



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 pump performance

Thursday April 15th 2010
8:00am - 5:00pm

Doubletree Hotel Houston
Intercontinental Airport
15747 John F. Kennedy Blvd.
Houston TX 77032 (281) 848-4000

Program presented by: AMERICAN GROUND WATER TRUST

CONTINUING EDUCATION

WATER SYSTEM OPERATORS - 8 hours approved by Texas Commission Environmental Quality; Provider Code/ Title: 0698 - American Ground Water Trust; Course Code/Title: 0548 – Groundwater Workshop

WATER WELL CONSTRUCTION & PUMP INSTALLERS - 7 hours approved by TX Dept. of Licensing & Regulation; Course # 5618, American Ground Water Trust Provider Registration # 1701

MORE WATER LESS COST - BACKGROUND

By 2060 the population of Texas is likely to double and be close to 46 million. Ground water accounts for 60% of the state's available fresh water. Much of the state is experiencing drought. 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.

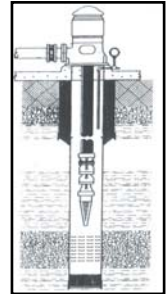
EVENT SPONSORS



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 address 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?



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?
- How to solve the conundrum of identifying well, pump or aquifer problems
- 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 in 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**

Jackson W. "Jay" Suddath, Lead Geologist, MWH Americas, Inc., Houston, TX

- 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

Jackson W. “Jay” Suddath, P.G. is a Senior Project Manager and Geologist with MWH Americas, Inc. and a licensed Professional Geologist reregistered in the state of Texas with over 12 years of groundwater and environmental consulting experience. Mr. Suddath has overseen the construction and performance testing of a variety of groundwater wells. He has also provided oversight and direction on groundwater monitoring and injection well installations. He has conducted numerous aquifer and groundwater classification assessments. In addition, Mr. Suddath has led and participated in remedial activities involving groundwater contamination throughout Texas and the southern United States. He has a Bachelors of Science degree in Geology from Texas Tech University.

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

Mark Harkness, Account Manager, Layne Christensen Company, Houston, TX

- 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

Mark Harkness is an Account Manager at Layne Christensen Company operating from the Houston, TX office. He has a background in chemical engineering and is a licensed P. E. in Texas. In his eight years working for Layne he has been involved in drilling, well rehabilitation, pump maintenance and water treatment projects.

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 do 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 Tryon, 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. He specializes in flexible drop pipe.

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

1:15 – 2:15 **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
- Success 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.

2:15 – 3:00 **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.

3:00 – 3:15 **BREAK**

3:15 – 4:00 **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

4:00 – 4:45 **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 and has worked in the water well industry for nine years specializing in sand separators, pump protection separators and water well camera systems. He has presented CE programs in over 50 locations domestically and internationally. He has an MBA from the Thunderbird School of Global Management.

4:45 – 5:00 **WRAP-UP (All presenters)**
 - *Continuing education sign-out*

April 14th TECHNICAL TOUR TO BAROID (Industrial Drilling Products)

Technical tour to Baroid IDP Research and Development facility - Wednesday, April 14th from 1:30 to 4:30pm.
 [This tour is only available to people who register for the Thursday, April 15th Workshop]
 [Space is limited – pre-registration required – acceptance subject to company security clearance]

The Baroid IDP Facility is at 3000 N. Sam Houston Pkwy. E. - just a few hundred yards from the Workshop hotel
 There will be an 1:00pm shuttle service available from the hotel to Baroid and an 4:30 pm shuttle from Baroid to the Hotel. Parking at Baroid will be available for those using their own vehicles.

Baroid IDP Staff, Technical Tour Leaders:
Charles R. Landis, Technical Director
Ryan Collins, Chemist
Toby McClain, Senior Technical Specialist

Baroid IDP has been an annual corporate supporter of the American Ground Water Trust's Education Programs for over 15 years. The AGWT is most grateful to Baroid for providing this "value-added" learning opportunity for participants at the Houston Water Well Performance Workshop

The Technical Tour will include:

1. Welcome & Introduction:

Baroid's past and present position and role in water well drilling industry research & development

2. Analytical Capability:

An inspection of the various analytical techniques and equipment used for fundamental characterization of drilling fluids and the geology encountered in well construction

3. Product Formulation and Application:

A review of the functionality of various drilling fluid additives and demonstrations on how they may be mixed and used, including selected videos of drill-site applications

4. Geothermal Clay-Based Grouts:

A review of the techniques used to measure thermal conductivity, the thermal properties of common grouts, the behavior of thermal grouts during use and issues related to geothermal well construction

Baroid Industrial Drilling Products, a Product Service Line of Halliburton, is a worldwide network of sales and service engineers, laboratory scientists, and support personnel dedicated to servicing all facets of the non-oil well drilling industries.

Since the 1950s, products and services have been expanded to include all types of drilling. Baroid Industrial Drilling Products now supplies a comprehensive line of drilling, grouting, plugging, abandonment, and well rehabilitation and development products specifically engineered to optimize performance and end-user cost.



REGISTRATION

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

Double Tree Hotel Houston Intercontinental Airport, 15747 John F. Kennedy Blvd., Houston TX 77032

Thursday, April 15, 2010 ~ 8:00am - 5:00pm

April 14 Optional technical tour to Baroid IDP facility (Only available for those registered for the April 15 program)

- General \$230
- Government employees (Federal, state, county, local) \$200
- Employees of AGWT Members) (\$250+ Level) \$180
- 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
- Pre-Conference Technical tour April 14: Baroid IDP Facility, 3000 N. Sam Houston Pkwy. E \$50

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>