FBH
&H
FRITZ, BYRNE, HEAD & HARRISON, LLP
Attorneys at Law

June 27, 2008

VIA FACSIMILE NO. 239-3311
- and -
U. S. FIRST CLASS MAIL

Ms. LaDonna Castañuela, Chief Clerk
Office of the Chief Clerk (MC-105)
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-3087

Re: In re the Application of BFI Waste Systems of North America, Inc., for a Major Amendment to Type I MSW Permit No. 1447A

Dear Ms. Castañuela:

Enclosed are an original and one copy of TJFA, L.P.'s Designation of Experts which we respectfully request be filed among the other papers in the above-referenced proceeding. Please return a file-stamped copy of the Designation to me in the self-addressed, postage prepaid envelope provided for your convenience.

A copy of the Designation is being forwarded to all parties of interest as set forth below. Thank you for your assistance in this matter.

Very truly yours,

FRITZ, BYRNE, HEAD & HARRISON, PLLC

By: Ann M. Devers

Ann M. Devers
Assistant to Bob Renbarger

Enclosures

cc: See, Certificate of Service (w/encl)

SOAH DOCKET NO. 582-08-2178
TCEQ DOCKET NO. 2007-1774-MSW

APPLICATION OF BFI WASTE SYSTEMS OF NORTH AMERICA, INC., FOR A MAJOR AMENDMENT TO TYPE I MSW PERMIT NO. 1447A	§ § § § §	**BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS**

TJFA, L.P.'s DESIGNATION OF EXPERTS

TJFA, L.P. ("TJFA") hereby serves its expert designations pursuant to Order No. 1 and Texas Rules of Civil Procedure §§ 194.2(f) and 195. TJFA's designations are set forth in **Exhibit A** attached hereto. Resumes of TFJA's retained experts are attached as **Exhibit B**.

Respectfully submitted,

FRITZ, BYRNE, HEAD & HARRISON, PLLC
98 San Jacinto Blvd., Suite 2000
Austin, TX 78701
TEL: 512/476-2020
FAX: 512/477-5267

By: Bob Renbarger
J. D. Head
State Bar No. 09322400

Bob Renbarger
State Bar No. 16768100

ATTORNEYS FOR TJFA, L.P.

CERTIFICATE OF SERVICE

By my signature above, I hereby certify that a true and correct copy of the foregoing document has been served this 27th day of June, 2008, via e-mail, facsimile transmission or U.S. First Class mail, to the following:

Mr. Paul G. Gosselink
Mr. John E. Carlson
Lloyd, Gosselink, Blevins, Rochell & Townsend, P.C.
816 Congress Ave., Suite 1900
Austin, TX 78701
TEL: 512/322-5800
FAX: 512/472-0532
E-MAIL: pgosselink@lglawfirm.com
E-MAIL: jcarlson@lglawfirm.com
BFI WASTE SYSTEMS OF NORTH AMERICA, INC. and GILES HOLDINGS, L.P.

Mr. Steve Shepherd
Legal Counsel
Environmental Law Division (MC-173)
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-3087
TEL: 512/239-0464
FAX: 512/239-0606
E-MAIL: sshepher@tceq.state.tx.us
EXECUTIVE DIRECTOR

Ms. Susan White
Staff Attorney
Litigation Division (MC-173)
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-3087
TEL: 512/239-0454
FAX: 512/239-0606
E-MAIL: swhite@tceq.state.tx.us
EXECUTIVE DIRECTOR

Ms. Christina Mann
Attorney
Office of Public Interest Counsel (MC-103)
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-3087
TEL: 512/239-4014
FAX: 512/239-6377
E-MAIL: cmann@tceq.state.tx.us
OFFICE OF PUBLIC INTEREST COUNSEL

Mr. Kevin W. Morse
Assistant Travis County Attorney
P.O. Box 1748
Austin, TX 78767
TEL: 512/854-9513
FAX: 512/854-4808
E-MAIL: kevin.morse@co.travis.tx.us
TRAVIS COUNTY

Ms. Holly C. Noelke
Assistant City Attorney
City of Austin Law Department
P.O. Box 1088
Austin, TX 78767
TEL: 512/974-2630
FAX: 512/974-6490
E-MAIL: holly.noelke@ci.austin.tx.us
CITY OF AUSTIN

Ms. Meitra Farhadi
Assistant City Attorney
City of Austin
P.O. Box 1088
Austin, TX 78767
TEL: 512/974-2310
FAX: 512/974-6490
E-MAIL: meitra.farhadi@ci.austin.tx.us
CITY OF AUSTIN

Mr. Jim Blackburn
Ms. Mary W. Carter
Blackburn & Carter, P.C.
4709 Austin St.
Houston, TX 77004
TEL: 713/524-1012
FAX: 713/524-5165
E-MAIL: jbb@blackburncarter.com
E-MAIL: mcarter@blackburncarter.com
NORTHEAST NEIGHBORS COALITION; MARK MCAFEE; MELANIE MCAFEE; ROGER JOSEPH; DELMER D. ROGERS; WILLIAMS, LTD.; and PIONEER FARMS

EXHIBIT A

RETAINED TESTIFYING EXPERT WITNESSES

1. Mr. Jim Neyens, P.E.
TRC Solutions/Austin
505 East Huntland Dr., Suite 250
Austin, TX 78752
TEL: 512/684-3156

Mr. Neyens has over thirty-five (35) years of experience in environmental engineering, including solid and hazardous waste facility design and permitting, regulatory compliance, investigation and remediation of contaminated properties, and water and wastewater engineering projects.

Mr. Neyens will provide expert testimony regarding issues referred by the Texas Commission on Environmental Quality ("TCEQ") including, but not necessarily limited to, the adequacy of the application and draft permit to control disease vectors, odors, spilled and windblown waste and cleanup of spilled wastes; whether the application and draft permit contain adequate provisions for groundwater monitoring; whether the applicant has properly calculated the estimated rate of waste deposition and operating life of the facility; whether the application and draft permit sufficiently address the receipt, handling and disposal of special wastes; whether the application and draft permit properly identify and designate the facility's owner, operator and responsible parties; whether the application and draft permit are adequate to prevent the disposal of unauthorized wastes at the subject landfill; whether the application adequately addresses dust controls and maintenance of site access roads; whether the application and draft permit contain adequate provisions for fire protection; whether the proposed expansion is compatible with surrounding land uses; whether the application provides sufficient buffer zones and screening for neighboring properties and land uses; whether the application and draft permit provide sufficient protections for the health and safety of neighboring properties and their residents; whether the application contains adequate provisions to prevent the creation of nuisance conditions in the vicinity of the subject landfill; whether the landfill's proposed operational hours are appropriate; and whether the application and draft permit adequately address the storage, treatment and disposal of contaminated water resulting from the facility's operations. In addition, Mr. Neyens will testify about deficiencies in the proposed Site Operating Plan which affect the above-referenced issues as well as compliance with the relevant permitting regulations. Detailed analyses and Mr. Neyens' opinions on these issues will be set forth in his pre-filed testimony to be filed in these proceedings. Mr. Neyens' testimony and opinions will be based on his review of the permit application and draft permit, information and documents obtained in discovery and his considerable knowledge, skill, training, education and experience in permitting solid waste facilities, solid waste facility operations and regulatory compliance.

2. Mr. Pierce L. Chandler, Jr., P.E.
1204 Bayshore
Rockwall, TX 75087
TEL: 972/771-1310

Mr. Chandler has over thirty-five (35) years experience in civil engineering, geoscience and hydrogeology related to planning, design and construction of public works projects, water resources, electric power generation, mining, waste management facilities and remediation projects.

Mr. Chandler will provide expert testimony regarding issues referred by the TCEQ including, but not necessarily limited to, whether the application and draft permit contain adequate provisions to manage landfill gas; whether the application provides for proper slope stability for the subject landfill; whether provisions contained in the application sufficiently address the needs for and deposition of adequate cover for the landfill; whether the application includes adequate fire protection provisions; whether the applicant has complied with relevant financial assurance requirements; whether the erosion control methods identified in the application and draft permit are adequate; and whether the storage, treatment and disposal of contaminated water is adequately addressed in the application and draft permit. Mr. Chandler may also testify to the sufficiency and propriety of key elements of the landfill's design and geotechnical considerations affecting the sufficiency of the application to address same in the context of the referred issues as well as compliance with the relevant regulations. Detailed analysis and Mr. Chandler's opinions on these issues will be set forth in his pre-filed testimony to be filed in these proceedings. Mr. Chandler's testimony and opinions will be based on his review of the permit application and draft permit, information and documents obtained in discovery and his considerable knowledge, skills, training, education and experience in permitting solid waste facilities, geotechnical design, and regulatory compliance.

3. Dr. Robert S. Kier, Ph.D.
Robert S. Kier Consulting
505 East Huntland Dr., Suite 250
Austin, TX 78752
TEL: 512/684-3343

Dr. Kier has over thirty-five (35) years experience as a consultant in matters involving geology, hydrogeology, water resource development, municipal solid waste, and hazardous waste management and cleanup. He is a frequent speaker and a lecturer with the Department of Geological Sciences at the University of Texas.

Dr. Kier will provide expert testimony on issues referred by the TCEQ including, but not limited to, whether the application is adequate with respect to the protection of groundwater resources and whether the application provides adequate provisions for groundwater monitoring at or near the landfill site. Dr. Kier will also testify about site hydrogeology, groundwater flow direction and rate, groundwater quality, the design and location of the proposed groundwater monitoring wells and the proposed groundwater monitoring program. Dr. Kier will also offer expert testimony on whether the application and draft permit comply with the relevant permitting regulations and requirements relevant to these issues. Dr. Kier's opinions and detailed analyses on these matters will be set forth in his pre-filed testimony to be filed in these proceedings. Dr. Kier's opinions and testimony will be based on his review of the application and draft permit, information and documents obtained through discovery, and his considerable knowledge, skills, training, education and experience in the permitting of solid waste facilities, evaluation of hydrogeological conditions and the design and development of groundwater monitoring systems and programs.

4. L. Stephen Stecher, P.E., CFM
Crespo Consulting Services, Inc.
4131 Spicewood Springs Rd., B-2
Austin, TX 78759-8658
TEL: 512/343-6404 (Ext. 101)

Mr. Stecher is a licensed professional engineer with over thirty (30) years of experience in civil engineering related to hydrologic, hydraulic and water quality studies and design. He has significant knowledge and experience involving drainage, flooding, water quality and erosion control issues relevant to the Austin area.

Mr. Stecher will provide expert testimony on issues referred by the TCEQ with his primary focus being on site drainage issues. Mr. Stecher will testify about the adequacy of the drainage evaluation provided in the application including, but not limited to, compliance with the Clean Water Act and the Texas Water Code, management of site run-on and run-off, site flood protection, floodplain issues, analysis of site modeling and drainage calculations, drainage considerations for the landfill's existing condition, intermediate condition and final condition at build-out and site closure and the adequacy of the design and features of the proposed landfill's water management structures and improvements. Mr. Stecher will also testify on referred issues related to surface water protection and erosion as well as the application and draft permit's compliance with applicable regulatory requirements. Mr. Stecher's opinions and detailed analyses will be set forth in his pre-filed testimony to be filed in these proceedings. Mr. Stecher's opinions and testimony will be based on his review of the application and draft permit, information and documents obtained through discovery

and his considerable knowledge, skills, training, education and experience in the permitting of solid waste facilities, site-specific drainage evaluations, drainage system designs and various models utilized in the evaluation of drainage issues.

RETAINED EXPERT WITNESSES

The following witnesses are retained by TJFA, L.P. and may testify with respect to the subject areas and issues listed below.

1. Mr. Bruce L. Wiland, P.E.
   Wiland Consulting, Inc.
   1510 Oxford Ave.
   Austin, TX 78704
   TEL: 512/444-3188

Mr. Wiland is a water quality specialist with over thirty (30) years experience in the public and private sectors. He has conducted numerous evaluations of wastewater permits, performed water quality surveys and investigated potential water quality impacts of various commercial and industrial activities.

Mr. Wiland may provide expert testimony about the application and draft permit's adequacy to protect surface water quality, the sufficiency of various landfill features designed to ensure water quality protection, compliance with the Clean Water Act and the Texas Water Code and the management of contaminated water at the facility as well as compliance with the relevant regulations. If asked to testify, Mr. Wiland's opinions and testimony will be based on his review of the application and draft permit, information and documents obtained through discovery and his considerable knowledge, skills, training, education and experience in water quality permitting, design and evaluation of storm water and wastewater controls and systems and regulatory compliance.

2. Dr. Matthew M. Uliana, Ph.D., P.G.
   Martin Geologic Consulting
   P.O. Box 81883
   Austin, TX 78708
   TEL: 512/791-9076

Dr. Uliana is an experienced geoscientist with expertise in the areas of groundwater and surface water hydrology, computer modeling of groundwater flow and water resource consulting. He is a frequent author of articles addressing groundwater and hydrogeology issues and has taught and conducted research at the university level.

Dr. Uliana may provide expert testimony on issues referred by the TCEQ with his primary focus being on groundwater-related issues. Dr. Uliana may testify on whether the application and draft permit provides adequate provisions for groundwater monitoring at or near the site, site hydrogeology, groundwater flow direction and rate, groundwater quality, and the design and location of the proposed groundwater monitoring wells and the proposed groundwater monitoring program. Dr. Uliana may also offer testimony on whether the application and draft permit comply with the relevant permitting regulations and regulatory requirements relevant to these issues. If asked to testify, Dr. Uliana's opinions and testimony will be based on his review of the application and draft permit, information and documents obtained through discovery, and his considerable knowledge, skills, education, training and experience in the field of groundwater, geology, hydrogeology and water resources issues.

OTHER PARTIES' EXPERTS

TJFA, L.P. reserves its right to elicit expert opinion testimony from experts designated or utilized by any party to these proceedings.

TJFA, L.P. further reserves its rights to supplement these designations, to substitute experts, to designate rebuttal experts and to designate consulting experts whose work was relied upon by any testifying expert, all in accordance with applicable rules and/or State Office of Administrative Hearings orders.

EXHIBIT B

TRC

JAMES F. NEYENS, PE

EDUCATION

B.S., Civil Engineering, University of Iowa, 1965

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

Professional Engineer - Arizona #21709, Arkansas #6011, Colorado #23177, Illinois #28494, Indiana #20121, New Mexico #12505, Texas #57266
Civil Engineer - California #39336, Oregon #13609

AREAS OF EXPERTISE

Mr. Jim Neyens, P.E. has over 35 years of experience in the following general areas:

- Solid and Hazardous Waste Facility Design and Permitting
- Regulatory Compliance
- Site Investigation and Remediation
- Water and Wastewater Facility Engineering
- Water and Wastewater System Master Planning
- Environmental Engineering
- Risk Assessment
- Litigation Support

REPRESENTATIVE EXPERIENCE

Mr. Neyens has more that 35 years of experience in environmental engineering, including solid and hazardous waste facility design and permitting, regulatory compliance, investigation and remediation of contaminated property, and water and wastewater engineering. He served as a consultant on major solid and hazardous waste management design and permitting projects, providing technical, regulatory, and managerial services. He has extensive experience in the design and permitting of solid and hazardous waste management facilities, directing remedial investigations and feasibility studies at Superfund and similar sites, and performing environmental risk assessments and contaminated site evaluations. He specializes in working with regulatory agencies on behalf of clients to obtain environmental permits and approval of site remediation plans.

Permitting, Design and Planning of Solid Waste Facilities

Finley Buttes Landfill Co., Design Engineering – Boardman, OR
(Project Manager, Lead Design Engineer/Permit Negotiator: 1991-1993)
Permitted for 60 million tons of solid waste, the Finley Buttes Landfill was one of the largest greenfield landfills in the country, and one of the first designed with an RCRA Subtitle D liner and leachate collection system. Project included hydrogeological investigation, geotechnical engineering, preparation of engineering design, permit application and operating plans, land use certification, and public hearings. Developed innovative liner design by optimizing a blend of

bentonite with on-site sandy silt to achieve a hydraulic conductivity of less than 1 x 10E-7 centimeters per second. Liner effectiveness was demonstratated with on-site construction of a liner and testing with a sealed double ring infiltrometer (SDRI). Designed and gained approval of alternative final cover system that employs a monolithic evapotranspiration (ET) cover constructed from sandy silt supporting indigenous vegetation.

The Sprint Companies, Storm Water Management – Houston, TX (Project Manager: 2002-2003)
Prepared comprehensive, staged drainage and storm water management plan as part of a permit application for a significant expansion of a Houston-area landfill bisected by a flowing stream. Secured a Conditional Letter of Map Revision (CLOMR) from the Federal Emergency Management Administration (FEMA) that resulted in removal of the proposed landfill footprint from the 100-year flood plain.

Waste Management, Leachate Treatability Study – Bay City, MI (Project Manager: 2006-2007)
Conducted field investigation and directed the bench scale testing and conceptual design of leachate treatment system for closed hazardous waste landfill.

Liquid Environmental Solutions, MSW Permitting – Austin, Dallas, El Paso, Houston and San Antonio, TX (Project Manager: 2006-2008)
Prepared multiple municipal solid waste (MSW) permit applications for one new and four existing liquid waste management facilities.

Microgy, Inc., MSW Permitting – Dublin, TX (Project Manager: 2007-2008)
Prepared municipal solid waste (MSW) registration application for proposed liquid waste transfer station that will provide grease trap waste as feedstock to renewable energy generation plant.

Allied Waste Industries, Leachate Treatability Studies – Beaumont and Galveston, TX (Project Manager: 2006)
Project manager for bench scale testing and conceptual design of leachate treatment systems for two active municipal solid waste landfills.

City of McAllen, Facility Design – McAllen, TX (Project Manager: 2001)
Directed the design of a recyclables processing center complex, including facilities and equipment for processing curbside-collected commingled recyclables and source-separated materials from commercial generators. The facility included two processing lines within a 20,000 square foot building, a separate 4,000 square foot waste container repair shop, and a citizens drop-off facility.

East Texas Sanitation, Transfer Station Design and Registration – Nacognoches, TX (2003-2004)
Designed and secured TCEQ registration for 80 tons-per-day (tpd) municipal solid waste transfer station.

Pro Star Waste, Transfer Station Design and Registration – Goodrich, TX (2006-2007)
Designed and secured TCEQ registration for 80 tons-per-day (tpd) municipal solid waste transfer station.

Browing-Ferris Industries (BFI), Design and Permitting – Houston, TX (Project Manager/Permit Negotiator: 1987-1989)
Supervised the engineering design, directed the hydrogeological investication and prepared successful permit application for a major commercial non-hazardous industrial waste treatment and landfill disposal facility in southeast Texas.

Western Waste Industries, Design and Permitting – Pasadena, TX (Project Manager/Permit Negotiator: 1985-1987)
Prepared engineering design and successful permit application for proposed 1,500-ton-per-day municipalsolid waste transfer station in the Houston area.

Western Waste Inudustries, Landfill Permitting – Conroe, TX (Project Manager/Permit Negotiaton: 1983-1985)
Directed the geotechnical investigation, performed engineering redesign, obtained technical supporting data, and prepared application for permit amendment to significantly expand an existing Type I MSW landfill near Houston, Texas.

Western Waste Industries, Geotechnical Investigation – Houston, TX (Project Manager/Permit Negotiator: 1983)
Directed the geotechnical investigation and developed site operating plan, closure plan, and final grading and drainage plans for a commercially operated industrial solid waste landfill located near Houston, Texas. Successfully negotiated the settlement of an Agreed Order with the Texas Attorney General's Office based on rapid and effective compliance.

Laidlaw Waste Systems, Design and Permitting – Fort Worth, TX (Project Manager/Design Engineer: 1986-1988)
Directed project team and participated in geotechnical and hydrogeological investigations, engineering design and preparation of a permit application for a proposed Type I municipal solid waste landfill partially located in the 100-year floodplain of the West Fork of the Trinity River. Secured Condition Letter of Map Revision (CLOMR) from the Federal Emergency Management Agency (FEMA) after performing drainage and stormwater detention designs to meet FEMA requirement that the landfill development would produce less than a 0.01-foot

increase in the 100-year flood surface elevation. Project incorporated sequential excavation of existing landfill and construction of new landfill in its place.

Laidlaw Waste Systems, Solid Waste Management – Fort Worth, TX (Project Manager: 1989)
Performed a waste composition and compaction study for a proposed landfill mining project. In a related project, Mr. Neyens prepared a permit application for a new landfill on a site that included an old, closed municipal solid waste landfill. Development of the proposed landfill included excavation and re-landfilling existing buried waste. The purpose of this study was to assess the feasibility of mining the old waste, identify and estimate the volume of any materials in the waste that could be recycled or beneficially re-used and calculate the potential volume reduction that could be achieved by effective recompaction of the waste. The study showed relatively little material in the old landfill that was recoverable or recyclable. The compaction study predicted a volume reduction of about 40 percent for about 10 million cubic yards of existing waste. These results significantly improved the projected financial performance of the proposed landfill.

City of Lake Jackson, Solid Waste Design – Lake Jackson, TX (Project Manager: 1997)
Designed collection routes for residential solid waste collection vehicles for a municipal client. The routes were developed to efficiently serve about 7,500 homes with new collection vehicles, wheeled carts and single or two-person crews.

Indian Health Services/U.S. Department of Health & Human Services, Solid Waste Management – Albuquerque, NM (Project Manager: 1995)
Provided the solid waste engineering elements for a comprehensive solid waste management plan for the Pueblo of Isleta, a Native American community.

Montgomery County/Western Waste Industries, Landfill Closure – Conroe, TX (Project Manager: 1983)
Developed closure, grading, and drainage plans for an existing Type I MSW landfill located in Montgomery County, Texas. Monitored closure activities and certified closure.

Various Clients, Solid Waste Landfill – TX (Project Manager/Design Engineer: 1983-1993)
Prepared Soil and Liner Quality Control Plans for a number of municipal solid waste landfills in Texas. These plans prescribe the methods of evaluating in situ soils for possible use as liners and specify the methods for constructing, monitoring, and testing compacted clay liners at landfills.

Various Clients, Construction Management – TX (Project Manager/Design Engineer: 1983-1993)
Monitored the construction methods and supervised the construction quality control procedures for more than 40 soil liner sections at various Type I and Type IV municipal solid waste landfills throughout Texas. Prepared certifications of construction (Soil and Liner Evaluation Reports, or SLERs) for review and approval by regulatory authorities.

Various Solid Waste and Venture Capital Clients, Solid Waste Facility Evaluations – U. S. (Project Manager: 1989-2008)
Conducted more than 25 capacity, performance and environmental compliance evaluations of existing commercial MSW and industrial waste landfills and trnasfer stations for proposed acquisitions and new company start-ups. Some acquisitions became part of the start-up of Republic Services, Inc. and USA Waste Services (now Waste Management, Inc.)

Phillips Petroleum Company, Engineering Design – Borger, TX (Project Manager: 1993-1994)
Project included geotechnical investigation, engineering design, and registration documentation (facility exempted from State permit) for a Class 1 Non-hazardous and Class 2 Industrial Waste landfill at the Phillips refinery.

GSX Corporation, Design and Permitting – White Castle, LA (Project Engineer: 1987-1991)
Project involved the design and permitting of the then-largest commercial non-hazardous industrial waste land treatment facility (landfarm) in the U.S. Significant design and permitting challenges involved drainage and management of stormwater runoff from waste treatment areas at a site that receives an average of more than 55 inches of rainfall per year.

Lower Colorado River Authority, Landfill Closures - La Grange, Texas (Project Manager) 2001
Directed geotechnical exploration, site and groundwater characterization, risk factor determination and closure plan preparation at two former construction and plant thrash landfills at a power generating plant. Achieved closure under the Texas risk reduction standards.

International Paper Company, Landfill Design and Permitting – Mobile, AL (Project Engineer: 1990-1993)
Served on project team for conceptual design, permit application and engineering plans for a new industrial waste landfill for a paper mill.

Permitting, Design, Planning, and Evaluation of Hazardous Waste Facilities

Browning-Ferris Industries, Inc./Highway 36 Land Development Co., Design and Permitting – Last Chance, CO (Project Engineer and Manager: 1981-1985)
Performed engineering design and permitting services for the first new commercial hazardous waste treatment, storage, and landfill disposal (TSD) facility to be successfully permitted following adoption of RCRA Regulations and amendments ion the 1980's. Engineer-of-Record for final stages of design modifications and permitting.

Browning-Ferris Industries, U.S. Ecology, ENSCO – U.S. (Project Manager: 1985-1994)
Directed the preparation and review of RCRA Part B permit applications for several commercial hazardous waste treatment, storage, and disposal facilities in Texas, Arizona, and the Midwest.

Univar/McKesson Chemical Corp, Hazardous Waste Permitting – San Francisco, CA (Project Manager: 1987)
Coordinated the transfer of federal, state, and local hazardous waste transporter and TSD facility permits for more than 50 sites nationwide as part of a corporate acquisition.

U.S. Army Corps of Engineers, Rocky Mountain Arsenal, Commerce City, Colorado; U.S. EPA, Times Beach, Missouri; and Texas Water Commission, French Ltd. and Sikes, Crosby, TX (Project Engineer: 1982-1994)
Engineering design for on-site containment during remedial design phase at Rocky Mountain Arsenal. Remedial investigations and feasibility studies (RI/FS) for the Times Beach, French Limited and Sikes Disposal Pits Superfund Sites.

IBM Corporation, Regulatory Compliance – Nationwide U.S. (Project Engineer: 1985)
Conducted regulatory compliance and potential liability evaluations of a commercial hazardous waste incinerator complex for an electronics manufacturer.

IBM Corporation, Hazardous Waste – Nationwide U.S (Project Engineer: 1983)
Participated in nationwide survey to evaluate potential generator liabilities associated with commercial solvent recovery facilities that treated hazardous waste generated by semi-conductor manufacturer.

Water and Wastewater Master Planning

City of Rosenberg, Water and Wastewater Plan – Rosenberg, TX (Project Manager, Planning Engineer: 2003)
Assessed condition of existing water and wastewater infrastructure, conducted demographics analysis and 20-year population projections, and prepared master plan, schedule and cost estimates for the City of Rosenberg. Assimilated data from the City's Public Works and Planning Departments, plus many land developers. Population expected to increase from about 26,000 to over 60,000 in the 20-year planning period. Master Plan identified over $30 million in needed infrastructure to support this growth.

City of Galveston, East End Wastewater Master Plan – Galveston, TX (Project Manager, Planning Engineer)
Assessed condition of existing wastewater infrastructure, conducted demographics analysis and 20-year population projections, and prepared Master Plan, schedule and cost estimates for the historic East End of Galveston Island. Recent resurgence in tourism and land development created need for additional wastewater capacity. With existing wastewater treatment plant near its permitted capacity and physically constrained from expansion, the Master Plan provided for collection system improvements and a new 7.5 MGD wastewater treatment plant (WWTP). Innovative approach used to determine boundary of service area for the new WWTP.

City of Galveston, Pelican Island Wastewater Master Plan – Galveston, TX (Project Manager, Planning Engineer)
Assessed condition of existing wastewater infrastructure, conducted 20-year land use and population projections, and prepared master plan, schedule and cost estimates for the largely unsewered Pelican Island area of the City of Galveston. Growth factors for Pelican Island include expansion of Texas A&M University-Galveston and area maritime industries. Project included site study for the new 7.5 MGD WWTP to also serve the East End of Galveston Island.

Galveston County WCID No. 1, Water and Wastewater Master Plan – Dickinson, TX (Project Manager, Planning Engineer: 2005)
Assessed condition of existing water and wastewater infrastructure, conducted demographics analysis and 20-year population projections, and prepared master plan, schedule and cost estimates. The population served is expected to more than double from about 18,000 to 37,500 in the 20-year planning period. Future peak water demands were found to exceed the contracted maximum flow rate for purchased treated water. Developed plan to return the District's groundwater wells to service, using flow control valves, remote monitoring and automatic controls to produce well water when needed to meet peak demand flows.

City of Bellaire, Wastewater System Master Plan – Bellaire, TX (Project Manager, Planning Engineer: 2006)
Assessed condition of existing wastewater treatment plant (WWTP) and three lift stations, prepared 20-year population projections, and prepared master plan, schedule and cost estimates for rehabilitating the WWTP and lift stations on a prioritized basis. This study identified approximately $6 million of rehabilitation that could be expected to give the WWTP 20 years or more of service life. Compared expected capital, operating and maintenance costs of operating the WWTP for another 20 years to the cost of contracting for wastewater treatment with a neighboring city. Demonstrated a cost savings of about $5 million by rehabilitating and continuing to operate the WWTP.

City of Bastrop, Utility Infrastructure Analysis – Bastrop, TX (Project Manager: 2000)
Prepared public utility infrastructure analysis and recommendations for City of Bastrop's 20-year Comprehensive Plan. Tasks included analyzing existing water, wastewater, electric power and drainage systems, projecting growth and capacity needs over a 20-year planning period, and recommending action necessary to meet expected demands for these utilities. Results were written for inclusion in the comprehensive plan.

City of Bastrop, Water and Wastewater Master Plan – Bastrop, TS (Project Manager and Planning Engineer: 2001)
Responsible for preparing a water and wastewater master plan for more than 5,000 acres in the rapidly developing growth area of Bastrop. Tasks included assessing existing water and wastewater system capacities, evaluating land development plans, assessing future land use conditions, and projecting the location, cost, and construction schedule for expansion of these systems. The plans identified needs, costs and project timing for the 5, 10, and 20-year planning horizons.

Private Developer, Water and Wastewater Master Plan – Kerrville, TX (Project Engineer: 2000)
Prepared water and wastewater master plans for Comanche Trace Ranch and Golf Club, at 1,132-acre master planned community of about 1,300 homes located near Kerrville, Texas.

Permitting and Design, Water and Wastewater Systems

Texas Department of Criminal Justice, Wastewater Treatment Plant and Lift Station – Navasota, TX (Project Manager and Design Engineer: 2002)
Project included a dual unit, 0.5 MGD extended aeration wastewater treatment plant and a four pump, 1,400 GPM lift station. All facilities were designed for protection from more than 10 feet of potential flooding. Design included

engineered sludge dewatering system, which significantly reduced the required size of drying facilities.

City of Pearland, Barry Rose TPDES Permit Renewal – Pearland TX (Project Manager: 2002)
Prepared permit renewal application for the Barry Rose WWTP. Prepared operation and maintenance plan for beneficial reuse of treated wastewater effluent to irrigate nursery stock for City's Parks and Recreation Department. Obtained TCEQ authorization for reuse under 30 TAC Chapter 210.

City of Galveston, Influent Bar Screen Replacement – Galveston, TX (Project Manager: 2004)
Designed the replacement of two existing bar screens with new mechanically-cleaned bar screens at the City of Galveston's 10 MGD Main Wastewater Treatment Plant. The new screens are entirely stainless steel with automatic operation. Project also included the design of new screening presses, screening bagging systems, access platforms, and application of a protective epoxy coating to all exposed reinforced concrete inside the headwork's structure. Services included engineering design, preparation of plans and specifications, bidding and award phase, and construction phase services.

City of Cedar Park, Garner Park Lift Station and Force Main – Cedar Park, TX (Project Manager and Design Engineer: 2000)
Designed 3,000 GPM lift station and 3,100-foot, 16-inch diameter force main. Design included three submersible pumps in new lift station that replaces existing, smaller capacity lift station and force main.

Bastrop County WCID No. 2 and LCRA, Low Pressure Sewer System and Lift Stations – Bastrop, TX (Project Manager: 2000-2001)
Prepared engineering design, plans and specifications for a low pressure sanitary sewer (LPSS) wastewater collection system to serve major portions of Tahitian Village, a 7,000-lot subdivision. Hilly terrain at the 2,000-acre project site prevented the use of a conventional gravity-flow wastewater collection system. The collection system included more than 80,000 linear feet of 2-to 8-inch diameter force main, 3 lift stations, and grinder pump stations at each property served. The entire project area had been designated as endangered species habit, a challenge that was successfully overcome by permitting under the Federal Endangered Species Act.

City of Galveston, Lift Station No. 1 Improvements – Galveston, TX (Project Manager: 2004)
Designed the replacement of the existing bar screen with new mechanically-cleaned bar screen at the City of Galveston's 12.7 MGD Lift Station No. 1. Performed design of a new screenings press and screenings handling system to reduce odors and eliminate unsanitary conditions. Standby generator system

was designed to assure reliability of the lift station. Services included engineering design and preparation of plans and specifications.

City of Galveston and Gulf Coast Water Authority, 16-Inch Water Transmission Line – Galveston, TX (Project Manager: 2003-2004)
Provided permitting, design, bidding, and construction phase services for approximately 17,000 feet of 16-inch diameter water transmission main to serve the rapidly developing west end of Galveston Island. Project included two flow control valves to maintain water system pressure and repairs to an existing 30-inch water transmission main that crosses Galveston Bay from the mainland. Coordinated the delineation of jurisdictional wetlands with the water transmission line design to avoid significant impacts to wetlands.

City of Pearland, Wastewater Treatment Plant Clarifier Rehabilitation – Pearland, TX (Project Manager: 2003)
Evaluated final clarifier performance issues at the Barry Rose and Longwood Wastewater Treatment Plants. Designed replacement overflow weirs and collection troughs to be compatible with hydraulic characteristics of the clarifiers. Selected stainless steel equipment that will be long lasting and easier to maintain than previous equipment.

City of Kerrville, Water and Wastewater Treatment – Kerrville, TX (Project Manager: 2000)
Completed engineering design and plans and specifications for a nearly 3-mile-long treated wastewater effluent force main, pumping facilities, and a lined storage reservoir for beneficial reuse of wastewater. By providing nearly 1,000,000 gallons per day of irrigation capability for a municipal golf course, project made an equivalent amount of ground water available for use in the city's public water supply system.

City of Fredericksberg, Water Distribution System Design – Fredericksberg, TX (Project Manager: 2000-2001)
Project manager for the design of water distribution system improvements to balance flow and maintain adequate system pressure during fire flow situations. Approximately 11,000 feet of water main was designed along with appurtenances. The majority of the new mains were designed to minimize construction impacts on downtown businesses in Fredericksberg, a major historic Texas tourist attraction.

City of Austin, Lower Williamson Creek Interceptor Sewer Replacement – Austin, TX (Project Engineer and QC Reviewer: 2000)
Preliminary engineering study for the replacement of 19,500 linear feet of 42-inch and 36-inch diameter interceptor sewer located along Williamson Creek in South Austin. Engineering analysis indicated replacement of the existing sewer with a larger diameter open-cut parallel line was not feasible due to physical and

environmental constraints including poor access, wetlands, parkland and protected trees. Four alternatives were studied including boring and tunneling along various routes. While tunneling provided a much straighter alignment and a reduced overall length, each alignment option required analysis of the cost for connecting existing lateral sewers to the proposed interceptor, and the feasibility of rehabilitating the existing interceptor so that it could continue to accept some wastewater flow. The recommended alternative was for a new 16,500 foot interceptor up to 66 inches in diameter that would be installed in a bored tunnel.

City of Sequin, Wastewater Assessment – Sequin, TX (Project Engineer: 2000)
Performed capacity assessment of existing wastewater collection system, conducted an engineering analyses of alternatives, and prepared preliminary engineering design report for a 1.5-mile wastewater collection system and dual submersible pump life station to serve a 375-acre area that included a mix of industrial, commercial, and residential land uses.

Various Clients, Wastewater Treatment Permitting – TX (Project Engineer: 1998-2006)
Prepared wastewater treatment plant permit renewal applications for facilities in the Houston and Austin areas. Responsibilities included data review, engineering calculations, updating permit application information, and preparing applications in accordance with current regulatory agency requirements.

William L. Bonnell Co., Inc., Industrial Wastewater Treatment System – El Campo, TX (Project Engineer: 1998)
Designed gravity separation system to remove oil and grit from a 100 gpm industrial wastewater stream for an aluminum foundry. As a result of this treatment, the water was re-circulated back to the foundry for reuse and the oil was recycled.

Guadalupe-Blanco River Authority, Coleta Creek Dam Inspection – Victoria, TX (Project Engineer: 1999-2001)
Performed periodic comprehensive inspections of 19,000-foot long earth dam, multi-gated concrete spillway structure, and related features at the 3,100-acre Coleta Creek Reservoir, operated by the Guadalupe-Blanco River Authority. Services included evaluation of monthly piezometer data, examination of physical features of dam and all structures, review of operating and maintenance activities, and providing recommendations based on the results of the inspection.

PROFESSIONAL AFFILIATIONS

- Member of American Society of Civil Engineers
- Member American Water Works Association

PUBLICATIONS AND PRESENTATIONS

"Alternative Approaches to Wastewater Planning for the City of Galveston." Presented at Texas Water 2005 (Texas Section American Water Works Association/Water Environment Association of Texas) Galveston, Texas. April 2005.

"Innovative Approach to Managing Water Resources in Galveston County." Presented at the 2005 Fall Quad Section Meeting, ASCE. El Paso, Texas. October 2005.

"The Value of Landfill – Is It the Land or the Fill?" Presented at the National Conference of the Real Estate Counseling Group of America. Houston, Texas. October 1997.

"Design and Construction of Landfill Containment Systems." Presented at NSWMA Waste Expo, Solutions West. San Jose, California. October 1989.

EXPERT AND LEGISLATIVE TESTIMONY

Lemle and Kelleher – New Orleans, LA (Principal Technical Expert: 1995-1996)

As the principal technical expert in *Kaiser Aluminum vs. The City of Baton Rouge/East Baton Rouge Parish,* sucessfully demonstrated the significant increase in the value of Plantiff's property after Defendant expropriated it for a municipal solid waste landfill site.

Confidential Law Firm - Texas (Principal Technical Expert: 1999)

Performed state-wide landfill property evaluation to demonstrate the considerable appreciation of value that occurs when land is obtained for developing or expanding a solid waste landfill. Testimony in deposition enabled Plaintiff Appraisal District to reach settlement for a significant increase in appraised value of land acquired for expansion of a major landfill in Texas.

Womack, McClish, Wall & Foster – Austin,TX (Principal Technical Expert: 1997)

Conducted engineering analysis, performed market study, consulted with attorneys and provided testimony in *Travis County Landfill Corporation vs. The City of Austin* that resulted in a considerable settlement for Plaintiff who had suffered the loss of permitted landfill capacity due to a restriction on landfill height caused by the City's conversion of Bergstrom AFB into the Austin Bergstrom International Airport.

Hennessey *vs.* City of Cedar Rapids, et al – Cedar Rapids, IA (Principal Technical Expert: 2000)
Provided engineering study, market analysis, and testimony on behalf of landowner to support a significant increase in property value for undeveloped land as a result of its being taken by condemnation for development as a regional landfill in central Iowa.

Hatch Engineering *vs* Dual Removal – Toronto, Ontario, Canada (Principal Technical Expert: 1995)
Investigation and testimony at trial in Toronto, Ontario, Canada, supported Respondent's position that this small solid waste recycling business was provided insufficient and inadequate design and construction services in connection with its proposed solid waste processing and transfer station facility.

The City of Englewood vs Denver Waste – Denver, CO (Principal Technical Expert: 2000)
Provided market evaluation, technical consultation and testimony that helped Respondent recover significant compensation for its property that held a valid authorization to develop and operate a municipal solid waste transfer station. Property was taken by Plaintiff through eminent domain condemnation.

Pierce L. Chandler, Jr., P.E.

Mr. Chandler is a consultant in civil engineering, geoscience, and hydrogeology. In a professional career spanning over thirty-five years, he has had extensive experience in the planning, design, and construction of public infrastructure, water resource, electric power generation, mining, and waste management projects. This experience includes over twenty-five dams, fifteen power plants, twenty surface mines, and one hundred waste management facilities. Over the last twenty-five years, his experience has also covered a number of high-profile environmental remediation projects. The majority of his experience is in the state of Texas.

He has provided consulting services to a variety of both private- and public-sector clients including U.S. EPA, U.S. Army Corps of Engineers, U.S. Navy, and the states of Kansas and Texas for various projects in the water resource and waste management areas. He has been retained as an expert witness by U.S. EPA and various other clients – particularly on waste management projects. He was a co-author of the 1998 EPA publication, Evaluation of Subsurface Engineered Barriers at Waste Sites. From 1987 through 1996, he taught graduate level contaminant hydrogeology courses at the University of Texas at Dallas. He currently has pending patent #10/128,157 for an "Enhanced Subtitle D Design Standard Composite Liner."

Specific Experience

Mr. Chandler has specific experience in the following technical practice areas:

- **Dams** – Mr. Chandler has extensive experience in water resource projects and particularly with respect to earthen dams. He has acquired extensive experience in the siting, design, construction, operation, evaluation, and restoration of dams. These dams have impounded water for flood control, water supply, navigation, and hydroelectric power. Mr. Chandler has had significant professional involvement with over twenty-five large earthen dams. Mr. Chandler has also been involved in underwater inspection as an engineer-diver with both the Corps of Engineers and as a private consultant. A list of representative dam projects is appended to this resume.

- **Waste Management** – Mr. Chandler has extensive experience in all areas and facets of waste management – both hazardous and non-hazardous. This experience covers both investigation and remediation of existing facilities and planning, siting, design, permitting, construction, and operation of new facilities. He has provided consulting services to a variety of private- and public-sector clients on over one hundred waste management projects. These projects have included regional plans, transfer facilities, transportation systems, landfills, site remediation, recycling/reuse facilities, and composting facilities. Representative cross sections of both municipal waste management and hazardous/industrial waste management experience is appended to this resume.

- **Environmental Remediation** – Mr. Chandler has extensive experience in the remediation of a broad spectrum of environmental media –soil, soil gas, groundwater, and surface water. This experience has included planning, investigation, assessment, design, construction, and

monitoring as well as negotiation/coordination with regulatory agencies. Remediation projects have included innovative solutions. A representative cross section of his remediation experience is appended to this resume.

- **Fossil Fuel Electric Power Generation** – Mr. Chandler has supervised field exploration and laboratory testing and provided engineering design and construction QA/QC services for numerous projects. These projects included lignite-fueled steam electric stations, coal ash disposal facilities, cooling water reservoirs (dams), lignite surface mines, and railroads / haulroads. His work also included various studies of coal ash and fly ash as an engineering construction material. Through these various projects, he has extensive knowledge of subsurface conditions in the "lignite belt" of Texas and extensive experience in engineering design and construction for power generation facilities. A representative cross section of his power generation experience is appended to this resume.

- **Water / Wastewater Management** – Mr. Chandler has provided planning, investigation, geotechnical design, materials engineering design, construction QA/QC, and monitoring services for a variety of water and wastewater management projects. A representative cross section of his water/wastewater experience is appended to this resume

- **Coastal and Ocean Engineering Projects** – Mr. Chandler has provided planning, investigation, design, and construction QA/QC services for shore protection, dredging, littoral by-passing, and beach restoration. A representative cross section of his coastal and ocean engineering experience is appended to this resume.

Professional Employment History

Self-Employed Consultant: 1997- Present
Black & Veatch: 1994-1997
PRC Environmental Management: 1993-1994
HDR Engineering: 1990-1993
University of Texas at Dallas, 1987-1996
Harding Lawson Associates: 1987-1990
Trinity Engineering Testing Corporation: 1983-1987
Self-Employed Consultant: 1982-1983
Rone Engineers: 1982-1982
Pekor Pump Company: 1976-1977 (Consultant 1977-1985)
NFS/National Soil Services: 1973-1976, 1977-1982
U.S. Army COE Waterways Experiment Station: 1971-1973
Center for Dredging Studies: 1970-1971
LTV Aerospace Corporation: 1967-1970

Education

M.S., Civil Engineering, Texas A&M University, 1971
B.S., Aerospace Engineering, University of Texas at Arlington, 1967

Professional

Licensed Professional Engineer, Texas #33368 (1972)
Registered Engineering Firm, Texas #566

Personal

Third-generation, native Texan born in Decatur, Texas. Educated in the Mineral Wells, Texas, public school system. Married to Joan Dawson of Rockwall, Texas. Two daughters. Currently resides / offices in Rockwall.

Affiliations

Society of Mining Engineers (Founding Registered Member)
Tau Beta Pi

Presentations

Wave Transformation of Non-Breaking Waves Passing Over a Submerged Long Shore Bar, Thirteenth International Conference on Coastal Engineering, 1971.

Exploration Techniques for Lignite Mine Development in the Gulf Coast Region, Trinity Section S.M.E., 1981.

Stability Analyses for Excavations and Embankments in the Lignite Areas of Texas, Phillips Coal Company Seminar, 1981.

Metroplex Foundation Problems, Causes and Cures, presented to various realty associations in the DFW area, 1982-1983.

Environmental Regulation in the Mining Industry, Trinity Section S.M.E., 1987.

Geotechnical and Hydrogeologic Aspects of Landfill Design – Landfill Insurance, Texas SWANA seminar, 1990.

Dye Tracer Study Case Histories, Dallas Geological Society, 1994.

Federal New Source Performance Standards and Emission Guidelines for MSWLF's in Texas, APWA International Congress and Exposition, 1995.

Use of Shredded Tire Materials in Landfills, Texas SWANA annual meeting, 1996.

Appendix I – Representative examples of dam experience (Texas):

1. Brazos River Authority of Texas
   Sterling C. Robertson Dam (Lake Limestone)
   Siting, geotechnical design, construction supervision and QA/QC, operational monitoring, safety inspections
   De Cordova Bend (Lake Granbury)
   Geotechnical design for hydroelectric facility, shoreline stability studies

2. Sabine River Authorities of Texas and Louisiana
   Toledo Bend Dam and Hydroelectric Facility
   Hydrogeologic studies, seismic stability analyses, design and construction of remedial pressure relief system, safety inspections, operational monitoring
   Iron Bridge Dam (Lake Tawakoni)
   Stability analyses, remedial investigations, operational monitoring, safety inspections
   Lake Fork Dam
   Geotechnical design, construction supervision and QA/QC

3. San Antonio River Authority of Texas
   San Juan Dam
   Geotechnical design

4. Texas Utilities
   Morgan Creek Dam, Monticello Dam, Twin Oak Dam, Forest Grove Dam, Oak Knoll Dam, Big Brown Dam, and Martin Lake Dam
   Siting studies, geotechnical design, construction supervision and QA/QC, operational monitoring, safety inspections, rehabilitation activities

5. Titus County (Texas) Water District
   Fort Sherman Dam (Lake Bob Sandlin)
   Geotechnical design, construction supervision and QA/QC
   Franklin County Dam (Lake Cypress Springs)
   Remedial investigations, stability analyses

6. U.S. Army Corps of Engineers
   National Dam Safety Inspections (Texas)
   Safety inspections of existing dams in the State of Texas
   McClellan-Kerr Waterway Locks and Dams (Arkansas)
   Safety inspections

7. City of Dallas, Texas
   Bachman Lake Dam, White Rock Lake Dam
   Remedial investigations, stability analyses, rehabilitation activities

8. Guadalupe – Blanco River Authority
   Coleto Creek Dam
   Geotechnical design, construction supervision and QA/QC

Appendix II – Representative examples of municipal solid waste management experience:

1. North Texas Municipal Water District (NTMWD), Wylie, Texas.
   121 Regional Disposal Facility (RDF)
   Design engineer for the recently-opened 110-million-cubic-yard regional disposal facility for Collin County and the cities of Plano, Richardson, Frisco, Allen, and McKinney. Provided QA/QC for initial cell construction.
   McKinney Landfill
   Engineer for design and supervision of remediation of old City landfill and adjacent wastewater treatment plant. Remediation was completely funded through creation of additional airspace for new municipal waste. Conducted Tier 2 NSPS emission calculations.
   Maxwell Creek Landfill
   Engineer for permit amendments and modifications to increase capacity and to comply with Federal Subtitle D requirements. Conducted Tier 2 NSPS emission calculations and provided closure certification.

2. Texas Disposal Systems, Inc. (TDS), Austin, Texas
   Texas Disposal Systems Landfill
   Design engineer for composting facility processing C&D waste, yard waste, food waste, and scrap paper. Engineer for gas collection and control system.
   Starcrest Transfer Station
   Design engineer for conversion of the old City of San Antonio Starcrest Transfer Station to accommodate high payload open-top transfer trailers. Approximately one third of waste generated in San Antonio is currently transferred through this facility.

3. American Refuse, Inc., Houston, Texas.
   Reuse/Recycling Facility
   Design engineer for registration of facility reusing/recycling approximately 65,000 tons per year.

4. Kansas Department of Health and Environment
   Statewide Evaluation of C&D Landfills
   Principal investigator for evaluation of current state-of-practice at C&D landfills.

5. Four-County Solid Waste Management Plan, Levelland, Texas
   Solid Waste Options
   Project manager for solid waste plan development for Bailey, Cochran, Hockley, and Lamb Counties. Plan included regional transportation system, regional landfill, and other management alternatives.

6. Waste Management, Inc., Ferris, Texas.
   Skyline Landfill
   Design engineer for currently operating twenty-six-million-ton capacity municipal landfill.

Appendix III – Representative examples of industrial / hazardous waste management experience:

1. Texas Utilities
   Monticello Steam Electric Station
   Investigation, characterization, design, and construction supervision of multiple storage and disposal facilities including soil-bentonite slurry wall and groundwater monitoring system.
   Sandow, Big Brown, Twin Oak, and Martin Lake Electric Stations
   Investigation, characterization, design, and construction supervision of multiple storage and disposal facilities including soil-bentonite slurry wall and groundwater monitoring system.

2. U.S. Navy
   Cecil Field Naval Air Station, Jacksonville, Florida
   Planned, designed, supervised, and prepared RCRA Facilities Investigation (RFI) Report for eighteen solid waste management units (SWMUs).

3. Sparton Technologies, Inc.
   Coors Road Facility, Albuquerque, New Mexico
   Planned, designed, investigated, supervised, and prepared RCRA Facilities Investigation (RFI) Report and Corrective Measures Study (CMS) Report.

4. Van Waters & Rogers
   Spokane Facility
   Facility was located over shallow "sole-source aquifer". Provided technical negotiation for RCRA section 3013 and 3008(h) Consent Orders. Planned and implemented site investigation and characterization and designed corrective measures that successfully remediated solvent contamination of soil, soil gas, and groundwater to allow clean closure.

5. City of Dallas Texas
   Southside Sludge Management Facility
   Planned and implemented site investigation and characterization and designed groundwater protection system consisting of multiple soil-bentonite slurry walls.

6. U.S. Department of Justice
   U.S. v Marine Shale Processors
   Expert witness for U.S. DOJ/EPA on site characterization during penalty phase of enforcement trial.

7. U.S. EPA
   Region VI Corrective Action Oversight
   Provided technical review and technical support for corrective action at five industrial manufacturing plants, two hazardous waste disposal sites, and four military bases.

Appendix IV – Representative examples of environmental remediation experience:

1. North Texas Municipal Water District
   City of McKinney WWTP and MSWLF
   Investigated, designed, and implemented successful remediation to address chlorinated solvent contamination in soil, groundwater and surface water. Over 3 million cubic yards of contaminated material were excavated and relocated into a new "lined" facility. Project was financed by creation of new airspace for MSW disposal.

2. Van Waters & Rogers
   Spokane Facility, Washington
   Facility was located over shallow "sole-source aquifer". Planned and implemented corrective measures that successfully remediated solvent contamination of soil, soil gas, and groundwater to allow clean closure.

3. Sparton Technologies, Inc.
   Coors Road Facility, Albuquerque, New Mexico
   Planned and implemented corrective measures that addressed chlorinated solvent contamination and successfully remediated soil gas contamination and began successful groundwater remediation [in progress] including recharge.

4. Texas Utilities
   Monticello Steam Electric Station Ash Ponds
   Planned and implemented corrective measures that addressed high pH and heavy metal release to groundwater and surface water. Corrective measures included a soil-bentonite slurry wall.

5. City of Frisco, Texas
   Stewart Creek WWTP
   Planned and implemented corrective measures to address lead contamination resulting from sludge drying beds. The affected area was remediated and clean closed.

6. U.S. Navy
   Point Molate Fuel Depot, California
   Technical consultant for planning and implementing corrective measures to address hydrocarbon contamination of soil, groundwater, and surface water. Remediation included biopolymer interception trench and geosynthetic subsurface barrier.

7. U.S. EPA
   Evaluation of Subsurface Engineered Barriers at Waste Sites, EPA 542-R-98-005
   Co-author of the two-volume 1998 EPA publication that provided an in-depth evaluation of subsurface barriers at 162 environmental sites to serve as a "summary" of the state of practice and a detailed evaluation of methodology and design recommendations.

8. U.S. Air Force
   March Air Force Base, California
   Technical consultant for planning and implementing a multi-dye tracer study that confirmed operating characteristics of an in situ groundwater treatment system demonstration (UVB system).

Appendix V – Representative examples of fossil fuel electric power generation experience (Texas):

In the 1970's and early 1980's, Pierce Chandler was a principal in the Dallas office of NFS/ National Soil Services, Inc. – a primary geotechnical engineering, materials engineering, and environmental engineering consultant to the Texas power generation industry for that era. He was field supervisor, chief engineer, and vice-president in that organization. Mr. Chandler supervised field exploration and laboratory testing and provided engineering design and construction QA/QC services for numerous projects. These projects included lignite-fueled steam electric stations, coal ash disposal facilities, cooling water reservoirs (dams), lignite surface mines, and railroads / haulroads. His work also included various studies of coal ash and fly ash as an engineering construction material. Through these various projects, he has extensive knowledge of subsurface conditions in the "lignite belt" of Texas and extensive experience in engineering design and construction for power generation facilities.

Specific examples of his Texas power generation experience would include:

- Big Brown SES, Freestone County (waste management facilities, haulroads, dam)
- Sandow SES, Milam County (generating unit 4, lignite exploration, entrance road)
- Monticello SES, Titus County (generating unit 3, waste management facilities, railroad, dam, lignite exploration)
- Martin Lake SES, Rusk County (generating units 1, 2 & 3, railroad, waste management facilities, loading stations, dam)
- Thermo Loading Station, Hopkins County (loading station, railroad, haulroad)
- San Miguel SES, Atascosa County (generating units, railroad, haulroad, waste management facilities, lignite exploration)
- Gibbons Creek SES, Grimes County (generating units, dam, lignite exploration)
- Henry Pirkey SES, Harrison County (generating units)
- Oklaunion SES, Wilbarger County (generating units)
- Coleto Creek SES, Goliad County (generating unit, dam, railroad)
- Twin Oak Project, Robertson County (generating units, waste management facilities, dam, railroads)
- Oak Knoll Project, Limestone County (siting studies, mining impact to groundwater)
- Forest Grove Project, Henderson County (generating units, dam, railroad)
- Ward County Project (siting studies)
- Fayette Power Project, Fayette County (dam)
- Morgan Creek SES, Mitchell County (dam)

Appendix VI – Representative examples of water / wastewater management experience:

1. City of Dallas
   East Side Water Treatment Plant, Phases II and III
   Provided geotechnical design and construction QA/QC for Phase II and III expansions.

   Southside Wastewater Treatment Plant
   Provided geotechnical design and construction QA/QC for the Sludge Management Facilities.

   Tawakoni Balancing Reservoir and Pump Station
   Provided geotechnical design and construction QA/QC for the raw water transmission facility.

   North High Feeder Waterline
   Provided geotechnical design and construction QA/QC for the North High Feeder Line.

   Central Wastewater Treatment Plant
   Provided geotechnical design and construction QA/QC for various expansions.

2. City of Commerce Texas
   Wastewater treatment Plant
   Provided geotechnical design and construction QA/QC for new wastewater treatment plant

3. City of Sherman Texas
   Wastewater treatment Plant
   Provided geotechnical design and construction QA/QC for major expansion to City's wastewater treatment plant.

4. City of The Colony, Texas
   Water and Wastewater Facilities
   Provided geotechnical design and construction QA/QC for the City's raw water intake pump station water treatment and wastewater treatment plants.

5. North Texas Municipal Water District
   Texoma to Trinity Pipeline
   Provided geotechnical design and construction QA/QC for raw water pipeline

Appendix VII – Representative examples of coastal / ocean engineering experience:

1. Corps of Engineers Waterways Experiment Station
   Portable Littoral Drift Bypassing Program
   Managed program responsible for development of portable bypassing equipment and techniques – both in-house and at selected Universities. Prototype evaluations were conducted at Mexico Beach and Destin Florida, Virginia Beach Virginia, and Santa Cruz and Camp Pendleton, California.

   Assistant Station Diving Officer
   Served as Assistant Station Diving Officer and was appointed to Corps-wide committee regulating technical Corps diving policies and procedures.

   Technical Consultant
   Provided technical consulting services to the Office, Chief of Engineers on various dredging projects.

2. Monterey Bay, California
   Technical consultant on various remedial shore protection projects, beach restoration, and new developments from Santa Cruz to Monterrey.

3. Pekor Pump Company
   Provided design and custom applications of pumping equipment for numerous dredging and coastal zone management projects. Work was conducted for the Corps of Engineers, California and Florida Departments of Natural Resources, Southern Public Service Company, and Georgia Power.

Blue Flats Development Permit Application and Hearing *(Stability analyses) 1997*

Texas Disposal Systems Landfill (Austin) MSW Composting Facility *(Design Engineer) 1997*

City of Garland Transfer Station; North Texas Municipal Water District (NTMWD) Lookout, Parkway, and Custer Transfer Stations; NTMWD McKinney and Maxwell Creek MSW Landfills; Texas Disposal Systems (TDS) MSW Landfill; San Antonio Starcrest Transfer Station; and Austin Eco Depot Transfer Station *(Engineer for Closure/Post-Closure Plans and Cost Estimates) 1997-2006*

City of Garland's Raney MSW Landfill Citizen's Convenience Center *(Design Engineer) 1997-1998*

City of Irving (w/ Trinity River Authority) Pilot Study – Beneficial Use of Biosolids as Landfill Cover, *(Design Engineer) 1997-1998*

NTMWD McKinney MSW Landfill Footprint and Final Cover Permit Modifications *(Design Engineer) 1997-2003*

NTMWD McKinney MSW Landfill Liner QA/QC *(Engineer of Record) 1997-2004*

NTMWD 121 RDF Permit Application *(Engineer-of-Record, Design Engineer) 1997- Permit issued 2003*

Evaluation of Subsurface Engineered Barriers at Waste Sites, Volumes I and II, EPA-542-R-98-005, USEPA Office of Solid Waste and Emergency Response *(Co-Author) 1998*

NTMWD, NSPS/EG Tier 2 Testing – Maxwell Creek and McKinney Landfills *(Engineer of Record) 1998*

American Refuse (Houston) Type V Transfer Station Registration *(Registration Engineer) 1998*

Adobe Ecosystems MSW Landfill Permit Application *(Geotechnical Engineer and Hydrogeologist representing party opponents) 2000-2002*

Texas Disposal Systems System Landfill, NSPS/EG Tier 2 Testing *(Engineer of Record) 2000-2003*

TSP Industrial Landfill Permit Application *(Geotechnical Engineer and Hydrogeologist representing party opponents) 2001-2002*

Pending Patent 10/128,157 for "Enhanced Subtitle D Design Standard Composite Liner" filed 04/23/02 *(Design Engineer and Applicant) 2002*

Tan Terra Environmental Services Inc. MSW Landfill Permit Application, Jones County, Texas *(Design Engineer) 2002-2004*

North Texas Municipal Water District (NTMWD), NSPS/EG Tier 2 Testing – Maxwell Creek and McKinney Landfills *(Engineer of Record) 2003*

NTMWD, 121 RDF Initial Cell Construction QA/QC, Gas and Groundwater Monitoring System Installation *(Engineer of Record) 2003-2004*

NTMWD, 121 RDF Permit Modifications for Site Operating Plan *(Engineer-of-Record, Design Engineer) 2003-2006*

Geotechnical Report for City of Commerce MSW Landfill Subtitle D Permit Modification *(Geotechnical Engineer) 2003*

Closed Type IV Landfill Gas Investigation (Buda, Texas) *(Engineer of Record) 2004*

Texas Disposal Systems Landfill, Design and Installation of Gas Collection and Flare Control System *(Engineer of Record) 2004-2005*

City of Mason (Texas) Landfill, Permit Modification to increase height ten feet *(Engineer of Record) 2004-2005*

Texas Disposal Systems Landfill, Permit Amendment Application for major expansion *(Review Engineer) 2005-2007*

City of Mason (Texas) Landfill, Various Permit Modifications including Site Operating Plan *(Engineer of Record) 2005-2007*

NTMWD, Maxwell Creek Closure Certification *(Engineer-of-Record) 2006*

McCarty Road MSWLF Expansion *(consulting expert opposing permit) 2006-2008*

Kendall Land & Cattle / Waste Management of Illinois, Willow Run Landfill Permit Application *(Peer Reviewer, QA/QC) 2006-2007*

Texas Organic Products, Travis County, Texas *(testifying expert opposing permit) 2006-2007*

Williamson County MSWLF Expansion *(consulting expert opposing permit) 2007-2008*

Comal County [Mesquite Creek] MSWLF Expansion *(consulting expert opposing permit) 2007-2008*

Blue Ridge MSWLF Expansion (*consulting expert opposing permit*) 2007-2008

ROBERT S. KIER, Ph.D.
CONSULTING
PRINCIPAL
2008

ROBERT S. KIER

June

QUALIFICATIONS SUMMARY

More than thirty-five years experience in geology, hydrogeology, engineering geology, water resources development, municipal solid waste, and hazardous waste management and cleanup. Specific experience includes multidisciplinary investigations and project management, as well as independent technical consulting, consulting expert and expert witness services, and teaching at the university level.

EXPERIENCE

Principal of Robert S. Kier Consulting, an independent consulting firm serving private and municipal clients. Included in his experience are investigation and cleanup operations at the new Austin Bergstrom International Airport, review of investigation activities at Reese Air Force Base in Lubbock, removal and cleanup operations of approximately forty gasoline and diesel USTs at several manufacturing plants, cleanup and removal activities for an underground waste treatment system and landfill at an oil well service company site, outside review of cleanup activities for the first state-supported UST cleanup in Texas, and expert witness services related to cleanup operations at six service stations. In addition, Dr. Kier has evaluated numerous proposed and existing municipal and industrial landfill sites, developed a cleanup program for a furniture manufacturer and a well service company, performed numerous environmental audits and site assessments, participated in evaluating the nature and extent of contamination at a Superfund site in Arkansas, prepared several Part B Permit Applications, a Ground Water Compliance Monitoring Plan Application and follow-on investigatory reports, evaluated hydraulic testing in low permeability rocks at a hazardous waste landfill, investigated ground water conditions at numerous uranium mill and insitu mine sites, evaluated the impact of wastewater disposal on the Edwards Aquifer, the Paluxy Aquifer, and several other water-bearing formations, as well as several surface streams, prepared several geologic assessments for the Edwards Aquifer, evaluated potential leakage from five proposed and existing reservoirs, participated in the development of rules and management plans for several ground water conservation districts, evaluated several municipal water supplies, examined ground water conditions with respect to a retaining wall failure, examined stream erosion related to wastewater discharges from a municipal treatment plant, prepared a hazardous waste management plan for a geotechnical engineering firm, and evaluated the interrelationship between ground and surface water with respect to several water rights issues. Dr. Kier has provided consulting expert and expert witness services and testimony at numerous public hearings and in state and federal courts of law.

Previously with Camp Dresser & McKee Inc. (CDM), Dr. Kier participated in or managed approximately fifty different projects. Nearly all the projects were multidisciplinary, melding engineering, geologic, hydrologic, economic, and ecologic considerations. Projects dealt with numerical modeling of local and regional ground water flow systems, surface and ground water quality, and the transport and fate of toxic, hazardous, and nuclear wastes. Other projects involved determination of water requirements, water resources availability, and wastewater treatment alternatives for development of nonconventional energy in Texas, New Mexico, Colorado, and Utah, and analysis of the hydrogeology of a multistate, multiaquifer system, including available water supplies and the potential for salt water intrusion. Dr. Kier worked on eight Superfund sites and was the site manager for three of these sites. In addition, he developed ground and surface water investigation programs for four other hazardous waste sites.

Dr. Kier has contributed more than twenty-five papers to the professional literature and authored more than a hundred technical reports for the projects in which he has participated. In addition, Dr. Kier has served as a part-time lecturer of a geology for engineers course at the University of Texas at Austin. Dr. Kier is a Licensed Professional Geoscientists in Texas (196), a Certified Professional Geological Scientist (6358) by the American Institute of Professional Geologists, and is a Registered Professional Geologist in the State of Arkansas (316).

EDUCATION

A. B., Geology, Franklin and Marshall College, 1965
M. S., Geology, Franklin and Marshall College, 1967
Ph.D., Geology, The University of Texas at Austin, 1972

CERTIFICATION

State of Texas, Licensed Professional Geoscientist, No. 196
American Institute of Professional Geologists,
Certified Professional Geological Scientist (CPGS), No. 6358
State of Arkansas, Registered Professional Geologist, No. 416

TECHNICAL SOCIETIES

Association of Ground Water Scientists and Engineers, National Ground Water Association
Texas Ground Water Association
Association of Engineering Geologists
Austin Geological Society
American Association of Petroleum Geologists;
Division of Environmental Geosciences
Air and Waste Management Society

PROFESSIONAL HISTORY

August 2006 to 2007 — Lecturer, Department of Geological Sciences, The University of Texas at Austin; Undergraduate and graduate level courses

June 1994 to Present — Secretary/treasurer; Crespo Consulting Services, Inc.; Civil and Environmental Engineers; Austin, Texas

February 1992 to November 30, 2005 — Chairman, Board of Directors, Terra Dynamics Inc.; Environmental Services; Austin, Texas

September 1986 to Present — Principal and Sole Proprietor, Robert S. Kier Consulting; Hydrogeology, Geology, and Engineering Geology

Representative Projects Include:

Participated in evaluating the hydrogeology of a hazardous waste disposal site in California, the potential for deep contaminant migration, and interpretation of various kinds of well tests.

Technical consultant or manager for removal and cleanup of contamination associated with over forty USTs at more than fifteen manufacturing plants in Texas and in other states.

Served as outside reviewer of cleanup plans develloped by another consultant for the first state-supported UST cleanup in Texas.

Provided consulting expert and expert witness services related to cleanup and cost recovery at former service station sites in Dallas, Beaumont, Tyler, and McAllen and for property adjacent to existing service stations in Fort Worth and in Brownsville.

Participated in evaluating the nature and extent of contamination related to industrial waste disposal operations at a Superfund site in Arkansas.
Prepared a Ground Water Compliance Monitoring Plan Application for a steel tube manufacturer near Houston, Texas; assisted with preparation of the Part B Application; prepared several other compliance and investigatory reports.

Prepared a Part B Application and Affidavit for Exclusion for an aircraft manufacturer.

Developed a compliance and clean up program for a furniture manufacturer in Austin, Texas.

Developed a compliance and cleanup program for a major well service company.

Evaluated proposed municipal and construction and demolition debris landfill sites near Muenster, Itasca, Cibolo, Bastrop, San Antonio, Wilmer, Royse City, Fort Worth, Leakey, Ferris, Corsicana, McKinney, Maxwell Creek, Madden Road, Melissa, Ennis, Corsicana, Waco, Corpus Christi, Brownwood, Harlingen, Gordon, Austin, Houston, College Station, Texas City, Maverick County, and La Marque, Texas; developed a ground water monitoring program four sites.

Evaluated potential ground water contamination at an existing landfill site in South Texas and two in North Texas.

Managed preparation of three applications for modifications to municipal solid waste landfill permits to comply with new federal Subtitle D rule and revised Texas municipal solid waste regulations; provided permitting assistance for more than twelve sites.

Served as outside reviewer for quality assurance related to enforcement actions by the Texas Water Commission and the Texas Department of Health at two landfill sites.

Evaluated the impact of a potential wastewater treatment plant sludge disposal site near Red Oak, Texas.

Evaluated a proposed ground water monitoring system for two hazardous waste disposal sites and two Class I, non-hazardous industrial waste disposal sites in Texas; evaluated the geologic, hydrogeologic, and geotechnical investigations and findings, as well as the ground water monitoring system for another proposed hazardous waste landfill site in Texas; participated in developing geological, geotechnical, and hydrogeological information for a third proposed site in the state.

Evaluated the potential for irrigated wastewater to discharge into Barton Creek, which recharges the Edwards Aquifer near Austin, Texas.

Evaluated ground water impacts of proposed wastewater irrigation near Ingram and near Lake LBJ, Texas.

Evaluated a proposed septic tank and filter field system for a development on the Paluxy Formation in North Texas.

Examined the evidence for seepage from two uranium mill tailings disposal ponds; reviewed closure and post-closure monitoring plans.

Evaluated proposed remedial actions at a former uranium mill site to be cleaned up by DOE under the UMTRA.

Evaluated ground water conditions at five proposed insitu uranium mining sites.

Evaluated the geology and hydrogeology for a proposed landfill site for uranium mill tailings and other wastes with similar radiological characteristics.

Investigated whether discharge of municipal wastewater effluent into a stream was the cause of or incidental to bank erosion along the downstream reaches of the stream.

Performed environmental audits and site assessments for several clients.

Prepared hazardous waste management plan for a major geotechnical engineering firm: the plan encompassed health and safety, medical monitoring, personnel certification, generation and disposal of hazardous wastes, and client and project risk assessment.

Prepared several Geologic Assessments for proposed development on and adjacent to the Edwards Aquifer.

Examined hydrogeologic conditions at and in the vicinity of three dairy and one calf raising operation in Erath County, Texas, and another confined animal feeding operation in the Bryan-College Station area, Texas.

Examined the role of ground water in failure of a retaining wall in Austin, Texas.

Examined the origin of ground water seepage at a private residence and at a commercial establishment in Austin and potential ground water seepage at an elementary school south of Austin.

Developed dewatering requirements for clean up of a hazardous waste site in Houston, Texas.

Evaluated potential leakage from four proposed and existing reservoir sites and the interaction between the reservoirs and the regional ground water flow systems.

Evaluated and presented testimony with respect to well contamination in the Edwards Aquifer of Medina County; examined water quality related to a bottled water plant supplied by the Edwards Aquifer; Investigated the overall hydrogeology of the Edwards Aquifer System in relation to spring flow discharge and reservoir operation.

Provided hydrogeological analysis related to transport and cleanup of a gasoline release into shallow ground water in San Marcos, Texas.

Provided quality assurance and quality control concerning the hydrogeology and fate and transport of metals contamination in ground water at a former rockwool production plant in Belton, Texas, and with respect to hydrocarbon contamination at a cement plant in Dallas.

Provided hydrogeologic assistance for a private water supply company using the Carrizo-Wilcox Aquifer and assistance to a municipality investigating conjunctive use of surface and ground water resources.

Provided hydrogeologic assistance to private landowners evaluating the water supply potential of the Edwards Aquifer beneath their land.

Consultant to the City of Austin, Department of Aviation, with regard to remedial investigations and cleanup at Bergstrom Air Force Base and construction of a new municipal airport.

Consultant to a private group reviewing investigation activities related to the offsite spread of chlorinated hydrocarbons from Reese Air Force Base.

Evaluated potential soil and ground water contamination at former gravel pits and a salvage yard in Fort Worth and near Dallas, Texas.

Developed ground water monitoring system for wastewater treatment system near Canyon, Texas.

Evaluated water supply and water quality implications for a proposed mining operation in the Hickory Sandstone aquifer; in part based on application of a ground water flow model.

Performed Phase II environmental assessment for two apartment complexes in Fort Worth that had been affected by fuel pipeline breaks.

Served as a consultant to the Barton Springs-Edwards Aquifer Conservation District and to Plum Creek Conservation District. Currently serve as consulting hydrogeologist for Lost Pines Groundwater Conservation District.

February 1979 to August 1986

Principal Scientist, Camp Dresser & McKee Inc. Team leader, environmental and hazardous waste group, Austin office.

Representative Projects Include:

Participated in Six-State High Plains-Ogallala Aquifer Study geology; ground water hydrology, environmental impacts of changing conditions on the High Plains, interbasin transfer, and project management.

Project manager for a study to determine leakage rates, quantities of ground water, and fate of mine water that had seeped from a disposal pond in South Texas; ascertained company liability; and suggested and tested ground water recovery measures using a two-layer, three dimensional ground water flow model.

Investigated the potential of using salt domes to dispose of toxic and hazardous wastes.

Project manager for a ground water quality assessment at a military installation in East Texas; designed ground and surface water monitoring program to evaluate the extent of migration of contaminants that had seeped from an unlined evaporation pond.

Project manager for a ground water study for Texas Tech University; applied a three-dimensional ground water model to simulate the Ogallala Aquifer system in the Lubbock area, sampled and evaluated ground water quality, reviewed potential uses of the ground water by the University and the City of Lubbock for domestic, industrial cooling and irrigation supplies, determined treatment costs, and formulated ground water control plans.

Project manager for developing a conceptual ground water model for transport of high-level radionuclids from a salt dome repository; salt dome basins in Texas, Mississippi, and Louisiana.

Project manager for ascertaining the availability of surface and ground water for unconventional energy sources, e.g. coal gasification, low-head hydropower, biomass conversion, geothermal energy in Texas, New Mexico, and Colorado; examined use requirements, applicable state water law, committed water rights, mechanisms of developing the water resources, and wastewater treatment requirements. Participated in similar study for portions of Colorado and Utah.

Participated in multistate water resources evaluation of a portion of the Delaware River Basin; reviewed hydrogeology of the aquifers to develop aquifer parameters and geometry and to evaluate degree of interconnection among the aquifers; evaluated the causes of salt water intrusion along the eastern shore.

Participated in evaluating a multiaquifer system, comprising confined and unconfined aquifers, for capability to meet anticipated municipal water supply demands.

Investigated the origin and nature of spring flow from the Edwards Aquifer in Concho and Tom Green Counties, Texas; testimony cited by court of appeals reaffirming Texas water law.

Evaluated the hydrogeology, foundation conditions, and leakage potential for a proposed dam in West Texas; employed quasi three-dimensional ground water flow model; participated in evaluating estimated yield from the proposed reservoir.

Managed evaluation of the hydrologic and water quality impacts of ground water withdrawals for irrigation purposes from a confined aquifer in northwestern Indiana; assisted in developing test program to ascertain the impacts of ground water withdrawals from the confined aquifer on the overlying, shallow water table aquifer and the surface water regime.

Project manager for an evaluation of the feasibility of constructing reservoirs to store surface runoff for later recharge to the Edwards Aquifer; supervised hydrologic investigation and prepared report.

Supervised hydrologic studies and foundation exploration program for a water quality improvement and flood-control dam in Austin, Texas; Developed conceptual design for dam and concealed outlet structure; designed ground water seepage collection system to reduce uplift pressures and to prevent piping.

Designed ground water monitoring program for a dedicated land disposal site in North Texas.

Site manager for three Superfund sites encompassing remedial investigation and feasibility activities, technical support to EPA, and compliance monitoring; participated in the investigation of four other Superfund Sites.

Evaluated the potential for leakage from two proposed reservoirs in North-Central Texas.

Project manager for investigation of the relationship of discharges from a wastewater treatment plant to bank erosion along the downstream reaches of receiving stream.

September 1971 to February 1979 — Research Scientist, Bureau of Economic Geology, The University of Texas at Austin.

While at the Texas Bureau of Economic Geology, Dr. Kier's specialties included a broad spectrum of environmental geologic considerations, resource use, and multidisciplinary research.

Pertinent major projects include:

A multidisciplinary study to develop a methodology to evaluate alternative coastal zone management policies. Dr. Kier worked first in delineating environmental,

hydrogeologic and economic resources of the coastal zone (including submerged lands), then as project coordinator for the various geologic, biologic, economic, demographic and water resources disciplines, and finally as project director. The study, funded by the National Science Foundation, focused on the Corpus Christi area, but used other parts of the Texas Gulf Coast for comparative examples.

Project director and senior author of Land Resources of Texas, an inventory of the land and water resources of Texas based on natural physical, biological and chemical characteristics, and man-made or modified attributes. The various land and water resources units delineated include those where the primary characteristic or aspect is their geohydrologic attributes, mineral resource potential, physical properties, geomorphology, occurrence of active process, biologic character, submerged character, or man-induced properties. Required extensive reinterpretation of existing maps and original mapping on aerial photographs.

Aerial photo interpretation and mapping for the Brownwood and the Wichita Falls and Lawton Sheets of the Geologic Atlas of Texas.

Crespo Consulting Services, Inc.
Civil & Environmental Engineering

L. STEPHEN STECHER, PE, CFM

Principal Engineer / Project Manager

Areas of Expertise:
Civil Engineering
Drainage
Storm Water
Erosion Control
Water Quality Management
Hydrologic Modeling
Hydraulic Modeling
Floodplain Studies

Registration:
Texas Professional Engineer,
No. 55645
Certified Floodplain Manager,
No. 1131-06N

Education:
M.S. Civil Engineering, University of Texas at Austin (1985)
B.S. Civil Engineering with Highest Honors, University of Texas at Austin (1978)

Continuing Education/Training:
Floodplain Management Training
Streambank Stabilization
Sedimentation/Erosion Control
SWMM Short-Course
EPA Watershed Management
Storm Water Management/Stream Restoration

Professional Affiliations:
American Society of Civil Engineers (ASCE)
Society of Hispanic Professional Engineers
Water Environment Federation/ Water Environment Assoc. of Texas
Texas Floodplain Managers Association

Employment History:
1994-present: Crespo Consulting Services, Inc
1989-1994: COA – Environmental & Conservation Service Department
1985-1989: R.J. Brandes Company
1977-1985: Camp Dresser & McKee Inc.
1976: Radian Corporation

Mr. L. Stephen Stecher, P.E., President of Crespo Consulting Services, directs a locally-owned and operated civil and environmental engineering firm in Austin. He has over twenty-four years of project management and engineering experience in civil engineering related to hydrologic, hydraulic and water quality studies and design. He has direct project experience involving drainage, flooding, water quality and erosion in the Austin area. Mr. Stecher has performed or directed numerous engineering projects including street, drainage and utility design; Storm Water Pollution Protection Plans (SW3P); channel improvements for flood and erosion control; design and permitting of innovative water quality facilities and flood management projects; design of regional detention facilities and park improvements; preparation and updating of watershed master plans; hydrologic and hydraulic modeling; revising and updating of FEMA maps; and use and analysis of GIS for watershed planning and engineering.

Specific Relevant Experience:

- **Gilleland Creek Modeling and Mapping Project: Austin, Texas.** *Project Manager.* Performed field reconnaissance to study the Elm Creek Watershed, to measure hydraulic structures and to determine land use and vegetative cover. Developed a HEC-RAS model using ArcGIS and HEC-GeoRAS based on data including surveyed cross sections, LIDAR based elevation data, field observations, and as-built drawings of existing structures. Developed a HEC-RAS model to develop new, existing and future water surface elevation profiles for the entire Elm Creek Watershed for the purpose of remapping the floodplain. Performed a Watershed Flood Hazard Assessment to determine an estimate of the number of structures inundated and the depth of inundation for each storm return frequency.

- **Barton Hills Retrofit: Austin, Texas.** *Project Manager.* Evaluated a number of nonpoint source pollution controls to reduce the amount of pollution and sediment reaching Barton Creek and Barton Springs Pool. Conducted geomorphic and sediment transport studies in conjunction with an environmental assessment, hydraulic and hydrologic modeling, and floodplain analyses in order to develop an integrated solution to managing the site's storm water. Directed the development of a WPAP and corresponding geologic assessment to comply with TCEQ requirements. Directed and performed the final project design which included erosion control measures, a sedimentation/infiltration pond, storm sewers and inlets, channel revegetation, tree mitigation and planting plan, and parkland aesthetics.

- **Ben White/IH-35 Bioretention Pond Design: Austin, Texas.** *Project Manager.* Provided preliminary and final engineering services for a bioretention/extended detention pond to treat storm water runoff from the IH-35/Hwy 71 interchange. This complex project involved not only hydrologic, hydraulic, and storm water modeling but it also included numerous coordination efforts with State

agencies and City departments. Designed an innovative pond that was effective at removing pollutants and cost efficient with minimal environmental disturbance. Supervised the productive of the construction documents for the project which is expected to break ground fall 2008. Provided value engineering services to determine the most cost-effective design.

- **Texas Disposal Systems Landfill Evaluation and Design: Austin, Texas.** *Project Engineer.* Performed computer modeling of potential runoff, infiltration, evapotranspiration, and leachate formation at this municipal solid waste landfill in southeast Austin using EPA's HELP (Hydrologic Evaluation of Landfill Performance) and MULTIMED (Multimedia Exposure Assessment) models and ordinary analytical approaches to demonstrate compliance with the federal and state performance design criteria. Performed potential contaminant transport evaluations for BTEX using AT123D. Evaluated soils, geology and ground water hydrology of the host formation to determine potential for migration of pollutants and developed and evaluated design alternatives for landfill covers and leachate collection systems. Work included storm water and leachate pond design, and development of the Storm Water Pollution Prevention Plan (SW3P).

- **Mabel Davis Park Landfill Remediation: Austin, Texas.** *Project Manager.* Provided environmental and civil engineering services for this environmental remediation feasibility study, including development of pollution and flood control alternatives. Performed hydrologic, hydraulic and water quality modeling to develop a preliminary design of a combined flood, water quality and erosion control facility, as well as other site features.

- **Water Quality Ordinance Expert Testimony: Austin, Texas.** *Expert Witness.* Provided expert testimony and technical support at trials and hearings concerning the City's watersheds ordinances. Performed various storm water and pollution control analyses and investigations related to protection of water quality in Barton Creek and the Edwards Aquifer. Evaluated mitigation measures for detention ponds, infiltration devices and buffer zones. Various types of innovative water quality controls were researched and evaluated with respect to pollutant removal efficiency. Performed pollutant loading, drainage, and flood analyses to evaluate potential water quality, erosion and flooding impacts associated with local development, and produced conceptual plan and designs. Evaluated surface and ground water quality for potential impacts to recreational, water supply and aquatic life uses. Long-term daily runoff and infiltration simulations have been made with over 50 years of daily rainfall data using PONDOP, EPA's HELP model and GLEAMS in order to evaluate the effects of buffer zones, impervious cover limitation and detention volume requirements.

- **TECO Landfill: South Texas.** *Project Manager.* Groundwater Modeling and Well Field Spacing. Performed groundwater modeling using MODFLOW to determine the required well spacing and pumping rates to de-water the area beneath the landfill. Localized well hydraulics and interference from boundaries were considered.

- **Dallas County WCID#6 Wastewater Permitting: Dallas, Texas.** *Expert Witness.* Performed wastewater discharge modeling for Dallas County WCID#6, including verification of field conditions for wastewater and storm water discharge permitting. Provided testimony for the permit hearing. The modeling included a small creek at the proposed discharge point as well as the Trinity River. Evaluated the existing ground water problems caused by sub-standard individual systems. Other work included the flood hydraulics modeling of the area, consideration of channel losses and evaluation of the regional ground water flow.

- **Big Cypress Water Quality Monitoring: Northeast, Texas.** *Project Engineer.* Performed water quality modeling of the Big Cypress Creek and Tankersley Creek upstream of Lake-of-the-Pines. This work evaluated point and nonpoint source pollution, including an existing industrial discharge, the existing municipal discharges, a proposed industrial discharge and agricultural nonpoint source pollution. This effort served as a preliminary step in the development of a TMDL and reclassifying the water bodies on the 303(d) list. Modified and updated the existing TCEQ QUAL-TX model to allow consideration of nonpoint source loads, including increases in the sediment oxygen demand. Participated in the hydrologic evaluation of the stream assessment that led to the reclassification of tributary stream. Control measures to protect the water resources were developed. Testified at an EPA hearing for an NPDES permit for the existing industrial discharge to ensure the necessary level of treatment was provided.

- **Stormwater and Drainage Master Plan: Fredericksburg, Texas.** *Project Manager.* Prepared and completed for the City of Fredericksburg a master drainage plan. Identified existing flooding problem areas and developed appropriate mitigation measures. Regional storm water detention ponds, storm drain systems and improved channels were considered. Work included coordination with city officials to develop appropriate storm water detention and sedimentation control ordinances that can be utilized to better manage future development. Developed preliminary cost estimates and project rankings for selection by the

City. Directed the design of five major storm sewer projects to alleviate significant flooding problems. One project included the modeling and design of a detention pond to mitigate the changes in flow due to the storm sewer project.

- **CapMetro North Operations and Maintenance Center, Street and Drainage Improvements: Austin, Texas.** *Project Manager.* Provided civil engineering and hydrologic services with respect to detailed analysis of detention pond capacity and detailed analysis of runoff to the proposed Capital Metro redevelopment site. Work included collection of record information, review of complaints data, hydraulic analysis of the existing system, delineation of subareas using GIS, hydrologic modeling using HEC-1, hydraulic analysis of storm sewer, inlet location and preliminary storm sewer design. Crespo provided civil design services with respect to Rundberg Lane Extension / Saunders Lane roadway improvements and Waterford Center extension associated with the Capital Metro site development.

- **Citywide Erosion Assessment: Austin, Texas.** *Project Manager.* Performed the stream erosion inventories for the central-east Austin creeks including Boggy Creek and its Tannehill and Fort Branches, Little Walnut and Walnut Creeks. This work involved walking the entire stream channel to identify stream bank conditions and locate erosion sites. Determined inset channel characteristics, documented soils and geologic conditions, and threatened structures and utility lines along the length of creeks. Responsible for updating the City's existing hydrologic and hydraulic models or the Williamson Creek erosion assessment. Models were updated based on new regional detention ponds and used to determine flows, velocities and depths within the main channel and tributaries for the 6-month and 2-year storms. Evaluated the impacts of water quality control ponds on downstream flows for both the standard water quality volumes and those required by the SOS ordinance.

- **US 183A Water Pollution Abatement Plan (WPAP): Williamson County, Texas.** *Project Manager.* Prepared the Water Pollution Abatement Plan (WPAP) for this highway project located over the recharge and contributing zones of the Edwards Aquifer related to the schematic design of 183A. Prepared water quality portions of the WPAP and water quality BMP design drawings. Work involved pollutant loading determination and design of temporary and permanent water quality structures measures in accordance with the Edwards Rules. Responsible for an environmental assessment including an evaluation and review of endangered species, FEMA floodplain issues and Corps 404 permits for the creek crossing. Also developed detention pond designs using SWMM.

- **TCEQ Dam Safety Inspections: Various, Texas.** *Project Manager.* Provided preliminary assessment and dam safety inspection services to TCEQ for 40 high hazard dams, including on-site inspections. Preliminary assessment and inspection included field visits and reports. Delivered a prioritized list of potential needs for improvements and recommendations, compared original design with current design standards, performed hydraulic/hydrologic engineering and analysis, and made recommendations. Deliverables included: general information, overview/background, inspection results, hazard classification, hydraulic adequacy, emergency action plan, security, and recommendations. Also included in this project are GIS and graphic design for final map layouts for report submittal.

- **Collin County Arts Center Storm Water Management Plan: Austin, Texas.** *Project Manager.* Directed the storm water and environmental engineering aspects for the new Collin County Arts Center in Allen, Texas. Designed an innovative storm water system that was aesthetically pleasing, effective at removing pollutants from the storm water, and efficient at controlling runoff. The system included non-traditional components such as grass swales, water quality ponds, and channels in addition to the more traditional pipes, culverts, and inlets. Streambank stabilization designs were also made to stabilize the banks of the creek that received the storm water and fix existing erosion problems. Supervised the environmental construction drawings for the project.

- **Blue Bluff and Cameron Road Bridge Replacements: Travis County, Texas.** *Project Manager.* Performed floodplain analyses for two tributaries of Gilleland Creek. Hydraulic modeling was used in conjunction with the floodplain analyses and the City digital topographic maps to develop a new HEC-RAS model. Developed hydrologic models of the watersheds using HEC-1.

BRUCE L. WILAND, P.E.

Education

Master of Science in Environmental Health Engineering; The University of Texas at Austin, Austin, Texas; December, 1975.

Bachelor of Engineering Science with Highest Honors; The University of Texas at Austin, Austin, Texas; January, 1974.

Continuing Education

Nutrient Management Short Course, Texas Cooperative Extension/Natural Resources Conservation Service, College Station, Texas, October, 2005.

Design Criteria for Sewerage Systems, Central Texas Section of the Water Environment Association of Texas in cooperation with TNRCC, Austin, Texas, March, 2000.

Innovations and New Horizons in Livestock and Poultry Manure Management; Texas Agricultural Extension Service, Austin, Texas, September, 1995.

Urban Storm Water Quality Management; American Society of Civil Engineers, Austin, Texas; May, 1991.

Industrial Wastewater Pretreatment Short Course; The University of Toledo, San Antonio, Texas; September, 1989.

USCE-EPA CAPDET Workshop; USAE Waterways Experiment Station, Dallas, Texas; June, 1978.

Water Quality Management Short Course; Vanderbilt University, Nashville, Tennessee; June, 1978.

Institute of Mathematical Modeling of Natural Water Systems; Manhattan College, New York, New York; May 1977.

Experience

President, Wiland Consulting, Inc., Austin, Texas; October, 1991 - present.

Division Director/Chief Engineer; Jones and Neuse, Inc., Austin, Texas; September, 1988 - October, 1991.

Project Manager/Project Engineer; Jones and Neuse, Inc., Austin, Texas; February, 1986 - October, 1988.

Engineer/Hydrologist/Engineering Technician; Texas Water Commission/Texas Department of Water Resources/Texas Water Quality Board, Austin, Texas; September, 1976 - February, 1986.

Associate Research Scientist; Environmental Health Engineering Department, The University of Texas at Austin; April, 1975- August, 1976.

Registration

Licensed Professional Engineer, State of Texas; No. 45700.
Licensed Professional Engineer, State of Louisiana; No. 31981.
Certified Texas Nutrient Management Specialist, TCE/USDA/NRCS; No. TX20167
Passed Principles and Practices Examination; April, 1978.
Passed Engineer-in-Training Examination; November, 1973.

Affiliations

Water Environment Federation
Water Environment Association of Texas, Past President of the Central Texas Section
American Society of Civil Engineers
American Society of Agricultural and Biological Engineers

Honors

Tau Beta Pi, National Engineering Honor Society

Detailed Experience Record

As an Independent Consultant, Mr. Wiland conducts engineering and environmental studies and evaluations for water quality, air quality, and hazardous and solid waste projects. Projects have included the following:

- Development of the water quality model LA-QUAL for the Louisiana Department of Environmental Quality.

- Technical assistance to the City of Waco in evaluating the potential water quality impacts from confined animal feeding operations in the Lake Waco watershed including soil sampling and evaluation of hydrology and nutrient management plans.

- Technical assistance in evaluating the potential water quality impacts from a proposed permit for land disposal of municipal biosolids including evaluation of the nutrient management plan.

- Evaluation of potential air and water quality impacts from numerous dairies, feedlot operations, swine facilities, and other confined animal feeding operations in Erath County, the Texas Panhandle, and other counties in Texas. Preparation of affidavits and expert witness testimony in State permit hearings.

- Preparation of industrial permit applications and permit application assistance for various industries including several power plants, a reverse osmosis system for the City of Electra, and a hazardous waste incinerator operated by Rollins Environmental

- Dissolved oxygen modeling and evaluation of various water bodies including the Rio Grande (City of Brownsville), San Marcos River (City of San Marcos), Blanco River, Still Creek/Thompson Creek (City of Bryan), Little Cleveland Creek (City of Jacksboro WWTP), Padera Lake/Newton Branch (City of Midlothian), Hackberry Creek/Aquilla Reservoir (City of Hillsboro), South San Gabriel River (private developer), Texas Ship Channel tributary (Marathon Oil), Taylor Bayou (Motiva), Cowleech Fork of Lake Tawokoni (Cobisa), and a canal system adjacent to Arroyo Colorado (Pelican Pointe Development).

- Temperature modeling of a tributary to the Calcasieu River in Louisiana to determine impacts of a low temperature discharge (Trunkline LNG) and of the Comal River to determine the effects of reduced flows from Comal Springs (City of San Antonio).

- Preparation and implementation of a water quality and/or hydraulic surveys to determine impacts from dischargers and appropriate effluent limitations including Onion Creek (private developer), Still Creek and Thompson Creek (City of Bryan WWTP), Little Cleveland Creek (City of Jacksboro WWTP), and the San Marcos River (City of San Marcos WWTP).

- Evaluation of discharge alternatives for proposed power plants in Panola County, Henderson County, Upshur County, and Johnson County.

- Investigation, sampling, and evaluation of various wastewater/permit issues including raw sewage discharge from a lift station upstream of a horse breeding operation in Bowie County (included expert witness testimony in State District Court), contaminated wastewater from a sewer line that was part of the wastewater system at an abandoned Air Force Base in Maverick County, and a City of Sherman wastewater discharge to Post Oak Creek.

- Evaluation of various proposed composting facilities including ones in Tarrant County and in Travis County. Preparation of comments to the TNRCC on proposed composting regulations.

- Outfall diffuser design and modeling using Cormix.

- Evaluation of air emissions from a proposed cement batch plant and expert witness testimony in a TNRCC permit hearing.

- Evaluation of a 9.7 MGD industrial wastewater discharge to Lavaca Bay. The work included review of the water quality impacts, wastewater treatment system design, and compliance with State and Federal water quality standards and effluent limitations. Expert witness testimony was provided in a TWC permit hearing.

- Preliminary engineering design of a lift station and force main to serve a maintenance facility at a county club.

- Evaluation of a proposed wastewater permits and permit renewals to determine adherence with normal permitting procedures and water quality standards including the Longhorn Army Depot on Caddo Lake, a uranium mill reclamation site, and a limestone quarry in Limestone County.

- Evaluation of the City of Austin's South Austin Outfall (Phase II) Project to determine if feasible alternatives existed. The work included review of existing wastewater lines and lift stations, existing and projected wastewater flows, and the proposed 48-inch wastewater line including a three-barrel siphon under Barton Creek. The work was performed for the Save Barton Creek Association and included deposition testimony.

- Participation as the quality control/quality assurance officer in a trial burn at a cement kiln incinerating hazardous wastes. The trial burn for Texas Industries, Inc. (TXI) was required as part of the new boiler and industrial furnace (BIF) permitting regulations.

As Division Director of the Water Quality and Environmental Impacts Division for Jones and Neuse, Inc. (JN), Mr. Wiland directed a staff of engineers and biologists responsible for water quality projects, environmental site assessments, environmental audits, evaluation of regulatory impacts, and preliminary engineering assistance in industrial wastewater design. Mr. Wiland was also Director of the Air and Water Quality Division during the initial development of JN's air program. Due to the success of this program, a separate Air Quality Division was eventually created. Specific projects and areas of responsibility and engineering application included the following:

- Development of procedures, execution, and review of environmental site assessments and audits for over 100 sites and facilities in numerous states, Mexico, and Central America. Investigations involved solid and hazardous waste, water quality, and air quality issues. Types of properties and facilities including office buildings, apartments, hospitals, oil field service facilities, pipeline terminals, refineries, electroplaters, manufacturing facilities, iron and steel smelters, and numerous other industrial properties.

- Preparation of environmental impact documents involving issues related to air quality, water quality, solid and hazardous waste, and other natural resources (wetlands and endangered species). Clients included AES Corporation, American General Insurance Corporation, and the Port of Corpus Christi.

- Review of Federal and State environmental regulations and preparation of recommendations to various industrial clients with particular attention to the RCRA toxicity characteristic, RCRA primary sludge issues, SARA Title III requirements, and the State of Texas Water Quality Standards. Clients included Fina Oil and Chemical, La Gloria Oil and Gas, Mobil Oil, and Texaco.

- Wastewater system evaluations of industrial treatment facilities for Fina Oil and Chemical, Alcoa, and RTF Industries. Types of facilities have included electroplaters, petroleum refiners, and chemical manufacturers.

- Performance of industrial wastewater treatability studies for Alcoa in Point Comfort, Texas.

- Preliminary engineering and design of wastewater collection and treatment facilities for several petroleum refineries, including Fina Oil and Chemical Company in Big Spring, Texas, Howell Hydrocarbon in San Antonio, Texas, and Trifinery in Corpus Christi, Texas. Processes have included caustic and acid neutralization, oil/water separation, and biological treatment.

- Development of procedures and review of dye dispersion studies for Alcoa, Koppers Industries, Empak, Inc., Champion International Corporation, and Gulf Coast Waste Disposal Authority.

- Development of NPDES stormwater permitting strategies for Pride Refining, Quantum Chemical, and Central Tractor.

- Preparation of NPDES and TWC industrial wastewater permit applications and supporting information for industries, including Carrier Corporation, Alcoa, Tex-Trac, Inc., Hoechst-Celanese, Fina Oil and Chemical Company, and Howell Hydrocarbon. Types of facilities have included refineries, bulk handling terminals, and manufacturing plants.

- Preparation of NPDES and TWC municipal wastewater permit applications, technical representation before the TWC, and expert witness testimony at public hearings for several cities and private developers.

- Development of procedures and review of benzene NESHAP studies for Fina Oil and Chemical Company, Shell Oil Company, and Howell Hydrocarbons.

- Preparation of TACB air permit applications and supporting technical information for industries including Tex-Trac, Inc., Kenaf International, H. B. Zachary, Great Lakes Carbon, and Fina Oil and Chemical Company. Types of facilities have included bulk handling terminals, petroleum coke storage facilities, asphalt plants, kilns, cogeneration units, landfills, and wastewater treatment units.

- Preparation of responses to TACB Notices of Violation (NOVs) and assistance in enforcement negotiations.

- Evaluation of computer programs and mathematical models used to predict water quality for the Lower Colorado River Authority.

- Development of permit applications for water appropriation, including irrigation and off-channel reservoirs for the City of Robinson, Texas.

- Water and wastewater rate studies and evaluations, including expert witness testimony for the City of Mission, City of Copperas Cove, Williamson County MUD #3, and Hidalgo County Irrigation District #7.

In addition to his duties as Division Director, Mr. Wiland served as Chief Engineer for Jones and Neuse, Inc. In this position, Mr. Wiland was responsible for non-project related administrative and technical duties including the following:

- Preparation and presentation of technical seminars on such subjects as environmental site assessments, the RCRA Toxicity Characteristic rule, the RCRA primary sludge rule for refineries, the benzene NESHAP rule, and the NPDES industrial stormwater regulations.

- Development of JN's professional services agreement and contract procedures and review of all contracts.

- Development of JN's project accounting and billing system.

- Development of standard proposal procedures/formats and preparation of major project proposals.

As an Engineer for the Texas Water Commission and predecessor agencies, Mr. Wiland was responsible for performing work in water resource analysis and mathematical modeling of water quality. His responsibilities included the following:

- Analysis of existing water quality data, design and execution of water quality surveys, and assessment of the impact of wastewater discharges upon the receiving waters.

- Design, development, and modification of various computer programs used to predict the water quality of natural and man-made systems including the steady-state stream model, QUAL-TX, used by the State of Texas to evaluate all discharge permits and determine all wasteload allocations.

- Development of a detailed methodology manual describing data requirements and modeling techniques for the evaluation and performance of wasteload allocations.

- Performance of wasteload evaluations and AST/AWT justifications including performance of economic analyses and cost-benefit justifications.

- Review of wasteload evaluations performed by the Modeling Unit for technical accuracy and consistency.

- Review and evaluation of the technical aspects of the Houston Ship Channel instream aeration studies and nonpoint source studies.

- Participation in a major hydrodynamic study of Laguna Madre involving measurement of currents and tidal dispersion.

- Participation as representative to the TDWR Executive Review Committee, which entailed reviewing and evaluating all injection well, solid waste, municipal and industrial discharge permits to be certain they were in compliance with wasteload evaluations and would not seriously degrade water quality in the receiving water.

- Coordination between the Construction Grants and Water Quality Management Division and the Permits Division to ensure consistency between grant projects and discharge permits. Participation as a member of the Innovative Alternative Technology Ad Hoc Support Group to resolve issues pertaining to specific Construction Grants projects proposed for funding as IA technology.

- Performance of wasteload evaluations including data collection and computer modeling for the Houston Ship Channel, West Fork San Jacinto River, Spring Creek, Cypress Creek, Clear Creek, and the San Jacinto River Tidal.

- Development of a methodology and nomograph for evaluating discharges into undesignated stream segments and tributaries.

- Assistance in the development of the water quality ranking system for the State of Texas.

- Design of water quality surveys and evaluation of results to determine the necessity of nutrient limitations in the Clear Lake watershed to prevent eutrophication.

- Administration of a contract for the development of an apparatus and methodology to measure benthal demand in stream sediments.

- Development of steady-state and stormwater models for the State's "208" Designated and Non-Designated Area Planning activities as required by PL 92-500.

- Analysis of hydrologic data and performance of a comprehensive hydraulic balance on the Edwards Aquifer to support water quality regulations over the Edwards Aquifer.

- Review of the EPA policy on land application and determination of its effects on Texas

While employed as an Associate Research Scientist for the Environmental Health Engineering Department at The University of Texas, Mr. Wiland conducted laboratory analyses and evaluations including the following:

- Determination of quantities of certain contaminants in stormwater runoff from highways using analytical techniques of infrared spectrophotometry and atomic absorption, and assessment of the impact of highway stormwater runoff on the environment.

- Characterization of various wastewaters for typical pollution parameters, such as COD, BOD, TOC, suspended solids, TKN, phosphates, TDS, and MPN.

- Performance of wastewater treatability studies for Texas Eastman and Kerr-McGee utilizing bench-scale biological treatment processes, including oxidation ponds, activated sludge, aerated lagoons, and anaerobic columns and physical-chemical processes such as lime coagulation, carbon absorption, and ozonation.

MARTIN GEOLOGIC CONSULTING
CONSULTING IN HYDROGEOLOGY, GEOLOGY, AND WATER RESOURCES

P.O. Box 81883 • Austin, Texas 78708
Office: 512-791-9076
muliana@rskconsult.com

Matthew M. Uliana, Ph.D., P.G.

PRIMARY EXPERTISE

Groundwater and surface-water hydrology, computer modeling of groundwater flow and geochemical reactions, the use of naturally-occurring geochemical and isotopic tracers for hydrologic characterization, groundwater availability studies, aquifer test analysis, and fluid flow in fractured systems. Over 12 years experience in geology, hydrology, and water resource consulting and over 5 years experience in university-level teaching and research.

EDUCATION AND PROFESSIONAL CERTIFICATIONS

2000	Ph.D.	Geological Sciences (Hydrogeology)	The University of Texas at Austin
1995	M.A.	Geological Sciences (Hydrogeology)	The University of Texas at Austin
1991	B.S.	Geology/Anthropology	James Madison University
2003	P.G.	Professional Geoscientist (Texas) #2506	

CURRENT POSITION

January 2007 to Present: **Owner and Principal Hydrogeologist**, *Martin Geologic Consulting* (Austin, Texas). Perform geologic and hydrologic assessments, groundwater availability studies, aquifer testing and analysis, aqueous geochemistry investigations, and groundwater modeling. Involved in groundwater and water-resource related consulting projects in Texas since 1995.

RELEVANT WORK EXPERIENCE

Consulting

September 2002 to December 2006: **Independent consulting professional geologist** (Austin, Texas)

October 1995 to August 2001: **Consulting Hydrogeologist/Staff Scientist**, R. J. Brandes Company, Terra Dynamics, Inc, and Robert S. Kier Consulting (Austin, Texas)

August 1991 to August 1992: **Project Geologist**, Geotechnical and Environmental Services (Mt. Sydney, Virginia)

Teaching/University Research

August 2002 to December 2006: **Assistant Professor**, Geology Program and Aquatic Resources (Department of Biology), Texas State University-San Marcos.

August 2001 to August 2002: **Assistant Professor**, Department of Geological Sciences, State University of New York at New Paltz

DESCRIPTIONS OF SIGNIFICANT PREVIOUS PROJECTS

Unimin Sand Quarry Dewatering Models (multiple projects)

The general objective of this series of projects is to use aquifer test data, subsurface geologic site data, current and historical water level data, and multi-year mine excavation and backfill plans to develop a series of MODFLOW model that simulate mine drainage and dewatering at the UNIMIN sand quarry operations in Ottowa, Minnesota. The primary goals of the numerical modeling are to predict pump rates necessary for dewatering the quarry and to determine potential impacts of quarry operations on nearby properties. Model results have been used by the operators to determine dewatering pump sizes, to apply for the required operation and discharge permits from the state, and to satisfy state Environmental Impact Statement requirements. To date, two different models have been developed for two separate mining areas, and a third model is currently under construction.

City of Bryan Well #18 Impact Assessment

The objective of this project was to evaluate the proposed impact of a new, high-capacity well, recently installed by the City of Bryan, on other wells in the surrounding aquifer. This assessment was performed in conjunction with a groundwater use permit application submitted to the Brazos Valley Groundwater Conservation District by the City of Bryan. Impact of the new well on other wells in the district was determined using a parsimonious

groundwater model based on inputs from the Texas Water Development Board's Central Queen City-Sparta Groundwater Availability Model (GAM). The model was used to simulate aquifer response to the well under the maximum pump rate and at 67% of the full pump capacity. Model results were used to develop maps of drawdown in the aquifer related to the locations of current permitted wells.

Newman Property Hydrogeologic Assessment
The objective of the project was to estimate potential water well yields from the Carrizo-Wilcox aquifer on a property located in Atascosa County, Texas using historical data from the literature. Literature sources were compiled and reviewed, and a database of aquifer parameters (including transmissivity, storage parameters, historical water levels and water-level trends, sand thickness maps, etc) was developed. These data were used to develop a MODFLOW model of the site. The model was then used to predict drawdowns at the site, and on properties adjacent to the site, under various pumping scenarios, and to determine potential future well yields from the proposed well field.

Geological Assessment for Barton Hills Retrofit WPAP
The objective of this project was to perform a geologic assessment of a property, proposed for the location of a drainage retention pond and drainage management system, for a Water Pollution Abatement Plan (WPAP) as required by 30 TAC §213.5(b)(3). The primary purpose of this assessment was to use site visits and literature investigations to identify potentially significant recharge features on the site. Results indicated that there was a major sub-surface hydrogeologic feature (the Barton Springs Fault) running through the site; however, the hydrogeologic conditions in the overlying soil layer, in combination with proper lining of the retention pond, would provide sufficient protection for the aquifer and nearby springs.

Culberson County Groundwater Salinization
The objective of this project was to determine the source of salinization of several ranch wells on a property in Culberson County, Texas. The ranch owner noted that cattle stopped drinking water from several shallow (~50-150 ft deep) stock wells located near deep brine injection wells in a petroleum field under secondary recovery. Analysis of water samples from those wells showed increasing concentration of Na and Cl compared to other wells near the site. Graphical analysis and geochemical models were used to show that the most likely source of salinization of the wells is from brine leaking up from the injection zone through faulty casing. The case resulted in a lawsuit; sworn testimony provided by MGC staff resulted in a settlement of the case before trial. The results of this project were published in the peer-reviewed journal *Environmental & Engineering Geoscience* (Uliana, 2005).

PUBLICATIONS

Chowdhury, A.H.; Uliana, M.M.; and Wade, S.; Recharge and Ground Water Flow Constraints in the Presidio-Redford Bolson Aquifer: *Ground Water (submitted September 2006, currently in press)*

Uliana, M.M.; Banner, J.L.; and Sharp, J.M., Jr., 2007. Regional groundwater flow paths in Trans-Pecos, Texas inferred from oxygen, hydrogen, and strontium isotopes: *Journal of Hydrology*, vol. 334 (3-4) p. 334-346.

Uliana, M.M., 2005. Identifying the Source of Saline Groundwater Contamination Using Geochemical Data and Modeling: *Environmental & Engineering Geoscience*, vol. 11 (2) p. 107-123.

Uliana, M.M., 2005. Entry GW-1103: Storage Coefficient. *In* Wiley Encyclopedia of Water (J. Lehr, ed.), John Wiley & Sons, New York

Uliana, M.M., 2005. Entry GW-486: Hydraulic Head. *In* Wiley Encyclopedia of Water (J. Lehr, ed.), John Wiley & Sons, New York

Uliana, M.M., 2005. Entry GW-979: Regional Flow Systems. *In* Wiley Encyclopedia of Water (J. Lehr, ed.), John Wiley & Sons, New York

Sharp, J.M., Boghici, R. and Uliana, M.M., 2003. Groundwater systems feeding the springs of West Texas. *In* Aquatic Fauna of the Northern Chihuahuan Desert (Garret, G.P., and Allan, N.L., eds.), Special Pub. No. 46, Museum of Texas Tech Univ., p. 1-11.

Uliana, M.M., and Sharp, J.M. Jr., 2001. Tracing regional flow paths to major springs in Trans-Pecos Texas using geochemical data and geochemical models: *Chemical Geology*, vol. 179 (1-4) p. 53-72.

Uliana, M.M., 2001.The geology and hydrogeology of the Capitan aquifer: a brief overview. *In* Aquifers of West Texas (Mace, R.E., Mullican, W.F., III, and Angle, E.S., eds.), Texas Water Development Board Report 356, Ch. 11, p. 153-166.

Uliana, M.M., 2000. Delineation of regional groundwater flow paths and their relation to structural features in the Salt and Toyah Basins, Trans-Pecos Texas: unpub. Ph.D. Dissertation, The University of Texas at Austin, 215 p.

Sharp, J.M., Jr., Halihan, T., Uliana, M.M., Tsoflias, G.P., Landrum, M.T., and Marrett, R., 2000. Predicting fractured rock hydrogeological parameters from field and laboratory data. *In* Groundwater: Past Achievements and Future Challenges (Sililo, O., et al., eds.), Proceedings of the 30th Congress, International Association of Hydrogeologists, Cape Town, South Africa, p. 319-324

Halihan, T., Simmons, C., Sharp, J.M. Jr., Uliana, M.M., and Fenstemaker, T, 1999. GSA International Internet Symposium: an experiment in scientific communication: *GSA Today*, vol. 9, no. 5, p. 9.

Sharp, J.M. Jr., Uliana, M.M., and Boghici, R., 1999. Fracture controls on regional groundwater flow in a semiarid environment and implications for long-term maintenance of spring flows: Water 99 Joint Congress, Inst. of Eng. Brisbane, Au., v. 2, p. 1212-1217.

Uliana, M.M., and Sharp, J.M. Jr., 1996. Springflow augmentation possibilities at Comal and San Marcos Springs, Edwards aquifer: Transactions of the Gulf Coast Association of Geological Societies, vol. XLVI, p. 423-432.

Uliana, M.M., 1995. The potential for springflow augmentation at Comal and San Marcos Springs, Central Texas: unpub. M.A. Thesis, The University of Texas at Austin, 147 p.

Uliana, M.M., 1994. Potential methods of springflow augmentation at Comal and San Marcos Springs: Edwards Aquifer in Barton and San Marcos Springs Area Field Trip Guidebook, American Institute of Hydrology Annual Meeting, Austin, Texas, 14 p.

PROFESSIONAL SERVICE

Member of the National Ground Water Association, the Texas Association of Professional Geoscientists, and the Austin Geological Society.

Member of Texas Water Development Board Groundwater Availability Modeling (GAM) program Technical Advisory Group.

Technical advisor to Texas Oasis Springs Region Watershed Management Plan Team

Member of The University of Texas at Austin Hydrogeology Library Fund Development committee

Registered stakeholder for several Texas Water Development Board GAM projects

Provided manuscript peer reviews for the journals *Applied Geochemistry* (Elsevier), *Ground Water* (NGWA), *Environmental & Engineering Geoscience* (GSA/AEG), and *Lakes & Reservoirs: Research and Management* (Blackwell) as well as various state agency reports.

PROFESSIONAL DEVELOPMENT

Participant in the "Teaching Hydrogeology in the 21st Century" workshop sponsored by the *On the Cutting Edge* Professional Development for Geoscience Faculty project, Lincoln, Nebraska, July 23-28, 2005.

"Using the Queen City-Sparta GAM Model"; 3-hour workshop sponsored by INTERA, Inc., Austin Texas; October 19, 2004.

"Water Well Rehabilitation"; 1-day workshop sponsored by Johnson Well Screens, Inc.; June 2003.