



# WATER WELL AND PUMP PERFORMANCE: THE ECONOMIC BASIS FOR WATER WELL OPERATION, REHABILITATION & MAINTENANCE DECISIONS

A one-day workshop on practical, cost-effective solutions to extend asset value by maximizing well and pump performance

Wednesday May 19<sup>th</sup> 2010  
8:00am – 4:45pm

The Center at Sycamore Plaza  
5050 Clark Avenue  
Lakewood, CA 90712

Program presented by: AMERICAN GROUND WATER TRUST

## MORE WATER LESS COST - BACKGROUND

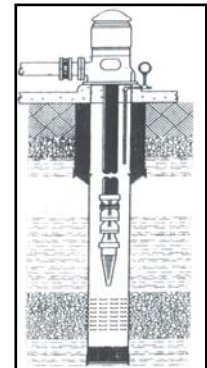
Inefficient wells cost millions of dollars in increased pumping costs and in unnecessary increments to the state's carbon footprint. Well efficiency techniques and recent pump, and pump motor technology advances provide ways to reduce operation costs. This workshop program will show how major water users can save energy, manage resources efficiently and reduce infrastructure costs.

More than fifteen hundred utility managers, water industry professionals, regulatory staff, well owners, water users and ground water specialists have attended this program in: Baltimore MD; Little Rock AR; Des Moines IA (2); Nashua NH; Houston TX (2); Lansing MI; Charlotte NC; Denver CO; Cincinnati OH; Wilsonville OR (2); Lakewood CA;(2) Seattle WA (2); Richmond VA, Long Island NY (2), Bucks County PA , Phoenix AZ, Langley BC, Orlando FL, Fort Lauderdale FL and Boynton Beach, FL.

## MORE WATER LESS COST - WHAT IS IT ALL ABOUT?

The presentations combine the practical aspects of pump technology, well rehabilitation, maintenance and operation with the economic principles of asset management. The workshop addresses core questions involved in assessing well performance and provides clear guidance for well designers, contractors, owners and operators who make decisions related to well operation schedules, pump selection, maintenance, rehabilitation and replacement.

- ◆ What proportion of your overall water cost is related to well efficiency?
- ◆ Which asset management tools & concepts work best for decision-making?
- ◆ How much can you reduce your operation costs with VFD pump motors?
- ◆ How does a well's pumping schedule affect build-up of biological and chemical encrustation ?
- ◆ How overseas research findings should impact operator/ contractor rehabilitation strategies
- ◆ What diagnostic indices determine the most effective rehabilitation techniques?
- ◆ Do you know if your supply wells have the potential to provide higher yield?
- ◆ Is declining yield related to the aquifer, the pump or the well?
- ◆ How do you calculate the cost-benefit of maintaining pump efficiency?
- ◆ What is the basis for assessing the success of maintenance or rehabilitation?



## EVENT SPONSORS



## MORE WATER LESS COST - PROGRAM

7:00 – 8:00      **REGISTRATION, COFFEE, AND SIGN-IN FOR CEUs**

8:00 – 8:15      **OVERVIEW OF THE WORKSHOP PROGRAM**

**Andrew Stone, Executive Director, American Ground Water Trust, Concord, NH**

- Ground water as a local, regional and national economic & environmental resource
- Water is free! What are the costs of accessing and delivering water?
- What's new in the pump selection, well rehabilitation decision-making process?

*Mr. Stone is a hydrogeology graduate from London University and has over thirty years of ground water experience in Africa and the U.S. as a professor and ground water consultant. He has first-hand experience of all aspects of well design and construction in a wide variety of geologic environments. As the director of the Trust's education programs he has participated in over 100 ground water related technical conference and workshop programs.*

8:15 -9:00      **WELL HYDRAULICS – THE BASICS**

**David Kill, Marketing Development Manager, ITT Industries, Minneapolis, MN**

- Definitions of the key hydraulic terms that are used in well efficiency calculations
- Explanations of the flow of water in aquifers towards wells
- Flow dynamics through rock fractures or screens into well bores and into pump intakes

*Mr. Kill is a Registered Professional Engineer and has a BS in Agricultural Engineering from the Univ. of Minnesota. He joined Johnson Screens in 1969 and became Regional Manager in 1974. In 1979 he joined the Fluid Systems Division UOP in the reverse osmosis water treatment business in San Diego, CA as 2002 Director of Marketing. He rejoined Johnson Screens in 1981 as Environmental Products Manager. In 1988, he founded Recovery Equipment Supply, a supplier of products for ground water monitoring and remediation. In 1996, he joined Goulds Pumps ITT and was promoted to Regional Commercial Business Manager and Regional Market Development Manager in 2004. He was the 2005 NGWA McElhiney Distinguished Lecturer and presented "Well Efficiency Is Not a Myth" to over 20 water well contractor conventions.*

9:00 – 9:45      **ASSET MANAGEMENT PRINCIPLES AND IMPLEMENTATION STRATEGIES**

**Victor Harris, Vice President, MWH Americas, Sacramento, CA**

- How to compile and interpret costs of construction, operation & maintenance
- Assessment of well economics in the context of overall utility assets
- Value of an economic model template in rehabilitation/ replacement decisions
- Risk-based approach for Asset Management Prioritization

*Mr. Harris is a Vice President at MWH, Americas, Inc. with 27 years experience in water resources in the western United States and Alaska. He has a B.S. degree in Geology and M.S. degree in Hydrogeology from San Diego State University, and is a Certified Engineering Geologist and Certified Hydrogeologist in California. His specialty is groundwater resources, conjunctive use, well design and construction, and groundwater modeling. He is currently managing projects involving the relationship between groundwater management and vegetation in the Owens Valley of California utilizing combined ecological and groundwater modeling tools. He has also completed water resources planning, well design and construction, and groundwater modeling projects in the Middle East and Europe.*

9:45 – 10:30      **DRILL NEW OR FIX? REHABILITATION: IS IT TIME? IS IT WORTH IT?**

**Thomas Nanchy Project Manager, Layne Christensen Company, Fontana, CA**

- Well design & construction criteria to maximize efficiency
- Data need for a scientifically based well maintenance schedule
- Mechanical vs. chemical rehabilitation
- Will any kind of preventive maintenance help?
- How about well operation? Does this impact rehabilitation?
- Frequency and cost considerations in well rehabilitation

*Mr. Nanchy has over 27 years experience in the water industry. At Layne he is responsible for management of turnkey projects, including design and installation, for municipal and industrial water supply, well, pump repair and maintenance. As a well rehabilitation specialist he provides technical oversight of well rehabilitation projects including chemical, mechanical, Aqua Freed®, and Bore Blast methods. He has served as project manager for numerous projects throughout Southern California involving loss of well capacity and problems in water quality. He is a recognized professional, accredited NGWA well driller and certified pump installer.*

10:30 – 10:45    **BREAK**

10:45 – 11:30    **METHODS FOR IMPROVING WELL PERFORMANCE**

**Jim Bailey, Principal Hydrologist, Kleinfelder, Bellevue, WA**

- A practical approach to managing wells as an asset
- Why rehabilitate - Well inspection technology
- Key well performance indicators
- Prioritizing well condition factors
- How to decide on treatment options

11:30 – 12:00    **RESEARCH ON THE DYNAMICS OF WATER FLOW AND ENERGY DISSIPATION IN WELLS**

- Theory behind particle movement during well development
- Simulations of well-aquifer / aquifer-well flow dynamics during rehabilitation

*Mr. Bailey has a MS degree in hydrogeology and is a registered professional geologist. He has over 20 years of experience in ground water supply work and hydrogeological investigations. Mr. Bailey was previously President of a well services company in the Pacific Northwest and has conducted a scientific study in Europe of proprietary German well rehabilitation technology. He has managed numerous water well rehabilitation projects using this technology in the Pacific Northwest, Western Canada, and the Southeast and gives frequent workshop presentations on well maintenance and rehabilitation.*

12:00 – 12:15    **ECONOMIC SIGNIFICANCE OF FLEXIBLE DROP PIPE WHEN WELLS NEED REHABILITATION**

**Tanner Tyron, Engineer, Hose Solutions, Inc., Scottsdale, AZ**

- Physical properties of flexible hose (strength and durability of hose)
- Hydraulic performance capabilities (elasticity, pressure thresholds)
- Pump installation and removal logistics (time out and time in)

*Tanner Tryon received his bachelors in engineering at Arizona State University and is currently studying for his Masters in Business Administration from the University of Wisconsin. Tanner joined Hose Solutions in 2008. Tanner works with well design projects and pump installations.*

12:15 – 1:15    **LUNCH** (Provided On-Site)

1:15 – 2:00    **DOWN-HOLE CAMERA TECHNOLOGY: APPLICATIONS FOR WELL & PUMP PROBLEMS**

**Steve Strong, Global Products Manager, Laval Underground Surveys, LLC, Fresno, CA**

- Evolution of down-hole camera technology
- Case studies of camera use in well & pump problem diagnosis
- Using the camera to verify successful completion of work performed

*Steve Strong is a 1984 graduate of Brigham Young University in Provo, Utah and has worked in the water well industry for 10 years specializing in sand separators, pump protection separators and water well camera systems. He has presented Continuing Education programs to the groundwater industry in over 50 locations domestically and internationally, including the United States and Canada, South America, Europe and Asia. He is fluent in Japanese and earned an MBA from the Thunderbird School of Global*

Management in Glendale, Arizona in 1985. He is currently the Product Manager of Laval Underground Surveys in Fresno, California.

2:00 – 2:45 **WELL PERFORMANCE SOLUTIONS**

**Kevin McGinnis, President, Cotey Chemical Corporation, Lubbock, TX**

- The arsenal of chemicals available to enhance/ restore well performance
- Matching the solution to the problem (How to decide on the “cocktail” to be used)
- The importance of a dual mechanical/ chemical approach
- Successful well-yield restoration case-studies

*Mr. McGinnis graduated from Texas Tech Univ. in 1984 with a BA degree. He has worked in the water well remediation industry for 10 years. He has delivered technical papers to Saudi Arabia’s Ministry of Agriculture and Water in Riyadh, and to the Philippine Water Works Assoc. In addition to his experiences in the U.S., Mr. McGinnis has supervised water well rehabilitation projects in several states of the Middle East, Far East and Latin America.*

2:45 – 3:30 **WELL DEVELOPMENT and REHABILITATION: METHODS AND APPLICATIONS**

**Toby McClain, Senior Technical Professional, Baroid IDP, Houston, TX**

- Mitigating physical blockage by proper maintenance of drilling fluids
- Remediation methods for wells not adequately developed during construction
- How well rehabilitation chemicals work & how they should be used
- Case studies of yield restoration following treatment

*Mr. McClain is The Global Technical Training Coordinator in the Technical Services Group for Baroid Industrial Drilling Products. He has been with Baroid IDP for 8 years and has worked in both Research and Development and Technical Services. Prior to joining Baroid he spent 3 years as a Field Engineer and Account Manager in the chemical cleaning industry providing solutions and services for the rehabilitation of utilities and refinery process equipment. He has a Bachelors of Science degree in Zoology from Texas A&M University.*

3:30 – 3:45 **BREAK**

3:45 – 4:30 **SELECTION AND MAINTENANCE OF PUMPS FOR MAXIMIZING WELL YIELD/ COST BENEFITS**

**David Kill, Marketing Development Manager, ITT Industries, Minneapolis, MN**

- How pumps work – evolution of the US pump market
- Pump efficiency principles, horsepower and bowl assembly selection criteria
- Pump efficiency testing, identifying the weak link in your system
- Merits of submersible vs. line-shaft for high yield wells
- VFD technology
- Case studies of installation and O & M costs for different types of pump
- Pump replacement criteria, \$ return on upgrading motor or bowls
- Information needed for deciding on pump specification for high-yield applications

4:30 – 4:45 **WRAP-UP (All presenters)**

- Continuing education sign-out

## CONTINUING EDUCATION CREDIT

Contact Hours: 7.25

The American Ground Water Trust will provide a Certificate of Attendance to those attendees who sign-in and sign-out.  
Certificates will be mailed after the event.

## REGISTRATION

**WATER WELL & PUMP PERFORMANCE: THE ECONOMIC BASIS FOR WATER WELL  
OPERATION, REHABILITATION & MAINTENANCE DECISIONS**  
**The Center at Sycamore Plaza, 5050 Clark Avenue, Lakewood, CA 90712**  
Wednesday, May 19th, 2010 ~ 8:00am – 4:45pm

- General .....  \$230  
Government employees (Federal, state, county, local) .....  \$200  
Employees of AGWT Members) (\$250+ Level) .....  \$180  
SWS Operators (ERG # required at time of registration. Must mail or fax registration form.)  ERG# \_\_\_\_\_  
Full-Time Student) (ID Required at Registration) .....  \$110  
CD of Presentations (pdf versions of PowerPoint presentations – mailed post-event)  \$15  
Exhibit Table (Registration not included; You must also register.) .....  \$250  
TOTAL \$ \_\_\_\_\_

- Registration includes on-site lunch and breaks
- Walk-in on day of event registration cost (General \$270, Government \$240, AGWT Member \$210, Student \$130)

**PAYMENT:**  **Check** [Make checks payable to: American Ground Water Trust]  
 **AMEX**                       **VS/MC**                       **Discover**                       **PO#** \_\_\_\_\_

Credit Card No. \_\_\_\_\_ Exp \_\_\_\_\_

Cardholder Name \_\_\_\_\_ Cardholder Email \_\_\_\_\_

Registrant Name \_\_\_\_\_

Professional Training \_\_\_\_\_ Job Title \_\_\_\_\_

Company/ Organization \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_ Email \_\_\_\_\_

### CANCELLATION POLICY

- Cancellations received in the AGWT office by 5 pm (ET) 5 days prior to the start of the event will be granted a full refund less a \$25 processing fee.
- Cancellation four to two prior to the start of the event will receive a 50 % registration refund.
- Cancellations one day before the start of the event , or on the day of the event, are considered "No Shows." Refunds will not be made for "No Shows." Substitutions gladly accepted.
- The AGWT will not cancel a conference program because of bad weather conditions. Except that, as the result of an event cancellation resulting from, (but not limited to) circumstances such as a state mandatory evacuation or a fire at the program facility, the AGWT will reschedule the event and honor registrations as payment for the new event.

### Register by:

**MAIL - American Ground Water Trust, 50 Pleasant Street, Suite 2, Concord, NH 03301-4073**  
 **FAX - (603) 228-6557**     **TEL - (603) 228-5444**     **WEB – <http://www.agwt.org/workshops.htm>**