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Similar Soils Provision Guidance

Guidance for Identifying When Soil Concentrations at a Receiving Location Are “Not Significantly Lower Than” Managed Soil Concentrations Pursuant to 310 CMR 40.0032(3)

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The information contained in this document is intended solely as guidance. This guidance does not create any substantive or procedural rights, and is not enforceable by any party in any administrative proceeding with the Commonwealth. Parties using this guidance should be aware that there may be other acceptable alternatives for achieving and documenting compliance with the applicable regulatory requirements and performance standards of the Massachusetts Contingency Plan.

I. Purpose and Scope

The Massachusetts Contingency Plan (“MCP”, 310 CMR 40.0000) establishes conditions and requirements for the management of soil excavated at a disposal site. This guidance addresses the specific requirements of 310 CMR 40.0032(3) and the criteria by which a Licensed Site Professional (“LSP”) may determine that soil may be moved without prior notice to or approval from the Department. Soil managed pursuant to 310 CMR 40.0032(3) may be transported using a Bill of Lading (“BOL”), but a BOL is not required. Attachment 1 provides a flowchart depiction of the Similar Soil regulations and guidance.

This guidance is not applicable to the excavation and movement of soil from locations other than M.G.L. Chapter 21E disposal sites, nor to the management of soils considered Remediation Waste under the MCP.

¹ Updated to revise an inaccurate RCS-1 concentration for lead in Table 2 and an inaccurate RCS-2 concentration for selenium in Table 3.

² Updated to reflect the 2014 revisions to the Massachusetts Contingency Plan, 310 CMR 40.0000

II. Relationship to Other Local, State or Federal Requirements

This guidance is intended to clarify and more fully describe regulatory requirements contained within the MCP. Nothing in this guidance eliminates, supersedes or otherwise modifies any local, state or federal requirements that apply to the management of soil, including any local, state or federal permits or approvals necessary before placing the soil at the receiving location, including, *but not limited to*, those related to placement of fill, noise, traffic, dust control, wetlands, groundwater or drinking water source protection.

III. Requirements of 310 CMR 40.0032(3)

The requirements specified in 310 CMR 40.0032(3) are:

- (3) Soils containing oil or waste oil at concentrations less than an otherwise applicable Reportable Concentration and that are not otherwise a hazardous waste, and soils that contain one or more hazardous materials at concentrations less than an otherwise applicable Reportable Concentration and that are not a hazardous waste, may be transported from a disposal site without notice to or approval from the Department under the provisions of this Contingency Plan, provided that such soils:
- (a) are not disposed or reused at locations where the concentrations of oil or hazardous materials in the soil would be in excess of a release notification threshold applicable at the receiving site, as delineated in 310 CMR 40.0300 and 40.1600; and
 - (b) are not disposed or reused at locations where existing concentrations of oil and/or hazardous material at the receiving site are significantly lower than the levels of those oil and/or hazardous materials present in the soil being disposed or reused.

There are therefore four requirements that must be met before the managed soil can be moved to and re-used (or disposed) at a new location without notice to or approval from MassDEP. Each requirement (A. through D.) is addressed below.

A. The Managed Soil Must Not Be a Hazardous Waste

310 CMR 40.0032(3) applies to soils containing oil or waste oil that are not otherwise a hazardous waste, and to soils containing hazardous materials that are not a hazardous waste. The MCP definition of hazardous waste (310 CMR 40.0006) refers to the definitions promulgated in the Massachusetts Hazardous Waste Regulations, 310 CMR 30.000.

Under the federal Resource Conservation and Recovery Act of 1976 (“RCRA”, 42 U.S.C. §§6901 *et. seq.*), the Massachusetts Hazardous Waste Management Act (M.G.L. c.21C), and the Massachusetts Hazardous Waste Regulations (310 CMR 30.000), soil is considered to contain a hazardous waste (hazardous waste soil) if, when generated, it meets either or both of the following two conditions:

- the soil exhibits one or more of the characteristics of a hazardous waste pursuant to 310 CMR 30.120 [such as exhibiting a characteristic of toxicity under 310 CMR 30.125 and 30.155 (Toxicity Characteristic Leaching Procedure, or TCLP)]; or
- the soil contains hazardous constituents from a listed hazardous waste identified in 310 CMR 30.130 or Title 40, Chapter I, Part 261 (Identification and Listing of Hazardous Waste) of the Code of Federal Regulations.

MassDEP has published a Technical Update entitled: *Considerations for Managing Contaminated Soil: RCRA Land Disposal Restrictions and Contained-In Determinations* (August 2010, <http://www.mass.gov/eea/docs/dep/cleanup/laws/contain.pdf>) that focuses on the determination of whether contaminated soil must be managed as a hazardous waste subject to RCRA requirements, and the presumptive approval process an LSP/PRP can use to document such a determination.

B. The Managed Soil Must Be Less Than Reportable Concentrations (RCs).

This requirement is intended to ensure that the soil being excavated and relocated from a disposal site is not “Contaminated Soil” and therefore neither “Contaminated Media” nor “Remediation Waste” as those terms are defined in 310 CMR 40.0006³.

310 CMR 40.0361 sets forth two reporting categories for soil (RCS-1 and RCS-2). Reporting Category RCS-1 applies to locations with the highest potential for exposure, such as residences, playgrounds and schools, and to locations within the boundaries of a groundwater resource area. Reporting Category RCS-2 applies to all other locations.

Note that the “applicable Reportable Concentrations” referred to in 310 CMR 40.0032(3) may be the RCS-1 or RCS-2 criteria, depending upon which category would apply to the soils being excavated at the original disposal site location, not the RCs applicable to the soils at the receiving location (see Section III.C. below).

EXAMPLE: If soil is being excavated from a disposal site at an RCS-2 location and the soil contaminant concentrations are found to be less than the RCS-2 criteria, then the soil is not “Contaminated Soil” since the soil is less than the release notification threshold established for RCS-2 soil by 310 CMR 40.0300 and 40.1600. The RCS-2 soil in this example is not “Contaminated Soil” even if one or more constituent concentration is greater than an RCS-1 value.

Also, the language at 310 CMR 40.0032(3) specifies the *applicable* RCs. If a notification exemption (listed at 310 CMR 40.0317) applies to the OHM in soil at its original location, then the corresponding Reportable Concentration is not *applicable*. Thus 310 CMR 40.0032(3) should be read to apply to soils containing concentrations of oil or hazardous material (“OHM”) less than the applicable RCs or covered by a notification exemption. This interpretation of the requirement is consistent with the definition of Contaminated Soil, which uses the term “notification threshold” rather than “Reportable Concentration.”

³ Contaminated Soil - means soil containing oil and/or hazardous material at concentrations equal to or greater than a release notification threshold established by 310 CMR 40.0300 and 40.1600.

Contaminated Media - means Contaminated Groundwater, Contaminated Sediment, Contaminated Soil, and/or Contaminated Surface Water.

Remediation Waste - means any Uncontainerized Waste, Contaminated Media, and/or Contaminated Debris that is managed pursuant to 310 CMR 40.0030. The term "Remediation Waste" does not include Containerized Waste.

C. The Managed Soil Must Not Create a Notifiable Condition at the Receiving Location.

This requirement is intended to prevent the creation of new reportable releases that must be subsequently assessed and remediated.

If the contaminant concentrations in the soil being relocated are less than the RCS-1 criteria, then placement of the soil in any RCS-1 location would not create a new notifiable condition. There are, however, conditions that could result in a notifiable condition.

First, if the soil is excavated from an RCS-2 location (as described in the example in Section III.B. above) with contaminant concentrations *between* the RCS-1 and RCS-2 criteria, then the placement of that soil at an RCS-1 receiving location would create a notifiable condition since one or more concentrations of OHM would then exceed the RCS-1 criteria in the RCS-1 receiving location.

Second, a notification exemption that applies to the original location of the soil may not apply to the receiving location. (For example, the lead paint exemption at 310 CMR 40.0317(8) is specific to “the point of application.”) In cases where a notification exemption applies only to the original location, the managed soil must be evaluated solely based on whether its OHM concentrations exceed the applicable RCs at the receiving location.

D. The Managed Soil Must Not Be Significantly More Contaminated Than the Soil at the Receiving Location.

This requirement has been referred to as the “anti-degradation provision” although it is more accurately described as the “Similar Soils Provision.” 310 CMR 40.0032(3)(b) requires that the concentrations of OHM at the receiving location not be “significantly lower” than the relocated soil OHM concentrations. One could also say that the provision requires that “there is no significant difference between the relocated soil and the soil at the receiving location,” or that “the soils being brought to the receiving location are similar to what is already there.” This requirement embodies several considerations.

First, as a general principle, M.G.L. c.21E is intended to clean up contaminated properties and leave them better than they started -- even to clean sites to background conditions, if feasible. It would be inconsistent with this principle to then raise the ambient levels of contamination in the environment as a consequence of a response action conducted under the MCP.

Second, despite the three other requirements (A. through C. above) of 310 CMR 40.0032(3), decisions about the movement of the managed soil will be based upon sampling of soil that is likely to have significant heterogeneity. The Similar Soils Provision is an additional measure to minimize the adverse effects of soil characterization that may not be representative of such heterogeneity.

Third, none of the criteria of 310 CMR 40.0032(3) address the question of whether the soil poses a *risk* in its original or receiving location, although the hazardous waste- and notification-related requirements seem to *imply* risk-based decision making. Put simply, soil that is not a hazardous waste and does not require notification may still pose incremental risk at the receiving location. The Similar Soils Provision is intended to ensure that the managed soil does not increase risk of harm to health, safety, public welfare or the environment at the receiving location, since it will be similar to what is already there.

The “not... significantly lower” language of 310 CMR 40.0032(3)(b) can be interpreted to mean either a quantitative “not statistically different” analysis, or a semi-quantitative, albeit somewhat subjective, approach. MassDEP does not believe that a statistics-driven quantitative approach is necessary when comparing managed soil to known or assumed background conditions, given (a) the relatively low concentrations at issue and (b) the cost of such an analysis, driven by the quantity of sampling needed to show a statistical difference.

The regulations imply that the LSP must have knowledge about the concentrations of OHM in the soil at the receiving location in order to apply the Similar Soils Provision. The regulations also imply that the new soil may contain concentrations of OHM that are somewhat higher than those levels at the receiving location – just not “significantly” higher.

MassDEP recognizes that there may be several approaches to address this “knowledge” issue when implementing the Similar Soils Provision of the MCP.

- **Assume the soils at the receiving location are natural background.**
Sampling of the soil at the receiving location is not necessary if it is assumed that the concentrations of OHM there are consistent with natural background conditions. MassDEP acknowledges that there is a range of background levels, and that the concentrations at any given location may be lower than the statewide levels published by the Department⁴, but the costs associated with determining site-specific background are not justified by likely differences. Further, the published “natural background” levels are similarly used in several areas of the MCP as an acceptable endpoint, including site delineation and the development of the MCP cleanup standards.

Of course, routine due diligence about the receiving location may still reveal factors that would make the location inappropriate to receive the proposed fill material. Nothing in this guidance relieves any party of the obligation to conduct such due diligence and appropriately consider and act on information thereby obtained.

⁴ See Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil (May, 2002)
<http://www.mass.gov/eea/docs/dep/cleanup/laws/backtu.pdf>

- **Sample the soils at the receiving location.**

The sampling plan should include a sufficient number of samples taken at locations selected to provide an understanding of the concentrations of OHM present and the distribution of OHM throughout the receiving location. In order to provide data appropriate for the Similar Soils comparison, the soil at the receiving location should be analyzed for constituents that are likely to be present there (e.g., naturally occurring metals) as well as any OHM known or likely to be present in the soil brought from the disposal site. If a receiving location has been adequately and comprehensively characterized, that data may then be used for comparison to the OHM concentrations in any subsequent soil deliveries - additional sampling is not required.

- **Provide Technical Justification for an Alternative Approach**

There may be situations for which a different combination of analytical and non-analytical information available for both the source and receiving locations is sufficient to conclude that the nature and concentrations of OHM in the soils are not significantly different. Guidance on recognizing such conditions and the level of documentation that would be necessary to support such a technical justification is beyond the scope of this guidance.

Once the concentrations of OHM in the soils are known (or assumed consistent with this guidance), the LSP must compare the concentrations of the source and receiving locations and determine whether the concentrations at the receiving location are “significantly lower” than those in the soil proposed to be relocated from the disposal site. This comparison may be conducted in several ways, including analyses with appropriate statistical power and confidence. MassDEP has also developed a *rule-of-thumb* comparison to simplify this determination, as described in Section IV.

IV. Determining whether soils at the receiving location are “significantly lower” using a simplified approach

The simplified comparison shall be made using the *maximum* values of the OHM concentrations in both the soil at the receiving location and the soil proposed to be disposed of or reused.

Use of the maximum values is appropriate for several reasons. First, the provisions of 310 CMR 40.0032(3) include comparisons to Reportable Concentrations, and notification is triggered by any single value (i.e., maximum value) exceeding the RC. Second, soil is by its nature heterogeneous, and the use of maximum values is a means of minimizing sampling costs while addressing the expected variability of results. Third, if natural background levels are assumed at the receiving location, the MassDEP published background concentrations are upper percentile levels that are only appropriately compared to similar (e.g., maximum) values of the soil data set.

Note also that when using the maximum reported concentrations for comparison purposes, the typical or average concentration will be lower. This is important to recognize if/when the question of the risk posed by the soil is raised. For example, the RCS-1 and the Method 1 S-1 standard for arsenic are both 20 mg/kg. The Reportable Concentration is applied as a not-to-be-exceeded value, triggering the need to report the release and investigate further. However the S-1 standard is applied as an average value, considering exposure over time. At a location where the highest arsenic value found is less than 20 mg/kg, the average concentration would be well below the Method 1 S-1 standard.

The maximum concentration in the soil at the receiving location may be less than that in the proposed disposed/reused soil by some amount and not be considered “significantly lower.” The question is how much lower is “significantly lower”? In this guidance, MassDEP establishes a multiplying factor to be applied to the concentration in the soil at the receiving location. The multiplying factor varies depending upon the concentration in the soil at the receiving location, as shown in Table 1.

Table 1. Receiving Soil Concentration Multiplying Factors

| If the concentration in soil at the receiving location for a given OHM is: | Then use a multiplying factor of: |
|---|--|
| < 10 mg/kg | 10 |
| 10 mg/kg ≤ x < 100 mg/kg | 7.5 |
| 100 mg/kg ≤ x < 1,000 mg/kg | 5 |
| ≥ 1,000 mg/kg | 2.5 |

EXAMPLE: The soil at a receiving location that is considered RCS-1 is appropriately sampled and the maximum concentration of silver is found to be 6 mg/kg. Using Table 1, the concentration of silver at the receiving location would not be considered “significantly lower” than $10 \times 6 \text{ mg/kg} = 60 \text{ mg/kg}$. Since 60 mg/kg is less than the silver RCS-1 value of 100 mg/kg, soil containing a maximum concentration that is less than 60 mg/kg silver could be reused at this location.

EXAMPLE: The soil at a receiving location that is considered RCS-1 is assumed to be consistent with natural background. The MassDEP published natural background level for arsenic is 20 mg/kg. Using Table 1, the concentration of arsenic at the receiving location would not be considered “significantly lower” than $7.5 \times 20 \text{ mg/kg} = 150 \text{ mg/kg}$. However, since 150 mg/kg is greater than the arsenic RCS-1 value of 20 mg/kg, only soil containing a maximum concentration that is less than 20 mg/kg arsenic could be reused at this location. [The managed soil must not create a notifiable condition at the receiving location, see Section III.C. above.]

EXAMPLE: The soil at a receiving location that is considered RCS-2 is assumed to be consistent with natural background. The MassDEP published natural background level for benzo[a]anthracene is 2 mg/kg. Using Table 1, the concentration of benzo[a]anthracene at the receiving location would not be considered “significantly lower” than $10 \times 2 \text{ mg/kg} = 20 \text{ mg/kg}$. Since 20 mg/kg is less than the benzo[a]anthracene RCS-2 value of 40 mg/kg, soil containing a maximum concentration that is less than 20 mg/kg benzo[a]anthracene could be reused at this location. [Note that due to the lower reportable concentration, RCS-1 receiving locations could only accept soil containing less than 7 mg/kg benzo[a]anthracene.]

The multiplying factors in Table 1 and the MassDEP published natural background levels can be used to establish concentrations of OHM in soil that would be acceptable for reuse at an RCS-1 receiving location, consistent with the requirements of 310 CMR 40.0032(3). Table 2 lists such concentrations. Note that soil that meets the criteria in Table 2 could be re-used at any location (RCS-1 or RCS-2). Similarly, Table 3 lists concentrations of OHM in soil that would be acceptable for reuse at an RCS-2 receiving location (but not RCS-1 locations).

If a chemical is not listed on these tables, then MassDEP has not established a natural background concentration⁵. This guidance is limited to the use of only MassDEP-published statewide background concentrations. Therefore an alternative approach, such as sampling the receiving location and comparing maximum reported concentrations, would be appropriate to meet the requirements of 310 CMR 40.0032(3).

⁵ For example, MassDEP has not established natural background levels for PCBs, volatile organic compounds (VOCs) or petroleum-related constituents.

Table 2.
Limits to the Concentration of OHM In Soil for Re-Use
Assuming Natural Background Conditions at an RCS-1 Receiving Location

| OIL OR HAZARDOUS MATERIAL | Concentration | Rule-of- Thumb Multiplier | Multiplied Value mg/kg | RCS-1 mg/kg | Limiting ¹ Soil Concentration mg/kg | |
|------------------------------|-------------------------------|---------------------------------|------------------------------|----------------|---|-------|
| | In "Natural" Soil mg/kg | | | | < | |
| ACENAPHTHENE | 0.5 | 10 | 5 | 4 | < | 4 |
| ACENAPHTHYLENE | 0.5 | 10 | 5 | 1 | < | 1 |
| ALUMINIUM | 10,000 | 2.5 | 25000 | | < | 25000 |
| ANTHRACENE | 1 | 10 | 10 | 1000 | < | 10 |
| ANTIMONY | 1 | 10 | 10 | 20 | < | 10 |
| ARSENIC | 20 | 7.5 | 150 | 20 | < | 20 |
| BARIUM | 50 | 7.5 | 375 | 1000 | < | 375 |
| BENZO(a)ANTHRACENE | 2 | 10 | 20 | 7 | < | 7 |
| BENZO(a)PYRENE | 2 | 10 | 20 | 2 | < | 2 |
| BENZO(b)FLUORANTHENE | 2 | 10 | 20 | 7 | < | 7 |
| BENZO(g,h,i)PERYLENE | 1 | 10 | 10 | 1000 | < | 10 |
| BENZO(k)FLUORANTHENE | 1 | 10 | 10 | 70 | < | 10 |
| BERYLLIUM | 0.4 | 10 | 4 | 90 | < | 4 |
| CADMIUM | 2 | 10 | 20 | 70 | < | 20 |
| CHROMIUM (TOTAL) | 30 | 7.5 | 225 | 100 | < | 100 |
| CHROMIUM(III) | 30 | 7.5 | 225 | 1000 | < | 225 |
| CHROMIUM(VI) | 30 | 7.5 | 225 | 100 | < | 100 |
| CHRYSENE | 2 | 10 | 20 | 70 | < | 20 |
| COBALT | 4 | 10 | 40 | | < | 40 |
| COPPER | 40 | 7.5 | 300 | | < | 300 |
| DIBENZO(a,h)ANTHRACENE | 0.5 | 10 | 5 | 0.7 | < | 0.7 |
| FLUORANTHENE | 4 | 10 | 40 | 1000 | < | 40 |
| FLUORENE | 1 | 10 | 10 | 1000 | < | 10 |
| INDENO(1,2,3-cd)PYRENE | 1 | 10 | 10 | 7 | < | 7 |
| IRON | 20,000 | 2.5 | 50000 | | < | 50000 |
| LEAD | 100 | 5 | 500 | 200 | < | 200 |
| MAGNESIUM | 5,000 | 2.5 | 12500 | | < | 12500 |
| MANGANESE | 300 | 5 | 1500 | | < | 1500 |
| MERCURY | 0.3 | 10 | 3 | 20 | < | 3 |
| METHYLNAPHTHALENE, 2- | 0.5 | 10 | 5 | 0.7 | < | 0.7 |
| NAPHTHALENE | 0.5 | 10 | 5 | 4 | < | 4 |
| NICKEL | 20 | 7.5 | 150 | 600 | < | 150 |
| PHENANTHRENE | 3 | 10 | 30 | 10 | < | 10 |
| PYRENE | 4 | 10 | 40 | 1000 | < | 40 |
| SELENIUM | 0.5 | 10 | 5 | 400 | < | 5 |
| SILVER | 0.6 | 10 | 6 | 100 | < | 6 |
| THALLIUM | 0.6 | 10 | 6 | 8 | < | 6 |
| VANADIUM | 30 | 7.5 | 225 | 400 | < | 225 |
| ZINC | 100 | 5 | 500 | 1000 | < | 500 |

¹ Concentration of OHM in soil must be LESS THAN (not equal or greater than) this value.

Table 3.
Limits to the Concentration of OHM In Soil for Re-Use
Assuming Natural Background Conditions at an RCS-2 Receiving Location

| OIL OR HAZARDOUS MATERIAL | Concentration | | | RCS-2 mg/kg | Limiting ¹ Soil Concentration mg/kg | |
|------------------------------|-------------------------------|---------------------------------|------------------------------|----------------|---|-------|
| | In "Natural" Soil mg/kg | Rule-of- Thumb Multiplier | Multiplied Value mg/kg | | | |
| ACENAPHTHENE | 0.5 | 10 | 5 | 3000 | < | 5 |
| ACENAPHTHYLENE | 0.5 | 10 | 5 | 10 | < | 5 |
| ALUMINIUM | 10,000 | 2.5 | 25000 | | < | 25000 |
| ANTHRACENE | 1 | 10 | 10 | 3000 | < | 10 |
| ANTIMONY | 1 | 10 | 10 | 30 | < | 10 |
| ARSENIC | 20 | 7.5 | 150 | 20 | < | 20 |
| BARIIUM | 50 | 7.5 | 375 | 3000 | < | 375 |
| BENZO(a)ANTHRACENE | 2 | 10 | 20 | 40 | < | 20 |
| BENZO(a)PYRENE | 2 | 10 | 20 | 7 | < | 7 |
| BENZO(b)FLUORANTHENE | 2 | 10 | 20 | 40 | < | 20 |
| BENZO(g,h,i)PERYLENE | 1 | 10 | 10 | 3000 | < | 10 |
| BENZO(k)FLUORANTHENE | 1 | 10 | 10 | 400 | < | 10 |
| BERYLLIUM | 0.4 | 10 | 4 | 200 | < | 4 |
| CADMIUM | 2 | 10 | 20 | 100 | < | 20 |
| CHROMIUM (TOTAL) | 30 | 7.5 | 225 | 200 | < | 200 |
| CHROMIUM(III) | 30 | 7.5 | 225 | 3000 | < | 225 |
| CHROMIUM(VI) | 30 | 7.5 | 225 | 200 | < | 200 |
| CHRYSENE | 2 | 10 | 20 | 400 | < | 20 |
| COBALT | 4 | 10 | 40 | | < | 40 |
| COPPER | 40 | 7.5 | 300 | | < | 300 |
| DIBENZO(a,h)ANTHRACENE | 0.5 | 10 | 5 | 4 | < | 4 |
| FLUORANTHENE | 4 | 10 | 40 | 3000 | < | 40 |
| FLUORENE | 1 | 10 | 10 | 3000 | < | 10 |
| INDENO(1,2,3-cd)PYRENE | 1 | 10 | 10 | 40 | < | 10 |
| IRON | 20,000 | 2.5 | 50000 | | < | 50000 |
| LEAD | 100 | 5 | 500 | 600 | < | 500 |
| MAGNESIUM | 5,000 | 2.5 | 12500 | | < | 12500 |
| MANGANESE | 300 | 5 | 1500 | | < | 1500 |
| MERCURY | 0.3 | 10 | 3 | 30 | < | 3 |
| METHYLNAPHTHALENE, 2- | 0.5 | 10 | 5 | 80 | < | 5 |
| NAPHTHALENE | 0.5 | 10 | 5 | 20 | < | 5 |
| NICKEL | 20 | 7.5 | 150 | 1000 | < | 150 |
| PHENANTHRENE | 3 | 10 | 30 | 1000 | < | 30 |
| PYRENE | 4 | 10 | 40 | 3000 | < | 40 |
| SELENIUM | 0.5 | 10 | 5 | 700 | < | 5 |
| SILVER | 0.6 | 10 | 6 | 200 | < | 6 |
| THALLIUM | 0.6 | 10 | 6 | 60 | < | 6 |
| VANADIUM | 30 | 7.5 | 225 | 700 | < | 225 |
| ZINC | 100 | 5 | 500 | 3000 | < | 500 |

¹ Concentration of OHM in soil must be LESS THAN (not equal or greater than) this value.

V. Sampling Considerations

The soil proposed for disposal/re-use should be sampled at sufficient and adequately distributed locations so that the concentrations of the contaminants of concern in the soil are adequately characterized. This includes sampling for the purpose of MCP site assessment and sampling to characterize the soil in any given stockpile/shipment leaving the site. The factors listed below should be considered when developing and implementing such a sampling plan. Evaluation of release, source, and site specific conditions assist in developing the basis for the selection of field screening techniques, sampling methodologies, sampling frequencies, and the contaminants of concern (e.g., analytical parameters) used to characterize the soil. These include, but are not necessarily limited to the following:

- the type(s) and likely constituents known or suspected to be in the soil;
- current and former site uses, past incidents involving the spill or release of OHM, and past and present management practices of OHM at the site;
- the potential for the soil to contain listed hazardous waste or to be a characteristic hazardous waste;
- the presence or likelihood of any other OHM (e.g., chlorinated solvents, metals, polychlorinated biphenyls (PCBs), semi-volatile organic compounds (SVOCs), halogenated volatile organic compounds (VOCs));
- visual/olfactory observations, field screening, analytical data, and/or in-situ pre-characterization data;
- soil matrix type - naturally occurring soil or fill/soil mixtures (e.g., homogeneous or heterogeneous soil conditions);
- the identification and segregation of discrete "hot spots";
- the concentration variability in the soil;
- the volume of soil;
- the current and likely future exposure potential at the receiving location, including the potential for sensitive receptors, such as young children, to contact the soil (for example, more extensive sampling of the stockpiles would be warranted for soil slated to be moved to a residential setting than for soil being moved to a secure, low-exposure potential regulated receiving facility); and
- any sampling requirements stipulated by the receiving location.

The assessment of the soil, including the nature and concentrations of OHM therein, is a component of the MCP site assessment and therefore must meet all applicable performance standards, including those for environmental sample collection, analysis and data usability⁶. The assessment should address the precision, accuracy, completeness, representativeness, and comparability of the sampling and analytical results used to determine whether the soil

⁶ Additional guidance on data usability is available in Policy #WSC-07-350, [MCP Representativeness Evaluations and Data Usability Assessments](http://www.mass.gov/eea/docs/dep/cleanup/laws/07-350.pdf). <http://www.mass.gov/eea/docs/dep/cleanup/laws/07-350.pdf>

stockpiles meet the Similar Soils Provision requirements. The representativeness of any site assessment sampling data if used to characterize contaminant concentrations in soil to be moved and reused offsite should be carefully evaluated. Additional guidance on soil sampling considerations is available from U.S. EPA and other state environmental agencies.⁷

VI. Segregation and Management of Soils of Different Known Quality

Soil containing concentrations of OHM equal to or greater than the values listed in Table 3 cannot be managed using the streamlined approach described in this guidance. Such soil must be managed in a manner consistent with its regulatory classification, which may include management as a hazardous waste, as a remediation waste, or under a case-specific Similar Soils determination.

Segregation of soil of different quality should occur based upon *in-situ* pre-characterization sampling results. Stockpiles of soil are mixtures that would require more extensive sampling to document the effectiveness of any attempted post-excavation segregation.

The known presence of soil that exceeds the Table 3 concentrations and the subsequent segregation of soil is one factor that would indicate the need for more frequent sampling (at least in that area of soil excavation) as described in Section V.

⁷ Note that the guidance below are not specific to MGL Chapter 21E disposal sites and may not reflect MCP-specific considerations to determine the suitability of soils for offsite transport and use, such as for residential and other S-1 locations.

NJDEP. 2011. Alternative and Clean Fill Guidance for SRP Sites.
New Jersey Department of Environmental Protection Site Remediation Program
http://www.state.nj.us/dep/srp/guidance/srra/fill_protocol.pdf

USEPA. 1992. Supplemental Guidance to RAGS: Calculating the Concentration Term.
Office of Solid Waste and Emergency Response (OSWER), Washington, DC
http://www.epa.gov/oswer/riskassessment/pdf/1992_0622_concentrationterm.pdf

USEPA. 1995. Superfund Program Representative Sampling Guidance Volume 1: Soil.
OSWER. Washington, DC.
(Note that guidance for determining the number of samples for statistical analysis is addressed in Section 5.4.1).
http://www.epa.gov/tio/download/char/sf_rep_samp_guid_soil.pdf

Attachment 1 – Similar Soil Flowchart

