Waste Sampling

Use this fact sheet when sampling waste for off-site disposal, or receipt from off-site, of:

- Excavated Natural Material (Environment Fact Sheet EFS-702)
- Recovered Aggregates (Environment Fact Sheet EFS-704)

Introduction

This fact sheet describes the procedure for sampling waste soils and aggregates that have been excavated from road projects and applies when these materials are to be exported off-site to a non road construction site or project (e.g. as fill material to a building site). This procedure should also be followed for soils and recovered aggregates that are imported onto site from non road construction sites.

The sampling methodology described in this fact sheet is consistent with the NSW Environment Protection Authority's (EPA) resource recovery exemptions.

When is Sampling and Testing Required?

Whether sampling and testing is required, depends on the type of material that has been excavated and the location and land use of the site receiving the material.

Materials that <u>do not</u> require sampling and testing

- <u>Re-Use of Excavated Road Materials Back into Road Corridors</u>

  The EPA has issued a Resource Recovery Exemption to facilitate the re-use of excavated road materials back into road corridors. This exemption permits the following excavated materials to be re-used without prior testing and sampling:

  "Rock, soil, sand, bitumen, reclaimed asphalt pavement, gravel, slag from iron and steel manufacturing, fly and bottom ash, concrete, brick and ceramics excavated during the construction and maintenance of council and RMS public roads and road public infrastructure facilities."

  The exceptions to this are soils and other materials that contain coal tar or asbestos, or any waste that is classified as hazardous, restricted solid, special or liquid waste as defined in the Protection of the Environment Operations Act 1997. For example, soils or materials that have been excavated from areas that are known to be contaminated sites would need to be sampled and tested. In these cases you will need to obtain specialist advice from a contaminated site or waste expert on sampling and testing requirements and to determine if the material can be re-used or must be disposed of.

- <u>Virgin Excavated Natural Material (VENM)</u>

  Rock and soils that meet the definition of VENM (see Environment Fact Sheet EFS-701) do not require prior sampling and testing irrespective of whether the VENM is being re-used on or off site. If there is any doubt whether the material is VENM, then sampling and testing should be undertaken as per the procedure below for excavated natural material (ENM).

- Reclaimed Asphalt Pavement (RAP) re-used for road making

  Asphalt that is excavated from a road and that does not contain coal tar or asbestos may be re-used without prior testing for road construction and maintenance activities.

  If RAP is to be transported off-site for non road making purposes then the recovered aggregate exemption is to be complied with (see Environment Fact Sheet EFS-704).

Materials that require sampling and testing

The following materials must be sampled and tested for contaminants prior to being transported off-site and applied to land outside a road corridor.

- ENM (can be sampled from stockpiles or in-situ prior to excavation)
- Recovered Aggregates (can only be sampled from stockpiles).

Similarly, if the above wastes are being imported onto a road project from a non road construction site, they must be sampled and tested as described below. Virgin quarried materials do not require testing.

The EPA's resource recovery exemptions for ENM and recovered aggregates list the contaminants to be tested and the acceptable contaminant levels. The exemptions also list the record keeping requirements for both the "producer" (the person who excavates the material) and the "consumer" (the person who receives the material).

Sampling Methodology

1. Stockpile sampling

- Sampling must be undertaken in accordance with Australian Standard 1141 Methods for sampling and testing aggregates (or equivalent). Sampling and information on sample storage and preparation must be detailed in a written sampling plan.
- 10 composite samples are to be collected every 4,000 tonnes of material. For quantities less than 4,000 tonnes the number of samples to be collected are as per Table 1.
- A composite sample means a sample that combines 5 discreet sub-samples of equal volume into a single sample (see Figure 1).

Table 1: Sampling Frequency

Quantity (tonnes)	Number of Samples Required
<500	3 composite samples
500-1000	4 composite samples
1,000 – 2,000	5 composite samples
3,000 – 4,000	7 composite samples
4,000 and above	10 composite samples per 4,000 tonnes

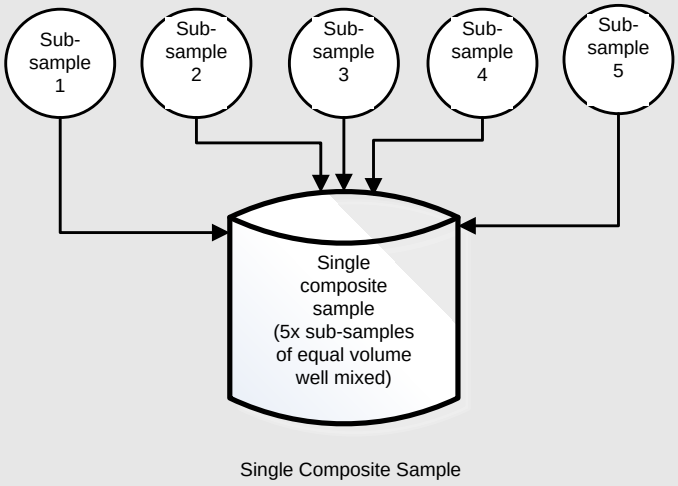

Figure 1 – Composite Sampling

Sampling locations and depths

- Sub-samples are to be collected uniformly throughout the stockpile to account for potential variability in soil characteristics.
- It is not acceptable to just collect sub-samples from the surface. Samples should also be collected at various depths in the stockpile.
- It is recommended that a systematic grid sampling pattern be used although this may not always be possible due to practicality and work health and safety issues.
- Figure 2 shows a typical stockpile grid sampling pattern. Note that the grid size will vary depending on the number of samples to be collected.

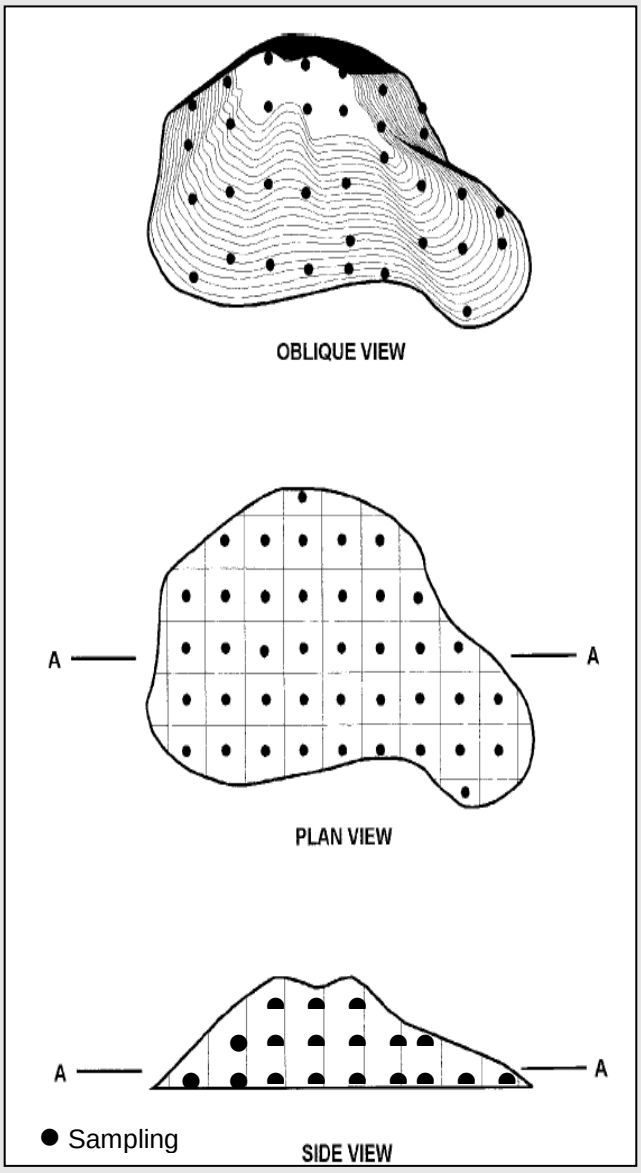

Figure 2 – Stockpile Sampling

(Extract from D 6009-96 (2006) Standard Guide for Sampling Waste Piles, ASTM International).

2. In Situ sampling

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

The number of samples to be collected depends on the size of the area to be excavated and the depth of excavation. This is determined by first working out the number of surface sampling points and then the depth at which samples are to be taken.

- *Number of Surface Sampling Points*: The number of surface sampling points is determined using Table 2 below which is an extract from the EPA's resource recovery order for ENM.
- *Depth of Samples:* The first sample is to be collected at the surface of the sampling point followed by 1 soil sample every metre below ground level until the excavation depth is reached.

If the depth of excavation is between 0.5 to 0.9 metres after the last metre interval, the last depth sample is collected at the same level as the depth of excavation. No further samples are required beyond the last metre interval if the depth of excavation is less than 0.5 metres from this point. (See the worked examples below).

If there is still soil to be excavated below the last sample location and it exhibits discolouration, staining, odour or other indicators of contamination then additional samples should be taken to the full depth of excavation.

Table 2: Number of Surface Sampling Points

Size of In-situ Area (m^2)	Number of Sampling Points	Minimum Distance Between Two Sampling Points (m)
0- 500	5	10.0
501-1000	6	12.9
1001-2000	7	16.9
2001-3000	9	18.2
3001-4000	11	19.1
4001-5000	13	19.6
5001-6000	15	20.0
6001-7000	17	20.3
7001-8000	19	20.5
8001-9000	20	21.2
9,001-10,000	21	21.8
10,001-15,000	25	25.0
15,001-20,000	30	25.8
20,001-25,000	35	26.7
25,001-30,000	40	27.5
30,001-35,000	45	27.9
35,001-40,000	50	28.3
40,001-45,000	52	29.3
45001-50,000	55	30.2

Worked examples for in-situ sampling are shown over the page.

WORKED EXAMPLES OF IN-SITU SAMPLING

Example 1

An RMS contractor is proposing to excavate 2000 square metres of ENM to a depth of 2.6 metres. Before that can occur the material needs to sampled and sent to a laboratory for testing.

How many samples need to be taken and at what depth?

Using Table 2, seven surface sample points are needed and they must be located at least 16.9 metres apart. Because the contractor is excavating to 2.6 metres, at each of the 7 sampling locations, 4 samples are to be collected. The first at the surface, followed by one at 1m, one at 2m and one at 2.6m depth (because the excavation depth is between 0.5 and 0.9 metres after the last metre interval).

In total 28 samples are to be collected (4 samples x 7 sample locations)

Example 2

An RMS contractor is proposing to excavate 1000 square metres of ENM to a depth of 2.4 metres. Before that can occur the material needs to sampled and sent to a laboratory for testing.

How many samples need to be taken and at what depth?

Using Table 2, six surface sample points are needed, located at least 12.9 metres apart. Because the contractor is excavating to 2.4 metres, at each of the 6 sampling locations, 3 samples are to be collected. The first at the surface, followed by one at 1m and one at 2 metres only (because the excavation depth is less than 0.5 metres after the last metre interval, no further depth sampling is required).

In total 18 samples are to be collected (3 samples x 6 sample locations)

Further information

If you require further advice on Roads and Maritime waste issues, please contact your regional environment staff or the Senior Environmental Specialist (Sustainability) in the Environment Branch on 02 8843 3055.