



## **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 February 29, 2012  
Pasco, Washington**

**TRAC Center  
6600 Burden Boulevard,  
Pasco, WA 99301**

**PROGRAM PRESENTED BY AMERICAN GROUND WATER TRUST**

### **EVENT SPONSORS**



**SHANNON & WILSON, INC.**  
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS



### **CONTINUING EDUCATION**



**WA Water Well Drillers/Pump Installers:** 5 CEUs Approved through the WA Well Construction & Licensing Office  
**Water Operators:** Approval for CEU pending  
**Engineers:** 7.25 PDHs

**Certificate of Attendance:** (Contact Hours: 7.25) will be provided to those attendees who sign-in and sign-out.

These certificates may be used by attendees to obtain continuing education credit from other professional organizations or licensing agencies. Attendance Certificates will be mailed after the event. (Sign-in, sign-out required)

Hear from experts about technologies and techniques to save money and reduce carbon footprint. It is all about maximizing efficiency and increasing performance. This program is for consultants, engineers & designers and for well operators, pump and well contractors, utility managers, irrigators, owners and end-users. Just one tip on well & pump operation or problem-solving diagnosis could save you thousands of dollars in operation costs and reduce replacement expense by extending the asset value of your wells & pumps.

The American Ground Water Trust is a national, non-profit public education organization that has been providing ground water information, awareness and education since 1986.

#### **The Trust's programs:**

- ☺ Promote efficient and effective ground water management
- ☺ Communicate the environmental and economic value of ground water
- ☺ Showcase ground water science and technology solutions
- ☺ Increase citizen, community and decision-maker awareness
- ☺ Facilitate stakeholder participation in water resource decisions



## **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 seventeen hundred utility managers, water industry professionals, regulatory staff, well owners, water users and ground water specialists have attended this program in: Baltimore MD (2); Little Rock AR; Des Moines IA (2); Nashua NH; Houston TX (2); Lubbock TX, Lansing MI; Charlotte NC; Denver CO; Chicago IL; Cincinnati OH; Indianapolis IN; Wilsonville OR (2); Lakewood CA;(3) Seattle WA (2); Richmond VA, Long Island NY (2), Bucks County PA, Fresno, CA; Phoenix AZ, Langley BC, Orlando FL, Fort Lauderdale FL and Boynton Beach, FL.

## **MORE WATER LESS COST - PROGRAM**

### **8:00 WELL & PUMP TECHNOLOGIES TO MAXIMIZE GROUNDWATER POTENTIAL**

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

- AGWT programs that showcase groundwater industry technology
- One size does not fit all for well design, construction, operation or maintenance
- The importance of understanding the relationships among aquifer, well & pump in achieving optimum well yield at least cost

### **8:30 WELL HYDRAULICS – THE BASICS**

David Kill, P.E. Training Consultant, Xylem Goulds Water Technology, St. Paul, 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

### **9:15 DESIGNING WATER WELLS TO OPTIMIZE PERFORMANCE AND ECONOMIC EFFICIENCY**

Dan Pexplinski, Senior Hydrogeologist, Layne Christensen Company, Milwaukee, WI

- Design basics for high-yield wells (screen selection, gravel pack etc.)
- How to record, analyze and interpret well performance data
- Techniques of managing pumping rates, and well operation to minimize energy costs
- Case studies of well performance

### **10:15 BREAK**

### **10:30 METHODS FOR IMPROVING WELL PERFORMANCE**

Jim Bailey, National Well Services Director, Shannon & Wilson, Seattle, 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

### **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

### **11:30 WELL PERFORMANCE SOLUTIONS**

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

- Typical problems (mineral and biological blockage) that reduce well bore inflow
- 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

### **12:15 LUNCH (Provided on-site)**

### **1:15 ECONOMIC SIGNIFICANCE OF FLEXIBLE DROP PIPE FOR WATER WELLS**

Dan Saba, 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 methods (connectors, reels etc.)
- Cost savings for rapid “pump-in, pump-out” during pump maintenance or well rehabilitation
- Case studies of flexible pipe installation

### **1:45 PROVEN TECHNOLOGY TO REDUCE PUMPING COSTS FOR IRRIGATED AGRICULTURE**

Kent Madison, Farmer, and President, 3R Valve, Echo, OR

- Background to development of on-farm innovations in pumping and water management
- How aquifer recharge system can operate with variable flow rates
- Technology and economics of generating electricity in aquifer recharge wells
- How sophisticated on-farm water and energy management impact agricultural profits

### **2:30 INTELLIGENT PUMP VARIABLE FREQUENCY DRIVES**

Danny Peters, West Coast Application Engineering, Yaskawa Electric America, Cypress, CA

- Energy consumed by pumps
- Fixed speed with valve control vs. VFD
- AC drive basics (how VFD systems work)
- Water industry and agricultural applications of VFD controlled pumps
- Adding “intelligence” to pump system controls
- Case studies of cost advantages of using VFD to improve pump efficiency
- VFD controls to optimize management of multi-pump systems

### **3:30 BREAK**

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

David Kill, P.E. Training Consultant, Xylem Goulds Water Technology, St. Paul, 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 WRAP-UP AND DISCUSSION**

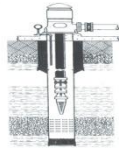
### **4:45 ADJOURN**

#### **HOTEL INFORMATION - Hotel adjacent to TRAC Center**

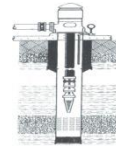
**Holiday Inn Express Hotel & Suites: PASCO-TRICITIES**  
4525 Convention Place, Pasco, WA 99301

**Hotel Reservations: 1 877 834 3613 | Hotel Front Desk: 1-509-543 7000**

**"Best one-day program on well & pump performance!"**



Another Education Program from:  
**American Ground Water Trust**  
 50 Pleasant Street (Suite 2)  
 Concord, NH 03301



# WATER WELLS & PUMPS

**“More Water – Less Cost”**

**Workshop on operation, rehabilitation & maintenance**

**TRAC Center, 6600 Burden Boulevard, Pasco, WA 99301**  
**Wednesday, February 29, 2012**

**~~ WELLS & PUMPS ~ THE VITAL LINKS THAT CONNECT RESOURCE AND CUSTOMER ~~**

- \$ Increase well yields** ~ it is all about design & maintenance and operation
- \$ Save on operation costs** ~ how your pump impacts well performance
- \$ Reduce energy costs** ~ it is all about well & pump efficiency
- \$ Time to fix your well?** ~ how to decide what to do and when
- \$ Technology** ~ are you up to speed with VFD for pumps?

**Pasco WA - WELL & PUMP PROGRAM - REGISTRATION FORM – (or register on-line at [www.agwt.org](http://www.agwt.org))**

General.....	<b>\$230</b>	<input type="checkbox"/>
Government employees (Federal, state, county, local).....	<b>\$200</b>	<input type="checkbox"/>
AGWT Members( \$250+ level) .....	<b>\$180</b>	<input type="checkbox"/>
Full-time Student (ID required) .....	<b>\$110</b>	<input type="checkbox"/>
CD (pdf versions of PowerPoint presentations – mailed post-event)	<b>\$ 20</b>	<input type="checkbox"/>
Exhibit Table (personal registration also required) .....	<b>\$250</b>	<input type="checkbox"/>
Registration includes handouts, coffee breaks & lunch	<b>TOTAL \$</b>	

**CANCELLATION POLICY**

Cancellations received in the AGWT office by 5 pm EST 5 days prior to event will receive a full refund less \$25. For cancellation 4-2 days prior to the there is a 50 % refund. Cancellations one day prior to the start of the event or on the day of the event are considered "No Shows" and no refund will be made - (substitutions gladly accepted).

The AGWT will not cancel a 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 Trust will reschedule the event and honor registrations as payment for the new event.

**PAYMENT:**  Check *[payable to: American Ground Water Trust]*  
 AMEX  Visa  MasterCard  PO Expiration \_\_\_\_\_

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**SPONSORSHIP & EXHIBITS**

There are opportunities to showcase work, projects, products and services as exhibitors or event sponsors. Sponsors will receive recognition for their financial assistance. Call 800-423-7748 for more information or visit [www.agwt.org](http://www.agwt.org)

**Mail: American Ground Water Trust, 50 Pleasant Street, Concord, NH 03301**  
**Fax: (603) 228-6557 Phone: (800) 423-7748 Register on line <http://www.agwt.org> (Conferences/workshops)**