

## STEVEN B BACHMAN, PH.D.

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### EDUCATION

- 1971 BS, Aeronautical Engineering  
University of Washington
- 1974 MS, Geological Sciences  
University of California, Los Angeles
- 1979 PhD, Geological Sciences  
University of California, Davis

### EXPERIENCE

- 1996-present Steven Bachman, Ph.D., Consulting Groundwater Geologist
- 1993-present Consulting Groundwater Programs Manager, United Water Conservation District; retained consultant, Calleguas Municipal Water District, Ventura County
- 2000-2002 Elected Director, Montecito Water District
- 1990-1996 V Pres, President, Integrated Water Technologies, Inc.
- 1984-1990 Director, co-founder of Crouch, Bachman & Assoc., Inc.
- 1983-1984 Research Associate, Scripps Institute of Oceanography
- 1979-1983 Asst. Professor, Geological Sciences, Cornell University
- 1977-1979 Lecturer, Univ. Calif., Davis
- 1974-1979 Geologist/Geophysicist, Chevron USA
- 1966-1969 US Army Officer

**SUMMARY** Dr. Bachman has over 30 years of professional geological experience ranging from academic to consulting to public sector. He currently splits his time between consulting from his Santa Barbara office, his role as consulting Groundwater Programs Manager for United Water CD, and as a retained consultant to Calleguas Municipal Water District. His experience in water projects in California, Nevada, and Arizona includes artificial recharge planning and implementation, groundwater management, water transfers, timing of reservoir releases, groundwater quality studies, aquifer studies, groundwater modeling, groundwater recharge studies, fisheries issues, wetlands treatment, technical advice and testimony for State regulatory proceedings, and expert witness on groundwater and water availability. Dr. Bachman co-authored the book *California Groundwater Management*, recently released in its second edition by the Groundwater Resources Association. He was the Chair of the Groundwater Committee for ACWA (Association of California Water Agencies) from 2000 to 2006, and now serves as the Vice-Chair. Dr. Bachman lectures statewide on groundwater management and groundwater monitoring/modeling.

## AREAS OF EXPERTISE

### Groundwater Management:

- Manage all groundwater activities for United Water Conservation District (Ventura County), including optimizing reservoir releases for downstream river and spreading basin recharge, collecting and analyzing groundwater level and quality data, installing water wells and monitoring networks, monitoring and mitigating seawater intrusion and nitrate problems, determining pumping volumes and pump charges, groundwater modeling to determine overdraft and test efficacy of proposed groundwater management strategies, determining fate of pathogens through vadose zone and in areas of exposed groundwater, developing water conservation measures with farmers.
- Oversee continuing groundwater management activities for Calleguas Municipal Water District (Ventura County), particularly addressing Calleguas MWD / Metropolitan Water District of Southern California's 300,000 acre-foot Las Posas Basin Aquifer and Storage Project, including determining basin overdraft, determining water budget, basin monitoring for water levels and water quality, evaluating alternate sources of supplemental water to solve overdraft in basin, overseeing construction of and running groundwater model, technical facilitator for committee of basin pumpers and Calleguas MWD.
- Facilitated/wrote AB3030 groundwater management plans for Piru basin and Fillmore basins (Ventura County) and Santa Clarita basin (Los Angeles County).
- Technical advisor to Groundwater Management Plan for Fox Canyon Groundwater Management Agency (Ventura County), including overdraft calculations, management strategies to counter seawater intrusion. Author of new Groundwater Management Plan for the GMA.
- Technical panel for continuing management (under court jurisdiction) of a portion of the Santa Maria basin adjudication (Nipomo Mesa Management Area).
- Technical lead for Expert Panel on determining potential overdraft for Santa Paula Basin Adjudication, including water budget analysis, hydrograph and base period analysis for safe yield, and water quality analysis.
- Member of White Paper Committee for Monterey County Water Resources Agency to optimize releases and recharge from Nacimiento/San Antonio for groundwater recharge to prevent seawater intrusion.
- Co-technical lead on groundwater management for the Santa Clarita groundwater basin, including yield analysis and calibration of groundwater model.
- Technical advisor to City of Riverside on all groundwater issues and water-supply studies.
- Evaluation of groundwater model in determining groundwater impacts from increasing pumping of basin and seawater intrusion (Huntington Beach/Fountain Valley, Orange County Water District).
- Evaluation of planned in-river recharge and recharge basins from release of Colorado River water from canal into local river (Central Arizona Project).
- Water supply analyses for south coast Santa Barbara water districts, including banking of State Water.



- Emergency drought supplies from untapped groundwater resources including: bedrock wells, wells through dry Gibraltar Reservoir into underlying saturated gravels, enhanced bedrock groundwater inflow into Mission Tunnel, and artificial recharge through well injection (Santa Barbara); bedrock wells for municipal supply (Los Angeles, Kern, and San Diego counties); new groundwater supplies (Sierra Pacific, Reno).

**Regulatory/Expert Testimony:**

- Expert testimony on groundwater geology, overdraft, and physical solutions, Antelope Valley Adjudication (Los Angeles-Kern counties).
- Expert testimony on overdraft, seawater intrusion and groundwater quality, Santa Maria Basin Adjudication (Santa Barbara-San Luis Obispo counties).
- Expert on basin yield, overdraft, aquifer storage projects, Monterey Peninsula Adjudication.
- Expert testimony on groundwater supply, overdraft, and groundwater quality for Newhall Ranch project (Ventura County vs. Los Angeles County).
- Expert testimony in California Public Utilities Commission judicial hearings on groundwater quality and safe yield in Santa Clarita groundwater basin (Los Angeles County).
- Expert testimony in California State Water Resources Control Board hearings on the legal definition of groundwater. Devised technical tests to determine the presence/absence of subterranean stream flow.
- Expert testimony on groundwater causes for landslide of 18<sup>th</sup> hole of golf course into ocean (Trump National, Palos Verdes, Los Angeles County).
- Expert testimony on role of irrigation/natural groundwater in causing landslides that destroyed several houses (1995) and killed ten people (2004), (La Conchita, Ventura County).
- Expert testimony on role of broken municipal water mains/natural groundwater in causing a landslide that destroyed several houses (Santa Barbara).
- Expert testimony in oil/gas case against Exxon, Mobil, Amoco. Provided court with geologic education, key geologic issues to be considered (Alberta, Canada).
- Expert testimony for regional well users/farmers over impacts of bedrock groundwater pumping and irrigation use on spring water (Goleta, Santa Barbara County).
- Testimony on offshore geologic conditions and faults for the California Public Utilities Commission (Diablo Canyon Nuclear Plant rate case, San Luis Obispo County).
- Testimony before the Nevada Public Service Commission on groundwater supplies in northern Nevada.
- Lead expert to TAC for Santa Paula basin adjudication (Ventura County).

## PROFESSIONAL ACTIVITIES

Author/Co-author of over 50 technical publications on groundwater, analysis of sedimentary patterns in basins, and structural control on formation of basins. Co-author of first and second editions of *California Groundwater Management*.

Chair, Groundwater Committee, Association of California Water Agencies (ACWA), 2000-present

Technical Advisory Committee, State Water Resources Control Board, legal definition of surface water and groundwater, 2001-2002

Advisory Panel, California Dept. Water Resources, Groundwater Management Grant Funding, 2000-present.

Technical Advisory Panel, California Dept. of Health Services, Drinking Water Source Assessment Program, 2001-present.

Past-President of Pacific Section, SEPM (Society of Sedimentary Geology).

Associate Editor, Geological Society of America's *GEOLOGY*, 1983-85.

Organizer and lead instructor, AAPG School on *Sedimentation, Tectonics, and Basin Analysis*, annual weeklong school in Banff, Alberta.

Technical Program Chairman, Coeditor/convener of several symposia, including *Tectonics and Sedimentation Along the California Margin*.

U.S. Environmental Protection Agency seminar speaker

## HONORS AND AWARDS

Richard Laubacher Award for Water Conservation, annual award of United Water Conservation District (2006)

John Flynn Award for Groundwater Stewardship, annual award of Fox Canyon Groundwater Management Agency (2006)

AWA Water Leadership Award, annual award of Association of Water Agencies Ventura County

## MEMBERSHIPS AND REGISTRATIONS

Professional Geologist #4060, CA

Groundwater Resources Association of California

Pacific Section, Society of Sedimentary Geologists (SEPM)

Association of Groundwater Scientists and Engineers