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Recycled Fill Materials for Transport Infrastructure  
Environmental Instruction 21.6





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This document has been approved and authorised for use by the Department of Planning, Transport and Infrastructure and its authorised agents by:

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19 May 2014

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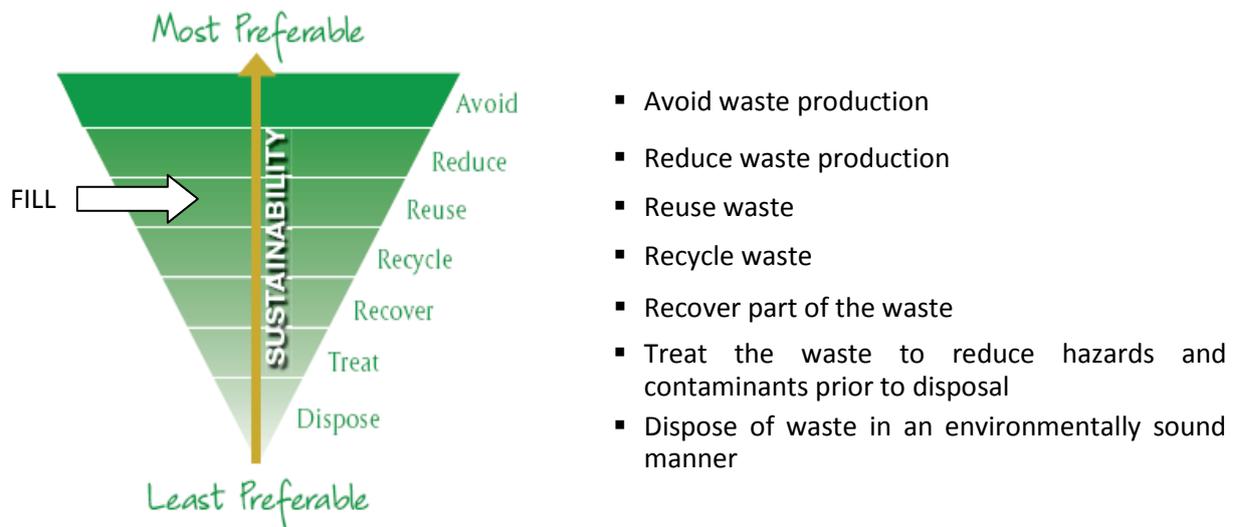
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## 1. PURPOSE

South Australia's Waste Strategy 2011 - 2015 sets the overall framework and goals for sustainable waste management in the State. The strategy aims for the diversion of waste to more sustainable options in accordance with the waste hierarchy. DPTI supports the principles of waste minimisation and recycling and ecologically sustainable development.

Figure 1.1 – Waste Hierarchy



The Recycled Fill Materials for Transport Infrastructure Environmental Instruction (EI) 21.6 has been developed by the Department for Planning, Transport and Infrastructure (DPTI) for the management of soils, asphalt planings, road base, concrete, ballast and timber sleepers that are generated and re-used on transport infrastructure maintenance and construction projects managed by DPTI staff and contractors.

The processes outlined in this EI have been developed to maximise the re-use of materials in DPTI works in a manner that protects the environment and human health from risks posed by the handling of these materials during the works and to long term users of the infrastructure. It adopts a risk-based approach to the reuse of these materials, which is based on the principles established in the Standard for the Production and Use of Waste Derived Fill. The EI specifies appropriate uses, suitable receiving environments and required management controls for each type of material.

## 2. GLOSSARY

(Source of definition is shown in brackets)

### **Environmental Harm** (*Environment Protection Act 1993*):

Any harm, or potential harm, to the environment (of whatever degree or duration) and includes -  
(a) an environmental nuisance; and  
(b) anything declared by regulation (after consultation under section 5A) or by an environment protection policy to be environmental harm.

### **Environmental Nuisance** (*Environment Protection Act 1993*):

(a) any adverse effect on an amenity value of an area that—  
(i) is caused by pollution; and  
(ii) unreasonably interferes with or is likely to interfere unreasonably with the enjoyment of the area by persons occupying a place within, or lawfully resorting to, the area; or  
(b) any unsightly or offensive condition caused by pollution;

Note that an environmental nuisance of a high impact or on a wide scale is treated as material environmental harm under Section 5 of the Environment Protection Act

### **Intermediate Waste Soil:**

Material which exceeds the criteria for Waste fill but does not exceed the criteria (maximum dry weight and leachable concentrations for chemical substances) specified for Intermediate Waste in EPA information sheet 889/10: *Current criteria for the classification of waste—including Industrial and Commercial Waste (Listed) and Waste Soil*, shown below.

Note that these criteria are waste disposal criteria as opposed to re-use criteria. A site contamination auditor must determine the requisite physical and chemical criteria (up to the maxima specified) for re-use, depending on the specific site purpose.

Chemical substance	Max total dry weight concentration (mg/kg)	Max leachate concentrations (mg/L)	Chemical substance	Max total dry weight concentrations (mg/kg)	Max leachate concentrations (mg/L)
Aldrin/ Dieldrin (total)	<2	#	Lead	<1,200	5
Arsenic	<200	5	Manganese	<6,000	50
Benzene	<5	#	Mercury	<30	0.1
Benzo(a)pyrene	<2	%	Methyl Mercury	<20	#
Beryllium	<40	1	Nickel	<600	2
Cadmium	<30	0.5	Phenolic compounds (total)	<17,000	#
Chlordane	<2	#	Polychlorinated biphenyls (PCBs)	<2	#
Chromium (III)	<12%	#	Polycyclic aromatic hydrocarbons (PAH) (total)	<40	#
Chromium (VI)	<200	5	Tetrachloroethylene	<14	#
Cobalt	<170	#	Toluene	<50	#
Copper	<2,000	10	Total Petroleum Hydrocarbons (TPH) C6 – C9	<100	#
Cyanides (total)	<1,000	10	TPH > C9	<1,000	#
DDT	<2	#	Xylene (total)	<180	#
Ethylbenzene	<100	#	Zinc	<14,000	250
Heptacholor	<2	#			

**Leachability:**

the presence of leachate concentrations above standard limit of reporting levels adopted by reputable NATA accredited environmental analytical laboratories for analysis of leachate derived from extraction following AS4439.2 (1997), AS4439.3 (1997) or multiple extraction to USEPA Method 1320 protocols as required

**Listed Waste:**

Wastes listed in Part B of Schedule 1 of the *Environment Protection Act 1993*.

**NEPM investigation level:**

The *National Environmental Protection (Assessment of Site Contamination) Measure 1999* (as amended 2013) sets investigation levels for various land uses (depending on the likely exposure to soil or water). These investigation levels establish maximum concentrations of contaminants which, if exceeded, trigger the need to conduct further investigations to determine the likely impact on ecological values or human health.

**Potentially Contaminating Activity** (*Environment Protection Regulations 2009*):

- (a) an activity of a kind set out in Schedule 3 clause 2 of the *Environment Protection Regulations 2009*, undertaken in the course of a business;
- (b) any other activity (other than an activity of a kind excluded under Schedule 3 clause 2 from the ambit of potentially contaminating activities) undertaken in the course of a business involving:
  - (i) the manufacture, production (including as a by-product or waste) or recycling of a listed substance or a product containing a listed substance; or
  - (ii) the storage at a discrete premises of the business of 500 litres or more of a liquid listed substance 500 kilograms or more of a listed substance other than a liquid;
- (c) a domestic activity of a kind set out in Schedule 3 clause 3 of the *Environment Protection Regulations 2009*.

*Note: an abbreviated list of Potentially Contaminating Activities is provided in Appendix 1 of this EI*

**Sensitive land use** (*Environment Protection Act 1993*):

- 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 the *Environment Protection Regulations 2009* (at the time of writing, no sensitive uses have been prescribed).

**Site:**

'Site' is defined in the EP Act as "*an area of land (whether or not in the same ownership or occupation)*".

With regard to DPTI's activities, a 'site' normally encompasses the project area generating the surplus material or the project area receiving the material. In specific cases, the EPA has agreed that a project 'site' may encompass several parcels of land including public roads and non-adjacent land (see case study in Appendix 4). The extent of the site will differ depending on individual project circumstances, and will need to be discussed and agreed with the EPA on a case-by-case basis, as management requirements vary considerably depending on whether material is to be moved within a site or taken off-site.

**Site contamination auditor** (*Environment Protection Act 1993*):

A person accredited under Division 4 of Part 10A of the *Environment Protection Act 1993* as a site contamination auditor.

**Site contamination audit report** (*Environment Protection Act 1993*):

A detailed written report that—

- (a) sets out the findings of the audit and complies with the guidelines from time to time issued by the Authority; and
- (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;

**Site contamination consultant** (*Environment Protection Act 1993*)

A person, other than a site contamination auditor who, for fee or reward, assesses the existence or nature or extent of site contamination

In addition, DPTI expects site contamination consultants to be suitably qualified, meaning that the person:

- (a) has relevant qualifications and demonstrated professional experience and expertise in the field of site contamination; and
- (b) is eligible for inclusion on the DPTI Site Contamination Panel; and
- (c) is either a full member, or is eligible for full membership, of one of the following organisations or equivalent organisations:
  - the Institution of Engineers Australia
  - the Association of Consulting Engineers Australia
  - the Australian Contaminated Land Consultants Association Incorporated

**Waste:**

Under Section 3(1) of the *Environment Protection Act 1993*, 'Waste' means:

- (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
- (b) anything declared by regulation (after consultation under section 5A) or by an environment protection policy to be waste, whether of value or not.

Under Clause 4 of the *Environment Protection (Waste to Resources) Policy 2010*:

waste or material resulting from the treatment of waste continues to be waste except insofar as—

- (a) it constitutes a product that meets specifications or standards published from time to time or approved in writing by the Authority; or
- (b) if no specification or standard published or approved in writing by the Authority applies to such waste or treatment of waste—it constitutes a product that is ready and intended for imminent use without the need for further treatment to prevent any environmental harm that might result from such use.

**Waste Fill** (*Environment Protection Regulations 2009*):

Waste consisting of clay, concrete, rock, sand, soil or other inert mineralogical matter in pieces not exceeding 100 millimetres in length and containing chemical substances in concentrations (calculated in a manner determined by the Authority) less than the concentrations for those substances set out in the *Environment Protection Regulations 2009* (shown below), but does not include waste consisting of or containing asbestos or bitumen:

Chemical substance	Max total dry weight chemical concentrations (mg/kg)	Chemical substance	Max total dry weight chemical concentrations (mg/kg)
Aldrin/ Dieldrin (total)	2	Ethylbenzene	3.1
Arsenic	20	Heptacholor	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	Polychlorinated biphenyls (PCBs)	5
Cobalt	170	Polycyclic aromatic hydrocarbons (PAH) (total)	2
Copper	60	Toluene	1.4
Cyanides (total)	500	Xylene (total)	14
DDT	2	Zinc	200

**Waste or Recycling Depot:**

Under Schedule 1(3)(3) of the Environment Protection Act, a Waste or Recycling Depot is defined as:

the conduct of a depot for the reception, storage, treatment or disposal of waste other than—

- (a) temporary storage at the place at which the waste (not being tyres or tyre pieces) is produced while awaiting transport to another place; or
- (e) the handling of waste solely for recycling or reuse where—
  - (i) the waste handled does not consist of or include—
    - (B) substances or things listed in Part B of this Schedule<sup>1</sup>; or
    - (C) waste oil in quantities exceeding 5 000 litres per year; or
    - (D) waste lead acid batteries in quantities exceeding 500 batteries per year; or
    - (E) waste tyres or tyre pieces in quantities exceeding 5 tonnes per year; and
  - (ii) the quantities of waste handled do not exceed 100 tonnes per year; or
- (f) the handling and disposal of waste tyres or tyre pieces in a manner approved by the Authority; or
- (i) a depot that the Authority is satisfied will be conducted for such limited purposes that requirement of an environmental authorisation under Part 6 would not be justified.

*(note: details irrelevant to DPTI operations have been removed)*

**Waste soil (Standard for the production and use of waste derived fill 2010):**

All soil excavated and removed from any site, other than virgin excavated natural material.

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.

<sup>1</sup> Note that Hydrocarbons (including oils) are listed in Part B of Schedule 1(3)(3)

**Virgin excavated natural material** (*Standard for the production and use of waste derived fill 2010*):

Material excavated from a mine site such as a quarry or sand mine specifically for the purpose of being used as fill. The material (such as clay, gravel, sand, soil or rock fines) must not contain any sulfidic ores or soils or any other waste, and must have 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.

### 3. ABBREVIATIONS

<b>EI</b>	Environmental Instruction
<b>EP Act</b>	Environment Protection Act 1993
<b>EPA</b>	South Australian Environment Protection Authority
<b>IWS</b>	Intermediate Waste Soil
<b>NEPM</b>	National Environment Protection (Assessment of Site Contamination) Measure 2013
<b>NEPM-EIL</b>	Ecological Investigation Level established under Schedule B(5) the National Environment Protection Measure
<b>NEPM-HIL</b>	Health Investigation Level established under Schedules B(1) and B(7a) of the National Environment Protection Measure.  HIL-A is used for sensitive land uses, such as standard residential settings and children's services  HIL-D is used for residential settings with minimal opportunities for soil access  HIL-E is used for parks, recreational open space and playing fields  HIL-F is used for commercial and industrial settings
<b>PAH</b>	Polycyclic aromatic hydrocarbons
<b>PCA</b>	potentially contaminating activity
<b>RAP</b>	Recycled Asphalt Planings
<b>TPH</b>	Total Petroleum Hydrocarbons
<b>WDF</b>	Waste Derived Fill
<b>WDSE Standard</b>	Standard for the Production and Use of Waste Derived Soil Enhancer
<b>W2R Policy</b>	Environment Protection (Waste to Resources) Policy 2010

#### **4. MATERIALS INCLUDED IN THIS ENVIRONMENTAL INSTRUCTION**

All soil type materials and other waste materials that are generated as part of DPTI activities are included in this EI. The materials have been divided into the following five categories.

1. Commercially produced recycled materials imported for use
2. Recycled concrete and road base
3. Materials (soils, ballast and timber sleepers) generated from rail construction and maintenance
4. Recycled Asphaltic Planings (RAP)
5. Soil materials (fill and natural soils) generated from road construction and maintenance

For each of the above categories, a methodology has been developed that outlines the sampling and testing requirements to facilitate re-use of these materials, as well as the appropriate uses, management controls, and documentation/reporting requirements to demonstrate environmental due diligence and/or compliance with relevant standards and guidelines.

Where re-use is not feasible, disposal options are also summarised.

## 5. REGULATORY FRAMEWORK

### 5.1 Legislation, Guidelines and Standards

The Environment Protection Act, 1993 is the principal legislation addressing the management of waste in South Australia. There are also several relevant Policies, Standards and Guidelines created under the EP Act, which contain mandatory provisions enforceable under the Act.

The following legislation, guidelines and standards are relevant to this Environmental Instruction:

- *Environment Protection Act, 1993*
- *Environment Protection (Waste to Resources) Policy, 2010*
- *EPA Standard for the Production and Use of Waste Derived Fill, 2010*
- *EPA Standard for the Production and Use of Waste Derived Soil Enhancer*
- *EPA Guidelines for Stockpile Management*
- *EPA Guidelines for Environmental Management of On-site Remediation*
- *EPA Guidelines for the Site Contamination Audit System*
- *EPA Current criteria for the classification of waste—including Industrial and Commercial Waste (Listed) and Waste Soil*
- *National Environment Protection (Assessment of Site Contamination) Measure, 1999 (as amended 2013)*

The key points for each of these documents are outlined below.

#### 5.1.1 Environment Protection Act, 1993 (the EP Act)

Section 25 of the EP Act imposes a general environmental duty on all persons:

*“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 (Section 3(1)) defines ‘waste’ as:

- (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
  - (b) anything declared by regulation (after consultation under section 5A) or by an environment protection policy to be waste,
- whether of value or not.

It is important to note that ‘waste’ can include surplus soils and other materials generated from transport infrastructure projects (see 5.1.2 and 5.1.3).

It also provides that a ‘waste and recycling depot’ (defined in Schedule 1 (3)(3), paraphrased below) is a prescribed activity of environmental significance, for which an environmental authorisation is required.

*“The conduct of a depot for the reception, storage, treatment or disposal of waste other than-*

- (a) *Temporary storage at the place at which the waste (not being tyres or tyre pieces) is produced while awaiting transport to another place; or*
- (e) *the handling of waste solely for recycling or reuse where – (ii) the quantities of waste do not exceed 100 tonnes per year; or*

- (i) *a depot that the Authority is satisfied will be conducted for such limited purposes that requirement of an environmental authorisation under Part 6 would not be justified*

It is important to note that unclassified surplus soil which has been removed from a site is considered a waste, and therefore its storage at a place other than where it was produced (for example, at a depot or stack site) is considered an activity of environmental significance.

### **5.1.2 Environment Protection (Waste to Resources) Policy, 2010 (the W2R Policy)**

Clause 4(a) of the W2R Policy states that:

*“waste continues to be waste except insofar as it constitutes a product that meets specifications or standards published from time to time or approved in writing by the Authority”.*

Excavated soil is not considered a waste if it is to remain on the same site. This soil can be re-used in accordance with the EPA Guidelines for Environmental Management of On-site Remediation.

However, surplus soil which has been excavated from a construction site and which is destined for another site, is considered a waste. Clause 4(a) of the W2R Policy means that this soil will be considered a waste until it can be demonstrated that it constitutes a ‘product’ (as defined in the Standard for the production and use of Waste Derived Fill, 2010).

### **5.1.3 Standard for the production and use of Waste Derived Fill, 2010 (the WDF Standard)**

The WDF Standard is an approved standard and specification for the purposes of the W2R Policy (specifically clause 4(a)). It sets out the physical and chemical criteria which a material must meet in order to be classified as a ‘product’, and establishes the circumstances when a site contamination auditor needs to be engaged to verify that re-use of Intermediate Waste Soil is suitable for the intended use.

It also establishes some key principles for a risk-based approach to the reuse of waste materials:

- *Ensure sound science is used to assess risk*
- *Ensure the use of the Waste Derived Fill has acceptable and manageable risks, considering both short and long term impacts*
- *Ensure appropriate quality controls are proposed to manage risks*

These principles are particularly relevant to the risk-based approach to the reuse of waste material adopted in this EI.

### **5.1.4 EPA Standard for the Production and Use of Waste Derived Soil Enhancer, 2010**

The Waste Derived Soil Enhancer Standard is an approved standard and specification for the purposes of the Environment Protection (Waste to Resources) Policy 2010 (specifically clause 4(a)). The standard relates to the recycling of waste by its application to land as a soil enhancer. It is generally used in the context of agricultural applications, however, the re-use of timber sleepers for mulch in landscaping projects falls within the scope of the guideline (further detail is provided in section 8).

#### **5.1.5 EPA Guideline for Stockpile Management – Waste and Waste Derived Products for Recycling and Re-use, 2009**

This guideline was issued by the EPA to provide guidance on the stockpiling of waste and waste derived products such that the risk to human health and the environment is prevented or minimised. In particular, it addresses issues related to on-site layout, stability and dimensions of stockpiles and timeframes for storing waste and waste derived products (waste materials).

Appendix 1 of the guideline presents a summary of the key risks, factors affecting risk and general suggested measures. This has been used in the development of DPTI's stockpile management guide, provided in section 12.

#### **5.1.6 EPA Guidelines for Environmental Management of On-site Remediation, 2008**

This guideline is relevant where materials from a site which has a risk of contamination are to be reused within the same site. It provides advice on the environmental management of on-site (site contamination) remediation activities so as to minimise any actual or potential adverse impacts and to provide adequate protection to the community. It clarifies EPA's expectations regarding who is an appropriately qualified person to assess the suitability of various land uses.

More specifically, the Guideline states that:

- for sensitive land uses, an independent site contamination auditor should assess and provide an expert opinion on the suitability of the site for its intended use.
- for non-sensitive land uses, assessment by an experienced environmental consultant should generally be acceptable. The consultant's report should state that the site assessment has been completed taking into account the *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013)*. The report must also provide definitive statements that the site, following remediation, does not pose unacceptable risks to human health or the environment, taking into account the intended uses(s).

#### **5.1.7 National Environment Protection (Assessment of Site Contamination) Measure (NEPM), 2013**

Under Section 28A of the EP Act, National Environment Protection Measures automatically become environmental protection policies under the Act. The Assessment of Site Contamination NEPM is therefore a policy under the EP Act and has particular relevance for the assessment and management of site contamination issues.

The schedules to the NEPM establish investigation levels for various land uses (maximum chemical concentrations, above which further investigation and evaluation is required). These may be used as a guide in determining whether soils pose an unacceptable risk to human health or the environment, given the likely exposure scenario.

Note that the NEPM investigation levels only apply to the management of *on-site* contamination, ie they are not relevant to the classification of soil and other surplus material which is to be re-used or disposed of *off-site*. The off-site re-use or disposal of surplus materials is guided by the WDF Standard and the Current criteria for the classification of waste—including Industrial and Commercial Waste (Listed) and Waste Soil.

The NEPM also provides guidance on sampling techniques.

#### **5.1.8 EPA Guidelines for the Site Contamination Audit System, 2009**

These guidelines provide information on the site contamination audit system, the accreditation process and the responsibilities and obligations of site contamination auditors and others in relation to site contamination and auditing.

Typically, the instances where DPTI may require an auditor's involvement are:

- projects that involve the re-use of WDF that exceeds Waste Fill criteria
- projects that involve the re-use of WDF (regardless of classification) at a sensitive land use (as defined in the glossary)
- remediation of sites with significant contamination issues, where a consultant is unable to provide a definitive statement that the site, following remediation, does not pose unacceptable risks to human health or the environment.

This EI provides guidance as to when DPTI should engage a site contamination auditor.

#### **5.1.9 Current criteria for the classification of waste—including Industrial and Commercial Waste (Listed) and Waste Soil, 2010**

This document provides the current criteria for the classification of waste prior to disposal to licensed facilities. These criteria are applied at waste depots to define disposal criteria for Industrial and Commercial Waste (Listed) and Waste Soil, and in the assessment of risk posed by and determinations made for materials proposed for reuse.

**6.           COMMERCIALY PRODUCED RECYCLED MATERIALS IMPORTED FOR USE**

This EI does not apply to the purchase of quarry materials, natural sand and gravel. Purchase and use of these materials is permitted without environmental assessment.

Commercially produced recycled materials (such as crushed concrete or bricks) purchased from an EPA licensed source can be used in accordance with the DPTI Pavement Specification, Division R, Part R15 – Pavement Materials (the DPTI Pavement Specification).

Recycled products comprising blends of quarried material and/or reclaimed concrete, with or without supplementary source materials (brick, tile and asphalt) shall comply with the designated quality requirements for each recycled product detailed in Attachment A of Part R15. No more than 20% by mass of supplementary materials shall be incorporated and the constituent proportions shall remain unchanged during production.

The following table summarises the physical criteria for Class 1-3 Recycled Pavement Materials.

**Figure 6.1 - Physical Criteria for Class 1-3 Recycled Pavement Materials**

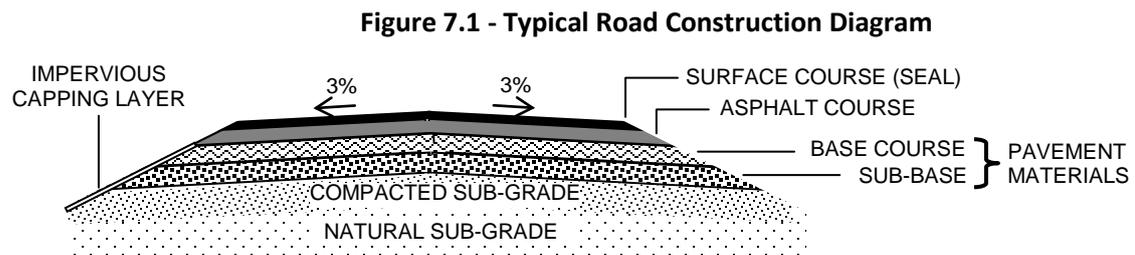
<b>Material Type</b>	<b>Limit</b>	<b>Detail</b>
Type II Foreign Materials	Maximum 1%	plaster, clay lumps and friable materials
Type III Foreign materials excluding bitumen	Maximum 0.5%	Rubber, plastic, paper, cloth, paint, wood and other vegetable matter
Bitumen Content	Maximum 1%	-
Asbestos	0%	

## 7. ROAD BASE AND WASTE CONCRETE

Many of DPTI's activities result in the generation of inert aggregate, e.g. quarry rubble and clean quarry sand from the road base and waste concrete, e.g. from culverts, kerbing, bridge structures etc.

### 7.1 Risk based assessment

Below the surface course and asphalt course, a road pavement comprises layers of engineered aggregate - typically crushed rock, gravel and sand (see Figure 7.1).



DPTI's pavement specification controls the composition and source of pavement materials used in road construction:

- Materials must be sourced either from a quarry or an EPA licensed recycling facility.
- Where recycled aggregates are to be used in the road pavement, they must comply with the quality requirements detailed in Figure 6.1, and must not exceed 20% by mass of the total amount.
- Recycled aggregates permitted for pavement construction consist of inert products such as crushed concrete, brick, tile and other ceramics.

Given that pavement materials imported for road construction are subject to this quality control process at the time of construction, the risk associated with the reuse of these materials within the DPTI network is therefore considered low. However, there is a chance that material in unsealed sections of the road formation (eg unsealed shoulders) could have been subject to contamination through spills, and as such, it is necessary to undertake a risk assessment prior to reusing pavement materials from these areas. It is assumed that material excavated from beneath the sealed road surface has a lower risk of contamination and does not require a risk assessment<sup>2</sup>.

In some cases, where good quality pavement materials are not readily accessible (such as in remote locations), stabilisers and binders may be added to the base course to improve the strength of the pavement. DPTI's pavement specification allows for the addition of cement, fly ash, bitumen and slag for this purpose.

The physical, chemical and environmental characteristics of both fly ash and slag are well documented. Golder Associates (1993, 1996, 1997) and Moeyan Management Pty Ltd (2004) after undertaking chemical analysis of slag samples from several different sources, concluded that the material is an 'inert waste'.

<sup>2</sup> If excavating deeper than 0.5m, the potential for tar-based contamination of pavement materials must be considered (see Section 9.2). This is only a risk for certain roads in the DPTI network, and the Site Contamination Officer can advise whether further investigation is necessary prior to reuse.

Queensland EPA (1999) confirmed that “slag materials are relatively fixed and offer little potential to cause environmental harm once laid down under an impervious surface”. Moeyan Management Pty Ltd (2004, 2007, 2009) have also confirmed the inert nature of fly ash through an extensive monitoring program on behalf of the Ash Development Association of Australia.

## **7.2 Reuse Options**

### **7.2.1 Road base**

Material that meets the following criteria:

- (1) the material is not mixed with natural soils or other foreign material (such as green waste, plastics, steel, timber, electrical wiring etc) in excess of the DPTI Pavement specification (Figure 6.1); and
- (2) the material has come from a road constructed in accordance with DPTI’s pavement specification; and
- (3) the material has been excavated from beneath the sealed road surface

is considered low risk and can be reused within the following locations on the DPTI road and rail network without the need for sampling and classification:

- Under sealed pavements;
- Shoulder treatments (i.e. the surface treatments located adjacent to road pavements);
- Batter fill;
- Unsealed hard-stand areas associated with road construction;
- Access Roads; and
- Footpaths.

If the material does not meet the criteria described in (1) and (2) above, it will be subject to the same risk assessment process for waste soils (refer to Section 10).

### **7.2.2 Waste concrete**

Material that meets the following criteria is considered low risk and can be reused within the DPTI network without the need for sampling and classification, provided it meets DPTI technical specifications for use:

- the material is clean and is not mixed with natural soils or other foreign material (such as green waste, plastics, steel, timber, electrical wiring etc)
- the material size is fit for the intended purpose

If the material does not meet these criteria, it will be subject to the same risk assessment process for waste soils (refer to Section 10).

## **8. MATERIALS (SOILS, BALLAST AND TIMBER SLEEPERS) GENERATED FROM RAIL CONSTRUCTION AND MAINTENANCE**

### **8.1 Background**

DPTI owns and operates the Metropolitan passenger rail lines and is the owner of a number of country rail lines.

The following materials are typically generated from rail maintenance and construction activities:

- Ballast / fines;
- Subbase materials (fill or natural); and
- Timber sleepers.

Given the historical application of arsenic based herbicides and the use of contaminated fill materials during the original construction of railways, as well as asbestos brake linings on trains, use of lubricants and fuels ('oil pots', diesel etc) and transport of various materials (e.g. lead ore transportation), the following chemical substances are associated with rail activities:

- Metals (predominantly arsenic), but also lead and other metals;
- Hydrocarbons (predominantly TPH and PAH); and
- Asbestos fibres and fragments.

DPTI contains a significant body of knowledge relating to typical concentrations for these chemical substances across rail lines in SA (refer to Rail Contamination Register, Knet #5027769). This information has been obtained from the Australian National Railways Commission assessment program, and the recent upgrade of the metropolitan passenger rail lines through the Rail Revitalisation project including the Noarlunga line, Gawler line and the Belair line.

The chemical substances outlined above are predominantly associated with the fines component of the ballast/fines and subbase materials. Historical testing on the Rail Revitalisation project has shown that the ballast materials (when separated from fines) do not contain elevated concentrations of these chemical substances. This lends support to a reduced sampling rate for ballast material where it is going to be screened and separated from the overall ballast/fines mix. However, due to the difficulty in managing the sieving process, and the significant costs involved in disposing of the fines (which have higher chemical concentrations), the separation of ballast and fines for separate handling and disposal is not recommended.

Typically rail maintenance projects do not separate out the ballast from subbase due to difficulties in removing individual layers 'cleanly'. Given that the layers of ballast and subbase are usually poorly defined, it can be difficult to ensure that no mixing has taken place between layers, and generally the material ends up being combined as one product. However, it is possible to separate out the ballast from subbase and recover two distinct products.

### **8.2 Risk Based Assessment**

#### **8.2.1 Timber sleepers**

DPTI has undertaken contamination testing of timber sleepers across approximately 85% of the metropolitan passenger rail network. The data collected shows a definitive trend in contamination levels of sleepers, with sleepers from stations and depots displaying higher contamination levels (particularly hydrocarbon contamination) compared with other sleepers.

This data has been reviewed by an independent contamination consultant and used to form the basis of a non-site specific risk assessment for the re-use of timber sleeper mulch. This risk assessment (knet #5131475) can be referenced to determine appropriate uses for timber sleeper mulch originating from the metropolitan passenger rail network.

It should be noted, however, that whilst there is sufficient data to be able to predict with a reasonable level of confidence the contamination levels of in-track sleepers in the metropolitan passenger rail network, this is not the case for country rail lines, which have not undergone the same level of testing. Therefore, it is recommended that data is collected for all non-metropolitan passenger rail lines where surplus sleepers are to be generated.

### 8.2.2 Ballast/ Fines/ Subbase

Whilst it is possible to make some assumptions about the likely chemical composition of ballast materials when they have been isolated from the fines and subbase (as discussed in 8.1), the concentrations of the various chemical substances found in ballast/fines/subbase mix is not consistent between sites - it varies depending on the historical use of each section of track, and can be quite high. Therefore, assumptions on the contamination status of ballast/fines/subbase mix cannot be made for all rail lines in SA, and it is not possible to produce a non-site specific risk assessment for the re-use of this material. It is recommended that sampling be undertaken whenever surplus ballast/fines/subbase is to be generated.

## 8.3 Reuse Options

### 8.3.1 Timber Sleepers

Timber sleepers can be reused in the following ways:

- Creosote treated sleepers: Re-use of whole sleepers in heritage railways (e.g. Steam Ranger and Pichi Richi railways, where there is a signed indemnity agreement and the recipient understands and accepts the contamination level present in the sleepers);
- Non-station or depot sleepers:
  - Mulching and controlled re-use for landscaping non-sensitive areas<sup>3</sup> on DPTI projects (based on the risk assessments mentioned above)
  - Controlled re-use of whole sleepers for landscaping on DPTI projects (e.g. retaining walls).
- Sleepers may also be used as an alternative fuel following processing at the ResourceCo alternative fuels facility (e.g. fuel for the kiln at Adelaide Brighton Cement).
- Sleepers are not to be disposed of for use by the general public.
- Station or depot sleepers - Use of more highly contaminated sleepers as an alternative fuel following processing at the Resourceco alternative fuels facility (e.g. fuel for the kiln at Adelaide Brighton Cement).

Risk assessments for site specific application of sleeper derived mulch (Section 6.2 of the WDSE Standard) and also broad application of sleeper derived mulch (Section 6.1 of the WDSE Standard) have been completed as part of the Rail Revitalisation project and endorsed by the EPA (refer Appendix 2, knet #5131475).

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<sup>3</sup> Non-sensitive landscaped areas (as defined in the risk assessment for the reuse of timber sleeper mulch) include:

- areas where people are unlikely to play, not within 30m of the nearest primary school, kindergarten, childcare centre or residential property
- areas where groundwater is greater than 3m below the ground surface
- areas that are more than 100m from surface water bodies
- not within ephemeral drainage lines (ie dry creek beds, open drains etc)

Re-use of timber sleeper mulch outside non-sensitive areas requires a site-specific risk assessment and EPA approval

These risk assessments provide guidance on where mulch from timber sleepers may safely be used. Provided re-use proposals are consistent with the recommended re-use locations contained in the risk assessment, there is no requirement for verification by a site contamination auditor.

### Sampling and Testing

The operation of a railway is listed in Schedule 1(7)(2) of the EP Act as a prescribed activity of environmental significance. It is also listed in Schedule 3 of the *Environment Protection Regulations 2009* as a potentially contaminating activity. Therefore there is a risk of contamination and any material should be tested prior to its removal off-site.

The overall mass of chemical substances within a timber sleeper can be characterised by calculating a weighted average by analysing various samples from different depths throughout a sleeper. Typically this comprises a surface sample, middle sample and base sample. The rate of sampling depends on the weight of the sleepers being tested.

### Reporting / Documentation

The reporting requirements will depend on the proposed re-use option for the materials.

- For the reuse of timber sleeper mulch, records should be kept of the site contamination consultant's testing and classification report. DPTI requires that the source of the mulch as well as its contamination level and the end location be recorded in DPTI's Recycled and Contaminated Materials Database (knet # 4943339).
- For the re-use of whole creosote-treated sleepers in heritage railways (e.g. SteamRanger and Pichi Richi railways), a signed indemnity agreement should be in place, ensuring that the recipient understands and accepts the contamination level present in the sleepers. Details should also be recorded in DPTI's Recycled and Contaminated Materials Database (knet # 4943339).
- For the use of timber sleepers as an alternative fuel there are no reporting requirements for DPTI. However, details should be recorded in DPTI's Recycled and Contaminated Materials Database (knet # 4943339). The waste transporter is required to keep waste tracking forms.
- For the disposal of sleepers to an EPA licensed waste facility, there are no reporting requirements for DPTI. The waste transporter is required to keep waste tracking forms.

### Management Requirements

The management requirements for the re-use of timber sleepers will depend on the proposed re-use option for the materials.

If sleepers are to be mulched:

- the mulcher must be licensed to receive waste
- stockpiles of mulch must be managed in such a way as to reduce fire risk (see Section 12 for specific requirements for stockpiling)

#### 8.3.2 Ballast

- Re-use within the same project site:

Provided that a suitably qualified contamination consultant has verified that re-use is in accordance with the EPAs *Guidelines for Environmental management of on-site Remediation*, ballast may be re-used within the same project site without the need for auditor involvement. Note that if the ballast exceeds NEPM HIL-F criteria, remediation may be required.

- Re-use on other project sites:

Ballast is often sought as a waste derived fill in road construction products, for its compressive strength properties. However, reuse within DPTI projects will depend on the classification of the material:

- Ballast material up to Waste Fill classification may be re-used as WDF within DPTI road and rail corridors, without limitations on its placement within the corridor.
- Material exceeding Waste Fill classification but not exceeding Intermediate Waste classification may (subject to Auditor and EPA approval) be transferred off-site and used as WDF within DPTI road and rail corridors, with some restrictions on its placement within the corridor. Suitable locations for WDF up to Intermediate Waste classification are described in Section 10.3.2.

This EI does not cover the re-use of this material outside of DPTI road and rail corridors. In these circumstances, the requirements in the WDF Standard should be adhered to.

### Sampling and Testing

Where ballast/fines/subbase mix is to be re-used on the same site, it should be sampled and classified in accordance with the *National Environment Protection (Assessment of site contamination) Measure 1999 (as amended 2013)*.

Where ballast/fines/subbase mix is to be re-used off-site or disposed of, the contamination status of the material should be characterized in accordance with Appendix 3 of the WDF Standard. Particular focus should be on the common chemical substances associated with rail materials, being:

- Metals (predominantly arsenic), but also lead and other metals;
- Hydrocarbons (predominantly TPH and PAH); and
- Asbestos fibres and fragments.

On DPTI's rail revitalisation projects, a weighted average concentration has been calculated from total concentrations measured in both the ballast and fines materials. This weighted average has been used to classify the materials as a whole.

Typically, sampling would be undertaken whilst the materials are in-situ. Sampling density is based on compliance with AS4482-2005 - *Guide to the investigation and sampling of sites with potentially contaminated soil*, taking into account the length of track, depth of excavation and assumed width of the track. Targeted sampling around stations is also recommended.

### Reporting / Documentation

The reporting requirements for the ballast/fines/subbase generated from rail activities depend on the classification of the material:

- Re-use of material within the same project site requires a report from a suitably qualified contamination consultant recommending suitable options for re-use.
- Re-use elsewhere within DPTI road and rail corridors, of material up to Waste Fill classification does not require a report from a suitably qualified contamination consultant. However, DPTI requires that the source of the material as well as the classification report and the end location be recorded in DPTI's contaminated materials register (knet # 4943339).

- Re-use elsewhere within DPTI road and rail corridors, of material exceeding Waste Fill classification but not exceeding Intermediate Waste classification triggers the Auditor protocol. A site management plan must be prepared by a suitably qualified contamination consultant and endorsed by a site contamination auditor. The Auditor will provide interim audit advice to the EPA (prior to transfer of the material to the re-use site), followed by an Audit Report (after the transfer of the material to the re-use site). Details should also be recorded in DPTI's Recycled and Contaminated Materials Database (knet # 4943339).

### **Management Requirements**

The management requirements for ballast/fines/subbase generated from rail activities are the same as for soil materials presented in Section 10 of this EI.

## 9. RECYCLED ASPHALTIC PLANINGS (RAP)

Often maintenance activities involve 'planing' the surface of the road pavement for re-surfacing. Depending on the method used, planings can be pure asphaltic concrete, or they may consist of a mixture of asphaltic concrete as well as pavement materials.

Recycled Asphalt Planings are a valuable resource and should where possible be planed in a way that enables its reuse in asphalt plants. Reusing both the aggregate and bitumen in the RAP in new asphalt saves on resources, the use of virgin materials, energy and greenhouse emissions, and contributes to reducing the department's ecological footprint.

For the purpose of this EI, RAP are defined as material produced by DPTI personnel or its contractors only. Commercially produced recycled bituminous material that is purchased from a supplier is covered in Section 6 of this EI.

### 9.1 Background

DPTI predominantly uses hot mix asphalt pavements in metropolitan Adelaide, although emulsions and cutback are used in limited quantities. Additives such as plastimers and elastomers, as well as spray seal bitumen are also used on occasions. Bitumen comes from petroleum, either naturally occurring or as a by-product of oil refining, however these hydrocarbons are not mobile in the environment.

Historically, these bituminous materials have been disposed to municipal landfills within South Australia. However, significant environmental and economic benefits can be achieved by recycling asphalt planings and using them in new road seals, as well as in other locations outlined in section 9.3.2.

DPTI's Pavement Specification now allows the asphalt supplied to the Metropolitan Plane and Reinstatement contracts to contain up to 20% RAP, with a view to increasing the percentage of RAP in future.

Re-use of RAP is optimised if the profiling machine does two cuts, the first cut being deliberately thin, so as to harvest only the top layer of asphalt (which is the most valuable product for re-use in asphalt mixes). The second cut picks up the rest of the asphalt, along with some pavement material. This second cut does not contain neat asphalt, and the material is generally not suitable for reuse in asphalt production. Re-use options for both types of material are presented below.

### 9.2 Risk Based Assessment

DPTI has analysed asphalt planings from various road pavements in the Metropolitan and regional areas for contaminants of potential concern (refer to [knet #2776629](#)).

The results were compared to health based investigation levels for a range of land uses, and ecological investigation levels that are protective of plant growth as presented in the NEPM. The findings of the assessment were:

- The results were generally consistent;
- Total concentrations were below the investigation levels for the protection of human health in all land uses (i.e. below HIL 'A' for residential use, where available) and the environment (where present); and
- The TPH present in the samples was not leachable.

These results confirm that asphalt planings are inert and are not leachable, making them suitable for re-use in specified locations (as described in 9.3.2), *unless they contain tar*.

Given that:

- tar based pavements were phased out in SA in the late 1960s, and
- most pre-1970 pavements have now been replaced (the design life for most of Adelaide's arterial roads is 20 years, but can be up to 30-40 years)

tar based pavements are not expected to be encountered in the Adelaide metropolitan area.

However, it is possible to encounter residual contamination in the lower pavement layers of some older roads which historically had a tar seal. Whilst the tar seal itself may have been replaced long ago, associated contaminants may have leached into the pavement material underneath. This is generally only a risk when excavating to a depth >0.5m. For the majority of road maintenance works, excavations are limited to the top 450mm.

### 9.3 Reuse options

**Planings, wherever possible should be removed in a manner that does not mix the planings with base course and other materials, and should be sent to an asphalt plant for incorporating within new mix.**

Acceptable re-use options for asphaltic concrete planings (not containing tar) within DPTI road and rail corridors are:

- Within new asphalt mix (DPTI's pavement specification allows for up to 20% RAP. Greater percentages will be considered on a trial basis);
- Under sealed pavements;
- Shoulder treatments (i.e. the surface treatments located adjacent to road pavements);
- Batter fill;
- Unsealed hard-stand areas associated with road construction;
- Access Roads; and
- Footpaths.

Asphaltic concrete planings shall not be used in locations where more sensitive environmental or health receptors are present, or where they are not desirable for aesthetic reasons, such as:

- Landscaped areas; and
- Within watercourses, drains, culverts, or other areas that are submersed for long periods.

Asphaltic concrete planings which are mixed in with pavement materials (not sub-base soils) may be used in the same locations as described above (with the exception of re-use in new asphalt mixes).

This EI does not cover the re-use of asphaltic concrete planings outside of DPTI road and rail corridors.

#### 9.3.1 Sampling and Testing

No sampling and testing is required for asphaltic concrete planings, unless there is reason to believe that the pavement is tar based. It is obvious if a pavement contains tar, due to the distinctive odour released when the pavement is milled. It is also possible to rule out tar based surface layers by checking the age of a road surface on DPTI's Road Asset Information Map Server or by using the test method T542 [#7696368](#).

**Using DPTI's Road Asset Information Map Server to determine pavement age**

Make sure the 'Surface Age' layer (under Treatment Layers) is turned on. Zoom to the relevant location and, using the Lightning tool, click on the road section you are interested in. A box will pop up showing the year the surface was laid. If it was laid after 1970, it is safe to assume the pavement is not tar-based.

If the pavement is suspected or known to contain tar, then workers must follow the *coal tar handling protocol*, and the planings must be sampled and tested to facilitate off-site disposal to an EPA licensed waste facility. The materials must be sampled and tested in accordance with Appendix 3 of the WDF Standard.

**Coal tar handling protocol**

Whenever coal tar is identified work should cease immediately and the supervisor notified.

Prior to any further work, any areas of exposed skin should be washed with soap and water and dried well. Barrier cream and SPF 30+ sunscreen should be applied to exposed skin and rubbed in well (the chemicals that make up coal tar have been found to cause serious skin irritation and photosensitisation (increasing the risk of sunburn) when appropriate personal protective equipment is not used).

Overalls (which are to be washed separately after use), impervious gloves, safety glasses and a half face combination dust/organic vapour respirator must be issued and worn by any staff remaining in the area to carry out removal work.

Where practical, coal tar should be removed by non-milling methods including saw cutting the perimeter of the area to be removed and excavating the material to a separate stockpile in a bunded area. The work area should be kept damp. Following the excavation, the exposed area should be cleaned with a suction sweeper using water and brooming. Plant and equipment must be washed down in an approved wash bay with interceptor pits.

All material must be disposed of to an EPA licensed facility, using EPA licensed waste transporters.

**9.3.2 Reporting / Documentation**

Generally, no reporting or documentation is required for the re-use of asphaltic concrete planings within DPTI road or rail corridors. However, details should be entered into DPTI's Recycled and Contaminated Materials Database (knet # 4943339).

If the pavement is suspected or known to contain tar, the sampling and testing results must be incorporated into a report by a suitably qualified contamination consultant to facilitate off-site disposal of the materials to an EPA authorised facility.

**9.3.3 Management Requirements**

The following management practices should be followed when re-using asphaltic concrete planings:

- **Where feasible, planings should not be stored, but should be taken directly to an asphalt plant for incorporation into new mixes;**
- Any quantity of planings may be temporarily\* stockpiled either on the site where they are generated or on the site where they are to be re-used, but only if they have a direct and imminent re-use;

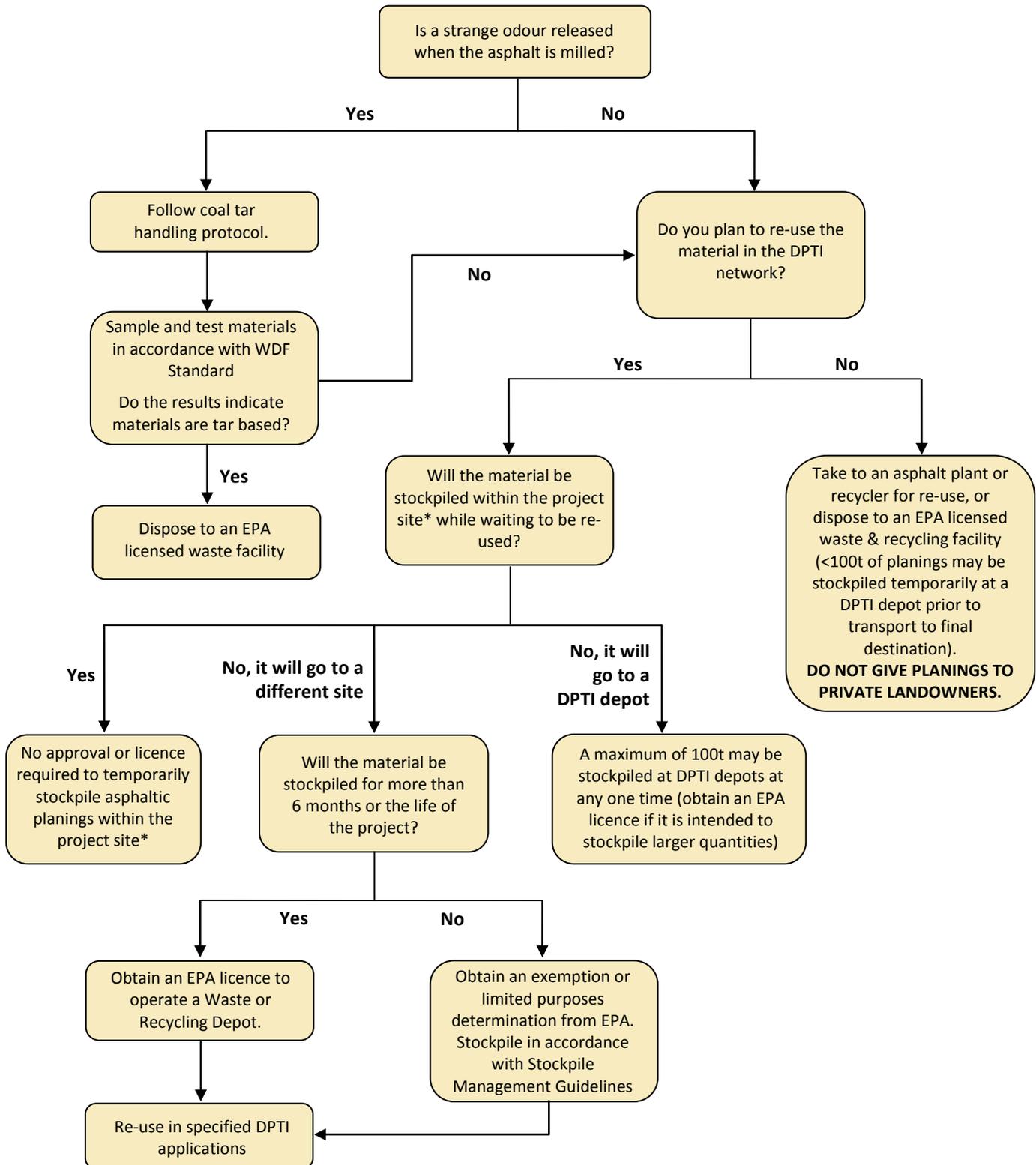
- Minor quantities of planings (<100 tonnes at any one time) may be stored at DPTI depots while awaiting transport to another place (for example, planings from minor works undertaken at night may be stored at DPTI depots until the waste facility or asphalt plant is open and able to accept them)
- If large quantities of planings (>100 tonnes at any one time) are to be stored off site, ie at a site other than the site where they were generated or the site where they are to be re-used, a licence will be required from the EPA;
- All stockpiling activities should comply with the *EPA Guideline for Stockpile Management – Waste and Waste Derived Products for Recycling and Re-use (April 2009)*. Refer to the stockpile management guidelines in section 12 of this EI.

*\* 'temporary' storage means a maximum of 6 months or the life of the project. However, if the construction schedule is such that the material needs to be stored for longer, seek advice from the EPA regarding the need for a licence or limited purposes determination.*

A flowchart showing the methodology for the re-use of asphaltic concrete planings is presented in Figure 9.1.

Figure 9.1 - Flowchart for Re-use of Asphaltic Concrete Planings

The preferred use for asphalt planings is to send it to an asphalt plant for use within new asphalt.



\* see definition of 'site' in Glossary

## 10. SOIL MATERIALS (FILL AND NATURAL SOILS) GENERATED FROM ROAD CONSTRUCTION AND MAINTENANCE

### 10.1 Background

Under the Environment Protection Act, everyone has a duty of care to ensure that its activities (including the re-use or disposal of surplus soil) do not cause harm to human health or the environment. The EPA's WDF Standard provides a sampling-based approach to demonstrating that a surplus soil is fit for re-use at a certain location. It requires the producer of the surplus soil to sample the material at a nominated rate and classify it according to published criteria prior to the material's transfer to a re-use site.

In many circumstances this is the most appropriate way to manage the risk of site contamination. However, in some situations where the risk has been assessed as low, it is not reasonable and practical to carry out sampling and classification prior to re-use. These situations are described in Section 10.2.

### 10.2 Risk Based Assessment

It is prudent to carry out some form of risk assessment for all projects involving the removal of excavated soil. The level of risk assessment required depends on the following risk factors:

- **The volume of soil**

This EI recognises that small volumes of material (<100 tonnes) generated from the DPTI network (such as from minor road maintenance jobs), are relatively low risk and should not be subject to the same requirements for sampling and assessment as larger volumes.

- **The historical use of the site and nearby land uses**

The likelihood of contaminated material being encountered on a road project is linked to the historical use of the site and adjacent sites<sup>4</sup>. It is also linked to the source of fill materials originally used in road construction. This EI recognises that the vast majority of DPTI's roads have been constructed from materials sourced from quarries, EPA licensed recycling facilities and/or won from the site, however the possibility of encountering situations where contaminated fill materials have historically been imported and used as fill in the road/ rail corridor cannot be discounted. The EI also recognises that adjacent land uses can contribute to contamination of soil within the road corridor (eg through the movement of contaminated groundwater). As such, the presence of potentially contaminating activities nearby is a trigger for a more detailed risk assessment.

- **The nature of the end-use or receiving location for the soil**

Given the limited exposure of workers and members of the public to soil materials used in road construction, and the presence of sealed pavements or footpaths over much of the road reserve (which serve to limit the potential for infiltration of water and mobilisation of any contaminants), this EI recognises that the risk to human health or the environment is relatively low when soil is re-used within the road corridor (see [knet #962961](#) for a report on the risks posed by contaminated soils to users of roads). When soil is proposed to be re-used in more sensitive locations (eg in unsealed landscaped areas), the risk is higher and a greater level of investigation is warranted.

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<sup>4</sup> When DPTI acquires land for road projects, an Environmental Site Assessment, Phase 1 Site History is undertaken, to ensure that any potential site contamination issues are identified. If land is not being acquired, it is still necessary to check whether potentially contaminating activities may have occurred, for example, operation of the [former Metropolitan Adelaide tram network](#).

### 10.3 Reuse and disposal options

A flowchart showing the methodology for the re-use of surplus soils generated from road construction and maintenance activities is presented in Figure 10.1. The methodology for the disposal of surplus soils generated from road construction and maintenance activities is presented in Figure 10.2.

Acceptable re-use options for soils generated from DPTI road construction or maintenance activities depend on the risk of contaminants being present in the materials, and on the risk of exposure.

- **Reuse of materials as fill within the same site:** Materials may be able to be re-used within the same site, however, DPTI must take reasonable precautions to ensure that no environmental harm results from the movement of potentially contaminated materials within a site. If the use of the site is changing to a more sensitive use, or if the risk assessment indicates potential for contamination, a suitably qualified contamination consultant will need to verify that re-use is in accordance with the EPA's Guidelines for Environmental management of on-site remediation.
- **Reuse of materials as fill elsewhere within the DPTI network (different sites):** Figure 10.2 and 10.3 outline the circumstances where various types of material may and may not be reused within the DPTI network, and the restrictions on re-use.

Potential re-use locations within the DPTI network fall into two broad categories:

- Sealed applications: re-use in sealed applications would typically include the incorporation of recycled materials within or immediately below the bitumen road seal (or other impermeable seal).
- Unsealed applications: re-use in unsealed applications may include
  - Road shoulders
  - Unsealed car parks
  - Unsealed roadways (dirt roads)
  - Noise mounds and buffers
  - Embankment batters
  - Roadside vehicle stopping areas
- **Disposal to a waste or recycling depot:** Disposal of material to a licensed waste or recycling facility may be possible, depending on the type of waste and its classification. Under the EP Act, landfills or waste/recycling depots are required to be licensed by the EPA. Depending on the conditions of the licence, operators of waste/recycling depots are restricted in the types of material they can accept. For example, some facilities are not licensed to accept material that exceeds waste fill criteria (they may not be equipped to safely manage more contaminated material). DPTI's site contamination officer can advise on which waste facilities can accept various types of waste.

For waste soils, a classification report is required for disposal of volumes >100t.

- **Disposal off-site:** If DPTI proposes to dispose of surplus soils generated from road construction/maintenance activities to a site outside of DPTI's network, other than a licensed waste or recycling facility (for example to a Council or landowner), the material must first be tested and classified in accordance with the WDF standard.

Material that meets Waste Fill criteria can be re-used at any site for any suitable purpose. If it is proposed to dispose of material that exceeds Waste Fill criteria to a site outside DPTI's network, DPTI's site contamination officer should be consulted and a Site Contamination Auditor will be required to verify suitability for use at the receiving site.

Consideration should be given to the need for a formal agreement between DPTI and any recipient of surplus fill materials. An example of such an agreement is provided in Appendix 5.

### 10.3.1 Sampling and Testing

#### ▪ Re-use of small quantities of soil (< 100t) between DPTI infrastructure projects

For small quantities of material (< 100t), where there is no reason to suspect that the material is contaminated (ie there are no PCAs adjacent the site and no visual or olfactory indicators of contamination), no sampling and testing is required prior to re-use in DPTI infrastructure projects. However, if visual or olfactory indicators of potential contamination are observed, works should cease and sampling should be undertaken.

Visual / olfactory indicators of potential contamination include:

- Discoloured fill materials;
- Hydrocarbon odours and staining;
- Inclusions within fill materials (foundry sands, slag, industrial wastes, refuse, asbestos, physical inclusions);
- Soils that are known or suspected to be acid sulphate soils;
- Other non-natural odours.

#### ▪ Re-use of larger quantities of soil (> 100t) between DPTI infrastructure projects

When it is proposed to move larger volumes of material (>100t) between project sites, it is DPTI's policy to undertake a risk based assessment of the source project site. This may be undertaken by DPTI's Site Contamination Officer, or a suitably qualified contamination consultant.

A risk assessment should have regard to procedures detailed in the *Assessment of Site Contamination NEPM 2013* with particular reference to Schedule B(2), to the extent required for the potential risk.

A risk assessment checklist which sets out the key steps to be followed in the risk assessment process is provided in Appendix 3.

If the risk assessment does not identify any PCAs then no sampling and classification is required to classify the materials for immediate re-use in DPTI infrastructure projects. However, if visual or olfactory indicators of potential contamination are observed during works a qualified site contamination consultant must be engaged to undertake sampling and advise on appropriate interim action (including risk minimisation for staff and public) prior to works continuing.

If the risk assessment or observations do identify PCAs, a suitably qualified contamination consultant must be appointed to undertake an ESA Phase 1 (site history), which may include sampling, prior to transport to the re-use site.

Sampling involves:

- Comparison against the physical criteria for waste fill
- Comparison against the chemical criteria for waste fill (including the suite of analytes listed in Section 3 of the *Environment Protection Regulations 2009*, plus any other contaminant reasonably expected to be present)
- Leachate testing. Australian Standard 4439.2-1997 'Wastes, sediments and contaminated soils Part 2: Preparation of leachates - Zero headspace procedure' provides guidance on the selection of leaching fluids depending on the proposed receiving environment:

Receiving environment	Leaching fluid
Disposal over land	Reagent water (neutral) or local groundwater if appropriate
Disposal to landfill: Monofill	
Putrescible material	Acetate buffer pH 5
Non-putrescible material	Reagent water (neutral)
Co-disposed with	
Putrescible material	Acetate buffer pH 5
Non-putrescible material	Acetate buffer pH 5 and tetraborate buffer pH 9.2 (ie 2 elutions)

Even if it is proposed to re-use material within the DPTI network, it may be most efficient to undertake both acid and neutral leachate testing up front to keep disposal options open (without the need for re-sampling).

Note that for the purpose of this EI, the historical importation of base-course and sub-base materials (i.e. road pavement materials) is not considered to be a PCA that would trigger sampling and testing, as these pavement materials would have initially been subject to quality assurance procedures to ensure they met the DPTI pavement specification. Importation of other materials (besides pavement materials) for the purpose of filling land may be considered a PCA if the nature and source of the material is unknown, or is known to be contaminated.

DPTI's Site Contamination Officer can arrange for sampling and classification of material. Sampling should be undertaken before the material is taken off site. If there is no room to stockpile the material at the site, it may be taken to an appropriately licensed waste or recycling depot until it has been classified. Unclassified soil may NOT be taken to a depot or other DPTI site for temporary storage.

▪ **Re-use of any quantity of soil within the same project site**

Where it is proposed to re-use excavated materials within the same site (ie where the excess soil is not being taken off-site), the WDF Standard does not apply. If there is reason to believe that the material is contaminated, or if the land use is changing to a more sensitive use, the *EPA Guideline for the Environmental Management of On-Site Remediation* should be used to determine the requirements for sampling and assessment. For non-sensitive land uses (e.g. road and rail reserves), the guideline recommends assessment by a suitably qualified contamination consultant: "The consultant's report should state that the site assessment has been completed taking into account the *Assessment of Site Contamination NEPM*. The report must also provide definitive statements that the site, following remediation, does not pose unacceptable risks to human health or the environment, taking into account the intended uses(s)". A site contamination auditor is generally not required where material is not being moved between different sites.

Note that a 'site' normally encompasses the project area generating the surplus material or the project area receiving the material. It may encompass several parcels of land including public roads and non-adjacent land (see case study in Appendix 4). However, in such cases, the extent of the 'site' must be discussed and agreed with the EPA, as management requirements vary considerably depending on whether material is to be moved within a site or taken off-site.

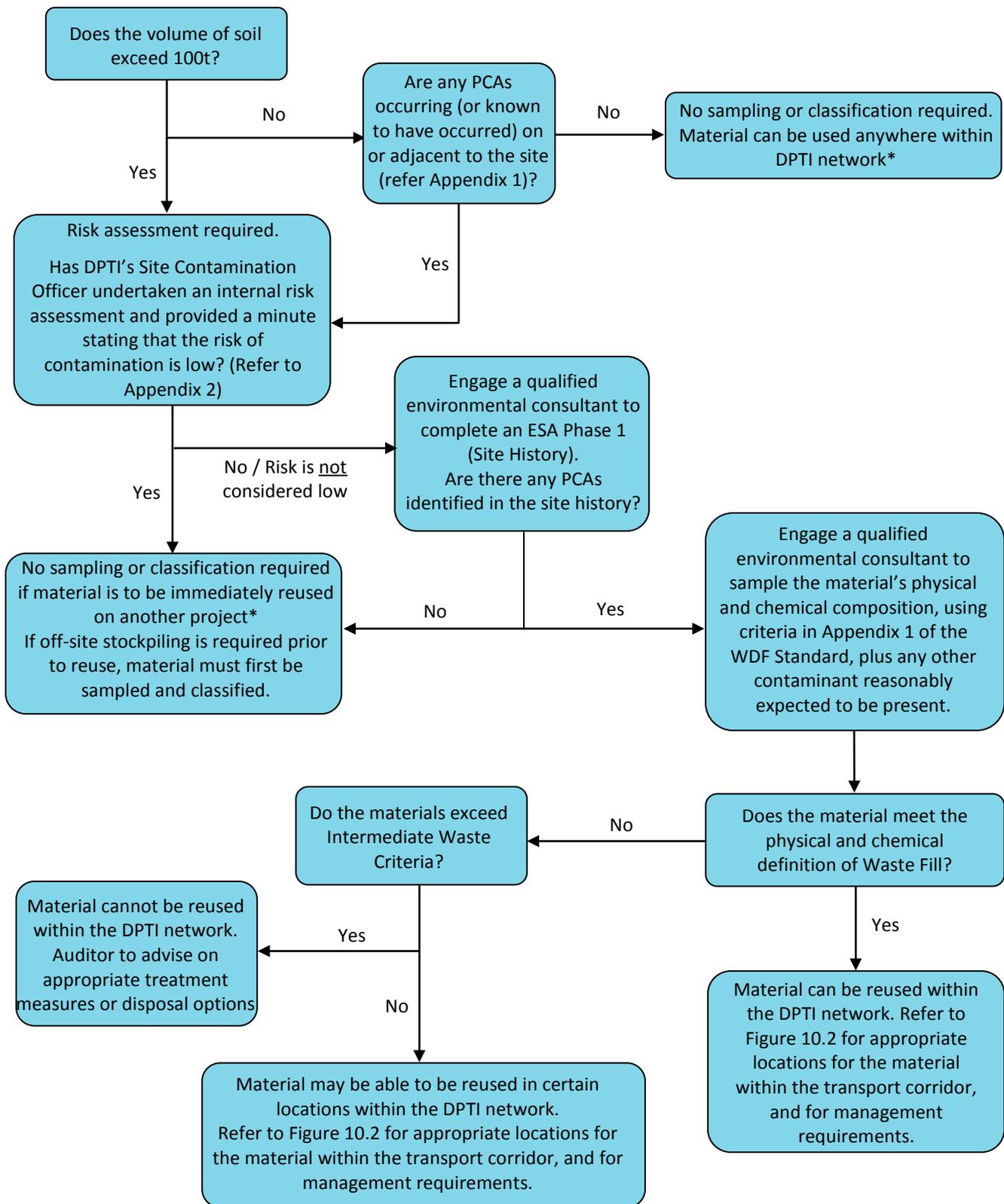
- **Disposal of soil to a waste facility**

Operators of waste facilities are bound by the conditions of their EPA licence, which include when they can accept waste which has not been classified. Waste facilities do not require a classification report for small volumes of soil (<100t). To dispose of larger volumes (>100t) of soil, sampling and classification is required.

- **Disposal of soil to a third party**

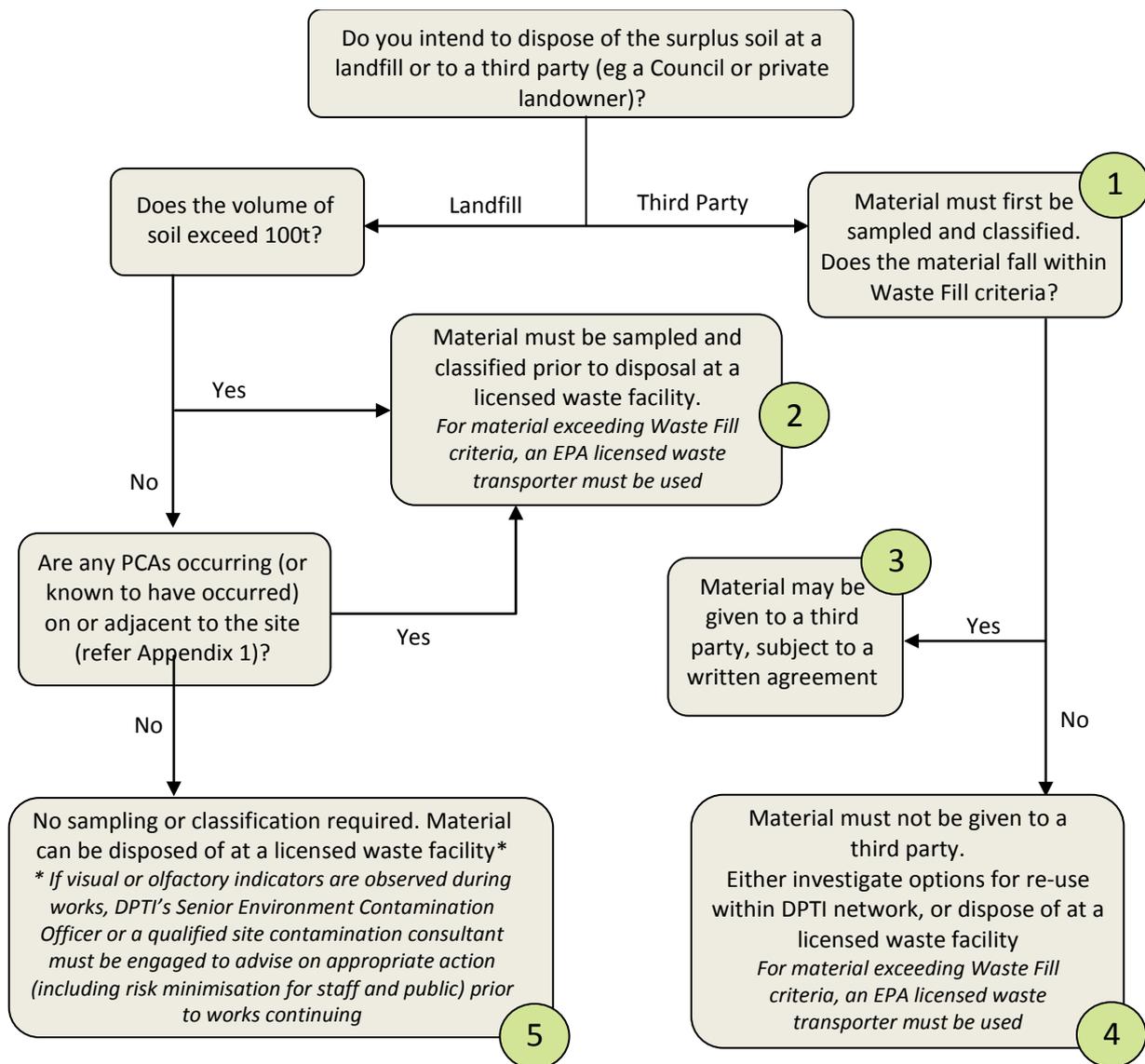
Sampling and classification is always required for disposal of surplus soil to a site outside of DPTI's network (other than a licensed waste facility), regardless of volume. See Section 10.3.2 for additional requirements and limitations on disposal to a third party.

Figure 10.1 - Flowchart for the re-use of surplus soils generated from DPTI road construction



\* If visual or olfactory indicators are observed during works a qualified site contamination consultant must be engaged to advise on appropriate action (including risk minimisation for staff and public) prior to works continuing

Figure 10.2 - Flowchart for disposal of Surplus Soil from the DPTI network



1. It is usually preferable to sample material in-situ, ie before excavation work begins. This gives you the information you need to determine disposal options in advance, and avoids the need for double-handling and stockpiling excavated material whilst waiting for test results.
2. Landfill operators are obliged to request a classification report prior to accepting more than 100t of soil from a non-domestic source.  
  
The licensed waste transporter should complete a waste tracking form detailing the nature, source and destination of the material.
3. An example of a written agreement between DPTI and recipients of waste fill can be found in Appendix 5 (or [knet 6418908](#)).
4. Unclassified surplus soil, or soil that exceeds Waste Fill criteria should not be passed on to private land-owners, due to the potential for DPTI to be held liable for any harm to the environment or human health resulting from the use of the material.
5. Depending on the landfill facility's licence conditions, the operator *may* require a classification certificate before accepting the surplus soil.

### 10.3.2 Reporting / Documentation

Figure 10.3 provides information on the reporting requirements for waste soils generated from DPTI road construction and maintenance activities.

**Figure 10.3 - Appropriate locations for surplus soil within DPTI network, depending on classification**

Classification	Suitable location(s) within road/rail reserve	General management requirements
Waste soil which has undergone a risk assessment in accordance with this EI and has been deemed low risk, no visual or olfactory indicators of contamination	<ul style="list-style-type: none"> <li>▪ Anywhere within DPTI network</li> </ul>	<ul style="list-style-type: none"> <li>▪ If visual or olfactory indicators are observed during works, a suitably qualified site contamination consultant must be engaged to advise on appropriate action prior to works continuing.</li> <li>▪ Details must be recorded on recycled materials database (maintained by DPTI's Environment Systems Unit).</li> </ul>
Waste Fill	<ul style="list-style-type: none"> <li>▪ Anywhere within DPTI network</li> </ul>	<ul style="list-style-type: none"> <li>▪ Details must be recorded on recycled materials database (maintained by DPTI's Environment Systems Unit).</li> </ul>
Intermediate Waste Soil	<ul style="list-style-type: none"> <li>▪ Sealed applications within DPTI network</li> <li>▪ Unsealed applications within DPTI network, <i>excluding</i> the following areas:                             <ul style="list-style-type: none"> <li>– Groundwater is known to be less than 1m below the ground surface in the area of the project</li> <li>– The site within 100m of a surface water body, creek or river</li> <li>– The site is located adjacent to a reservoir</li> <li>– The site is located within 100m of residential properties or schools (including Day Care Centres and Pre-Schools)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ A suitably qualified contamination consultant must prepare a site contamination report verifying that the material is suitable for the intended use.</li> <li>▪ If the material is to be re-used at a different site, this report must be endorsed by a site contamination auditor prior to the material being transported, and the site contamination auditor must prepare an Audit Report for lodgement with the EPA following re-use of the material.</li> <li>▪ A licensed waste transporter must be used to transport the material (if material is to be transported on a public road)</li> <li>▪ Details must be recorded on recycled materials database (maintained by DPTI's Environment Systems Unit).</li> </ul>
Low level contaminated soil	<ul style="list-style-type: none"> <li>▪ No use permitted within DPTI network. Material must be disposed of to a licensed landfill facility or retained and managed on site</li> </ul>	<ul style="list-style-type: none"> <li>▪ Follow Auditor advice</li> <li>▪ Details must be recorded on recycled materials database (maintained by DPTI's Environment Systems Unit).</li> </ul>
High level contaminated soil	<ul style="list-style-type: none"> <li>▪ No use permitted within DPTI network. Material must be disposed of to a licensed landfill facility or retained and managed on site</li> </ul>	<ul style="list-style-type: none"> <li>▪ Follow Auditor advice</li> <li>▪ A high level waste treatment plan must be approved by the EPA before high level waste is removed from site</li> <li>▪ Details must be recorded on recycled materials database (maintained by DPTI's Environment Systems Unit).</li> </ul>

### 10.3.3 Management Requirements

The following management practices should be followed when re-using soils generated from road construction/maintenance work:

- A licensed waste transporter must be used to transport materials exceeding waste fill criteria on a public road, and waste tracking forms must be submitted to the EPA.
- If >100t of waste soils are to be stockpiled at a site other than the site where they were generated or the site where they are to be reused, a licence or exemption will be required from the EPA, if the activity falls within the definition of a Waste or Recycling Depot under Schedule 1(3)(3) of the EP Act.
- If waste soils have a direct re-use and are to be stockpiled either on the site where they are generated or on the site where they are to be re-used, then a licence is not required, provided the stockpiling period does not exceed 6 months or the life of the project.
- All stockpiling activities should comply with the *EPA Guideline for Stockpile Management – Waste and Waste Derived Products for Recycling and Re-use (April 2009)*. See Section 12 of this EI for stockpile management measures and details of the process for obtaining approval to stockpile materials.

The risks associated with stockpiling unclassified soil material off-site (eg at a depot) are significant and require extensive site preparation and management measures. If stockpiling unclassified soil off-site is unavoidable, it must be stockpiled at a licensed waste facility.

## 11. USE OF MATERIALS OR SOIL FROM NON-DPTI SOURCES

The use of soil from other external sources (for example from other Government Departments, from Local Councils, or from a Developer) will be subject to more rigorous testing than material provided either by DPTI, or commercial providers of soils or recycled products. Prior to acceptance, material provided from external sources must be classified by a suitably qualified environmental consultant in accordance with the WDF standard.

## 12. STOCKPILE MANAGEMENT

### 12.1 General Requirements

A site-specific Environmental Management Plan (EMP) should be prepared prior to stockpiling activities commencing.

The *EPA Guideline for Stockpile Management – Waste and Waste Derived Products for Recycling and Re-use* provides general requirements on stockpiling waste derived fill. These requirements should be incorporated into the Environmental Management Plan:

- The location of each stockpile shall be accurately identified on a site plan and by labelling on-site with a stake or similar. The stockpile should be identified with its source location, type of material contained in the stockpile, estimated volume, and the date it was stockpiled.
- The Contractor shall maintain a register of re-used materials. This shall include the material's source, contamination information and final destination (once the material leaves the stockpile site). The register shall be provided to DPTI's Contracts and Environment Group for inclusion in DPTI's Recycled and Contaminated Materials Database (knet # 4943339).
- Sediment and erosion control shall be undertaken in accordance with EPA requirements (see *EPA Guideline for Stockpile Management – Waste and Waste Derived Products for Recycling and Re-use* and *EPA Guideline for Environmental Management of on-site remediation, including dust, stormwater, noise etc management requirements* for further detail).
- Dust control measures shall be undertaken at all stages of the project, and shall comply with the EPA Guidelines mentioned above. Measures may include:
  - spraying water or a polymer/dust suppressant on traffic areas or stockpiles and limiting truck speed on unsealed access roads;
  - covering trucks transporting materials to and from site (i.e. when full and empty)
  - minimising wind erosion by limiting the height of stockpiles to a maximum of 5m above the surrounding ground level, and rounding the top of the stockpiles where possible.
- Roads shall be inspected by DPTI personnel during transportation of material and cleaned if necessary.
- Site inductions shall be undertaken for all staff, to ensure workers are fully aware of restrictions for no go areas, and all relevant management measures including the importance of keeping materials with different contamination status separate.
- The transport of contaminated material onto public roads surrounding the site shall be prevented by cleaning tyres and undercarriage or installing shaker bars (or other methods as necessary). Where material is transported onto public roads, this shall be cleaned up as soon as possible by using dry brushing methods. Drains close to the entry/exit points on public roads should be protected by sediment controls.
- In order to protect the health and safety of workers, the following general requirements should be incorporated into any site specific health and safety plans for projects involving the re-use of soils:
  - Vehicles transporting, loading and handling fill materials must keep windows closed to prevent exposure to dust. Truckloads transporting materials shall be covered during transportation to minimise dust generation.

- Personnel must wash their hands before eating, drinking or smoking.
- Long sleeved shirts and pants should be worn to minimise potential for skin exposure to contaminants

## 12.2 Additional requirements for soils exceeding Waste Fill criteria

Where soils are classified as exceeding the Waste Fill criteria, then the following *additional* management measures for stockpiles shall be implemented, plus any additional site specific management requirements considered necessary:

- Once a dedicated stockpile has been completed and sampled, further material shall not be added to the stockpile (unless both have been classified and are known to be the same – see knet 5813931 for example). Stockpiles from different sources may be located next to each other (with the toes-of-batter touching), as long as no mixing occurs between stockpiles.
- Materials should be stored on hardstand areas.
- Materials containing leachable contaminants should either be stored on an impervious surface such as compacted clay or heavy-duty plastic (e.g. Forticon), or should be covered with a layer of low-permeability soil or other impermeable cover. Physical covers should be anchored down (e.g., with old tyres).
- Where stockpiles will be left exposed for more than 48 hours after sampling, flagging or fencing should be placed around stockpiles to prevent machinery from accessing these areas.
- Stockpiles should be created to separate materials from different sources, and by likely significance of contamination. Mixing stockpiles from different source may result in rejection of the entire stockpile. Known contaminated soils should not be mixed with clean soils, as the resulting soil mix will be considered contaminated, and is unlikely to be approved for use.
- Stockpiles should be limited to 5m in height (3m if located in close proximity to sensitive receivers).

## 12.3 Requirements for stockpiling mulch

Mulch stockpiles must be managed in such a way that they don't cause a fire risk. The following management measures have been recommended by the Metropolitan Fire Service:

- Restrict the size of mulch stockpile(s) to no greater than 3 m in height, 6 m in width and 20 m in length
- Allow at least 12m between the mulch stockpile(s) and the nearest property boundary (to reduce the spread of fire in case of an emergency)
- Provide 5m separation between each mulch stockpile (to allow adequate emergency vehicle access in case of fire)
- The location of the mulch stockpile(s) is such that potential for dust generation is minimised (e.g. buffered between soil stockpiles)
- Do not store any flammable or combustible liquids in the vicinity of the mulch stockpiles.
- Where possible, provide two separate and opposing access points, and an adequate water supply for fire fighting.

## 12.4 Process for Obtaining Approval for a Stockpile site outside a Project site

*Note that no licence is required where material generated from one location within a project site is stockpiled at another location within the same project site, for future re-use within that project.*

Where materials are to be stockpiled for future re-use at a place other than where they were produced or are to be re-used, the following approvals/ licences may be required:

- An EPA licence to conduct a waste & recycling depot **or** EPA limited purposes determination. For a limited purposes determination the EPA must be satisfied that the operation will be 'conducted for such limited purposes that requirement of an environmental authorisation under Part 6 would not be justified' (as per Schedule 1, Section (3)(3)(i) of the EP Act).
- A Development Approval under the *Development Act 1993* may be required (check if the Development Act applies to the project or if the activity is exempt from approval)
- A Works Approval may also be required under Section 35 of the EP Act, except in circumstances where the *Development Act 1993* applies (in which case a Development Approval negates the requirement for a works approval).

If the material has a direct re-use and is being stored temporarily\* either at the site where it was excavated or at the site where it is intended to be reused, this activity is not considered a Waste or Recycling Depot, and no licence is required.

*\* Previous interpretations of 'temporary' storage suggest a maximum of 6 months or the life of the project. However, if the construction schedule is such that the material needs to be stored for longer, advice should be sought from the EPA regarding the need for a licence or limited purposes determination.*

If the material is being stored at a place other than that where it was excavated or that where it is intended to be reused, either a licence or limited purposes determination is required from the EPA.

Depending on the waste classification of the materials being stockpiled and the nature of the stockpile site, the following steps may be required in order to obtain a licence or limited purposes determination:

- Prepare a Site History for the site and undertake baseline testing of soil and groundwater for the site. Sampling density will depend on the results of the site history and should be determined with reference to Australian Standard 4482.1—2005 – 'Guide to the investigation and sampling of sites with potentially contaminated soil'
- Prepare an Environmental Management Plan for the site (see Knet #5133020, #5023861 and #4879462 for examples)
- Monitor dust, groundwater and surface water during operation of the site.
- Rehabilitate the site at decommissioning
- Undertake soil and groundwater testing at closure to document the site condition for disposal or sale

### 13. REFERENCES

- Department for Environment and Heritage (2000) Waste Management in SA Discussion Paper
- DPTI (17 March 2004) Discussion Paper: Reuse of Bitumen Pavement Materials (K-net File 2006/01083/01)
- DPTI Pavement Specification, Division R, Part R15.
- Golder Associates (1993, 1996, 1997) Ecotoxicity & Chemical Characterisation of Experimentally Generated Leachate from Unbound Rock Blast Furnace Slag
- Moeyan Management (2004) Material Classification of Iron and Steel Slag Byproduct Waste Classification Investigation Report
- Moeyan Management (2004, 2007, 2009) Coal Combustion Product (CCP) Environmental Monitoring Program, Ash Development Association of Australia, URL: <http://www.adaa.asn.au/environment.htm>
- National Environment Protection Council (NEPC) The National Environment Protection (Assessment of Site Contamination) Measure, 1999 (as amended 2013) <http://www.ephc.gov.au/>
- NSW EPA (1995) Sampling Design Guidelines
- Parliament of South Australia (1993) Environment Protection Act 1993
- Parliament of South Australia (1993) Environment Protection Regulations 2009
- Queensland Environment Protection Agency (1999) Draft Environmental Guideline: Beneficial re-use of ferrous foundry by-products, accessed online, URL: <http://www.derm.qld.gov.au/register/p00059aa.pdf>
- SA EPA (2010) Current criteria for the classification of waste—including Industrial and Commercial Waste (Listed) and Waste Soil
- SA EPA (2010) Environment Protection (Waste to Resources) Policy 2010
- SA EPA (2010) Standard for the Production and Use of Waste Derived Fill
- SA EPA (2010) Standard for the Production and Use of Waste Derived Soil Enhancer
- SA EPA (2010) Guidelines for Stockpile Management – Waste and Waste Derived Products for Recycling and Reuse
- SA EPA (2009) Guidelines for the Site Contamination Audit System
- SA EPA (2009) Waste Definitions (Guideline 842/09)
- SA EPA (2008) Guidelines for Environmental Management of On-site Remediation
- Soil and Groundwater Consulting (19 September 2003) Results of Analytical Testing: Samples of Bitumen ‘Planings’ (K-net File 2002/05771/01)
- Soil and Groundwater Consulting (27 June 2005) Proposed Screening Levels for Re-Use of Fill Materials in Transport SA Road Corridors (K-net Document 962961)
- Standards Australia (1997) Guide to the sampling and investigation of potentially contaminated soil, Part 1: Non volatile and semi volatile compounds (AS4482.1 – 1997)
- Standards Australia (1997) Guide to the sampling and investigation of potentially contaminated soil – Part 2” Volatile compounds (AS4482.2 – 1997)
- ZeroWaste SA (2010) South Australia’s Waste Strategy 2010-2015

## **APPENDIX 1 POTENTIALLY CONTAMINATING ACTIVITIES**

*(Refer to Schedule 3 of the Environment Protection Regulations 2009 for a full description of each activity)*

### **Activities undertaken in course of business:**

Abrasive blasting

Acid sulphate soil generation

Agriculture: - animal dips or spray race facilities

- animal feedlots

- animal saleyards

- burial of animals or parts of animals,

- burial of other waste,

- irrigation using wastewater,

- intensive application or administration of a listed substance to animals, plants, land or water (excluding routine spraying, in accordance with manufacturers' instructions, of pesticides used in broad-acre farming)

Airports, aerodromes or aerospace industry

Asbestos disposal

Asphalt or bitumen works

Battery manufacture, recycling or disposal

Breweries

Brickworks

Bulk shipping facilities

Cement works

Ceramic works

Charcoal manufacture

Coal handling or storage

Coke works

Compost or mulch production or storage

Concrete batching works

Curing or drying works (meat, fish or other edible products)

Defence works

Desalination plants Dredge spoil disposal or storage

Drum reconditioning or recycling works

Dry cleaning

Electrical or electronics component manufacture

Electrical substations

Electrical transformer or capacitor works

Electricity generation or power plants

Explosives or pyrotechnics facilities

Fertiliser manufacture

Fibreglass manufacture

Importation, to premises of a business, of soil or other fill originating from a site at which another potentially contaminating activity has taken place

Fire extinguisher or retardant manufacture

Fire stations (underground storage of fuel at fire stations)

Fire training areas

Foundry

Fuel burning facilities

Furniture restoration

Gasworks

Glass works

Glazing

Hat manufacture or felt processing

Incineration

Iron or steel works  
Laboratories  
Landfill sites  
Lime burner  
Metal coating, finishing or spray painting  
Metal forging  
Metal processing, smelting, refining or metallurgical works  
Mineral processing, metallurgical laboratories or mining or extractive industries  
Mirror manufacture  
Motor vehicle manufacture  
Motor vehicle racing or testing venues  
Motor vehicle repair or maintenance  
Motor vehicle wrecking yards  
Mushroom farming  
Oil recycling works  
Oil refineries  
Paint manufacture  
Pest control works  
Plastics manufacture  
Printing works  
Pulp or paper works  
Railway operations\*  
Rubber manufacture or processing  
Scrap metal recovery  
Service stations  
Ship breaking  
Spray painting  
Tannery, fellmongery or hide curing  
Textile operations  
Transport depots or loading sites  
Vermiculture  
Vessel construction, repair or maintenance  
Waste depots  
Wastewater storage, treatment or disposal  
Water discharge to underground aquifer  
Wetlands or detention basins  
Wineries or distilleries  
Wood preservation works  
Woolscouring or wool carbonising works  
Works depots

\* Adelaide's historical tram network can be viewed in knet [9373665](#)

### **Domestic activities**

Importation, to domestic premises, of soil or other fill originating from a site at which another potentially contaminating activity has taken place

Storage of more than 500 litres of liquid organic chemical substances in underground or aboveground tanks or vessels at a discrete premises (excluding storage of oil for domestic heating at the premises)

**APPENDIX 2 RISK ASSESSMENT CHECKLIST**

This risk assessment template may be used as a guide to determine the likelihood of encountering contaminated material. Note that it does not represent a full Site History Investigation (as described in the National Environment (Assessment of Site Contamination) Measure). If there is any reason to believe that contamination may exist, or if the material is intended for use at a more sensitive site, engage DPTI's contamination specialist or a qualified site contamination consultant to undertake a site assessment.

Road/Property Name and Location: \_\_\_\_\_

Inspection/ Assessment Date: \_\_\_\_\_ Officer: \_\_\_\_\_

CONTAMINATION RISK CHECKLIST	COMMENTS / OBSERVATIONS
<p>Is the land use changing to a more sensitive land use? Is the soil intended to be re-used for a more sensitive land use?</p> <p><i>Road reserves are not considered sensitive land uses because the likelihood of people coming into contact with the soil is relatively low. However, the likelihood of exposure (and potential for health impacts) increases on land used for residential or recreational purposes (eg walking trails, playgrounds), land used for food production, and land which is part of a watercourse or floodplain. Check whether the site will be used for any of these land uses (or other sensitive land uses), or if the soil will be re-used on land used for these purposes.</i></p>	
<p>Are there any records of known site/ groundwater contamination in the immediate area?</p> <p><i>Check the EPA's Site Contamination Groundwater Notification Index: <a href="http://www.epa.sa.gov.au/what_we_do/public_register_directory/site_contamination_index">http://www.epa.sa.gov.au/what_we_do/public_register_directory/site_contamination_index</a></i></p>	
<p>Does the current zoning for the land and adjacent properties suggest that potentially contaminating activities may be permitted?</p> <p><i>Check the local Council Development Plan, or Atlas SA: <a href="http://www.atlas.sa.gov.au">http://www.atlas.sa.gov.au</a></i></p>	
<p>Does the historical zoning of the land and adjacent properties suggest that potentially contaminating activities were permitted?</p> <p><i>Contact the local Council to obtain backdated copies of the Development Plan to check historical zoning.</i></p>	
<p>Is there any staining from leaks or spills, or</p>	

<p>any other visual or olfactory indicators of site contamination?</p> <p><i>Use your own observations, and also check if any geotechnical tests have been done for the project. If so, ask about the soil profile.</i></p>	
<p>Are any potentially contaminating activities occurring on or adjacent the site?</p> <p><i>Check appendix 1 of this document or refer to Schedule 3 of the <a href="#">Environment Protection Regulations 2009</a> for a full description of each activity</i></p> <p><i>Use your own observations or check the 'generalised land use' layer and 'industrial database' layer on Atlas SA: <a href="http://www.atlas.sa.gov.au">http://www.atlas.sa.gov.au</a> (both of these are found in the 'Land Management' set of layers)</i></p>	
<p>Have any potentially contaminating activities occurred on or adjacent the site in the past?</p> <p><i>Check historical aerial photos, accessed through MapLand (for a fee).</i></p> <p><i>Check Adelaide's former tram network (<a href="#">knet 9373665</a>)</i></p> <p><i>Historical importation of fill for road construction is not listed as a PCA, however, importation of contaminated material has been known to occur in the past. Check any available records of road pavement construction/ rehabilitation</i></p>	
<p>Have there been under-ground or above-ground storage tanks on the property?</p> <p><i>Contact SafeWork SA to find out if any dangerous substances have been stored on the property in the past.</i></p>	
<p>Is there any evidence of dumping (eg mounds of soil or other material)?</p>	

If any of the above questions are answered YES, contact DPTI's Site Contamination Officer to discuss the level of risk and potential need for further site assessment.

If all of the above questions are answered NO, then the risk of encountering site contamination is considered low.

APPENDIX 3 CASE STUDY DEMONSTRATING THE INTERPRETATION OF A 'SITE'



EPA 05/10/4133

Andrew Milazzo  
Executive Director  
Department Transport, Energy & Infrastructure  
GPO Box 1533  
ADELAIDE SA 5001

Dear Andrew

Thank you for your recent letter regarding the management of contaminated materials along the South Road Superway and Northern Connector projects. The letter, dated 20<sup>th</sup> October 2010, seeks an agreement between the EPA and DTEI to identify the projects as one site enabling the transfer of materials of unknown contamination status along the 'project site' corridor between non EPA licensed material storage facility sites.

In addition to the information provided in the letter dated the 20<sup>th</sup> October 2010, the EPA met with DTEI officers and requested supplementary information regarding the surety of the Northern Connector project. The requested information was provided to the EPA in a letter signed by Luigi Rossi, Project Director dated 18<sup>th</sup> November 2010. The subsequent information included the Draft *Roberts Lane Materials Storage Facility – Environmental Management Plan* dated 17<sup>th</sup> November 2010. DTEI have requested EPA comment on the draft Environmental Management Plan and this will be provided to DTEI separately from this letter.

Based upon the information provided, the EPA agrees that the South Road Superway and Northern Connector projects can be viewed as one site for the purposes of materials transfer along the 'project site' corridor. In the event that the Northern Connector project is delayed beyond the 2017 completion date or cancelled the storage of waste soil on the Northern Connector project site is a prescribed activity of environmental significance and requires an Authorisation as per section 36 of the Environment Protection Act, 1993.

Please note, in the event of a delay beyond 2017 or cancellation of the Northern Connector project, the EPA will review this matter and may require DTEI to apply for an EPA Licence for each site or decommissioning ie classification and removal of the stockpiled materials.

For further information on this matter, please contact Steven Sergi on 8204 2038 or [steven.sergi@epa.sa.gov.au](mailto:steven.sergi@epa.sa.gov.au).

Yours sincerely



Steven Sergi

**MANAGER WASTE TO RESOURCES  
REGULATION & COMPLIANCE DIVISION  
ENVIRONMENT PROTECTION AUTHORITY**

Date: 14/12/2010



In reply please quote 2010/14673/01  
Enquiries to Luigi Rossi  
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DIVISION

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ABN 92 366 288 135

Dear Ms Fulcher,

**NORTH-SOUTH CORRIDOR - MANAGEMENT OF CONTAMINATED  
MATERIALS SOUTH ROAD SUPERWAY AND NORTHERN CONNECTOR**

The Department for Transport, Energy and Infrastructure (DTEI) has recently released, for public comment, the *State Strategic Infrastructure Plan for South Australia: 2010 Discussion Paper*. The plan identifies Adelaide's 78 km North-South Transport Corridor project running from Gawler to Old Noarlunga with a series of non-stop road links including the Northern Expressway, the Northern Connector, South Road (from Port River Expressway to the Southern Expressway) and the Southern Expressway. Funding availability requires that delivery of the North-South Corridor is undertaken in a staged manner.

The service relocation works required to enable construction of the South Road Superway will begin in November 2010. This, together with the construction of the elevated Superway (construction from early 2011), is expected to produce approximately 120 000 to 150 000 m<sup>3</sup> of road pavement and soil materials that will be surplus to the project. In addition, the adjacent Northern Connector will likely require 4 000 000 m<sup>3</sup> of fill materials for construction.

The need to continue traffic flow along the South Road corridor presents a number of issues in undertaking insitu sampling for classification of soils materials prior to construction occurring. These include issues around traffic management, worker/public safety, impacts to local businesses and damage to road pavement. In addition, the South Road corridor is constrained in space and there is a lack of sufficient land available adjacent to the South Road corridor that could be used to temporarily stockpile the expected quantity of surplus waste derived fill in order for it to be sampled and classified. Whilst small areas for stockpiling adjacent South Road may be available, this presents logistical issues through double handling of fill materials and presents a significant risk to the South Road Superway construction program in meeting the timeframes set by the Australian and South Australian Governments.

It is considered that the recognition of the Northern Connector and the South Road Superway as part of the 78 km North-South corridor provides justification to identify the Superway and Northern Connector within the same 'site boundary'. It is therefore proposed that DTEI enters into an agreement with the

Environment Protection Authority to identify the two projects with the same site boundary to enable excavated materials, of unknown contamination status, that can be directly transported from the source to a stockpile site within the Northern Connector corridor, for later reuse (see attached plans). An environmental management plan would be developed to manage the process.

The transport, storage and reuse of materials from the Superway project to the Northern Connector:

- contributes to the State Strategic Plan target to reduce waste to landfill by 25% by 2014;
- contributes to South Australia's Waste Strategy 2005-2010 to increase Construction and Demolition (relating to State Government capital works) recovery and reuse of materials by 50% by 2010;
- is consistent with the guiding principles of the *Zero Waste SA Act 2004*, particularly the waste management hierarchy outlined in this Act;
- prevents double handling of materials (thereby reducing greenhouse gas emissions);
- provides economic efficiencies; and
- prevents the equivalent volume of virgin material being quarried and transported to the Northern Connector project.

In addition, DTEI is currently reviewing its *Recycled Fill Materials for Transport Infrastructure Operational Instruction* and it is planned that this operational instruction be agreed with the EPA and adopted as a code of practice under the Standard for the Production and Use of Waste Derived Fill. This review will seek to build on this approach outlined above to allow excavated materials, of unknown contamination status, to be transported to a stockpile site within the North-South corridor through identification as a 'project site'.

As an interim measure, whilst broader issues are negotiated regarding the adoption of the *Recycled Fill Materials for Transport Infrastructure Operational Instruction* as a code of practice, DTEI is seeking a rapid agreement with the EPA to identify the Superway and Northern Connector project as a 'project site' to allow materials of unknown contamination status to be transferred to unlicensed stockpile sites along the Northern Connector corridor, beginning with the service relocation surplus material from November 2010.

DTEI looks forward to working with the EPA to ensure the Superway project is delivered efficiently and surplus materials are managed in a manner acceptable to both DTEI and the EPA. Please contact Mr Luigi Rossi, Project Director South Road Superway on (08) 8343 2940 if you would like any further information.

Yours sincerely,

  
Andrew Milazzo  
Executive Director  
20 October 2010



Mr Andrew Larwood  
Senior Environment Officer  
South Road Superway

15 December 2010

VE23490

Dear Andrew,

### **South Road Superway - Contamination Management Advice (WP0004)**

Please find below SKM's response following a request from the Department for Transport Energy & Infrastructure (DTEI) to provide written advice regarding the implications of the South Road Superway and Northern Connector being recognised as the same site for the management, storage and re-use of materials within the Northern Connector project. DTEI propose to re-use materials as part of the Northern Connector project under sealed roads and embankments.

#### **1. Implications of Recognition as One Site**

Recognition of the South Road Superway and the Northern Connector project, including the Roberts Lane Stockpile site as one site (the site) by the SA EPA has the following potential implications for the management and re-use of materials for the project.

1. Materials can be shifted around the site and used as part of the site development as long as the final use of these materials is consistent with the development land use from a human health and environmental perspective. This assumes that the SA EPA also accepts that the proposed transport route as identified on the plan provided by DTEI to SKM is considered part of the site for the movement of materials within the site.
2. Unclassified material would be able to be transported within the site and classification could then occur at the storage facilities to determine re-use options within the site.
3. DTEI should obtain clarification regarding the SA EPA's position regarding whether the proposed transport route supported by a traffic management plan can be considered a temporary portion of the site. If this does occur then waste tracking certificates under the current EPA requirements may not be required as part of the transportation and management of soils within the site and this could potentially be replaced by a project based materials tracking system. DTEI should ensure the Site Contamination Auditor endorses this approach. This approach is consistent with Site Audits where soils are moved around a site.

4. Based on the South Road Superway, Northern Connector including Roberts Lane materials storage facility being recognised as one site the need to classify materials according to the current Standard for the production and use of Waste Derived Fill would no longer apply unless DTEI propose to re-use this material at locations outside of the defined site. Materials classification should therefore focus on classifying materials based on NEPM (1999) Health Investigation Levels (HILs) and Ecological Investigation Levels (EILs) and Landfill disposal guidelines for materials not considered suitable for use within the site boundary. Where guidelines or criteria do not exist then DTEI should request guidance from the Site Contamination Auditor regarding his acceptance criteria for the site. Factors the Site Contamination Auditor may take into account will potentially include aesthetic considerations (eg. Odour, discolouration), leachability of contaminants or the presence of asbestos).
5. Material classification should therefore focus on the end use alternatives for the material such as:
  - Beneath permanently sealed roadways or beneath sealed structures;
  - Within and beneath embankments;
  - Roadside verges where access to rainfall infiltration exists;
  - Placement above seasonal groundwater levels.

The Site Contamination Auditor may accept material originating from the site up to and exceeding Low Level Contaminated Waste (LLCW) within portions of the road development that are permanently sealed subject to conditions which will likely include an environmental management plan for the ongoing use of the site. This plan will need to identify the soil contamination status of the site following construction and will need to identify how these soils should be managed in the future if subsequent earthworks occur. It is likely that the Auditor may require all service to be placed in trenches surrounded by clean fill with a warning marker layer separating clean fill from contaminated material.

If the site is subject to the re-use standard then only material up to Intermediate Waste Soil criteria could be re-used on-site. Therefore the recognition of the area as one site means an Auditor can consider the use of material within that site on a risk based approach

6. The Site Contamination Auditor is likely to still require all stockpiles to be characterised however a new classification system would comprise disposal to landfill criteria and NEPM (1999) – HIL's and EILs and other supporting guidelines eg, Dutch Intervention Levels (DIL). This will then allow the Site Contamination Auditor to approve the re-use of materials within the project site depending on whether this material is being placed under a sealed surface or on a roadside verge. This approach also means the stockpile management process at the storage facility should take in whether the material is to be disposed of off-site to a licensed landfill or retained within the Northern Connector project as suitable for use under the range of end use scenarios. Therefore rather than classify stockpiles as WF and IWS a new classification system may comprise the following:
- Waste Fill – suitable for all uses;
  - Suitable for roadside verges – NEPM (1999) – E (non leachable)
  - Suitable for use beneath sealed surfaces – NEMP – F or greater and leachable material.
  - A separate temporary stockpile area could also be established for material to be taken to landfill that will not be re-used on-site eg, potentially highly odorous material.

## **2. Review of Roberts Lane Materials Storage facility EMP**

The EMP for the Roberts Lane Storage facility appears to be comprehensive and covers most aspects. Based on my advice regarding the implications of recognising the entire area as one site the references to waste derived fill may need to be changed to reflect a risk based approach for human health and the environment.

Other more specific comments are detailed below:

- 1) Section 4.3.1 – page 11 first paragraph refers to transferring possibly contaminated materials to the MSF or appropriately licensed landfill for storage (awaiting contamination classification). Please note that fill/soil should not be transferred to a licensed landfill for storage prior to classification unless the consultant or Site Contamination Auditor can state that they believe the material will not exceed LLCW criteria. Alternatively EPA and landfill approval could be obtained but sufficient information would need to be provided to demonstrate the material is or

can be made suitable for disposal to landfill (eg. Treatability trials if the material exceeds LLCW classification).

- 2) Section 4.3.3 Items 11 and 12 may need to be modified based on the possible changes to classification procedures discussed in Section 1 of this response.
- 3) Changes to the classification procedure may result in changes to the stockpile layout plan contained in Appendix B. For instance rather than having stockpiles based on waste derived fill classification they could be based on potential end use classification. In addition stockpiles may be generated that may go to landfill if they do not meet end land use criteria.
- 4) Section 5.3.2 – third dot point indicates DTEI will install an unlined stormwater detention basin. It is recommended that this basin is lined with a suitable impermeable liner (such as HDPE or equivalent) to prevent infiltration to groundwater.
- 5) Section 5 should also include a sub-section on odour and gaseous emissions.

### **3. Re/use/Replacement/Disposal Decision Tree**

Based on the potential implication of recognising the South Road Superway, Northern Connector project including the Roberts Lane material storage facility as one site it is recommended that a meeting occur between DTEI and the Site Contamination Auditor to confirm the implications discussed in this response with the Site Contamination Auditor and subsequent to that meeting SKM undertake the agreed modification to the decision tree.

If you have any questions, do not hesitate to contact me on the undersigned phone number.

Yours sincerely



**Don McCarthy**  
*Principal Hydrogeologist*

*Tel: +61 8 8245 5342*

*Fax: +61 8 8424 3810*

*Mobile: +61 (0)407 203 329*

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**APPENDIX 4                      EXAMPLE LEGAL AGREEMENT BETWEEN DPTI AND RECIPIENT  
OF SURPLUS FILL**

**LETTER HEAD**

**ADDRESS**

**ATTENTION:**

Dear **Insert**

**RE: AGREEMENT FOR SUPPLY OF WASTE FILL FOR PRIVATE USE**

You have expressed an interest in the Waste Fill (described in Attachment 1) produced as a by product of one of the construction projects undertaken by the Commissioner of Highways (“**Commissioner**”) through the Department for Planning, Transport and Infrastructure.

We are willing to consider the supply of the Waste Fill to you however you (or your company) (named as Recipient in Attachment 1) must first agree to enter into the “**Agreement**” set out in this letter and attachments.

Importantly, the Agreement clearly states that the Waste Fill is only permitted to be used at your premises and that once delivered, you will be responsible for the waste fill and will use it solely at your own risk.

To accept the Agreement please arrange for the Acknowledgement and Acceptance of Offer set out on the next page of this letter to be executed by a person authorised to do so and return it to **INSERT** at this address:

**INSERT ADDRESS DETAILS.**

Please note this offer will lapse if not accepted within 30 days from the date of this letter. If you accept this offer, the following documents will comprise the Agreement:

- This Letter of Offer;
- Your executed acceptance of this Offer;
- Attachment 1 – Particulars; and
- Attachment 2 – Terms and Conditions.

If you have any questions please contact **INSERT** on **INSERT**.

On behalf of the Commissioner of Highways

**INSERT SIGNATURE AND NAME**

Date:

Enclosed: Attachment 1 – Particulars.

Attachment 2 – Terms and Conditions.

**ACKNOWLEDGEMENT AND ACCEPTANCE OF AGREEMENT**

I ....., acknowledge and agree (or agree on behalf of the Recipient named in Attachment 1) to the terms and conditions specified in this letter and in Attachments 1 and 2. I also declare that I am authorised to so agree.

Signature: .....

Print Full Name: .....

Position/ Office: .....

Date: .....

Signed in the presence of:

Witness Signature: .....

Print Full Name: .....

Date: .....

## ATTACHMENT 1 - PARTICULARS

<b>1. RECIPIENT OF THE WASTE FILL (Individual)</b>	
<u>Note:</u> DPTI Officer to fill in this item 1 if the Recipient of the Waste Fill is an individual or a sole trader (i.e. not a company)	
Your Full Name:	
Trading Name (if applicable):	
Address:	
ABN (if applicable):	

<b>2. RECIPIENT OF THE WASTE FILL (Company)</b>	
<u>Note:</u> DPTI Officer to fill in this item 2 if the Recipient of the Waste Fill is a company incorporated under the Cth Corporations Law.	
Registered Name of Company:	
Trading Name (if applicable):	
Address:	
ACN:	
ABN:	

<b>3. RECIPIENT OF THE WASTE FILL (Incorporated Association)</b>	
<u>Note:</u> DPTI Officer to fill in this item 3 if the Recipient of the Waste Fill is an Association incorporated under the <i>Associations Incorporation Act 1985</i>	
Registered Name of Association:	
Trading Name (if applicable):	
Address:	
SA Reg No:	
ABN (if applicable):	

## ATTACHMENT 1 - PARTICULARS

### 4. DESCRIPTION OF WASTE FILL

DPTI Officer to insert description of waste fill. You may want to include references to weeds and other materials such as building debris etc.

**IMPORTANTLY:** Please note that this agreement must only be used for materials that have been professionally classified as "Waste Fill" for unrestricted use.

You **must not** supply any soil or other materials that are contaminated or of an unknown contamination status – such material must be disposed of directly by DPTI (or its contractor).

### 5. REQUIREMENTS FOR DELIVERY

Mode of Delivery:

DPTI Officer to insert how the Waste Fill is to be delivered.

Delivery Requirements:

DPTI Officer to insert any special requirements for the delivery of the Waste Fill.

Premises for Delivery:

DPTI Officer to insert the address of the Recipient's Premises to which the Waste Fill is to be delivered.

Payment for Delivery Costs:

DPTI Officer to insert amount for any upfront payment to cover Delivery costs. If no charge then state that no payment is required.

### 6. INSURANCE

DPTI Officer to insert any minimum insurance that the Recipient will be required to hold or indicate that no minimum insurance requirements apply.

### 7. Additional Conditions

DPTI Officer to insert any additional conditions that are specific to the particular supply of Waste Fill or state that no additional conditions apply.

## ATTACHMENT 2: TERMS AND CONDITIONS

### IT IS AGREED:

#### 1. INTERPRETATION

In this Agreement unless a contrary intent is evident:

- (a) **“Agreement”** means this Agreement between the Commissioner and You and includes the covering letter, Your executed acceptance, all Attachments and any other document expressly incorporated by reference;
- (b) **“Commissioner”** means the Commissioner of Highways a body corporate under the *Highways Act 1926*;
- (c) **“Crown”** means the Crown in Right of the State of South Australia;
- (d) **“DPTI”** means the Department for Planning, Transport and Infrastructure;
- (e) **“Environmental Law”** means any laws relating to or controlling impacts on the environment, including any law relating to land use planning, pollution of air or water, soil or groundwater contamination, chemical waste or use of dangerous goods and without limitation the Environment Protection Act 1993 (SA) and the Environment Protection and Biodiversity Conservation Act 1999 (Cth) and all regulations, statutory rules, guidelines and policies made under those Acts and any National Environment Protection Measures issued pursuant to those laws or adopted by the EPA;
- (f) **“EPA”** means the *Environmental Protection Authority* of South Australia;
- (g) **“Parties”** means You and the Commissioner and **“Party”** means either of the Parties;
- (h) **“Recipient”** means the person (or company) named as the Recipient in Attachment 1;
- (i) **“Standard for the Production and Use of Waste Derived Fill”** means the document of that title dated January 2010 published by the EPA and includes any subsequent amendments to (or replacement or reissuing of) the document by the EPA;
- (j) **“Waste Fill”** means soil or other materials that have been classified as “Waste Fill” for unrestricted use under the Standard for the Production and Use of Waste Derived Fill;
- (k) **“You”** or **“Your”** means the person or company named as the Recipient of the Waste Fill in Attachment 1; and
- (l) **“including”, “includes”, “for example”** are not words of limitation.

#### 2. SUPPLY OF WASTE FILL

- (a) The Commissioner is **NOT** obligated under this Agreement to provide any Waste Fill to You and You agree that the supply of Waste Fill to You under this Agreement is at the Commissioner’s sole discretion.
- (b) Provided the relevant Waste Fill is surplus to the Commissioner’s requirements, the Commissioner will select the Waste Fill and determine the amount to be made available to You.
- (c) Once selected by the Commissioner, the Commissioner may provide the Waste Fill to You in accordance with the delivery requirements set out in Attachment 1.
- (d) Risk and ownership of the Waste Fill passes to You upon delivery of the soil to Your Premises stated in Attachment 1.
- (e) If indicated in Attachment 1 as a requirement of delivery, before the Waste Fill is delivered You must pay the Commissioner’s invoice for the amount indicated in Attachment 1 (plus applicable GST) to cover the Commissioner’s costs in delivering the Waste Fill.
- (f) You must at Your cost also obtain and keep current any consent, approval or permit required by law relating to the transportation and use of the Waste Fill.

#### 3. RESPONSIBILITY FOR WASTE FILL

- (a) You acknowledge and agree that once delivered, You are responsible for the storage, handling and disposal of the Waste Fill in compliance with Environment Law.
- (b) Without limiting the Recipient’s obligation to comply with Environmental Law, You must comply with the Standard for the production and use of Waste Derived Fill.
- (c) You must immediately notify the Commissioner in the event that You identify (or have cause to have concern) that the soil material delivered to You is in any way contaminated or otherwise does not satisfy the criteria of classified Waste Fill for unrestricted use under the Standard for the production and use of Waste Derived Fill.

#### 4. PERMITTED USE OF WASTE FILL

- (a) Any Waste Fill provided to You under this Agreement is for private use on Your Premises.

## ATTACHMENT 2: TERMS AND CONDITIONS

- (b) You undertake to only use the Waste Fill at Your Premises and NOT to provide or sell any of the Waste Fill to another person.

### 5. RISK

- (a) The Commissioner makes no representations, warranty or undertaking with respect to any of the Waste Fill supplied to You under this Agreement including any representations, warranty or undertakings given as to the Waste Fill's level of contamination, quality or suitability for any particular purpose.
- (b) You release and indemnify the Commissioner and the Crown together with their employees, contractors and agents ("those indemnified") from and against any loss or liability incurred or suffered by any of those indemnified as a result of any claim, suit, demand, action or proceeding brought by any person against any of those indemnified as a result of Your negligent act or omission, Your use of the Waste Fill, any contamination in the Waste Fill or otherwise caused by Your breach or default under this Agreement.
- (c) If required as indicated in Attachment 1, You must effect and maintain insurance of the type and for the amount set out in Attachment 1.

### 6. GENERAL PROVISIONS

- (a) If required to give legal effect to this Agreement, You agree to pay \$1 on demand to the Commissioner in consideration for the supply of the Waste Fill.
- (b) If this Agreement requires that You take action, such action is to be taken solely at Your cost.
- (c) Nothing in this Agreement derogates from the powers of the Auditor-General under the *Public Finance and Audit Act 1987* (SA).
- (d) Any modification of this Agreement must be in writing and signed by (or on behalf of) each Party.
- (e) This Agreement contains the entire agreement between the Parties with respect to its subject matter and supersedes any prior agreement, understanding, or representations of the Parties on the subject matter.
- (f) The laws in force in South Australia apply to this Agreement. The courts of South Australia have non-exclusive jurisdiction to determine any proceeding in relation to this Agreement. Any proceeding brought in a Federal Court must be instituted in (and remain with) the Adelaide Registry of that Federal Court.
- (g) You must not assign or encumber any of Your rights and obligations under this Agreement without the Commissioner's prior written consent.
- (h) Any waiver of any provision of this Agreement is ineffective unless it is in writing and signed by the Party waiving its rights.
- (i) The rights and remedies under this Agreement are cumulative and not exclusive of any other rights or remedies under this Agreement or provided by law or any other right or remedy.
- (j) This Agreement includes any additional conditions set out in Attachment 1.