

IMPORTED FILL PROTOCOL – REV C

Aspect Industrial Estate, Mamre Road, Kemps Creek, NSW

Prepared for Mirvac Office and Industrial Pty Ltd

09 OCTOBER 2020



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IMPORTED FILL PROTOCOL

Aspect Industrial Estate, Mamre Road, Kemps Creek, NSW

Draft Document Prepared for Client Review

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Report No 10035157_IFP

Date 9/10/2020

Revision Text Rev C

This report has been prepared for Mirvac Office and Industrial Pty Ltd in accordance with the terms and conditions of appointment in the Consultant Agreement for Lots 54-58 (DP 259135) Mamre Road, Kemps Creek – Phase 2 DSI, FIP, UFP, Dam Decommissioning Strategy, Groundwater Management Plan dated 24th September 2019. Arcadis Australia Pacific Pty Limited (ABN 76 104 485 289) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

REVISIONS

Revision	Date	Description	Prepared by	Approved by
A	1/11/2019	Draft for Client Review	D.T.	L.M.
B	22/11/19	Revision B	D.T	C.L.
C	9/10/2020	Revision based on legislation amendments	B.K.	BV

CONTENTS

1 INTRODUCTION	2
1.1 Purpose	2
1.2 Background	2
1.2.1 Preliminary Site Investigation	3
1.2.2 Detailed Site Investigation	4
2 SCOPE	5
3 TRAINING AND INDUCTION REQUIREMENTS	6
4 NSW REGULATORY GUIDELINES	7
5 APPROVED FILL MATERIAL TYPES	8
5.1.1 Virgin Excavated Natural Material	8
5.1.2 Excavated Natural Material	8
6 PROCEDURE	10
6.1 VENM Assessment	10
6.2 ENM Assessment	10
6.3 Source Site Material Inspections	11
6.4 Materials Tracking Documentation	11
6.5 Material Inspection Prior to Acceptance	11
6.6 Supervision During Unloading and Spreading	11
6.7 Stockpile Management	12
6.8 Identification of Unsuitable Material and Unexpected Finds	12
6.8.1 Acid Sulfate Soils	12
6.8.2 Asbestos	13
6.8.3 Suspected Contaminated Soil	13
6.9 Records Keeping	13
6.10 Security	15
7 LIMITATIONS	16
8 REFERENCES	17
Figure 1: Site Location	18
Figure 2: Site Layout	18

APPENDICES

APPENDIX A FIGURES

APPENDIX B NSW EPA (2014) ENM ORDER

APPENDIX C MATERIALS TRACKING AND INSPECTION REGISTER

1 INTRODUCTION

Arcadis Australia Pacific (Arcadis) was engaged by Mirvac Office and Industrial (Mircvac) to prepare an Imported Fill Protocol (IFP) for use during the proposed Aspect Industrial Estate development located at Lots 54-58 DP259135 Mamre Road, Kemps Creek, NSW 2178. The location of the site is illustrated in Figure 1, **Appendix A** and the site features are depicted in Figure 2, **Appendix A**.

Information provided to Arcadis by Mirvac indicates that approximately 200,000 m³ of Virgin Excavated Natural Material and/or Excavated Natural Material (VENM and/or ENM) will be imported onto the site to support earthworks undertaken as part of the site redevelopment. Materials covered by a specific NSW EPA Resource Recovery Order and Exemption (NSW EPA RROE) should also be managed in accordance with this protocol.

This IFP outlines procedures and processes that must be followed during the assessment, import and placement of fill materials onto the site.

1.1 Purpose

This protocol outlines the actions which must be implemented to:

- Prevent the import of fill material that presents a risk to the environment or human health.
- Prevent the importation of contaminated or asbestos containing materials.
- Ensure compliance with NSW regulatory requirements.
- Facilitate materials tracking and records keeping for site management.

1.2 Background

The site comprises an approximate area of 56.3 ha and is located within the Penrith City Council Local Government Area (LGA). Known historical land uses at the site include rural residential, grazing, dairy farming, poultry farming and horticulture. The proposed redevelopment of the site will facilitate land uses consistent with commercial and industrial use, as prescribed in the National Environmental Protection Measure as amended in 2013 (NEPM, 2013) and will involve the following activities:

- The demolition and removal of existing rural structures.
- Heritage salvage works (if applicable).
- Clearing of existing vegetation and associated dam dewatering and decommissioning.
- Realignment of existing creek.
- On-site bulk earthworks including any required ground dewatering.
- The importation, placement and compaction of soil material, consisting of:
 - Virgin Excavated Natural Material (VENM) within the meaning of the Protection of the Environment Operations Act 1997 (POEO Act); and/or
 - Excavated Natural Material (ENM) within the meaning of the NSW Environmental Protection Agency's (EPA) Resource Recovery Exemption under Part 9, Clauses 91 and 92 of the POEO (Waste) Regulation 2014 – The Excavated Natural Material Order 2014; and/or
 - Materials covered by a specific NSW EPA RROE which are suitable for their proposed use.
- Boundary retaining walls.
- Catchment level stormwater infrastructure, trunk service connections, utility infrastructure, roads and access infrastructure.
- Stormwater, services and utility infrastructure associated with the construction of industrial logistics and warehouse buildings within Stage 1 of the development.

- Boundary stormwater management, fencing and landscaping.

Information provided to Arcadis by Mirvac indicates that approximately 200,000 m³ of VENM and/or ENM will be imported onto the site to support earthworks undertaken as part of the site redevelopment works.

1.2.1 Preliminary Site Investigation

In January 2019, JBS&G conducted a Preliminary Site Investigation (PSI) with limited soil sampling at the site.

The JBS&G review of the site history indicated that the site was historically used for light agricultural purposes (i.e. grazing, historical dairy farming, poultry farming and horticulture).

The findings of the desktop study (confirmed by detailed site inspections completed by JBS&G on 30 November 2018 and 16 January 2019) identified current and potential historical sources of on-site contamination. The sources of potential contamination were associated with the following storage, handling and uses on the site:

- Pesticides/herbicides used in former and current market gardens;
- Potential biological impacts from livestock/poultry farming;
- Potential use of hazardous building materials (asbestos, lead based paints, PCBs) in historic and current site structures resulting in localised impacts to soils in proximity to the location of site structures;
- Potential hydrocarbon and pesticide contamination from the storage of materials and consumables at various locations across the site area (former and current sheds).
- Fill materials of unknown origin; and
- Potential asbestos containing materials (ACM) in irrigation lines (conduits).

JBS&G collected soil samples from a total of 38 locations across the site (29 soil boreholes, two test pits and seven stockpiles). The results from the samples collected by JBS&G have been summarised below:

- Elevated Total Recoverable Hydrocarbon (TRH) concentrations were identified in stained soils below a fuel drum (sample BH10 at 0.1m). This impact was limited in lateral extent and did not appear to migrate vertically, based on visual observations of stained soil;
- A small number of heavy metal impacts to surface soils were also identified but were not considered to pose unacceptable ecological health risks under the proposed land use;
- Anthropogenic materials at some locations were present in quantities that may pose an aesthetic concern for sensitive land uses. JBS&G however noted that with the proposed land use (commercial/industrial), these materials may be retained beneath hardstand without any further management. The impacts identified were typical of historical land uses; and
- Trace level friable asbestos was identified at one location (HA13) adjacent to historical structures, which were observed to contain possible ACM sheet board. JBS&G noted that there was the potential for ACM to be present within site structures and in soil in the vicinity of the structures.

JBS&G concluded that whilst the investigation identified localised surficial soil impacts at the site, the investigation did not identify widespread contamination which may preclude rezoning or future redevelopment of the site. Identified soil impacts are considered representative of common contaminants and historical land use activities which can be readily dealt with during the DA stage for redevelopment and assessment for site suitability. JBS&G also recommended that a Hazardous Building Material Survey (HBMS) be undertaken prior to any demolition of existing site structures.

1.2.2 Detailed Site Investigation

During October 2019, Arcadis undertook a Detailed Site Investigation (DSI) which involved intrusive works to assess soil, groundwater and surface water on site for contaminants of potential concern (CoPC) identified in the PSI.

Review of previous site reports, observations from site walk overs on 8th, 9th, 16th and 23rd October 2019 and analytical results from soil, surface water, groundwater and potentially asbestos containing material (PACM) indicated that impact at the site is unlikely to be widespread. Observations were consistent with the JBS&G findings.

The results from the samples collected by Arcadis have been summarised below:

- Soil samples were taken from fifteen (15) test pits and six (6) monitoring wells. One sample reported an outlier exceedance of benzo(a)pyrene at MW02_2.0, however this exceedance was considered an anomaly and does not represent the concentration of benzo(a)pyrene in natural soil materials, nor does it present a risk when compared to ecological screening levels.
- Three (3) soil samples collected from areas adjacent to treated timber posts were assessed, with one sample (SO01) which exceed the NSW EPA General Solid Waste CT1 criteria for nickel.
- All surface waters reported analytes below the adopted criteria.
- Surface waters reported elevated pH and electrical conductivity when compared to the adopted criteria.
- A small number of heavy metal impacts to groundwater were observed and these were attributed to the elevated background concentrations of metals in on-site clay soils.
- Potential asbestos containing material (PACM) reported positive identification of asbestos at three out of four samples locations. No PACM was observed on roads or access tracks, with identified material adjacent current or former structures.

Based on the findings of the DSI, the site was deemed suitable from a contamination perspective for the proposed development as an industrial estate, pending the removal of identified asbestos containing material and the issuing of a clearance certificate to soil surfaces. Arcadis recommended that a HAZMAT survey and an asbestos register should be developed for the site prior to demolition works, asbestos removal works should be undertaken, and a clearance certificate issued post demolition and that a site unexpected finds protocol should be implemented prior to any intrusive works. Arcadis also recommended that on-site surface water should be measured after a significant rainfall event and compared to previously recorded the observations to observed water quality prior to dam de-watering. Accordingly, there is potential for unexpected finds, including contamination or waste, which may be encountered during demolition or earthworks at the site.

2 SCOPE

This protocol applies to the following activities:

- Importation of Virgin Excavated Natural Material (VENM), Excavated Natural Material (ENM) or Materials covered by a specific NSW EPA Resource Recovery Order and Exemption (NSW EPA NSW EPA RROE) to support earthworks undertaken as part of the site redevelopment works.

Arcadis note that an assessment of the geotechnical and/or engineering properties of the fill material has not been included within the scope of this protocol.

3 TRAINING AND INDUCTION REQUIREMENTS

All site-based Mirvac personnel and sub-contractors operating at the site should be inducted on this procedure, the associated Unexpected Finds Protocol (UFP) and the identification of potentially contaminated materials, waste and asbestos, along with other mandatory site-specific induction requirements.

A hardcopy of this IFP should be retained on-site at all times. Electronic copies of this IFP should be provided to site personnel and sub-contractors, as required.

4 NSW REGULATORY GUIDELINES

The importation of materials onto the site is regulated by the NSW EPA under the *Protection of the Environment Operations Act 1997* (POEO Act) and *Protection of the Environment Operations (Waste) Regulation* (2014).

The following regulatory guidelines apply to the import of VENM and/or ENM:

- NSW Acid Sulfate Soils Management Advisory Committee (1998). Acid Sulfate Soils Assessment Guidelines.
- NSW EPA (1995) Sampling Design Guidelines.
- NSW EPA (2014) Waste Classification Guidelines and associated addendums.
- NSW EPA (2014) Excavated Natural Material Order.
- NSW EPA (2014) Excavated Natural Material Exemption.
- NSW EPA (2017) Contaminated Land Management Guidelines for the NSW Site Auditor Scheme (3rd edition).
- NSW EPA Resource Recovery Framework, including current Orders and Exemptions.
- National Environment Protection (Assessment of Site Contamination) Measure, National Environment Protection Council, 1999 as amended in 2013 (NEPC 2013).
- NSW RMS (2015) Virgin Excavated Natural Material (VENM) Environment Fact Sheet EFS-701.

5 APPROVED FILL MATERIAL TYPES

Imported Fill Materials (IFM) should only be accepted onto the site if they comply with:

- The definition of VENM published in the POEO Act 1997.
- The definition of ENM published in the POEO Act 1997.
- Materials covered by a specific NSW EPA RROE which are suitable for their proposed use

Prior to accepting VENM, ENM or material subject to a NSW EPA RROE onto the site, appropriate documentation verifying the source, classification and nature of the material must be provided. In addition, acceptance of approved fill material types must be conducted in accordance with the protocols outlined in Section 6 of this document.

5.1.1 Virgin Excavated Natural Material

VENM is naturally occurring rock or soil that has been excavated or quarried from areas that are not contaminated with manufactured chemicals or process residues, as a result of industrial, commercial, mining or agricultural activities. VENM must not contain sulphidic ores or soils.

VENM is pre-classified by the NSW EPA as General Solid Waste (GSW). However, an Environment Protection Licence (EPL) is not required to re-use VENM on-site or off-site if the conditions of the NSW EPA (2014) ENM Order and Exemption are met.

If the material meets the above definition, there is no requirement to test VENM for contamination. However, if the material is suspected to be contaminated or there is any doubt regarding the material quality, testing of the material in accordance with the NSW EPA (2014) ENM Order and the protocol outlined in Section 6 of this document is recommended.

5.1.2 Excavated Natural Material

ENM is naturally occurring rock and soil that has been excavated from the ground, contains at least 98% natural material and does not meet the definition of VENM.

ENM does not include material that has been processed or contains acid sulfate soils (ASS) or potential acid sulfate soils (PASS).

ENM is pre-classified by the NSW EPA as General Solid Waste (GSW). However, an Environment Protection Licence (EPL) is not required to re-use ENM on-site or off-site if the conditions of the NSW EPA (2014) ENM Order and Exemption are met.

Additional responsibilities apply to the generators of ENM. For example, the generator of ENM must certify that the ENM complies with the relevant conditions of the NSW EPA (2014) ENM Order and Exemption and provide the consumer with the following:

- A written statement of compliance, certifying that the ENM complies with the conditions of the NSW EPA (2014) Order.
- Copies of all test results.
- A copy of the NSW EPA (2014) Exemption.

The generator must also keep written copies of the quantity of ENM supplied and the details of each person the generator supplied with ENM for a minimum period of six years.

The consumer is also responsible for ensuring that the ENM:

- Meets all chemical and other material testing requirements as per the NSW EPA (2014) ENM Order. The testing requirements for ENM are summarised in **Section 6.2** and **Appendix B**.
- Is only applied to land as engineering fill or for use in earthworks.
- Is applied to land within a reasonable time after receipt.

The consumer must also keep records of the quantity of ENM received and the supplier's details for a minimum period of six years.

6 PROCEDURE

6.1 VENM Assessment

When selecting an appropriate source site and VENM supply, documentation providing evidence of the following should be reviewed and retained:

- That the VENM is natural material that has been excavated or quarried from areas that are not contaminated as a result of industrial, commercial, mining or agricultural activities.
- That the VENM does not contain sulphidic ores or soils.
- That the VENM is not from an area that presents a high risk of ASS or PASS.
- That the material has been responsibly sourced and reliably tracked to the site from the generators source site.
- That a VENM assessment has been undertaken by a suitably qualified Environmental Consultant. This assessment is typically provided as a VENM report or VENM classification.

If the material meets the above criteria, there is no requirement to test VENM for contamination. However, if the material is suspected to be contaminated or there is any doubt regarding the material quality, testing of the material in accordance with the NSW EPA (2014) ENM Order and other assessment recommendations presented in Sections 6.2-6.11 below would be required.

6.2 ENM Assessment

The NSW EPA (2014) ENM Order outlines strict requirements for the testing of ENM.

Prior to accepting ENM on-site, the following documentation should be reviewed by a suitably qualified person:

- The sampling and testing plan completed by the generator. The sampling and testing plan must adhere to the NSW EPA (2014) Order.
- Test results for Acid Sulfate Soils (ASS) and Potential Acid Sulfate Soils (PASS). Refer to Section 6.8.1 of this document for further guidance.
- Test results for Contaminants of Potential Concern (CoPC) as reported in Table 4 of the NSW EPA (2014) ENM Order (**Appendix B**).
- Evidence that testing was undertaken in accordance with the sampling frequencies outlined in the NSW EPA (2014) ENM Order.
- Evidence that the ENM is not from an area that presents a high risk of ASS or PASS.
- Evidence that the material has been responsibly sourced and reliably tracked to the site from the generators source site
- An ENM assessment undertaken by a suitably qualified Environmental Consultant. This assessment is typically provided as an ENM report or ENM classification.

Additional testing (beyond the ENM criteria) is only required if there is evidence that potentially contaminating activities previously took place on the excavation site (for example, but not limited to, former service station sites, cattle tick dip sites, banana plantations). In this case, specialist advice should be obtained from a suitably qualified Environmental Consultant.

To provide additional certainty regarding the quality and condition of material imported onto the site, an on-site Audit and/or random inspection should be completed by the Environmental Consultant or a suitably qualified person at least once per month to ensure compliance with this protocol. Additional certainty may be provided by implementing a spot testing program inclusive of random sampling and analysis of IFM in accordance with the requirements of the NSW EPA (2014) ENM Order.

6.3 Source Site Material Inspections

Prior to engaging a generator or supplier or VENM, ENM or material subject to an NSW EPA RRO, an inspection of the source site should be completed by Mirvac and/or the Environmental Consultant.

6.4 Materials Tracking Documentation

To ensure that VENM, ENM or material subject to an NSW EPA RRO has been reliably sourced, the following tracking information should be provided by the generator and reviewed by a suitably qualified person prior to acceptance of VENM or ENM on-site:

- GPS tracking information for each truck, including starting location, time of departure, route of travel and time of arrival onto site.
- The generator's contact details.
- The contact details of the driver.
- Photographic evidence of each truck. This information should be recorded in a photographic log.
- Vehicle licence plate and registration details.
- The date and time that the load was picked up.
- The delivery date and time.
- The volume and weight of the load at the time of loading.
- The volume and weight of the load at the time of arriving on-site.

6.5 Material Inspection Prior to Acceptance

Prior to unloading, the vehicles should be inspected by a suitably qualified Environmental Consultant or Mirvac Site Supervisor following review of materials tracking documentation and assessment information outlined in Sections 6.1, 6.2 and 6.4 using the Material Inspection and Tracking Register provided in **Appendix C**.

Each inspection should involve an inspection of the vehicle and the load. If the material is suspected of being unsuitable during the initial inspection of material due to odours, colouring or other visual signs of contamination, the material should not be approved for importation onto site and an alternative source material supplier should be sourced.

If material that is found to be unsuitable is identified on-site, is required to be immediately reloaded onto the truck and to be removed from the site.

6.6 Supervision During Unloading and Spreading

If the material is accepted and imported on to the site following a review of the required information. A suitably qualified Environmental Consultant or the Mirvac Site Supervisor should inspect the unloading and spreading of VENM, ENM or material subject to an NSW EPA RRO as part of earthworks. As part of the project record keeping requirements including completion of the form provided in **Appendix C**, each load should be documented with the following information:

- Date.
- Time.
- Truck information.
- Person supervising unloading and spreading.
- Generator contact details.
- Volume of material imported.
- Classification (VENM/ENM).

- If subject to an NSW EPA RROE, the material type and applicable Order and Exemption should be noted.
- GPS location of area where material was unloaded and spread.
- Approximate area and boundary of spread material.
- Photo log.

During spreading, emphasis should be placed on visually inspecting material for any suspected Potential Asbestos Containing Materials (PACM) or other visual indicators of contamination. If PACM is identified during spreading, the material should be assessed and managed in accordance with the site-specific Unexpected Finds Protocol (UFP) (Arcadis, 2019b).

6.7 Stockpile Management

Stockpiling of VENM or ENM on-site prior to spreading is not recommended. However, if there is a requirement for surplus material to be temporarily stockpiled on-site, the following activities should be undertaken:

- The location of each stockpile must be accurately identified and documented on a site plan.
- A Stockpile Register should be created. The Register should document the material source location, type of material contained in the stockpile, estimated volume, date it was stockpiled and the material supplier's details.
- Stockpiles of materials from different generators must be separated and segregated from other materials.
- Sediment and erosion controls must be implemented in accordance with NSW EPA requirements.
- Dust control measures should be implemented on-site, including covering trucks transporting material, spraying water or suitable dust suppressants on stockpiles and traffic areas.
- The height of stockpiles should be limited to no greater than 5 m above ground level.
- Any material of unknown contamination status which is awaiting sampling must be banded and kept separate from other material until it has been sampled and classified.
- Site inductions shall be undertaken for all staff, to ensure workers are fully aware of restrictions and all relevant management measures including the importance of keeping materials with different contamination status separate.

The volume of stockpiled materials must remain below the EPL thresholds outlined in POEO Act.

6.8 Identification of Unsuitable Material and Unexpected Finds

If unsuitable materials are identified prior to unloading, the material should not be approved for importation onto site and an alternative source material supplier should be sourced.

If a material is suspected of being unsuitable following receipt on-site, the material should be assessed and managed in accordance with the site-specific Unexpected Finds Protocol (UFP) developed for the site (Arcadis, 2019b).

Additional guidance on some potential environmental risks commonly encountered with fill material is provided in the following sections.

6.8.1 Acid Sulfate Soils

Acid sulfate soils (ASS) are the common name given to sediments and soils that contain iron sulfides which generate sulfuric acid when exposed to oxygen. ASS can have considerable adverse effects on engineering and landscaping works, agricultural practices and land management.

Prior to accepting VENM, ENM or material subject to an NSW EPA RREO onto site, the following documentation should be reviewed to ensure that the generator has assessed for the presence of ASS or PASS in accordance with the NSW Acid Sulfate Soil Manual (1998):

- pH data demonstrating that pH in the measured material is below 5.
- A review of the applicable Acid Sulfate Soil Risk Maps to indicate the likely potential presence of ASS.
- A review of the material to identify any potential ASS or PASS indicators such as shells, waterlogged soils, sulphurous odours, iron oxide colouring or yellow mineral deposits.

6.8.2 Asbestos

If PACM unexpectedly identified on-site, an exclusion zone should be immediately established, the site manager notified, and the material should be documented, photographed and assessed in accordance with the site-specific Unexpected Finds Protocol (UFP) developed for the site (Arcadis, 2019b). Guidance for the management of PACM is provided in the site-specific Unexpected Finds Protocol (UFP) and Remediation Action Plan (RAP).

Works should not recommence without inspection by the Environmental Consultant and consent from the NSW EPA Accredited Site Auditor.

6.8.3 Suspected Contaminated Soil

If potentially contaminated soil or stockpiled soil of unknown origin is inadvertently received on-site, an exclusion zone should be immediately established, and the site manager should be notified. Following establishment of a clearly marked exclusion zone, the material should be documented, photographed and assessed in accordance with the site-specific Unexpected Finds Protocol (UFP) developed for the site (Arcadis, 2019b).

To enable off-site disposal, stockpiled soil should be sampled by a suitably qualified Environmental Consultant to facilitate classification and off-site disposal to an NSW EPA licenced landfill in accordance with the NSW EPA (2014) Waste Classification Guidelines and associated addendums.

6.9 Records Keeping

Table 1 below details the records which should be collected and retained for a minimum period of six years

Table 1 – Records Keeping Requirements

VENM Assessment	ENM Assessment	Materials Tracking Documentation	Unloading and Spreading	Unexpected Finds	Stockpile Management
<p>Evidence of the following:</p> <ul style="list-style-type: none"> The VENM is natural material that has been excavated or quarried from areas that are not contaminated as a result of industrial, commercial, mining or agricultural activities. The VENM does not contain sulphidic ores or soils. The VENM is not from an area that presents a high risk of ASS or PASS. The material has been responsibly sourced and reliably tracked to the site from the generators source site. A VENM Assessment Report. 	<p>Evidence of the following:</p> <ul style="list-style-type: none"> A sampling and testing plan from the generator that adheres to the NSW EPA (2014) Order. Test results for ASS and PASS. Test results for CoPC as reported in Table 4 of the NSW EPA (2014) ENM Order (Appendix B). Testing was in accordance with the sampling frequencies outlined in the NSW EPA (2014) ENM Order. Evidence that the material has been responsibly sourced and reliably tracked to the site from the generators source site. An ENM assessment Report. 	<ul style="list-style-type: none"> GPS tracking information for each truck, including starting location, time of departure, route of travel and time of arrival onto site. The generator's contact details. The contact details of the driver. Photographic evidence of each truck. This information should be recorded in a photographic log. Vehicle licence plate and registration details. The date and time that the load was picked up. The delivery date and time. The volume and weight of the load at the time of loading. The volume and weight of the load at the time of arriving on-site. 	<p>Evidence of the following:</p> <ul style="list-style-type: none"> Date. Time. Truck information. Person supervising unloading and spreading. Generator contact details. Volume of material imported. Classification (VENM/ENM). GPS location of area where material was unloaded and spread on-site. Approximate area and boundary of spread material. 	<p>The following records should be documented on the site Unexpected Finds Register:</p> <ul style="list-style-type: none"> Identification number. Date. GPS location. Name of person who identified the find. Material type. Approximate area of impacted area Approximate depth of impact. Approximate volume. Sample identification Photograph log. Notification actions. Remedial actions. Validation action. Clearance. Status. Comments. 	<p>Evidence of the following:</p> <ul style="list-style-type: none"> The location of each stockpile on a Stockpile Register. The Register should document the material source location, type of material contained in the stockpile, estimated volume, date it was stockpiled and the VENM or ENM generator supplier's details. Stockpile height.

6.10 Security

Appropriate measures must be implemented to ensure that the site is secure, with all access controlled to prevent illegal dumping and prevent the public from entering the site.

7 LIMITATIONS

This Unexpected Finds Protocol has been prepared for use by the Mirvac in accordance with the agreed scope of work. Arcadis performed its services in a manner consistent with the normal level of care and expertise exercised by members of the environmental assessment profession. No warranties expressed or implied are made.

Subject to the scope of work, Arcadis' assessment was limited strictly to the subject site and environmental conditions associated with the subject property and does not include evaluation of any other issues. The absence of any identified hazardous or toxic materials should not be interpreted as a guarantee that such materials do not exist on the subject property.

This report does not comment on any regulatory obligations based on the findings. This report relates only to the objectives stated and does not relate to any other work undertaken for the Client. It is a report based on the results and conclusions for the site that were made available to the consultant at the time of writing. These conditions may change with time and space.

All recommendations regarding the property are the professional opinions of the Arcadis personnel involved with the project, subject to the qualifications made above. While normal assessments of data reliability have been made, Arcadis assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements or sources outside of Arcadis, or developments resulting from situations outside the scope of this project.

Arcadis is not engaged in environmental assessment and reporting for the purpose of advertising sales promoting, or endorsement of any client interests, including raising investment capital, recommending investment decisions, or other publicity purposes. The client acknowledges that this report is for the exclusive use of the client.

8 REFERENCES

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APPENDIX A FIGURES

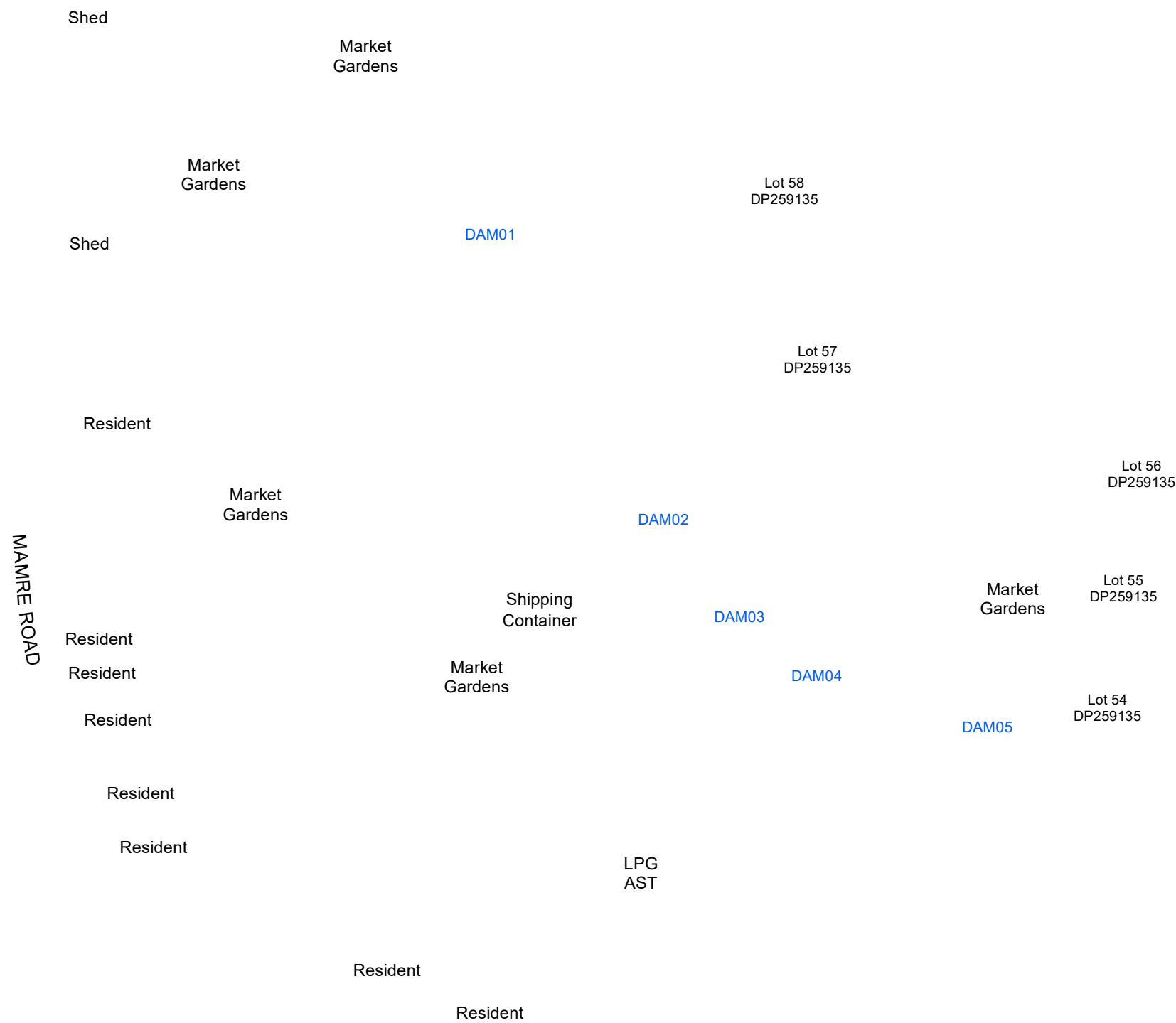
Figure 1: Site Location

Figure 2: Site Layout

10035157 - Aspect Industrial Estate - Detailed Site Investigation



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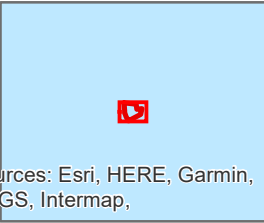


Legend

- Dams
- Site Boundary
- Lot Boundaries

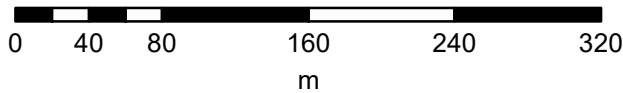
1:4,133 at A3

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Date issued: October 24, 2019



Sources: Esri, HERE, Garmin,
GS, Intermap,

Figure 2 - Site Layout



APPENDIX B NSW EPA (2014) ENM ORDER



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>	<p>Required if the depth of excavation is equal to or greater than 1.0 m bgl</p>

* 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.

APPENDIX C MATERIAL INSPECTION AND TRACKING REGISTER

Material Inspection and Tracking Register

Load number	Date	Time	Vehicle Registration	Name of vehicle driver	Person supervising unloading and spreading	Material generator name	Volume and weight of material imported	Material type (VENM, ENM or RRO)	GPS location where material was unloaded/spread	Approximate area and boundary of spread material	Photo log	Comments