

KENNETH D. SCHMIDT AND ASSOCIATES
GROUNDWATER QUALITY CONSULTANTS

PROFESSIONAL EXPERIENCE

KENNETH D. SCHMIDT
AUGUST 2014

BIRTHPLACE AND DATE

Madera, California on November 8, 1942

DEGREES

B.S. Geology, Fresno State College, Fresno, California (1964)
M.S. Hydrology, University of Arizona, Tucson, Arizona (1969)
Ph.D. Hydrology, University of Arizona, Tucson, Arizona (1971)

REGISTRATION AND CERTIFICATION

Geologist No. 1578 in California (1970)
Geologist No. 23685 in Arizona (1989)
Geologist No. G462 in Oregon (1978)
Hydrogeologist No. 176 in California (1995)

SOCIETY MEMBERSHIP

American Water Resources Association (1972)
American Water Works Association (1970) (Life Member)
California Groundwater Resources Association (1996)
Geological Society of America (2006)
Water Pollution Control Federation (1972)

PROFESSIONAL EXPERIENCE

July 1972 to Present: Principal, Kenneth D. Schmidt and Associates, Groundwater Quality Consultants, Fresno, California.

January 1969 to June 1972: Hydrologist, Harshbarger & Associates, Consultants in Hydrogeology, Tucson, Arizona.

December 1964 to February 1967: Engineering Geologist, Bookman-Edmonston Engineering, Inc., Arvin, California.

As an engineering geologist with Bookman-Edmonston Engineering, Inc. in Arvin from 1964-67, Schmidt's primary duties included hydrogeologic studies associated with the development and operation of two large-scale recharge and groundwater recovery facilities southeast of Bakersfield, California. This experience included the basic aspects of groundwater studies, including preparing a well inventory, water-level measurements, aquifer testing, logging drill cuttings, interpreting geophysical logs, observing well drilling and construction, collecting water

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samples for chemical analyses from hundreds of water supply wells, and data interpretation. He conducted specific studies of land surface subsidence due to groundwater overdrafting and of the occurrence of high boron contents in groundwater north-east of Arvin. Schmidt subsequently completed a Master's thesis (in the hydrology program at the University of Arizona) in 1969 on the boron problem in the Arvin area.

As a hydrologist with Harshbarger & Associates in Tucson from 1969-72, an investigation was conducted on groundwater conditions and potential groundwater development for the City of Fresno. Schmidt's interest in the presence of high nitrate contents in groundwater of the Fresno urban area resulted in the subsequent completion of a Ph.D. dissertation in 1971 (also at the University of Arizona) on that topic. Since that time, he has participated in four master plan updates for the Fresno Metro area and prepared a comprehensive nitrate evaluation for the City of Fresno in 2006.

As the principal of his own consulting firm (Kenneth D. Schmidt & Associates) since 1972, Schmidt has conducted and supervised over a thousand hydrogeologic investigations in the southwest, primarily in Central California. In the early 1970's, he participated in development of the Tulare Lake Basin (south part of the San Joaquin Valley) Water Quality Plan. As part of this project, he developed salt budgets for sub-basins, and evaluated the distribution of chemical constituents such as nitrate and boron in groundwater, and the impacts of irrigation and waste disposal facilities on groundwater quality. In the mid-1970's, Schmidt worked on development of some of the first national guidelines for groundwater quality monitoring for the U.S. Environmental Protection Agency.

By the late 1970's, Schmidt began to design, develop, and implement some of the earliest groundwater quality monitoring programs at specific sites in California. His involvement with a number of these has continued through to the present. Although a fulltime consultant, he has conducted more than a dozen University of California extension classes and other short courses since the late 1970's on groundwater hydraulics, groundwater quality and contamination, and monitoring. Since 1973, he has periodically taught hydrogeology classes at California State University, Fresno.

In 1980, Schmidt began working on a number of projects to develop new public-supply wells in water quality problem areas.

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Included have been hundreds of such wells in high salinity, nitrate, sulfate, arsenic, fluoride, iron, manganese, hydrogen sulfide, methane gas, color, DBCP, EDB, 1,2,3-TCP, and uranium areas of the San Joaquin Valley. His work in this regard for dozens of cities, water utilities, and schools in the San Joaquin Valley has continued through to the present.

From 1985 to 1988, he was a member of the National Academy of Sciences Committee on Irrigation-Induced Water Quality Problems. The committee work focused on agricultural drainage problems, including the San Joaquin Valley. For a number of years following the inception of the U.S. Geological Survey's National Water Quality Assessment Program in the mid-1980's, Schmidt was a member of a national advisory committee for that program. In 1987, he was named the Chairman of the Groundwater Sub-Committee of the Technical Advisory Committee for the San Joaquin Valley Agricultural Drainage Program. From 1992-98, Schmidt was a member of the Industrial Advisory Council in the College of Engineering at the University of Arizona. From 1993-2003 he was a member of the Department Advisory Committee that evaluated the hydrology program at the University of Arizona.

Since the mid-1990's, KDSA has been a leader in groundwater resource and quality evaluations in Central California. The firm has been involved with a number recharge and water banking projects, including: the Arvin-Edison Water Storage District in Kern County, the Semitropic Water Banking Project in the Shafter-Wasco area, the Kern Fan Water Banking Projects west of Bakersfield, the Apex Ranch project southwest of Kingsburg, the Fresno Irrigation District Water Bank, the James Irrigation District project near San Joaquin, and the Madera irrigation District Madera Ranch project. KDSA has worked on numerous other groundwater recharge evaluations, including selection and evaluation of areas favorable for recharge, exploration, and monitoring of existing facilities. KDSA has completed detailed groundwater evaluations for development of Water Management Plans and Water Supply Evaluations in the Cities of Bakersfield, Clovis, Fresno, Madera, Livingston, Tulare, Dinuba, Patterson, Porterville, Selma, and Sanger. KDSA has prepared numerous groundwater sustainability evaluations. Ken Schmidt has also provided expert witness services for numerous litigation cases involving groundwater in the San Joaquin Valley Court. In 2012, he was selected by Judge Wanger of the Federal Court in Fresno to serve as an independent 701 expert on a chromium contamination case near Atwater. KDSA has conducted detailed groundwater studies

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associated with EIRs for numerous gravel mines and rocks quarries in Fresno, Madera, Merced, Tulare, and Stanislaus Counties. During the past two decades, KDSA has designed and implemented enhanced groundwater monitoring programs at dozens of sites, including municipal WWTF, food processing sites, and dairies. The firm specializes in interpretation of groundwater monitoring results. During the past two decades, the firm has worked on hundreds of new deep irrigation wells in the west and south parts of the valley. In 2003 the firm opened a branch office in Bakersfield. During 2007-14, the firm worked on arsenic mitigation programs for the Cities of Hanford and Delano and for the Arvin CSD.

AWARDS

- 1958 Outstanding Achievement Award, California Central Valley Science Fair.
- 1959 Outstanding Laboratory Science Award, Madera Union High School.
- 1977 Best Paper Award, Journal of Groundwater, National Water Well Association.
- 1986 Outstanding Service Award, American Water Resources Association.
- 1995 Distinguished Citizens Award, University of Arizona Alumni Association.
- 1998 Centennial Achievement Award, University of Arizona Alumni Association.
- 2013 Top Dog Award, College of Science & Mathematics, Fresno State Alumni Association.
- 2014 Golden Shovel Award, California State University, Fresno, Earth & Environmental Sciences.

SELECTED CLIENTELE

Cities and Towns

Atwater, Public Works Department
Bakersfield, Wastewater Division
Clovis, Public Works Department
Corcoran, Public Works Department
Delano, Water Division and Wastewater Division

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Dinuba, Public Works Department
East Oroquieta
Exeter, Water Division and Wastewater Division
Firebaugh
Fresno, Public Works Department, Water Division, and Wastewater
Division
Galt
Gustine
Hanford, Public Works Department
Kerman, Public Works Department
Los Banos
Lindsay, Public Works Department
Madera, Public Works Department
Mammoth CWD (Mammoth Lakes)
McFarland
Mendota, Public Works Department
Modesto, Public Works Department
Newman
Patterson
Porterville
Reedley, Public Works Department
Sanger, Public Works Department
San Joaquin, Water Department
Santa Clara, Department of Public Works
Stevenson Ranch
Sultana
Tulare, Public Works Department
Turlock, Public Works Department
Wasco, Wastewater Division
Woodlake

Counties

County of Fresno, Departments of Public Works, Planning, and
Environmental Health
County of Madera, Department of Public Works
County of Merced
County of Sierra
County of Tulare, Department of Public Works

Engineering Firms

AECOM, Fresno and Bakersfield
Alan Mok Engineering, Clovis
Blair, Church, and Flynn, Clovis
Carollo Engineers, Fresno and Sacramento
The H₂O Group, Folsom and Elk Grove
Dee Jaspas and Associates, Bakersfield

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Fremming, Parsons, & Pechenino, Merced
GEI (Bookman-Edmonston Engineering), Bakersfield
Provost & Pritchard Engineering Group, Fresno, Visalia, and
Bakersfield
Quad Knopf, Fresno, Visalia, and Bakersfield
Yamabe and Horn Engineering, Fresno

Farming Entities

ACDF, Inc., Kern County
Britz Farms, Five Points
Coleman Farming, Fresno and Madera Counties
Dalena Farms, Avenal
Delano Farming, Kern County
Gary Esajian Farms, Lemoore
Farmland Management Services, Kern County and Madera County
Five Points Ranch, Five Points
Brad Gleason Pleasant Valley
Grimmway Farms, Kern County
Harris Ranch, Coalinga
John Seasholtz Farms
Kaweah-St. Johns Farmers League
Lucich Farms, Kern County
Maricopa Orchards, Kern County
Mike Wolf Farms
O'Neill Farming Enterprises, Five Points
Newton Farms, Stratford
Paramount Farms, Madera, Kern, and Tulare Counties
Primex World
Red Rock Ranch, Five Points
Gary Robinson, Western Fresno County
RTS Agribusiness, Kern County
Schmiederer Farms, Mendota
Setton Pistachios, Terra Bella
Starrh Farms, Shafter
Sun Pacific, Cawelo
Sun World, Bakersfield
Ted Sheely Farms, Lemoore
Triangle T Ranch, El Nido
James Walker Farms, Fresno
Westside Harvesting, LLC, Huron
Wolf Farms, Huron

Industries

California Portland Cement Co., Mojave and Colton
Central Valley Meat, Hanford
CIBA GEIGY, Sanger

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Delano Growers Grape Products, Delano
Dole Fruit & Nut Co., Fresno
Food Machinery Corporation, San Jose
Gallo Winery, Fresno and Livingston
The Garlic Company, Lerdo
Guardian Glass Plant, Kingsburg
GWF Power Systems, Inc., Hanford and Kingsburg
Holly Sugar Co., Tracy and Imperial
Kraft Foods, Tulare
Kenetech Alternative Power Systems, Kingsburg
Pacific Ethanol, Madera
Rogers Helicopters, Inc., Clovis
Sperry New Holland, Fowler
Spreckels Sugar Company, Manteca, Mendota, Salinas, and Woodland
Sunkist, Tipton
Sun-Maid Growers of California, Kingsburg and Orange Cove
Thermo-Electron Energy Systems, Mendota
Ultra Power, Inc., Kern County
Valley Perforating Co., Bakersfield

Irrigation Entities

Aliso Water District
Angiola Water District, Corcoran
Arvin-Edison WSD, Arvin
Central California Irrigation District, Los Banos
Columbia Canal Company, Firebaugh
Eastside Water District, Stanislaus County
Firebaugh Canal Water Co. Firebaugh
Friant Water Users
James Irrigation District, San Joaquin
Madera Irrigation District
North Kern Water Storage District, Cawelo
Panoche Drainage District
Pleasant Valley Water District, Coalinga
Santa Paula Pumpers Association, Santa Paula
San Joaquin River Exchange Contractors Authority, Los Banos
Semitropic Water Storage District, Wasco

Mining Companies

Artesia Ready Mix, Lemoncove
Calavaras Materials, Fresno and Merced Counties
Granite Construction, Fresno and Madera Counties
Jaxon Enterprises, Red Bluff
LeHigh Hanson, LLC-CMI, Kings River and Merced Co.
Madera Quarry Hildreth Creek
Madera Sand & Rock, Madera

Sonora Mining Corporation, Jamestown
Stewart & Nuss, Fresno
Vulcan Materials, Centerville, Fresno, Los Banos, and
Madera County

Private Water Companies

Bakman Water Co., Fresno
Cal Water Service, Selma and Bakersfield
Deer Creek Water Co. Terra Bella
East Niles CSD, Bakersfield
Greenfield CSD Greenfiled
North of the River MWD, Bakersfield
Oildale Mutual Water Co., Bakersfield
Vaughn Water Co., Bakersfield
West Kern Water District, Taft

Special Districts

Kern County Water Agency, Bakersfield
Monterey County Flood Control and Water Conservation
District, Salinas
Monterey Peninsula Water Management District, Monterey
Selma-Kingsburg-Fowler County Sanitation District, Kingsburg
Sierra Valley Groundwater Management District, Sierraville

Publications and Articles

"The Use of Chemical Hydrographs in Groundwater Quality Studies",
in Hydrology and Water Resources in Arizona and the Southwest,
vol. 1, Arizona Section AWRA, pp 211-223, 1971.

"Nitrate in Groundwater of the Fresno-Clovis Metropolitan Area,
California", Ground Water, vol, 10, No. 1, pp 50-64, 1972.

"Groundwater Contamination in the Cortaro Area, Pima County, Ari-
zona", in Hydrology and Water Resources in Arizona and the South-
west, vol. 2, Arizona Section AWRA, pp 95-111, 1972.

"Groundwater Quality in the Cortaro Area Northwest of Tucson, Ar-
izona", Water Resources Bulletin, vol. 9, No. 3, pp 598-606,
1973.

"Nitrates and Groundwater Management in the Fresno Urban Area",
Journal AWWA, vol. 66, No. 3, pp 146-148, 1974.

"Regional Sewering and Groundwater Quality in the Southern San

Joaquin Valley", Water Resources Bulletin, vol. 11, No. 3, pp 514-525, 1975.

"Salt Balance in Groundwater of the Tulare Lake Basin, California", in Hydrology and Water Resources in Arizona and the Southwest, vol. 5, Arizona Section AWRA, pp 177-184, 1975.

"Monitoring Groundwater Pollution", Proceedings of the International Conference on Environmental Sensing and Assessment, Groundwater Section, sponsored by EPA, WHO, and University of Nevada, Las Vegas, Nevada, September 1975, The Institute of Electrical and Electronics Engineers, Inc., vol. 1, session 9, No. 4, pp 1-6, 1976.

"Academic Training for Groundwater Quality Specialists", in Hydrology and Water Resources in Arizona and the Southwest, vol. 6, Arizona Section AWRA, pp 119-123, 1976.

"Monitoring Groundwater Quality: Methods and Costs", U.S. Environmental Protection Agency, Environmental Monitoring Series, Report EPA-600/4-76-023, with L.G. Everett, 1976.

"Monitoring Groundwater Quality: Monitoring Methodology", U.S. Environmental Protection Agency, Environmental Monitoring Series, Report EPA 600/4-76-026, with D.K. Todd, R.M. Tinlin, and L.G. Everett, 1976.

"Monitoring Groundwater Quality: Illustrative Examples", U.S. Environmental Protection Agency, Environmental Monitoring Series, Report EPA 600/4-76-036, with R.M. Tinlin, 1976.

"A Groundwater Quality Monitoring Methodology", Journal AWWA, vol. 68, No. 11, pp 586-593, with D.K. Todd, R.M. Tinlin, and L.G. Everett, 1976.

"Water Quality Variations for Pumping Wells", Ground Water, vol. 15, No. 2, pp 130-137, 1977.

"Protection of Groundwater from Nonpoint Sources of Pollution", Proceedings of Symposium on Drinking Water Quality Enhancement through Source Protection, American Chemical Society, Division of Environmental Chemistry, New Orleans, Louisiana, March 20-25, 1977, Ann Arbor Science Publishers, Inc., pp 257-273, 1977.

"Impact of Land Treatment of Wastewater on Groundwater", Proceedings of National Conference on Environmental Engineering, Kansas City, Missouri, July 10-12, 1978, University of Missouri-Columbia, pp 118-125, 1978.

"Proceedings of Symposium on Establishment of Water Quality Mon-

itoring Programs", Edited by L. G. Everett and K. D. Schmidt, American Water Resources Association, San Francisco, California, June 12, 14, 1978, 370p, 1979.

"The 208 Planning Approach to Groundwater Protection - What is Wrong and What Can be Done About It?", Ground Water, vol. 17, No. 2, pp 148-153, 1979.

"Monitoring Perched Ground Water in the Vadose Zone", in Proceedings of the Symposium on Establishment of Water Quality Monitoring Programs, American Water Resources Association, Minneapolis, Minnesota, pp 134-149, with L.G. Wilson, 1979.

"Groundwater Quality Impact Determined from Well Sampling", Arizona Department of Water Resources, Report No. 1, Proceedings of Deep Percolation Symposium, Scottsdale, Arizona, April 24-25, 1980, pp 74-84.

"Brine Pollution at Fresno - Twenty Six Years Later", Ground Water, vol. 19, No. 1, pp 12-19, with J.A. Krancher and G. Bisel, 1981.

"Hydrogeology of the Sierra Nevada Foothill Lineament Near Oakhurst, California", Ground Water, vol. 19, No. 2, pp 149 - 155, with S. Mack, 1981.

"Persistence of Brine Pollution in Fresno, California Aquifer", Journal Environmental Health, vol. 43, No. 6, pp 314-318, with J.A. Krancher, C.R. Auernheimer, and G. Bisel, 1981.

"Monitoring Groundwater Quality at State Permitted Sites in California", Proceedings of the Thirteenth Biennial Conference on Groundwater, Irvine, California, September 14-15, 1981, California Water Resources Center Report No. 53, pp 87-91, 1981.

"How Representative are Water Samples Collected from Wells?" Proceedings of the Second National Symposium on Aquifer Restoration and Groundwater Monitoring, Columbus, Ohio, May 1982, Water Well Journal Publishing Company, Worthington, Ohio, pp 117-128.

"The Occurrence of Trace Organic Chemical Constituents in Groundwater of the Salt River Valley", Proceedings of the Deep Percolation Symposium, Scottsdale, Arizona, October 1982, Arizona Department of Water Resources Report No. 4, pp 48-58.

"Limitations in Implementing Aquifer Reclamation Schemes", Proceedings of the Third National Symposium on Aquifer Restoration and Ground Water Monitoring, Columbus, Ohio, May 1983, Water Well

Journal Publishing Company, Worthington, Ohio, pp 105-110.

"Groundwater Quality Studies in California", Proceedings of the ASCE Irrigation and Drainage Division Specialty Conference, Jackson, Wyoming July 1983, American Society of Civil Engineers, pp 183-191.

"Management of Groundwater Quality Beneath Irrigated Arid Lands", Proceedings of the Western Regional Conference on Groundwater Management, San Diego, California, October 1983, Water Well Journal Publishing Company, Worthington, Ohio, pp 77-84.

"Developing Groundwater Quality Monitoring Networks in California", Proceedings of the 15th Biennial Groundwater Conference, San Diego, September 23-25, 1985, University of California, Davis, pp 47-51.

"Proceedings of Symposium on Groundwater Contamination and Reclamation", Edited by K.D. Schmidt, American Water Resources Association, Tucson, Arizona, August 14-15, 1985.

"Are Humid Area Monitoring Concepts Applicable to Arid Lands?", Proceedings of Sixth National Symposium and Exposition on Aquifer Restoration and Groundwater Monitoring, May 19-22, 1986, Columbus, Ohio, pp 41-49.

"Hydrologic Aspects of Subsurface Drainage", Proceedings of the 1986 Regional Meetings, U.S. Committee on Irrigation and Drainage, July 30-August 1, 1986, Fresno, Calif., pp 55-64.

"Monitoring Groundwater Quality in the Southwest", American Society of Civil Engineers, Proceedings of Water Forum '86, World Issues in Evolution, August 4-6, 1986, Long Beach, Calif., 6 p.

"DBCP in Groundwater of the Fresno-Dinuba Area, California", National Water Well Association, Proceedings of the Agricultural Impacts on Groundwater Conference, August 11-13, 1986, Omaha, Nebraska, pp 511-529.

"Monitor Well Drilling and Sampling in Alluvial Basins in Arid Lands", National Water Well Association, Proceedings of the FOCUS Conference on Southwestern Groundwater Issues, October 20-22, 1986, Tempe, Arizona, pp 443-455.

"Effect of Irrigation on Groundwater Quality in the Southwest", Proceedings of the 1986 Regional Meetings, U.S. Committee on Irrigation and Drainage, October 22-24, 1986, Mesa, Arizona, pp 273-290.

"Effect of Irrigation on Groundwater Quality in California",

with I. Sherman, Journal of Irrigation and Drainage Engineering, ASCE, Vol 113, No. 1, 1987, pp 16-29.

"Development of Public-Supply Wells in the Salt River Valley", in Proceedings of the Arizona Hydrological Society 1st Annual Symposium, Phoenix, Arizona, September 1988, pp 131-151.

"Contaminant Hydrology Associated with River Recharge of Sewage Effluent", with D.M. Esposito and D.G. Eaker, in Proceedings of Fourth Symposium on Artificial Recharge of Groundwater in Arizona, Tempe, Arizona, May 23-23, 1989, pp 1-20.

"Developing Integrated Management Strategies for Groundwater Production, Recharge, and Protection in the Salt River Valley", in Proceedings of the Arizona Hydrological Society 2nd Annual Symposium, Casa Grande, Arizona, September 1989.

"Problems with Groundwater Remediation Projects in the Southwest", Proceedings of the Arizona Hydrologic Society 4th Annual Symposium, Casa Grande, Arizona, September 12-13, 1991, pp 3-9.

"Hydrologic Factors Affecting Mobility of Trace Inorganic Constituents", Journal of Irrigation and Drainage Engineering, ASCE, vol. 119, No. 3, 1993, pp 600-612.

"Results of Twelve Years of Groundwater Monitoring at the SKF-CSD Facility in Central California", with D. Michel, Proceedings of the Symposium on Effluent Use Management, American Water Resources Association, Tucson, Arizona, August 29-September 2, 1993, pp 203-212.

"Monitoring Perched Water in Arid Lands", in Handbook of Vadose Zone Characterization and Monitoring, edited by L.G. Wilson, L.G. Everett, and S.J. Cullen, Lewis Publishers, 1995 pp 639-655.

"Groundwater Monitoring Associated with Water Transfer and Banking Projects", Proceedings of the Symposium on Conjunctive Use of Water Resources: Aquifer Storage and Recovery, American Water Resources Association, Long Beach, California, October 19-23, 1997.

"Enhanced Understanding of Aquifer Confinement in the San Joaquin Valley", in Groundwater and Shared Responsibility, Lorman Educational Services, Fresno, California, January 21, 2009, pp 41-66.

"Developing New Public Supply Wells in the San Joaquin Valley",

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in Groundwater and Shared Responsibility, Lorman Educational Services, Fresno, California, January 21, 2009, pp 83-123.

"Aquifer Tests", in Groundwater and Wells: Shared Resources, Lorman Educational Services, Fresno, California, January 21, 2010, pp 37-84.