DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Waste Management

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EFFECTIVE DATE: January 16, 2021

TITLE: Management of Fill Policy

AUTHORITY: This document is established in accordance with the Solid Waste Management Act, 35 P.S. §§ 6018.101 *et seq.* (SWMA); the Clean Streams Law, 35 P.S. §§ 691.1 *et seq.*; Section 1917-A of the Administrative Code, 71 P.S. § 510-17; and the Land Recycling and Environmental Remediation Standards Act, 35 P.S. §§ 6026.101 *et seq.*

POLICY: A person placing solid waste onto the ground is generally required to obtain a disposal permit from the Department of Environmental Protection (Department or DEP). A person is not required to obtain a permit under SWMA if the person can demonstrate that the material qualifies as clean fill in accordance with the municipal and residual waste regulations, 25 Pa. Code § 271.101(b)(3) and § 287.101(b)(6).

PURPOSE: This policy provides DEP's procedures for determining whether fill is "clean fill," as defined in the municipal and residual waste regulations at 25 Pa. Code § 271.1 and § 287.1, respectively, or "regulated fill," as defined in this policy. Regulated fill may not be used outside of a project area or right-of-way of a project unless a SWMA permit has been issued to the person using the regulated fill.

APPLICABILITY: This policy shall be used to evaluate whether a person is required to obtain a permit under the SWMA for the use of fill in accordance with the municipal and residual waste regulations, 25 Pa. Code § 271.101(b)(3) and § 287.101(b)(6). This policy describes the type of fill that qualifies as clean fill or regulated fill. This policy does not apply to mine land reclamation activities subject to a permit or fill used within the same project area or project right-of-way. Excavation, movement or reuse of fill within a project area or right-of-way of a project is not an activity that requires a SWMA permit. This policy does not apply to fill that has been determined to be clean or regulated fill prior to the effective date of this policy, unless the fill is moved to a new receiving site or off the project area or project right-of-way after the effective date of this policy. This policy does not apply to fill that has been determined to be clean or regulated fill prior to the implementation of revised clean fill concentration limits or regulated fill concentration limits, unless the fill is moved to a new receiving site or off the project area or project right-of-way after the effective date of the revised limits.

DISCLAIMER: The policies and procedures outlined in this guidance document are intended to supplement existing requirements. Nothing in the policies or

procedures shall affect regulatory requirements. The policies and procedures herein are not an adjudication or a regulation. There is no intent on the part of the DEP to give the rules in these policies that weight or deference. This document establishes the framework within which DEP will exercise its administrative discretion in the future. DEP reserves the discretion to deviate from this policy statement if circumstances warrant.

PAGE LENGTH: 26 pages

DEFINITIONS:

Acid-producing rock – Stone, rock or other mineral materials that, when exposed to air and water, cause a low pH discharge that adversely affects or endangers public health, safety, welfare, or the environment or causes a public nuisance.

Act 2 – The Land Recycling and Environmental Remediation Standards Act, 35 P.S. §§ 6026.101 *et seq.*

Act 2 site – A site as defined in Section 103 of Act 2, 35 P.S. § 6026.103, for which a notice of intent to remediate has been submitted to DEP.

Background – The concentration of a regulated substance that is present at a site but not related to the release of regulated substances from a specific point source or activity at the site.

Background reference area – The area identified for sampling that: will be used to establish background; is sampled and analyzed to determine the concentration of regulated substances found at or within a close proximity to the donor site, at a depth comparable to that of the area to be excavated at the donor site, in the same soil layer as the donor fill; is unaffected by a release of regulated substances from a specific point source or activity at the site; and meets one of the following criteria:

i. The concentration of regulated substances in the soil is attributable to the parent material from which the soil was derived and the natural processes which produce soil, or

ii. The concentrations of regulated substances in the soil resulted from an atmospheric deposition, including lead or polynuclear aromatic hydrocarbons, but are not attributable to a specific point source or release of a regulated substance. For the purposes of this definition, "atmospheric deposition" refers only to the ubiquitous, widespread deposition of regulated substances from the air that is incapable of being traced to a specific point source or multiple point sources. For example, chromium that has condensed on the ground outside an electroplater air vent would not be due to "atmospheric deposition" because the presence of the chromium is a result of a discharge from a specific point source, even though the chromium was released into the air before being deposited on the ground. However, the presence of lead or benzo-a-pyrene (BAP) in an urban or industrial area that can be traced to the operation of motor vehicles may be due to atmospheric deposition if the concentration levels are demonstrated to be pervasive over the greater urban or industrial area.

Clean fill – Uncontaminated, nonwater-soluble, nondecomposable, inert solid material used to level an area or bring an area to grade. The term does not include materials placed in or on the waters of the Commonwealth. Although the placement of clean fill in or on waters of the Commonwealth cannot be managed under this policy, placement of clean fill in or on waters of the Commonwealth may be approved under a separate DEP authorization. The term includes only those materials that are identified as "fill," as the term is defined in this policy. The term does not include fill that has been blended, mixed or treated with the purpose of meeting the definition of "clean fill" and that without being blended, mixed or treated would fail to meet the numeric limits identified in the definition of "uncontaminated material" contained in this policy.

Clean fill concentration limits (CFCLs) – With the exception of PCBs and chloride, the concentrations of regulated substances that do not exceed the numeric values specified in Table 3 [Medium-Specific Concentrations (MSCs) for Organic Regulated Substances in Soil] and Table 4 [Medium-Specific Concentrations (MSCs) for Inorganic Regulated Substances in Soil] of Appendix A in 25 Pa. Code

Chapter 250 (relating to administration of land recycling program). The applicable numeric limit is determined by comparison of the Generic Soil to Groundwater Value[1] with the Direct Contact Residential Value[2] and selection of the lower of the two values. For PCBs, the sum total of the concentration of all PCB aroclors (total PCB concentration) may not exceed 50 ppm. Fill containing a concentration of total PCBs greater than 2 ppm may be subject to regulation under the Toxic Substances Control Act (TSCA), 15 U.S.C. Section 2601 et seq., and 40 C.F.R. Part 761, which is administered and implemented by the U.S. Environmental Protection Agency (EPA). EPA's TSCA requirements are independent of any use of fill that is otherwise in accordance with the Department's policy and regulations. An applicant should be aware that its characterization and handling of any soils through the guidance of the Management of Fill policy does not necessarily satisfy a potential EPA TSCA inquiry, and that an applicant may need a separate approval from EPA should EPA require it. For all such material, DEP recommends that you contact the PCB Coordinator for EPA Region 3 by email at R3_PCB_Coor@epa.gov to determine whether PCB-containing fill may be used and to obtain information relating to the associated EPA procedures for collecting and analyzing samples. For chloride, the value obtained using the Synthetic Precipitation Leaching Procedure, (SPLP, SW-846, Method 1312) may not exceed the numeric value specified in Table 2 [MSCs for Inorganic Regulated Substances in Groundwater] of Appendix A in 25 Pa. Code, Chapter 250.

Composite sample – A sample collected across a spatial range that typically consists of a set of discrete samples that are combined or "composited." A composite sample should not be confused with a discrete sample that is created from multiple increments taken at a single location to obtain a sample of the desired size, shape and orientation.

Discrete sample – A sample that represents material from a single location. A discrete sample can be composed of more than one increment.

Donor site – The area from which fill originates that is separate from a receiving site. Multiple donor sites may be identified on a single project area.

Environmental due diligence – Investigative techniques used to determine whether fill from a donor site has been affected by a release of a regulated substance. Examples of investigative techniques included in this term are visual property inspections, electronic data base searches, review of ownership and historical use of a property, Sanborn maps, environmental questionnaires, transaction screens, analytical testing, environmental assessments, audits, or procedures outlined in ASTM standard E1527-13. A single investigative technique may not be used as the basis for environmental due diligence. Environmental due diligence includes visual property inspection and a review of ownership and historical property use, at a minimum, unless analytical sampling is performed in lieu of a review of ownership and historical property use.

Fill – The term is limited to clean, regulated and historic fill that is soil, rock, stone, gravel, used asphalt, brick, block or concrete from construction and demolition activities that is separate from other waste and recognizable as such, and "dredged material," as the term is defined by the municipal and residual waste regulations, 25 Pa. Code §§ 271.1 and 287.1, whichever is applicable. The term does not include reclaimed asphalt pavement, naturally occurring asbestos, mine spoils or acid-producing rock.

Grab sample – A discrete sample, consisting of one increment, collected specifically for Volatile Organic Compounds (VOC) analysis.

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[1] Numeric values based on generic leaching modeling for soils at residential properties overlying used aquifers with total dissolved solids at concentrations less than or equal to 2500 mg/L.

[2] Direct contact numeric values for soils at residential properties.

Historic fill – Material, excluding material disposed in landfills, waste piles and impoundments, used to bring an area to grade prior to 1988, and consisting of a conglomeration of soil and residuals, such as ashes from the residential burning of wood and coal, incinerator ash, coal ash, slag, dredged material and construction and demolition waste. The term does not include iron or steel slag that is separate from residuals if it is a coproduct, as the term is defined in 25 Pa. Code § 287.1 and satisfies the requirements of 25 Pa. Code § 287.8. The term does not include coal ash that is separate from residuals if it is beneficially used in accordance with 25 Pa. Code §§ 290.1 – 290.415.

Increment – Material collected in a single operation of the sampling device.

PCB – A chemical substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees or a substance that contains that substance.

ppm – Parts per million.

Project area – The boundary within which earth disturbance activities occur, including areas in close proximity to the earthmoving activities that are necessary for the completion of a construction project, or other human activity which disturbs the surface of the land, including land clearing and grubbing; grading; excavations; embankments; land development; agricultural plowing or tilling; operation of animal heavy use areas; timber harvesting activities; road maintenance activities; linear projects such as utility line work; oil and gas activities; well drilling; mineral extraction; and the moving, depositing, stockpiling, or storing of soil, rock or earth materials. The term includes the boundary within which all earth disturbance activity, construction, materials storage, grading, landscaping and related activities occur.

Reclaimed asphalt pavement (RAP) – Small particles, typically less than one inch in size, of bitumen and inorganic materials produced by the mechanical grinding of bituminous pavement surfaces that have not been subject to a release of regulated substances or mixed with other solid waste. The term does not include "used asphalt," as the term is defined in this policy.

Receiving site – The area to which fill is proposed to be relocated. A receiving site is separate from a donor site and not part of a project area or right-of-way.

Regulated fill – "Fill," as the term is defined in this policy, that has been affected by release of a regulated substance and is not "uncontaminated material," as the term is defined in this policy. The term does not include fill that has been blended, mixed or treated with the purpose of meeting the definition of "regulated fill" and that without being blended, mixed or treated would fail to meet the regulated fill concentration limits, as the term is defined in this policy.

Regulated fill concentration limits (RFCLs) – With the exception of PCBs, the concentrations of regulated substances that do not exceed the numeric values specified in Table 3 [Medium-Specific Concentrations (MSCs) for Organic Regulated Substances in Soil] and Table 4 [Medium-Specific Concentrations (MSCs) for Inorganic Regulated Substances in Soil] of Appendix A in 25 Pa. Code Chapter 250 (relating to administration of land recycling program). The applicable numeric limit is determined by comparison of the Generic Soil to Groundwater Value[3] with the Direct Contact Non-Residential Value[4] and selection of the lower of the two values. For PCBs, the sum total of the

[3] Numeric values based on generic leaching modeling for soils at non-residential properties overlying used aquifers with total dissolved solids at concentrations less than or equal to 2500 mg/L.
[4] Direct contact numeric values for soils at non-residential properties.

concentration of all PCB aroclors (total PCB concentration) may not exceed 50 ppm. Fill containing a concentration of total PCBs greater than 2 ppm may be subject to regulation under the Toxic Substances Control Act (TSCA), 15 U.S.C. Section 2601 et seq., and 40 C.F.R. Part 761, which is administered and implemented by the EPA. EPA's TSCA requirements are independent of any use of fill that is otherwise in accordance with the Department's policy and regulations. An applicant should be aware that its characterization and handling of any soils through the guidance of the Management of Fill policy does not necessarily satisfy a potential EPA TSCA inquiry, and that an applicant may need a separate approval from EPA should EPA require it. For all such material, DEP recommends that you contact the PCB Coordinator for EPA Region 3 by email at R3_PCB_Coor@epa.gov to determine whether PCB-containing fill may be used and to obtain information relating to the associated EPA procedures for collecting and analyzing samples.

Regulated substance – The term includes hazardous substances and contaminants regulated under the Hazardous Sites Cleanup Act, 35 P.S. §§ 6020.101 *et seq.*; and substances regulated by the Clean Streams Law, 35 P.S. §§ 691.1 *et seq.*; the Air Pollution Control Act, 35 P.S. §§ 4001 *et seq.*; the Solid Waste Management Act, 35 P.S. §§ 6018.101 *et seq.*; the Infectious and Chemotherapeutic Waste Law, 35 P.S. §§ 6019.1 *et seq.*; and the Storage Tank and Spill Prevention Act, 35 P.S. §§ 6021.101 *et seq.*

Release – Spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping or disposing of a regulated substance into the environment in a manner not authorized by the Department. The term includes the abandonment or discarding of barrels, containers, vessels and other receptacles containing a regulated substance.

Uncontaminated or *Uncontaminated material* – The term means either of the following:

(1) Fill unaffected by a release of a regulated substance or,

(2) Fill affected by release of a regulated substance, if the concentrations of regulated substances in the fill do not exceed the clean fill concentration limits, as the term is defined in this policy. Analysis should be carried out for only those regulated substances that are suspected to be present due to a release.

The term does not include fill that has been blended, mixed or treated with the purpose of meeting the definition of "uncontaminated material."

Used asphalt **–** Pieces of bitumen and inorganic materials from the demolition of bituminous pavement. The term does not include "reclaimed asphalt pavement," as the term is defined by this policy.

REFERENCES:

25 Pa. Code Chapters 287 to 299 (residual waste regulations)
25 Pa. Code Chapters 271 to 285 (municipal waste regulations)
Solid Waste Management Act, 35 P.S. §§ 6018.101 *et seq.*
Land Recycling and Environmental Remediation Standards Act, 35 P.S. §§ 6026.101 *et seq.*
Section 1917-A of the Administrative Code, 71 P.S. § 510-17
The Clean Streams Law, 35 P.S. §§ 691.1 *et seq.*

TECHNICAL GUIDANCE:

A. Purpose and Applicability

Fill is used in construction or earthmoving projects across the Commonwealth to level an area or bring an area to grade. These projects may involve using fill as a subbase or to fill in low-lying areas. The manner in which fill may be used depends on whether the fill is clean fill or regulated fill. This policy provides procedures for determining whether fill is clean fill or regulated fill and describes how each category may be managed after a fill determination has been performed.

This policy does not apply to the following activities:

- Mine land reclamation activities subject to a permit.
- Management of waste from land clearing, grubbing and excavation, including trees, brush, stumps and vegetative material.[5]
- Movement or use of fill within a project area or right-of-way of a project.
- Use of reclaimed asphalt pavement in accordance with DEP's industry-wide coproduct determination.
- The use of clean fill or regulated fill prior to January 1, 2020, unless the fill is moved to another receiving site, project area or off the project right-of-way after January 1, 2020.

In general, fill that is demonstrated to be clean fill can be used in an unrestricted manner, provided it is not placed in waters of the Commonwealth; it is used in compliance with 25 Pa. Code, Chapters 102 and 105 (relating to erosion and sediment control; and dam safety and waterway management); and it is managed in accordance with Section D of this policy. Persons using fill must also comply with the fugitive emissions regulations under 25 Pa. Code, Chapter 123 (relating to standards for contaminants) issued under the Air Pollution Control Act, 35 P.S. § 4001, and shall comply with all the applicable provisions of 25 Pa. Code §§ 123.1 and 123.2 (relating to prohibition of certain fugitive emissions and fugitive particulate matter). Depending on the manner in which it is generated, clean fill may be a "waste," as that term is defined in the municipal or residual waste regulations, 25 Pa. Code § 271.1 and § 287.1, respectively, whichever is applicable.

This policy does not apply to fill that has been determined to be clean or regulated fill prior to the implementation of revised CFCLs or RFCLs, unless the fill is moved to a new receiving site or off the project area or project right-of-way after the effective date of the revised CFCLs or RFCLs.

Fill that is demonstrated to be regulated fill can be used by persons who have applied for and obtained coverage under the Department's General Permit No. WMGR096, Beneficial Use of

[5] In accordance with 25 Pa. Code § 271.101(b)(4), a person managing waste from land clearing, grubbing and excavation, including trees, brush, stumps and vegetative material, shall implement best management practices developed by the Department. Refer to Document No. 254-5400-001 - *Best Management Practices for the Management of Waste From Land Clearing, Grubbing, and Excavation (LCGE)*.

Regulated Fill. Coverage under General Permit No. WMGR096 is not required in the following instances:

- Remediation activities undertaken entirely on an Act 2 site, pursuant to the requirements of § 902 of Act 2.

- When fill from an Act 2 site is used as construction material at a receiving site that is being remediated to attain an Act 2 standard, provided the procedural and substantive requirements of Act 2 and the conditions specified in Section C.2.a. and b. of this policy are satisfied.

- Use of the regulated fill is limited to the excavation, movement or use of the regulated fill within a project area or right-of-way of a project.

Regulated fill is a "waste," as that term is defined in the municipal or residual waste regulations, 25 Pa. Code § 271.1 and § 287.1, respectively.

B. Procedure for Performing a Fill Determination

Prior to the movement of fill to a receiving site, either the person proposing to provide the fill from a donor site or the person proposing to receive the fill determines whether the fill is clean fill or regulated fill pursuant to this policy. Use the following steps to make that determination:

1. Determine Eligibility: A material is eligible for management as clean or regulated fill under this policy if it satisfies the following criteria:

    a. The material is "fill," as the term is defined in this policy. If the fill under consideration contains acid-producing rock, it is specifically excluded from the definition of fill. Appendix B contains information relevant to identifying acid-producing rock.

    b. The fill does not contain regulated substances that were intentionally released.

    c. The fill has not been blended, mixed or treated with the purpose of meeting the definition, or applicable numeric limits, of "uncontaminated material," "clean fill" or "regulated fill."

    d. The fill does not exhibit a characteristic of toxicity, as determined by 40 CFR § 261.24 (relating to toxicity characteristic). The toxicity characteristic is of concern only when environmental due diligence indicates that the fill being considered for use may have been affected by a release of a regulated substance that is included in Table 1 in 40 CFR § 261.24. If the total concentration of the substance exceeds the limit for the substance in Table 1 of 40 CFR § 261.24 by a factor of 20 or more, the issue regarding potential toxicity should be addressed either by performing the Toxic Characteristic Leaching Procedure (TCLP), in accordance with Method 1311, found in the most recent version of EPA's publication, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, also known as SW–846, or providing additional description of the fill, indicating that the substance is bound in the matrix and not leaching.

e. PCB-containing Fill: If the environmental due diligence indicates that the fill may have been subject to a release of PCBs, test it for the presence of PCBs. Fill containing a concentration of total PCBs greater than 2 ppm may be subject to regulation under the Toxic Substances Control Act (TSCA), 15 U.S.C. §§ 2601 *et seq.*, and 40 CFR Part 761, which is administered and implemented by the EPA. EPA's TSCA requirements are independent of any use of fill that is otherwise in accordance with the Department's policy and regulations. An applicant should be aware that its characterization and handling of any soils through the guidance of the Management of Fill policy does not necessarily satisfy a potential EPA TSCA inquiry, and that an applicant may need a separate approval from EPA should EPA require it. For all such material, DEP recommends that you contact the PCB Coordinator for EPA Region 3 by email at R3_PCB_Coor@epa.gov to determine whether PCB-containing fill may be used and to obtain information relating to the associated EPA procedures for collecting and analyzing samples.

2. Perform Environmental Due Diligence: Once determined that the fill is eligible for use under this policy, evaluate the fill to determine whether it has been affected by a release of a regulated substance by performing "environmental due diligence," as the term is defined in this policy. Except for historic fill, analytical testing of the fill is not necessary unless environmental due diligence indicates that the fill may have been affected by a release of a regulated substance. However, a person performing a fill determination may choose to perform analytical testing in lieu of conducting a review of ownership and historic property use to satisfy the minimum condition for performing environmental due diligence.

The use of historic fill as clean fill under this policy is limited to historic fill that is a conglomeration of soil, residuals and fill. Historic fill that is comprised primarily of residuals does not represent a conglomeration of soil, residuals, and fill and therefore, cannot be used as clean fill. Pockets of residuals, such as ash or slag, should be removed and managed separately from other historic fill prior to making a determination that the historic fill can be used as clean fill. Perform analytical testing to demonstrate that the historic fill meets the definition of uncontaminated material. To qualify for use as clean fill, historic fill should be tested for the parameters included in Table 1, below, as well as any additional parameters that are suspected based on historic property use or review of records. The placement of historic fill as clean fill may not contaminate groundwater. For regulated substances detected in the historic fill, the value obtained using the Synthetic Precipitation Leaching Procedure, (SPLP, SW-846, Method 1312) may not exceed the numeric value as identified in Table 1 [MSCs for Organic Regulated Substances in Groundwater] and Table 2 [MSCs for Inorganic Regulated Substances in Groundwater] of Appendix A in 25 Pa. Code, Chapter 250.

a. If due diligence shows no evidence that the fill may have been affected by a release of a regulated substance, the fill may be managed as clean fill in accordance with the Section D of this policy (relating to management of clean fill) unless during movement, transport or placement there are observable indications (such as appearance or odors) which indicate evidence of a release of a regulated substance.

b. If due diligence shows evidence that the fill may have been affected by a release of a regulated substance, test the fill to determine if it is clean fill or regulated fill. Perform the testing in accordance with Appendix A of this policy. Analysis should be carried out for only those regulated substances that are suspected to be present due to a release or based upon historic use of the donor site.

i. Except as provided elsewhere in this policy, if testing reveals that the fill contains regulated substances at concentrations that are below the CFCLs, the fill may be managed as clean fill in accordance with Section D of this policy (relating to management of clean fill). A person may not blend, mix or treat fill that would otherwise fail to meet the CFCLs with the purpose of meeting the definition of uncontaminated material or clean fill. For the purposes of completing Form FP-001 for the certification of clean fill, the CFCLs in effect on the date of submission should be used to evaluate whether the fill qualifies for use as clean fill.

ii. Except as provided elsewhere in this policy, if testing reveals that the fill contains regulated substances at concentrations that exceed the CFCLs but are at or below the RFCLs, the fill may be managed as regulated fill only if coverage under General Permit No. WMGR096 is obtained. A person may not blend, mix or treat fill that would otherwise fail to meet the RFCLs with the purpose of meeting the definition of regulated fill. Manage regulated fill in accordance with the Section C of this policy (relating to management of regulated fill).

iii. Except as provided elsewhere in this policy, if testing reveals that the fill contains regulated substances at concentrations that exceed the RFCLs, the fill may not be managed as clean fill or regulated fill. Fill exceeding the RFCLs may require disposal in accordance with the hazardous, municipal or residual waste regulations, 25 Pa. Code, Articles VII, VIII or IX, respectively, whichever is applicable.

TABLE 1: Screening Parameters for Historic Fill

Regulated Substance	CASRN	Regulated Substance	CASRN	Regulated Substance	CASRN
Aldrin	309-00-2	PCB-1254 (Aroclor)	11097-69-1	Copper	7440-50-8
Anthracene	120-12-7	Phenanthrene	85-01-8	Iron	7439-89-6
Benzene	71-43-2	Pyrene	129-00-0	Lead	7439-92-1
Benzo(a)anthracene	56-55-3	Toluene	108-88-3	Manganese	7439-96-5
Benzo(a)pyrene	50-32-8	Trichloroethane, 1,1,1-	71-55-6	Mercury	7439-97-6
Benzo(b)fluoranthene	205-99-2	Trichloroethylene (TCE)	79-01-6	Molybdenum	7439-98-7
Benzo(ghi)perylene	191-24-2	Xylenes (Total)	1330-20-7	Nickel	7440-02-0
Chrysene	218-01-9	Aluminum	7429-90-5	Selenium	7782-49-2
Cumene (Isopropyl benzene)	98-82-8	Antimony	7440-36-0	Silver	7440-22-4
DDD, 4,4	72-54-8	Arsenic	7440-38-2	Thallium	7440-28-0
DDE, 4,4	72-55-9	Barium	7440-39-3	Vanadium	7440-62-2
DDT, 4,4	50-29-3	Beryllium	7440-41-7	Zinc	7440-66-6

TABLE 1: Screening Parameters for Historic Fill

Regulated Substance	CASRN	Regulated Substance	CASRN	Regulated Substance	CASRN
Dichloroethylene, cis-1,2-	156-59-2	Boron	7440-42-8	Ammonia	7664-41-7
Dieldrin	60-57-1	Cadmium	7440-43-9	Chloride	7647-14-5
Ethylbenzene	100-41-4	Chromium(III)	16065-83-1	Fluoride	7681-49-4
Fluorene	86-73-7	Chromium(VI)	18540-29-9	Sulfate	7757-82-6
Ideno(1,2,3-cd) pyrene	193-39-5	Chromium (total)	7440-47-3		
Napthalene	91-20-3	Cobalt	7440-48-4		

C. Management of Regulated Fill

Regulated fill must be managed in accordance with the Department's municipal or residual waste regulations, 25 Pa. Code § 271.2 and § 287.2, respectively, whichever is applicable, and may be beneficially used in accordance with General Permit No. WMGR096.

Coverage under General Permit No. WMGR096 is not required in the following instances:

1. Remediation activities undertaken entirely on an Act 2 site, pursuant to the requirements of Section 902 of Act 2.

2. When fill from an Act 2 site is used as construction material at a receiving site that is being remediated to attain an Act 2 standard, provided the procedural and substantive requirements of Act 2 and the following are satisfied:

    a. Regulated substances contained in the fill are incorporated into the notice of intent to remediate and the final report for the remediation taking place at the receiving site.

    b. Movement of fill between Act 2 sites is documented in the final reports for both the donor site and receiving site.

    c. Except as provided elsewhere in this policy, placement of the fill does not and will not cause the receiving site undergoing remediation to exceed the selected Act 2 standard.

3. Use of the regulated fill is limited to the excavation, movement or use of the regulated fill within a project area or right-of-way of a project.

A person or municipality interested in obtaining coverage under General Permit No. WMGR096 must apply to the Department in accordance with the application instructions provided in the permit. The terms and conditions of General Permit No. WMGR096 are available on the Department's website.

D. Management of Clean Fill

Pursuant to 25 Pa. Code § 271.101(b)(3) and § 287.101(b)(6), use of clean fill does not require a permit under the SWMA or the municipal or residual waste regulations. Clean fill may be used in accordance with all applicable requirements governing the placement or use of clean fill,

including 25 Pa. Code Chapter 102 (relating to erosion and sediment control) and 25 Pa. Code Chapter 105 (relating to dam safety and waterway management). Persons using fill must also comply with the fugitive emissions regulations under 25 Pa. Code, Chapter 123 (relating to standards for contaminants) issued under the Air Pollution Control Act, 35 P.S. § 4001, and shall comply with all the applicable provisions of 25 Pa. Code §§ 123.1 and 123.2 (relating to prohibition of certain fugitive emissions and fugitive particulate matter). The use of clean fill may be regulated under other environmental laws and regulations.

If the uncontaminated brick, block or concrete from a construction or demolition activity is intended for use as clean fill, best management practices (BMPs) should be followed prior to demolition activities to remove from a building or structure all materials that do not meet the definition of clean fill, such as materials or surfaces covered with lead-based paint, friable asbestos, and hazardous materials such as mercury switches, PCB ballasts, tritium-containing exit signs, and fluorescent light bulbs.

Clean fill may not contain any free liquids based on visual inspection and cannot create a public nuisance (such as an objectionable odor) to users of the receiving site or adjacent properties.

If any person wants to use clean fill under this policy, complete Form FP-001, Certification of Clean Fill, and submit it to DEP electronically on the DEP website at https://www.dep.pa.gov/Business/Land/Waste/SolidWaste/Residual/Pages/default.aspx. Complete and submit the FP-001 prior to movement of clean fill to the receiving site. Complete and submit FP-001 regardless of whether sampling and analysis are performed as part of environmental due diligence.

If the donor site has undergone or is undergoing cleanup or remediation under a local, state or federal regulatory program that requires site characterization, or if the fill proposed to be managed as clean fill has otherwise been subject to analytical testing or other procedures identified in the definition of "environmental due diligence," attach the following to Form FP-001:

- Copies of the sampling plan developed for the fill,
- All laboratory reports,
- Documentation and data associated with a background determination and equivalent site evaluation conducted as part of the fill determination, including the identification and location of point sources, the proximity of identified point sources to the background reference area, identification of areas of imported fill other than imported clean fill, etc.

If a person receives fill from multiple donor sites, a separate Form FP-001 is necessary for each donor site. DEP will accept the completed FP-001 electronically via a link on the DEP website.

If a background demonstration is made, as described in Appendix A of this policy, use the FP-001 to include documentation of the background demonstration along with documentation demonstrating that an equivalent site evaluation has been performed and the provisions of Appendix A have been satisfied.

Both the donor site and the receiving site are responsible for maintaining copies of the completed Form FP-001 for a period of five (5) years. Copies of the form and all supporting documentation, including analytical test reports, should be made available and provided to DEP upon request.

Appendix A
Sample Collection and Analytical Testing Protocol for Performing Environmental Due Diligence

Prior to movement of fill to a receiving site, use Sections B-D of the Management of Fill policy to make a fill determination. Analytical testing of the fill is not necessary unless environmental due diligence indicates a release of a regulated substance. This Appendix provides guidelines for using analytical testing as part of the environmental due diligence.

A. Sampling Plan Development

The first step in a chemical evaluation of fill is to develop a plan for sampling. To use analytical testing as part of the environmental due diligence, develop and implement a scientifically credible sampling plan in accordance with the most recent version of the EPA's publication, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,* also known and hereinafter referred to as SW-846, and the *RCRA Waste Sampling Draft Technical Guidance, EPA530-D-02-002*. Chapter 9 of SW-846 describes procedures for developing a sampling plan and the statistical treatment of data. Where there is disagreement between the procedures outlined in this Appendix and the referenced EPA documents, follow the procedures contained in this Appendix.

Employ a systematic planning process, such as the Data Quality Objectives Process identified in the *RCRA Waste Sampling Draft Technical Guidance*, to set objectives for the type, quantity and quality of data needed to demonstrate with a known level of assurance that the applicable standards for clean fill or regulated fill are achieved. The level of complexity and detail needed in the sampling plan are directly related to the size, scope and level of complexity of the donor site.

The following are the minimum scientific objectives of a sampling plan developed under this policy:

- Identify and quantify known or suspected contaminants in the fill.
- Collect samples that will allow measurements of the chemical properties of the fill that are both accurate and precise.
- Collect representative samples, which for the purposes of implementing this policy are samples exhibiting typical properties of the whole volume of fill.
- Collect enough samples, and in no case less than eight discrete samples or two composite samples, to sufficiently represent the variability of the fill.
- Obtain a statistically valid and reliable estimate of the fill's chemical properties.

Characterize the fill both horizontally and vertically to represent the entire volume of fill to be transported off the donor site and used at a receiving site. A thorough characterization will provide the following information:

- Identity of regulated substances associated with a release that are present in the fill, the concentration of each identified regulated substance, and the spatial variation in concentration of each regulated substance both horizontally and vertically.

- The physical characteristics of the fill in which the regulated substances associated with a release are present. Examples of these include the fill type (such as soil, rock, dredge), texture, dry bulk density, permeability, organic carbon content, porosity, and moisture content. Include documentation of physical characteristics and any significant variability over the donor site.

In the sampling plan include a summary of existing information about the donor site, including any previously performed sampling or analysis information, preliminary estimates of summary statistics such as the mean and standard deviation, process descriptions and materials used, spatial boundaries of the donor site to be managed under this policy, information about what is known or suspected at the donor site, releases, and release mechanisms. Document this information by written descriptions of site conditions supported by maps, cross-sections, site diagrams, or other descriptive, graphical, or tabular illustrations necessary to characterize the site conditions.

Sampling units for fill managed under this policy should represent the total volume of fill being characterized pursuant to Sections B and C of this Appendix. Sampling plans may include a combination of probability sampling and authoritative sampling designs depending on conditions at the donor site. Probability sampling should be used to characterize the fill as a whole. Some sites may require additional, more focused sampling, such as authoritative sampling, to evaluate problem areas, such as localized areas that are suspected to contain the highest levels of regulated substances, or "hot spots," or areas that may require further evaluation. For example, areas that housed an underground storage tank or experienced a release of regulated substances should be sampled authoritatively and more frequently than other areas of the donor site. The remaining area of the donor site should be sampled using probability sampling, in which all parts of the fill being characterized have a known probability of being included in the characterization. Samples collected to delineate a "hot spot" are typically in addition to those collected for the overall site characterization.

B. Sampling Procedures for Fill Stored in Piles

There are several variables involved in the sampling of fill stored in piles, including the size and shape of the pile, compactness of the fill, and physical properties of the fill. The size and shape of the pile should be used to calculate volume and plan for the correct number of samples to be taken. Simple random sampling or stratified random sampling should be used to obtain representative samples from a fill pile, in accordance with SW-846 and Sections 5.2.1 – 5.2.2, and 5.3 of the *RCRA Waste Sampling Draft Technical Guidance, EPA530-D-02-002*. A method of random sampling, such as simple random or stratified random sampling should be used unless one of the following conditions exists:

- There are known distinct strata.

- An objective of the sampling is to prove or disprove that there are distinct strata.

- The number of samples is limited, and an objective of the sampling is to statistically minimize the size of a "hot spot" that might not get sampled.

Stratified random sampling can be employed only if all points within the pile can be accessed. In such cases, the pile should be divided into a three-dimensional grid system. The grid cubes should be numbered, and the grid cubes to be sampled should be chosen by random number tables or generators.

Generally, stainless-steel shovels, trowels, or scoops should be used to clear away surface material before samples are collected. Depth samples may be collected using a decontaminated auger. For a sample core, thin-wall tube samplers or grain samplers may be used. Near surfaces, samples can be collected with a clean, stainless-steel spoon or trowel. All samples collected, except those for VOCs analysis, should be placed into a Teflon-lined or stainless-steel pail and mixed thoroughly before transfer to the appropriate sample container. Since volatilization of VOCs can occur rapidly once the matrix is disturbed, grab samples are necessary for VOCs analysis. Grab samples should be handled as intact cores and transferred immediately to the container that will be used for analysis. Refer to SW-846, Method 5035, for container and preservation details specific to samples for VOCs analysis.

The sampling and subsequent analysis of fill stored in piles may be performed by collecting composite or discrete samples.

1. Procedure for Using Composite Samples:

    a. Do not use composite sampling if the integrity of the individual sample changes because of the physical mixing of discrete samples.

    b. For up to 125 cubic yards of fill, collect and handle eight discrete samples (plus two grab samples for VOCs) as follows:

        i. Prior to compositing, field screen the eight discrete samples to identify the two that are most likely to contain the highest concentrations of VOCs.

        ii. In accordance with SW-846, Method 5035, collect grab samples for VOC analysis from the two points identified by the field screening described above.

        iii. For all other substances, combine the eight discrete samples collected into two composite samples comprised of four discrete samples each. Perform the analysis on the two composite samples in accordance with SW-846.

c. For greater than 125 cubic yards and up to and including 3,000 cubic yards, collect and handle 12 discrete samples (plus three grab samples for VOCs) as follows:

i. Prior to compositing, field screen the 12 discrete samples to identify the three samples that are most likely to contain the highest concentrations of VOCs.

ii. In accordance with SW-846, Method 5035, collect grab samples for VOC analysis from the same sampling points as the three discrete samples identified by field screening.

iii. For all other substances, combine the 12 discrete samples collected into three composite samples comprised of four discrete samples each. Perform the analysis on the three composite samples in accordance with SW-846.

d. For each additional 1,000 cubic yards of fill or part thereof over the initial 3,000 cubic yards, collect four additional discrete samples (plus one grab sample for VOCs). Composite and analyze the four discrete samples in accordance with SW-846.

2. Procedure for Using Discrete Samples:

a. For up to 125 cubic yards of fill, collect and analyze a minimum of eight discrete samples (plus two grab samples for VOCs). For volumes of fill greater than 125 cubic yards and up to and including 3,000 cubic yards, collect and analyze a minimum of 12 discrete samples (plus three grab samples for VOCs). For each additional 1,000 cubic yards of fill or part thereof over the initial 3,000 cubic yards, collect and analyze a minimum of four additional discrete samples (plus one grab sample for VOCs).

b. For VOCs analysis, perform grab sampling as described in subsection B.1 of this Appendix.

C. Sampling Procedures for In-situ Fill

For the purposes of this policy, “in-situ fill” refers to fill that is undisturbed in its original location at the donor site or fill that has previously been used as clean or regulated fill and will be subsequently excavated and moved to a receiving site. If conducting sampling on in-situ fill to evaluate whether that fill can be managed as clean or regulated fill, characterize both the vertical and horizontal extent of the fill to be transported and used at a receiving site. Where multiple zones of contamination are possible due to site-specific conditions, including separate and discrete releases or the manner in which fill was originally placed, the characterization and demonstration that the fill meets the CFCLs or RFCLs apply individually to the separate zones.

For in-situ sampling where the purpose of the sampling is to characterize a specific release at the donor site, discrete samples collected using a focused sampling technique, such as authoritative sampling, must be used for analysis. These areas may be:

- Localized areas that are known to contain levels of regulated substances that exceed the CFCLs or RFCLs, whichever is applicable, based on analytical results, or

- Localized areas suspected to contain levels of regulated substances that exceed the CFCLs or RFCLs from a specific release, whichever is applicable, based on the historic use of the site.

Once the specific release at the donor site has been characterized, composite samples may be used to confirm that the remaining fill to be excavated and transported to a receiving site and used as clean or regulated fill meets the CFCLs or RFCLs, respectively.

To characterize the remaining area, the area should be sampled using a method of random sampling, such as simple random or stratified random sampling. Composite samples can then be used to verify that the fill intended for excavation and transportation meet the CFCLs or RFCLs, whichever is applicable. When composite samples are utilized for in-situ samples, the sampling plan must demonstrate that localized areas that are known to contain regulated substances exceeding the CFCLs or RFCLs, whichever is applicable, are not included in the portion of the site evaluated using composite samples.

Apart from known hot spots, which may require further sampling and analysis, as discussed above, the donor site should be divided into a three-dimensional grid. Where possible, each grid unit should be of similar size and shape and be comprised of equal volumes of fill. A method of random sampling, such as simple random or stratified random sampling, should be chosen based on knowledge of the donor site as set forth in SW-846 or the *RCRA Waste Sampling Draft Technical Guidance, EPA530-D-02-002*.

The number of sample points is determined by the volume of fill being characterized. Sampling frequency should account for the depth of donor fill to be removed. If an area of donor fill will be excavated to more than one depth (for example, three feet in one part and six feet in another part), then the samples should be distributed accordingly at multiple depths to be representative of the full depth of each cut. Determine the minimum number of samples using the procedure outlined in subsection B.2 of this Appendix. Additional sampling may be necessary based on site-specific conditions.

D. Evaluation of Data

Evaluate sample data generated in accordance with Sections B and C of this Appendix in accordance with the following:

1. For a composite sample collected in accordance with subsection B.1, the measured numeric value for a parameter may not exceed the CFCL for that parameter for the fill to be managed as clean fill, or the RFCL for that parameter for the fill to be managed as regulated fill.

2. For a grab sample collected for VOC analysis in accordance with the above sections, the measured numeric value for a parameter may not exceed the CFCL for that parameter for the fill to be managed as clean fill, or the RFCL for that parameter for the fill to be managed as regulated fill.

3. For discrete samples collected in accordance with subsection B.2, the measured numeric values for a substance in 75% of the discrete samples may not exceed the CFCL for that parameter for the fill to be managed as clean fill, or the RFCL for that parameter for the fill to be managed as regulated fill. For persons using the discrete sampling method, no single sample may show regulated substances at a concentration that is more than twice the CFCL or RFCL, whichever is applicable, for any parameter.

E. Alternate Evaluation of Data

In lieu of Section D of this Appendix, a person may use the 95% Upper Confidence Limit (UCL) of the arithmetic mean to determine whether the fill meets the CFCL or RFCL, whichever is appropriate, for a parameter. The calculated 95% UCL of the arithmetic mean should be below the appropriate CFCL or RFCL for that parameter. Persons intending to use this method for the treatment of data should determine a minimum number of samples in accordance with SW-846 and the *RCRA Waste Sampling Draft Technical Guidance, EPA530-D-02-002*. The application of the 95% UCL of the arithmetic mean should comply with the following performance standards:

1. The null hypotheses (Ho) is that the true arithmetic average concentration is at or above the CFCL or RFCL for that parameter, whichever is appropriate, and the alternative hypothesis (Ha) is that the true arithmetic average concentration is below the CFCL or RFCL for that parameter, whichever is appropriate.

2. Meet the underlying assumptions of the statistical method, such as data distribution.

3. Compositing cannot be used for VOCs.

4. The censoring level for each non-detect is the assigned value randomly generated that is between zero and the limit related to the practical quantitation limit (PQL).

5. Tests should account for spatial variability, unless otherwise approved by the Department.

6. Statistical testing should be done individually for each parameter for which a single sample result or multiple results exceed(s) a limit.

7. Where a fill has distinct physical, chemical or biological characteristics, or originates from different areas, do the statistical testing separately.

8. Document the following information:

    a. A description of the original areas of the fill and physical, chemical and biological characteristics of the fill.

b. A description of the underlying assumptions of the statistical method.

c. Documentation showing that the sample data set meets the underlying assumptions of the statistical method.

d. Documentation of input and output data for the statistical test, presented in tables or figures, or both, as appropriate.

e. An interpretation and conclusion of the statistical test.

F. Use of the Synthetic Precipitation Leaching Procedure (SPLP, SW-846 Method 1312) to Establish an Alternative Soil-to-Groundwater Value

Fill may be analyzed using SPLP to provide an alternative soil-to-groundwater value for use in making a fill determination. The value obtained using the SPLP represents a concentration of a regulated substance in the fill that does not produce leachate in which the concentration of the regulated substance exceeds the applicable groundwater MSC identified in Table 1 [MSCs for Organic Regulated Substances in Groundwater] or 2 [MSCs for Inorganic Regulated Substances in Groundwater] of Appendix A in 25 Pa. Code, Chapter 250. For both clean and regulated fill, the groundwater MSC for used aquifers with TDS <2,500 mg/L should be used to compare the SPLP result to Tables 1 or 2. For clean fill, use the groundwater MSC for residential use ("R") for comparison. For regulated fill, use the groundwater MSC for non-residential use ("NR") for comparison. If SPLP is used to identify an alternative soil-to-groundwater value, the alternative value is only applicable to the fill that was tested using SPLP.

Use the following procedure to determine an alternative soil-to-groundwater value based upon the SPLP:

1. During characterization of the donor site, obtain a minimum of ten samples from the proposed fill. For volumes of fill less than 125 cubic yards, collection of a minimum of eight samples is acceptable. Submit the four samples with the highest total concentration of the regulated substance for SPLP analysis. Samples obtained will be representative of the soil type and horizon impacted by the release of the regulated substance.

2. Determine the lowest total concentration (TC) that generates a failing SPLP result. The alternative soil-to-groundwater value will be the next lowest TC.

3. If all samples result in a passing SPLP level, the alternative soil-to-groundwater value will be the TC corresponding to the highest SPLP result. Additional samples may be collected.

4. If none of the samples generates a passing SPLP, additional samples may be collected and concurrent TC/SPLP analyses performed to satisfy the above conditions for establishing an alternative soil-to-groundwater value.

5. The alternative soil-to-groundwater value is then compared to the direct contact residential value for clean fill or the direct contact non-residential value for regulated fill

found in Chapter 250, Appendix A, Tables 3[6] or 4[7]. The lower of the compared values is the applicable numeric limit.

G. Performing a Background Demonstration and Equivalent Site Evaluation

A background demonstration may be utilized for both clean fill and regulated fill determinations. For clean fill determinations, use the CFCLs. For regulated fill, use the RFCLs. If fill from the donor site contains regulated substances at concentrations exceeding the CFCL or RFCL, whichever is appropriate, for that parameter, a demonstration may be made to show that the exceedance is due to background at the donor site. If a successful background demonstration is made, perform an equivalent site evaluation prior to movement of fill to a receiving site. The equivalent site evaluation ensures that no new regulated substance is placed on the receiving site other than a regulated substance already determined to be present and that the concentration(s) of regulated substance(s) in the donor fill has been compared to the concentration(s) of the same regulated substance(s) at the receiving site in accordance with subparagraphs G.3.b.i-ii. of this Appendix. Regulated substances detected in the donor fill that are below the CFCL or RFCL, whichever is appropriate, for that parameter, do not require a background demonstration or an equivalent site evaluation.

Generally, only naturally occurring metals, lead and some ubiquitous organics, such as polynuclear aromatic hydrocarbons (PAHs), from widespread atmospheric deposition, are eligible for a background demonstration. When data or other information indicates that a regulated substance has migrated onto the donor site from the release of a regulated substance at another site, the regulated substance is not due to background of that substance at the donor site. Pathways for the migration of a regulated substance due to an offsite release include surface runoff from specific sources (such as runoff from parking lots and storage facilities where spills have occurred); spills at railroad facilities and in railroad rights-of-way; and air deposition of regulated substances from specific sources.

Previously collected background data published by an accredited source with appropriate peer review may be considered, provided the information is sufficiently focused and contains the level of detail on the area used to determine background necessary to legitimately compare it to the donor site. The description of the sampling and analysis performed should be detailed enough to provide statistical validity.

Use the following guidelines when performing a background demonstration under this policy:

1. Select a Background Reference Area:

   The first step in making a demonstration that the presence of a regulated substance is due to background at the donor site and is not due to a release is to select a background reference area, as the term is defined in this policy, to collect samples for the purpose of establishing background at the donor site. Samples may be collected from the background reference area to demonstrate that an exceedance of a CFCL or RFCL, as appropriate, can be attributed to background, as the term is defined in this policy. Background reference areas should not include areas affected by a known or suspected

[6] Direct contact numeric values for soils at residential properties
[7] Direct contact numeric values for soils at non-residential properties

release of a regulated substance, including areas impacted by road runoff, areas near railroads affected by engine exhaust contaminants, and areas near buildings contaminated by paint chips. In urban areas, background reference areas may include areas where widespread, ubiquitous contamination is present that cannot be traced to a specific source.

Background reference areas should be as similar as possible to the donor site. Every attempt should be made to reduce the factors that are different between the background reference area and the donor site. This does not mean that a sample collected at a location that is a considerable distance from an area known or suspected to have been affected by a release of a regulated substance is unacceptable merely because the known or suspected regulated substance is detected in the sample. The presence of regulated substance outside of the area known or suspected to have been affected by a release may indicate that the presence of the regulated substance is truly ubiquitous, widespread and incapable of being traced to a specific source. In this case, the regulated substance may be part of the background at the donor site.

A background reference area, as the term is defined in this policy, should be selected for use in the background demonstration.

2. Sampling, Analysis and Evaluation of Data:

Establish background by a sampling methodology that is statistically valid and consistent with the methodology used to perform the fill determination. Use the same analysis methods for the background samples that were used for performing the fill determination.

Compare the analytical results of the background samples with the results obtained from the fill determination. Use the following statistical methods for the comparison:

a. Demonstrate that the highest measurement from the donor site is not greater than the highest measurement from the background reference area. The Department may accept insignificant variances in numbers. The minimum number of samples to be collected is 10 from the background reference area and 10 from each donor site. Analysis should be carried out on discrete samples.

b. The Department may accept another appropriate statistical method if it meets the conditions below.

    i. For nonparametric and parametric methods, the false-positive rate for a set of data applied to a statistical test may not be greater than 0.05. The minimum number of samples to be collected is 10 from the background reference area and 10 from each donor site.

    ii. For parametric methods, the censoring level for each non-detect (ND) should be the assigned value randomly generated that is between zero and the limit related to the PQL.

3. Equivalent Site Evaluation:

The equivalent site evaluation ensures that no new regulated substance is placed on the receiving site other than a regulated substance that is already determined to be present and that the concentration(s) of regulated substance(s) in the donor fill has been compared to the concentration(s) of the same regulated substance(s) at the receiving site in accordance with subparagraphs G.3.b.i-ii. of this Appendix. Regulated substances detected in the donor fill that are below the CFCLs or RFCLs, as appropriate do not need to be included in the equivalent site evaluation. Perform the equivalent site evaluation prior to the movement of fill to a receiving site. Include documentation in the FP-001 demonstrating that the equivalent site evaluation has been performed and is satisfied in accordance with this section.

a. Develop a Plan for Sampling the Receiving Site.

Make a background determination on the receiving site to determine whether the same regulated substances present in the donor fill due to background are also present at the receiving site, and if so, determine the concentrations of the identified regulated substances. Development of a sampling plan in accordance with Section A of this Appendix is necessary to characterize the receiving site.

In the sampling plan include a summary of existing information about the receiving site, including any previously performed sampling or analysis information, process descriptions and materials used, spatial boundaries of the receiving site, information about what is known or suspected at the receiving site, releases, and release mechanisms. Document this information by written descriptions of site conditions and supported by maps, cross-sections, site diagrams, or other descriptive, graphical, or tabular illustrations necessary to characterize the site conditions.

The receiving site should be sampled using probability sampling, in which all parts of the site being characterized have a known probability of being included in the characterization, except for areas of the receiving site that are known to be or suspected of being affected by a release of a regulated substance, including areas impacted by road runoff, areas near railroads affected by engine exhaust contaminants, and areas near buildings contaminated by paint chips, unless the entire receiving site is part of a larger urban area where ubiquitous, widespread contamination is present that is incapable of being traced to a specific source.

Select the area of the receiving site used for the equivalent site evaluation in accordance with the following:

i. The area sampled is unaffected by a release of a regulated substance.

ii. The area sampled should be at a depth comparable to the area where donor fill is to be placed on the receiving site.

iii. The concentration of regulated substances in the area sampled is attributable to the parent material from which the soil was derived and the

natural processes which produce soil; or the concentrations of regulated substances resulted from an atmospheric deposition, as the term is described in the definition of "background reference area," but are not attributable to a specific point source or release of a regulate substance.

b. Sampling, Analysis and Evaluation of Data.

Establish the background by a sampling methodology that is statistically valid and consistent with the methodology used to perform the fill determination. Use the same analysis methods for background samples that were used for performing the fill determination.

Compare the analytical results of background samples for the receiving site with the results obtained from the donor fill. Use one of the following statistical methods for comparison:

i. Demonstrate that the highest measurement from the donor site is not greater than the highest measurement from the receiving site. The Department may accept insignificant variances in numbers. The minimum number of samples to be collected is 10 from the receiving site and 10 from each donor site.

ii. The Department may accept another appropriate statistical method if it meets the conditions below.

(A) For nonparametric and parametric methods, the false-positive rate for a set of data applied to a statistical test may not be greater than 0.05. The minimum number of samples to be collected is 10 from the receiving site and 10 from each donor site.

(B) For parametric methods, the censoring level for each non-detect (ND) should be the assigned value randomly generated that is between zero and the limit related to the PQL.

Appendix B
Recognition and Identification of Acid-Producing Rock

Pennsylvania's municipal and residual waste regulations define clean fill, in part, as inert solid material. Acid-producing rock reacts when exposed to air or water and therefore does not meet the regulatory definition of clean fill. In addition to presenting abrupt and adverse environmental concerns, exposed acid-producing rock can also have long-term damaging effects on highways and highway structures, including corrosion of concrete and steel structures; destabilization of cut slopes and fill slopes; ground heaving of structures and pavements; toxicity to roadside vegetation and aquatic life; and degradation of drinking water supplies.

Determining whether or not fill contains acid-producing rock begins with determining the presence of or likelihood of encountering acid-bearing rock (ABR), which is widespread in Pennsylvania. The primary source of acidity in Pennsylvania sedimentary rocks is sulfide minerals. Although there are many minerals that contain sulfur, those containing pyrite, or ferrous disulfide, are the major contributors to the release of acid. While pyrite minerals are not always large enough to be visible to the unaided eye, larger crystals have a yellowish, metallic appearance. Deposits containing pyrite concentrations greater than 0.5% have the potential to be significant sources of acid. Various other forms of sulfide minerals are of lesser concern due to their chemical stability, and include chalcopyrite (CuFeS2), galena (PbS) and sphalerite (ZnS), but can be problematic when present with pyrite.

Although there are more than 200 common minerals that contain sulfur, only those classified as iron sulfide are of potential concern due to the ability of these elements to promote oxidation, hydration and the release of acid. In Pennsylvania, there are four potential sulfide deposit types, listed as follows in descending order of pyrite oxidation reactivity:

- Veined Rock Deposits;
- Sedimentary Rock Deposits;
- Mine Spoils; and
- Acid Sulfate Soil Deposits.

Typically, the upper 25- to 35-feet of bedrock does not contain pyrite because pyrite is not stable under atmospheric conditions and will weather away. Therefore, if excavations are shallower than 30 feet, the risk of acid release is generally minimal. This is particularly true if a site is located south of the glacial margin. Within the glaciated regions of Pennsylvania, weathered bedrock may have been removed by glaciers and pyrite may exist closer to the surface. Unconsolidated sediments, such as glacial till, sand, and gravel, are not acid-producing and can be excavated without risk of acidic drainage. With regard to characterization of fill excavated to depths greater than 25 feet, environmental due diligence should include details demonstrating that the fill does not contain acid-producing rock.

The following publicly available resources may also assist in assessing the likelihood of encountering ABR:

- The Pennsylvania Geological Survey's a map of potentially acid bearing rocks (OFMI Report 05-01.1);
- The Pennsylvania Department of Transportation's (PennDOT) Geotechnical Engineering Manual, Publication 293 (4/18) (PUB 293 (4/18)); and
- DEP's Fact Sheet titled, "How to Avoid and Handle Acid-Producing Rock Formations Encountered During Well Site Development" (PA DEP Link)

If ABR is anticipated in the fill based on published information or identified during due diligence, testing should be done to estimate the acid-producing potential. For more information on testing procedures and acid-base accounting procedures, please refer to PennDOT's "Geotechnical Engineering Manual, Publication 293 (4/18) (PUB 293 (4/18))," DEP's "Coal Mine Drainage Prediction and Pollution Prevention in Pennsylvania (Coal Mine Drainage Prediction and Pollution Prevention)" or DEP's "Evaluation of Acid-Base Accounting Using Computer Spreadsheets (Evaluation of Acid-Base Accounting)."