



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

Tuesday October 23, 2012
Kearney, Nebraska

Younes Conference Center,
416 Talmadge Street
Kearney, Nebraska, 68845

PROGRAM PRESENTED BY AMERICAN GROUND WATER TRUST

EVENT SPONSORS



Preferred Pump



CONTINUING EDUCATION



Water Well Drillers/Pump Installers: 7 hours Approved by Licensing Board

Water Operators: 7 Hours Approved for Operators Grade I - IV

Engineers: 7 PDH's

Irrigation Association: 2 CEUs – Tier 3 – Approved



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)

PROGRAM

8:00 WELL & PUMP TECHNOLOGIES TO REDUCE COST AND 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

8:15 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

9:00 DESIGNING WATER WELLS TO OPTIMIZE PERFORMANCE AND ECONOMIC EFFICIENCY

Kevin McGillicuddy, Senior Hydrogeologist, Roscoe Moss Company, Los Angeles, CA

- 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

10:00 BREAK

10:15 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

11:15 WELL PERFORMANCE DECLINES: CAUSES AND CURES

Neil Mansuy, VP, Subsurface Technologies, Kansas City, MO

- Chemical, microbiological and physical reasons for well problems
- Understanding typical “declining yield” problems
- Case studies of well yield declines attributable to encrustation
- Case studies on cost-effective maintenance for high yield wells
- Preventive maintenance procedures

12:15 LUNCH (Provided on-site)

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

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 methods (connectors, reels etc.)
- Cost savings for rapid “pump-in, pump-out” during pump maintenance or well rehabilitation

1:45 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

2:30 INTELLIGENT PUMP VARIABLE FREQUENCY DRIVES

Dan Peters, Applications Engineer, Yaskawa America, Inc., 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

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



**Presenter Background Information - Well & Pump Performance Program
Kearney, Nebraska, October, 2012**

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

Andrew Stone has over thirty five years of ground water experience in Africa and the United States as a university professor, ground water consultant and ground water advocate & educator. He has first-hand experience of ground water exploration, well design and source protection in a wide variety of geologic environments. As the director of the AGWT's education programs he has convened and coordinated over one hundred and fifty conference programs related to ground source heating and cooling technology, well design, ground water management, aquifer storage recovery, conjunctive use, water banking, and asset management. From 1990 to 2002, as adjunct professor, he taught an annual course on Ground Water Protection Policy in the Masters Degree Program at Antioch New England Graduate School. He is the Director of *the International Association of Hydrogeologists' Commission on Groundwater for Decision Makers*.

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

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.

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

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.

Tanner Tryon, Engineer, Hose Solutions, Inc., Scottsdale AZ

Tanner Tryon received his bachelors in engineering at Arizona State University and his Masters in Business Administration from the University of Wisconsin. Tanner is the lead technical assistant for installations involving Flexible Drop Pipe. He frequently works on site to tackle specific problems and provide assistance at installations. He also shares his experiences at conferences all over the US with several organizations including the NGWA, AGWT, and several state organizations.

Kevin McGinnis, President, Cotey Chemical Corporation, Lubbock TX

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.

Neil Mansuy, Vice President, Subsurface Technologies Inc., Newburg, NY

Mr. Mansuy has 20 years of extensive worldwide well rehabilitation experience. He holds a MS from the Univ. of Regina, Saskatchewan, Canada, specializing in iron-related bacteria and causes of well plugging. He was previously an aquifer and well rehabilitation specialist with Layne GeoSciences Inc. for 10 years. Mr. Mansuy's workshop presentations cover all aspects of well problems and solutions related to lost capacity and water quality problems. Neil is the author of the book, "Water Well Rehabilitation," 1999, Lewis/CRC Press.

Kevin McGillicuddy, Senior Hydrogeologist, Roscoe Moss Company, Los Angeles CA

Kevin McGillicuddy is the Senior Hydrogeologist and Director of the Stormwater Treatment Division of Roscoe Moss Company. He joined the Roscoe Moss Company in 1996 and has worked as a technical liaison to municipal water agencies, groundwater consultants, and water well contractors. He has managed and participated in several educational workshops on water well design, testing and rehabilitation. Prior to joining Roscoe Moss Company, he worked as Director of Recharge Operations and as a Senior Hydrogeologist for the Orange County Water District in Fountain Valley, CA. He holds a Bachelor of Science Degree in Geology from Boston College and Masters' of Science Degree in Geology from the University of Southern California. He is a Registered Geologist in the State of California.

Daniel Peters, Applications Engineer, Yaskawa America, Inc., Cyprus, CA

Dan Peters has over 19 years experience in applying variable frequency drives (VFD's) to a variety of commercial and industrial applications. He has 10 years experience developing and or testing custom VFD software for a variety applications including water pumping, elevators, and electronic line shaft.

For the last seven years his work has focused on water pump specific applications for VFD's using custom application software environment. This includes extensive field testing on a variety of water pumping applications including: Vertical Turbines, Centrifugal pumps & Submersible pumps.