



New Jersey Department of Environmental Protection



Site Remediation Program

Historic Fill Material Technical Guidance

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Version 2.0**

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1. INTENDED USE OF GUIDANCE DOCUMENT

This technical guidance is designed to help the person responsible for conducting remediation to comply with the New Jersey Department of Environmental Protection (the Department) requirements established by the Technical Requirements for Site Remediation (Technical Requirements), N.J.A.C. 7:26E-3.12 and 4.7).

This technical guidance will be used by many different people involved in the remediation of a contaminated site; such as Licensed Site Remediation Professionals (LSRPs), non-LSRP environmental consultants and other environmental professionals. Therefore, the generic term “investigator” will be used to refer to any person that uses this guidance to remediate a contaminated site on behalf of a remediating party, including the remediating party itself.

The procedures for a person to vary from the technical requirements in regulation are outlined in the Technical Requirements at N.J.A.C. 7:26E-1.7. Deviation from technical guidance must be documented and adequately supported with data or other information. In applying technical guidance, the Department recognizes that professional judgment may result in a range of interpretations on the application of the guidance to site conditions.

The Department prepared this guidance document with stakeholder input. The following people were on the committee who prepared this document:

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2. PURPOSE

This technical guidance document details methods that investigators may use to confirm the presence of historic fill material and provides procedures to delineate and remediate the associated soil and ground water contamination. The investigator may either remediate historic fill material under the assumption that it is contaminated or they may establish, via sampling, that the historic fill material is not contaminated above the Department’s residential soil remediation standards, N.J.A.C. 7:26D-4. The investigator must investigate all areas of concern (AOCs) located within historic fill material independently pursuant to N.J.A.C. 7:26E-3.4 through 3.6.

This guidance provides direction for remediating contaminated historic fill material when it is encountered at a site that is required to conduct remediation pursuant to N.J.A.C. 7:26C-2. It neither discusses nor implies that every site in New Jersey that is in an area that is mapped by

the New Jersey Geological Survey (NJGS) as being within an area of historic fill or is suspected to contain historic fill must enter the Site Remediation Program in order to remediate historic fill material. When contaminated historic fill material is encountered at a site that is required to conduct remediation pursuant to N.J.A.C. 7:26C-2, the person responsible for conducting remediation must remediate historic fill material consistent with the Technical Requirements and this guidance. Remediation of historic fill material must also be conducted when historic fill material is encountered at a site subject to ISRA or when a whole site RAO is sought.

3. DOCUMENT OVERVIEW

3.1. Historic Fill Material

Historic fill material is material generally deposited to raise the topographic elevation of the site, which was contaminated prior to emplacement and was used extensively throughout the State, particularly along industrialized water front areas in North-Eastern and South-Western New Jersey. The Department considers historic fill material an AOC pursuant to the Technical Requirements, N.J.A.C. 7:26E-1.8.

The Legislature, through passage of the Brownfield Act N.J.S.A. 58:10B-35h(1), directed the Department to identify procedures to demonstrate the presence of historic fill material and to establish remediation requirements designed to prevent exposure to these contaminants that allow for the continued use of the property, are less costly than removal or treatment, and are protective of human health and the environment.

In 2003, in response to this legislative mandate, the Department adopted procedures for historic fill material in the Technical Requirements. These procedures were still in effect at the time that the first version of this technical guidance was prepared and provided the remediating party with straightforward investigation and remediation requirements. Investigation requirements allow the remediating party to either sample the fill for typical historic fill material contaminants (metals and polynuclear aromatic hydrocarbons (PAHs)) or to assume that the fill is contaminated. Remediation requirements allow for the use of engineering and institutional controls to mitigate exposure to historic fill material contaminants. Remediating parties that choose to assume that the historic fill material is contaminated are allowed to characterize the general nature of the materials as identified during the subsurface investigations in the Deed Notice established for the site. Although the collection of analytical data are not required, any analytical data that may have been collected during the investigation of the site must be included in the Deed Notice.

Since that time, the Department and the regulated community have gained more experience with contamination associated with historic fill material and the recommendations provided here represent advances based on that knowledge.

3.2. Diffuse Anthropogenic Pollution (DAP)

Version 1.0 of this technical guidance (originally issued by the Department on October 24, 2011) included recommendations for the remediation of diffuse anthropogenic pollution (DAP). These recommendations had been included to support proposed rule provisions for DAP that were part of rulemaking for the proposed new Technical Requirements (see August 15, 2011 New Jersey Register 43 N.J.R. 1935(a); proposed as N.J.A.C. 7:26E-3.9). The Department chose to not adopt these DAP rule provisions when it adopted the final Technical Requirements on May 7, 2012 (see 44 N.J.R. 1339(b)).

The Department has posted administrative guidance regarding DAP on its web site at www.nj.gov/dep/srp/guidance/. The administrative guidance describes what DAP is, and provides the associated administrative process to address DAP when it is identified at a site that is required to conduct remediation pursuant to N.J.A.C. 7:26C-2.

4. DEFINITION OF HISTORIC FILL MATERIAL

Historic fill material means non-indigenous material, deposited to raise the topographic elevation of the site, which was contaminated prior to emplacement, and is in no way connected with the operations at the location of emplacement and which includes, without limitation, construction debris, dredge spoils, incinerator residue, demolition debris, fly ash, or non-hazardous solid waste. Historic fill material does not include any material which is substantially chromate chemical production waste or any other chemical production waste or waste from processing of metal or mineral ores, residues, slag or tailings. In addition, historic fill material does not include a municipal solid waste landfill site. (N.J.A.C. 7:26E-1.8).

5. PROCEDURES FOR HISTORIC FILL MATERIAL

5.1. Preliminary Assessment

The investigator must evaluate the presence of historic fill material during the preliminary assessment (PA) conducted for the site if a PA is required. If a PA is not required at the site basic historical site information is still needed, but would be conducted during the site investigation. This evaluation can be conducted by review of available historical site records, maps and aerial photographs. The evaluation should include review of the NJGS historical fill maps which are available for much of New Jersey, and are available at: www.nj.gov/dep/njgs/geodata/dgs04-7.htm.

It should be noted that the Site Remediation Reform Act (SRRA) at N.J.S.A. 58:10C-16k exempts an LSRP from the requirement to contact the Department Hotline when contaminated historic fill material is encountered. While SRRA exempts the discovery of contaminated historic fill material from being a reportable discharge, the person responsible for conducting the remediation must still investigate and remediate the contaminated historic fill material in accordance with the Technical Requirements. If contaminated historic fill material is the only

known contaminated area of concern, this process is initiated by the submission to the Department of an “LSRP Retention or Dismissal” form through the Online portal (www.nj.gov/dep/online/), as well as a “Confirmed Discharge Notification” form (www.nj.gov/dep/srp/srra/forms/). If contaminated historic fill is not the only known contaminated area of concern, an LSRP is still required to be retained to address the contaminated historic fill; however a “Confirmed Discharge Notification” form is not required to be submitted.

5.2. Site Investigation

It is important that other potential AOCs are identified and investigated independently of the historic fill material. Information obtained during the preliminary assessment, such as a diligent inquiry of the origin of the fill material and site history, or the information from the site investigation such as elevated PID/FID readings (example: five times site background levels) or the detection of any free and/or residual product are good indications that additional, non-historic fill material AOCs are present. Where field instrumentation (PID/FID) detects volatile organics above background, the investigator should also analyze samples for the EPA Target Compound List Volatile Organic compounds pursuant to N.J.A.C. 7:26E-2.1 (Table 2-1 and footnote 1).

5.2.1. Soil/Historic Fill Material

If historic fill is suspected to be present at a site the investigator must determine, pursuant to N.J.A.C. 7:26E-3.12(a), whether historic fill is present. Delineation and characterization of historic fill may be accomplished during the site investigation (SI) or the remedial investigation (RI) pursuant to N.J.A.C. 7:26E-4.7(a). The presence of historic fill material may be confirmed as follows:

- Install test pits, trenches or borings within the suspected extent of the historic fill material to a depth of two feet below the fill material to determine the vertical and general horizontal extent of the fill.
- Screen all boring/test pits/trenches utilizing field instruments (PID/FID) and log the results to document subsurface conditions including soil types, field instrument readings and a detailed description of fill materials including the vertical extent in the profile and characteristics (i.e., ash, brick, debris). When extending the test pit below the fill, care must be exercised to avoid breaching any low permeability soils underlying the fill.
- Document the depth to ground water, if encountered, and the presence of odor, soil discoloration, and free and/or residual product if found.
- Photo-documentation for sampling locations and subsurface stratigraphy is encouraged.

Once the presence of historic fill material is confirmed the investigator must choose either of the following two options:

- Assume that the historic fill material **is contaminated** above the residential soil remediation standards (N.J.A.C. 7:26D-4) and conduct a remedial investigation pursuant to N.J.A.C. 7:26E-4.7; (**Note that this option does not require chemical analysis of the historic fill material**); or
- Collect samples pursuant to N.J.A.C. 7:26E-3.4 to document that the historic fill material **is not contaminated** above the residential soil remediation standards (N.J.A.C. 7:26D-4) and as follows:
 - Select a minimum of two sample locations per acre of historic fill material (regardless of site size);
 - If the material is homogeneous, collect one discrete sample, per sample location, from a six inch interval in the historic fill material; or
 - If the fill has defined strata (or layers of different fill material), collect a minimum of one discrete sample from a six inch interval from each stratum within the historic fill material present at the site (not recommending sampling each strata from each subsurface sample);
 - Conduct sampling in accordance with N.J.A.C. 7:26E-2.1;
 - Analyze soil samples for the EPA Target Compound List (TCL) Polynuclear Aromatic Hydrocarbons (PAHs) and EPA Target Analyte List (TAL metals). Twenty-five percent of all samples collected should be analyzed for complete TCL/TAL analysis and Extractable Petroleum Hydrocarbons (EPH) with a minimum of one sample, per stratum/fill type, per site; and
 - Analyze EPH following the Department’s “Protocol for Addressing Extractable Petroleum Hydrocarbons,” available at: www.nj.gov/dep/srp/guidance/srra/eph_protocol.pdf and evaluate the results using EPH Category 2.

Evaluate the soil analytical results as follows:

- If analytical results confirm that the historic fill material does not exceed the Department’s residential soil remediation standards, no further investigation of the fill is required (note that an evaluation of impact to ground water soil remediation standards would not be required and the ground water requirements in section 5.2.2 must be followed); or
- If analytical results confirm the presence of contaminants exceeding residential soil remediation standards, then the investigator must submit a Confirmed Discharge

Notification form and conduct a remedial investigation as outlined in section 5.3 of this guidance. If contaminated historic fill material is the only area of concern identified at the site the Confirmed Discharge Notification form should be completed as indicated in Appendix B.

Investigate other potential AOCs independently of the historic fill material based on information obtained during the preliminary assessment or the site investigation.

5.2.2. Ground Water

Once the presence of historic fill material is confirmed the investigator must either:

- Assume that the ground water associated with historic fill material **is contaminated** above the applicable ground water remediation standards pursuant to N.J.A.C. 7:26D-2 and conduct a remedial investigation pursuant to N.J.A.C. 7:26E-4.7; **(Note that this option does not require chemical analysis of ground water); or**
- Collect ground water samples to document that the ground water associated with historic fill material **is not contaminated** above the ground water remediation standards pursuant to N.J.A.C. 7:26D-2 as follows:
 - Select a minimum of one ground water sample location within the fill area;
 - If it is not possible to take a ground water sample in the fill, collect the ground water sample in the expected downgradient flow direction and within 10 feet of the historic fill material area. Predict ground water flow direction based on data from existing ground water monitoring wells, topographic relief, the location of surface water bodies, structural controls in the bedrock or soils, location of pumping wells and subsurface conduits at or below the water table.
 - Collect one sample pursuant to N.J.A.C. 7:26E-3.5 using any generally acceptable sampling method specified in the NJDEP Field Sampling Procedures Manual. The Department recommends the use of the low-flow sampling method to minimize sediment in the sample in order to prevent a false positive result.
 - Conduct sampling in accordance with N.J.A.C. 7:26E-2.1;
 - Analyze ground water sample(s) for the USEPA Target Compound List and the EPA Target Analyte List (TCL/TAL);

If ground water samples are collected, evaluate the ground water analytical results as follows:

- If analytical results confirm that the ground water associated with the historic fill material does not exceed the Department's ground water remediation standards, N.J.A.C. 7:26D-2, no further investigation of the ground water is required; or
- If analytical results confirm that the ground water associated with the historic fill material contains any contaminant that exceeds the Department's ground water remediation standards, N.J.A.C. 7:26D-2, the investigator must propose to establish a ground water classification exception area (CEA).

The extent of the CEA may be based on the property boundaries of the site and the duration of the CEA may be identified as indeterminate because it is presumed that the historic fill material will remain in place.

5.3. Remedial Investigation

When the presence of historic fill is confirmed at a site the investigator must delineate and characterize the historic fill material during the remedial investigation N.J.A.C. 7:26E-4.7(a) if it was not accomplished during the SI.

5.3.1. Soil/Historic Fill Material

The investigator must confirm the vertical and horizontal extent of historic fill material as follows:

- Install at least four borings, test pits or trenches per acre of historic fill material with a minimum of four locations per site, regardless of size. A reduced number of borings, test pits or trenches based upon professional discretion may be used at large sites based on the investigator's professional judgment and documented in the remedial investigation report.
- Locate the borings or test pits to establish the vertical extent of the historic fill material. Advance the borings or test pits through the historic fill material to native soil, meadow mat, or bedrock whether or not ground water is encountered.
- It is not necessary to delineate historic fill material beyond the property boundary.
- If the investigator knows or suspects that the historic fill material extends to or beyond the site boundaries he or she may submit aerial photos or other applicable documentation, such as information obtained from the Department Geographic Information Systems (NJ-GeoWeb/i-Map NJ DEP) or New Jersey Geological Survey historic fill maps. Such mapping, if paired with other lines of evidence, may be used in lieu of perimeter borings/test pits/trenches to verify that historic fill material is site-wide.
- If historic fill material is not part of a regional historic fill material area and is limited to an area within the site, it should be investigated as an AOC and the extent of the

historic fill material must be documented. Install a minimum of four borings/test pits/trenches installed in non-fill areas evenly spaced around the historic fill material area. The Department recommends more extensive additional subsurface investigations to more accurately delineate large areas of historic fill material.

- While sampling and analysis of historic fill are not required, if analytical data do exist the investigator should include those data in the Deed Notice if the data indicates chemicals of concern are above applicable remediation standards. If analytical data of the historic fill material do not exist, the investigator should provide a general description of the fill material including information such as the depth below ground surface, thickness and characteristics of the fill material (i.e., ash, brick, debris) as identified during the subsurface investigation.

5.3.2. Ground Water

If information needed for a Ground Water Classification Exception Area (CEA) was not obtained during the site investigation it should be gathered during the remedial investigation. If it is determined or assumed that the ground water is contaminated the investigator must establish a CEA pursuant to N.J.A.C. 7:26C-7 and the Department's "Final Guidance on Designation of Classification Exception Areas" (www.nj.gov/dep/srp/guidance/cea/cea_guide.htm).

The extent of the CEA may be based on the property boundaries of the site and the duration of the CEA may be identified as indeterminate because it is presumed that the historic fill material will remain in place.

5.4. Remedial Action

If historic fill material is contaminated above applicable soil remediation standards (either by assumption or sampling) and will not be removed, engineering and institutional controls are required as part of the remedial action pursuant to N.J.A.C. 7:26E-5.4 and to N.J.A.C. 7:26C-7. Contaminant levels identified as being between residential and non-residential for a non-residential use site would only require a limited restricted use remedy such as a Deed Notice. The person responsible for conducting the remediation must file a Deed Notice and obtain a soil remediation permit to ensure the continued protectiveness of the engineering control. Deed Notice and soil remediation permit requirements are provided in N.J.A.C. 7:26C-7 and the Model Deed Notice format is provided in N.J.A.C. 7:26C Appendix B. The Deed Notice should include maps and summary information presenting the historic fill material related data and contaminant distribution found at the site.

Based on the current or intended use of the site, a cap may be required to prevent exposure to the contaminants in the historic fill material. A cap must consist of an engineered surface such as, asphalt, concrete or clean soil fill material and be maintained pursuant to N.J.A.C. 7:26C-7.8.

The investigator may demonstrate that historic fill material is already capped, making additional engineering controls unnecessary. Soil sampling conducted consistent with section 5.2.1 of this guidance must be conducted to confirm that a soil cap, if present, does not exceed the Department's residential soil remediation standards, unless the investigator can demonstrate that the cap consists of clean fill.

The Department recommends that the investigator provide a general description of the historic fill material in the Deed Notice, including, but not limited to, information such as the depth below ground surface, thickness and characteristics of the historic fill material (i.e., ash, brick, debris) and the following statement:

“Historic fill material is likely to contain contaminants including PAHs and metals at levels in excess of the Department's applicable soil remediation standards.”

APPENDIX A


ACRONYMS

AOC	area of concern
CEA	classified exception area
EPA	Environmental Protection Agency
EPH	extractable petroleum hydrocarbons
LSRP	Licensed Site Remediation Professional
N.J.A.C.	New Jersey Administrative Code
NJDEP	New Jersey Department of Environmental Protection
NJGS	New Jersey Geological Survey
N.J.S.A.	New Jersey Statutes Annotated
PAH	polynuclear aromatic hydrocarbons
PID/FID	Photoionization Detector/Flame ionization Detector
SRRA	Site Remediation Reform Act
TAL	Target Analyte List
TCL	Target Compound List
U.S. EPA	United States Environmental Protection Agency

APPENDIX B

CONFIRMED DISCHARGE NOTIFICATION FORM

If contaminated historic fill material is the only area of concern identified at the site the Confirmed Discharge Notification form should be completed as indicated below. This form is available for download or can be completed at the following link:
http://nj.gov/dep/srp/srra/forms/confirmed_discharge_notification.pdf

	New Jersey Department of Environmental Protection Site Remediation Program CONFIRMED DISCHARGE NOTIFICATION																			
SECTION A. SITE LOCATION																				
Site Name: _____																				
List all AKAs: _____																				
Street Address: _____																				
Mailing Address if different than street address: _____																				
Incident Number(s)/Com. Center Number(s):		Not Required																		
Program Interest (PI) Number(s):		Only needed if PI # exists from a different (non-historic fill) triggering event																		
Date Remediation Initiated Pursuant to N.J.A.C. 7.26C-2.2 or 2.3(b): _____																				
SECTION D. SITE USE																				
Current Site Use (check all that apply) <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Industrial</td> <td><input type="checkbox"/> Park or recreational use</td> </tr> <tr> <td><input type="checkbox"/> Residential</td> <td><input type="checkbox"/> Vacant</td> </tr> <tr> <td><input type="checkbox"/> Commercial</td> <td><input type="checkbox"/> Government</td> </tr> <tr> <td><input type="checkbox"/> School or child care</td> <td><input type="checkbox"/> Other: _____</td> </tr> <tr> <td><input type="checkbox"/> Agricultural</td> <td></td> </tr> </table>		<input type="checkbox"/> Industrial	<input type="checkbox"/> Park or recreational use	<input type="checkbox"/> Residential	<input type="checkbox"/> Vacant	<input type="checkbox"/> Commercial	<input type="checkbox"/> Government	<input type="checkbox"/> School or child care	<input type="checkbox"/> Other: _____	<input type="checkbox"/> Agricultural		Intended Future Site Use, if known (check all that apply) <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Industrial</td> <td><input type="checkbox"/> Park or recreational use</td> </tr> <tr> <td><input type="checkbox"/> Residential</td> <td><input type="checkbox"/> Vacant</td> </tr> <tr> <td><input type="checkbox"/> Commercial</td> <td><input type="checkbox"/> Government</td> </tr> <tr> <td><input type="checkbox"/> School or child care</td> <td><input type="checkbox"/> Future site use unknown</td> </tr> </table>	<input type="checkbox"/> Industrial	<input type="checkbox"/> Park or recreational use	<input type="checkbox"/> Residential	<input type="checkbox"/> Vacant	<input type="checkbox"/> Commercial	<input type="checkbox"/> Government	<input type="checkbox"/> School or child care	<input type="checkbox"/> Future site use unknown
<input type="checkbox"/> Industrial	<input type="checkbox"/> Park or recreational use																			
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<input type="checkbox"/> School or child care	<input type="checkbox"/> Other: _____																			
<input type="checkbox"/> Agricultural																				
<input type="checkbox"/> Industrial	<input type="checkbox"/> Park or recreational use																			
<input type="checkbox"/> Residential	<input type="checkbox"/> Vacant																			
<input type="checkbox"/> Commercial	<input type="checkbox"/> Government																			
<input type="checkbox"/> School or child care	<input type="checkbox"/> Future site use unknown																			
Date Discharge Occurred: Unknown		Date Discharge Notification to the Department: Date this form is submitted																		
Substance Released	State (liquid, solid, etc.)	Amount																		
Description of Discharge: Historic Fill Material		Note: Within 45 days submit an LSRP retention form to DEP																		