
ENVIRONMENTAL Fact Sheet



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Residential Spring Well Design

The definition of a “spring” varies widely. Most authorities would describe a spring as a dug well in which the static (non-pumped) water level rises above the top of the surrounding ground level. For this reason, many spring features are similar to those for dug wells. For a discussion of dug well construction, refer to NHDES fact sheet [DWGB-1-4, “Dug Well Design.”](#) For information concerning the proper abandonment of springs, see fact sheet [DWGB-1-7, “Decommissioning Inactive Wells.”](#) It is not normally possible to stop a spring from flowing.

Well Location Considerations

Well drillers and pump installers in New Hampshire are licensed by the Water Well Board under [NH RSA 482](#). The rules of the Board are [We 100-1000](#). These rules govern contractor licensing, well construction standards (including location requirements), and well reporting processes. For a private single family home, water wells shall be located 75 feet from septic system components, 100 feet from livestock pens, 75 feet from property lines, and 50 feet from a surface water body. A well should not be placed in locations subject to any flooding unless the immediate vicinity (25-foot radius) of the well is built up above the maximum possible flood level. Refer to [DWGB-21-1, “Site Selection for Private Drinking Water Wells”](#) for more information pertaining to locating private wells.

Springs are naturally occurring; the location of a spring is not selected by a homeowner. If a spring is to be constructed into a water supply where the setbacks listed above or required in the Water Well Board rules are not met, a Setback Reduction Form must be signed by the homeowner. This form is an acknowledgement that there is a risk of potential contamination of the well from land uses directly around the spring/well.

Springs on Other Properties

Many springs are located on property adjacent to that of the user’s. At best, the user’s right to the spring is based on an easement that gives very little detail. Such easements are often deficient in the following areas.

- a) Lack of restriction of hazardous activity uphill or otherwise near the spring.
- b) Lack of sufficient room or approval for maintenance around the spring or connecting piping.
- c) Approval or access to the spring or delivery piping.
- d) Comments on the amount of water allowed to be taken.

NHDES recommends that these shortcomings be corrected before the spring is developed or, if the spring already exists, as soon as possible.

Well Yield Considerations

There are no state requirements for what a private residences water source well needs to yield. Ultimately, that

water source shall yield enough water to meet the daily demands of the home day after day. It should also be recognized that a spring's yield may change with time and can be subject to drought effects. The best time to construct a spring is in the late summer or early fall when low water tables facilitate construction. This will allow a deep spring while minimizing muddy conditions and excavation cave-in. The outlet pipe should be set as low as possible and also must be "laid to grade."

Water Quality Considerations

Spring wells experience few iron, manganese, and taste and odor conditions. Spring wells generally do not experience arsenic, fluoride and radiological problems that are seen in bedrock wells. Spring wells often experience bacteria problems caused by poor configuration, poor construction materials, vandalism, animal entry and inadequate soil filtration.

For recommendations on water quality testing, refer to a brochure developed by NHDES and the New Hampshire Department of Human Health Services titled "What's in Your Water" or fact sheet [DWGB-2-1, "Suggested Water Quality Testing for Private Wells."](#)

Construction of New Springs

In choosing which spring location to develop, it is important to ensure that the spring has year-round flow capacity. If the spring goes dry during the summer, this location should be either bypassed or the location should be developed as a dug well with a pump. Springs are constructed in a very similar manner to dug wells. Refer to NHDES fact sheet [DWGB-1-4, "Dug Well Design"](#) for details on the materials to be used in construction (concrete, steel, plastic), excavating and backfilling around the spring, and what type of cover to construct.

Overflow Pipe

Springs typically have an enormous range in flow from the highest in the spring to the lowest in the early fall. If the outlet pipe is insufficiently sized, the pressure behind the flow and lift the casing out of position. To gauge the extreme of flow, observed the spring during the snow melt season to properly design and size the spring construction components.

The design of a spring shall incorporate storage and an adequate pathway for overflow. A diagram of a typical overflow pipe is shown on the diagram presented within. Key components of good overflow pipe design include:

- Resistant to vandalism.
- Have the elevation of the spring casing sufficiently high to achieve an approximate 1-foot "free fall" of the excess water from the overflow pipe to the ground.
- Have ½-inch or finer hardware wire screen at the end of the overflow pipe covered by typical household mosquito screening to prevent entry of animals or insects back into the spring.
- Place stones below the overflow spill point to prevent soil erosion.

A spring's overflow pipe is typically the cause of most bacterial contamination. Typical problems include.

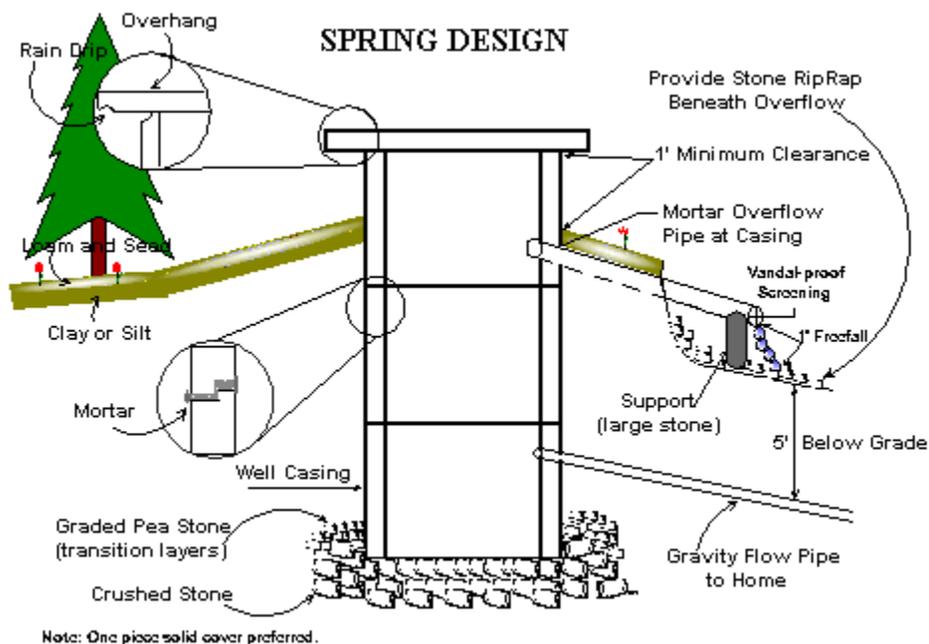
- The reverse flow of contaminated surface water back into the spring.
- The use of the overflow pipe by small animals as a nesting area or walkway.

The high end of the overflow pipe is typically placed approximately 12 inches or more down from the top edge of the spring casing. The free fall discharge point should be approximately 3 or more feet away from the spring casing. The overflow pipe should slope away from the spring. Use an appropriate sized single piece of steel pipe supported at the outer end.

Water Supply Line and Pump System

Some springs are constructed at a location that allows for gravity flow into a home (no pump required). If the flow is continuous, the water line may not need to be buried below frost zone (however it is recommended). For others, a pump system must be installed. A New Hampshire Pump Installer's license is required to install a pump on a water system. Provide at least one foot of clearance between the suction end of the pipe/pump and the bottom of the well. The water line to the home comes off the well at a pitless adaptor buried four to five feet deep for frost protection. The water line shall be steel or thick plastic rated for 160 psi or greater. Fittings used shall not be made of nylon.

Springs can be equipped with either a submersible pump or a centrifugal pump (also known as a jet pump or suction pump). Centrifugal pumps are subject to at least two operational limitations. First, no matter how good the pump's vacuum, water cannot be raised by suction more than approximately 32 feet at sea level. As a practical reality, conventional centrifugal pumps can only raise water by suction 20-25 feet. The second constraint occurs if the vacuum is lost by air entering the well line through leakage at the piping joints or because the water level is below the intake. The most important part of using a suction pump is that the entire assembly is airtight and the pump maintains a vacuum within the well. Air entering a point well will cause a loss of vacuum and the inability to pump. Piping joints must be tight and the well point must be below the lowest seasonal water table.



Disinfection - Chlorination

Due to the continual flow of water, it is very difficult (if not impossible) to properly chlorinate a spring. For more information on disinfection, see fact sheet [DWGB-4-11, "Disinfecting a Drinking Water Well"](#).

For Additional Information

Please contact the Drinking Water and Groundwater Bureau and the New Hampshire Water Well Board at (603) 271-1974 or waterwellprogram@des.nh.gov or visit our website at www.des.nh.gov.

Note: This fact sheet is accurate as of September 2019. Statutory or regulatory changes or the availability of additional information after this date may render this information inaccurate or incomplete.