

Announcement

Hydrogeology Course - Offered by CSU Sacramento Regional and Continuing Education

The course presents the conceptual and mathematical fundamentals of the occurrence and flow of ground water, as well as practical approaches to the solution of hydrogeologic problems. It is an undergraduate level hydrogeology course, geared to working ground water professionals. Methods for characterizing ground water conditions, processes affecting transport of contaminants, the use of models to simulate ground water flow, and techniques for ground water cleanup will be stressed.

The course will be taught by John Woodling, who has 12 years experience in water supply and contaminant hydrogeology. He is currently Senior Geologist with the U.S. Army Corps of Engineers. Mr. Woodling is a registered geologist, certified engineering geologist and certified hydrogeologist in California.

Dates: September 2nd - December 16, 1997; Tuesday nights from 6:00 - 8:45

Cost: \$435 for three academic credits

Location: CSU Sacramento, Placer Hall, Room 1013

For more information, contact John Woodling at (916) 557-5375 or jwoodling@usace.mil

To register contact CSUS at (916) 278-6984

[Return to Summer '97 Table of Contents](#)

[Return to HydroVision Home Page](#)

DATES & DETAILS

1997 Board of Directors Meeting Dates

August 17, 1997 Wallace-Kuhl & Associates, Inc., West Sacramento. Contact: David Von Aspern, (916) 372-1434.

November 10, 1997 Downey, Brand, Seymour & Rohwer, Sacramento. Contact: Steve Goldberg, (916) 441-0131, ext. 231

1997 Annual Meeting

The 1997 GRA Annual Meeting will be September 15-16, 1997, at the Radisson Hotel, Sacramento. This year's meeting will be held in conjunction with the Biennial Groundwater Conference.

1997 Short Course

Soil Vapor extraction course will be offered September 24th at California State University, Sacramento and September 25th at the Wyndham Garden Hotel, Costa Mesa. A flyer describing the course will be mailed this summer.

The next HydroVisions due date for articles is August 22, 1997. We welcome your articles and photos. Articles may be e-mailed to: editor@grac.org

[Return to Summer '97 Table of Contents](#)

[Return to HydroVision Home Page](#)

Enterprise, Innovation and Partnership

After five years of planning, meetings, and construction, the Geology Department at California State University, Sacramento (CSUS), has a new home. Placer Hall is also the new home of the Water Resources Division of the U.S. Geological Survey (USGS). The building symbolizes a landmark relationship between a University and the USGS. This partnership is now considered a model for increased cooperation between federal agencies and academia. This partnership, and completion of the new building, also sets the stage for exciting learning, teaching and research opportunities.

GRA is proud to be a supporter of the CSUS/USGS collaborative venture. On April 19, the GRA Board of Directors held their board meeting at Placer Hall and had a complete tour of the department and building.

How this unique partnership began goes back to 1992, when, then geology department chair Greg Wheeler met with representatives of the Water Resources Division to discuss how CSUS and USGS could facilitate cooperation on mutual research and teaching interests. By the next year, agreement was reached on forming a partnership that would allow construction of a building on campus to house both the geology department and the Water Resources Division. The CSUS Foundation agreed to sell bonds to help construct the building that will be paid off, in large part, by lease payments from the USGS.

Placer Hall represents the first building constructed as the result of a partnership between a university and the USGS. The five story building, completed in December 1996, includes the geology department, USGS labs, offices, conference rooms, and the California district office headquarters.

The first floor includes geology department faculty offices, display cases and three geology labs, including one in which hydrogeology and earth structure will be taught and another, funded by the Homestake Mining Company, for mineralogy, paleontology and the study of sedimentary rocks. Wheeler said all the new equipment and furniture for students and faculty was funded by non-state sources.

The second floor includes the geology department office and what Wheeler said may be the most frequently used room in the building -- the lunch meeting room. "One of the many benefits of working with the USGS on this project is the incredible opportunity it will mean for students and faculty to work directly in the lab with Water Resource Division scientists," explained Wheeler. "We already have an outstanding job placement record for our students and with these new opportunities, including a room where faculty, students and USGS staff can network, I can't help but think our students will have a direct career link to the federal government."

"When the geology department was formed 25 years ago, the science building was already up and there weren't any labs specifically designed for our students," said Wheeler. "We've had to struggle over the years to provide the space and equipment necessary. We're very pleased now to be moving into a building that was designed with our direct input for our specific needs."

Wheeler anticipates other academic departments on campus will be sending students and faculty to Placer Hall on USGS-related projects. "Because USGS work involves many disciplines, there are going to be research and project opportunities related to biology, chemistry, computer science, civil engineering, geography, and even communication."

Wheeler said the USGS's top executive, Director Gordon Eaton, is already hailing Placer Hall as an example of cost-conscious scientific partnerships. "In an era of tightening fiscal resources and increasing demands on both earth resources and human resources, the partnership that has developed between CSUS and the USGS will certainly become a model for further efforts in the public sector," Wheeler added.

Placer Hall's uniqueness has been bolstered by two state-of-the-art laboratories for hydrogeologic studies, established and equipped as the result of a \$220,000 grant from the W. M. Keck Foundation.

CSUS President Donald R. Gerth said CSUS is pleased to become a part of the prestigious Keck grant family. "Over the years, the Keck Foundation has contributed immensely to the enhancement of learning in higher education. Through this generous gift we expect over the years ahead to have one of the strongest water geology programs in the United States."

The W. M. Keck Foundation, headquartered in Los Angeles, is one of the nation's largest private grantors to universities and colleges in the United States, with particular emphasis in the fields of science, engineering and medical research. The Foundation was established in 1954 by the late William M. Keck, founder of Superior Oil Company.

The Keck Foundation's commitment to higher education reflects its founder's belief that by nurturing the minds and talents of exceptional people and in strengthening their academic and research environments, the Foundation is able to make critical investments in the future of our society.

Diane Carlson, current chair of the geology department, said the Keck grant "provides state-of-the-art equipment for students to use in laboratory classes and in collaborative research with faculty and the USGS. Our students currently benefit from one of the largest on-campus well fields in the nation and the funding from the Keck Foundation allows us to expand the capabilities of our existing well field and provide additional equipment for students, laboratory analysis and computer modeling of hydrogeologic systems."

GRA has a unique partnership with the CSUS Geology Department. GRA is able to use the well field for our short courses as well as the new building for branch meetings and short courses. To demonstrate appreciation and support, GRA recently gave a \$1,000 donation towards furnishing the science labs. It is hoped we can pledge a total of \$5,000 over five years to endow a scholarship fund in GRA's name that could be used to support students pursuing hydrogeology. For more information how you can help with the GRA scholarship fund, contact Vicki Kretsinger at (916) 661-0109 or Brian Lewis at (916) 323-3632.

Portions of this article were reprinted from the Capital University Journal.

[Return to Summer '97 Table of Contents](#)

[Return to HydroVision Home Page](#)

Get Ready! Get Set! CCGO!

by Betsy Mathieson

CCGO, the California Council of Geoscience Organizations, is moving along toward incorporation. A second organizing meeting was held February 15 in Berkeley and a third organizing meeting was held March 23 in Pasadena.

CCGO is a proposed coalition of geoscience-based professional/technical organizations and businesses with an interest in two overlapping areas: the quality of geologic practice in California, and the implementation of reasonable laws and regulations that incorporate geoscience-based rationale.

Attending the February 15 meeting were representatives of these organizations: Groundwater Resources Association of California (state level and San Francisco Bay Branch); Association for Women Geoscientists (San Francisco Bay Area Chapter and national); American Association of Petroleum Geologists (Pacific Section); Northern California Geological Society; Association of Engineering Geologists (all three California sections plus national); American Institute of Professional Geologists (California Section); Inland Geological Society, and South Coast Geological Society.

The group reaffirmed the mission and vision statements adopted at the first meeting, and then moved on to defining the structure and operating methodology of CCGO via a review of proposed bylaws. A bylaws committee was established to refine the draft document based on suggestions provided at the meeting. The AEG section chairs present agreed to look into subsidizing some initial legal advice, perhaps leading to the preparation of Articles of Incorporation.

The approach to financing CCGO was explored. CCGO member organizations seem to be of two types, organizations composed predominantly of geoscience professionals, and organizations composed predominantly of geoenthusiasts (to use Geotimes terminology). The dues structures of the two types of organizations are different, and their financial contributions to CCGO may differ. Both types of organizations, however, have expertise and clout to contribute to CCGO, and both can benefit from participation in CCGO. Because businesses that employ geoscientists will benefit from CCGO's quest for both a better regulatory climate and for geoscience-based laws and regulations for the protection of the public, those businesses might become a prime financing source for CCGO. A marketing committee was established and charged with promoting CCGO and with exploring potential funding mechanisms.

The third organizational meeting was held in Pasadena on March 23, 1997. The Council intends to be a leader of recognized integrity in advancing programs and legislation that take into consideration California's diverse geologic conditions, advocate knowledgeable use of resources, and work to reduce the impact of geologic hazards. With a goal of achieving the sound practice of the geological sciences in the public interest, the Council will work to provide balanced information to lawmakers, regulatory agencies and the public regarding the economic, environmental, and human costs associated with geologic matters.

Issues covered at the March 23 meeting included the conceptual development of programs and strategies to reach the Council's goals, with specific identification of six areas: Legislation and Regulation, Regulatory Peer Review, Governmental Relations, Professional Practice, Professional Licensure, and Public Outreach. The group set a target date to have the Council fully incorporated and operational by August 1, 1997. Working aggressively toward this date, both strategic planning and development committees were formed. Organizational meetings will continue on a monthly basis. I know I speak for all of the participating organization's leaders who have volunteered their precious time and challenged themselves to see the great benefits that CCGO could provide in urging you to investigate for yourself, ask questions of organizational participants, and see what CCGO can do for you.

The fourth CCGO organizing meeting was held Sunday, June 21, in Sacramento. The next issue of **HydroVisions** will summarize the Sacramento meeting.

CCGO invites participation from all professional and technical organizations that have an interest in promoting quality geological work in California, improving the geoscience-based regulatory environment, or promoting better recognition of geologic resources and hazards.

If you have any thoughts either pro or con about GRA's possible involvement in CCGO. Please contact Brian Lewis (916) 323-3632 or e-mail admin@grac.org.

For further information about CCGO, contact Betsy Mathieson, CCGO Communications Volunteer, Chairman AEG SF Section, c/o

Terratech Inc., 1365 Vander Way, San Jose, CA 95112, (408) 297-6969, fax (408) 297-7716, e-mail BMathieson@aol.com.

[Return to Summer '97 Table of Contents](#)

[Return to HydroVision Home Page](#)

GRA Annual Meeting

"Groundwater and Future Supply"

September 15-16, 1997

Radisson Hotel Sacramento

Groundwater has always played an integral role in California's history. Management of groundwater has been guided by a number of court decisions that started in the late 1800s. Those decisions have provided guidance that is relevant to specific groundwater rights issues in each dispute, but they have not provided a workable framework dealing with groundwater that can be applied to the day-to-day workings required for effective groundwater management throughout the state.

In a similar manner, the legislature has passed a number of statutes that deal with specific water issues. Yet the Water Code, like the case law, does not provide a workable framework that deals with groundwater supplies. Instead, the Water Code treats surface water and groundwater as if they were two independent resources.

Water managers in many basins have developed groundwater management plans in response to AB 3030, some other section of the Water Code, or court decision. Managers in some areas have not yet developed groundwater management plans. Enactment of county ordinances relating to groundwater has created a concern among water agencies about equitable sharing of the water supply. What ordinances will accomplish in terms of groundwater management remains to be seen. It will be necessary for water agencies and cities and counties to pool their authorities to manage ground water resources efficiently.

This 21st Biennial Groundwater Conference emphasizes that groundwater managers must be concerned not only with quantity, but also with water quality. Natural chemical constituents as well as synthetic chemicals can render our ground water supply unusable. Thus, the program includes a discussion of ground water quantity, groundwater quality, and protection of the resource to ensure usefulness into the future.

The 21st Biennial Groundwater Conference will offer a new, concurrent session format which will address the professional needs of those who attend the traditional groundwater conference as well as members of the Groundwater Resources Association of California, a new conference sponsor joining the University of California Water Resources Center, Department of Water Resources, State Water Resources Control Board, and the Water Education Foundation. Plenary sessions with the Keynote Address and the lunch speaker will be given. Conference participants may attend alternate concurrent sessions and may switch sessions as they deem appropriate. Vendors will exhibit along with posters at the Monday evening reception.

Here are the session topics and some presentation titles:

KEYNOTE ADDRESS

"Groundwater: Its Place in the West - Past and Future"

John Leshy, Solicitor of the U.S. Department of the Interior

GROUNDWATER & INTERBASIN TRANSFER

Ground Water and the CALFED Process

Stream Flow and Groundwater Use

State Interest in Water Banking/Conjunctive Use

MAJOR HAZARDS

Lawrence Livermore Lab Report: Leaking

Underground Fuel Tanks

Contaminant Policy Regulatory Response

Dumps/Seeps/Tanks

Ground Water Disinfection

Seawater Intrusion: Salinas - Oxnard Salinity Plan

Risk Based Corrective Action

IMPLICATIONS OF WIDESPREAD TRANSFER ON GROUNDWATER MANAGEMENT

How to Shape the Legal Framework

Economic Implications

Legal Implications

RIGHTS AND CLAIMS

Area of Origin

Local Groundwater Management

Political or Hydrologic Management?

**IMPLICATIONS OF WIDESPREAD GROUND-
WATER TRANSFERS IN CALIFORNIA**

Wellhead Protection - EPA Source Water

Local Concerns vs. Regional & Statewide Desires

CALIFORNIA'S FUTURE GROUNDWATER QUALITY

Water Quality Issues Facing California

Is Our Groundwater Quality Sustainable?

Incorporating Uncertainty in Contaminant

Transport Models in Risk

Water Quality Changes in the Unsaturated Zone

During Artificial Recharge of Reclaimed Water -

Nitrate, Organic Carbon and Pathogens

Chemical Loading in Unsaturated Zone, Future

Burden to Groundwater Quality

New Developments in Remediation

Emerging Treatment Techniques

Application of the Common Sense Initiative

Groundwater Reclamation Through

Plating Processes

The Big Valley and PCE - Its Impact and Any Solutions

Trends in Industry Waste Generation and Management

OVERVIEW OF SAFE WATER DRINKING ACT

Safe Drinking Water Act of 1996 - What's on Tap?

Source Water Protection with a Focus on Groundwater

Potential Impact of SDWA Regulations on the Horizon

Policy and Regulations Concerning Recharge in California

Overview on New USEPA Cancer Screening

Levels The Groundwater Rule and Implications

for Disinfection Byproducts

Proposed Arsenic, Rule - Will It Impact You?

Radon Standards - Problems with Mitigating

Below Ambient Concentrations

The Politics and Economics of MTBE

Flyers will be mailed this summer. Save the dates September 15-16, 1997. If you have any questions, please contact Vicki Kretsinger (916) 661-0109.

[Return to Summer '97 Table of Contents](#)

[Return to HydroVision Home Page](#)

GRA's New Executive Director

GRA is pleased to announce that we have contracted with Harrison Phipps to serve as our new Executive Director. Harrison has an extensive background in association administration and has worked on numerous groundwater issues; he has experience as Executive Coordinator for the Water Resources Association of Yolo County and as a Water Resources Specialist for the Woodland Public Works Department. Harrison initially will be working part-time for GRA as an independent contractor, focusing primarily on fund raising, grant writing, and on improving the communication between GRA officers and members. Harrison also will be writing a regular Legislative Corner feature in this newsletter; look for his first article on Page 8. GRA looks forward to a long and productive relationship with Harrison. Please call him at (916) 758-3656 if you have issues that you would like GRA to address.

[Return to Summer '97 Table of Contents](#)

[Return to HydroVision Home Page](#)

Legislative Corner

by HARRISON PHIPPS

Two bills relating to the gasoline oxygenate methyl *tert*-butyl ether (MTBE) are moving through the California Senate. If passed, SB 521 (Mountjoy) would enact the *MTBE Public Health and Environmental Protection Act of 1997* and SB 1189 (Hayden) would enact the *Local Drinking Water Protection Act*. Both bills have been approved by the Senate Appropriations Committee. This update is as of June 3rd, 1997.

SB 521 (Gasoline: MTBE)

The purpose of SB 521 is to provide an evaluation of the risks of using MTBE in gasoline, and to ensure that the air, water quality, and soil impacts of the use of MTBE (if any) are fully mitigated. To this end, \$500,000 would be allocated for a study of risks associated with MTBE, including:

- MTBE leaking from storage tanks, watercraft and tankers
- Levels of MTBE in public and private water systems, reservoirs, lakes and streams
- Costs and effectiveness of treatment technologies to remove MTBE from surface and groundwater
- Corrosive effects of MTBE on vehicle parts and storage tanks
- Evaluation of the scientific peer-reviewed research and literature on the effects of MTBE.

If the study indicates MTBE has significant risks, the director of the Department of Health Services shall take appropriate action to protect the public health and the environment. Nine million dollars in direct emergency grants to public water systems will be provided for monitoring surface and groundwater for MTBE in drinking water.

SB 1189 (Drinking Water: Groundwater Wells: MTBE Contamination)

This senate bill would only be operative if SB 521 is enacted.

Requires the State Department of Health Services to establish primary and secondary drinking water standards for MTBE.

It also would expand laws for petroleum pipeline inspection to include pipes within a one-mile radius of a well used for drinking water.

It requires owners and operators to test for leaks in petroleum pipelines within 1,000 feet of a drinking water well and perform well tests for MTBE if leaks are detected.

It would require underground storage tanks within a mile of a drinking water well to meet design and monitoring standards, and would evaluate alternative gasoline additives.

Harrison Phipps is the recently appointed Executive Director of The Groundwater Resources Association of California.

[Return to Summer '97 Table of Contents](#)

[Return to HydroVision Home Page](#)

Non-Target Compounds - You Can't Always Get What You Want

by BART SIMMONS

An issue that has resurfaced recently is the reporting of non-target compounds. Each of the U.S. EPA approved methods has a list (or lists) of target compounds which are within the scope of the method. The compounds which are actually reported will vary from lab to lab and from project to project - a well-designed project will specify exactly which target compounds should be included in each method. Gas chromatography - mass spectroscopy (GC-MS) methods have the option of looking at non-target peaks and making tentative identifications by comparison with library mass spectra. These tentatively-identified compounds (TICs) are typically reported with an estimated concentration, since the TICs were not used in calibration. The U.S. EPA Contract Lab Program (CLP) requires the reporting of up to 20 TICs per sample. Some laboratories have fixed prices for reporting the largest ten or twenty non-target compounds.

Reporting TICs for non-GC-MS methods is less routine, since tentative identifications usually cannot be made without re-analysis using a standard of the suspected compound. However, the number of non-target peaks can be reported for chromatographic methods.

The reporting of non-target compounds is not required by the California Environmental Laboratory Accreditation Program (ELAP). Since the reporting of non-target compounds is not required by method, and not required as part of lab certification, the user of data should be aware. A lab which discovers an unexpected peak during analysis may report verbally or in writing to the client, but will often follow the client's request. Commercial labs have been caught in ethical dilemmas when significant non-target compounds appear but were not part of the client's request.

The history of site investigations has revealed examples of unconventional contaminants that are not target compounds in the usual test methods: methyl-tetrahydrothiophenes from refinery alkylation sludge (McColl site), lewisite, an extremely toxic chemical agent buried with kits used for military training, 1,4-dioxane, a commonly used solvent (can be measured by Method 8260 or 8270, but with method modifications), glycol ethers, and methyl-*tert*-butyl ether (MTBE).

Methyl-*tert*-butyl ether (MTBE), which we discussed in an earlier column, is an example of a non-target compound for EPA Method 8260, which is a popular method for volatile organics. The occurrence of MTBE has motivated Regional Water Quality Control Boards to require MTBE monitoring to be included in leaking underground fuel tank (LUFT) investigations and most laboratories now include MTBE as a target compound in GC-MS as well as GC-FID/PID methods for petroleum contamination. There is a body of data on groundwater contamination, including data used in the Lawrence Livermore National Laboratory "Plumathon" study, which does not include MTBE because it was not a target compound, although it may have been present at detectable concentrations in some samples.

The lessons for lab clients: know what you are asking for, and whether the lab will be reporting non-target compounds. For regulators: require the reporting of TICs if a site is uncharacterized and there is a reasonable probability of contamination with unconventional pollutants.

The laboratory ethical dilemma for reporting non-target compounds is yet to be resolved. ELAP and the National Environmental Laboratory Accreditation Conference have encountered the issue, and future quality standards may help create more consistency in reporting unexpected pollutants.

Bart Simmons, Ph.d., is the Chief of the Hazardous Material Laboratory, Department of Toxic Substances Control, Berkeley, CA.

[Return to Summer '97 Table of Contents](#)

[Return to HydroVision Home Page](#)

PRESIDENT'S MESSAGE

by Susan Garcia

This President's Message is an excellent opportunity for us to reflect on GRA's mid-year performance and to discuss actions implemented to address concerns voiced by our membership during 1996.

Mid-Year Reflections

We held a retreat in January 1997 to establish short-term and long-term goals for the organization that addressed issues associated with our organizational growth and defined our vision for the future. We developed our mission statement which says that GRA is dedicated to resource management that protects and improves groundwater through education and technical leadership. A variety of committees were created and action items were identified to obtain our goals. Activities that are currently ongoing consist of developing educational seminars and meetings, including teaming opportunities with other organizations; reviewing our bylaws and proposing changes that reflect our current status; continuing to make our Web Page more informative; and many other activities.

In addition, we have recently appointed an Executive Director and contracted with a Membership Database Administrator to assist us in achieving our goals. I am pleased to announce that GRA has appointed Mr. Harrison Phipps as our new Executive Director. Harrison will assist GRA in promoting our mission, keeping us abreast on legislative issues, and obtaining foundation grants and funding for the organization. I am also pleased to announce that we have contracted Ms. Paula Noble as our membership database administrator. Paula will be responsible for updating and maintaining our membership database (see lower right portion of this page for information on how to contact Paula). GRA will certainly benefit from the efforts of these two individuals.

Actions Implemented to Address Member Concerns

Feedback from our membership on our performance last year indicates that there were five areas that GRA should examine to improve the organization. These areas are as follows:

1. Better Communication Between State GRA and the Various GRA Branches
2. Timely Mailing List and Directory Updates
3. Policy on Endorsements for Political Appointees to Groundwater/Water Organizations
4. Clarifications to the GRA Bylaws

The GRA Board has examined each of the above-listed areas and within the last six months has implemented potential solutions to address these concerns. Discussed below are the solutions that have been implemented and that are currently being evaluated.

Better Communication Between State GRA and the Various GRA Branches

Communication between GRA state officers and the various GRA Branches has always been a concern. The widespread geographic locations for our Branches increases the potential for communication breakdowns. In response to the breakdown in communication that occurred last year, we have undertaken the following specific actions to improve communications between the GRA state officers and the various Branches:

Creating a GRA Web page and providing each Branch with their own mail box. Statewide and Branch activities and HydroVisions will be reported on the GRA Web page. The page is currently being used and to date has been visited over 950 times. As we all become more comfortable with using the Web page, more benefits will be experienced by GRA members.

- Distributing copies of our Board of Director Minutes to the various Branch Presidents. (We are currently considering posting the final minutes on the GRA Web page for member review.)
- Encouraging the attendance of Branch Officers and interested members at GRA Board meetings. The schedule and location for GRA Board Meetings have been identified in HydroVisions. At least one week prior to the Board Meeting the Branch President is provided with a copy of the draft agenda and asked to comment on it.
- Assigning a member of the Board as a Branch Sponsor and encouraging Directors to attend Branch meetings.
- Establishing a Liaison Committee.
- Listing in HydroVisions phone numbers and e-mail addresses for members of the Board of Directors, State Officers, and Branch Officers.

- Contracting with Harrison Phipps as our new Executive Director. Harrison will be preparing an informal newsletter for Branch and State Officers and the Board of Directors that will keep us abreast of activities and legislation of interest.
- Contracting with Ms. Paula Noble as our new Membership Administrator. She will be contacting each of the Branches to discuss the format and schedule that they would like for receiving membership information updates.

Timely Mailing List and Directory Updates

GRA acknowledges that during 1996, difficulties were encountered in the distribution of updated mailing lists and directories to our membership. Prior to 1996, we had contract labor perform these activities with much success; however, following the resignation of Ms. Wendy Ernst, membership renewal notices and reminders were not accomplished in a timely manner so distribution of the Membership Directory was delayed.

To mitigate these problems, we have contracted with Ms. Paula Noble to maintain our membership database, distribute updated mailing lists to Branches, send out renewal notices and reminders, and send out an updated membership directory. Paula will provide updated membership data information to the Branches monthly, or as needed. Mr. Paul Dorey, Membership Chair and member of the Board of Directors, will be working closely with Paula to ensure that GRA's needs are communicated to her. As noted above, Paula will be contacting the Branches to discuss their specific needs. This year we will be providing our members with the directory on computer disk. The directory should be available about the end of July 1997.

Policy on Endorsements for Political Appointees

GRA, in the past, has neither endorsed nor provided monetary contributions to political candidates. We do not yet have a policy on non-monetary endorsements and would like your thoughts and suggestions for consideration during our August 1997 Board Meeting.

Clarifications to the GRA Bylaws

The GRA Bylaw committee has reviewed our current bylaws and has proposed changes to clarify the Board of Director terms and selection process. In addition, GRA is proposing increasing the size of the Board to eleven individuals so that the State officers have a vote. These proposed changes will be finalized in August 1997 and will be submitted to the membership for approval by mail prior to this year's annual meeting. Results of the Bylaw changes will be announced at our 1997 Annual Meeting, being held September 15 and 16, at the Radisson Hotel in Sacramento.

Summary

The GRA Board of Directors and State Officers have made concerted efforts within the last six months to address most of the concerns identified by our members. We hope that some of our efforts have already improved communication between the Board, the State Officers, and the Branches. Please feel free to contact me to share your thoughts or comments (e-mail 73661.1162@compuserve.com). I look forward to hearing from you.

[Return to Summer '97 Table of Contents](#)
[Return to HydroVision Home Page](#)

Regulatory Board Duped by Flawed Study

by Floyd Flood

On April 23, 1997, Lawrence P. Kolb, Acting Executive Officer for the Los Angeles Regional Water Quality Control Board, issued guidelines for implementing the non-purge method of sampling groundwater as well as for identifying conditions where purging of groundwater monitoring wells are required. The Western States Petroleum Association (WSPA), composed of the major oil refining and transportation companies operating in the western states, commissioned the report, "The California Groundwater Purging Study for Petroleum Hydrocarbons." The non-purge method and concerns about the study methodology were outlined in the Spring 1997 issue of HydroVisions. Based on numerous requests, GRA has sent out copies of the study for a nominal fee with Dr. Michael Barcelona's comments attached.

Michael Barcelona, Ph.D., formerly with the Illinois Water Survey and now Director of the "National Center for Integrated Bioremediation Research and Development" at the University of Michigan, Ann Arbor, was asked to peer review the study. Dr. Barcelona reviewed the initial workplan and the final report. Dr. Barcelona also reviewed Mr. Kolb's guidelines and wrote to both Mr. Kolb and Mr. James Giannopoulos, Chief Regulatory Programs, California State Water Resources Control Board. The letters were essentially identical. **HydroVisions** received a copy of both letters. The following is a copy of Dr. Barcelona's response to Mr. Giannopoulos.

June 3, 1997

Mr. James Giannopoulos
Chief - Regulatory Programs
California State Water Resources Control Board
P. O. Box 944212
Sacramento, CA 94244-2120

Dear Mr. Giannopoulos:

I am writing to you as an educator, researcher and ground water professional who has often provided sampling guidance and workshops across the country. I have always had an appreciation for the eagerness with which local and state governments have embraced the results of research to improve the efficiency of their programs. California government, in particular, has been a stand out in this regard, until very recently. The April 23, 1997 memo, "Use of Non-Purge Method for Sampling of Ground Water Monitoring Wells at Gasoline Impacted Sites" written by the L.A. Regional Water Quality Board's Executive Officer was very disappointing reading. Indeed the "method" is a fraud.

I can understand an interest in reducing the costs of monitoring. *However, given that the designated wells are "impacted"* the annual costs of remediation should no doubt be considerably greater than the total long-term monitoring costs. The facts as I see them are:

1) The WSPA study (conducted by SECOR over the past year) was flawed from the beginning since it is not possible to bail a well to "purge" stagnant water from wells. This has been shown by numerous, peer-reviewed papers in the last 15 years. Purging poorly creates very high variance in results which makes it impossible to show significant differences between unpurged (biased) samples and those after purging with very disruptive techniques (i.e. bailing or vacuum truck).

2) The most volatile compounds (e.g. MTBE and benzene) are also the most mobile and likely to be lost from stagnant or poorly purged water in wells. They also can drive further cleanup action given their biological effects which may influence risk evaluations. These evaluations should be based on the most reliable samples possible.

3) Wells screened across the water table aren't very useful to determine the chemical and hydrogeologic conditions in the subsurface. (As opposed to multiple discrete completions above, in, and below the "plume".) They cannot be tested for hydraulic conductivity testing. and,

4) The WSPA study design and the results were reviewed, but the comments of experienced critical reviewers were ignored at both stages I can tell you with confidence that, having been the editor of a major journal, "Ground Water Monitoring and Remediation" for over five years, the results of this study should not be expected to be favorably peer reviewed towards publication. I urge you to carefully review the facts in this matter and resist lobbying or interests that would have us give leave of our logic and commitment to high quality, consistent environmental monitoring.

Thank you for your consideration of my thoughts.

Sincerely,

Michael J. Barcelona, Ph.D.

Research Professor

Dr. Barcelona seems to be the best credentialed critic of the WSPA study. I have read his comments and WSPA's response. Dr. Barcelona has repeatedly demonstrated how the fundamentals of the study were flawed. It's unfortunate that "poor science" is being used to justify a "no-purge" option. The inherit bias of a bailer as a sampling device makes it a poor candidate to demonstrate that purging is not necessary.

GRA is attempting to help disseminate information by making Dr. Barcelona's comments available, as well as the WSPA study.

If you would like a copy of the study and Dr. Barcelona's comments, please send \$5.00 to GRA to cover reproduction and mailing costs.

[Return to Summer '97 Table of Contents](#)

[Return to HydroVision Home Page](#)

Sacramento Branch

BY TIM PARKER

The Sacramento Branch has continued to have good attendance at the Branch meetings, which have provided social and networking opportunities over a good variety of technical discussions. We are currently working with CSUS to develop a local student presence for the organization.

An overview of the CALFED Bay-Delta Program was provided at the February meeting, held on Thursday the 27th at the royal Hong King Lum Restaurant in Sacramento. Mary Scoonover, a Deputy Attorney General in the Land Section of the Public Rights Division of the California Department of Justice, provided the informative, broad brush overview of the program, which was very interesting. The CALFED Bay-Delta Program is a cooperative effort among state and federal agencies and the public to ensure a healthy ecosystem, reliable water supplies, good water quality, and stable levees in California's Bay-Delta system. The program mission is to develop a long-term comprehensive plan that will ensure ecological health and improve water management for beneficial uses of the Bay-Delta. The program started in June 1995 as a collaborative effort to address a declining ecosystem, uncertain water supplies, imperiled water quality, and unstable levees in California's Bay-Delta, the region where the San Francisco Bay meets the Sacramento/San Joaquin River estuary. This 738,000 acre area of channels, sloughs, and islands is a critical habitat for 120 fish and wildlife species. It also serves as the hub of California's water distribution system, supplying drinking water to approximately 20 million people in northern, central, and southern California and irrigation water to roughly 4 million acres of farmland. The CALFED Bay-Delta Program has been divided into three phases. Phase I, conducted in 1995 and 1996, included the problem identification, mission statement, guiding policy, and three alternative solutions development for the Bay-Delta problems. In Phase II (ongoing), the feasibility of the three alternative solutions is being evaluated, a comparative analysis conducted, and a preferred alternative solution will be selected. Phase III, currently scheduled for late 1998, or early 1999 and projected to require many years to complete, will involve implementing the selected alternative. For more information, visit CALFED's home page at [\[http://calfed.ca.gov\]](http://calfed.ca.gov).

Joseph C. Stagner, PE, provided an interesting presentation on a development on groundwater remediation technology featuring simultaneous in-well air-lift pumping and treatment by aeration of groundwater contaminated with volatile organic compounds (see article in the next issue). This remarkably simple device (no moving parts), the Multi-Stage In-Well Aerator (Aerator), is considerably less expensive in initial capital costs and operation and maintenance costs than conventional air stripping. The Aerator capitalizes on the high Henry's Law constants of most solvents, and operates on essentially the same principles as a conventional air stripper. Engineering design parameters for the Aerator include the air/water flow ratio, number of successive aeration passes, water temperature, concentration and Henry's Law constant of target contaminants. Mr. Stagner, who presently holds the position of Solid Waste Manager with the University of California Davis, discussed how the Aerator was employed in a remedial action.

The April meeting was held on the evening of the 24th at Placer Hall, California State University Sacramento, the joint facilities of the CSUS Geology Department and the Water Resources Division of the United States Geologic Survey (USGS) California District office.

An overview of injection pilot tests to assess feasibility of storage and recovery of imported surface water from production wells, City of Lancaster, California, was presented by Steve Phillips, Hydrologist with the USGS. The purpose of the tests is to determine the general feasibility of injecting and recovering imported surface water through the existing production wells, and to collect data required for development of an injection program management tool. Early (1994) tests showed unexpectedly large changes in land surface with the onset of injection, so measurement and analysis of these changes became a secondary goal in subsequent tests (April 1996, November 1996 to April 1997).

Several methods were used to monitor the hydraulic effects of injection, and to learn more about the relation between injection and aquifer system deformation. Water levels were measured continuously or periodically in wells near the injection site. Microgravity surveys were made to measure mass changes for the purposes of mapping the position of the water table and determining water storage capacity of the aquifer. Aquifer-system deformation was measured directly with a two-stage borehole extensometer, and indirectly with a continuous GPS station, first-order leveling, and an L-shaped array of tiltmeters. These data will be utilized to constrain a numerical model of groundwater flow and aquifer-system deformation, which will be linked to optimization tools for use in managing an injection program. Also provided was an overview of the USGS California regional activities, presented by Walt Swain, Hydrologist with the USGS.

The USGS is a pure research organization, with no data generated being proprietary. Current USGS programs in California include: earthquake hazard assessment and mapping; flood forecasting/surface water data collection and monitoring; volcanic hazard assessment and monitoring; landslide hazard studies and map development; San Francisco Bay/Delta System monitoring and

assessment; marine waste assessment and mapping; Monterey Bay National Marine Sanctuary studies; San Joaquin-Tulare, Sacramento, and Santa Ana River Basin National Water Quality Assessment Program long term monitoring for changes in water quality; water supply/water management including a comprehensive approach integrating surface and groundwater resources; investigation of saltwater intrusion into Santa Barbara and Ventura Counties; geologic resource studies and mapping; reduction of environmental impacts of mining through better byproduct recovery; mercury distribution and source identification in the Cache Creek drainage area; studies on threatened or endangered species throughout California, as well as focused evaluations of the rare desert tortoise and Mojave Desert; southeastern California Colorado Desert assessment that includes studies of the environmental impact of mined and un-mined mineral deposits, baseline and background studies to protect numerous threatened and protected species; Sierra Nevada Ecosystem studies; topographic mapping.

For more information: USGS, Placer Hall, 6000 J Street, Sacramento, CA 95819-6129; phone (916) 278-3026; e-mail [dc_ca@usgs.gov]; California District Home Page [<http://water.wr.usgs.gov/>]; USGS Home Page [<http://www.usgs.gov/>]; for USGS reports, maps and products call 1-800-USA-MAPS.

The following two meeting will be reported in the next Issue of HydroVisions.

May 22, 1997 - Litigation of Groundwater Contamination Cases - Minefields and Pitfalls - Dan Costa, Esq., of Diepenbrock & Costa of Sacramento provided a discussion on the litigation process, including initial investigations, prosecuting and defending groundwater contamination actions, presentation of expert witness testimony, and typical issues such as fingerprinting of sources, contaminant migration history, procedural hurdles, importance of good record keeping, availability of insurance coverage, and settlement negotiation.

June 19, 1997 - MTBE in California: An Overview - The oxygenate methyl *tert*- butyl ether (MTBE), added to reformulated gasoline to meet Federal and State requirements for cleaner burning fuel, has become a technical, regulatory and political focal point of controversy in California. The presentation, by Susan Henry, PhD, of Kennedy Jenks Consultants, provided an updated overview of issues associated with the use of MTBE in California and resultant impacts on groundwater and drinking water supplies.

Future planned meetings of the Sacramento Branch include:

July 17, 1997 - Statistics in Groundwater - To be presented by Barbara Heinsch of EMCON, Inc. - Hear an interesting presentation on a challenging subject. To be held at the royal Hong King Lum Restaurant, Sacramento.

August 21, 1997 - USGS National Water-Quality Assessment Program (NAWQA) - An overview of the NAWQA program, design of the Sacramento studies, and results of the San Joaquin Valley studies. To be presented by Karen Borrow-Fogg and Barbara Rushdon of the USGS at Placer Hall, California State University Sacramento.

[Return to Summer '97 Table of Contents](#)
[Return to HydroVision Home Page](#)

San Francisco Branch

BY JAMES S. ULRICK

Dr. Jay Lehr provided an entertaining evening discussion on "The State of the Environment and the Environmental Professional in 1997." Because of his 40 plus years in the groundwater industry, Jay has a unique perspective on the overall "health" and prosperity of the groundwater industry. He felt that the "boom and bust" cycle of environmental hydrogeology has been completed and the manpower level of industry professionals is beginning to stabilize. The industry peaked in about 1990 and 1991. He iterated that the environmental awareness of the public that was piqued and supported by environmental legislation will not disappear. The shift of the environmental work will be toward free enterprise and marketing in a capitalistic country. For instance, the employer of the groundwater professional is beginning to change from traditional engineering firms to financial institutions (i.e., banks, loan companies, and insurance companies). However, there will always be employment in private engineering companies. Large multi-disciplined engineering companies have been downsizing; whereas small, efficient, and cost effective "niche" companies are continuing to thrive. Because of the extensive and long-term experience US engineers and geologists obtained in the last 20 years, opportunities abound in overseas work. The US is the leader of the world in environmental cleanup. Most countries are from five to thirty years behind the US.

[Return to Summer '97 Table of Contents](#)

[Return to HydroVision Home Page](#)

So. California Branch

BY JIM CARTER

The Southern California Branch was pleased to have Keith Elliott as our keynote speaker. Mr. Elliott is with the LA Regional Water Quality Control Board, and the title of his presentation was "Working with the LARWCQB--How to Get Approval For Containment Zones." On October 2, 1996, the State Water Resources Board adopted Amendment Resolution 92-49, Policies and Procedures for Investigation and Cleanup and Abatement. This Amendment to Section 13304 of the Water Code calls for the inclusion of a "Containment Zone Policy." The policy establishes conditions under which a Regional Water Quality Board may approve containment zones. Mr. Elliot discussed the conditions under which a containment zone would be approved. A primary condition would be that a specific portion of groundwater bearing units existed where water quality objectives cannot be reasonably achieved. Keith went on to discuss the requirements for long term monitoring to ensure that there is no migration of contaminants, and the requirement to have on file an approved contingency plan if migration is detected. Keith enlightened us to the fact that the containment zone policy was not intended for broad use, but rather for specific and limited application. He said that probably less than 100 sites in California may meet the requirements to be approved as containment zones. The meeting was very interesting and well attended. We wish to thank the sponsor of the flyer, Tri-County Drilling, Inc., for their support.

Our May meeting was a panel presentation on Brownfields. Ms. Lynn Preslo of Earth Tech and Mr. John Van Vlear of Brown, Pistone, Hurley & Van Vlear were our keynote speakers for the dinner meeting held at the Wyndham Gardens Hotel in Costa Mesa. The speakers addressed the legal aspects of Brownfield projects as well as an overview of where we have been and where we are going with the remediation and redevelopment of Brownfields. More information on this talk will be presented in our next newsletter.

[Return to Summer '97 Table of Contents](#)
[Return to HydroVision Home Page](#)

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[Return to Summer '97 Table of Contents](#)

[Return to HydroVision Home Page](#)