

Curriculum Vitae

Roger W. Lee, Ph.D., P.G.

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EDUCATION:

1996 - University of Texas at Austin, Ph.D., Geochemistry and Hydrology (36 sem hrs)
Dissertation: "Geochemistry of sewage-contaminated water in the shallow sand and gravel glacial outwash aquifer, Cape Cod, Massachusetts," Produced three journal articles, involving geochemistry, equilibrium modeling, transport modeling, oxidation-reduction processes, and carbon dioxide flux determinations related to global carbon dioxide cycles. University of Texas, Austin, TX USGS selection for Graduate Training, Dr. Philip Bennett, Advisor.

1982-1983 Georgia Tech University, Graduate Geosciences (8 sem hrs.),

1975 - USGS Graduate Training Program, Geosciences, (32 sem hrs)

1975 - Texas Tech University, M.S., 1975, Chemistry and Geology
Thesis: "Clay-kerogen associations in Washakie Basin oil shales," involving laboratory methods of clay separation, X-ray diffraction, transmission and scanning electron microscopy, optical petrology, and infrared absorption to define the nature of clay-organic associations. Paper in Proc. AAAS Regional Conference, Los Alamos, New Mexico

1971 to 1972 University of Houston (12 sem hrs.)

1965-1969 Texas Tech University, B.S. Chemistry and Mathematics, (130 sem hrs)
Texas Tech University, graduate teaching & research assistant, Lubbock, TX, 1973-75, (40HRS/WK) Necip Guven, Advisor

LANGUAGES:

Spanish (some reading, speaking ability);
German (reading).

AWARDS AND HONORS:

Sigma Gamma Epsilon, 1974;
USGS Special Achievement Award, 1986;
USGS Special Achievement Award, 1988;

Adjunct Professor Appointment, 1989-93, University of Texas School of Public Health;
USGS Graduate School Program, 1989-90;
USGS Special Achievement Award 1992; Cash Award; Special Achievement, 1993, STAR
Cash Awards, 2000, 2002, 2003, Raving Fan Award from Chesapeake Resources, 2008.

PROFESSIONAL SOCIETIES:

American Geophysical Union,
National Ground Water Association.

PROFESSIONAL EXPERIENCE

2010 to Present - Sims & Associates, LLC, Austin, Texas, Senior Geoscientist.

Established work with two law firms and clients having pending legal actions for oil-field brine contamination of groundwater in West Texas and Louisiana. Designed field work for West Texas designed to confirm the release of brine to groundwater and the court action and subsequent depositions and testimony. The Louisiana brine case was settled out of court with a major oil company in September, 2014. Other selected projects:

- Assisted with NEPA and Phase I site investigations and reporting for cell tower placements throughout the U.S, acting as both an investigator and report QA and review.
- Obtained two contracts to Sims & Associates, one an extension of a USGS contract for a web-based training class in water-quality principles, completed in 2014, and a research project for soil-vapor intrusion research conducted at Hill AFB in Utah in 2010, by a team of researchers, and completed in 2012.
- Served as a Consultant to Pioneer Technical Services as Senior Geochemical advisor to BP/ARCO for the Butte Mining Superfund Site, Butte, Montana, since 2010. My three principal projects in Butte include working on a team to address a) copper and zinc contamination of a shallow alluvial aquifer from ARD, b) arsenic contamination and geochemistry of groundwater at a timber treatment facility, and c) geochemical modeling of the neutralization process for captured groundwater contaminated with ARD.
- Served as lead geochemist in solid phase analyses of contaminated alluvial sediments, conducting column experiments and data gathering, and preparing most of the final documents.

2006 to 2010 – Environmental Resources Management (ERM), Austin, TX, Senior Consultant, Led technical investigation teams in a variety of site investigation and remediation activities, from aqueous geochemical and hydrogeological modeling of ground water and contaminated aquifers, to environmental audits and expert testimony in litigation for confidential clients. Was a key environmental scientist at ERM for more than 10 site investigations and remediation at contaminated sites in industrial, manufacturing, mining, and oil and gas sectors, including three Superfund sites, and one large mining site in Washington State. Here are some details:

- Modeled geochemistry of neutralization of ARD from the Holden Mine, WS, for Rio Tinto.
- Assisted Goldcorp Inc. in evaluating hydrology and geochemistry at two gold mine sites in South Dakota.
- Began a project funded by U.S. Geological Survey to develop and produce a web based e-learning course in Water Quality Principles.
- Have been a technical expert in four litigation support actions, providing chemical and hydrogeological expertise, including 3 depositions and one court testimony.
- Have provided geochemical and 1-D transport modeling of contaminants for more than 6 contaminated sites.
- Was also a key member of a team that prepared a manual for arsenic management in groundwater at petroleum contaminated sites for the American Petroleum Institute.
- Was instrumental in developing approaches to water resources and water management for shale gas development in the southeastern U.S., providing a basis for multiple projects in assessing water issues for the industry to oversight agencies and the general public, which resulted in multiple projects for ERM.
- Wrote more than 20 proposals that have resulted in more than \$200,000 in project wins in the last 2 years, although sales were not my principal activities at ERM.

1976 – 2006, U.S. Geological Survey-Water Resources Division and Research

Division: Served as a hydrogeologist and geochemist for 30 years working on state and national programs related to groundwater assessments and research in Montana, Atlanta, Nashville, and Texas. Experience transformed from research aqueous geochemistry to environmental geochemistry and hydrogeology. Even more recently, he served seven years as technical support and USGS/EPA liaison for Region 6 Superfund in Dallas, TX. including meeting with other U.S. Department of Interior trustees to assist with Natural Resources Damages Assessments in conjunction with Superfund sites.

Work focused on three principal areas of environmental work and technical support to the Superfund program in Region 6 as described below. In 1989 he was selected for advanced graduate training by USGS-WRD in geochemistry and was transferred to University of Texas and the Austin District office where he completed work course work and research, and received a Ph.D. in Geological Sciences in 1996.

USGS Field Oversight Activities

- Specific expertise in aqueous geochemistry and hydrogeology, where I conducted research and field investigations with USGS. My long experience in collection of water samples has been used for oversight and review of sampling programs proposed by USGS and by contractors for EPA at Superfund sites.
- Significant experience at USGS and applications at EPA in isotope hydrology. I was the principle technical adviser to EPA Region 6 on monitored natural attenuation remedies.

- Most of my work has been with ground water and I worked on many projects overseeing temporary and permanent well installations in both unconsolidated sediments and hard rock aquifers employing a variety of drilling and direct push technologies.
- My knowledge of and experience with gas chromatography have been used on contaminated sites to delineate plumes of BTEX, chlorinated solvents, and naphthalene (creosote). I also used field gas chromatography to analyze soil vapor and ground water to determine the location of VOCs in shallow ground water at 2 industrial sites in Tennessee, 1 U.S. military site at Diego Garcia, British Indian Ocean Territories, 3 military sites in Texas, and 1 industrial site in New York near Niagara Falls.
- Superfund sites where I have been the principal for technical support in field and methods applications:

Sol Lynn, TX—Sampling, monitored natural attenuation parameters, dynamic field work using CPT & in situ analyzers, field analyses of soil vapor for Vinyl chloride;

GCVMS & DL Mud, LA—improved field sampling methods to overcome years of poor quality data gathered by consultants for a PRP;

Perryton, TX—applied novel methods of nitrogen isotopes & cultural chemicals in water to determine source of nitrate contamination;

Griggs & Walnut, NM—oversight of soil gas sampling for PCE;

Grants, NM—oversight of field sampling for monitored natural attenuation and soil gas sampling to support geoprobe plume delineation;

Molycorp, NM—application of field method of radon analyses in streams and springs of the Red River, NM to determine the magnitude of ground water discharge;

N. Cavalcade, TX—field gas chromatography to support geoprobe delineation of BTEX & PAH plume at Creosote site;

Brio, TX—Technical support to EPA on remedial action, natural attenuation, and sampling and field analyses for VOCs;

Tar Creek—provided field data for geochemistry and groundwater flow directions in flooded mines and reported results leading to a successful method of disposing of waste tailings and rock in the flooded mines.

Fate & Transport Modeling

- Experience with 2 & 3-D fate & transport modeling, I focused my efforts at USEPA and elsewhere on modeling using 1-D models (centerline) such as BIOSCREEN, BIOCHLOR, PHREEQ-C, and PHREEQM, as cost-saving, yet effective approaches to predictive modeling. I have developed models to assess solute transport and to assist in remedy selection at a number of Superfund sites
- Experience with BIOSCREEN, a 1-D fate and transport model for petroleum products at Ouachita-Nevada, AR for PCP transport at a wood-treating site; at N. Cavalcade, TX to predict transport of naphthalene; at Madisonville, LA to assess effectiveness of a clay layer at inhibiting transport of naphthalene from a shallow contaminated aquifer to a deeper one; at Old Midland, OK to assess transport of PCP & PAHs to evaluate the location of monitoring wells for the remedy.
- Experience with BIOCHLOR, a 1-D fate and transport model for chlorinated solvents (I was a peer reviewer of the latest version of BIOCHLOR) at Sol Lynn, TX to assess contaminant mobility in support of remedy selection and to evaluate natural attenuation and degradation of TCE in groundwater; at Grants, NM to assess natural attenuation of PCE from dry cleaners; at Brio, TX to assess natural attenuation of a mixed chlorinated solvents plume, and two client privileged sites in the U.S.
- Used PHREEQ-C, a 1-D reaction coupled transport model at a client-privileged site in Washington to determine sludge accumulation, reaction rates, and neutralization chemistry of acid rock drainage before pilot studies and remedial actions;
- Also at Delatte, LA to determine fate and transport of dissolved lead in a shallow sand aquifer to determine an appropriate remedy for the site;
- At Central Wood, LA with David Parkhurst, the creator of PHREEQ-C, to model transport of chromium and cadmium;
- At Tar Creek, OK with David Parkhurst and Weston Solutions, Inc. to evaluate chemical reactions that might occur when waste lead-ore rock is emplaced in water-filled mine rooms;
- At Mass. Military Reservation, Cape Cod, MA, I used PHREEQM to model transport of iron and manganese in groundwater.
- Applied most of the principal aqueous geochemical modeling software WATEQF, PHREEQE, NETPATH, PHREEQ-C to various projects with Sims & Associates, LLC, USGS, EPA, and ERM.
- Developed expertise in GEOCHEMISTS' WORKBENCH over the last 6 years that has been a key analytical tool for geochemistry of all three of the areas of investigation in the work for BP/ARCO in Butte, Montana.

Technical Review and Professional Activities

- Provided technical review and technical assistance with planning of all phases of EPA Superfund actions (more than 70 sites) with consulting firms, especially Remedial Investigations/Feasibility Studies, Remedial design, Remedial Actions, and five-year reviews of active Superfund sites.
- Provided colleague reviews for USGS and numerous peer reviews for papers in scientific journals.
- Coordinated and lectured in a USGS course on Water Quality Principles, for the last 15 years.
- Chaired various technical sessions at national conferences, including organizing a technical session on EPA's Formerly Used Defense Sites (FUDS) at the joint USGS-Dept. of Defense conference in 2004, and
- Chaired a technical session on wood-treating sites at the Battelle Conference on Recalcitrant Compounds in 2000.
- Led a United Nations technical team to provide technical support to a coal mining project in Xi'an, People's Republic of China in 1994.

PROFESSIONAL EXPERIENCE

- ❖ USGS/USEPA liaison and technical support in water chemistry and hydrogeology, at Superfund Sites, Region 6, Dallas, TX 7/1998-present, GS-14 (40HRS/WK)
- ❖ Battelle Conference on Recalcitrant Compounds in the Environment, 2000, session Chair. Presentation on Chromium remediation I helped to conduct, Battelle 2004.
- ❖ USGS-DOD Joint Conference Session Chair for EPA Interagency Work On Formerly Used Defense Sites, 2004.
- ❖ Assisted teaching and coordination of a field hydrogeology class for University of Texas, Austin, at the Carswell AFB Phytoremediation Site, Ft. Worth, Texas, 2002.
- ❖ Coordinator for Water-Quality Principles Course National Training Center, 2000-01; Instructor, USGS, 1993-2004. I taught this course with colleagues in 2002 in the United Arab Emirates to staff of the National Drilling Company.
- ❖ Lectured students and faculty of the Technical University in Delft, the Netherlands on environmental research and remedies at Superfund sites in the United States, 2002.
- ❖ Lectures to regional audiences at a joint seminar by USGS/USEPA on chemistry of natural attenuation processes of organic contaminants in ground water, 1999-2000.

- ❖ Project Chief for Phytoremediation Research, Rio Grande trace metals in sediment, Brio Superfund site investigation, Dallas NWIRP Superfund site
- ❖ Consulting and assistance to USGS Michigan Regional Aquifer Study (1991-93).
- ❖ Consulting and assistance to USGS Edwards RASA (1991-93).
- ❖ Blue-ribbon panel review of hydrogeologic studies at Los Alamos, New Mexico, 1993
- ❖ Consulting and assistance to USGS Hawaii District in Fuel Contaminated Ground water at the US Air Base, Diego Garcia, British Indian Ocean Territories (1993).
- ❖ Consulting and assistance to Offices of Ground Water and Water Quality, USGS
- ❖ Session Chair, planning committee and workshop coordinator. American Institute of Hydrology, National meeting, 1994,
- ❖ Tennessee District Research Geochemist, Nashville, TN1986-89 GS-13, (40HRS/WK) Fred Quinones, Supervisor (ret.)
- ❖ Completed two projects in volatile organic compounds in soil vapor, geochemical modeling in Oak Ridge, Tennessee.
- ❖ Geochemistry in Cape Cod, MA shallow ground water.
- ❖ Acting Investigations Section Chief, 8 mos, Proposed, developed, and arranged funding for three other cooperative projects.
- ❖ Coordinated research project in Puerto Rico with Lamont-Doherty researchers in use of Radon-222 in groundwater surface-water relations.
- ❖ CH2M-Hill engineering consultants, 8/85 to 11/85, Milwaukee, WI, staff geochemist, Mike Anglea, Supervisor (ret.), \$42,000/yr
 - Carried out two projects, consulted to six others, water-quality related issues, project development
- ❖ Southeastern Coastal Plain-Regional Aquifer Study, Southeast Region, Atlanta, GA, Geochemist 9/1979-9/86 GS-12, GS-13 in 1983, (40HRS/WK) James Miller, Supervisor (ret.).
 - Designed, executed, and completed research geochemistry on Regional Aquifer Study
 - Provided consulting to several Districts in Southeast Region
 - Conducted regional and national training courses in aqueous geochemistry

Nations Development Project in Xi'an, People's Republic of China. I provided technical support and led a technical support mission there in 1995 with Derek Elsworth, Penn State University. The program was highly successful in meeting the Chinese objectives. With scientists at the Hawaii District, I conducted and guided research in the unsaturated zone of a fuel-contaminated fresh-water lens in Diego Garcia, British Indian Oceans Territory. I developed field methods for permanent gas analyses in water and soil gases. I have completed research activities on a merit project in mine spoils geochemistry in Texas. I further led a project to use nitrogen isotope geochemistry in the study of nitrate sources in an urban watershed in Austin. In 1993, Niel Plummer was awarded the O.E. Meinzer award in part for a paper on geochemical modeling of the Madison aquifer that I co-authored.

1989-1990, I completed 32 graduate class hours (GPA 3.70) at the University of Texas, toward a Ph.D. in ground-water geochemistry. Passed the qualifying examination in March 1991, and obtained a Ph.D in 1996.

1986-1989 in the Tennessee District, I was involved in several research, investigation, and management activities. I directed a Superfund site investigation that included some of the earliest applications of soil gas survey methods for VOC's. We used Radon-222 as a tracer of ground-water discharge to streams, which led to a research paper. In 1988, I was invited to participate in geochemical research at the Cape Cod Toxic Waste Site in order to study sewage contaminant geochemistry. From January 1986-July 1986, I was acting Investigations Section Chief, Tennessee District. I managed a 25-member section that included four RGE staff. I contacted potential cooperators and helped develop programs for our District. During this time, I maintained my status as RGE, and continued as project chief of another Superfund site. As section chief, I recognized the need to improve the District's in-house education program. We used several ongoing field activities for on-the-job training, and established classes throughout the year in ground-water modeling, surveying methods, and geochemistry. I was given a special achievement award in 1988 for my efforts.

1979-1986, I completed the Southeastern Coastal Plain-Regional Aquifer investigation with several publications. Specifically, journal articles in 1985 and 1988 that used flowpath geochemical mass-transfer modeling were breakthrough applications in Coastal Plain sedimentary aquifers. The work was widely acknowledged and cited, and I received several international requests for reprints, including China, where one of my papers was translated into Chinese. I completed the Professional Paper for the RASA study, and extended the modeling work to include radiocarbon dating in the Coastal Plain aquifers. Final results of flow velocities from radiocarbon dating served to verify the regional hydrologic model flow velocities. During 1985, I directed implementation of a Radon-222 technique to quantify base flow. The project was planned and executed by myself and colleagues at Lamont-Doherty Geological Observatory and the Caribbean District for the Rio Manati, Puerto Rico. A journal article gave method and applications. I taught the method to hydrologists in MN, LA, ID, TN, and SD for application to projects. I further assisted project staff in design and execution of a flow path modeling effort in the North Coast Limestone that resulted in co-authorship of a WRI.

1975-1979 I began my duties as geochemist for Montana on the Madison Limestone project and the Powder River Basin Coal Hydrology Study. I presented a paper at the Rocky Mountain Section of GSA on ground-water geochemistry. I completed reports on the shallow ground-water geochemistry of the Powder River basin. I was promoted to GS-11 in April 1978. Work began on the Madison Limestone geochemistry report. Deep drilling and testing of well no. 3 began, and I was responsible for water-sample collection. I completed all District projects and accepted the position of project geochemist on the Southeastern Coastal Plain Regional Aquifer System Analysis, as a GS-12.

1973-1975 I enrolled in Texas Tech University Graduate School, Department of Geosciences, as a teaching and research assistant under Dr. Necip Guven. During my 2-year term, I completed work on and published two research papers, presented papers at two regional conferences, and successfully defended my Master's thesis -- Clay-Kerogen Association in Washakie Basin Oil Shales. I began work for the U.S. Geological Survey, Water Resources Division, in late July as a hydrologic field assistant in order to expedite an appointment to a professional position. On November 24, 1975, I became a GS-9 WAE Chemist. In May 1976, I received a full-time rating. My first assignments involved field work on the Fox Hills aquifer in southeastern Montana, then field work and assignment full time to the Fort Union Study in southeastern Montana.

1965-1973 I received a B.S. in chemistry from Texas Tech University. I began work for Lubrizol Corporation as a quality-control chemist for lubricants and additives. During my term of employment as a chemist (1969-1973), I attended the University of Houston Graduate School part time and completed 13 hours of course work in chemistry (9) and mineralogy (4).

OTHER CONTRIBUTIONS

1986 to 1998, I corresponded with a colleague at Xiangtan Mining College, Hunan, P.R. China. In 1992, I accepted an invitation to visit China as an exchange scientist to lecture on geochemistry and geochemical modeling. I traveled under a government visa as a USGS scientist from July to September 1992 where I delivered about 50 hours of lectures and visited three research facilities in Xiangtan, Xi'an, and Beijing. In 1993, I hosted my Chinese colleague here in Austin, Texas. We attended one conference and carried out office and field research on some of my projects.

From this collaboration, I have established two contacts with ongoing research projects, one of which I expect to participate in the near future. A second project dealing with hydrology and chemistry of acid mine water with the Coal Research Institute in Xi'an is funded by the United Nations Developmental Program. I have been asked to serve as Chief Technical Advisor for the project. The scientists on the project visited the USGS in Denver in early 1993, and I was able to conduct them on a tour of laboratory, research, computer facilities, and District operations of WRD, as well as meeting with interested parties of the Geologic Division and U.S. Bureau of Mines, all under the auspices of the Office of International Hydrology.

With the support of Jim Blakey, Regional Hydrologist, CR, we designed a scientific exchange program involving about five USGS scientists and an equal number of Chinese scientists. The program was approved by the International Hydrology Program, and the exchanges of scientists occurred from 1994-95. Financially, the program was supported from the UN Development Program for all parties involved, at virtually no cost to the USGS.

I led a two-man delegation (Derek Elsworth, Penn State University) on a two-week advisor trip in April 1995 to provide technical support service in mining engineering, geochemistry, and software support. As a result of my positive experiences in China, I was asked to assist the NAWQA program and the Chief, Pat Leahy, in WRD to develop the cooperative program with China in the paired-basins initiative between the Haihe River Basin in China and the Delmarva NAWQA in the USA. The delegation traveled to China in 1994 to develop the project implementation plan. I helped with the reciprocal visit in 1995 by coordinating the Denver part of the visit. The project implementation plan has been approved and the technical work will should begin in late 1996.

BIBLIOGRAPHY

PUBLISHED REPORTS

Lee, R.W., and Guven, N., 1975, Chemical interferences in atomic absorption spectrometric analysis of silicates in the fluoboric-boric acids matrix: *Chemical Geology*, v. 16, p. 53-58.

Lee, R.W., 1976, Flow-through bath to stabilize temperature for field pH measurements of water well samples: *U.S. Geological Survey WRD Bulletin*, October-March 1977, p. 48-49.

Feder, G.L., Lee, R.W., Busby, J.F., and Saindon, L.G., 1977, Geochemical survey of the western energy regions, Fourth Annual Progress Report: *U.S. Geological Survey Open-File Report 77-872*, p. 173-179.

Brown, D.W., Blankennagel, R.K., Busby, J.F., and Lee, R.W., 1977, Preliminary data of Madison Limestone well no. 2: *U.S. Geological Survey Open-File Report 77-863*.

Hanshaw, B.B., Busby, J.F., and Lee, R.W., 1978, Geochemical aspects of the Madison aquifer system: *Williston Basin Symposium Guidebook*, Fall, 1978.

Lee, R.W., 1979, Ground-water quality data from the Powder River basin, southeastern Montana: *U.S. Geological Survey Water-Resources Investigations Open-File Report 79-1331*.

Lee, R.W., 1980, Geochemistry of water in the Fort Union Formation of the northern Powder River basin, southeastern Montana: *U.S. Geological Survey Water-Supply Paper 2076*, Preliminary presentation at GSA, Rocky Mountain Section, Missoula, Montana, 1977; presented at GSA National Meeting, Atlanta, Georgia, 1980.

Lee, R.W., Slagle, S.E., and Stimson, J.R., 1980, Magnitude and chemical quality of base flow of Otter Creek, Tongue River, and Rosebud Creek, southeastern Montana, October 26-November 5, 1977: U.S. Geological Survey Water-Resources Investigations Open-File Report 80-1298.

Dockins, W.S., Olson, G.J., McFeters, G.A., Turbak, S.C., and Lee, R.W., 1980, Sulfate reduction in ground water of southeastern Montana: U.S. Geological Survey Water-Resources Investigations 80-9.

Levings, J.F., Levings, G.W., Feltis, R.D., Hotchkiss, W.R., and Lee, R.W., 1981, Selective annotated bibliography of geology and ground-water resources for the Montana part of the Northern Great Plains Regional Aquifer System Analysis: U.S. Geological Survey Water-Resources Investigations Open-File Report 81-401.

Feder, G.L., and Lee, R.W., 1981, Water-quality reconnaissance of Cretaceous aquifer in the Southeastern Coastal Plain: U.S. Geological Survey Open-File Report 81-696.

Busby, J.F., Lee, R.W., Hanshaw, B.B., 1983, Major geochemical processes related to the hydrology of the Madison Aquifer system and associated rocks in parts of Montana, South Dakota, and Wyoming: U.S. Geological Survey Water-Resources Investigations Report 83-3093, 180 p.

Lee, R.W., 1984, Ground-water quality data from the Southeastern Coastal Plain, Mississippi, Alabama, Georgia, South Carolina, and North Carolina. U.S. Geological Survey Open-File Report 84-237.

Lee, R.W., 1985, Geochemistry of ground water in Cretaceous sediments of the Southeastern Coastal Plain eastern Mississippi-western Alabama: Water Resources Research, v. 21, no. 10.

Lee, R.W., Sparkes, A.K., and Barker, R.A., 1985, Distribution and altitude of the top of Saline ground water (as NaCl) in the Southeastern Coastal Plain. U.S. Geological Survey Water-Resources Investigations Report 85-4109.

Lee, R.W., 1985, Water-quality maps for selected Upper Cretaceous water-bearing zones in the Southeastern Coastal Plain, U.S. Geological Survey Water-Resources Investigations Report, 85-4193.

Slagle, S.E., Lewis, B.D., Lee, R.W., 1985, Ground-water resources and potential hydrologic effects of the surface coal mining in the Northern Powder River Basin, Southeastern Montana. U.S. Geological Survey Water-Supply Paper 2239.

Busby, J.F., Plummer, L.N., Lee, R.W., and Hanshaw, B.B., 1986, Geochemical Evolution of water in the Madison Aquifer in parts of Montana, South Dakota, and Wyoming, U. S. Geological Survey Professional Paper 1273-F.

Lee, R.W., 1986, Water-quality maps for the upper Cretaceous and lower Tertiary aquifer in the Southeastern Coastal Plain of Mississippi, Alabama, Georgia, South Carolina, and

Southeastern North Carolina, U.S. Geological Survey Water-Resources Investigations Report 86-4116.

Lee, R.W., 1986, Water-quality maps for the middle Tertiary aquifer in the Southeastern Coastal Plain of Mississippi, Alabama, Georgia, and South Carolina, U.S. Geological Survey Water-Resources Investigations Report 86-4117.

Lee, R.W., 1986, Geochemical processes in clastic aquifers of the Southeastern Coastal Plain, in *Chemical Quality of Water and the Hydrological Cycle*, R.C. Averett and D.M. McKnight, eds., p. 333-336.

Lee, R.W., 1986, Hydrochemical factors affecting ground-water quality, chemical processes, USGS Water-Supply Paper 2325, National Water Summary of 1986, pages 72-73.

Reid, M.S., Renken, R.A., Wait, R.L., Aucott, W.R., and Lee, R.W., 1986, Hydrologic and geologic Analysis of two wells in Marion County, South Carolina, U.S. Geological Survey Water-Resources Investigations Report 86-4102, 20 p.

Reid, M.S., Aucott, W.R., Lee, R.W., and Renken, R.A., 1986, Hydrologic and geologic analysis of a well in Dorchester County, South Carolina, U.S. Geological Survey Water-Resources Investigations Report 86-4161, 23 p.

Lee, R.W. and Hollyday, E.F., 1987, Radon measurement in streams to determine location and magnitude of ground-water seepage, in *Radon, Radium, and other Radioactivity in Ground Water*, Lewis Publishers, Chelsea, Michigan, p. 241-249.

Roman-Mas, Angel, and Lee, Roger W., 1987, Geochemical evolution of waters within the North Coast Limestone Aquifers of Puerto Rico, USGS Water-Resources Investigations Report 86-4080, 28 p.

Lee, R.W., and Strickland, D.J., 1988, Geochemistry of ground water in Tertiary and Cretaceous sediments in the Southeastern Coastal Plain--eastern Georgia-South Carolina-southeastern North Carolina. *Water Resources Research*, v. 24, no. 2, p. 291-303.

Lee, R.W., and Fernandez, M., 1988, Soil gas analyses to delineate a plume of volatile organic compounds from a hazardous waste site in Williamson County, Tennessee, proceedings paper, Conference on Field Screening methods, EPA-EMSL, October 1988, Las Vegas, Nevada.

Tucci, P.T., Withington, D.B., and Lee, R.W., 1989, Hydrogeology of a hazardous-waste disposal site near Brentwood, Williamson County, Tennessee, USGS Water-Resources Investigations Report, 89-4144.

Plummer, L. Niel, Busby, J.F., and Lee, Roger W., 1989, Geochemical modeling in the Madison Aquifer in parts of Montana, Wyoming, and South Dakota, journal article, *WRR*, v. 26 no. 9, p. 1981-2014.

I performed some of the earlier work in this area, involving sample collection, deep well testing, chemical mass transfer modeling, and some writing. Niel Plummer received the O.E. Meinzer Award with this paper cited specifically as a contributing factor to his selection.

Ellins, K.K., Roman-Mas, A., and Lee, R.W., 1989, Using ^{222}Rn to examine groundwater/surface discharge interaction in the Rio Grande De Manati, Puerto Rico, journal article, in review.

Lee, R.W., 1990, Delineation of ground-water contamination using soil-gas analyses near Jackson, Tennessee, U.S. Geological Survey Water-Resources Investigations Report 90-4137, 9 p.

Busby, J.F., Plummer, L.N., Lee, R.W., and Hanshaw, B.B., 1991, Geochemical evolution of water in the Madison aquifer in parts of Montana, South Dakota, and Wyoming, U.S. Geological Survey Professional Paper 1273-F, 89 p.

Bailey, Z.C., and Lee, R.W., 1991, Hydrogeology and geochemistry in Bear Creek and Union Valleys near Oak Ridge, Tennessee, U.S. Geological Survey Water-Resources Investigations Report 90-4008, 72 p.

Lee, R.W., and Hollyday, E.F., 1991, Use of radon measurements in Carters Creek, Maury County, Tennessee, to determine location and magnitude of ground-water seepage, in Field Studies of Radon in Rocks, Soils, and Water, USGS Bulletin 1971, p. 237-242.

Hileman, G.E., and Lee, R.W., 1992, Geochemistry of and radioactivity in ground water of the Highland Rim and Central Basin aquifer systems, Hickman and Maury Counties, Tennessee: U. S. Geological Survey Water-Resources Investigations Report 92-4092.

Lee, R.W., 1993, Geochemistry of ground water in the southeastern coastal plain aquifer system in Mississippi, Alabama, Georgia, Mississippi, and South Carolina, U.S. Geological Survey Professional Paper 1410-D, 72p.

Lee, R. W., 1993, Background aqueous chemistry and effects of carbon dioxide variations in recharge in shallow ground water in a glacial outwash aquifer, in Morganwalp, D.W., and Aronson, D.A., eds., 1994, U.S. Geological Survey Toxic Substances Hydrology Program--Proceedings of the Technical Meeting, Colorado Springs, Colorado, September 20-24, 1993: U.S. Geological Survey Water-Resources Investigations Report 94-4014.

Tribble, G.W., Lee, R.W., Wydoski, D.S., Torikai, J.D., and Hunt, C.D., 1993, Preliminary assessment of jet fuel contamination of an atoll aquifer, in Morganwalp, D.W., and Aronson, D.A., eds., 1994, U.S. Geological Survey Toxic Substances Hydrology Program--Proceedings of the Technical Meeting, Colorado Springs, Colorado, September 20-24, 1993: U.S. Geological Survey Water-Resources Investigations Report 94-4014.

Rea, B.A. and Lee, R.W., 1994, Influence of ground-water chemistry on contaminant transport at the USGS Cape Cod Toxic-Substances Hydrology research site, Massachusetts, AIH National Conference, Austin, Texas, April 1994.

Jones, S.A., Lee, R.W., and Busby, J.F., 1994, Geochemistry of the Trinity aquifer, south-central Texas, AIH National Conference, Austin, Texas, April 1994.

Ogle, K.M. and Lee, R.W., 1994, Activities and summary statistics of radon-222 in Stream- and Ground-water samples, Owl Creek Basin, North-Central Wyoming, September 1991 through March 1992, USGS OFR 94-93, 15 p.

Lee, R.W., 1996, Background aqueous chemistry and effects of Carbon dioxide variations in recharge in shallow ground water in a glacial outwash aquifer, Cape Cod, Massachusetts, in Morganwalp, D.W., and Aronson, D.A., eds., U.S. Geological Survey Toxic Substances Hydrology Program--Proceedings of the Technical Meeting, Colorado Springs, Colorado, September 20-24, 1993: U.S. Geological Survey Water-Resources Investigations Report 94-4015, vol. 1, p. 207-217.

Wahrer, M.A., Long, D.T., and Lee, R.W., 1996, Selected geochemical characteristics of ground water from the glaciofluvial aquifer in the central lower peninsula of Michigan: U.S. Geological Survey Water-Resources Investigations 94-4017.

Ging, P.B., Long, D.T., and Lee, R.W., 1996, Selected geochemical characteristics of groundwater from the Marshall aquifer in the central lower peninsula of Michigan: U.S. Geological Survey Water-Resources Investigations 94-4220.

Meissner, B.D., Long, D.T., and Lee, R.W., 1996, Selected geochemical characteristics of ground water from the Saginaw aquifer in the central lower peninsula of Michigan: U.S. Geological Survey Water-Resources Investigations 93-4220.

Ging, P.B., Lee, R. W., and Silva, S.R., 1996, Water chemistry of Shoal Creek and Waller Creek, Austin, Texas, and potential sources of nitrate: U.S. Geological Survey Water-Resources Investigations 96-4167.

Lee, R.W., 1997, Effects of carbon dioxide variations in the unsaturated zone on water chemistry in a glacial-outwash aquifer, Applied Geochem. 12: pp. 347-366.

Lee, R.W. and Rast, W., 1997, Light attenuation in a shallow, turbid reservoir, Lake Houston, Texas, U.S. Geological Survey Water-Resources Investigations Report 97-4064, 33p,

Lee, R.W., and Wilson, J.T., 1997, Geochemistry of water and mobilization and transport of solutes in coal mine spoils, east-central Texas, in Proceedings of the American Society of Surface Mining and Reclamation, May 10-16, 1997, Austin, Texas.

Lee, R.W., and Wilson, J.T., 1997, Trace elements and organic compounds associated with riverbed sediments in the Rio Grande/Rio Bravo Basin, Mexico and Texas, U.S. Geological Survey Fact Sheet/Open-File Report.

Fate and Transport Potential for Dissolved Polycyclic Aromatic Hydrocarbons from a Shallow to a Deep Aquifer at the Madisonville Creosote Works, 2002, *in* Proceedings, Battelle Conference, Recalcitrant Compounds in the Environment, Monterey, California.

Lee, R. W., Stokes, B., and Weaver, B.J., 2010, Capture of Methanol from a Shallow Aquifer at 700 g/L Concentration—Recalcitrance to Compliance, *in* Proceedings, Battelle Conference, Recalcitrant Compounds in the Environment, Monterey, California.