



Fill Material and Soil Management

What You Need to Know

The purpose of this fact sheet is to describe how fill material and excess soil can be reused properly during the cleanup and redevelopment of properties throughout Maryland. In many cases, excess soil is generated and fill material is necessary during the cleanup and development phases of a project. To assure that all projects are addressed consistently, the Land and Materials Administration (LMA) has prepared this guidance document for assisting parties that generate or need soil or fill material at sites under the purview of LMA's regulatory programs. This document does not, however, substitute for Maryland Department of the Environment (MDE) regulations, nor is it a regulation itself and does not impose legally binding requirements, and may not apply to a particular situation based upon the circumstances. MDE retains the discretion to adopt approaches on a case-by-case basis that differ from this guidance where appropriate. Any decisions regarding a particular site will be made based on the applicable statutes and regulations.

Introduction

The LMA has created this fact sheet to assist property owners with the management and reuse of fill material and excess soils generated or used at properties under LMA oversight. This fact sheet is to be used in conjunction with the Voluntary Cleanup Program's (VCP) Clean Imported Fill fact sheet and the Innovative Reuse and Beneficial Use of Dredged Material Guidance Document.

What Soils and Fill Material are Subject to this Fact Sheet?

This document lays out guidelines for persons that generate or import soil or fill material for reuse at LMA regulated sites. The fact sheet applies to soil and fill material that is impacted or potentially impacted by polluting substances. These pollutants may include petroleum or hazardous substances listed in the current MDE Soil and Groundwater Cleanup Standards (Cleanup Standards) document or the current U.S. Environmental Protection Agency's (EPA) Regional Screening Levels (RSLs) table. The guidance does not apply to soils or fill material that are subject to federal and state hazardous waste regulations (see 40 Code of Federal Regulations [CFR] Part 260 and the Code of Maryland Regulations [COMAR] 26.13 for requirements and applicability). Soils subject to hazardous waste regulations are any soils contaminated by a listed hazardous waste, or that display a characteristic of a hazardous waste. LMA maintains enforcement authority over soils or fill material when it is used in a manner that creates a threat to human health or the environment, in accordance with Environment Article, § 7-201 *et seq.*

Definitions

The following terms are defined for the purpose of this fact sheet.

Background Level means the level of a substance occurring naturally at the site prior to any manmade spill or release, as defined by § 7-501 of the Environment Article, Annotated Code of Maryland.

Category 1 - Residential Unrestricted Use Soil and Fill Material means a soil or fill material that is impacted by a hazardous substance or oil at concentrations less than or equal to the current residential EPA soil

RSLs (residential soil, <https://www.epa.gov/risk/regional-screening-levels-rsls-users-guide-june-2017>) for non-carcinogens set at a HQ of 0.1 and carcinogens at a lifetime cancer risk of 1×10^{-6} . The Category 1 screening levels incorporate the most common human exposure pathways (ingestion, dermal contact, and inhalation of contaminants from soil in outdoor air) using generic exposure assumptions and are protective of acute and chronic health effects for residential populations, including young children. If the soil or fill material background level contains naturally occurring substances at concentrations not exceeding the concentrations of such substances occurring naturally in the environment and in which all other substances are less than or equal to the residential standards, such soils and fill material are considered "Residential Unrestricted Use Soil and Fill Material."

Category 2 - Non-Residential Restricted Use Soil and Fill Material means a soil or fill material that is impacted by a hazardous substance or oil at concentrations less than or equal to the current industrial EPA soil RSLs for non-carcinogens set at a hazard quotient (HQ) of 0.1 and carcinogens at a lifetime cancer risk of 1×10^{-6} . The Category 2 screening levels incorporate the most common human exposure pathways (ingestion, dermal contact, and inhalation of contaminants from soil in outdoor air) using generic exposure assumptions and are protective of acute and chronic health effects for commercial and industrial populations. If the soil or fill material background level contains naturally occurring substances at concentrations not exceeding the concentrations of such substances occurring naturally in the environment and in which all other substances are less than or equal to the non-residential standards (industrial soil, <https://www.epa.gov/risk/regional-screening-levels-rsls-users-guide-june-2017>), such soils and fill material are considered "Non-Residential Restricted Use Soil and Fill Material."

Category 3 - Restricted Use Soil and Fill Material, Cap Required means any soil or fill material that is impacted by a hazardous substance or oil at concentrations meeting the restricted use screening criteria for soil and fill material in the Innovative and Beneficial Use of Dredged Material Guidance Document (<http://mde.maryland.gov/programs/Marylander/Pages/dredging.aspx>). Category 3 means soil or fill material that is impacted by any hazardous substance or oil at concentrations less than or equal to the current industrial EPA soil RSLs for non-carcinogens set at a HQ of 1 and carcinogens at a lifetime cancer risk of 1×10^{-5} .

Category 4 - Ineligible Soil and Fill Material means a soil or fill material that is impacted by any hazardous substance or oil at concentrations exceeding the restricted use screening criteria for soil and fill material in the Innovative and Beneficial Use of Dredged Material Guidance Document (<http://mde.maryland.gov/programs/Marylander/Pages/dredging.aspx>) but does not display a characteristic of a hazardous waste; has not been contaminated by a listed hazardous waste; and does not exceed the regional emergency removal management levels used by the EPA (<https://www.epa.gov/risk/regional-removal-management-levels-chemicals-rmls>).

Disposal Facility means a facility permitted to accept solid wastes by the State of Maryland or other State. In Maryland, such facilities must be permitted in accordance with Title 9 of the Environment Article and the regulations promulgated in COMAR 26.04 or COMAR 26.10.13.

Dredged Material means material excavated or dredged from the waters of State.

Dredged Material Containment Facility means an artificial confinement structure, site or area used for the dewatering of dredged material from the interstitial or carriage water.

Earthen Materials means any mixture of soil, stones or rocks that have been excavated or extracted from a quarry, borrow pit, earthen bank, gravel pit, or mine and have not been affected by a release of oil products, oils, chemicals or by any other polluting substance.

Eligible Property means property that is contaminated or perceived to be contaminated but does not include a site on the National Priority List, a site that is subject to a controlled hazardous substance permit, or a site that is subject to an enforcement action.

Engineered Cap means a system composed of a layer or several layers of natural and synthetic materials used to reduce the infiltration of water into the subsurface and/or to limit the possibility of human exposure to buried materials. A typical cap may consist of a vegetated or otherwise stabilized protective layer of clean soil on the surface, which overlies one or more additional layers that are intended to act as a barrier to infiltration of water; a drainage layer; a capillary break; a gas collection layer; a load dispersion layer; or other purpose depending on the design and intended purpose for the cap. Maryland and federal regulations include specific design requirements for caps depending on the purpose (e.g., solid waste or hazardous waste landfills, etc.).

Engineering Controls means remedial actions directed toward containing or controlling the migration of contaminants through the environment. These include, but are not limited to, storm water conveyance systems, slurry walls, liner systems, caps, leachate collection systems, pump and treat systems, and groundwater recovery systems.

Excess Soil means any soil or earthen material generated as a result of excavation, grading, or other activity that results in soil or earthen material that cannot be reused beneficially onsite.

Fill Material (construction) means soil or dewatered dredged material used to create a foundation for the construction of a structure, such as a road or building, to reclaim lost land such as gullies or mines, to raise the grade on a property, or to provide final cover material for a property.

Hazard Quotient means the ratio of a single substance exposure level over a specified time period to a reference dose for that substance derived from a similar exposure period.

Hazardous Substance means any substance that is defined as a hazardous substance under § 101(14) of the federal act (the Comprehensive Environmental Response, Compensation and Liability Act or CERCLA); or is identified as a controlled hazardous substance by the Department under COMAR 26.14.01.02.

Impervious Surface means a synthetic material with a minimum thickness of 20 mil and a maximum permeability of 1×10^{-10} centimeters/second, or a minimum of 1 foot of clay or other natural fine-grained material having an in-place permeability less than or equal to 1×10^{-5} centimeters/second. *Innovative Reuse* means utilizing excess soil and fill material as resource materials in productive ways as a substitute for other materials subject to certain land use controls. For dredged material, innovative reuse includes use of dredge material in the development or manufacturing of commercial, industrial, horticultural, agricultural, or other products.

Institutional Controls means legal or administrative tools designed to prevent or reduce human exposure to remaining contamination and to prevent activities that may result in increased exposure to or spread of such contamination, including the use of an environmental covenant in accordance with Maryland's Uniform Environmental Covenant Act, Environment Article, § 1-801 *et seq.*

Land Use Controls means any restriction or control that serves to protect human health and the environment by limiting use of or exposure to any portion of the property, including water resources.

Natural Soil means a soil in which all substances naturally occurring therein are present in concentrations not exceeding the concentrations of such substances occurring naturally in the environment and in which no other polluting substance is analytically detectable. *Oil* has the same meaning stated in § 4-401(h) of the Environment Article, Annotated Code of Maryland and COMAR 26.10.01.01 and includes petroleum, petroleum by-products, kerosene, and other compounds. *Risk Assessment* means the process to estimate the nature and probability of adverse health effects in humans who may be exposed to chemicals in contaminated environmental media, now or in the future. Human health risk assessments are based on the populations and land uses of the property in question and may include residential and non-residential scenarios.

Soil means unconsolidated geologic and organic materials overlying bedrock, if present.

Soil and Fill Material Management Guidelines

The following guidelines apply to management of soil and fill material received at eligible properties. These guidelines are also illustrated in Figure 1.

- Soil or fill material may not be placed where it is subject to intrusion by groundwater or surface water. It must be placed at least three (3) feet above the maximum expected groundwater elevations at all locations of placement or other sufficient protective measures must be implemented to ensure soil and fill material do not adversely impact groundwater or surface water resources;
- Soil and fill material placed in groundwater use areas may be subject to additional environmental measures and evaluations to ensure placement of soil or fill material will not adversely impact groundwater or surface water resources.
- Soil or fill material shall conform with all appropriate sediment and erosion control regulations during placement and construction.
- Impervious surfaces placed over soil or fill material shall be continuous in all areas that overlie the soil or fill material.

Land use controls may include, but are not limited to, engineering controls and institutional controls.

Residential Unrestricted Use Soil and Fill Material (Category 1)

Soil or fill material with concentrations of hazardous substances or oil less than or equal to the residential unrestricted use screening criteria may be innovatively reused at all sites without restriction. If potential contaminant concentrations in soil or fill material exceed the Category 1 screening criteria, then a more detailed soil or fill material residential risk assessment (considering factors such as magnitude and frequency of detections, land use, exposure parameters and factors, and toxicity values) may be performed that meets a HQ of 1 for non-carcinogens and a lifetime cancer risk of 1×10^{-5} for carcinogens. When the residential risk assessment is performed and meets a HQ of 1 for non-carcinogens and a lifetime cancer risk of 1×10^{-5} for carcinogens the soil or fill material may be innovatively reused at all sites without soil exposure restrictions and will be considered Category 1 soil and fill material. For soil or fill material that meets the Residential Unrestricted Use Soil and Fill Material definition, a person may send such soil or fill material to any offsite location. The owner or operator of the receiving site may be required to submit written acknowledgement regarding the volume and nature of such soil or fill material to LMA prior to transporting and accepting the materials at the receiving location. Additional documentation from a person placing or transporting the soil or fill material may be required by the LMA program regulating the receiving site, if applicable. Please contact the appropriate regulatory program for additional details.

Non-Residential Restricted Use Soil and Fill Material (Category 2)

Soil or fill material with concentrations of hazardous substances or oil less than or equal to the non-residential restricted use screening criteria may be innovatively reused at all non-residential and non-recreational sites without restriction. If potential contaminant concentrations in the soil or fill material exceed the Category 2 screening criteria, then a more detailed soil or fill material non-residential risk assessment may be performed that meets a HQ of 1 for non-carcinogens and a lifetime cancer risk of 1×10^{-5} for carcinogens. When a non-residential risk assessment on soil or fill material is performed and meets a HQ of 1 for non-carcinogens and a lifetime cancer risk of 1×10^{-5} for carcinogens, the soil or fill material may be innovatively reused at non-residential and non-recreational sites. The owner or operator of the receiving site may be required to submit written acknowledgement regarding the volume and nature of such soil or fill material to the LMA prior to the transport and acceptance of the material. Additional documentation from a person who places or transports the soil and fill material may be required by the LMA program regulating the receiving site, if applicable. Please contact the appropriate regulatory

program for additional details. The receiving site may also be required to encumber the property with land use controls to ensure that exposure to the soil or fill material meeting the Non-Residential Restricted Use Soil and Fill Material definition is appropriately managed. The land use controls may include a recorded environmental covenant that complies with the Maryland Uniform Environmental Covenants Act (UECA). The environmental covenant shall include a map drawn to scale identifying where the soil or fill material has been placed and copies of the manifests, bill of lading, or other documentation demonstrating the transport and acceptance of soil or fill material. The Department may sign on to the environmental covenant as agency and holder of the environmental covenant.

Restricted Use Soil and Fill Material, Cap Required (Category 3)

If the soil or fill material concentrations of hazardous substances or oil are less than or equal to the Category 3 -- Restricted Use Soil and Fill Material, Cap Required screening criteria (<http://mde.maryland.gov/programs/Marylander/Pages/dredging.aspx>), a person may transport such soil or fill material for innovative reuse to a commercial or industrial property with existing soil and fill material containing hazardous substances or oil at concentrations within or less than the same Category 3 parameters for placement beneath an environmental cap. The receiving site may be required to submit a written acknowledgement regarding the volume and nature of the soil or fill material to the LMA prior to transporting the material to the receiving location. The program regulating the receiving site may require additional documentation from a person who places or transports material at Category 3 sites. The receiving site must also agree to encumber the property with land use controls to ensure that exposure to the soil or fill material meeting the Category 3 definition is appropriately managed. The land use controls may include a recorded environmental covenant that complies with the Maryland's UECA. The environmental covenant shall include a map drawn to scale identifying where the soil or fill material has been placed and copies of the manifests, bill of lading, or other documentation demonstrating the transport and acceptance of soil or fill material. The Department may sign on to the environmental covenant as agency and holder of the environmental covenant.

Ineligible Soil and Fill Material (Category 4)

For soil or fill material that exceeds the Category 3 -- Restricted Use Soil and Fill Material, Cap Required screening criteria (<http://mde.maryland.gov/programs/Marylander/Pages/dredging.aspx>), a person may not use the material for an innovative reuse. Any soil or fill material that exceeds the Category 3 screening levels must be disposed of at either (1) an offsite disposal facility or dredge material containment facility that is permitted by the State of Maryland or another state to accept solid wastes; (2) for dredged material, to a dredged material containment facility; or (3) remain in place with appropriate land use controls. The owner or operator of the receiving site shall provide the Department with appropriate documentation, including but not limited to copies of the manifests, bill of lading, or other documentation demonstrating the transport and acceptance of soil or fill material.

Criteria for Total Petroleum Hydrocarbon

In addition to the criteria described above for each category, the following screening criteria apply for total petroleum hydrocarbon (TPH) diesel range organics (DRO) and gasoline range organics (GRO). These criteria are based upon the residential and non-residential soil cleanup standards set at a HQ equal to 0.1 for TPH published in the MDE Cleanup Standards for Soil and Groundwater, June 2008: Interim Final Guidance (Update No. 2.1).

- Category 1 TPH screening criteria: 230 mg/kg for TPH, DRO and 230 mg/kg for TPH, GRO
- Category 2 TPH screening criteria: 620 mg/kg for TPH, DRO and 620 mg/kg for TPH, GRO

- Category 3 TPH screening criteria: 620 mg/kg for TPH, DRO and 620 mg/kg for TPH, GRO
- Category 4 TPH screening criteria: exceeds Category 3 standard

Additional Resources

Cleanup Standards for Soil and Groundwater, June 2008: Interim Final Guidance (Update No. 2.1), Maryland Department of the Environment.

Facts About...VCP Clean Imported Fill Material, Maryland Department of the Environment.

Innovative and Beneficial Use of Dredge Material Guidance Document, August 2017, Maryland Department of the Environment in collaboration with Maryland Department of Transportation's Port Administration.

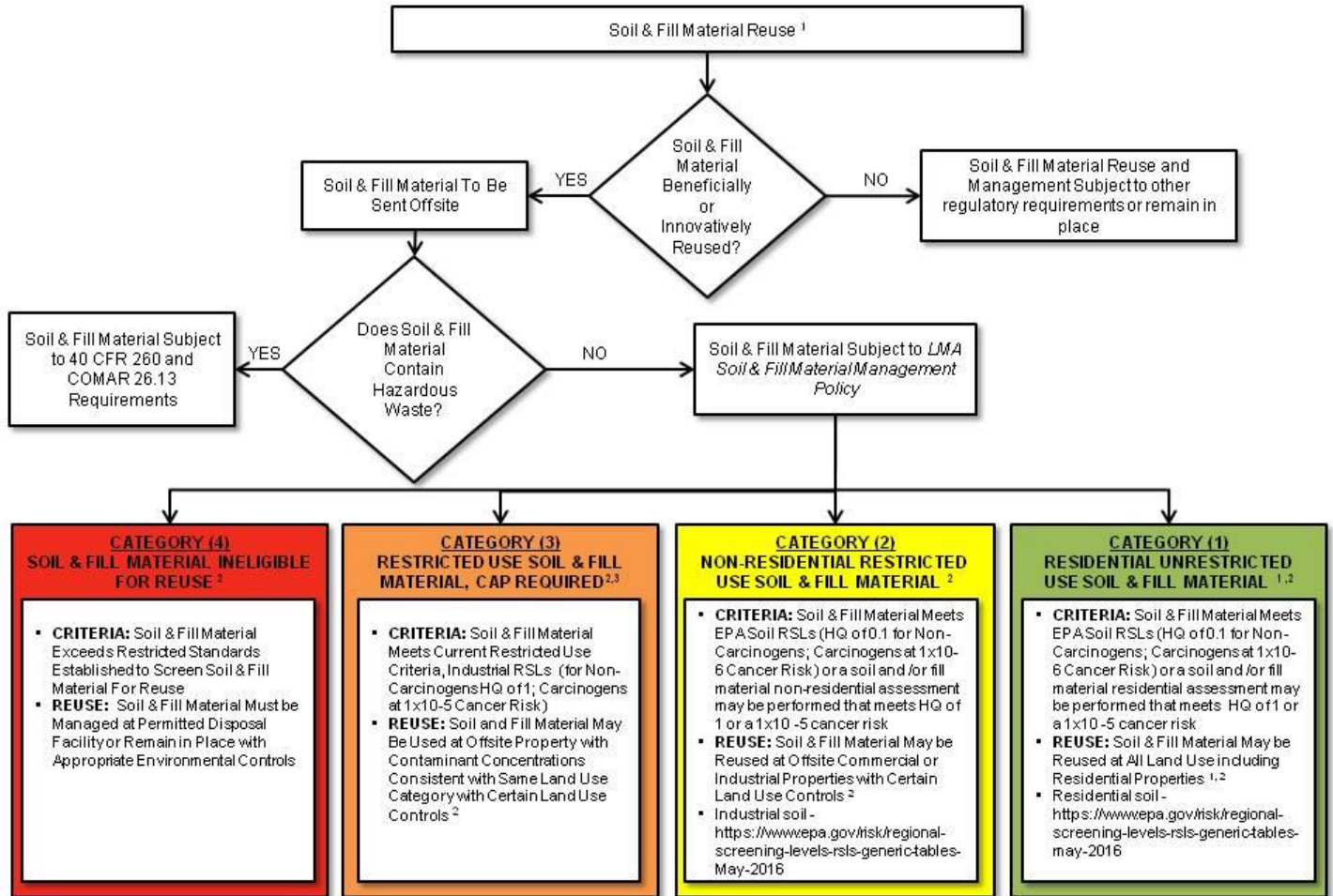
United States Environmental Protection Agency. Regional Screening Levels (RSLs) - Generic Tables (June 2017). <https://www.epa.gov/risk/regional-screening-levels-rsls-users-guide-june-2017>.



Fill Material and Soil Management

What You Need to Know

Figure 1: Soil & Fill Material Management Flow Chart



Footnotes:

- (1) Placement of soil or fill material within groundwater use area may be subject to additional environmental measures and evaluations to ensure placement of soil or fill material will not adversely impact groundwater resources.
- (2) Site-specific factors may be considered for reuse of Category 3: Restricted Use Soil and Fill Material Cap as fill in excess of the Category 3 criteria.

- (2) Soil and fill material transfer is limited to transfers only to a site having existing soils meeting the same or less stringent cleanup standard or within the same land use category as defined in the VCP. The VCP land use categories are: Industrial; Commercial; Recreational; and Residential.