Missouri Department of Natural Resources

Permit Requirements for Underground Injection Control (UIC) Wells

Water Protection Program technical bulletin 7/2006

Any person or business that proposes to introduce fluids into the subsurface must first determine if that activity is allowed by the law and regulations of the State of Missouri.

This technical bulletin discusses UIC wells in general and includes a specific discussion of bioremediation wells.

Background

The Safe Drinking Water Act of 1974 and later amendments established the Federal Underground Injection Control (UIC) Program. The State of Missouri has obtained primacy from the U.S. Environmental Protection Agency (EPA) for the UIC program. EPA has divided injection wells into five classes, based upon where the wells inject fluids in relation to Underground Sources of Drinking Water (USDW) and whether the injected fluids are hazardous or non-hazardous. The five classes of injection wells are defined as follows:

CLASS I

Wells used to inject hazardous wastes or dispose of industrial and municipal fluids beneath the lowest USDW.

Class I injection wells are **banned** in Missouri by RSMo 577.155. This law, a general ban on injection in the state except in specified instances, prohibits hazardous waste injection.

CLASS II

Wells used to inject fluids associated with oil and natural gas production or fluids and compounds used for enhanced hydrocarbon recovery.

Class II injection wells are regulated under the Rules and Regulations of the Missouri Oil and Gas Council, 10 CSR 50-1.1010 to 10 CSR 50-5.010. The law that regulates the council's activities, including injection wells, is RSMo 259.

CLASS III

Wells used to inject fluids to extract minerals.

Class III injection wells are regulated under 10 CSR 20-6.090. This regulation requires those wishing to operate Class III wells to obtain a permit. Applications for this permit are made to the Department of Natural Resources' Water Protection Program (WPP) and are jointly reviewed by the departments Divison of Geology and Land Survey (DGLS) and WPP.

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CLASS IV

Wells used to dispose of hazardous or radioactive wastes into or above a USDW.

Class IV injection wells are **banned** in Missouri by RSMo 577.155. These wells are also banned nationwide under the Federal UIC regulations.

CLASS V INJECTION WELLS

Class V wells include a variety of different well types and are also referred to as shallow injection wells. Some of these wells are regulated by DGLS and certain types by the WPP. These wells are generally used to inject non-hazardous fluids into, or above, a USDW.

Some examples of Class V injection wells are

Improved Sinkholes – These are sinkholes that have been improved in some way to enhance the flow of surface drainage into them. This type of 'well' requires a water discharge permit from the WPP. This program derives its authorities from the Clean Water Law, RSMo 644.

Heat Pump/Air Conditioning Return Flow Wells – Groundwater used in an open loop heat pump system can be reinjected through this type of well. Heat pump systems used by more than eight single family residences or rated at greater than 600,000 British Thermal Units per hour are permitted by the WPP under 10 CSR 20.6070. Additionally, all commercial heat pumps require a permit from the WPCB. All other heat pump systems are regulated under the Missouri Water Well Regulations, 10 CSR 23.5010 to 10 CSR 23.5080.

Mine Backfill Wells – These wells are used to place a mixture of liquid and solid material into mined out portions of subsurface mines. The Missouri Department of Natural Resources' Solid Waste Management Program requires solid waste permitting for disposal of fly ash and other types of solid material over most of the state. The Missouri Hazardous Waste Program regulates fill material that is hazardous under state regulations. The WPP requires a UIC permit for these activities.

Aquifer Recharge Wells – Aquifer recharge wells recharge depleted aquifers. In Missouri, they are also used to maintain hydrostatic pressure around an underground storage cavern. Permits for recharge wells are issued by the WPP under the Clean Water Law (RSMo 644), with direct review by the department's DGLS UIC program personnel.

Automobile Service Station Disposal Wells – Automobile service station disposal wells are used to inject waste from repair bay drains at service stations, garages and car dealerships. These wells are not allowed in Missouri under 577.155 RSMo. There are no known active wells of this type, and violators may be prosecuted.

Abandoned Water Wells Used for Waste Disposal – Abandoned wells have the potential to be used to dispose of a variety of waste products that could potentially contaminate groundwater supplies. RSMo 577.155 does not allow injection into wells for the purposes of waste disposal, and violators may be prosecuted. If a water well has been determined to present a groundwater threat, Water Well Regulations allow that well to be ordered plugged.

Groundwater Remediation Wells – These injection wells are used in the cleanup of contaminated sites, and are permitted by the WPP under the Missouri Clean Water Law,

RSMo 644. For fuel spill cleanups, general permits are issued for projects that do not directly affect the groundwater. UIC site specific permits are issued for projects determined by the state to directly affect the groundwater. UIC permit applications are reviewed in greater detail to assure maximum protection of groundwater resources. Other types of cleanup operations also require a site-specific UIC permit.

Permits Needed for Groundwater Remediation Wells

Two types of permits are available for UIC operations:

1. A General Permit (MO-R409) is available for in-place soil washing or bioremediation of petroleum contaminated soil and subsoil around storage tanks through injection of materials into strata that are not aquifers.

   The general permit allows the placement of remediation materials or chemicals, both inorganic and organic, as well as bacterial agents into the ground to enhance or speed the in-place remediation of petroleum contaminated soil and subsoil. This permit is to be used only for petroleum contaminated soils and subsoils. Other contaminants are not covered by this permit. Soils contaminated to such an extent that they are considered hazardous in accordance with 40 CFR 261.24 are also ineligible for this permit. A final pumping is required at the end of remediation to remove unused chemicals. The permit does not authorize injection into an aquifer or allow the injected substances to reach an aquifer. Construction permit it requirements are waived for the general permit.

   To apply for the general permit, Form E, a topographic map showing location of remediation site and a permit fee of $150 must be submitted to the WPP. A plan detailing what is being injected and how cleanup of the injected material will be performed should also be included.

2. A site-specific UIC permit is required for all other injection operations that cannot be covered by the general permit. When an applicant applies for a site-specific UIC permit, there are two different permits issued by WPP (in joint review and approval from DGLS):

   a. A construction permit must be issued by WPP to build the injection and withdrawal wells;
   b. An National Pollutant Discharge Elimination System operating permit must be issued. State statute (RSMo 577.155) bans the use of these wells as waste disposal systems. Because groundwater remediation wells are not a listed exemption in the statute, WPCB interprets the statute to require any detectable trace of fluids used for remediation be eliminated after the remediation is completed. This can be accomplished by using withdrawal wells or reversing the injection process and pulling back whatever remains from the injection process.

The effluent limits put into UIC permits are both to control what is injected and to permit what is discharged to the waters of the state during the final phase of the remediation project. An operating permit is required for the injection of any fluid other than ambient air.

To apply for a UIC site-specific permit, Submit Form UIC1 and UIC2 with a topographic map indicating the well locations along with a permit fee of $1,500.

WPP applications should be sent to the Permits Section at address listed below.

For more information call or write

Missouri Department of Natural Resources
Water Protection Program
Permits Section
P.O. Box 176
Jefferson City, MO 65102-0176
1-800-361-4827 or (573) 751-1300 office
(573) 526-1146 fax
www.dnr.mo.gov/env/wpp/index.html