

JAMES L. MACHIN, P.E., CPESC

EDUCATION

M.S., Environmental and Water Resources Engineering, University of Texas at Austin, 1980

M.B.A., University of Michigan, Ann Arbor, MI, 1974

B.S.E., Engineering, Princeton University, Princeton, NJ, 1971

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

Professional Engineer, Texas, No. 53349

Professional Engineer, Arizona, No. 29159

Certified Professional in Erosion and Sediment Control (CPESC), No. 6097

OSHA 40-hr HAZWOPER training, including Supervisor Certification

AREAS OF EXPERTISE

Mr. Machin has been in environmental and water resources consulting for over 30 years. His work has been in the fields of water resources engineering, hydrology, and water quality; design and construction; permitting and compliance; environmental engineering and water/waste treatment; environmental remediation and investigations; and environmental impact assessments. He is very knowledgeable in environmental regulations. He has performed and managed numerous projects of varying sizes with a proven track record of implementing projects on schedule and in budget. He is skilled in project management techniques and has taught a course on the subject. His experience has included surface-water availability studies, storm water management and design studies, intensive surface-water quantity and quality investigations, environmental impact assessments related to both water projects and multi-disciplinary projects, flood hydrograph and flood plain modeling, water/waste treatment studies, instream water quality impacts and modeling, storm water and wastewater permitting, and development of comprehensive planning documents for various governmental clients.

REPRESENTATIVE EXPERIENCE

1997 to Present. Senior Engineer, TRC, formerly R. J. Brandes Company, Austin, Texas.

Water Quantity

- Management of the development and application of water availability model for the Rio Grande Basin in Texas and Mexico for the Texas Commission on Environmental Quality (TCEQ). This complex project involved both prior appropriation and type of use priority water rights, evaluation of interstate compacts and international treaties, development of naturalized flows in both

Texas and Mexico, and determination of the share of water owned by both countries.

- Directed the development and application of water availability model for the Sulphur River Basin for the Texas Natural Resource Conservation Commission pursuant to the requirements of Senate Bill 1.
- Development of naturalized streamflows and water availability model for the Colorado River Basin, Texas. This major project involved over 1300 water rights, numerous return flows and impoundments, and the construction of 60 years of naturalized streamflows at approximately 50 gaging stations. Performed special study to quantify channel losses.
- Performed analysis of water rights and availability of water in the Trinity River Basin, Texas, in support of a major water rights application involving reuse of return flows and treatment in constructed wetlands. Performed quantitative analysis of channel losses. Determined yields in two major reservoirs under various scenarios.
- Participated in Lower Guadalupe River Water Supply Project. Involved evaluation of water availability and firm yield of combinations of surface-water diversions, groundwater, and off-channel reservoirs.

Water Quality and Permitting

- Support for development of dam and reservoir on the Rio Grande for water supply development for the Lower Rio Grande Valley. Included preparation of comprehensive Environmental Assessment. Significant coordination with TCEQ for water rights permit and Section 401 water quality certification, U.S. Army Corps of Engineers (USACE) to obtain Sections 404/10 permit, U.S. International Boundary and Water Commission, and U.S. Fish and Wildlife Service Section 7 endangered species consultation. Established recording, long-term water quality monitoring stations on the Rio Grande.
- Obtained permanent and temporary water rights, USACE 404/10 permits, TPDES storm water and wastewater permits, and Texas Parks & Wildlife Sand & Gravel permits for several sand and gravel mining operations. Provided technical support and expert testimony for contested case hearing.
- Preparation of Storm Water Pollution Prevention Plans and Water Pollution Abatement Plans for multiple industrial and municipal clients, and pipeline and highway construction projects.
- Obtained wastewater discharge permits and renewals for numerous municipal and industrial facilities. Performed water quality modeling, dye study,

and specialized instream studies for some facilities. Saved a client over \$3 million in potential upgrades by conducting instream study on receiving stream. Provided major litigation assistance and expert testimony on water quality impacts of proposed discharge on a sensitive stream for one client.

- Performed thermal water quality modeling for proposed cold water discharge from liquefied natural gas terminal in Louisiana.
- Investigated brine disposal options and performed analyses and field studies for several brackish groundwater desalination projects in the Lower Rio Grande Valley and worked with state agencies to obtain discharge permits for surface water disposal of concentrate. Established recording instream monitoring stations.
- Designed raw water characterization program and conducted ocean outfall dispersion modeling for proposed pilot- and full-scale seawater desalination plants in south Texas. Directed obtaining all permits for this major facility.

Environmental Impact Assessment

- Surface-water modeling and groundwater evaluation of water quality impacts of potential spills from controversial gasoline pipeline in environmentally sensitive area. Impacts to both rivers and reservoirs were evaluated. Contributed to preparation of comprehensive Environmental Assessment.
- Directed third-party Environmental Impact Statement (EIS) for proposed major water supply reservoir in east Texas.
- Environmental impact studies and assessments for several commercial and governmental projects.

1977 to 1997. Senior Engineer/Project Manager, Radian International LLC, Austin, Texas

- Received special award for excellence from the Chief of the U.S. Army Corps of Engineers for developing strategy and preparing plans and specs for cleanup of hazardous military site in a remote location in an endangered species habitat.
- For the USACE, prepared Storm Water Pollution Prevention Plans at Air Force bases in Texas, Nevada, South Dakota, and Delaware. Plans involved evaluation of complex facilities with many activities containing significant stormwater exposure. Evaluated cross-connections. Developed Best Management Practices for control of stormwater pollution from numerous

sources. Participated in design of stormwater detention impoundments at Dover AFB, DE.

- Specifically requested by client (USACE) to direct several very large projects to prepare Management Action Plans (MAPs) at over 50 Air Force bases in Texas and other states. The MAPs are comprehensive plans and strategy for ultimate cleanup of all contaminated sites at each base. The projects involved extensive management of and coordination with multiple project teams and many client personnel at the bases, commands, and service centers. Remedial actions for soil and water were selected, and detailed schedules and cost estimates were developed for several hundred sites.
- Performed intensive surface-water investigation over a one-year period for proposed surface mine in Wood, Rains, and Hopkins Counties in east Texas. Evaluated water quality and quantity and bottom sediments at numerous stream and impoundment sites, assessed impacts on water rights, and identified potential issues affecting the project.
- Conducted an assessment of hydrology-related regulatory risks for a lignite mining prospect in Panola County in the Sabine River Basin, Texas.
- Directed a water quality investigation and modeling study of a bayou near Houston, Texas for a petroleum refinery. Data were collected over a one-year period at several locations. A model was developed to support an increase in wastewater discharge anticipated from the addition of a new petrochemical facility. Also performed flood plain modeling on the same bayou and obtained state permit for development of the proposed facility.
- Directed several studies to conduct detailed surface-water field data collection programs including the design and construction of stream gaging stations at proposed surface mining sites. Also directed and participated in several comprehensive environmental assessments of proposed industrial, mining, and power generation sites in various regions of the country. These studies involved extensive field work and analyses in the areas of water quality, flood plain, and sediment mathematical modeling; design and implementation of water and sediment sampling programs; statistical data analysis; impact analysis; and surface-water supply availability.
- Directed a water quality study of a creek receiving wastewater discharge to evaluate the potential for a site-specific effluent limitations variance. Included water quality and biological data collection, and fish bioassay testing.
- Participated in evaluation of water rights under low-flow conditions in several states including water quality, aquatic biota, and water usage issues.

- Prepared NPDES stormwater permit applications for several furniture manufacturing facilities. Included training of plant personnel in stormwater flow measurement and flow-weighted sampling techniques.
- Performed a stormwater management study at a petroleum refinery in Illinois. Included evaluation of modifications to and construction of surface impoundments. Participated in a water quality study of a creek receiving NPDES discharge, which allowed the refinery to obtain a site-specific effluent limitations variance.
- Directed a comprehensive stormwater management study at a petroleum refinery in Indiana. Designed and evaluated four alternative systems. Project involved preparation of detailed topographic maps, modeling of runoff rates and quantities, design of conveyance systems, design of storage devices for surge capacity, evaluation of treatment needs, and recommendations for reducing potentially explosive vapor levels in sewers.
- Performed a special study on a 5-mile reach of the Yampa River in Colorado. Involved numerous hydrologic measurements over a period of time to quantify exchanges between the surface-water and ground-water systems. The study was used to support permitting activities at a mine and mine-mouth power plant.
- Conducted a nine-month analysis of streamflow in Ship Creek, an important water supply and recreational stream in Anchorage, Alaska. Measurements were performed at various locations in the creek to determine the degree of groundwater recharge and discharge over time in several reaches of the stream. The study was used to support feasibility studies for contaminated groundwater control in reaches of the stream where groundwater discharge was occurring.
- Designed contaminated runoff diversion, control, and collection system for railroad yard in Oklahoma.
- For EPA, participated in major study of the impacts of using large quantities of water for energy development in eight western states.
- Participated in eutrophication studies of lakes in Texas and North Carolina, which included modeling of the impacts of proposed wastewater discharges.

1975 to 1977. Hydrologist, Texas Water Quality Board/Department of Water Resources, Austin, Texas

- Mr. Machin's work at the Texas Water Quality Board/Department of Water Resources was primarily within the areas of engineering and water quality analysis, waste treatment, and economic evaluations. He helped design and manage a water quality investigation for Lake Livingston, a major water supply reservoir for the City of Houston. He also managed a study of impacts of different types of non-point sources throughout Texas.

1974. Manufacturing Engineer, Texas Instruments, Inc., Austin, Texas

- Upon graduation from Michigan Business School, Mr. Machin was employed by Texas Instrument's Digital Systems Division. He was responsible for control of all of the printed circuit boards and metal fabricated parts used in their Austin plant.

1971 to 1972. Pipestress Engineer, C-E Lummus, G.m.b.H., Wiesbaden, Germany

- While at Lummus, Mr. Machin was involved in planning and design of industrial facilities. He was primarily responsible for computer stress analysis of high- and low-pressure piping systems.

PROFESSIONAL AFFILIATIONS

Water Environment Association of Texas
American Society of Civil Engineers
Texas Water Conservation Association

PUBLICATIONS AND PRESENTATIONS

Mr. Machin has extensive technical writing experience and has authored or co-authored a number of published technical papers and presentations at national symposia.

EXPERT TESTIMONY

Mr. Machin has provided deposition and expert testimony on behalf of several clients in cases involving water quality, water quantity, and hazardous waste.