



Neil Mansuy

# Well Wellness

Regular water well cleaning is vital for maintaining acceptable water quality and operational efficiency, and lowering maintenance costs. *Water Quality Products* Assistant Editor Amy McIntosh spoke with Neil Mansuy of Subsurface Technologies Inc. about the importance of regular water well cleaning and how it impacts overall well health.

**Amy McIntosh:** What are the benefits of regular water well cleaning?

**Neil Mansuy:** There are many benefits of regular well cleaning. As the costs of well construction, operation and maintenance are ever increasing, there is much more awareness of the benefits of regular well cleaning. All of these benefits are related to decreasing the life-cycle costs. Life-cycle costs are decreased by increasing the life expectancy of wells, maintaining higher production from a well over its lifetime, reducing the overall cost of maintenance, decreasing the cost of pumping water by maintaining better well efficiency and maintaining consistent water quality.

**McIntosh:** What problems can occur if a well is not cleaned regularly?

**Mansuy:** Various problems can occur if a well is not cleaned regularly, including loss-of-capacity problems that can be difficult or impossible to restore; a shorter time frame between well cleaning intervals; water quality deterioration, such as discoloration, taste and odor; increased cost of pumping water—as wells lose their efficiency, the pumping water level gets lower, thus increasing the total dynamic head; and total coliform failure and persistent total coliform problems—total coliform bacteria are naturally occurring bacteria and are more problematic when a well is not cleaned regularly. If a well is cleaned on a regular basis, the overall environment is kept cleaner and bacterial test failure can be minimized.

**McIntosh:** What should the well cleaning process include?

**Mansuy:** Cleaning of wells involves the application of energy to get plugging deposits dissolved, disrupted and dispersed so they can be removed. The more aggressive rehabilitation cleaning process often utilizes a multiple-step approach, with each step removing more of the plugging deposits.

The first step is pretreatment. Different techniques are utilized for this step, including brushing, swabbing and percussive energies. The goal of this step is to remove the plugging material on the inside of the well.

Next is application of energy. This can include chemical, thermal or mechanical energy. This step allows the plugging deposits to be dissolved, disrupted and dispersed. It is important to note that these types of energy often are applied together.

Chemical approaches do not dissolve 100% of the plugging deposits and the remainder need to be disrupted with mechanical energy. From my experience, the most effective method to get energy into a well and the surrounding formation is with the use of carbon dioxide (primarily mechanical energy).

The final step is development. This step involves the removal of all material that has been dissolved, disrupted and dispersed from the well and the surrounding aquifer. Much of this material is disrupted biological and mineral scale. There also can be a significant amount of dispersed fines from the formation, including silts, clays and fine sand. It is important to achieve mobilization and fluidization of all of these materials. Pumping a well does not effectively achieve the removal of this material and it is most often necessary to achieve the mobilization and fluidization together.

Maintenance well cleaning is the cleaning of a well with equipment in the well. This lowers the cost of cleaning significantly because there is no cost to pull and set the pump and no step of performing more aggressive airlift swabbing. The key to success with a maintenance cleaning as previously described is removal of the deposited material on a periodic basis when it is not very extensive and softer in nature.

**McIntosh:** How does regular well cleaning affect overall well maintenance?

**Mansuy:** Regular well cleaning can make overall well maintenance more effective. Removal of biological slime and the associated minerals at the early stages, when they are soft and not very extensive, allows the well and the immediate zone around a well to be kept clean by managing deposits. This allows the best water quality possible from the well, maintains efficiency and significantly extends the life expectancy of the well. The key to success with regular well maintenance is performing time-based cleaning (often annual) and not relying on feedback monitoring of a well's performance or the water quality from a well. *wqp*

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## New Maps Provide Crucial Information for Water Managers

For the first time, U.S. Geological Survey scientists have mapped long-term average evapotranspiration rates across the continental U.S.—a crucial tool for water managers and planners because of the huge role evapotranspiration plays in water availability. Evapotranspiration rates will help water managers plan for the water availability challenges that will occur as the climate changes.



## Abu Dhabi Warns Against Illegal Groundwater Sales

The Environment Agency - Abu Dhabi (EAD) has called upon farmers, landowners and contractors to cease the drilling of wells without permits, and the illegal sale of groundwater. EAD has reaffirmed that it will be taking all necessary legal measures against violators.



## EPA Issues Revised Total Coliform Rule

The U.S. Environmental Protection Agency (EPA) published the revisions to the 1989 Total Coliform Rule in the Federal Register. The Revised Total Coliform Rule, which applies to all public water systems, offers an opportunity for greater public health protection against waterborne pathogens while also reducing implementation burdens for water systems. Public water systems and primacy agencies must comply with the revised requirements by April 2016.

## NGWA Offers Best Practices for Emergency Disinfection of Flooded Residential Wells

The National Ground Water Assn. has developed an industry best suggested practice (BSP) for water well system professionals, entitled "Residential Water Well Disinfection Following a Flood." Steps involved in emergency well disinfection, as outlined in the BSP, include inspection of the flooded well for organic matter; well flushing and/or cleaning; proper mix, contact time and distribution of disinfection agents; and water testing intervals.



## UNICEF Delivers Water Treatment Supplies to Syria

A large-scale operation is underway in Syria to secure safe water supplies for more than 10 million people—close to half the population. UNICEF will deliver 1,000 tons of chlorine to cities and communities across the country. The organization needs \$22.5 million to deliver life-saving assistance in Syria in the area of water and sanitation from January to June 2013. *wqp*

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