



A Citizen's Guide to Solidification/Stabilization

The Citizen's Guide Series

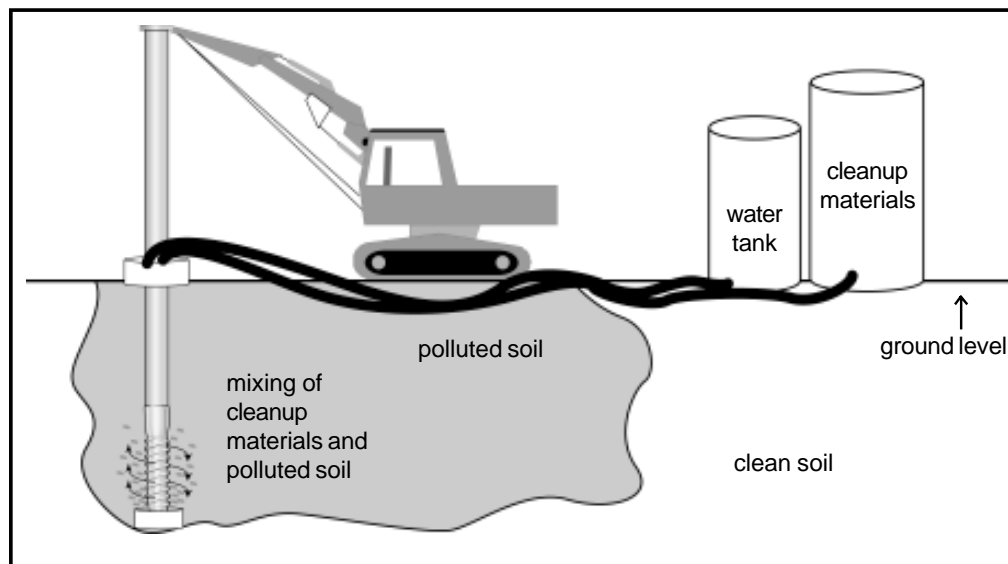
EPA uses many methods to clean up pollution at Superfund sites. If you live, work, or go to school near a Superfund site, you may want to learn more about these methods. Perhaps they are being used or are proposed for use at your site. How do they work? Are they safe? This Citizen's Guide is one in a series to help answer your questions.

What is solidification/stabilization?

Solidification/stabilization refers to a group of cleanup methods that prevent or slow the release of harmful chemicals from polluted soil or sludge. These methods usually do not destroy the chemicals—they protect human health and the environment by preventing the chemicals from moving into the environment. Solidification refers to a process that binds the polluted soil or sludge and cements it into a solid form. Stabilization refers to changing the chemicals so they become less harmful or less mobile. These two methods are often used together to prevent exposure to harmful chemicals.

How do they work?

Solidification involves mixing polluted soil or sludge with a substance, like cement, that causes the soil to harden. The mixture forms a solid that can be left in place or removed to another location. The solidification process prevents chemicals from spreading into the surrounding environment. Rain or other water cannot pick up or dissolve the chemicals as it



moves through the treated soil or sludge. Solidification does not get rid of the harmful chemicals, it simply traps them in place.

Stabilization changes harmful chemicals into substances that are less harmful or less mobile. For example, soil polluted with metals can be mixed with lime or cement. These cleanup materials react with metals to form less soluble metal compounds. These metal compounds do not move through or out of the soil as easily.

Solidification/stabilization methods may or may not require the soil to be removed. Sometimes the polluted soil or sludge is dug up and placed in large mixers above ground. The mixer blends the soil or sludge with cleanup materials, such as cement and lime. The treated soil or sludge may then be returned to the ground at the site or placed in a landfill.

At other sites, instead of digging up the soil or sludge, cleanup materials can be mixed directly into the soil or sludge while it remains in place. The mixing is done using large augers or rototillers. Treated soil or sludge left at the site is then covered with clean soil or pavement. After solidification/stabilization is complete, EPA tests the surrounding soil to make sure no pollution was missed.

Is solidification/stabilization safe?

In order ensure the safety of the cleanup, EPA tests the final mixture to confirm proper sealing of the harmful chemicals and for strength and durability of the solidified or stabilized materials. Sometimes EPA will restrict the use of areas that have been solidified or stabilized. These land use restrictions can prevent future damage to the treated area.

How long will it take?

Solidification/stabilization may take weeks or months to complete, depending on several factors that vary from site to site:

- types and amounts of chemicals present
- size and depth of the polluted area
- types of soil and geologic conditions
- whether the mixing occurs in place or in mixing tanks



Why use solidification/stabilization?

Solidification/stabilization provides a relatively quick and low cost way to protect human health and the environment from the threat posed by harmful chemicals, especially metals. Solidification/stabilization has been chosen as part of the remedy at over 180 Superfund sites across the country.

For more information

write the Technology Innovation Office at:

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Further information also
can be obtained at
www.cluin.org or
**www.epa.gov/
superfund/sites.**

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