

is the safest option for any abandoned well, however. It is the well owner's responsibility to employ a licensed driller to plug a well abandoned since 1988.



### Indiana's Goal

By setting standards for water well construction and plugging, Indiana has taken one big step toward protecting our ground water resource. Better well construction will reduce contamination of ground water aquifers. Our goal should be to reduce and eliminate the original sources of pollution. This, like the drilling law, will require changes in methods, materials, and habits.

For more information on the laws governing water well drillers and well construction in Indiana, please contact:

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**Indiana Department of Natural Resources  
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# Minimum Standards for Water Well Construction

Indiana Code 25-39



Indiana Department of Natural Resources  
*Division of Water*



Ground water is a precious natural resource. It is so abundant in much of Indiana that the supply seems inexhaustible. Increased demand in some areas and natural scarcity in others, however, reveal the limits of ground water supply. Ensuring the potability of this supply by protecting the quality of ground water

is the goal of a statute enacted in 1987 by the Indiana General Assembly. This law has been in force since January 1, 1988, and can be found in Indiana Code, Title 25, Article 39.

### What is Ground Water?

Ground water exists because the surface layers of the earth (soil, alluvium, and weathered bedrock) are porous. Rain and melting snow move downward through open spaces (pores) between soil particles and through fractures in bedrock, a process known as infiltration. In the saturated zone, all of the pores and fractures are filled with water. Ground water also moves horizontally, but this movement may be as little as a few feet per year. Geologic formations (layers of sediment or rock) that are able to receive, store, and transmit enough water to satisfy human uses are called aquifers. How much water is held in an aquifer and how fast water moves through it depend on the formation's porosity (percent of total volume that is pore space) and permeability (interconnectedness of the pore space). Water in an aquifer is held like water in a wet sponge, not an underground lake. Underground pools and streams in caverns are rare.

### How is Ground Water Being Protected?

In Indiana Code 25-39, the State of Indiana makes water well drillers responsible for installing private wells in ways that prevent ground water

contamination. The Division of Water in the Department of Natural Resources cooperated with the Indiana Ground Water Association to develop detailed well construction standards (cited as 312 IAC 13). These standards, like the statute, have been in effect since January 1, 1988.

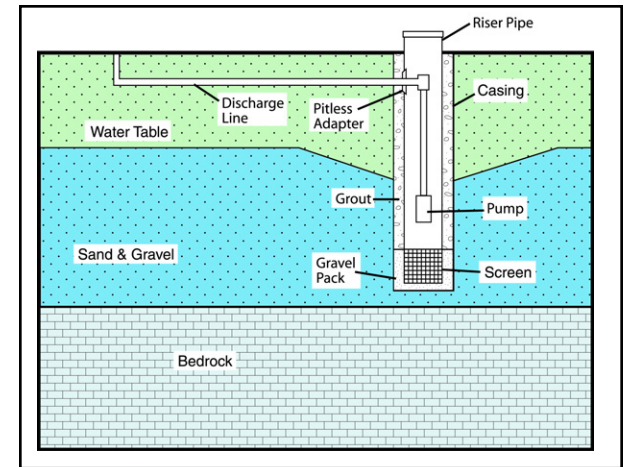
The well construction standards in Indiana Code and the Indiana Administrative Code regulate the drilling, casing, and grouting of new wells and the plugging of old wells. They also require every well driller to hold a license from the State and to submit well records to the Division of Water. Candidates for licensing are tested on Indiana's drilling statute and rules. Drillers pay an annual fee to maintain their licenses. A well record prepared by a driller describes the location and depth of the well; the well casing, screen, pump, and grout; the results of testing the well for yield; and the geological formations penetrated while drilling or driving the well.



Wells for cities and towns, churches, schools, and apartment complexes are usually part of public water supply systems. These wells are regulated by the Department of Environmental Management. IDEM's well standards are at 327 IAC 8-3.4.

### Location and Construction of Wells

A water well should be located as far as practicable from known sources of contamination, such as septic systems, fuel tanks, and livestock pens. A well is protected from surface water ponding, drainage, and flooding by the requirement that its finished casing or pitless adapter unit must extend at least one foot above ground level (or more, in a designated flood hazard area). Standards for well casing, screens, and



disinfection are designed to prevent contamination and extend the working life of a well.

Some well construction methods create a ring-shaped open space or annulus between the inside of the borehole and the outside of the well casing. The annular space can be a route for contaminants at the ground surface to move downward to the aquifer. To prevent this, the well construction standards require the annular space to be sealed (grouted) with an impermeable material after casing is installed. Approved grouting materials are neat cement (portland cement and water), crushed or pelletized bentonite clay, and bentonite slurries. Bentonite is a natural material mined in the western U.S. When dry bentonite clay is mixed with water, it swells and seals the annular space.

### Well Abandonment and Plugging

An older farmstead or residence may still have a hand pump or a dug well covered over with rotting boards. These old wells are potential conduits for ground water contamination, and the holes are safety hazards, especially for children. The water well drilling law requires recently abandoned wells to be plugged with the same impermeable materials used for grouting. Wells abandoned before 1988 may be sealed with a threaded or welded cap on the well casing, or a concrete slab or reinforced wood cover over the hole. Plugging