

GROUND WATER SCIENCE *FLOWLINES*

Useful information for customers & friends of Smith-Comeskey Ground Water Science

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"Watch, be ready" is ancient advice on everything from keeping yourself alive in time of war to ultimate salvation.

Research shows that most "luck" as defined by success is *actually the ability to perceive opportunities and to follow up on them.* Statistical chance (where you were born and to whom, or winning the 50:50 drawing) is something else entirely.

We can be looking for opportunities to improve and to serve.

- **Network. Attend your regional water sector meetings and find out what's going on, make yourself known.** This is hard for you shy people, but you know, others appreciate your quiet confidence, and you learn to converse normally after while.

- **Be prepared and accessible.** A lot of people just had their lives wrecked because they happened (largely by chance) to live along the eastern Indian Ocean during a massive seismic event – greater than any that had occurred in living memory. Because we were known to have worked on effective methods of emergency well disinfection, we were able to rapidly respond (using the electronic tools at hand), to a request to send information to emergency responders in India about methods to disinfect deep wells.

- The National Ground Water Association (www.NGWA.org) went on to develop and rapidly distribute a two-page instruction sheet that was gratefully received across the region. **We had the information, the people, and the will and capacity to respond.**

- **Take an opportunity to influence something or to make life better for someone.** Get involved in your watershed coalition, fight corruption, and support efforts to provide clean water to those who lack it.

- **Carpe diem (Latin for "seize the day")** Go forth and "just do it" – be a creative, faithful, honest, reliable, positive force in the water field, no matter how big or small your influence. **SAS.**

World Water Day is March 22 and Ground Water Awareness Week is March 13-19, 2005

So?

Here are some suggestions for observing these events

Ground Water Awareness Week

- 1. If you are using or serving users of ground water, take steps to educate your "public"** (customers, the general public, the major driver in the US economy – school children) about the importance of caring for their water and using it wisely. Ground water is largely better-protected and higher quality, and more abundant than surface water, but not infinitely abundant or immune to human neglect and ignorance.



- 2. "Time to Schedule Your Annual Water Well Checkup"**

The NGWA recommends that spring is a good season to have an annual water well checkup before the peak water-use season begins.

- An annual checkup by a hydrogeologist or qualified water well contractor is the best way to ensure problem-free

**Flowlines is a service of
Ground Water Science**

**372 W. Wyandot Ave.
Upper Sandusky, OH 43351 USA**

**Tel: 1-419.209.0298 or
1-419-358-0528**

**Email: <stusmith@udata.com>
or <hydro@wcoil.com>**

www.groundwatersystems.com

service and quality water. Municipal wells can be on multi-year schedules.

- Preventative maintenance usually is less costly than emergency maintenance.
- Good well maintenance, like good car maintenance, can prolong the life of your well and related equipment.

Ground Water is a vital national resource. Get involved! About half the U.S. population receives its drinking water from wells. More than 90% of the fresh water in the U.S. and around the world is ground water.

National Ground Water Awareness Week is sponsored by NGWA <http://www.ngwa.org>, co-sponsored by the Groundwater Foundation and The Centers for Disease Control and Prevention (which offers help for the public at <http://www.cdc.gov/ncidod/dpd/healthywater/index.htm>). Promotion by U.S. Environmental Protection Agency's Office of Ground Water and Drinking Water.

World Water Day March 22, 2005 (Earth Day) <http://www.worldwaterday.org/>

Water for People <http://www.water4people.org/> suggests that you can participate in this important event by:

- Making presentations to your local schools, civic groups, churches or other community forums
- Scheduling visits to your local plant or facility
- Talking with your local media representative
- Coordinating other activities in your community

Check with your AWWA section WFP committee or Judi Kraszewski, jkraszewski@waterforpeople.org tel 303.734.3494 for ideas. **Lots of people worldwide lack adequate water supplies.**

A Ground Water "Razzie Award"?

There should be one – for exemplary bone-headedness in ground water management

We nominate the Ottawa County (Ohio) health department. The county borders on Lake Erie and includes several islands. These townships attract a high seasonal population density. The bedrock is shallow there. Now – a sewage-well water pathway for illness has been *known since 1854* (demonstrated by London physician John Snow). Knowing that, shouldn't septic tanks right on top of bedrock have been eliminated early in the 20th Century? OK, it takes time for information to diffuse into the hinterlands. However, in summer 2004, there is a waterborne disease outbreak on South Bass Island (Ottawa Co.) – underlain by karstic (caves form) limestone. Culprit? Wastewater affected wells. The county still permitted unsuitable onsite wastewater treatment on the island. This was the case despite: 1) general knowledge that these aquifers were subject to contamination from wastewater and 2) abundant evidence of problems from nearby Catawba "Island" – 20 years before. Solution? Hook up to the Village of Put-in-Bay's water system.

Nominated for runner-up: All the nearby counties and the State of Ohio for allowing "storm water drain" wells to persist in Karst Country. These "Class V" wells allow surface water to drain directly to karst aquifers used by drinking water wells. Problems with these in the vicinity of Bellevue, Ohio, have been famous since the 1960s. The proposed solution? Hook up the affected well owners to municipal water. May we suggest putting an end to unrestricted contamination?

Information from your editor, Stuart Smith's, periodic article for NGWA's *Water Well Journal*, informing the ground water field since 1946. The idea of this column is to provoke discussion as well as to inform.

The November 2004 *WWJ* article on “Knowledge to Reduce Risk in Well Planning, Rehabilitation and Maintenance” struck a chord with readers based on feedback.

“There are still many facilities that operate well equipment worth hundreds of thousands of dollars who do not know 1) the operational performance of their assets, 2) what is happening to them, and 3) what to do about it. Many municipal, industrial and agricultural well systems can limp along for many years at a level of performance that is acceptable to them, although very inefficiently. ”

However, this lack of information is expensive. In the realm of well design, maintenance and rehabilitation, information deficit has several results:

- 1) Well designs have fatal flaws** – the wrong materials (corrosion), poor screen or formation interval selection, difficult to access and clean, overpumped... the list goes on.
- 2) Wells are permitted to decline until it is too late to rehabilitate effectively** – or until it requires heroic and expensive measures to help them.
- 3) No one can set goals for well cleaning or evaluate what (if anything) was accomplished.**
- 4) Treatments are chosen that are counterproductive** – now or in the long run, or won't work. Money is wasted.
- 5) Bad choices in replacement pumps** – poorly sized and made of corrodible materials.
- 6) Wells that could have been rehabilitated are replaced instead,** requiring acquisition of land, engineering designs, approval by regulatory oversight, and construction.
- 7) Well operators give up,** throw up their hands and decide never to deal with well contractors again.

Knowledge is power to decide – well. All these failings can be headed off through enlightenment by factual information.

- 1) Formation and water testing in the exploration phase** to choose materials to resist corrosion and structural loads, and critical screen design.
- 2) Data from regular measurement** of water levels, flow rates, and discharge pressure can be used to detect decline in well performance, in particular, calculating specific capacity, and pump wear, also changes in ground water levels and system head, both of which can affect well performance.
- 3) Knowing specific capacity and water quality, and charting changes in them,** informs goal setting for well cleaning.
- 4) Downhole video provides useful visual indicators** of clogging and corrosion, overall well operation and condition, and problems in wells that require repair.
- 5) Documenting well cleaning performance results** informs decisions about the next effort.

Action item: Include ground water professionals in the loop who do not have a financial stake in well services profitability, and who are willing to have experienced people on site on your job or involved in your troubleshooting.

See our “world water day” article in the March *WWJ*. After that is printed, we'll post the draft on our web site.



Ground Water Science notes:

- **Stuart Smith assumed chair of the joint technical group for *Standard Methods* Section 9240: Iron and Sulfur Bacteria – bring it into the modern era?**
- **Awarded: Contract from the U.S. Bureau of Reclamation for dam engineered drainage biofouling and maintenance research**
- **Presented: With BOR's Denise Hosler, paper on dam drainage biofouling at the NGWA Convention in December 2004.**

26 December Sumatra earthquake effects noticeable in U.S. aquifers

Reuters Jan 24, 2005 - by Jane Sutton -- Hydrogeologists with the South Florida Water Management District reported that the undersea earthquake that triggered the deadly 26 December tsunami in Asia caused water levels to jump by up to 4 inches (100 mm) in deep (400-575-m) monitoring wells in Florida some 8,000 miles (13,000 km) away. Water levels jumped, and then receded quickly in the wells. Seismic waves from the earthquake, traveling across the globe at approximately 7,400 mph (>3000 m/sec), caused small water-filled crevices in the limestone Floridan aquifer to expand and contract. Scientists in other states reported similar readings in deep wells, resulting from the earthquake off Sumatra. <http://www.reuters.com>.



Now that Las Vegas has a new water lifeline in an agreement with Arizona over Colorado River water, they need to take care of it. The Southern Nevada Water Authority and the Southern Nevada Home Builders Association have joined forces to design a proposed water conservation program, the Associated Press reported according to WaterTechOnline.com (January 18, 2005). The "Water Smart" program calls for reducing water use in a typical home by 30% or more, a total of about 75,000 gal (284 m³) per year for each new home. See "How We Use Water In These United States" (URL

Flowlines is our regular topical newsletter published about two times per year, now at our informative and linked up web site

www.groundwatersystems.com

Why do this? The better informed you are, the better decisions you make – and the more you appreciate the services and quality we offer. Enjoy.

<http://www.epa.gov/watrhome/you/chap1.html>) for statistics on per capita use – about 50 percent higher in the U.S. West than the East.

Great conference locations on which to burn business air miles in 2005

- "Where waters meet" IAH conference <http://www.iah.asn.au/conference.html> Auckland, New Zealand, 28 November to 2 December, 2005.
- Fourth Conference on Water and Civilization, Paris, France, 1-4 Dec 2005, International Water History Association (<http://www.iwha.net/>).

Thanks for your attention 

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Do yourselves a favor and call us first.