BOB OLIVER

Revitalizing Existing Water Wells

When the housing bubble burst in late 2008 and early 2009, the domestic water well drilling industry also took a big hit, especially in certain areas of the country. For a number of years, as the housing market was booming, there was a great need for water wells to service many of these homes. Water well drillers became accustomed to sizable backlogs every year. That ended with the coming of the recession, and these same drillers were faced with looking for other ways to sustain their businesses. Fortunately, for some, there were other markets to explore. Some of these included:

- Drilling irrigation wells and municipal wells,
- Environmental drilling,
- Ground source heat pump installations,
- Horizontal directional drilling,
- Mineral exploration drilling,
- Well rehabilitation of existing wells.

Today, all of these markets still are viable, and can be ways for drillers to diversify to maintain their businesses during lean times.

It is the last category above that will be the focus of this article. Well rehabilitation is a great market for drillers and pumps installers to consider as part of their marketing. There are many wells in the United States that are not yielding the gallons per minute (GPM) that they did when they were originally drilled and placed into production. In many cases, well rehabilitation can help these situations and return the wells to their original production.

There are some unique products that have been developed over the last several decades to combat well-yield problems. Some reasons for the decline of well yield include:

- A build-up of clays or bentonite drilling mud in screens and gravel pack,
- Accumulation of sands and silts in the screened area of wells,
- Bio-fouling from bacteria,
- Mineral scale build-up.

There are some indicators to determine what may be causing problems in the well. Sudden decline of well yield can indicate the presence of bacteria fouling. Slime, oily film or an odor also are indicators of bio-fouling.

Photo courtesy of Kyle Murray, Ph.D.

Well rehabilitation is a viable market for drilling contractors to consider, especially in today's economy. Photo courtesy of Kyle Murray, Ph.D.

Mechanical cleaning also is necessary to ensure success. Running a pumping test after completing well rehabilitation. Photo courtesy of Kyle Murray, Ph.D.

A slow, steady decline of production over time can indicate mineral scale. Changing chemistries and scale build-up on the pump or pump column also can be signs of mineral scale build-up.

Downhole cameras can be used to study problems in wells. If the well water is not clear enough to see with the camera, there are flocculants available, which drop the solids out of the water to enable the contractor to see the problem with the camera.

A couple of common well-cleaning products that have been used extensively for well rehabilitation include hydrochloric acid and chlorine. These two products have some definite disadvantages. Both are highly toxic and dangerous to handle. Hydrochloric acid reacts violently to calcium carbonate scale. Chlorine does not have the ability to penetrate bacteria colonies, and treatment with chlorine usually lasts only a short time and has to be repeated – often. Neither product has chelating properties for suspension of scale or bacteria once it has been dislodged.

As was mentioned above, there have been some really good well rehabilitation products developed in recent years that are safer to handle and more effective than hydrochloric acid or chlorine. These include acids for scale removal, acids for treating bio-fouling, and products for clay, sand or silt removal.

There are several companies that have taken the lead with these products; they include:

- Cotey Chemical Corp.
- Johnson Well Screen
- Design Water
- CETCO
- Baroid IDP

The products of these companies have been proven to be user-friendly and effective against mineral scale, bio-fouling and problems relating to the accumulation of clays, sands and silts. It is important to follow each manufacturer's specifications for its product in order for that product to perform effectively. Mechanical cleaning also is necessary to use, along with chemicals, to ensure successful rehabilitation.

There are some other practices that help guarantee the success of a well rehabilitation project. Some of these include:

- Give the product time to work.
- Include agitation a couple of times per day during the treatment to ensure that the chemical reaches all affected areas of the well.
- Select the right product to fix the well problem.
- Work safely, using protective equipment and proper ventilation while using the products.

When the well treatment has been completed, and the manufacturer's instructions have been carried out, the products need to be disposed of properly. The chemical should be pumped out of the well into a pit or tank. Acids then can be treated with soda ash or baking soda to neutralize them. Contractors need to check local, state and federal regulations for disposal of the product. These regulations help ensure the health and safety of everyone involved, as well as the ground water.

There is plenty of opportunity and potential growth in this field of well rehabilitation. There are safe, effective products to use for cleaning wells and protecting our precious ground water. If you have any questions regarding these products or their applications, please contact your supplier or manufacturer. You also can contact me through *National Driller*. ND

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