



CLASS V UIC STUDY FACT SHEET *LARGE-CAPACITY SEPTIC SYSTEMS*

What is a large-capacity septic system (LCSS)?

LCSSs are an on-site method for partially treating and disposing of sanitary wastewater. Only those septic systems having the capacity to serve 20 or more persons-per-day are included within the scope of the underground injection control (UIC) regulations. Many conventional LCSSs consist of a gravity fed, underground septic tank or tanks, an effluent distribution system, and a soil absorption system. LCSSs may also include grease traps, several small septic tanks, a septic tank draining into a well, connections to one large soil absorption system, or a set of multiple absorption systems that can be used on a rotating basis.

What types of fluids are injected into LCSSs?

Sanitary wastewater from a wide variety of establishments, including residential (multi-unit housing) and non-residential (commercial, institutional, and recreational) facilities. The characteristics of the sanitary wastewater from these establishments vary in terms of biological loadings and flow (e.g., daily, seasonal). Generally, the fluid is characterized by high biological oxygen demand and chemical oxygen demand, nitrate, trace metals and other inorganics, limited trace organics, and biological pathogens.

Do injectate constituents exceed drinking water standards at the point of injection?

Available sampling data indicate that LCSS effluent may contain arsenic, fecal coliform, nitrate, total nitrogen species, and formaldehyde (in septic systems serving recreational vehicles) at concentrations above primary drinking water standards or health advisory levels. The concentrations of aluminum, iron, manganese, and sodium may exceed secondary drinking water standards.

What are the characteristics of the injection zone of a LCSS?

Typically, LCSSs are located in well-drained soils; however, some LCSSs have been located in areas with karst or fractured bedrock.

Are there any contamination incidents associated with LCSSs?

Contamination incidents caused by LCSSs have occurred in Racine, MO; in Coconino County, AZ; and in Richmond Heights, FL. In addition, 24 other instances have been identified where LCSSs failed and ground water contamination may have resulted. While there are surely other examples of LCSS failure across the United States beyond these known incidents, the prevalence of contamination cases appears low relative to the prevalence of these systems.

Are LCSSs vulnerable to spills or illicit discharges?

LCSSs are vulnerable to spills because any materials spilled or dumped down sinks, toilets, or floor drains connected to the sanitary waste system can enter the septic tank. Examples of the materials that may enter LCSSs include household cleaning products and wastes (e.g., cleaning solvents and spent solutions) that were spilled as well as chemicals dumped illicitly (e.g., waste oil).

How many LCSSs exist in the United States?

There are about 43,000 LCSSs documented in the United States. Based on an inventory model developed by EPA, the estimated number of LCSSs is 353,400 nationwide. With a 95 percent prediction interval, the estimated number of LCSSs ranges from 304,100 to 402,600.

Where are LCSSs located within the United States?

LCSSs have been constructed nationwide.

How are LCSSs regulated in states with the largest number of this type of well?

Regulation of LCSSs varies among states. State regulations vary from stringent siting, construction, and operation requirements (e.g., MA, MN) to general construction permitting (e.g., NJ, IA).

Where can I obtain additional information on LCSSs?

For general information, contact the Safe Drinking Water Hotline, toll-free 800-426-4791. The Safe Drinking Water Hotline is open Monday through Friday, excluding federal holidays, from 9:00 a.m. to 5:30 p.m. Eastern Standard Time. For technical inquiries, contact Amber Moreen, Underground Injection Control Program, Office of Ground Water and Drinking Water (mail code 4606), EPA, 401 M Street, SW, Washington, D.C., 20460. Phone: 202-260-4891. E-mail: moreen.amber@epa.gov. The complete Class V UIC Study (EPA/816-R-99-014, September 1999), which includes a volume addressing LCSSs (Volume 5), can be found at <http://www.epa.gov/OGWDW/uic/cl5study.html>.
