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Environmental Protection
Agency

Office of Water
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Washington, DC 20460

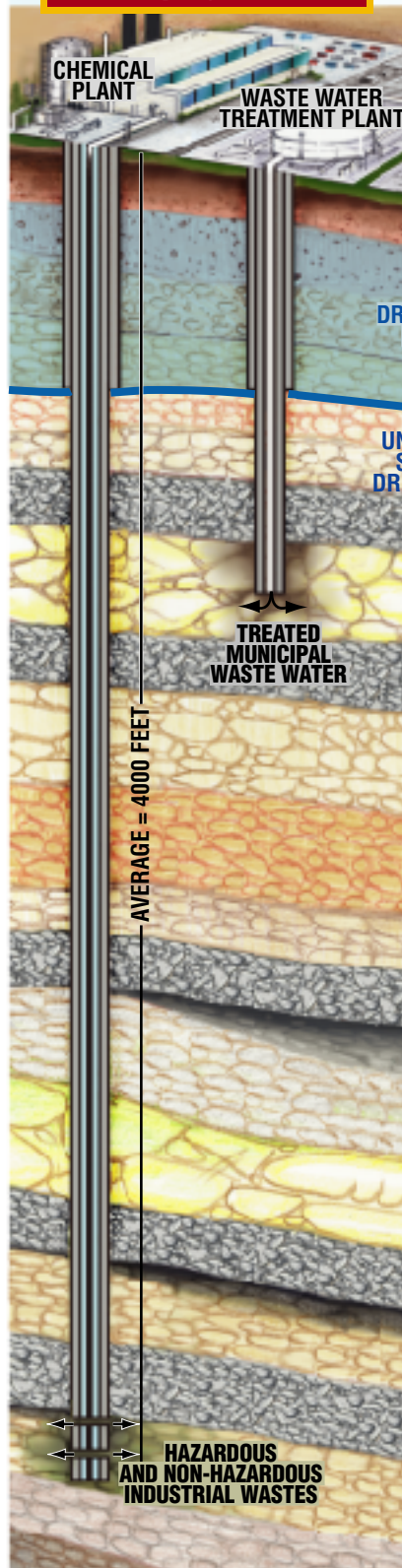
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Safe Drinking Water Act

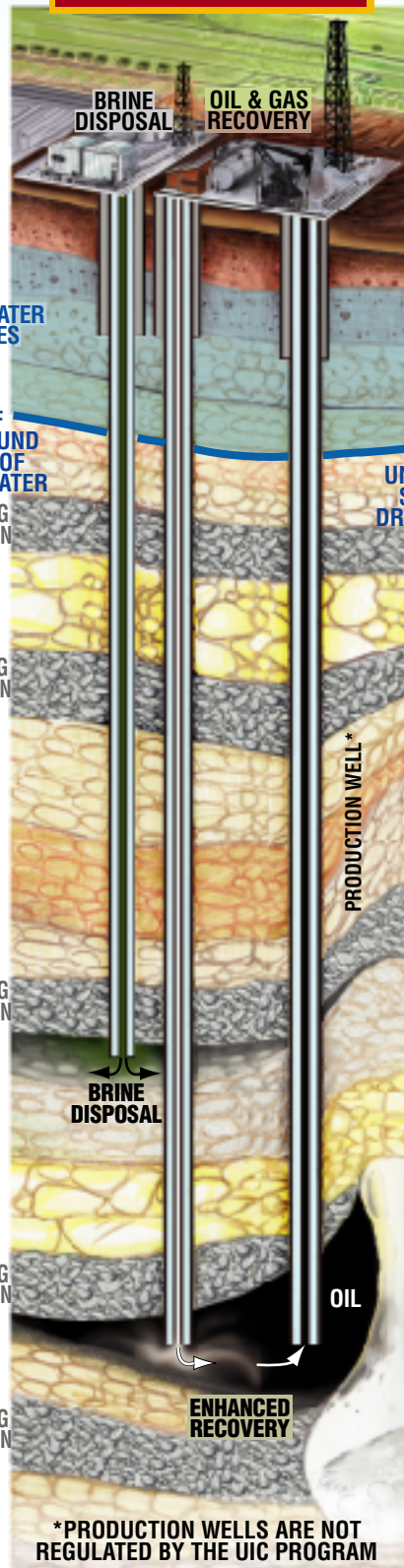
Underground Injection Control (UIC) Program

Protecting Public Health and Drinking Water Resources

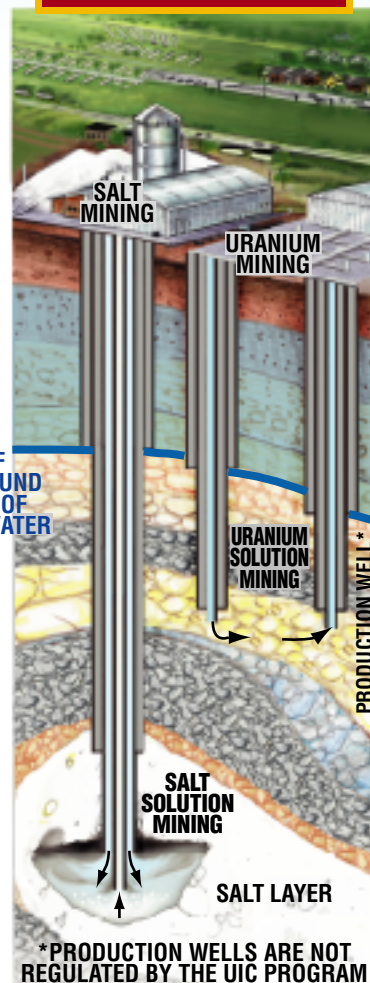
Class I wells-
Isolate hazardous,
industrial and municipal
wastes through
deep injection



Class II wells-
Inject oil and gas
production wastes



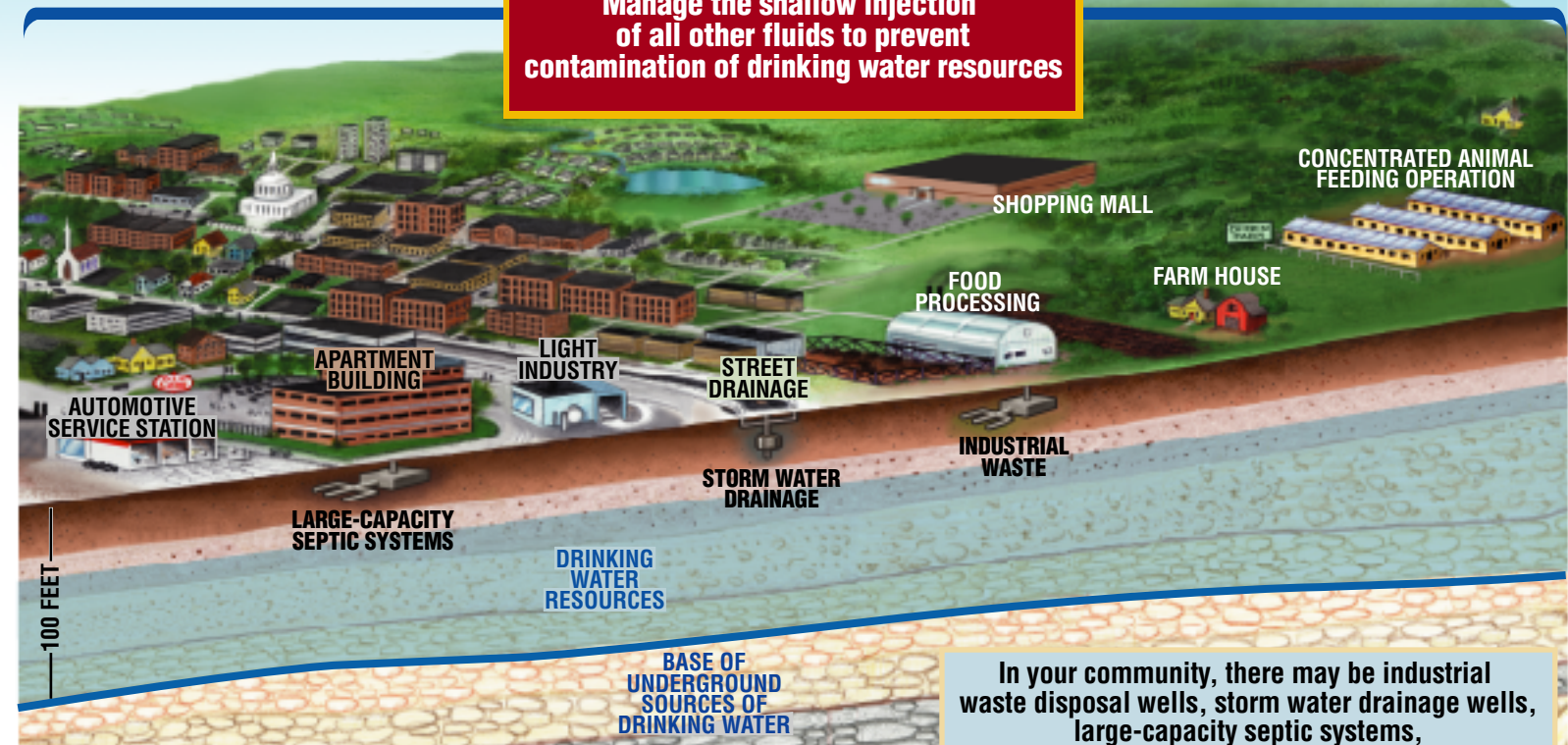
Class III wells-
Minimize
environmental impacts
from solution mining
operations



Class IV wells-
Prevent ground water
contamination
by prohibiting
the shallow injection
of hazardous waste
except as part of
authorized
cleanup activities

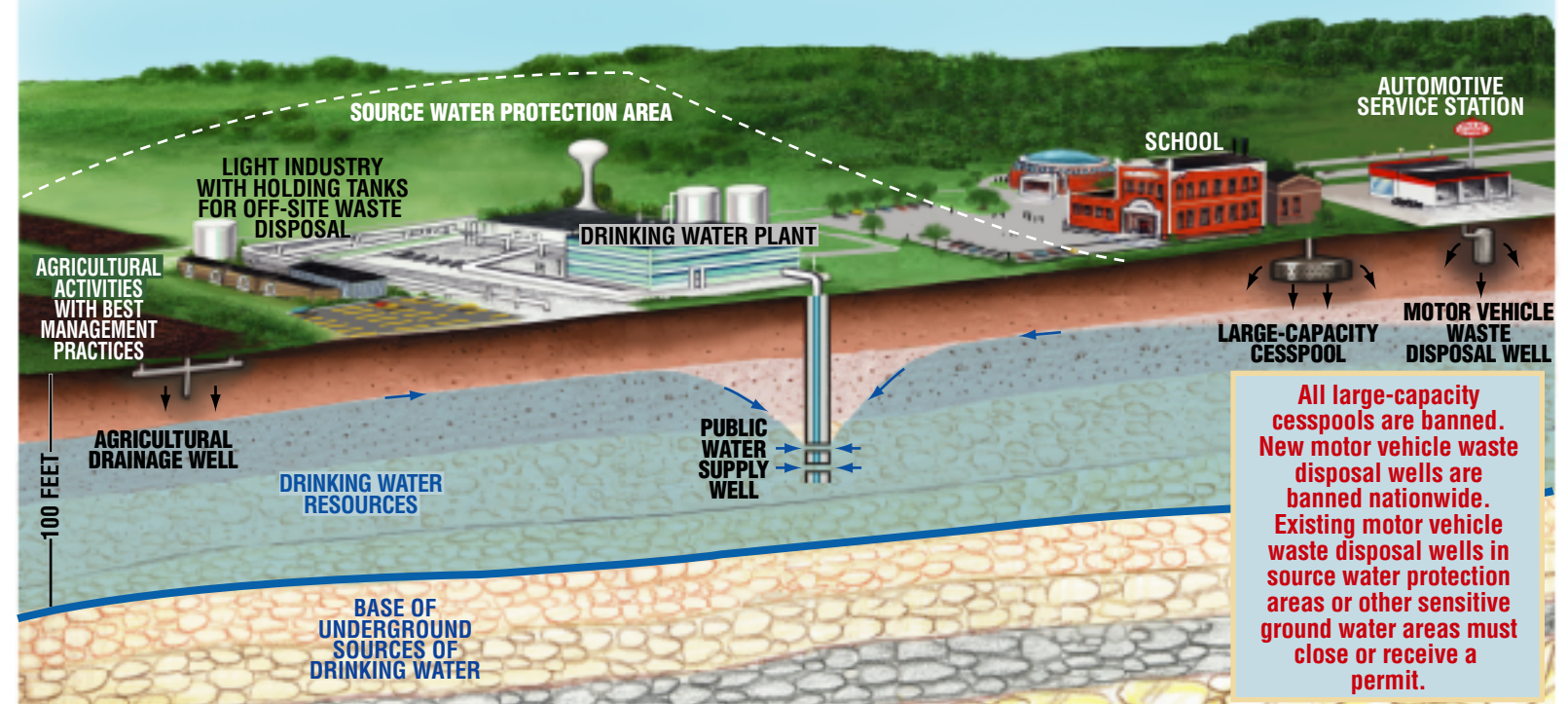


Class V wells-
Manage the shallow injection
of all other fluids to prevent
contamination of drinking water resources



In your community, there may be industrial waste disposal wells, storm water drainage wells, large-capacity septic systems, and other Class V wells. They are regulated and are not allowed to endanger drinking water resources.

Class V wells continued



All large-capacity cesspools are banned. New motor vehicle waste disposal wells are banned nationwide. Existing motor vehicle waste disposal wells in source water protection areas or other sensitive ground water areas must close or receive a permit.

Safe Drinking Water Act Underground Injection Control (UIC) Program

Protecting Public Health and Drinking Water Resources

Why Do We Have a Program to Regulate Underground Injection?

Each year Americans generate large amounts of waste fluids. More than 750 billion gallons of hazardous and non-hazardous fluids are disposed of safely through underground injection. The Underground Injection Control (UIC) Program is designed to protect underground sources of drinking water (USDWs) and provide a safe and cost-effective means for industries, municipalities, and small businesses to dispose of their wastewater, extract mineral resources, and store water for the future. Illegal discharges have the potential to contaminate our underground drinking water resources. Preventing this contamination is vital because most accessible fresh drinking water is found underground in shallow formations called aquifers. Aquifers provide water for more than 90 percent of the public water systems in America. They also supply agricultural wells, feed our lakes, and help recharge our streams and rivers, particularly during dry periods. In addition, millions of Americans living in rural areas rely on private wells that draw their water from aquifers. Safe and clean drinking water resources are essential for our growing population. Protecting future drinking water resources is essential for continued growth. The UIC Program prevents contaminants from entering our drinking water resources to protect our public health.

What Are Injection Wells?

An injection well is any bored, drilled, or driven shaft, or dug hole, whose depth is greater than its largest surface dimension; an improved sinkhole; or a subsurface distribution system used to discharge fluids underground. These wells range from deep, highly technical, and more frequently monitored wells to shallow on-site drainage systems, such as septic systems, cesspools, and storm water drainage wells. There are five categories or “classes” of injection wells based on function, construction, and operating features.

What Is the Statutory Basis for the UIC Program?

In 1974, Congress passed the Safe Drinking Water Act (SDWA). Part of SDWA required the U.S. Environmental Protection Agency (EPA) to report back to Congress on waste disposal practices, and develop minimum federal requirements for injection practices that protect public health by preventing injection wells from contaminating USDWs. USDWs are defined as aquifers or portions of aquifers that have a sufficient quantity of ground water to supply a public water system and contain fewer than 10,000 milligrams per liter (mg/l) or parts per million (ppm) total dissolved solids (water that can be treated to drinking water standards). This includes all current and future underground drinking water resources.

How Does the UIC Program Protect Public Health?

EPA established the UIC Program to set minimum federal requirements for all injection wells that discharge hazardous and non-hazardous fluids above, into, or below USDWs. They affect the siting, construction, operation, maintenance, monitoring, testing, and closure of injection wells. All operational injection wells require authorization under general rules or specific permits. Fluids cannot be injected if they may endanger a drinking water source.

- **Class I wells - *Isolate hazardous, industrial and municipal wastes through deep injection.*** Class I wells inject hazardous and non-hazardous wastes into deep, isolated rock formations below the lowermost USDW. There are specific siting, construction, operating, monitoring and testing, reporting and record keeping, permitting, and closure requirements for all Class I wells. There are two main types of Class I wells: hazardous waste wells and non-hazardous waste wells.

- ◆ Class I Hazardous Waste Disposal Wells are mainly used by industries such as petroleum refining and metal, chemical, and pharmaceutical production. These wells inject up to 2 miles below the surface and are designed to prevent any waste from escaping the injection zone. Because of the hazardous nature of the waste, Class I hazardous well owners must also show that the hazardous waste will not move from the injection zone for 10,000 years, or for as long as the waste remains hazardous. Eighty-nine percent of all hazardous waste disposal in the United States is done through Class I wells. Class I hazardous waste wells are stringently regulated under the SDWA (UIC Program) and the Resource, Conservation and Recovery Act (RCRA). There are approximately 120 Class I hazardous wells in operation in the United States.

- ◆ Class I Non-Hazardous Waste Disposal Wells are used by industries and municipal wastewater treatment facilities to dispose of non-hazardous waste, such as dilute manufacturing process waste and treated sanitary wastewater. All Class I non-hazardous wells are monitored, inspected, and tested regularly. There are approximately 380 Class I non-hazardous wells operating in the United States.

- **Class II wells - *Inject oil and gas production wastes and materials.*** Class II wells inject fluids associated with oil and natural gas production. Most of the injected fluid is brine pumped to the surface along with oil and gas. This brine is often saltier than seawater and can contain toxic metals and radioactive substances. By injecting the brine, Class II wells prevent surface contamination of soil and water. In addition, well operators inject residual brines, steam, polymers, and other fluids to enhance the production of oil and gas. Class II well operators must follow strict construction and conversion (from production wells) requirements, except when historical practices in the state and geology allow for different standards. Class II wells are permitted or authorized by rule; the well owner or operator must meet all applicable requirements; and the wells are tested and inspected regularly. There are about 147,000 Class II wells in operation in the United States.

- **Class III wells - *Minimize environmental impacts from solution mining operations.*** Class III wells inject fluids into rock formations to dissolve and extract minerals. The injected fluids are pumped to the surface and the minerals in solution are extracted. Generally, the fluid is recycled into the same formation for further mineral extraction. More than 50 percent of the salt and 80 percent of the uranium extraction in the United States involves Class III injection wells. These wells are permitted or authorized by rule. Class III well owners or operators must case and cement their wells, and the wells must be tested regularly. There are about 190 mining sites with approximately 17,000 Class III wells operating in the United States.

- **Class IV wells - *Prevent ground water contamination by prohibiting the shallow injection of hazardous waste except as part of authorized cleanup activities.*** Class IV wells were shallow wells used to inject hazardous or radioactive wastes. They are banned except when operated to inject treated contaminated ground water back into the original aquifer. These wells can be operated only with federal or state approval under the RCRA or Superfund programs. There are about 40 waste cleanup sites with Class IV wells in operation in the U.S.

- **Class V wells - *Manage the shallow injection of all other fluids.*** Class V wells are injection wells that are not included in Classes I through IV. Class V wells inject non-hazardous fluids into or above an aquifer. They are typically shallow, on-site disposal systems, such as floor and sink drains that discharge into dry wells, septic systems, leach fields, and similar types of drainage wells, although there are some Class V wells that are deep injection wells. When properly designed, sited, operated, and maintained, Class V wells do not endanger drinking water sources. Most Class V wells are authorized by rule. An estimated 500,000 to 685,000 Class V wells are in operation in the United States. Examples of Class V wells include the following:

- ◆ Agricultural Drainage Wells are used to drain farmland for cultivation. They include improved sinkholes, abandoned drinking water wells, and underground drain tiles and cisterns.

- ◆ Industrial Waste Disposal Wells are used to dispose of non-hazardous industrial or commercial waste and fluids. These wastes and fluids include wastewater from a wide variety of industries including petroleum refineries, carwashes, laundromats, commercial printers, food processors, chemical manufacturers, electroplaters, small machinery, tool and die, and other industrial operations.

- ◆ Large-Capacity Cesspools are typically drywells that receive untreated sanitary waste and which have an open bottom and, sometimes, perforated sides. Large-capacity cesspools are used by multiple dwelling units, business establishments, community or regional establishments such as churches and shopping malls, and other facilities such as camp grounds and highway rest stops. New large-capacity cesspools are banned and existing large-capacity cesspools must close.

- ◆ Large-Capacity Septic Systems are on-site systems that partially treat and dispose of sanitary wastewater. Most large-capacity septic systems consist of a septic tank and a leach field. Large-capacity septic systems are used by multiple dwelling units, business establishments, community or regional establishments, and other facilities.

- ◆ Motor Vehicle Waste Disposal Wells are used to dispose of fluids from the repair or maintenance of motor vehicles. Fluids entering these wells include organic chemicals such as petroleum products and inorganic chemicals such as heavy metals. New motor vehicle waste disposal wells are banned and existing wells must close or receive a permit.

- ◆ Saline Intrusion Barrier Wells (not shown) are used to inject water into an aquifer to prevent intrusion of salt water into that aquifer.

- ◆ Storm Water Drainage Wells are used to remove storm water and urban runoff from surfaces such as roadways, roofs, and paved surfaces to prevent flooding.

- ◆ Subsidence Control Wells (not shown) are used to control land sinking, or subsidence, caused by ground water withdrawal.

NOTE: The UIC Program does not regulate sanitary discharges from individual residential septic systems and cesspools, and nonresidential septic systems and cesspools that inject only sanitary waste and have the capacity to serve fewer than 20 persons per day.

There are many other subcategories of Class V wells. Additional information can be found by visiting EPA’s UIC Program Web site at <http://www.epa.gov/safewater/uic.html>.

Who Implements the UIC Program?

States and tribes may apply to EPA to obtain primary enforcement responsibility, or primacy, to administer the UIC Program. Primacy programs must meet the minimum federal requirements, but may have more stringent requirements. Thirty-three states, Guam, the Commonwealth of the Mariana Islands, and Puerto Rico have primacy for all classes of injection wells. Seven states share primacy with EPA. EPA directly implements the UIC programs for the remaining states, the Virgin Islands, American Samoa, and Indian Country.

What Can You Do to Protect Your Drinking Water?

Preventing contamination can save you money and protect your family’s health. Here are some of the things you can do to help protect your drinking water source:

- **Know where your drains go.** Many homes or businesses use septic systems or drywells for waste disposal. These systems are designed for household sanitary wastes only.

- **Become involved in Source Water Protection.** Every state is conducting Source Water Assessments for its public water systems. These assessments will identify the major potential sources of contamination (including Class V wells) to public drinking water supplies. The results will be provided to the public. Communities will use this information to plan protection activities and identify Class V wells for proper management to prevent contamination of drinking water sources. The UIC Program has banned motor vehicle waste disposal wells in source water protection areas. States are also encouraged to target these areas for UIC protective measures.

- **Read your consumer confidence report.** This report, published once a year by the agency providing you with your drinking water, gives you information about the quality of your drinking water and information about your state’s source water assessment for your system, when it has been completed.

For More Information:

Call the Safe Drinking Water Hotline (800) 426-4791 or the Office of Ground Water and Drinking Water (202) 260-7077; write to The UIC Program, Mail Code 4606, U.S. EPA, 1200 Pennsylvania Avenue, NW, Washington, D.C. 20460; or visit the Web site at <http://www.epa.gov/safewater/uic.html>.

Definitions

IMPROVED SINKHOLE – A naturally occurring depression or other natural crevice (for example, those found in limestone or volcanic rocks), which has been modified for the purpose of directing and discharging fluids underground.

SUBSURFACE DISTRIBUTION SYSTEM – An assemblage of perforated pipes, drain tiles, or other similar mechanisms intended to distribute fluids below the ground surface.

AUTHORIZATION BY RULE – An owner or operator of an injection well who submits proper inventory information to the UIC regulatory authority may construct or use his or her well as long as the injection activity does not endanger USDWs.

NON-ENDANGERMENT – No owner or operator shall construct, operate, maintain, convert, plug, abandon, or conduct any other injection activity in a manner that allows the movement of fluid containing any contaminant into USDWs, if the presence of that contaminant may cause a violation of any primary drinking water regulations or may adversely affect the health of persons.