

WATER SUPPLY SYSTEMS WORKSHOP

American Ground Water Trust Program - June 10th, 2016
Omni Austin Hotel at Southpark, 4140 Governor's Row, Austin, TX 78744

MAXIMIZE SUPPLY FROM WELLS CORRECT DESIGN, OPERATION & MAINTENANCE PROGRAM



A one-day program on practical, cost-effective solutions that work. The workshop will explain how to maximize yields and pump performance on existing wells and ensure correct design, construction, pump and pump control selection, and maintenance on new wells. New or existing, this program will enable groundwater users to reduce energy costs and prolong well life. Hear from experts about technologies and techniques to save money by maximizing

efficiency and increasing performance. This program is for well owners, irrigators, consultants, engineers & designers, well operators, pump and well contractors. Just one tip on well & pump operation or problem-solving diagnosis could save thousands of dollars in operation costs and reduce replacement expense by extending the asset value of your wells & pumps.



Continuing Education

Approved by the Texas Department of Licensing and Regulation
8.0 Continuing Ed Hours - Water Well Drillers and Pump Installers - Provider 1701 - Course 14260
Approved by TX Commission on Environmental Quality
7.0 Credit Hours - TX Water Utility Operators - Course Code: 0548/Ground Water Workshop
Provider Code 0698/American Ground Water Trust

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Supply Systems – Well & Pump Workshop Program June 10

7:30 – 8:10 REGISTRATION (Coffee & donuts) (Sign in for continuing education)

8:10 WORKSHOP INTRODUCTION - WELL & PUMP TECHNOLOGIES

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

- The water well as the crucial link between aquifer and end user
- Answering the basic question for declining performance: Is it the well the pump or the aquifer?

8:20 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
- Causes of well performance changes
- Flow dynamics through rock fractures or screens into well bores and into pump intakes

**9:00 EFFICIENT WELL DESIGN AND CONSTRUCTION PRINCIPLES:
MAXIMIZING THE LIFE EXPECTANCY AND PRODUCTIVITY OF YOUR WELL**

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

- How important is it to engage a hydrogeological expert before drilling a new well?
- Importance of investment in design, casing and screen materials, and construction techniques to maximize yield
- How to calculate performance in wells with constantly declining water levels
- Water well drilling, construction & well development methods to maximize yield
- The importance of monitoring and maintenance
- Case studies of improving well performance

10:00 ECONOMIC SIGNIFICANCE OF FLEXIBLE DROP PIPE FOR WATER WELLS

Tanner Tryon, General Manager, 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 maintenance or rehabilitation

10:30 BREAK

10:45 WELL DESIGN & CONSTRUCTION PROBLEMS ENCOUNTERED IN TEXAS

Dr. Hughbert Collier, Senior Vice-President, Collier Consulting, Stephenville, TX

- How hydrogeologists and engineers benefit from up-to-date knowledge of wells, pumps and pump controls
- Value of well yield and water quality data for diagnosing well problems
- Reasons for high yield well performance declines
- Importance for monitoring wells to maintain hydraulic contact with the aquifer
- What aquifer pumping tests reveal about a water well

11:30 WATER WELL REHABILITATION: WHEN AND HOW TO DO IT

Nick Winkelmann, Vice President, Gulf Coast Region, Layne, Houston, TX

- Where in Texas are the problem wells?
- Examples of troubleshooting to identify the problem and select the best solution
- Well redevelopment / rehabilitation techniques most frequently used in Texas
- Comparison of costs for different well treatments

12:15 LUNCH (Provided)

1:15 WELL PERFORMANCE SOLUTIONS

Kevin McGinnis, President, Cotey Chemical, 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

2:00 TYPICAL TEXAS WATER WELL PUMP ISSUES: TROUBLESHOOTING AND SOLUTIONS

Calvin Hale, Territory Manager, Gicon Pumps and Equipment, Haltom City, TX

- How a pump is selected based on known conditions
- Why materials of construction are important based on water chemistry and well conditions
- The problems created by changing conditions
- Diagnosing and available solutions
- Controls, Equipment, and Instruments for optimizing the pump selection

2:45 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

- Causes of pump capacity changes.
- 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
- 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

4:25 Workshop wrap-up

4:30 ADJOURN and continuing education sign-out

WORKSHOP PRESENTERS: June 10-Technical Workshop-WATER SUPPLY SYSTEMS (WELLS & PUMPS)

Hughbert Collier, Senior Vice President, Collier Consulting, Stephenville, TX

Dr Collier has over 30 years experience in consulting, research, technical support for litigation, and lecturing throughout the country. One of his specialties is the integration of various types of data (e.g. borehole geophysical, pumping tests, cuttings, cores, and surface geophysical) for the hydrogeological characterization of aquifers, including ASR feasibility. This expertise has assisted Collier Consulting in developing wells and well fields in Texas and Florida. He has a geology degree from Mississippi State University and a Ph.D. in Geosciences from the University of Texas at Dallas.

Calvin Hale, Director of Education, Gicon Pumps and Equipment, Lubbock, TX.

Calvin began working in the water systems industry in 1982 as a drillers helper and then a licensed driller. He became interested in the pump distribution business and worked in the supply industry for many years as a technical advisor. Throughout these years gaining expertise in Water Well, Irrigation, Water treatment, and Bottling. While working he attended classes at night at Tarrant County College, being interested in the physical sciences. All of this has culminated into a love of teaching. He now teaches classes for the TGWA, OGWA, NMGWA, Mountain States Ground Water Association as well as the Dallas Irrigation association and Austin Irrigation Association.

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 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.

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.

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.

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

Dan Peters has over 20 years experience in applying variable frequency drives (VFD's) to a variety of commercial and industrial applications. He has 11 years experience developing and or testing custom VFD software for a variety applications including water pumping, elevators, and electronic line shaft.

For the last eight 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.

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

Andrew Stone is a hydrogeology graduate from University College, London. He has over thirty five years of ground water experience in Africa and the U.S. as a university professor, ground water consultant and ground water advocate & educator. From 1990 to 2003 he taught an annual course on Groundwater Protection Policy at Antioch New England University. In recognition of his work in promoting ground water resource education in the US, he received the 1998 National Ground Water Association "Oliver Award" for outstanding contributions to the groundwater industry.

Tanner Tryon, General Manager, 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*.

Nicholas J. Winkelmann, P.E., Vice President Layne Christensen Company – Houston, Texas

Nicholas manages Layne's Gulf Coast Operations and has been with Layne for 19 years. He has a degree in Geological Engineering from the University of Missouri Rolla and Business Administration from Aurora University. During his experience at Layne, Nicholas has worked in various parts of the country and has been responsible for well design and construction and also well rehabilitation design and implementation. He has worked with many Layne offices and had various speaking engagements regarding the importance of properly designing a well rehabilitation program.

