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Fact Sheet: Soil Sampling

Why is soil at your home or building being tested for contaminants?

Your soil is being tested to find out whether contamination from a waste site is present. Results from earlier testing suggest that chemical contaminants from a waste site may be present in soil at your property.

Why is soil contamination a concern?

Exposure to chemicals through contact with soil can pose a health risk. Exposure only occurs when contaminants enter the body through: (1) touching the soil while gardening or playing in dirt; (2) breathing in small particles of contaminated dust; (3) eating contaminated soil stuck to the skin or to objects that may be mouthed by young children; or (4) eating produce grown in or near contaminated soil. The potential for health effects from soil contamination depends on the amount and toxicity of the contaminants, the extent of contact with the soil, and an individual's sensitivity to the chemical.

What contaminants are typically of concern in soil?

Types of contaminants that are often found in soil at waste sites include petroleum products such as fuel oil, organic compounds such as PCBs (polychlorinated biphenyls), and inorganic chemicals and metals such as arsenic, chromium, mercury, and lead.

What will the results of the laboratory tests show?

The tests will identify the types and amounts of chemicals in the soil. Soil tests are usually limited to the types of chemicals associated with the waste site. It is important to realize that even areas that aren't affected by a waste site may have chemicals in soil (ie, "background levels"). Therefore the lab results may include chemicals that are from sources other than a waste site.

What are other sources of chemicals in soil aside from waste sites?

Soil often contains chemicals from other sources, such as:

- Metals or hydrocarbons from nearby roads and smokestacks;
- Lead from old house paint;
- Pesticides (historically) used near the home; and
- Natural background concentrations of metals in soil.

How is the source of chemicals in soil identified?

The soil test data are compared to background levels of those chemicals found in areas without waste sites. If the levels in the soil are above background levels, further assessment is required. The history of land use in the area and the waste site itself are also considered when determining whether chemicals in soil are from background sources.

How is the potential for health effects evaluated?

Once the soil contaminants are determined to be from a waste site, their potential to cause health effects is evaluated. The chemical levels in soil will be either compared to risk-based soil standards that have been developed to protect health or evaluated by performing a site-specific risk assessment. Risk assessments consider the amount and toxicity of the contaminants and the potential exposures to that soil. For a residential property, the risk assessment assumes that sensitive individuals such as children are exposed to the soil by frequent contact through play. Using these high exposures ensures that everyone who might be exposed will be protected.

Do cleanup decisions consider all exposures that may cause health effects?

Yes, site remediation policies and practices are designed to be protective for all exposures. Some exposure pathways are not quantified in risk assessments, but are nevertheless accounted for in the waste site management process.

For example:

- Outdoor exposures included in the risk assessment are set at levels high enough to account for both outdoor and indoor exposures combined, so indoor exposures are not evaluated separately.
- The potential for inhalation of contaminated soil particles is included in risk assessments for sites where soil is not vegetated. Where there is grass or other plants covering the soil, the potential for airborne dust is expected to be minimal and therefore inhaling soil particles is not included in the risk assessment.
- Exposures from eating homegrown produce are not quantified in the risk assessment because existing science does not allow for accurate estimates of vegetable concentrations from soil contaminants. To protect gardeners and their families, MassDEP recommends gardening practices that minimize transfer of contaminants to plants.

What happens if there is soil contamination at levels of concern?

If soil contamination present at levels that could pose a risk of harm to human health, actions will be taken to reduce or prevent exposure to the contaminants. These measures may include removing contaminated soil or covering and containing the soil so that exposures to contaminated soil are reduced or eliminated.

What can you do to protect your family from any soil contamination during the investigation?

There are simple measures you can take to minimize exposure to any contaminated soil:

- Maintain landscaping so that there is vegetation on all soil, reducing dust.
- Discourage children from playing on bare soil -- provide a sandbox, if possible -- and make sure they wash hands and other exposed skin after playing outside, especially before eating. Wash toys before bringing them into the house.
- Keep pets clean. Dogs and cats can bring dirt and dust inside on their paws or fur.
- Clean up any dirt that is tracked into the building. Use a wet mop whenever you can, since sweeping or vacuuming can stir up dust in the air. Clean window sills and other surfaces with a damp cloth to minimize dust in warmer months.
- Use raised beds for growing vegetables. Wash all home-grown produce to remove any soil.