

20th Annual WaterReuse Symposium

Water Reuse & Desalination: Mile High Opportunities

Presented by:



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September 18 - 21, 2005 • Denver, Colorado

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2005 Symposium Planning Committee

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Denver Water

John Morris (Co-Chair)
MORRIS Water Resources Consultants

Nicole Adams
Plum Creek Wastewater Authority

Jeff Arnold

John Bambei
Denver Water

Jack Benson
Water Environment Federation

Christine Close
Damon S. Williams Associates, L.L.C.

James Crook
Environmental Engineering Consultant

Claudia Cummins
City of Aurora Utilities Department

Julie Ghent
Water Environment Federation

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PBS&J

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Joe Walters
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David York
Florida Department of Environmental Protection

2005 Technical Program Committee

James Crook
Environmental Engineering Consultant

Gary Grinnell
Las Vegas Valley Water District

Elson Gushiken
ITC Water Management

Paul Kinshella
Phoenix Water Services Department

Mark McNeal
CH2M HILL

John Morris
MORRIS Water Resources Consultants

Bahman Sheikh
Water Reuse Consultant

Don Vandertulip
Kimley-Horn & Associates

David York
Florida Department of Environmental Protection



Welcome to Denver!

On behalf of the WateReuse Association, the Water Environment Federation (WEF), and the American Water Works Association (AWWA), we welcome you to Denver for the 20th Annual WateReuse Symposium! This fast-growing city, situated in a semi-arid climate and full of water scarcity issues, is certainly a fitting location to complete a second decade of conferences devoted to water reuse and desalination.

A record 111 papers will be presented at this year's Symposium. Technical sessions will be devoted to stimulating and diverse topics such as micropollutants, desalination, indirect potable reuse, operational issues, and global water reuse. The extremely popular User Issues Forum and Regulatory Forum are back and will be held in more intimate settings designed to encourage discussion and debate.

The Opening Session is loaded with prominent speakers and will feature Michael Gabaldon, Director of Policy, Management, and Technical Resources at USBR, Denver Mayor John Hickenlooper, WEF President-Elect J. Michael Read, AWWA President Andy Richardson, and WateReuse Association President Mike Gritzuk. Tuesday's annual Legislative Outlook Session consists of a unique blend of both national issues and problems specific to the American West. Colorado Supreme Court Justice Gregory Hobbs, a popular speaker in many water circles, will be featured along with Erik Webb of Senator Pete Domenici's Office, Dave Akers of the Colorado Department of Public Health and Environment, and the WateReuse Association's lobbyist, Eric Sapirstein.

Monday night's President's Reception will be held at the Colorado History Museum. In addition to networking with your colleagues, please take a few moments to explore the museum and learn about Colorado's wild and rich history. Check your registration packet for a map and directions – it is an easy walk, but a bus will also be available for your convenience.

On Tuesday, we have an outstanding tour lined up that is offered in both the morning and afternoon. The tour will include stops at Denver Water's 30 MGD Recycling Plant, Xcel Energy's Cherokee Power Station, and the City of Westminster's Reclamation Facility. The City of Aurora's irrigation system will be highlighted along the way. The tours are nearly full, but if you are not signed up and would like to go, stop by the registration desk to see if there have been any cancellations.

This year's Symposium will feature a new session that is sure to be fun and full of spirited debate. Is Reclaimed Water Safe? will be moderated by Dr. James Crook and will include a mix of expert panelists from the United States, Australia, and Europe. If you have an opinion about how safe reclaimed water should be and for which uses it should be permitted, bring your boxing gloves and be ready to take the microphone!

Denver is a clean, young city with more than 200 parks and dozens of tree-lined boulevards. Nestled at the foot of the Rocky Mountains, downtown Denver boasts a mile-long pedestrian walkway (one block from the Hyatt!) with easy access to world-class restaurants, shopping, museums, and night spots. Just short drives from Denver are Rocky Mountain National Park and ski areas that offer a variety of recreational activities. Are you a sports fan? If so, you picked a great week to be in Denver as the Avalanche, Broncos, Rockies, and Rapids all have home games.

On behalf of the Symposium Planning Committee, we hope that you enjoy this premier water reuse and desalination conference. If there is anything we can do to make your attendance at the Symposium more meaningful, please let us know!

Brian Good

Denver Water

John T. Morris

MORRIS Water
Resources Consultants



2005 Symposium Sponsors

The WaterReuse Association would like to recognize and thank the sponsors of the 20th Annual WaterReuse Symposium.

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Walking Directions from the Grand Hyatt Denver to the Colorado History Museum for the President's Reception on Monday Night

1. Exit the Hyatt onto 17th Street by going through the revolving doors to the left of the registration desk and through the Hyatt Regency Shopping Pavilion.
2. Turn left on 17th Street and proceed 2½ blocks to Broadway (if you cross Welton Street you are going the wrong way).
3. Cross Broadway and take a right (south). After two long blocks, you will enter into Civic Center Park and will see the State Capitol on your left.
4. Keep walking on Broadway one block past Civic Center Park to 13th Avenue and you will see the Colorado History Museum on your left (corner of 13th and Broadway). The Southwest corner of the building is labeled "Colorado Heritage Center."

Estimated walking time: 10 minutes

A shuttle bus will loop between the hotel and the museum for people who do not want to walk.



Speakers

Mr. Jerry Allen

Senior Manager, Practice Leader
Kellogg Brown & Root
4100 Clinton Drive (03-1136C)
Houston, TX 77020
Phone: (713) 753-3108
Fax: (713) 753-3803
jerry.allen@halliburton.com
Session: D-2

Ms. Victoria Allies

President
TNT Technology Company
2121 West University Drive, Suite 112
Tempe, AZ 85281
Phone: (480) 966-9891
Fax: (480) 968-9469
tnttechnology@cox.net
Session: B-2

Mr. Brent Alspach

Project Engineer
Malcolm Pirnie
1902 Wright Place, Suite 180
Carlsbad, CA 92008
Phone: (760) 602-3828
Fax: (760) 602-3838
balspach@pirnie.com
Session: A-2

Dr. Gary Amy

Professor of Water Supply & Sanitation
UNESCO-IHE Institute for Water
Education
Westvest 7
2601 DA Delft, The Netherlands
Phone: +31-15-215-1781
Fax: +31-15-212-2921
g.amy@unesco-ihe.org
Session: B-4

Mr. Robert W. Angelotti

Director of Technical Services
Upper Occoquan Sewage Authority
14631 Compton Road
Centreville, VA 20121
Phone: (703) 830-2200 ext. 420
Fax: (703) 815-2054
bob.angelotti@uosa.org
Session: A-3

Mr. Richard P. Arber

President
Richard P. Arber Associates
198 Union Boulevard, Suite 200
Lakewood, CO 80228
Phone: (303) 831-4700
Fax: (303) 831-0290
rick@arber.com
Session: B-4

Mr. Brent P. Arns

Engineering Technician
Aqua Engineering
828 South 1040 West, Suite 4
Payson, UT 84651
Phone: (801) 465-5700
Fax: (801) 465-5715
brenta@aquaeng.com
Session: D-2

Dr. Roger Babcock Jr.

Associate Professor
University of Hawaii
2540 Dole Street
Holmes Hall 383
Honolulu, HI 96822
Phone: (808) 956-7298
Fax: (808) 956-5014
rbabcock@hawaii.edu
Session: A-3

Dr. William Bellamy

Vice President
CH2M HILL
9191 South Jamaica Street
Englewood, CO 80112
Phone: (720) 286-5598
Fax: (720) 286-9746
wbellamy@ch2m.com
Session: C-1

Mr. Christopher Bellona

Doctoral Candidate
Colorado School of Mines
1500 Illinois Street
Golden, CO 80401
Phone: (303) 384-2445
Fax: (303) 273-3413
cbellona@mines.edu
Session: A-3

Mr. Don Berger

Recycled Water Program Manager
Central Contra Costa Sanitary District
5019 Imhoff Place
Martinez, CA 94553
Phone: (925) 229-7259
Fax: (925) 228-4624
dberger@centralsan.dst.ca.us
Session: D-4

Mr. Rick Bond

Process Engineer
Black & Veatch
8400 Ward Parkway
Kansas City, MO 64114
Phone: (913) 458-3143
Fax: (913) 458-3802
bondrg@bv.com
Session: A-4

Speakers (continued)

Dr. Patrick Brady

Sandia National Laboratories
MS-0750
Albuquerque, NM 87185
Phone: (505) 844-7146
Fax: (505) 844-7354
pvbrady@sandia.gov
Session: A-4

Mr. Cortney Brand

Senior Project Engineer
Colorado Springs Utilities
215 Nichols Boulevard
Colorado Springs, CO 80907
Phone: (719) 668-5637
Fax: (719) 668-3990
cbrand@csu.org
Session: B-2

Ms. Alice Brawley-Chesworth

Civil Engineer III
City of Phoenix Water Services Department
200 West Washington Street, 8th Floor
Phoenix, AZ 85003
Phone: (602) 262-1828
Fax: (602) 495-5843
alice.brawley-chesworth@phoenix.gov
Session: D-1

Mr. Jack Bryck

Associate
Malcolm Pirnie
4646 East Van Buren Street, Suite 400
Phoenix, AZ 85008
Phone: (602) 797-4609
Fax: (602) 231-0131
jbryck@pirnie.com
Session: S-4

Mr. Michael E. Burton

President
Burton & Associates
2902 Isabella Boulevard, Suite 20
Jacksonville Beach, FL 32250
Phone: (904) 247-0787
Fax: (904) 241-7708
mburton@burtonandassociates.com
Session: C-3

Mr. Neil Callahan

Director
National Owners Advisory Services
3030 North Rocky Point Drive West,
Suite 760
Tampa, FL 33607
Phone: (813) 282-9797
Fax: (813) 282-9744
ncallahan@rwbeck.com
Session: A-2

Mr. Malcolm Castor

Water Conservation Analyst
Southwest Florida Water Management
District
2379 Broad Street
Brooksville, FL 34604
Phone: (352) 796-7211 ext. 4214
Fax: (352) 754-6885
malcolm.castor@swfwmd.state.fl.us
Session: B-5

Mr. Al Castro

Manager, Reclaimed Water Section
Orange County Utilities
9150 Curry Ford Road
Orlando, FL 32825
Phone: (407) 254-9683
Fax: (407) 254-9699
al.castro@ocfl.net
Session: D-2

Mr. Joseph D. Chwirka, P.E.

Project Manager
CDM
6000 Uptown Boulevard NE, Suite 200
Albuquerque, NM 87110
Phone: (505) 243-3200
Fax: (505) 243-2700
Session: B-4

Dr. Jennifer Clancy

President
Clancy Environmental Consultants
P.O. Box 314
Saint Albans, VT 05478
Phone: (802) 527-2460
Fax: (802) 524-3909
jclancy@clancyenv.com
Session: C-2

Ms. Tracy Clinton

Senior Project Manager
Carollo Engineers
2700 Ygnacio Valley Road, Suite 300
Walnut Creek, CA 94598
Phone: (925) 932-1710
Fax: (925) 930-0208
tclinton@carollo.com
Session: B-2

Dr. Miroslav Colic

Chief Scientist - Research Director
Clean Water Technology
6860 Cortona Drive, Building A
Goleta, CA 93117
Phone: (805) 685-9100
Fax: (805) 685-9105
mcolic@cleanwatertech.com
Session: A-1

Speakers (continued)

Mr. Phil Cross

Vice President/Area Manager
Woodard & Curran
PO Box 783125
Winter Garden, FL 34778
Phone: (407) 656-2332 ext. 223
Fax: (407) 877-0868
phil.cross@waterconservii.com
Session: D-3

Ms. Katharine Cupps

State Lead, Reclaimed Water Program
Washington Department of Ecology
PO Box 47600
Olympia, WA 98504
Phone: (360) 407-6452
Fax: (360) 407-6426
kcup461@ecy.wa.gov
Session: C-1

Mr. David Curry

Black & Veatch
11401 Lamar Avenue
Overland Park, KS 66211
Phone: (913) 458-7748
Fax: (913) 458-2934
curryd@bv.com
Session: A-2

Ms. Uzi Daniel

Environmental Quality Analyst
West and Central Basin Municipal Water
Districts
17140 South Avalon Boulevard
Carson, CA 90740
Phone: (310) 660-6245
Fax: (310) 217-2414
uzid@wcbwater.org
Session: B-3

Mr. Henry Day

Superintendent Pollution Control
City of Phoenix
2474 South 22nd Avenue
Phoenix, AZ 85009
Phone: (602) 495-5927
Fax: (602) 534-7151
henry.day@phoenix.gov
Session: B-2

Dr. Heleen De Wever

VITO
Boeretang 200
2400 Mol, Belgium
Phone: 00-32-14-336932
Fax: 00-32-14-321186
heleen.dewever@vito.be
Session: D-1

Dr. Dale Devitt

Professor
University of Nevada at Las Vegas -
Biology Department
4505 Maryland Parkway
Las Vegas, NV 89154
Phone: (702) 895-4699
Fax: (702) 895-3956
dev50@clark.nsvcc.edu
Session: S-3

Mr. Ken Diehl

Senior Environmental Coordinator
San Antonio Water System
517 Mission Road
San Antonio, TX 78210
Phone: (210) 704-1153
Fax: (210) 704-1152
kdiehl@saws.org
Session: D-1

Mr. Kelly DiNatale

Principal
CDM
1331 17th Street, Suite 1200
Denver, CO 80202
Phone: (303) 298-1311
Fax: (303) 293-8236
dinatalekn@cdm.com
Session: S-2

Dr. Jörg Drewes

Assistant Professor
Colorado School of Mines
Environmental Science & Engineering
Golden, CO 80401
Phone: (303) 273-3401
Fax: (303) 273-3413
jdrewes@mines.edu
Session: A-3

Mr. Bruce Durham

Alternative Water Resource
VEOLIA Water
52 RVE D'Anjon
Paris, France 75384
Phone: +44 772 184 9357
Fax: +44 177 374 2156
bruce.durham@veoliawater.com
Session: C-5

Ms. Kathleen Esposito

Metcalf & Eddy
605 Third Avenue
New York, NY 10158
Phone: (212) 984-7361
Fax: (212) 681-8713
Kathleen.Esposito@m-e.aecom.com
Session: S-1

Speakers (continued)

Dr. Larry Esvelt

Principal
Esvelt Environmental Engineering
7605 East Hodin Drive
Spokane, WA 99212
Phone: (509) 926-3049
Fax: (509) 922-3073
larry@esvelt.com
Session: D-1

Mr. John Forrest

Project Coordinator
W.A. Horticulture & Environmental
Science Skills Center
156 Fitzroy Road
Riverdale, Perth, Western Australia,
Phone: +618-92298420
Fax: +618-93554783
forrej@bigpond.com
Session: S-3 and D-2

Mr. Scott Freeman

Senior Membrane Process Engineer
Black & Veatch
8400 Ward Parkway
Kansas City, MO 64114
Phone: (913) 458-3421
Fax: (913) 458-3802
freemansd@bv.com
Session: D-5

Dr. Taku Fuji

Senior Toxicologist/Sediment Quality
Specialist
Kennedy/Jenks Consultants
200 SW Market Street, Suite 500
Portland, OR 97201
Phone: (503) 295-4911
Fax: (503) 295-4901 (fax)
TakuFuji@KennedyJenks.com
Session: B-2

Dr. Rajagopalan Ganesh

Senior Associate Engineer
Kennedy/Jenks Consultants
2151 Michelson Drive, Suite 100
Irvine, CA 92612
Phone: (949) 261-1577
Fax: (949) 261-2134
rganesh@kennedyjenks.com
Session: D-3

Mr. Robert Grantham

Carollo Engineers
2700 Ygnacio Valley Road, Suite 300
Walnut Creek, CA 94598
Phone: (925) 932-1710
Fax: (925) 930-0208
rgrantham@carollo.com
Session: C-3

Mr. Max Grimes

Director of Technical Services
Regulatory Management, Inc.
6190 Lehman Drive, Suite 106
Colorado Springs, CO 80918
Phone: (719) 531-6883
Fax: (719) 599-4410
maxlab@pcsys.net
Session: C-2

Mr. Gary Grinnell

Senior Civil Engineer
Las Vegas Valley Water District
1001 South Valley View Boulevard
Las Vegas, NV 89153
Phone: (702) 258-3909
Fax: (702) 259-8299
gary.grinnell@llvwd.com
Session: S-3

Mr. Francisco Guerrero

Los Angeles County Sanitation Districts
1955 Workman Mill Road
Whittier, CA 90601
Phone: (562) 699-7411
Fax: (562) 908-4293
fguerrero@lacsds.org
Session: D-3

Mr. Steve Hoch

Attorney
Hatch & Parent
11911 San Vicente Boulevard, Suite 350
Los Angeles, CA 90049
Phone: (310) 500-4611
Fax: (310) 500-4602
shoch@hatchparent.com
Session: S-2

Mr. Gary Hunter

Process Engineer
Black & Veatch
8400 Ward Parkway
Kansas City, MO 64114
Phone: (913) 458-3602
Fax: (913) 458-3730
huntergl@bv.com
Session: C-2

Mr. John Jackson

County Extension Agent
University of Florida Cooperative Extension
Service
30205 State Road 19
Tavares, FL 32778
Phone: (352) 343-4101
Fax: (352) 343-2767
jjackson@ifas.ufl.edu
Session: D-3

Speakers (continued)

Mr. Yusef Jalali

Senior Engineer
Los Angeles County Sanitation Districts
1955 Workman Mill Road
Whittier, CA 90601
Phone: (562) 699-7411
Fax: (562) 908-4293
yjalahi@lacsds.com
Session: A-5

Mr. Terry Jennings

Doctoral Candidate
Colorado School of Mines
Environmental Science & Engineering
1500 Illinois Street
Golden, CO 80401
Phone: (303) 273-3871
Fax: (303) 273-3413
tjennin@mines.edu
Session: S-1

Mr. Van Jew

Senior Water Resources Engineer
West & Central Basin Municipal Water
Districts
17140 South Avalon Boulevard, Suite 210
Carson, CA 90746
Phone: (310) 660-6234
Fax: (310) 516-1576
vanj@wcbwater.org
Session: D-5

Mr. Michael Johnson

Engineering Manager
Black & Veatch
6300 South Syracuse Way, Suite 300
Centennial, CO 80111
Phone: (720) 834-4231
Fax: (720) 834-4285
johnsonms@bv.com
Session: B-3

Mr. Darko Joksimovic

Centre for Water Systems, Engineering
Department
University of Exeter
Harrison Building
Exeter, EX4 4QF, UK
Phone: +44-1392-263730
Fax: +44-1392-217965
d.joksimovic@exeter.ac.uk
Session: C-4

Mr. Brian Jordan

Engineering Manager
Black & Veatch
800 Wilshire Boulevard, Suite 600
Los Angeles, CA 90017
Phone: (213) 312-3334
Fax: (213) 312-3399
jordanbl@bv.com
Session: A-2

Dr. Mohammad Karim

Environmental Scientist
American Water
213 Carraige Lane
Delran, NJ 08075
Phone: (856) 764-4920
Fax: (856) 764-3246
mkarim@amwater.com
Session: S-3

Dr. Stuart Khan

School of Civil & Environmental
Engineering
University of New South Wales
NSW, 2052, Australia
Phone: +61 414398239
s.khan@unsw.edu.au
Session: C-4

Mr. John Kmiec

Reclaimed Water Supervisor
Tucson Water
PO Box 27210
Tucson, AZ 85726
Phone: (520) 791-5080 ext. 1399
Fax: (520) 791-3293
john.kmiec@tucsonaz.gov
Session: C-3 and C-5

Ms. Melody LaBella

Assistant Engineer
Central Contra Costa Sanitary District
5019 Imhoff Place
Martinez, CA 94553
Phone: (925) 228-9500
Fax: (925) 228-4624
mlabella@centralsan.dst.ca.us
Session: D-4

Ms. Sarah Ladenburger

Richard P. Arber Associates
198 Union Boulevard, Suite 200
Lakewood, CO 80228
Phone: (303) 831-4700
Fax: (303) 831-0290
sladenburger@yahoo.com
Session: S-1

Mr. Bill Landin

Principal Engineer
MWH
1110 Elkton Drive, Suite B
Colorado Springs, CO 80907
Phone: (719) 278-1303
Fax: (719) 594-4516
bill.landin@mwhglobal.com
Session: A-1

Speakers (continued)

Mr. Joseph Leising

Hydrologist
Southern Nevada Water Authority
1900 East Flamingo Road, Suite 255
Las Vegas, NV 89149
Phone: (702) 822-3373
Fax: (702) 822-3311
leising@snwa.com
Session: S-1

Mr. Trevor Lindley

Project Engineer
Malcolm Pirnie
4646 East Van Buren Street, Suite 400
Phoenix, AZ 85008
Phone: (602) 797-4654
Fax: (602) 797-4654
tlindley@pirnie.com
Session: D-3

Mr. Wayne Lorenz

Project Manager
Wright Water Engineers
2490 West 26th Avenue, Suite 100A
Denver, CO 80211
Phone: (303) 480-1700
Fax: (303) 480-1020
wlorenz@wrightwater.com
Session: S-2

Mr. John Luna

Engineer
Carollo Engineers
380 Interlocken Crescent, Suite 780
Broomfield, CO 80021
Phone: (303) 635-1220
Fax: (303) 635-1373
jluna@carollo.com
Session: S-1

Ms. Linda Macpherson

Vice President
CH2M HILL
825 NE Multnomah Street
Portland, OR 97232
Phone: (503) 235-5022 x4404
Fax: (503) 736-2062
lmacpher@ch2m.com
Session: S-4

Mr. Jim Madole

Regional Account Manager
Nalco Company
615 North Upper Broadway, Suite 818
Corpus Christi, TX 78477
Phone: (903) 814-1528
Fax: (361) 881-9942
jwmadole@nalco.com
Session: A-4

Mr. Mark McNeal

Director, Groundwater Practices
CH2M HILL
4350 West Cypress Street, Suite 600
Tampa, FL 33607
Phone: 813-874-0777
Fax: 813-874-3056
mmcneal@ch2m.com
Session: A-4

Mr. Yi Meng

Illinois Institute of Technology
3139 South Normal Avenue
Chicago, IL 60616
Phone: (773) 396-2234
Fax: (312) 567-8874
mengyi@iit.edu
Session: S-2

Mr. Michael Mikeska

Manager, Central Wastewater Treatment
Dallas Water Utilities
1020 Sargent Road
Dallas, TX 75203
Phone: (214) 670-7406
Fax: (214) 670-4115
michael.mikeska@dallascityhall.com
Session: S-2

Mr. Mark Millan

Principal
Data Instincts
239 Windsor River Road, Suite 100
Windsor, CA 95492
Phone: (707) 836-0300
Fax: (707) 836-0842
millan@datainstincts.com
Session: S-4

Mr. Woodie Muirhead

Vice President
Brown and Caldwell
119 Merchant Street, Suite 200
Honolulu, HI 96813
Phone: (808) 523-8499
Fax: (808) 533-0226
wmuirhead@brwnccald.com
Session: B-2

Mr. Hoover Ng

Water Quality Program Manager
Water Replenishment District of Southern
California
12621 East 166th Street
Cerritos, CA 90703
Phone: (562) 407-1905
hng@wrdd.org
Session: C-2

Speakers (continued)

Dr. Daniel Okun

Keenan Professor, Emeritus
University of North Carolina at Chapel Hill
750 Weaver Dairy Road #204
Chapel Hill, NC 27514
Phone: (919) 918-3500
Fax: (919) 918-2649
dokun@unc.edu
Session: S-2

Ms. Joan Oppenheimer

Principal Scientist
MWH
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Phone: (626) 568-6006
Fax: (626) 568-6015
joan.oppenheimer@mwhglobal.com
Session: A-1

Mr. John Pasch

Project Manager
CDM
No. 6 Ahmed Zaki Street
Shmaisani, Amman, Jordan
Phone: 96265651913
Fax: 96265651902
paschjr@cdm.com
Session: C-4

Ms. Laurel Passantino

Project Engineer
Malcolm Pirnie
4646 East Van Buren Street, Suite 400
Phoenix, AZ 85008
Phone: (602) 797-4644
Fax: (602) 231-0131
lpassantino@pirnie.com
Session: B-1

Mr. James Peterson

Wastewater Process Engineer
Zenon Environmental
3239 Dundas Street West
Oakville, Ontario, Canada
Phone: (905) 465-3030 x3416
Fax: (905) 465-3050
jpeterso@zenon.com
Session: A-1

Mr. Jean-Marc Petit

Project Manager
Carollo Engineers
380 Interlocken Crescent, Suite 780
Broomfield, CO 80021
Phone: 303-635-1220
Fax: 303-635-1373
jmpetit@carollo.com
Session: A-5

Mr. John Powers

Senior Hydrogeologist
CH2M HILL
4350 West Cypress Street, Suite 600
Tampa, FL 33607
Phone: (813) 874-0777
Fax: (813) 874-3056
jpowers@ch2m.com
Session: C-5

Dr. Tanja Rauch

Carollo Engineers
380 Interlocken Crescent, Suite 780
Broomfield, CO 80021
Phone: (303) 635-1220
Fax: (303) 635-1373
trauch@carollo.com
Session: B-4

Dr. Robert Raucher

Executive Vice President
Stratus Consulting
PO Box 4059
Boulder, CO 80306
Phone: (303) 381-8000 ext. 316
Fax: (303) 381-8200
braucher@stratusconsulting.com
Session: C-3

Mr. Craig Riley

Water Reclamation & Reuse Program
Washington State Department of Health
1500 West Fourth Avenue, Suite 305
Spokane, WA 99207
Phone: (509) 456-2466
Fax: (509) 456-2997
craig.riley@doh.wa.gov
Session: B-3

Mr. Richard Riley

Facilities Staff Engineer
Arizona Corporate Services
4500 South Dobson Road
MS OC4-009
Chandler, AZ 85248
Phone: (480) 715-1471
rich.riley@intel.com
Session: B-5

Mr. Alan Rimer

Global Practice Leader - Water Reuse
Black & Veatch
11000 Regency Parkway, Suite 100
Cary, NC 27511
Phone: (919) 462-7506
Fax: (919) 462-8356
rimerae@bv.com
Session: C-4

Speakers (continued)

Mr. Jerry Rivers

Chemist
Wastewater Solutions, Inc.
PO Box 12529
Bakersfield, CA 93389
Phone: (661) 327-4616
Fax: (661) 327-4668
rivers_j_l@sbcglobal.net
Session: S-1

Ms. Lesley Robin

Associate
Katz & Associates
4250 Executive Square, Suite 670
San Diego, CA 92037
Phone: (619) 533-6606
Fax: (619) 533-5278
lrobin@sandiego.gov
Session: S-4

Mr. Dan Rodrigo

Principal Management Consultant
CDM
555 West 5th Street, Suite 3100
Los Angeles, CA 90013
Phone: (213) 996-8482
Fax: (213) 996-8481
rodrigod@cdm.com
Session: B-1

Dr. Abbas Rostim

Instructor
University of Dohuk
College of Engineering
Dohuk, Iraq
Phone: 0750-4621574
abbas_456@yahoo.com
Session: C-4

Mr. Don Safrit

Senior Project Manager
HDR Engineering
9970-14 Beach Drive
Calabash, NC 28467
Phone: (910) 575-5880
Fax: (910) 575-5882
don.safrit@hdrinc.com
Session: C-1

Mr. Andrew Salvesson

Project Manager
Carollo Engineers
2700 Ygnacio Valley Road, Suite 300
Walnut Creek, CA 94598
Phone: (925) 932-1710
Fax: (925) 930-0208
asalvesson@carollo.com
Session: A-5

Mr. Roger Schenk, Jr.

Principal Scientist
CDM
12357-A Riata Trace Parkway, Suite 210
Austin, TX 78746
Phone: (512) 346-1100
Fax: (512) 345-1483
schenkre@cdm.com
Session: B-1

Mr. Larry Schimmoller

Senior Project Manager
CH2M HILL
9193 South Jamaica Street
Englewood, CO 80112
Phone: (720) 286-5345
Fax: (720) 286-9844
lschimmo@ch2m.com
Session: D-5

Mr. Steven Schindler

General Manager
Big Bear Area Regional Wastewater Agency
PO Box 517
Big Bear City, CA 92314
Phone: (909) 584-4018
Fax: (909) 585-4340
gm@bbarwa.org
Session: S-4

Mr. Paul Shoenberger

Chief of Engineering and Operations
West Basin Municipal Water District
17140 South Avalon, Suite 210
Carson, CA 90746
Phone: (310) 660-6219
Fax: (310) 516-1577
pauls@wcbwater.org
Session: D-2

Mr. David Sloan

Senior Environmental Engineer
Freese & Nichols
4055 International Plaza, Suite 200
Fort Worth, TX 76109
Phone: (817) 735-7277
Fax: (817) 735-7492
dws@freese.com
Session: B-4

Dr. Shane Snyder

R&D Project Manager
Southern Nevada Water Authority
1350 Richard Bunker Avenue
Henderson, NV 89015
Phone: (702) 856-3668
Fax: (702) 856-3647
shane.snyder@snwa.com
Session: S-1

Speakers (continued)

Ms. Marsi Steirer

Water Department Deputy Director
City of San Diego
600 B Street, Suite 700, MS 700
San Diego, CA 92101
Phone: (619) 533-4112
Fax: (619) 533-5278
msteirer@sandiego.gov
Session: B-2

Mr. Wes Strickland

Attorney
Hatch & Parent
21 East Carrillo Street
Santa Barbara, CA 93105
Phone: (805) 963-7000
Fax: (805) 965-4333
wstrickland@hatchparent.com
Session: A-2

Ms. Patricia Tennyson

Senior Vice President
Katz & Associates
4250 Executive Square, Suite 670
San Diego, CA 92037
Phone: (858) 452-0031
Fax: (858) 552-8437
ptennyson@katzandassociates.com
Session: S-4

Mr. Joseph Towry

Assistant Director, Water Resources
City of St. Petersburg
1635 Third Avenue North
St. Petersburg, FL 33713
Phone: (727) 892-5095
Fax: (727) 823-9152
joseph.towry@stpete.org
Session: B-3

Mr. Ryujiro Tsuchihashi

Technical Specialist
Metcalf & Eddy
719 Second Street, Suite 11
Davis, CA 95616
Phone: (530) 792-8294
Fax: (530) 792-8294
ryujiro.tsuchihashi@m-e.aecom.com
Session: C-2

Mr. Frank Turek

Senior Project Manager
PBS&J
7310 North 16th Street, Suite 310
Phoenix, AZ 85020
Phone: (602) 943-1003 ext. 110
Fax: (602) 943-1303
fturek@pbsj.com
Session: B-4

Ms. Marie Valmores

Associate Civil Engineer
Contra Costa Water District
2411 Bisso Lane
PO Box H20
Concord, CA 94524
Phone: (925) 688-8132
Fax: (925) 688-8142
mvalmores@ccwater.com
Session: A-4

Mr. Nikolay Voutchkov

Senior Vice President - Technical Services
Poseidon Resources Corporation
1055 Washington Boulevard
Stamford, CT 06901
Phone: (203) 327-7740
Fax: (203) 327-5563
nvoutchkov@poseidon1.com
Session: A-4

Mr. Wayne West

Program Manager
Pinellas County Utilities
14 South Fort Harrison, 3rd Floor
Clearwater, FL 33756
Phone: (727) 464-3677
Fax: (727) 464-3817
wwest@co.pinellas.fl.us
Session: D-2

Dr. Thomas Wintgens

Department of Chemical Engineering
RWTH Aachen University
Turmstrasse 46
Aachen, Germany 52056
Phone: 49-241-8096233
Fax: 49-241-8092252
wintgens@ivt.rwth-aachen.de
Session: C-1

Mr. Gideon Winward

Cranfield University
School of Water Sciences, Building 39
Bedfordshire, MK43 OAL
Phone: 01234750111 ext. 3335
g.p.winward@cranfield.ac.uk
Session: C-4

Mr. Joseph Wong

Technical Director
Parsons
2121 North California Boulevard, Suite 500
Walnut Creek, CA 94596
Phone: (925) 941-3735
joe.wong@parsons.com
Session: B-5

Speakers (continued)

Mr. Ray Wong

Associate Engineer
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118
Phone: (408) 265-2600
Fax: (408) 979-5639
rwong@valleywater.org
Session: C-2

Mr. Dennis Wood

Partner
Carollo Engineers
5575 Ruffin Road, Suite 200
San Diego, CA 92123
Phone: (858) 505-1020
dwood@carollo.com
Session: B-1

Dr. Pei Xu

Research Assistant Professor
Environmental Science & Engineering
Division
Colorado School of Mines
1500 Illinois Street
Golden, CO 80401
Phone: (303) 273-3932
Fax: (303) 273-3413
pxu@mines.edu
Session: A-2

Mr. Michael Zavoda

Senior Project Engineer
American Water - Applied Water
Management Group
2 Clerico Lane, Suite 1
Hillsborough, NJ 08844
Phone: (908) 431-7021
mike.zavoda@amwater.com
Session: S-3

Exhibitors

Alan Plummer Associates, Inc.

Julie Lippe
Business Development Coordinator
7524 Mosier View Court, Suite 200
Fort Worth, TX 76018
Phone: (817) 806-1700
jlippe@apaienv.com
Booth Number: B2

Applied Process Technology, Inc.

Ray Milne
Director, Industrial Remediation
Business
3333 Vincent Road, Suite 222
Pleasant Hill, CA 94523
Phone: (925) 977-1811
lmaxwell@aptwater.com
Booth Number: T8

Aqua-Aerobic Systems, Inc.

Cheryl Kunz
Advertising & PR Manager
6306 North Alpine Road
Rockford, IL 61111
Phone: (815) 654-2501
ckunz@aqua-aerobic.com
Booth Numbers: B6 & B7

Aquionics Inc.

Patrick Bollman
Municipal Applications Manager
21 Kenton Lands Road
Erlanger, KY 41018
Phone: (859) 341-0710
patrickb@aquionics.com
Booth Number: T9

Ashbrook Simon-Hartley

Carl Boyd
11600 East Hardy
Houston, TX 77093
Phone: (281) 449-0322
cboyd@ashbrookcorp.com
Booth Number: B1

AWWA

Isaac Valdez
6666 West Quincy Avenue
Dever, CO 80235
Phone: (303) 734-3442
ivaldez@awwa.org
Booth Number: B19

Carollo Engineers

Tracy Clinton
Senior Project Manager
2700 Ygnacio Valley Road, Suite 300
Walnut Creek, CA 94598
Phone: (925) 932-1710
tclinton@carollo.com
Booth Number: T4

CDM

John Rehring
Associate
1331 17th Street, Suite 1200
Denver, CO 80202
Phone: (303) 298-1311
rehringjp@cdm.com
Booth Number: T13

Cerlic Environmental Controls, Inc.

Jim Radney
President
PO Box 420097
Atlanta, GA 30342
Phone: (404) 256-3097
jradney@cerlicusa.com
Booth Number: T5

Columbia Analytical Services, Inc.

Howard Boorse
Senior Chemist
1317 South 13th Avenue
Kelso, WA 98626
Phone: (360) 577-7222
hboorse@kelso-caslab.com
Booth Number: B9

Denver Water

Stacey Renouf
Community Affairs Specialist
1600 West 12th Avenue
Denver, CO 80204
Phone: (303) 628-6553
stacey.renaf@denverwater.org
Booth Number: B8

Enviroquip, Inc.

Ian Page
National Applications Manager,
Membranes
2404 Rutland Drive, Suite 200
Austin, TX 78758
Phone: (512) 834-6034
ian.page@enviroquip.com
Booth Number: B3

Hydranautics

Lisa Galloway
Marketing Coordinator
401 Jones Road
Oceanside, CT 92054
Phone: (760) 901-2677
lgalloway@hydranautics.com
Booth Number: T6

Koch Membrane Systems

Merrilee Galloway
Commercial Manager
850 Main Street
Wilmington, MA 01887
Phone: (978) 694-7000
mgalloway@kochmembrane.com
Booth Number: B12

Exhibitors (continued)

MEP Enviro Systems, Inc.

Karen Steele
Vice President, Marketing
3874 Fiscal Court, Suite 200
West Palm Beach, FL 33404
Phone: (561) 842-9900
karen@mepi.net
Booth Number: B16

Parkson Corporation

Chuck Morgan
Business Manager, Membrane Bioreactor
2727 NW 62nd Street
Fort Lauderdale, FL 33309
Phone: (954) 974-6610
cmorgan@parkson.com
Booth Number: B20

Pinellas County Utilities

David Baker
Manager, Conservation Resources
14 South Fort Harrison Avenue
Clearwater, FL 33756
Phone: (727) 464-3896
dbaker@pinellascounty.org
Booth Number: B5

Sanitaire/ITT Industries

John Koch
Product Manager -MBR
9333 North 49th Street
Brown Deer, WI 53223
Phone: (414) 365-5981
john.koch@itt.com
Booth Number: B14

Severn Trent Services

Mark Donovan
Sales Engineer
2660 Columbia Street
Torrance, CA 90503
Phone: (310) 618-9700
mdonovan@severntrentservices.com
Booth Number: B18

Solar Bee - Pump Systems Inc.

Harvey Hibe
Regional Manager
11853 Pecos Street
Westminster, CO 80234
Phone: (303) 469-4001
harvey@solarbee.com
Booth Number: T7

Trojan Technologies

Adam Festger
Marketing and Communications
3020 Gore Road
London, Ontario N5V 4T7 Canada
Phone: (519) 457-3400
afestger@trojanuv.com
Booth Number: B17

USFilter

Marietta Martire
Tradeshaw Manager
1681 Strasbourg Way
Henderson, NV 89014
Phone: (902) 454-3794
marietta.martire@usfilter.com
Booth Numbers: B10 & B11

Wastewater Solutions, Inc.

Randal Cecala
President
PO Box 12529
Bakersfield, CA 93389
Phone: (800) 615-5575
randc@wastewatersolutionsinc.com
Booth Number: B4

WaterReuse Association

Zachary Dorsey
Publications and Communications Manager
635 Slaters Lane, 3rd Floor
Alexandria, VA 22314
Phone: (703) 684-2409
zdorsey@waterreuse.org
Booth Number: T14

WEDECO/ITT Industries

Wesley Lobo
Sales Manager Municipal Ozone Solutions
14125 South Bridge Circle
Charlotte, NC 28273
Phone: (201) 760-7529
wesley.lobo@itt.com
Booth Number: B15

WEF

Julie Ghent
Marketing Coordinator
601 Wythe Street
Alexandria, VA 22314
Phone: (703) 684-2400
jghent@wef.org
Booth Number: B21

Western Summit Constructors, Inc.

Carey Pester
Business Development Director
5470 Valley Highway
Denver, CO 80216
Phone: (303) 298-9500
cpester@westernsummit.com
Booth Number: B13

Symposium Overview

| Sunday, September 18, 2005 | | Room |
|------------------------------------|--|-------------------|
| 9:00 am – 7:00 pm | Registration | Maroon Peak |
| 11:00 am – 4:00 pm | Exhibitor Set-up | |
| 1:00 pm – 4:30 pm | Four Concurrent Technical Sessions | |
| | • Micropollutants | Imperial Ballroom |
| | • Planning Opportunities, Innovation, & Liabilities | Grand Ballroom |
| | • Urban Reuse | Mount Elbert |
| | • Public Information | Mount Sopris |
| 5:00 pm – 7:00 pm | Meet and Greet Exhibitors Welcome Reception | |
| Monday, September 19, 2005 | | |
| 7:00 am – 5:00 pm | Registration | Maroon Peak |
| 7:00 am – 8:00 am | Continental Breakfast (in Exhibit area) | |
| 7:00 am – 5:00 pm | Exhibition | |
| 8:00 am – 9:30 am | Opening Session | Imperial Ballroom |
| 9:30 am – 10:00 am | Break (in Exhibit area) | |
| 10:00 am – Noon | Four Concurrent Technical Sessions | |
| | • Membrane Bioreactors for Water Reuse | Grand Ballroom |
| | • Planning Issues | Mount Sopris |
| | • Regulatory and Legislative Issues | Mount Elbert |
| | • Environmental Reuse | Mount Evans |
| Noon – 1:30 pm | Awards Luncheon | Imperial Ballroom |
| 1:30 pm – 5:00 pm | Four Concurrent Technical Sessions | |
| | • Desalination | Grand Ballroom |
| | • Planning – From Drought to Monsoons | Mount Sopris |
| | • Water Quality Issues | Mount Elbert |
| | • Innovative uses of Reclaimed Water | Mount Evans |
| 3:00 pm – 3:30 pm | Break (in Exhibit area) | |
| 5:30 pm – 7:30 pm | President's Reception at the Colorado History Museum | |
| Tuesday, September 20, 2005 | | |
| 7:00 am – 5:00 pm | Registration | Maroon Peak |
| 7:00 am – 8:00 am | Continental Breakfast (in Exhibit area) | |
| 7:00 am – 5:00 pm | Exhibition | |
| 8:00 am – 9:30 am | Legislative Outlook Session | Imperial Ballroom |
| 8:00 am – Noon | Technical Tour | |
| 9:30 am – 10:00 am | Break (in Exhibit area) | |

Symposium Overview (continued)

| Tuesday, September 20, 2005 (continued) | | Room |
|--|---|-------------------|
| 10:00 am – Noon | Four Concurrent Technical Sessions <ul style="list-style-type: none"> • Advance Treatment Technologies for Water Reuse | Grand Ballroom |
| | <ul style="list-style-type: none"> • Distribution Systems | Mount Sopris |
| | <ul style="list-style-type: none"> • Finance and Economic Issues | Mount Elbert |
| | <ul style="list-style-type: none"> • Agricultural Reuse | Mount Evans |
| Noon – 1:30 pm | Lunch on your own | |
| 1:00 pm – 5:00 pm | Technical Tour | |
| 1:30 pm – 5:00 pm | Three Concurrent Technical Sessions <ul style="list-style-type: none"> • Desalination – Concentrate Issues | Grand Ballroom |
| | <ul style="list-style-type: none"> • Indirect Potable Reuse | Mount Sopris |
| | <ul style="list-style-type: none"> • Global Water Reuse | Mount Elbert |
| 1:30 pm – 3:00 pm | Regulatory Forum | Mount Evans |
| 3:00 pm – 3:30 pm | Break (in Exhibit area) | |
| 3:30 pm – 6:00 pm | User Issues Forum | Mount Evans |
| Wednesday, September 21, 2005 | | |
| 7:30 am – 11:00 am | Registration | Maroon Peak |
| 7:30 am – 8:30 am | Continental Breakfast (in Exhibit area) | |
| 7:30 – Noon | Exhibition | |
| 8:30 am – 10:00 am | Four Concurrent Technical Sessions <ul style="list-style-type: none"> • Disinfection | Grand Ballroom |
| | <ul style="list-style-type: none"> • Industrial Reuse | Mount Sopris |
| | <ul style="list-style-type: none"> • Storage Issues | Mount Elbert |
| | <ul style="list-style-type: none"> • Operational Issues | Mount Evans |
| 10:00 am - 10:30 am | Break (in Exhibit area) | |
| 10:30 am - Noon | Panel Discussion: Is Reclaimed Water Safe? | Imperial Ballroom |
| Noon - 12:15 pm | President's Closing | |

Sunday, September 18, 2005

Registration

| 9:00 am -7:00 pm | Registration | | | |
|---------------------|---|---|---|---|
| | Session S-1 Micropollutants Moderator: Don Vandertulip | Session S-2 Planning – Opportu- nities, Innovation, & Liabilities Moderator: Christine Close | Session S-3 Urban Reuse Moderator: Andy Terrey | Session S-4 Public Information Moderator: Linda Macpherson |
| Room | Imperial Ballroom | Grand Ballroom | Mount Elbert | Mount Sopris |
| 1:00 -1:30 pm | The Implication of Emerging Contaminants in the Future of Water Reuse Kathleen Esposito (Metcalf & Eddy) | Dual Systems to Conserve Water While Improving Drinking Water Daniel A. Okun (University of North Carolina, Chapel Hill) | AWWA Golf Course Reclaimed Water Marketing Survey Results Gary Grinnell (Las Vegas Valley Water District) | Combining Technology and Public Understanding at Marin's Desal Pilot Plant Linda Macpherson (CH2M HILL) |
| 1:30 -2:00 pm | Endocrine Disrupting Activity Changes in Water Reclamation Systems Sarah Ladenburger (Richard P. Arber Associates) | Benefits of a Dual Pipeline System in a Water-Short Basin Wayne F. Lorenz, P.E. (Wright Water Engineers, Inc.) | Assessing the Impact of Transitioning to Reuse Water on Golf Courses in Southern Nevada Dale Devitt (University of Nevada at Las Vegas) | The WaterReuse Foundation's New On-Line Water Reuse Facility Database Jack Bryck (Malcolm Pirnie) |
| 2:00 -2:30 pm | Biological and Physical Attenuation of Endocrine Disruptors and Pharmaceuticals: Implications for Water Reuse Joseph Leising (Southern Nevada Water Authority) | Assessing Opportunities for Municipal Wastewater Reuse in the Metropolitan Chicago Area Yi Meng (Illinois Institute of Technology) | Improving Recycled Water Quality for Urban Reuse – A Case Study at Three Premier Golf Courses Jerry Rivers (Wastewater Solutions, Inc.) | Bridging the Demographic Divide: Study Shows Hispanic and African American Communities Most Likely to Oppose Water Reuse Patricia Tennyson (Katz & Associates) |
| 2:30 -3:00 pm | Networking Break | | | |
| 3:00 -3:30 pm | Toxicological Significance of Trace Endocrine Disruptors and Pharmaceuticals in Water Shane Snyder (Southern Nevada Water Authority) | Water Reuse Liability Concerns Steven L. Hoch (Hatch & Parent) | Monitoring Irrigation on Sandy Soils with Treated Effluent Water in Western Australia John Forrest (W.A. Horticulture & Environmental Science Skills Centre) | Let's Talk About it: How to Implement a Successful Speakers Bureau as Part of a Focused Public Outreach Effort Lesley Robin (Katz & Associates) |
| 3:30 -4:00 pm | Contributions of Household Chemicals to Sewage and their Relevance to Municipal Wastewater Systems and the Environment Terry Jennings (Colorado School of Mines) | City of Dallas Recycled Water Implementation Plan: A Creative Alternative to Traditional Raw Water Sources Michael L. Mikeska (Dallas Water Utilities) | The Solaire, A High Rise Residential Reuse Case Study Michael Zavoda (American Water – Applied Water Management Group) | Shout it From the Mountains: Maximizing Recycled Water's Potential in Big Bear Steven Schindler (Big Bear Area Regional Wastewater Agency) |
| 4:00 -4:30 pm | Selection of Indicator Compounds for Monitoring Wastewater-Derived Chemical Contaminants in Indirect Potable Reuse John Luna (Carollo Engineers) | Reuse Opportunities and Constraints: Colorado's Statewide Perspective Kelly DiNatale (CDM) | Microbial Quality of Urban Reuse Water Mohammad Karim (American Water) | Like Desperate Housewives... When Miss Information and Ms Nomer Get Together, Perception Often Becomes Reality Mark Millan (Data Instincts) |
| 5:00 -7:00 pm | Meet and Greet Exhibitors Welcome Reception - Exhibit Area | | | |

Monday, September 19, 2005 - Morning Sessions

| | | | | |
|---------------------|---|---|---|--|
| 7:00 am -5:00 pm | Registration | | | |
| 7:00 -8:00 am | Continental Breakfast | | | |
| 8:00 -9:30 am | Opening Session | | | |
| | <p>The Opening Session will feature Michael Gabaldon, Director, Policy Management and Technical Resources , USBR, Denver Mayor John Hickenlooper, WEF President Elect J. Michael Read, AWWA President Andy Richardson, and WateReuse Association President Mike Gritzuk.</p> <p>Room: Imperial Ballroom</p> | | | |
| 9:30 -10:00 am | Networking Break | | | |
| | Session A-1 Membrane Bioreactors for Water Reuse Moderator: Samer Adham | Session B-1 Planning Issues Moderator: Rich Nagel | Session C-1 Regulatory and Legislative Issues Moderator: Bill Jacoby | Session D-1 Environmental Reuse Moderator: Tracy Clinton |
| Room | Grand Ballroom | Mount Sopris | Mount Elbert | Mount Evans |
| 10:00 -10:30 am | Advanced Treatment Technologies for Indirect Potable Reuse and Industrial Reclaimed Water Applications Bill Landin (MWH) | Unconventional Sources of Water in Integrated Resource Planning Dan Rodrigo (CDM) | Groundwater Impact Assessments of Reclaimed Water Use in Western Washington State Katharine Cupps (Washington Department of Ecology) | Membrane Processes in Life Support Systems for Long-Term Manned Space Missions Heleen De Wever (VITO) |
| 10:30 -11:00 am | Reuse of High Strength Industrial Wastewater to Meet Zero Discharge Goal Miroslav Colic (Clean Water Technology) | Water Recycling in an Established Water Purveying Agency – What’s the Deal Dennis Wood (Carollo Engineers) | Political and Legislative Framework Conditions for Wastewater Reuse in Europe Thomas Wintgens (RWTH Aachen University) | Final Results – Edwards Aquifer Recharge Zone Irrigation Pilot Study Ken Diehl (San Antonio Water System) |
| 11:00 -11:30 am | Integrated MBR/RO for Removal of EDCs, Pharmaceuticals, and PPCPs in Water Reuse Applications Joan Oppenheimer (MWH) | Embracing Uncertainty in Re-Use Planning Laurel Passantino (Malcolm Pirnie, Inc.) | Water, Water, Everywhere But Not a Place to Discharge It! Don Safrit (HDR Engineering) | Water Supply Supplement for a Recreational Lake Larry Esvelt (Esvelt Environmental Engineering) |
| 11:30 am -Noon | Design and Supply of a Turnkey MBR for Reuse Water Production James Peterson (Zenon) | Georgetown, Texas Irrigation System Master Plan and Reclaimed Water Program Roger Schenk, Jr. (CDM) | Policy and Science of Micro-Pollutants in Drinking Water, Reuse, and Waste Waters William Bellamy (CH2M HILL) | Constructed Wetlands: Treatment or Reuse? Alice Brawley-Chesworth (City of Phoenix Water Services Department) |
| Noon -1:30 pm | Awards Luncheon & Annual Membership Meeting | | | |
| | Room: Imperial Ballroom | | | |

Monday, September 19, 2005 - Afternoon Sessions

| | Session A-2 Desalination Moderator: Darryl Miller | Session B-2 Planning – From Drought to Monsoons Moderator: Bahman Sheikh | Session C-2 Water Quality Issues Moderator: Elson Gushiken | Session D-2 Innovative Uses of Reclaimed Water Moderator: Paul Kinshella |
|--------------------------|--|--|---|---|
| Room | Grand Ballroom | Mount Sopris | Mount Elbert | Mount Evans |
| 1:30 -2:00 pm | Desalination: Pushing the Limits David Curry (Black & Veatch) | City of San Diego Water Reuse Study Marsi A. Steirer (City of San Diego) | Cryptosporidium in Wastewater: Occurrence, Removal and Inactivation Jennifer Clancy (Clancy Environmental Consultants, Inc.) | Orange County's Reclamation and Reuse System Al Castro (Orange County Utilities) |
| 2:00 -2:30 pm | Factors Driving the Increasingly Favorable Economics of Seawater Desalination in America Brent Alspach (Malcolm Pirnie) | Planning for Growth and Salinity at a Small Water Reclamation Plant Henry Day (City of Phoenix) and Victoria Allies (TNT Technology Company) | The Parker Water and Sanitation District Virus Study - 2000 Max Grimes (Regulatory Management, Inc.) | Payson City Utah Sustainable Wastewater Reuse Applications Brent Arns (Aqua Engineering) |
| 2:30 -3:00 pm | Tampa Bay Water Seawater Desalination Project Neil Callahan (R.W. Beck) | Reclamation Where it Rains Cats and Dogs - Incentives for Reclaimed Water Master Planning in the Tualatin River Basin Tracy Clinton (Carollo Engineers) | Water Quality Impacts of Percolating Recycled Water Hoover Ng (Water Replenishment District of Southern California) | Celebrating a Decade of Excellence in Recycled Water - 10th Anniversary of the West Basin Water Recycling Program Paul Shoemaker (West Basin Municipal Water District) |
| 3:00 -3:30 pm | Networking Break | | | |
| 3:30 -4:00 pm | Viability of Capacitive Deionization Technology (CDT) in Water Reuse and Desalination Pei Xu (Colorado School of Mines) | Water Reuse and Groundwater Protection in Central Oahu Woodie Mark Muirhead (Brown and Caldwell) | Case Study – Lowering Recycled Water TDS by Replacing Old Water Softeners with Demand Initiated Regenerated Water Softeners Ray Wong (Santa Clara Valley Water District) | Houston Ship Channel Wastewater Reclamation and Reuse Feasibility Study Jerry Allen (Kellogg Brown & Root) |
| 4:00 -4:30 pm | Surf's Up Dude! Learning from the New Wave of Desalination Plants on the West Coast Brian Jordon (Black & Veatch) | Using Risk Assessment to Support Water Reuse Decisions Taku Fuji (Kennedy/Jenks Consultants) | Approaches to Salinity Issues in Reclaimed Water Irrigation Ryujiro Tsuchihashi (Metcalf & Eddy) | Innovative Approaches and Sustainable Efficiencies for Cooling Towers Using Reclaimed Water Wayne West (Pinellas County Utilities) |
| 4:30 -5:00 pm | Who Owns the Ocean? Property Rules and Use of Oceanwater Resources for Desalination Wes Strickland (Hatch & Parent) | Colorado Springs' Nonpotable Water Strategy Cortney Brand (Colorado Springs Utilities) | Membrane Residuals Will Impact Wastewater Treatment Facilities and Effluent Quality Gary Hunter (Black & Veatch) | The Effectiveness of Sub-Surface Dripline Tubing Irrigation for Application of Treated Wastewater to Turf in Western Australia John Forrest |
| 5:30 -7:30 pm | President's Reception at the Colorado History Museum Directions to the museum are on page 6 of this program | | | |

Tuesday, September 20, 2005 - Morning Sessions

| | | | | |
|---------------------|---|---|---|--|
| 7:00 am -5:00 pm | Registration | | | |
| 7:00 -8:00 am | Continental Breakfast | | | |
| 8:00 -9:30 am | National Legislative Outlook Session | | | |
| | <p>Richard Atwater, Chair of WaterReuse's National Legislative Committee, will moderate this session. The session will feature presentations on the outlook and prospects for future water legislation. Featured speakers include Colorado Supreme Court Justice Gregory Hobbs and Dave Akers of the Colorado Department of Public Health and the Environment, Erik Webb of Senator Pete Domenici's Office, and Eric Sapirstein, the WaterReuse Association's national lobbyist.</p> <p>Room: Imperial Ballroom</p> | | | |
| 9:30 -10:00 am | Networking Break | | | |
| | Session A-3 Advanced Treatment Technologies for Water Reuse Moderator: Craig Lichty | Session B-3 Distribution Systems Moderator: Ken Thompson | Session C-3 Finance and Economic Issues Moderator: Pick Talley | Session D-3 Agricultural Reuse Moderator: Keith Israel |
| Room | Grand Ballroom | Mount Sopris | Mount Elbert | Mount Evans |
| 10:00 -10:30 am | Laboratory and Pilot-Scale Investigation into the Viability of Ultra Low Pressure Reverse Osmosis and Nanofiltration for Treating Waters of Impaired Quality during Water Reuse Projects Christopher Bellona (Colorado School of Mines) | Reclaimed Water Distribution System Maintenance Uzi Daniel (West and Central Basin Municipal Water Districts) | Reclaimed Water Rates Help Achieve Water Supply and Conservation Goals John Kmiec (Tucson Water) | Nitrogen Management Via Agricultural Reuse of Secondary Effluent in Palmdale, California Francisco Guerrero (Los Angeles County Sanitation Districts) |
| 10:30 -11:00 am | Rejection of Wastewater-Derived Micropollutants in High-Pressure Membrane Applications Leading to Indirect Potable Reuse Jörg Drewes (Colorado School of Mines) | Up and Down the Reclaimed Water Hill - Innovative Use of Existing Infrastructure in Henderson, NV Michael Johnson (Black & Veatch) | Reclaimed Water Metered Pricing and its Effect Upon Water and Sewer Rates Michael Burton (Burton & Associates) | Reliable Reclaimed Water End Use Planning in Metropolitan Phoenix, Arizona Trevor Lindley (Malcolm Pirnie) |
| 11:00 -11:30 am | Pilot Test Comparison of Five Different Membrane Bioreactors Roger Babcock, Jr. (University of Hawaii) | Reclaimed Water Pipeline Separation Guidance in Washington State Craig Riley (Washington State Department of Health) | An Economic Framework for Evaluating Water Reuse and Desal Projects: What are the Benefits and do they Exceed the Cost? Robert Raucher (Stratus Consulting Inc.) | Managing Water for Cold Protection Phil Cross (Woodard & Curran, Inc.) and John Jackson (University of Florida) |
| 11:30 am -Noon | Use of Granular Activated Carbon as a Treatment Technology for Implementing Indirect Potable Reuse Robert Angelotti (Upper Occoquan Sewage Authority) | Developing a Model Cross-Connection Program for a Dual Water System Joseph Towry (City of St. Petersburg) | Making Recycled Water Financially Feasible Robert Grantham (Carollo Engineers) | Evaluation of Beneficial Use of Oilfield Produced Water for Agricultural Irrigation in San Ardo, CA Rajagopalan Ganesh (Kennedy/Jenks Consultants) |
| Noon -1:30 pm | Lunch on your own | | | |

Tuesday, September 20, 2005 - Afternoon Sessions

| | Session A-4 Desalination – Concentrate Issues Moderator: John Morris | Session B-4 Indirect Potable Reuse Moderator: Tom Richardson | Session C-4 Global Water Reuse Moderator: Bob Matthews | Session D-4 Forums |
|----------------------|--|--|---|---|
| Room | Grand Ballroom | Mount Sopris | Mount Elbert | Mount Evans |
| 1:30 -2:00 pm | Alternatives for Ocean Discharge of Seawater Desalination Plant Concentrate Nikolay Voutchkov (Poseidon Resources Corporation) | Removal of Organic Micropollutants During Soil Infiltration Tanja Rauch (Colorado School of Mines) | Progress, Trends, Opportunities and Barriers to Water Reuse in Australia Stuart Khan (University of New South Wales) | Regulatory Forum Moderator: Jo Ann Jackson 1:30 - 3:00 pm This will be an open forum discussion of regulatory perspectives from across the nation. Invited state regulatory representatives will be available to assist in addressing discussion topics. Topics may include any issue ranging from building a state reuse program for those just entering the reuse arena to issues of concern for even established reuse programs, such as decentralization, pathogens, micropollutants, and other topics of interest to the audience. |
| 2:00 -2:30 pm | Converting Domestic Wastewater Injection Wells to Concentrate Disposal Wells While Increasing Beneficial Use of Reclaimed Water Through ASR Mark McNeal (CH2M HILL) | Indirect, Unintentional Potable Reuse: A Case Study of the Impact of Wastewater Effluent Organic Matter (EfOM) on a Drinking Water Source Gary Amy (UNESCO-IHE Institute for Water Education) | Disinfection Choices for Urban Grey Water Recycling Gideon Winward (Cranfield University) | |
| 2:30 -3:00 pm | Zero Liquid Discharge Technologies for Inland Desalination & Municipal Effluent Rick Bond (Black & Veatch) | Colorado's First Indirect Potable Reuse Project Rick Arber (Richard P. Arber Associates) | Water Reuse in Bangkok, Thailand—Retrofitting a 139-MGD POTW Alan Rimer (Black & Veatch) | |
| 3:00 -3:30 pm | Networking Break | | | |
| 3:30 -4:00 pm | A Regional Approach to Desalination Marie Valmores (Contra Costa Water District) | Agua Fria Linear Recharge Project, Phoenix, Arizona – Alternative Development and Environmental Impact Statement Frank Turek (PBS&J) | Building Sustainable Agricultural Wastewater Reuse in Jordan John Pasch (CDM International) | User Issues Forum Moderator: Bruce Lazenby 3:30 - 4:00 pm A Novel Use of Recycled Water: Kennel Wash-Down at a Regional Animal Shelter Don Berger (Central Contra Costa Sanitary District) 4:00 - 6:00 pm A round table discussion and brain storming session facilitated by Nicole Adams and Bruce Lazenby that includes panelists John Robinson (MWH Americas), Gary Grinnell (Las Vegas Valley Water District) and others. |
| 4:00 -4:30 pm | Concentrate Management Using Lime Softening and Vibratory Microfiltration Jim Madole (Nalco Company) | Concentrate Disposal for the Proposed Joint Desalination Facility, El Paso, Texas Joseph Chwirka (CDM) | Simulation Model for Integrated Planning of Water Reuse Schemes Darko Joksimovic (University of Exeter) | |
| 4:30 -5:00 pm | Development of Concentrate Management Guidelines for Water Reuse and Desalination Patrick Brady (Sandia National Laboratories) | Accelerating the Water Cycle David Sloan (Freese and Nichols, Inc.) | Planning for Water Reuse in Iraq Abbas Rostim (University of Dohuk) | |

Wednesday, September 21, 2005

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|----------------------|--|---|--|---|
| 7:00 am -11:00 pm | Registration | | | |
| 7:30 -8:30 am | Continental Breakfast | | | |
| | Session A-5 Disinfection Moderator: John Rehring | Session B-5 Industrial Reuse Moderator: Frank Johns | Session C-5 Storage Issues Moderator: Mark McNeal | Session D-5 Operational Issues Moderator: Ron Young |
| Room | Grand Ballroom | Mount Sopris | Mount Elbert | Mount Evans |
| 8:30 -9:00 am | Current Filtration and Disinfection Approaches at Large-Scale Wastewater Treatment Facilities for Water Reuse Jean-Marc Petit (Carollo Engineers) | From Seafood to Shrubbery Malcolm Castor (Southwest Florida Water Management District) | From Stormwater ASR To Stormwater ASTR, An Investigation Underway In South Australia Bruce Durham (VEOLIA Water) | Implementation of Biological Aerated Filters for the Denver Water Recycling Project Larry Schimmoller (CH2M HILL) |
| 9:00 -9:30 am | UV Disinfection of Tertiary Effluent and Effect on NDMA and Cyanide Yusef Jalali (Los Angeles County Sanitation Districts) | Testing of Membrane Technologies for Water Reuse in a Large Steel Plant Joseph Wong (Parsons) | Reclaimed Water ASR is a Key Component for Expansion of Reuse Systems in West-Central Florida John Powers (CH2M HILL) | Reducing and Minimizing Odor within the Recycled Water System Van M. Jew (West & Central Basin Municipal Water Districts) |
| 9:30 -10:00 am | Disinfection and Environmental Pollutants of Concern - A Comparison of Ozone, Chlorine, and Ultraviolet Light Andrew Salvesson (Carollo Engineers) | Wafer Conservation at Intel Corporation's Fab 22 Wafer Fabrication Facility Richard Riley (Arizona Corporate Services) | Sweetwater Recharge Facilities: Serving Tucson for 20 Years John Kmiec and Tim Thomure (Tucson Water) | Revisiting a Triple-Membrane Water Reclamation Plant Eight Years and Billions of Gallons After Start-up Scott Freeman (Black & Veatch) |
| 10:00 -10:30 am | Networking Break | | | |
| 10:30 am -Noon | Panel Discussion: Is Reclaimed Water Safe? | | | |
| | Moderated by noted water reuse expert Dr. James Crook, this final session promises to be lively, provocative, and insightful. Panelists will include Dr. Joseph Cotruvo of Joseph Cotruvo & Associates, LLC, Mr. Robert Hultquist of the California Department of Health Services, Dr. Stuart Khan of the University of New South Wales in Australia, and Dr. Thomas Wintgens from Aachen University in Germany. The discussion will focus, as the title suggests, on the safety of reclaimed water for a variety of applications. Panelists will examine the track record of reclaimed water for applications ranging from landscape irrigation to irrigation of edible crops, and indirect potable reuse. Room: Imperial Ballroom | | | |
| Noon -12:15 pm | President's Closing | | | |

Tour schedule:
Tuesday, September 20, 2005
8:00 am to noon or 1:00 pm to 5:00 pm

See Mile High Reuse in Action!

Come see new treatment technologies, advances in irrigation control, and industrial water use in action! This is an excellent opportunity to network and learn about others' experiences in multiple types of treatment and uses for reclaimed water. The tours will feature treatment facilities at both Westminster and Denver Water, use of reclaimed water for industrial cooling water at a major power plant, and a discussion of advanced irrigation control systems at Aurora.

City of Westminster Reclaimed Water Treatment Facility

Westminster's reclaimed system consists of 18 miles of waterline and a 6 mgd treatment facility. The tour will highlight the 5-year old plant's continuous self cleaning up-flow DynaSand cone sand filters. The system serves 33 customers, with annual demands of 2,600 acre-feet and expansion planned to 3,500 acre-feet.



City of Aurora Irrigation Controls

Between tour stops, the City of Aurora will describe its automated reclaimed water irrigation control systems, featuring advanced consumption and flow rate monitoring and controls and automated leak detection and shutdown. The system also calculates and controls the proper water to apply for the next irrigation cycle based on 24-hour evapotranspiration rates.

Denver Water Recycling Plant

In 2004, Denver Water finished construction of the initial phase of a recycled water system for industrial and outdoor irrigation uses. The tour will explore the 30 mgd Recycling Plant that utilizes biological aerated filtration, a first of its kind at a reuse plant, to provide ammonia removal. The water is then treated through

flocculation, sedimentation, gravity filtration, and disinfection. Distribution facilities include finished water pumping combined with on-site storage.

Xcel Energy Cherokee Generating Station

The Xcel Energy Cherokee Station is a coal-fired electric generating station. The plant's water supply includes 5,600 gallons per minute (gpm) of reclaimed water piped from the Denver Water Recycling Plant into the Cherokee Northwest Reservoir, plus surface water and potable sources. Water from the Reservoir is used as cooling water and for bottom ash sluicing to the ash ponds.





Mark your Calendars...

**21st Annual
WaterReuse Symposium**

**Renaissance Hollywood Hotel
Hollywood, CA**

September 10-13, 2006



Check our website for more information:

<http://www.WateReuse.org/>