



Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014

The excavated natural material order 2014

Introduction

This order, issued by the Environment Protection Authority (EPA) under clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 (Waste Regulation), imposes the requirements that must be met by suppliers of excavated natural material to which 'the excavated natural material exemption 2014' applies. The requirements in this order apply in relation to the supply of excavated natural material for application to land as engineering fill or for use in earthworks.

1. Waste to which this order applies

- 1.1. This order applies to excavated natural material. In this order, excavated natural material means naturally occurring rock and soil (including but not limited to materials such as sandstone, shale, clay and soil) that has:
- a) been excavated from the ground, and
 - b) contains at least 98% (by weight) natural material, and
 - c) does not meet the definition of Virgin Excavated Natural Material in the Act.

Excavated natural material does not include material located in a hotspot; that has been processed; or that contains asbestos, Acid Sulfate Soils (ASS), Potential Acid Sulfate soils (PASS) or sulfidic ores.

2. Persons to whom this order applies

- 2.1. The requirements in this order apply, as relevant, to any person who supplies excavated natural material, that has been generated, processed or recovered by the person.
- 2.2. This order does not apply to the supply of excavated natural material to a consumer for land application at a premises for which the consumer holds a licence under the POEO Act that authorises the carrying out of the scheduled activities on the premises under clause 39 'waste disposal (application to land)' or clause 40 'waste disposal (thermal treatment)' of Schedule 1 of the POEO Act.

3. Duration

- 3.1. This order commences on 24 November 2014 and is valid until revoked by the EPA by notice published in the Government Gazette.

4. Generator requirements

The EPA imposes the following requirements on any generator who supplies excavated natural material.

Sampling requirements

- 4.1. On or before supplying excavated natural material, the generator must:
 - 4.1.1. Prepare a written sampling plan which includes a description of sample preparation and storage procedures for the excavated natural material.
 - 4.1.2. Undertake sampling and testing of the excavated natural material as required under clauses 4.2, 4.3, and 4.4 below. The sampling must be carried out in accordance with the written sampling plan.
- 4.2. The generator must undertake sampling and analysis of the material for ASS and PASS, in accordance with the NSW Acid Sulfate Soil Manual, Acid Sulfate Soils Management Advisory Council, 1998 and the updated Laboratory Methods Guidelines version 2.1 – June 2004 where:
 - 4.2.1. the pH measured in the material is below 5, and/or
 - 4.2.2. the review of the applicable Acid Sulfate Soil Risk Maps (published by the former Department of Land and Water Conservation and available at <http://www.environment.nsw.gov.au/acidsulfatesoil/riskmaps.htm>) indicates the potential presence of ASS.
- 4.3. For stockpiled material, the generator must:
 - 4.3.1. undertake sampling in accordance with Australian Standard 1141.3.1-2012 Methods for sampling and testing aggregates – Sampling – Aggregates (or equivalent);
 - 4.3.2. undertake characterisation sampling by collecting the number of samples listed in Column 2 of Table 1 with respect to the quantity of the waste listed in Column 1 of Table 1 and testing each sample for the chemicals and other attributes listed in Column 1 of Table 4. For the purposes of characterisation sampling the generator must collect:
 - 4.3.2.1. composite samples for attributes 1 to 10 and 18 in Column 1 of Table 4.
 - 4.3.2.2. discrete samples for attributes 11 to 17 in Column 1 of Table 4.
 - 4.3.2.3. The generator must carry out sampling in a way that ensures that the samples taken are representative of the material from the entire stockpile. All parts of the stockpile must be equally accessible for sampling.
 - 4.3.2.4. for stockpiles greater than 4,000 tonnes the number of samples described in Table 1 must be repeated.
 - 4.3.3. store the excavated natural material appropriately until the characterisation test results are validated as compliant with the maximum average concentration or other value listed in Column 2 of Table 4 and the absolute maximum concentration or other value listed in Column 3 of Table 4.

Table 1

Sampling of Stockpiled Material		
Column 1	Column 2	Column 3
Quantity (tonnes)	Number of samples	Validation
<500	3	Required
500 – 1,000	4	
1,000 – 2,000	5	
2,000 – 3,000	7	
3,000 – 4,000	10	

4.4. For in situ material, the generator must:

- 4.4.1. undertake sampling by collecting discrete samples. Compositing of samples is not permitted for in-situ materials.
- 4.4.2. undertake characterisation sampling for the range of chemicals and other attributes listed in Column 1 of Table 4 according to the requirements listed in Columns 1, 2 and 3 of Table 2. When the ground surface is not comprised of soil (e.g. concrete slab), samples must be taken at the depth at which the soil commences.
- 4.4.3. undertake sampling at depth according to Column 1 of Table 3.
- 4.4.4. collect additional soil samples (and analyse them for the range of chemicals and other attributes listed in Column 1 of Table 4), at any depth exhibiting discolouration, staining, odour or other indicators of contamination inconsistent with soil samples collected at the depth intervals indicated in Table 3.
- 4.4.5. segregate and exclude hotspots identified in accordance with Table 2, from material excavated for reuse.
- 4.4.6. subdivide sites larger than 50,000 m² into smaller areas and sample each area as per Table 2.
- 4.4.7. store the excavated natural material appropriately until the characterisation test results are validated as compliant with the maximum average concentration or other value listed in Column 2 of Table 4 and the absolute maximum concentration or other value listed in Column 3 of Table 4.

Table 2

<i>In Situ Sampling at surface</i>				
Column 1	Column 2	Column 3	Column 4	Column 5
Size of <i>in situ</i> area (m ²)	Number of systematic sampling points recommended	Distance between two sampling points (m)	Diameter of the hot spot that can be detected with 95% confidence (m)	Validation
500	5	10.0	11.8	Required
1000	6	12.9	15.2	
2000	7	16.9	19.9	
3000	9	18.2	21.5	
4000	11	19.1	22.5	
5000	13	19.6	23.1	
6000	15	20.0	23.6	
7000	17	20.3	23.9	
8000	19	20.5	24.2	
9000	20	21.2	25.0	
10,000	21	21.8	25.7	
15,000	25	25.0	28.9	
20,000	30	25.8	30.5	
25,000	35	26.7	31.5	
30,000	40	27.5	32.4	
35,000	45	27.9	32.9	
40,000	50	28.3	33.4	
45,000	52	29.3	34.6	
50,000	55	30.2	35.6	

Table 2 has been taken from NSW EPA 1995, *Contaminated Sites Sampling Design Guidelines*, NSW Environment Protection Authority.

Table 3

<i>In Situ Sampling at Depth</i>	
Column 1	Column 2
Sampling Requirements *	Validation
<p>1 soil sample at 1.0 m bgl from each surface sampling point followed by 1 soil sample for every metre thereafter.</p> <p>From 1.0 m bgl, sample at the next metre interval until the proposed depth of excavation of the material is reached. If the proposed depth of excavation is between 0.5 to 0.9 m after the last metre interval, sample at the base of the proposed depth of excavation.</p>	Required if the depth of excavation is equal to or greater than 1.0 m bgl

* Refer to Notes for examples

Chemical and other material requirements

- 4.5. The generator must not supply excavated natural material waste to any person if, in relation to any of the chemical and other attributes of the excavated natural material:
- 4.5.1. The chemical concentration or other attribute of any sample collected and tested as part of the characterisation of the excavated natural material exceeds the absolute maximum concentration or other value listed in Column 3 of Table 4:
 - 4.5.2. The average concentration or other value of that attribute from the characterisation of the excavated natural material (based on the arithmetic mean) exceeds the maximum average concentration or other value listed in Column 2 of Table 4.
- 4.6. The absolute maximum concentration or other value of that attribute in any excavated natural material supplied under this order must not exceed the absolute maximum concentration or other value listed in Column 3 of Table 4.

Table 4

Column 1	Column 2	Column 3
Chemicals and other attributes	Maximum average concentration for characterisation (mg/kg 'dry weight' unless otherwise specified)	Absolute maximum concentration (mg/kg 'dry weight' unless otherwise specified)
1. Mercury	0.5	1
2. Cadmium	0.5	1
3. Lead	50	100
4. Arsenic	20	40
5. Chromium (total)	75	150
6. Copper	100	200
7. Nickel	30	60
8. Zinc	150	300
9. Electrical Conductivity	1.5 dS/m	3 dS/m
10. pH *	5 to 9	4.5 to 10
11. Total Polycyclic Aromatic Hydrocarbons (PAHs)	20	40
12. Benzo(a)pyrene	0.5	1
13. Benzene	NA	0.5
14. Toluene	NA	65
15. Ethyl-benzene	NA	25
16. Xylene	NA	15
17. Total Petroleum Hydrocarbons C ₁₀ -C ₃₆	250	500
18. Rubber, plastic, bitumen, paper, cloth, paint and wood	0.05%	0.10%

* The ranges given for pH are for the minimum and maximum acceptable pH values in the excavated natural material.

Test methods

- 4.7. The generator must ensure that any testing of samples required by this order is undertaken by analytical laboratories accredited by the National Association of Testing Authorities (NATA), or equivalent.
- 4.8. The generator must ensure that the chemicals and other attributes (listed in Column 1 of Table 4) in the excavated natural material it supplies are tested in accordance with the test methods specified below or other equivalent analytical methods. Where an equivalent analytical method is used the detection limit must be equal to or less than that nominated for the given method below.
 - 4.8.1. Test methods for measuring the mercury concentration.
 - 4.8.1.1. Analysis using USEPA SW-846 Method 7471B Mercury in solid or semisolid waste (manual cold vapour technique), or an equivalent analytical method with a detection limit < 20% of the stated absolute maximum concentration in Column 3 of Table 2 (i.e. < 0.20 mg/kg dry weight).
 - 4.8.1.2. Report as mg/kg dry weight.
 - 4.8.2. Test methods for measuring chemicals 2 to 8.
 - 4.8.2.1. Sample preparation by digesting using USEPA SW-846 Method 3051A Microwave assisted acid digestion of sediments, sludges, soils, and oils (or an equivalent analytical method).
 - 4.8.2.2. Analysis using USEPA SW-846 Method 6010C Inductively coupled plasma - atomic emission spectrometry, or an equivalent analytical method with a detection limit < 10% of the stated absolute maximum concentration in Column 3 of Table 2, (e.g. 10 mg/kg dry weight for lead).
 - 4.8.2.3. Report as mg/kg dry weight.
 - 4.8.3. Test methods for measuring electrical conductivity and pH.
 - 4.8.3.1. Sample preparation by mixing 1 part excavated natural material with 5 parts distilled water.
 - 4.8.3.2. Analysis using Method 103 (pH) and 104 (Electrical Conductivity) in Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).
 - 4.8.3.3. Report electrical conductivity in deciSiemens per metre (dS/m).
 - 4.8.4. Test method for measuring Polynuclear Aromatic Hydrocarbons (PAHs) and benzo(a)pyrene.
 - 4.8.4.1. Analysis using USEPA SW-846 Method 8100 Polynuclear Aromatic Hydrocarbons (or an equivalent analytical method).
 - 4.8.4.2. Calculate the sum of all 16 PAHs for total PAHs.
 - 4.8.4.3. Report total PAHs as mg/kg dry weight.
 - 4.8.4.4. Report benzo(a)pyrene as mg/kg.

- 4.8.5. Test method for measuring benzene, toluene, ethylbenzene and xylenes (BTEX).
- 4.8.5.1. Method 501 (Volatile Alkanes and Monocyclic Aromatic Hydrocarbons) in Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).
- 4.8.5.2. Report BTEX as mg/kg.
- 4.8.6. Test method for measuring Total Petroleum Hydrocarbons (TPH).
- 4.8.6.1. Method 506 (Petroleum Hydrocarbons) in Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).
- 4.8.6.2. Report as mg/kg dry weight.
- 4.8.7. Test method for measuring rubber, plastic, bitumen, paper, cloth, paint and wood.
- 4.8.7.1. NSW Roads & Traffic Authority Test Method T276 Foreign Materials Content of Recycled Crushed Concrete (or an equivalent method).
- 4.8.7.2. Report as percent.

Notification

- 4.9. On or before each transaction, the generator must provide the following to each person to whom the generator supplies the excavated natural material:
- a written statement of compliance certifying that all the requirements set out in this order have been met;
 - a copy of the excavated natural material exemption, or a link to the EPA website where the excavated natural material exemption can be found; and
 - a copy of the excavated natural material order, or a link to the EPA website where the excavated natural material order can be found.

Record keeping and reporting

- 4.10. The generator must keep a written record of the following for a period of six years:
- the sampling plan required to be prepared under clause 4.1.1;
 - all characterisation sampling results in relation to the excavated natural material supplied;
 - the volume of detected hotspot material and the location;
 - the quantity of the excavated natural material supplied; and
 - the name and address of each person to whom the generator supplied the excavated natural material.
- 4.11. The generator must provide, on request, the characterisation and sampling results for that excavated natural material supplied to the consumer of the excavated natural material.

5. Definitions

In this order:

application or apply to land means applying to land by:

- spraying, spreading or depositing on the land; or
- ploughing, injecting or mixing into the land; or
- filling, raising, reclaiming or contouring the land.

Bgl means below ground level, referring to soil at depth beneath the ground surface.

composite sample means a sample that combines five discrete sub-samples of equal size into a single sample for the purpose of analysis.

consumer means a person who applies, or intends to apply excavated natural material to land.

discrete sample means a sample collected and analysed individually that will not be composited.

generator means a person who generates excavated natural material for supply to a consumer.

hotspot means a cylindrical volume which extends through the soil profile from the ground surface to the proposed depth of excavation, where the level of any contaminant listed in Column 1 of Table 2 is greater than the absolute maximum concentration in Column 3 of Table 2.

in situ material means material that exists on or below the ground level. It does not include stockpiled material.

in situ sampling means sampling undertaken on *in situ* material.

N/A means not applicable.

stockpiled material means material that has been excavated from the ground and temporarily stored on the ground prior to use.

systematic sampling means sampling at points that are selected at even intervals and are statistically unbiased.

transaction means:

- in the case of a one-off supply, the supply of a batch, truckload or stockpile of excavated natural material that is not repeated.
- in the case where the supplier has an arrangement with the recipient for more than one supply of excavated natural material, the first supply of excavated natural material as required under the arrangement.

Manager Waste Strategy and Innovation
Environment Protection Authority
(by delegation)

Notes

The EPA may amend or revoke this order at any time. It is the responsibility of each of the generator and processor to ensure it complies with all relevant requirements of the most current order. The current version of this order will be available on ' www.epa.nsw.gov.au

In gazetting or otherwise issuing this order, the EPA is not in any way endorsing the supply or use of this substance or guaranteeing that the substance will confer benefit.

The conditions set out in this order are designed to minimise the risk of potential harm to the environment, human health or agriculture, although neither this order nor the accompanying exemption guarantee that the environment, human health or agriculture will not be harmed.

Any person or entity which supplies excavated natural material should assess whether the material is fit for the purpose the material is proposed to be used for, and whether this use may cause harm. The supplier may need to seek expert engineering or technical advice.

Regardless of any exemption or order provided by the EPA, the person who causes or permits the application of the substance to land must ensure that the action is lawful and consistent with any other legislative requirements including, if applicable, any development consent(s) for managing operations on the site(s).

The supply of excavated natural material remains subject to other relevant environmental regulations in the POEO Act and Waste Regulation. For example, a person who pollutes land (s. 142A) or water (s. 120), or causes air pollution through the emission of odours (s. 126), or does not meet the special requirements for asbestos waste (Part 7 of the Waste Regulation), regardless of this order, is guilty of an offence and subject to prosecution.

This order does not alter the requirements of any other relevant legislation that must be met in supplying this material, including for example, the need to prepare a Safety Data Sheet. Failure to comply with the conditions of this order constitutes an offence under clause 93 of the Waste Regulation.

Examples

In situ sampling at depth

Example 1.

If the proposed depth of ENM excavation is between 1 m bgl and 1.4 m bgl, then:

- 1 sample on surface (as per the requirements of Table 2).
- 1 sample at 1 m bgl.
- No further depth sampling after 1 m bgl, unless required under section 4.4.4.

Example 2.

If the proposed depth of ENM excavation is at 1.75 m bgl, then:

- 1 sample on surface (as per the requirements of Table 2).
- 1 sample at 1 m bgl.
- 1 sample at 1.75 m bgl.
- No further depth sampling after 1.75 m bgl, unless required under section 4.4.4.

Example 3.

If the proposed depth of ENM excavation is at 2.25 m bgl, then:

- 1 sample on surface (as per the requirements of Table 2).
- 1 sample at 1 m bgl.
- 1 sample at 2 m bgl.
- No further depth sampling after 2 m bgl, unless required under section 4.4.4.