

**Workshop Program: Stockton, CA - Tuesday, October 6<sup>th</sup> 2015**

# Design, operation, and maintenance of wells in times of drought

## Give a technological “kiss of life” to that underperforming well

San Joaquin Council of Governments Meeting Room, 555 East Weber Avenue, Stockton, CA 95202

### PROGRAM PRESENTED BY AMERICAN GROUND WATER TRUST

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

Hear from experts about technologies and techniques to keep water flowing, save money and reduce carbon footprint. It is all about 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 you thousands of dollars in operation costs and reduce replacement expense by extending the asset value of your wells & pumps.

### PROGRAM SPONSORS



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# "Get smart with your water well assets!"

## MORE WATER LESS COST – PROGRAM

**7:30 – 8:10 REGISTRATION (Coffee & donuts) SIGN-IN FOR WATER OPERATOR CREDITS OR COA**

**8:10 WORKSHOP INTRODUCTION - WELL & PUMP TECHNOLOGIES**

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

**9:15 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 mortgaging the farm for 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
- Well to obtain maximum yield from aquifers
- Water well drilling, construction & well development methods to maximize yield
- The importance of monitoring and maintenance
- Well redevelopment / rehabilitation techniques
- Case studies of improving well performance

**10:00 TYPICAL PROBLEMS & SOLUTIONS FOR WELLS IN CENTRAL CALIFORNIA**

Chris Johnson, Aegis Groundwater Consulting, Fresno, CA

- Drought related well and pump failures and frustrations
- The effects of declining groundwater levels on water quality and well yields
- Questions to answer about "fixing" existing wells before deciding to drill new ones
- Case studies of costs and benefits for well rehabilitation in central California

**10:45 BREAK**

**11:00 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
- Importance of Well Efficiency During Declining Water Levels
- Case studies on cost-effective maintenance for high yield wells
- Preventive maintenance procedures

**11:45 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
- Theory behind particle movement during well development
- Simulations of well-aquifer / aquifer-well flow dynamics during rehabilitation

**12:30 LUNCH (Provided)**

### 1:30 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

### 2:00 WELL PERFORMANCE SOLUTIONS

Norman Howard, Western US Sales Manager, Cotey Chemicals, 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

### 2:45 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

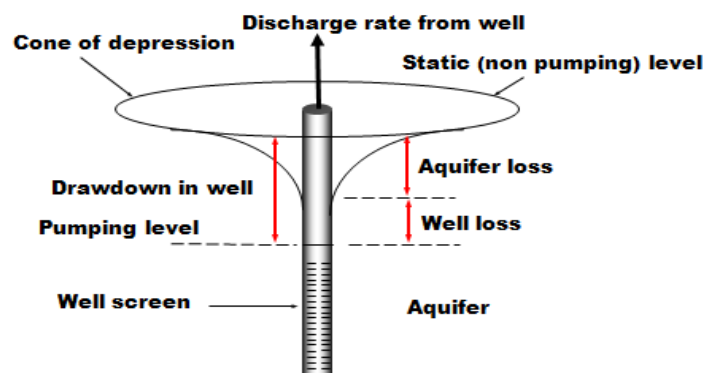
### 3:30 BREAK

### 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 - 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 ADJOURN and continuing education sign-out



**At the end of the workshop please hand in your badge holder and completed evaluation form!**