under the Occupational Health Safety & Workplace Act 1986**

*Code of Practice for the Safe Removal of Asbestos* 2nd Edition [NOHSC:2002 (2005)],  
<[www.ascc.gov.au/NR/rdonlyres/1A198A7C-D0A7-40AD-964E-31673C695E92/0/AsbestosCode.pdf](http://www.ascc.gov.au/NR/rdonlyres/1A198A7C-D0A7-40AD-964E-31673C695E92/0/AsbestosCode.pdf)>.

*Code of Practice for the Management and Control of Asbestos in the Workplace* [NOHSC:2018 (2005)],  
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### **WMAA**

*Code of best practice for waste processing in the construction and demolition industries*,  
<[www.wmaa.asn.au/uploads/documents/Construction%20and%20Demolition%20Best%20Practice%20Guidelines.pdf](http://www.wmaa.asn.au/uploads/documents/Construction%20and%20Demolition%20Best%20Practice%20Guidelines.pdf)>.

*Guidelines for the receipt of Construction and Demolition Materials at Dedicated Recycling Facilities* (draft),  
<[www.wmaa.asn.au/director/workinggroups/nsw\\_act/construction\\_and\\_demolition/papers.cfm](http://www.wmaa.asn.au/director/workinggroups/nsw_act/construction_and_demolition/papers.cfm)>.

### **State**

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### **National**

Australian Quarantine Inspection Service, <[www.daffa.gov.au](http://www.daffa.gov.au)>.

*National Environment Protection (Assessment of Site Contamination) Measure*  
<[www.ephc.gov.au/nepms/cs/con\\_sites.html](http://www.ephc.gov.au/nepms/cs/con_sites.html)>.

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<[www.environment.nsw.gov.au/clm/guidelines.htm](http://www.environment.nsw.gov.au/clm/guidelines.htm)>.

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<[epanote2.epa.vic.gov.au/EPA/Publications.nsf/2f1c2625731746aa4a256ce90001cbb5/11fe9e999f98de62ca25735c0012fe9e/\\$FILE/1178.pdf](http://epanote2.epa.vic.gov.au/EPA/Publications.nsf/2f1c2625731746aa4a256ce90001cbb5/11fe9e999f98de62ca25735c0012fe9e/$FILE/1178.pdf)>.

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*Australian exposure assessment handbook*, enHealth 2003, <[www.nphp.gov.au/enhealth/index.htm](http://www.nphp.gov.au/enhealth/index.htm)>.

*Management of asbestos in the non-occupational environment*, enHealth 2005,  
<<http://enhealth.nphp.gov.au/council/pubs/pdf/asbestos.pdf>>.

*Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres*, National Occupational Health and Safety Commission (NOHSC), <[www.ascc.gov.au/NR/rdonlyres/EBF8D7D0-A461-4A9F-BCA8-9BD70FC77882/0/MFM.pdf](http://www.ascc.gov.au/NR/rdonlyres/EBF8D7D0-A461-4A9F-BCA8-9BD70FC77882/0/MFM.pdf)>.

### **Legislation**

This and further relevant legislation may be viewed at:

<[www.epa.sa.gov.au/environmental\\_info/legislation/environment\\_protection\\_legislation](http://www.epa.sa.gov.au/environmental_info/legislation/environment_protection_legislation)> and  
<[www.legislation.sa.gov.au](http://www.legislation.sa.gov.au)>.

*Environment Protection Act 1993*

*Radiation Protection and Control Act 1982*

*Environment Protection (Air Quality) Policy 1994*

*Environment Protection (Waste Management) Policy 1994—Medical Waste*

*Environment Protection (Water Quality) Policy 2003*

*Environment Protection Regulations 2009*

*Radiation Protection and Control (Transport of Radioactive Substances) Regulations 2003*

*Natural Resources Management Act 2004*

*Development Act 1993*

## 8 Glossary

### Asbestos

The fibrous form of mineral silicates belonging to the serpentine and amphibole groups of rock-forming minerals, including actinolite, amosite (brown asbestos), anthophyllite, chrysotile (white asbestos), crocidolite (blue asbestos), tremolite or any mixture containing one or more of the mineral silicates belonging to the serpentine and amphibole groups.

**Asbestos-containing material** is any material, object, product or debris that contains asbestos.

Friable asbestos means:

- (a) non-bonded asbestos fabric, or
- (b) asbestos-containing material that:
  - (i) is in the form of powder, or
  - (ii) can be crumbled, pulverised or reduced to powder by hand pressure when dry.

**Non-friable asbestos** means asbestos-containing material in which the asbestos fibres are bonded by cement, vinyl, resin or other similar material, eg asbestos cement.

**Asbestos waste** means waste asbestos-containing material (ACM) including all removed ACM, as well as disposable items used during asbestos removal work, such as plastic sheeting and disposable coveralls, respirators and cleaning rags.

*Advice on the requirements for handling and transport of this waste can be found in EPA Guideline, Wastes containing asbestos: removal, transport and disposal.*

*See also Approved Codes of Practice under the OHS&W Act 1986.*

### Audit

See site contamination audit

### Audit Report

See site contamination audit report

### Auditor

See site contamination auditor

### Background concentrations

As prescribed in section 3(1) of the *Environment Protection Act 1993*

(in relation to chemical substances on a site or below its surface) means results obtained from carrying out assessments of the presence of the substances in the vicinity.

### Biosecurity waste

Biosecurity is the protection of people, animals, horticultural industries and ecological systems against disease and other biological threats.

Biosecurity waste may also be called quarantine waste determined by relevant state authorities (including Primary Industries and Resources SA, Department of Environment and Heritage, and the Department of Water, Land and Biodiversity Conservation) as related to biosecurity including plant and animal health risk and disease or pest control.

The Biosecurity Strategy for South Australia aims to protect South Australia's favourable pest and disease status from the increased risk of exotic pest, disease and weed incursions and to maintain and enhance access by South Australian industries to international animal and plant-related markets.

<[www.pir.sa.gov.au/pirsa/biosecurity](http://www.pir.sa.gov.au/pirsa/biosecurity)>.

### Chemical substance

As prescribed in section 3(1) of the *Environment Protection Act 1993*

Any organic or inorganic substance, whether a solid, liquid or gas (or combination thereof), and includes waste.

<b>Commercial and Industrial Waste (C&amp;I)</b>	<p><b>Commercial and Industrial Waste (General)</b> The solid component of the waste stream arising from commercial, industrial, government, public or domestic premises (not collected as Municipal Solid Waste), but does not contain Listed Waste, Hazardous Waste or Radioactive Waste.</p> <p><b>Commercial and Industrial Waste (Listed)</b> The solid component of the waste stream arising from commercial, industrial, government, public or domestic premises (not collected as Municipal Solid Waste), that contains or consists of Listed Waste.</p>
<b>Construction and Demolition Waste (C&amp;D)</b>	<p><b>Construction and Demolition Waste (Inert)</b> The solid inert component of the waste stream arising from the construction, demolition or refurbishment of buildings or infrastructure but does not contain Municipal Solid Waste, Commercial and Industrial Waste (General), Listed Waste, Hazardous Waste or Radioactive Waste.</p> <p><i>Notes:</i> <i>C&amp;D waste (Inert) should be such that the entire composition of the C&amp;D materials is Inert Waste with no contamination by foreign material. As such it is acknowledged that—with the aim of no contamination—there may be some negligible components of foreign material contained in the waste (as a guide, 0–5% maximum by volume per load). C&amp;D waste (Inert) includes bricks, concrete, tiles and ceramics, steel and inert soils.</i></p> <p><i>Foreign material includes green waste, plastics, electrical wiring, timber, paper, insulation, tins, packaging and other waste associated with construction or demolition of a building or other infrastructure. Foreign material must not be Municipal Solid Waste, Liquid, Listed, Hazardous or Radioactive Waste.</i></p> <p><b>Construction and Demolition Waste (Mixed)</b> The solid component of waste stream arising from the construction, demolition or refurbishment of buildings or infrastructure which contains some foreign material (as set out below), but does not contain Municipal Solid Waste, Commercial and Industrial Waste (General), Listed Waste, Hazardous Waste or Radioactive Waste.</p> <p><i>Notes:</i> <i>C&amp;D Waste is considered C&amp;D Waste (Mixed) if it contains significant foreign materials from construction and demolition activities that would render the load of waste no longer inert (as a guide, 5–25% maximum by volume per load).</i></p> <p><i>Foreign material includes green waste, plastics, electrical wiring, timber, paper, insulation, tins, packaging and other waste associated with construction or demolition of a building or other infrastructure. Foreign material must not be Municipal Solid Waste, Liquid, Listed, Hazardous or Radioactive Waste.</i></p> <p><i>Where waste from construction and demolition sites contains predominantly foreign materials or domestic waste, such as waste from household clean-ups collected by commercial skip bins, this is defined as Commercial and Industrial Waste (General).</i></p>
<b>Consultant</b>	See Suitably qualified consultant or Site contamination consultant
<b>Environment</b>	<p>Land, air, water, organisms and ecosystems, and includes—</p> <ul style="list-style-type: none"> <li>(a) human-made or modified structures or areas; and</li> <li>(b) the amenity values of an area.</li> </ul>

<b>Environmental Harm</b>	<p>As prescribed in section 5 of the <i>Environment Protection Act 1993</i></p> <p>Any harm, or potential harm, to the environment (of whatever degree or duration) and includes:</p> <ul style="list-style-type: none"><li>(a) an environmental nuisances; and</li><li>(b) anything declared by regulation (after consultation under section 5A) or by an environment protection policy to be environmental harm.</li></ul>
<b>Hazardous Waste</b>	<p>Listed waste having a characteristic described in schedule A list 2 of the National Environment Protection (Movement of controlled waste between States and Territories) Measure.</p> <p><i>Note: Hazardous Waste includes any unwanted or discarded material (excluding radioactive material), which because of its physical, chemical or infectious characteristics can cause significant hazard to human health or the environment when improperly treated, stored, transported, disposed of or otherwise managed.</i></p>
<b>Industrial Residues</b>	<p>Wastes and residual materials from industrial or manufacturing processes, including waste processing. Sometimes called by-products or secondary materials and includes Commercial and Industrial Waste (Listed).</p>
<b>Inert Waste</b>	<p>Solid waste that has no active chemical or biological properties. These wastes do not undergo environmentally significant physical, chemical or biological transformation and have negligible potential to cause environmental harm.</p>
<b>Leachate</b>	<p>A liquid that has percolated through and/or been generated by decomposition of waste material. It includes water that comes into contact with waste and is potentially contaminated by nutrients, metals, salts and other soluble or suspended components and products of decomposition of the waste.</p>
<b>Listed Waste</b>	<p>means wastes listed in Part B of Schedule 1 of the Environment Protection Act 1993.</p>
<b>Municipal Solid Waste</b>	<p><b>Municipal Solid Waste—Domestic sources</b></p> <p>The solid component of the waste stream arising from domestic premises that is received directly from the public, it is not received as Municipal Solid Waste—Kerbside bin collection.</p> <p><b>Municipal Solid Waste—Hard Waste</b></p> <p>The solid component of the waste stream arising from domestic premises which is not suitable for collection using a kerbside bin system, but does not contain Commercial and Industrial Waste (General), Listed Waste, Hazardous Waste, Radioactive Waste or waste that is not deemed suitable for collection by local councils.</p> <p><i>Note: MSW (Hard Waste) is typically collected in campaigns by local councils, which also advise on what wastes are suitable for that collection.</i></p> <p><b>Municipal Solid Waste—Kerbside bin collection</b></p> <p>The solid component of the waste stream arising from mainly domestic but also commercial, industrial, government and public premises including waste from council operations, services and facilities that is collected by or on behalf of the council via kerbside collection, but does not contain Commercial and Industrial Waste (General), Listed Waste, Hazardous Waste or Radioactive Waste.</p>



<b>Pollutant</b>	<p>(a) any solid, liquid or gas (or combination thereof) including waste, smoke, dust, fumes and odour; or</p> <p>(b) noise; or</p> <p>(c) heat; or</p> <p>(d) anything declared by regulation (after consultation under section 5A) or by an environment protection policy to be a pollutant,</p> <p>but does not include anything declared by regulation or by an environment protection policy not to be a pollutant.</p>
<b>Pollute</b>	<p>(a) discharge, emit, deposit or disturb pollutants; or</p> <p>(b) cause or fail to prevent the discharge, emission, depositing, disturbance or escape of pollutants,</p> <p>and <b>pollution</b> has a corresponding meaning.</p>
<b>Potentially Contaminating Activities</b>	As prescribed in regulation 50 and schedule 3 of the <i>Environment Protection Regulations 2009</i> .
<b>Quarantine Waste</b>	<p>Quarantine Waste means material or goods of quarantine concern as determined by the Australian Quarantine and Inspection Service (AQIS) and which is subject to and or identified under Commonwealth Legislation (<i>Quarantine Act 1908</i>) and associated regulations and proclamations. This includes:</p> <ul style="list-style-type: none"> <li>(a) material used to pack and stabilise imported goods</li> <li>(b) galley food and other waste from overseas vessels</li> <li>(c) human, animal or plant waste brought into Australia</li> <li>(d) refuse or sweepings from a hold of an overseas vessel</li> <li>(e) any other waste or other material, which comes into contact with Quarantine Waste</li> <li>(f) contents of AQIS airport amnesty bins</li> <li>(g) articles seized by AQIS and/or not collected by clients.</li> </ul> <p><i>Quarantine Act 1908:</i>  <a href="http://www.austlii.edu.au/au/legis/cth/consol_act/qa1908131.txt/cgi-bin/download.cgi/download/au.legis/cth/consol_act/qa1908131.rtf">www.austlii.edu.au/au/legis/cth/consol_act/qa1908131.txt/cgi-bin/download.cgi/download/au.legis/cth/consol_act/qa1908131.rtf</a></p> <p><i>Quarantine Regulations 2000:</i>  <a href="http://www.comlaw.gov.au/comlaw/Legislation/LegislativeInstrumentCompilation1.nsf/0/DA413F48F8983E81CA257472007FAF66?OpenDocument">www.comlaw.gov.au/comlaw/Legislation/LegislativeInstrumentCompilation1.nsf/0/DA413F48F8983E81CA257472007FAF66?OpenDocument</a></p>
<b>Radioactive Waste</b>	<p>Any radioactive substance in the form of a solid, liquid or gas (or combination thereof) that is left over, surplus or an unwanted by-product from any business or domestic activity, whether of value or not, but excluding the following:</p> <ul style="list-style-type: none"> <li>(a) substances to which the regulations under the <i>Radiation Protection and Control Act 1982</i> do not apply</li> <li>(b) substances which have been exempted from regulatory control under provisions of the Radiation Protection and Control Act</li> <li>(c) material containing activities or activity concentrations of radioactive elements below the exemption levels specified in the <i>National Directory for Radiation Protection</i> published by the Australian Radiation Protection and Nuclear Safety Agency.</li> </ul>

**Scheduled waste** A material or article containing a chemical, or mixture of chemicals, exceeding the threshold concentration and threshold quantity (see the relevant specific scheduled waste management plan), which is:

- organic in nature;
- resistant to degradation by chemical, physical or biological means;
- toxic to humans, animals, vegetation or aquatic life;
- bioaccumulative in humans, flora and fauna; and
- listed on Schedule X.

*Note: For scheduled wastes, their management plans and Schedule X, refer to Australian Government Department of Environment and Water Resources, <[www.environment.gov.au/settlements/chemicals/scheduled-waste/index.html](http://www.environment.gov.au/settlements/chemicals/scheduled-waste/index.html)>.*

**Sensitive use** (As prescribed in section 3(1) of the *Environment Protection Act 1993*) means—

- use for residential purposes; or
- use for a pre-school within the meaning of the *Development Regulations 1993*; or
- use for a primary school; or
- use of a kind prescribed by regulation.

**Site contamination** (in accordance with section 5B of the *Environment Protection Act 1993*)

(1) For the purposes of this Act, **site contamination** exists at a site if—

- (a) chemical substances are present on or below the surface of the site in concentrations above the background concentrations (if any); and
- (b) the chemical substances have, at least in part, come to be present there as a result of an activity at the site or elsewhere; and
- (c) the presence of the chemical substances in those concentrations has resulted in—
  - (i) actual or potential harm to the health or safety of human beings that is not trivial, taking into account current or proposed land uses; or
  - (ii) actual or potential harm to water that is not trivial; or
  - (iii) other actual or potential environmental harm that is not trivial, taking into account current or proposed land uses.

(2) For the purposes of this Act, environmental harm is caused by the presence of chemical substances—

- (a) whether the harm is a direct or indirect result of the presence of the chemical substances; and
- (b) whether the harm results from the presence of the chemical substances alone or the combined effects of the presence of the chemical substances and other factors.

(3) For the purposes of this Act, site contamination does not exist at a site if circumstances of a kind prescribed by regulation apply to the site.

<b>Site contamination audit</b>	<p>means a review carried out by a person that—</p> <p>is for the purpose of determining all of the following matters:</p> <ul style="list-style-type: none"> <li>(i) the nature and extent of any site contamination present or remaining on or below the surface of the site;</li> <li>(ii) the suitability of the site for a sensitive use or another use or range of uses;</li> <li>(iii) what remediation is or remains necessary for a specified use or range of uses.</li> </ul>
<b>Site contamination audit report</b>	<p>in relation to a site contamination audit, means a detailed written report that—</p> <ul style="list-style-type: none"> <li>(a) sets out the findings of the audit and complies with the guidelines from time to time issued by the Authority; and</li> <li>(b) includes a summary of the findings of the audit certified, in the prescribed form, by the site contamination auditor who personally carried out or directly supervised the audit.</li> </ul>
<b>Site contamination audit statement</b>	<p>in relation to a site contamination audit, means a copy (that must comply with the regulations) of the summary of the findings of the audit certified, in the prescribed form, by the site contamination auditor who personally carried out or directly supervised the audit.</p>
<b>Site contamination auditor</b>	<p>means a person accredited under Division 4 of Part 10A [of the Act or Amendment Act] as a site contamination auditor.</p>
<b>Site contamination consultant</b>	<p>means a person other than a site contamination auditor who, for fee or reward, assesses the existence or nature or extent of site contamination</p> <p>This person must be suitably independent, qualified and experienced in the undertaking of such assessments and the assessment for the purposes of this standard shall include potential for causing harm including site contamination.</p>
<b>Solid Waste</b>	<p>Any waste that is not gaseous and is not a Liquid Waste as determined by EPA Guideline <i>Liquid waste classification test (2003)</i>.</p>
<b>Suitably qualified consultant</b>	<p>A person who holds relevant qualifications, has demonstrated professional experience and expertise which encompasses an appropriate range of competencies and is either a full member, or eligible for full membership, of one of the following organisations or equivalent organisations:</p> <ol style="list-style-type: none"> <li>1. The Institution of Engineers Australia</li> <li>2. The Association of Consulting Engineers Australia</li> <li>3. The Australian Contaminated Land Consultants Association Incorporated.</li> </ol>
<b>Waste Soil</b>	<p>All soil including dredge soil excavated and removed from any site, other than virgin material. Waste Soil is classified according to the chemical substances it contains and physical criteria.</p> <p>Waste soil includes dredge spoil and consists of clay, rock, sand, soil, or other inert natural mineralogical matter and may have minor inclusions such as natural organic matter, but does not contain other wastes such as asbestos or bitumen.</p> <p>Note: The <i>NSW Protection of the Environmental Operations Act 1997</i> defines virgin excavated natural material as 'natural material (such as clay, gravel, sand, soil or rock fines):</p> <ul style="list-style-type: none"> <li>• that has been excavated or quarried from areas that are not contaminated with manufactured chemicals or process residues, as a result of industrial, commercial, mining or agricultural activities, and</li> <li>• that does not contain any sulfidic ores or soils or any other waste.</li> </ul>

<b>Waste</b>	<p>As defined under the Environment Protection Act 1993,</p> <p>Waste means —</p> <ul style="list-style-type: none"><li>(a) any discarded, rejected, abandoned, unwanted or surplus matter, whether or not intended for sale or for recycling, reprocessing, recovery or purification by a separate operation from that which produced the matter; or</li><li>(b) anything declared by regulation (after consultation under section 5A) or by an environment protection policy to be waste,</li></ul> <p>whether of value or not.</p>
<b>Waste derived fill</b>	<p>A consistent, homogenous material for the beneficial filling of land that consists of or contains waste or material recovered from waste (including waste soil, industrial residues and recycled waste) which meets an approved specification, is fit for purpose and will not cause harm to the environment or human health when used as fill, such as for development of infrastructure.</p>
<b>Watercourse</b>	<p>(for the purposes of the NRM Act) means a river, creek or other natural watercourse (whether modified or not) in which water is contained or flows whether permanently or from time to time and includes-</p> <ul style="list-style-type: none"><li>(a) a dam or reservoir that collects water flowing in a watercourse;</li><li>(b) a lake through which water flows;</li><li>(c) a channel (but not a channel declared by regulation to be excluded from the ambit of this definition) in to which the water of a watercourse has been diverted;</li><li>(d) part of a watercourse;</li><li>(e) an estuary through which water flows;</li><li>(f) any other natural resource, or class of natural resource, designated as a watercourse for the purposes of this Act by an NRM plan.</li></ul>

## Appendix 1 Classification for waste proposed for use as WDF

**Table 8 Maximum concentrations of chemical substances to meet waste fill criteria**

Waste fill criteria <sup>71</sup>			
Chemical substance	Maximum total dry weight chemical concentrations (mg/kg)	Chemical substance	Maximum total dry weight chemical concentrations (mg/kg)
Aldrin/Dieldrin (total)	2	Ethylbenzene	3.1
Arsenic	20	Heptachlor	2
Barium	300	Lead	300
Benzene	1	Manganese	500
Benzo(a)pyrene	1	Mercury	1
Beryllium	20	Nickel	60
Cadmium	3	Petroleum hydrocarbons TPH C6-C9 (total)	65
Chlordane	2	Petroleum hydrocarbons TPH >C9	1000
Chromium (III)	400	Phenolic compounds (total)	0.5
Chromium (VI)	1	Polycyclic aromatic hydrocarbons (PAH) (total)	5
Cobalt	170	Polychlorinated biphenyls (PCBs)	2
Copper	60	Toluene	1.4
Cyanides (total)	500	Xylene (total)	14
DDT	2	Zinc	200

In addition to the chemical limitations in Table 8, there is also a physical component to the waste fill criteria for this standard which is that the material is waste consisting of clay, concrete, rock, sand, soil or other inert mineralogical matter. It may contain bitumen<sup>72</sup> but must not include asbestos or other wastes<sup>73</sup>.

<sup>71</sup> The assessment of the chemical analysis carried out on samples may include statistical analysis to justify classification of the waste derived fill in accordance with the values listed in this table (refer Appendix 3).

<sup>72</sup> Bitumen that is known or suspected to be from before the late 1960s cannot be used. Today, asphalt mixes are made with bitumen but in the past, coal tar and other tar distillates were in extensive use (often referred to as Tar Macadam Pavements being a basic macadam road with a tar-bound surface). This has left a troublesome legacy of high PAH content in some asphalt pavements. All such materials must be disposed of to an authorised landfill.

## Appendix 2 Chemical substance criteria for Intermediate Waste Soil

The maximum criteria specified by the EPA for Intermediate Waste Soil are waste disposal criteria. There is no guarantee that material meeting these criteria will not cause harm in other situations. As such, these are maximum criteria that the EPA has set for consideration by the site contamination auditor (auditor) and the auditor must determine the precise criteria for the specific site, up to these maxima (total dry weight and leachable), as well as any requisite physical criteria that deems the material is fit for the specific site purpose such that harm to human health and the environment will not be caused. Liability for any harm remains with the proponent (producer and/or the owner of the land where WDF is used).

**Table 9 Maximum concentrations of chemical substances for Intermediate Waste Soil (and WDF)**

Chemical Substance	Intermediate Waste Soil criteria	
	Concentration in mg/kg (dry weight)	Maximum leachate concentrations in mg/L
		<b>Method of analysis AS4439.3-1997</b>
Aldrin + Dieldrin (total)	<2	#
Arsenic	<200	5
Benzo(a)pyrene	<2	#
Beryllium	<40	1
Cadmium	<30	0.5
Chlordane	<2	#
		<b>Method of analysis AS4439.3-1997</b>
Chromium (III)	<12%	#
Chromium (VI)	<200	5
Cobalt	<170	#
Copper	<2,000	10
Cyanides (total)	<1,000	10
DDT	<2	#
Heptachlor	<2	#
Lead	<1,200	5
Manganese	<6,000	50
Mercury	<30	0.1

<sup>73</sup> This is based on the definition of waste fill as per clause 3 of the Environment Protection Regulations 2009 however does not contain the maximum size limitation.

	Intermediate Waste Soil criteria	
Chemical Substance	Concentration in mg/kg (dry weight)	Maximum leachate concentrations in mg/L
Methyl mercury	<20	#
Nickel	<600	2
Phenolic compounds (total)	<17,000	#
Polychlorinated biphenyls (PCBs)	<2	#
Polycyclic aromatic hydrocarbons (PAHs) (total)	<40	#
Total Petroleum Hydrocarbons (TPH) C <sub>6</sub> -C <sub>9</sub>	<100	#
TPH > C <sub>9</sub>	<1,000	#
Zinc	<14,000	250
		<b>Method of analysis AS4439.2-1997</b>
Benzene	<5	#
Ethylbenzene	<100	#
Tetrachloroethylene	<14	#
Toluene	<50	#
		<b>Method of analysis AS4439.2-1997</b>
Xylene	<180	#

### Notes

- 1 The assessment of the chemical analysis carried out on samples of the waste may include scientifically valid statistical analysis (for total concentrations mg/kg) to justify classification of waste in accordance with the values listed in this table.
- 2 '#' indicates that leachate testing for that chemical substance is not required provided that the concentration of that chemical substance in mg/kg (dry weight) does not exceed the value specified for that category of waste.
- 3 '<' = 'less than'.

## Appendix 3 Waste sampling and assessment

Sampling programs should be based on standardised, scientifically valid procedures and methodologies. The design of the program should account for factors such as waste volume and heterogeneity, and knowledge of the activity and level of consistency of the process from which the waste is produced. This includes prior use or treatment of the waste, as well as the difference between the sample concentration and the applicable guideline criteria.

When designing a sampling program and selecting a testing laboratory, the following information must be addressed:

### **Waste characterisation:**

The sampling methodology for characterising waste (and waste derived products) must be representative of the entire waste stream and must accurately and reliably characterise the waste (or waste derived product).

Characterisation of soils must be in accordance with the Site Contamination NEPM. Waste characterisation needs to include quality assurance and quality control (QA/QC) procedures including guidance on sampling plans and statistical assessment as set out in Schedule B(2) of the Site Contamination NEPM.<sup>74</sup>

### **Number of samples:**

The number of samples to be collected should be determined on a case-by-case basis, based on investigation of the site history or the process producing the waste as applicable, combined with visual inspection to determine the homogeneity of the soil or waste being characterised. The chemical composition of the WDF based on a specification and control of the waste materials used to produce it should be well understood for full characterisation.

For waste soil, a minimum sampling rate should be one sample per 250 m<sup>3</sup>, with a minimum of five samples<sup>75</sup> however variability of the soil needs to be taken into account when designing the actual sampling program. If it is an industrially produced waste stream that is being assessed, the variability of that stream and process over time must be taken into account when determining the appropriate number of samples that will accurately characterise the waste.

Note: All sampling needs to be conducted by a suitably qualified and experienced person with the relevant expertise. This person should be independent of the organisation, however if the organisation has a person with the relevant expertise, this may be appropriate.

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<sup>74</sup> The following documents may provide useful guidance on sampling:

- Australian Standard 1141 series: Methods for sampling and testing aggregates
- *Sampling and analysis of waters, wastewaters, soils and wastes*, EPA Victoria, <[http://epanote2.epa.vic.gov.au/EPA/publications.nsf/2f1c2625731746aa4a256ce90001cbb5/d90f1ae51cb8f7a2ca2575df002086bd/\\$FILE/IWRG701.pdf](http://epanote2.epa.vic.gov.au/EPA/publications.nsf/2f1c2625731746aa4a256ce90001cbb5/d90f1ae51cb8f7a2ca2575df002086bd/$FILE/IWRG701.pdf)>
- *Solid industrial waste sampling*, EPA Victoria, <[http://epanote2.epa.vic.gov.au/EPA/publications.nsf/2f1c2625731746aa4a256ce90001cbb5/761d5e4ebc793c00ca2575e4002ee920/\\$FILE/IWRG703.pdf](http://epanote2.epa.vic.gov.au/EPA/publications.nsf/2f1c2625731746aa4a256ce90001cbb5/761d5e4ebc793c00ca2575e4002ee920/$FILE/IWRG703.pdf)>
- *Soil sampling*, EPA Victoria, <[http://epanote2.epa.vic.gov.au/EPA/publications.nsf/2f1c2625731746aa4a256ce90001cbb5/744c1556fb57f75dca2575e4002d81c4/\\$FILE/IWRG702.pdf](http://epanote2.epa.vic.gov.au/EPA/publications.nsf/2f1c2625731746aa4a256ce90001cbb5/744c1556fb57f75dca2575e4002d81c4/$FILE/IWRG702.pdf)>.

<sup>75</sup> Based on *Soils sampling guideline (Off-site management and acceptance to landfill)*, EPA Victoria, <[http://epanote2.epa.vic.gov.au/EPA/publications.nsf/2f1c2625731746aa4a256ce90001cbb5/11fe9e999f98de62ca25735c0012fe9e/\\$FILE/1178.pdf](http://epanote2.epa.vic.gov.au/EPA/publications.nsf/2f1c2625731746aa4a256ce90001cbb5/11fe9e999f98de62ca25735c0012fe9e/$FILE/1178.pdf)>.



***Duplicate samples:***

A minimum of one internal-laboratory field duplicate and one external-laboratory field duplicate per 20 primary samples (or part thereof) is recommended. However, further advice on sampling QA/QC is available in Schedules B(2) and B(3) of the Site Contamination NEPM.

***Composite sampling (not recommended):***

The EPA does not recommend composite sampling for heterogenous waste streams or waste soil. The use of composite sampling may be acceptable in situations where waste is from a single source and has been shown by previous sampling and analysis to be homogeneous (refer EPA guideline *Composite soil sampling in site contamination assessment and management*).

Composite sampling should not be used for sampling when volatiles are known, likely or suspected to be present.

***Laboratory selection:***

All analyses must be conducted by a laboratory that is accredited by the National Association of Testing Authorities (NATA) for the requisite test methods. The detection limits of the testing laboratory need to be sufficiently below the criteria listed in this standard for confidence in the results. If detection limits are above the standard criteria, then that detection limit will be taken as the result for the analyte in question.

***Chemical analysis:***

The WDF and the waste used as components of WDF must be analysed for all chemical substances that are reasonably expected to be present, based on knowledge of that waste including the expected variability.

Solid waste streams and waste soil can vary significantly in their nature. The testing regime should focus on chemical substances that can be reasonably expected to be present in the waste, provided there is sufficient knowledge and homogeneity in that waste stream and process producing it (based on a desktop assessment documenting the waste generation process and potential sources of chemical substances and contaminants). If contaminants are unknown, a broad screen analysis should be conducted. Consideration is required for those chemical substances listed in Appendices 1 and 2 as well as those listed in the Environment Protection Regulations 2009 for prescribed 'potentially contaminating activities'.

***Frequency of sampling:***

Initially, the WDF and the waste used as components of WDF should be regularly and thoroughly tested to gain confidence in its consistency of composition. Depending on the results of the initial assessment, a more limited ongoing assessment program may be suitable if there is confidence in the consistency as well as in the process producing the waste over time.

***Assessment and reporting of results:***

All assessment of results needs to be conducted by a suitably qualified consultant or site contamination auditor as required, with the relevant expertise. Where there are no specified total chemical criteria and only leachate criteria, then specific consideration of any potential human health risks including occupational health and safety must be included in the assessment of suitability for reuse.

***Durability of proposed WDF:***

The durability of the WDF needs to be assessed to demonstrate that no additional risk is posed if the waste proposed for reuse as WDF will break down under physical stresses in the environment. Typically, unconfined compressive strength is used for assessing the physical strength of the material.

### **Leachate analysis:**

Leachable concentrations of chemical substances should be measured in accordance with *Australian Standard 4439.2–1997 Wastes, sediments and contaminated soils–Preparation of leachates–Zero headspace procedure* (for volatile analytes) or AS 4439.3 *Wastes, sediments and contaminated soils–Preparation of leachates–Bottle leaching procedures* (for semi- or non-volatile analytes)<sup>76</sup>.

Leaching fluids must be chosen for the specific receiving environment proposed. The chemical assessment should include comparison of the current pH and redox potential (Eh) of the receiving environment. An assessment of the potential for the waste to react in situ with regard to leachate production and mobilisation of chemical substances should be made in order to select the appropriate reagent for the test and measure leachability.

Leachate assessment additional to ASLP may be required to demonstrate long-term behaviour and stability of the chemical substances in the waste. One option for this is Multiple Extraction Procedure (MEP)—US EPA Method 1320 (September 1986).

This method is designed to simulate the leaching that a material will undergo so as to determine the highest concentration of each constituent that is likely to leach into the environment. The procedure is particularly well suited to metal contaminants and contaminants whose behaviour is affected by pH.

Where a material is subject to MEP using USEPA Method 1320, a minimum of nine extractions must be used. If after completing the ninth extraction, the concentration of any chemical substance of concern is higher than that from the seventh and eighth extractions, the extraction process must continue until it no longer increases.

Alternative methods of assessing long-term leachability may be suitable depending on the nature and characteristics of the WDF material and documented use and suitability of the method.

### **Statistical assessment of the data:**

When classifying a WDF, if some samples exceed the chemical concentration criteria, statistical evaluation using 95% Upper Confidence Limit (UCL) calculations can be used on test results from representative sampling. The 95% UCL demonstrates with 95% certainty that the 'true' mean contaminant concentration will not exceed the value determined by this method. The Site Contamination NEPM including in Schedule B(7a), also has advice on statistical assessment which has been included in the points below. There is guidance on sampling plans and statistical assessment of sites provided in sections 4 and 6 of Schedule B(2) of the Site Contamination NEPM, which can also be referred to for sites being assessed accordingly.

Statistical assessment is only relevant to determining the **total dry weight concentrations**. It is NOT to be applied to the maximum leachate criteria for which all samples must be below the stated maxima.

If a proponent wants to use a statistical assessment, the following conditions to its use must be met:

- the statistical assessment must only be used where there has been adequate characterisation of a site or waste, eg systematic grid sampling or stockpile sampling in accordance with Australian standards and guidance provided in the Site Contamination NEPM
- the relevance of elevated values must be considered and should not be obscured by consideration of the arithmetic mean alone
- where a statistical method is used to determine disposal requirements, it needs to be calculated for each contaminant of concern

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<sup>76</sup> Polycyclic aromatic hydrocarbons are considered to be semi-volatile compounds.

- statistics need to include:
  - the 95% UCL estimation of the mean
  - the standard deviation of the results (which must be less than 50% of the stated maximum total dry weight concentration criteria)
  - the maximum value obtained during sampling (no single value can be greater than 250% of the maximum total dry weight concentration criteria).

The standard ISO 11648–1:2003: *Statistical aspects of sampling from bulk materials* can be referred to for guidance on statistically valid sampling on relevant waste materials.

Additional guidance on statistical assessment can be found in the *Contaminated Sites: Sampling Design Guidelines* (NSW EPA 1995) and *Soils Sampling Guideline (Off-Site Management and Acceptance to Landfill)* (Victorian EPA 2007).

## Appendix 4 Checklist

• Support for the waste hierarchy—no other practical higher order reuse or waste avoidance (3.1)	<input type="checkbox"/>
• Identification of an immediate market (3.2)	<input type="checkbox"/>
• Risk-based approach—risk has been assessed (including destination site) (3.3)	<input type="checkbox"/>
• Prevent environmental harm—assured avoidance or minimised risk of harm to the environment or human health (3.4)	<input type="checkbox"/>
• Beneficial purposes—benefit has been demonstrated (3.5)	<input type="checkbox"/>
• Process does not involve dilution (3.6)	<input type="checkbox"/>
• No prohibited wastes used in WDF (4.1)	<input type="checkbox"/>
• Characteristics of the WDF and the waste sources assessed—scientifically valid and robust sampling used, all chemical substances reasonably expected to be in the waste tested for and sampling done in accordance with Appendix 3	<input type="checkbox"/>
• Details of WDF source, destination and relevant stakeholders are identified as required	<input type="checkbox"/>
• WDF specification is known, consistent and fit for purpose	<input type="checkbox"/>
• Relevant plans and reports have been produced and, where required, submitted to the EPA	<input type="checkbox"/>
• Roles and responsibilities of producer, transporter and user are clearly defined	<input type="checkbox"/>
• Necessary approvals sought prior to commencing a WDF production and/or use activity	<input type="checkbox"/>
• In compliance with other legislation	<input type="checkbox"/>