# Vertical separation distance for existing subsurface sewage treatment systems

This fact sheet provides information for homeowners, Subsurface Sewage Treatment Systems (SSTS) inspectors, and Local Government Units (LGUs) on the vertical separation requirements for SSTS.

## What is vertical separation distance and why is it required?

Minn. R. 7080.1100, subp. 91, defines vertical separation as the vertical measurement of unsaturated soil or sand between the bottom of the distribution medium and the periodically saturated soil level or bedrock. For an SSTS to properly treat wastewater, this zone of unsaturated soil must be present in order for beneficial bacteria and microbes in the soil to remove harmful bacteria and viruses from the wastewater. The periodically saturated soil level is commonly identified by the presence of redoximorphic features.

## What are redoximorphic features?

Redoximorphic features, commonly referred to as 'redox features', and previously referred to as "mottles" or "mottling" are color patterns formed in the soil by the process of reduction, translocation and oxidation of iron or manganese compounds. They are used to determine compliance for existing systems and to determine the type of new or replacement system for a site. Redoximorphic features are further defined in Minn. R. 7080.1720, subp. 5. E.

## What is the required vertical separation distance?

Minn. R. 7080.1500 allows two different vertical separations for SSTS, depending on when and where the system was constructed.

For SSTS constructed after March 31, 1996, or in a Shoreland area, Wellhead protection area, or Food, beverage, or lodging establishment (SWF), at least three feet of vertical separation distance is required. The LGU may allow up to a 15 percent reduction in this distance; however, this reduction must be specified in the local SSTS ordinance.

For SSTS constructed before April 1, 1996, in areas that are not SWF, at least two feet of vertical separation distance is required. There is **no** allowance for an additional reduction of 15 percent in the vertical separation for these systems.

Systems that use a registered pretreatment device to assist in the treatment of sewage may be able to decrease the required vertical separation distance for their system. The required separation distance for systems that use registered treatment products varies with each product and components; the required separation ranges from one to three feet of suitable, unsaturated soil. Please refer to the Minnesota Pollution Control Agency SSTS product registration webpage and their requirements at https://www.pca.state.mn.us/business-with-us/ssts-product-registration.

The required vertical separation distance for systems designed under the "performance" section of previous rule versions (Minn. R. 7080.0179; 1999 to 2006), shall be based on the design approved by the local unit of government.

## Can a local ordinance be more restrictive?

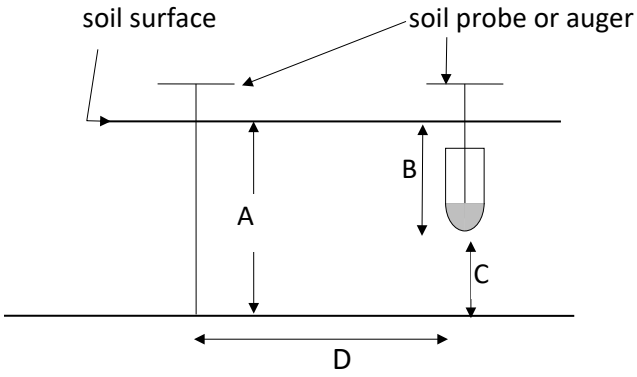
A LGU **can r**equire greater than three feet of vertical separation distance for systems constructed after March 31, 1996. However, LGUs **cannot r**equire systems to be replaced if they have at least two feet of vertical separation for systems constructed before April 1, 1996, for systems located outside of SWF areas (per Minnesota Stat. 115.55, subd. 5a).

## How is the vertical separation distance determined?

The separation distance is measured outside the area of system influence in an area of similar soil. Therefore, the measurement is taken:

- In an area adjacent to the system, but not affected by the system's use
- On the same contour and landscape position of similar soil

When a compliance inspection is conducted, the certified inspectors make soil borings based on the requirements above. This can be depicted graphically as:




Where:

A = depth from surface to periodically saturated soil or bedrock

B = depth from surface to bottom of distribution media

C = vertical separation distance

D = location on same contour and landscape position, but not in the soil dispersal system itself

Once the depths A and B have been determined, vertical separation is calculated as:

A – B = C

Depending upon when and where the SSTS was constructed, the value obtained in C must equal two feet or more for system compliance.

As soil conditions can vary considerably across the location of an onsite system, SSTS inspectors are encouraged to conduct more than one soil boring to get the best possible representation of soil conditions at the site.

## Where can I find more information?

For additional SSTS information, please visit our website at www.pca.state.mn.us or call us at 651-296-6300, or toll free at 800-657-3864.