

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

**A one-day workshop on practical, cost-effective solutions
to extend asset value by maximizing well performance**

Seattle, Washington – Monday, November 5th
Holiday Inn, Seattle-Seatac Intl Airport, 17338 Int'l. Blvd. Seattle, WA 98188

Wilsonville, Oregon – Tuesday, November 6th
Holiday Inn Wilsonville, 25425 SW 95th Ave, Wilsonville, OR 97070

Free well performance software

Attendance certificates will be provided for attendees to submit to CEU licensing agencies

Approval granted for CEU for water operators and well contractors in WA and OR

Program presented by:

AMERICAN GROUND WATER TRUST

Ground Water Information, Awareness & Education Since 1986

WHO SHOULD ATTEND

This program provides water engineers, water managers, well-field operators and well contractors with the latest information about cost-effective installation, operation and maintenance of water wells. The presentation team members are all experienced experts and their presentations will combine the practical aspects of well rehabilitation and maintenance with the economic principles of asset management so that well designers, owners, operators and managers can have a clear-cut basis to make decisions.

- ◆ What proportion of your overall water provision costs are related to well efficiency?
- ◆ Which asset management tools & concepts work best as a basis for decision-making?
- ◆ Do your well construction and design decisions include maintenance needs?
- ◆ What should be included in an RFP for well construction, maintenance or rehabilitation?
- ◆ What diagnostic indices can 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 can you calculate the cost-benefit of maintaining well efficiency?
- ◆ What is the basis for assessing the success of maintenance or rehabilitation?

BACKGROUND

More than twelve hundred utility managers, water industry professionals, regulatory staff, well owners, water users and ground water specialists have attended past American Ground Water Trust workshop programs on water wells in: Baltimore MD; Little Rock AR; Des Moines IA (2); Nashua NH; Houston TX; Lansing MI; Charlotte NC; Denver CO; Cincinnati OH; Wilsonville OR; Lakewood CA; Seattle WA; Richmond VA, Long Island NY, Bucks County PA and Boynton Beach, FL.

The workshop will help improve asset management assessment skills, increase awareness of the economic importance of sustainable management of assets among engineers, utility operators, and water managers, and address core questions involved in assessing well performance to assist decisions related to, operation, maintenance, rehabilitation and replacement. The program includes fundamental aspects of well design, construction, operation, rehabilitation and maintenance. The workshop focus is on explaining practical methods for diagnosing the causes of declining yield and in finding cost-effective solutions.

This is a multi-disciplinary program that provides up-to-date information about water well rehabilitation technologies and well maintenance from real case study experiences. The workshop will give participants a comprehensive understanding of the economic basis for well design & operation policy.

PROGRAM CONTENT (Same for WA and OR programs)

Program starts at 8:15 am and ends at 5:00 pm - Lunch is provided

8:15 – 8:30

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

OVERVIEW OF THE WORKSHOP PROGRAM

- Costs of delivering water
- Ground water as an economic resource

8:30 – 9:30

Jack Warburton, Senior Vice President, Brown and Caldwell, Seattle, WA

Steffran Neff, Northwest Asset Management Practice Leader, Brown and Caldwell, Seattle, WA

ASSET MANAGEMENT PRINCIPLES

- Why “asset management” concepts are becoming increasingly important
- Why a large withdrawal well user should develop an “asset” maintenance plan
- Case studies of economic benefit (more gallons at less energy cost) of treating and maintaining wells.
- Decision making models/ methods to select methods and timing of treatment

9:30 – 10:20

Neil Mansuy, Vice President, Subsurface Technologies, Kansas City, MO

DECLINE IN WELL PERFORMANCE

- Chemical, microbiological and physical reasons for well problems
- Understanding typical “declining yield” problems
- Case studies of well yield declines attributable to encrustation
- Diagnostic characteristics for rock wells, screened wells, horizontal wells and ASR wells

10:20 – 10:40

BREAK

10:40 – 11:20

Jack Sowers, Senior Field Sales Representative, Baroid Industrial Drilling Products, Yakima, WA

WELL DESIGN FOR HIGH CAPACITY PERFORMANCE

- Importance of initial well design
- Drilling fluids to ensure maximum well yield
- The importance of post-construction well development

11:20 – 12:10

Jim Bailey, Principal Hydrologist, Kleinfelder, Bellevue, WA

METHODS FOR IMPROVING WELL PERFORMANCE

- Key well performance indicators
- The Full Tool-Kit of treatment options
 - Mechanical Methods
 - Chemical Methods
- How do decide on treatment options
- Solving well performance issues in the Northwest

12:10 – 1:10 LUNCH

1:10 – 1:50

Henry Hunt, Project Manager, Collector Wells International, Columbus, OH

ALTERNATIVE WELL DESIGNS

- When to consider a horizontal collector well
- Advantages of riverbank filtration well systems
- Maintaining high yields from large diameter wells

1:50 – 2:30

Jeremy Osborne, Program Controls Manager, MWH, Cape Coral, FL
ASSET MANAGEMENT STRATEGIES

- **How to compile and interpret true costs**
- **Assessment of well field economics in the context of overall Utility assets**
- **Value of an economic model template in rehabilitation/ replacement decisions**

2:30 – 3:30

Tom Morris, Hydrologist, ASR Systems, Las Vegas, NV

PREDICTIVE MAINTENANCE PROGRAMS FOR PRODUCTION WELLS

- **Identification of the well facility processes that can be measured and evaluated**
- **Definition of baseline performance and monitoring programs**
- **How to manipulate data to evaluate aquifer, pump or wellbore issues**
- **How to determine the costs of well performance losses**

WELL PERFORMANCE TRACKING SOFTWARE

- **Efficiency indices used to maximize cost savings by deciding when to repair, rehabilitate or replace**
- **Explanation of the Well Field Maintenance Guide and Performance Tracking Software**

All participants will be provided with complimentary CD copies of the:

“Well Performance Tracking Software” and “Wellfield Maintenance Guide”

3:30 – 3:40 BREAK

3:40 – 4:40

Neil Mansuy, Vice President, Subsurface Technologies, Kansas City, MO
PREVENTION IS MORE COST EFFECTIVE THAN CURE

- **Cost / Benefit evaluation of well rehabilitation techniques**
- **Case studies on effective well maintenance**
- **Preventive maintenance procedures**

4:40 – 5:00

WORKSHOP WRAP-UP

- **Questions (all presenters)**
- **Attendance sign-out**

5:00pm

ADJOURNMENT

ATTENDANCE CERTIFICATES – CONTINUING EDUCATION

Attendance certificates will be provided for attendees to submit to CEU licensing agencies.

In order to receive a certificate of attendance you must sign-in and sign-out.

Oregon (OR-WRD Water System Operators (Distribution or Treatment)	Approved (1503) 0.7 CEUs
Oregon (OR-WRD) Well Constructors (Drillers)	Approved 7 CECs
Washington (WA-DOH) Certified Water Works Operators, (Distribution or Treatment)	Approved (A1380) 0.7 CEUs
Washington (WA-DOE) Licensed Well Drillers	Approved 7.250 CEUs
Washington or Oregon Engineers	Self-Certifying 7.25 Contact Hours
Washington or Oregon Geologists	Self-Certifying 7.25 Contact Hours

All registrants are responsible for confirming the applicability of this training directly with the organizations or agencies that administer their professional certification. The TRUST does not pre-certify the training for all organizations or professions.

Call the TRUST for updated CEU information about pending CEU Approvals - (603) 228-5444

↓ REGISTRATION FORM ↓

WATER WELL PERFORMANCE WORKSHOP - REGISTRATION FORM

(Registration includes lunch, breaks, and CD of well operation software.)
8:15am - 5:00pm

Check one location

Seattle, WA - Monday, November 5th, 2007 or

Wilsonville, OR – Tuesday, November 6th, 2007

Registration in advance of the event:

General Registration \$230.00

Government Employees \$210.00

Employees of American Ground Water Trust Members (\$250+Level) \$190.00

Full-Time Students(ID required at registration) \$110.00

Exhibit Table (6 foot table)..... (Personal registration not included) \$250.00

CD of presentations (mailed after the workshop in PDF format) \$15.00

Total..... \$ _____

[Walk-in registration (on day of event) General \$280, Government \$240, Trust Members \$220, Student \$130]

PAYMENT: **Check** *[Make checks payable to: American Ground Water Trust]*

AMEX **Visa** **MasterCard** **PO#** _____

Credit Card No. _____ **Expiration** _____

Cardholder Name _____

Registration Name _____

Title/Position _____

Company/ Organization _____

Address _____

City _____ **State** _____ **Zip** _____

Phone _____ **Fax** _____ **E-Mail** _____

Register by:

MAIL - American Ground Water Trust, 16 Centre Street, Concord, NH 03301

FAX - (603) 228-6557 **TEL** - (603) 228-5444 **WEB** – www.agwt.org