
ENVIRONMENTAL Fact Sheet



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DWGB-3-14

2021

Sand and Sediment in Water Supply Wells

This fact sheet covers the origins of sand and sediment in water supply wells and options to address them. When used here, the term “sediment” means material that is visible, but too small to be felt when rubbed between the fingers. The term “sand” means material that can be both seen and felt. There are three common explanations for sand and sediment in drinking water wells.

1. Rock cuttings or loose soils remaining from the installation of a new well. When a well is newly constructed, particles remaining from the construction can be removed from the well by pumping water to waste, sometimes for an extended period of time. Types of wells and their construction standards are discussed in other fact sheets. If wells are not properly flushed, this material will give the water a cloudy or muddy appearance and, if found in a bedrock (artesian or drilled) wells, they may include particles with sharp edges.

2. Precipitates from certain dissolved minerals in the water. Minerals, including iron or manganese (Fe/Mn), calcium (Ca) and magnesium (Mg) are commonly present in well water in New Hampshire. Fe and Mn can be present as sand pumped out of the well, or as a precipitate once exposed to air in the home. Fe precipitates are loose orange-brown and Mn precipitates are black. Precipitated Fe and Mn are typically that are too small to be felt between the fingers. Hardness is made up of the Ca and Mg minerals. A hardness precipitate would have a white or yellow color. These precipitates typically attach to the surface of a sink, bathtub, or toilet. In addition, fine sand-size grains of mineral precipitates have also been observed.

3. Continuous entry of fine clay or sand particles from the soil or from poor quality bedrock. This condition could exist if a well defect or an unstable naturally-occurring soil condition exists, allowing fine sand or sediment to enter a well. This material generally would have a gritty feel.

Origin of Sediment

In dug wells (those installed with an excavator to 10-20 feet deep), sediment entry can occur if the soil backfill passes through the joints between the sections of well casing or through the perforations or gravel present in the lowest well casing. In older fieldstone dug wells, soils can migrate into the well throughout the entire casing circumference and height. See fact sheet [DWGB-1-4, “Dug Well Design”](#) for information about proper dug well construction.

In bedrock wells, sediment entry can be from loose rock at the interface between the casing and bedrock. In some cases, this can be considered a well construction defect and should not occur in new

wells after sufficient flushing. Sand entry can also originate from unstable sediment and rock within the fractures (also referred to as faults or veins). In this situation, there is no manmade defect in the well but rather the sand entry is an unfortunate aspect of the location's geology. This situation could also occur if the surface of the rock fault consists of highly weathered bedrock. See fact sheet [DWGB-1-2, "Bedrock Well Design"](#) for information about proper bedrock well construction.

It is very difficult to determine which of the possibilities introduced above is the origin of the sand problem in bedrock wells. In some cases, a camera can be lowered into the well to inspect the tightness of the bottom of the drive shoe and steel casing or to view each intersected rock fracture. Another investigatory method is to install a temporary packer (a device to close off certain vertical intervals of the well) so that each segment can be pumped individually. The water pumped from each level can then be evaluated for the presence of sand. With either investigation method, there is only a moderate probability of identifying the entry location of the sand.

Corrective Action

1. In-The-Well Solution for Dug Wells

In dug wells the entry point(s) of the sand should be sealed. However, this may not be easily accomplished. When impractical, the situation could be allowed to continue and the pump suction line moved up. Or, the accumulated sand in the bottom of a dug well can be removed by a "mud-sucker" construction pump or by clamshell bucket. Please note that by raising the suction line you increase the well's susceptibility to drought conditions. Where substantial sand is entering a dug well, the soil surrounding the well casing can subside. The best remedy may be to replace the well.

2. In-The-Well Solutions for Bedrock Wells

Devices are available to seal off leakage at either the well casing/bedrock interface or lower fractures in the well hole. The best known device of this type is a Jaswell seal (see fact sheet [DWGB-1-9, "Secondary Well Seals and Liners"](#) for more information). Installing such a seal may reduce the well's safe yield. Another option is to install a sand separator over the pump intake to remove sand before it enters the pump. A licensed pump installer or water well contractor shall install either of these apparatuses.

3. In-The-Home Solutions

It is best try to fix the sediment problem in the well to minimize maintenance requirements for homeowners and to minimize sand's excessive wear on a well pump which shortens its life expectancy. However, it can be difficult to pin down where sand is entering the well and there are options to remove the sand when the water and sand mixture reaches the home. A centrifuge sand removal device removes sand by spinning the water within the housing of the device. Sand has a greater density than water, and thus accumulates around the perimeter of the device and is periodically bled off. A disadvantage is that clay-sized particles, which are smaller than sand, may not be totally removed. There is some pressure loss with this device. A sand filter removal system consists of installing a back-washable filter to strain out sand particles. The device must be periodically cleaned by backwashing.

For More Information

Please contact the Drinking Water and Groundwater Bureau at (603) 271-2513 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.