James C. Young, Ph.D., P.E.

Professor of Environmental Engineering, University of Arkansas, Fayetteville
General Manager, EnviTreat, llc., Springdale, AR 72764
Principal, JCY Environmental, Springdale, AR 72764

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EDUCATION:

B.S.C.E.	**New Mexico State University, Las Cruces, 1963**
M.S.C.E.	**New Mexico State University, Las Cruces, 1964**
Ph.D.	**Stanford University, Stanford, California, 1968**

HONORS AND AWARDS:

Outstanding Civil Engineering Senior, 1963: award of the New Mexico Chapter of the American Society of Civil Engineers; Graduated with Honors from New Mexico State University, 1963

Member: Phi Kappa Phi, Sigma Xi, Sigma Tau, Chi Epsilon and Blue Key National Honorary Societies

Recipient:

a. **1992 Willem Rudolfs medal from the Water Environment Federation for outstanding contributions to industrial waste treatment practice**
b. **1993 Research Award from the Water Pollution Control Association of Pennsylvania in recognition of outstanding research in the field of water pollution control**
c. **Outstanding paper, Fifth International Symposium on Emerging Technologies in Hazardous Waste Management, Sponsored by American Chemical Society, Atlanta, GA 1993.**

REGISTRATION:

Registered Professional Engineer - Arkansas, (inactive in Iowa)

PROFESSIONAL AND TECHNICAL SOCIETY ACTIVITIES:

Member: National Society of Professional Engineers; Water Pollution Control Federation; American Society of Civil Engineers; International Association on Water Quality; American Water Works Association; American Society for Engineering Education
Diplomate, American Academy of Environmental Engineers

Committees: Standard Methods for the Examination of Water and Wastewater, Chairman of the Biochemical Oxygen Demand Task Group - 1981-present; Water Pollution Control Federation conference program committee

APPOINTMENTS/POSITIONS HELD:

1968 - 1971: Assistant Professor of Civil Engr., Iowa State University, Ames
1971 - 1977: Associate Professor of Civil Engr., Iowa State University, Ames
1977 - 1982: Professor of Civil Engr., Iowa State University, Ames
1982 - 1991: Professor and Head of Civil Engineering, University of Arkansas, Fayetteville
1991- 1996: Kappe Professor of Environmental Engineering and Coordinator of Environmental Engineering Programs, The Pennsylvania State University, University Park, PA
Jan. 1997-pres: Professor of Environmental Engineering, University of Arkansas, Fayetteville, AR (Part-Time) and General Manager, EnviTreat, llc., Springdale, AR

EXPERIENCE

Teaching

Responsibilities have included teaching graduate and undergraduate courses on water and wastewater treatment, serving as academic advisor to 12 to 40 undergraduate students each year, serving as major professor and academic advisor to 4 to 8 graduate students each year and serving on various department, college and university committees.

Research

Research projects have involved investigation of factors affecting the design, operation, and performance of water and wastewater treatment systems and development and evaluation of analytical methods for assessing the effect of pollutants on water quality. Individual projects have included:
-- Anaerobic treatment of industrial wastes
-- Respirometers for aerobic and anaerobic applications
-- Aerobic packed-bed reactors for waste treatment
-- Design parameters for anaerobic packed-bed reactors
-- Protocols for assessing the effect of toxic organic chemicals to anaerobic digestion processes

Administration and Academic Service

1982-1991 Head of Civil Engineering Department, University of Arkansas, Fayetteville, AR
1991-1996 Director of Environmental Engineering programs, Penn State University, State College, PA
1997- present: Professor of Environmental Engineering (part time), University of Arkansas, Fayetteville, AR

Professional

Professional experience has included consulting with engineering firms and with industry concerning various water and wastewater treatment problems. Responsibilities have included proposal writing, organizing and implementing applied research and development projects, data collection and analysis, report writing, design of water and wastewater treatment hardware, evaluation of process performance, development of performance models to be used for design, field investigations to determine causes of treatment problems, and working with engineers to establishing system design and process layout and operation

PUBLICATIONS

a. Over 150 articles published in Journals or Proceedings of technical conferences.
b. Seven patents issued

TECHNICAL AND PROFESSIONAL ACCOMPLISHMENTS

Aerobic and Anaerobic Respirometers

1) **1968 – 1982: Developed the technology of electrolytic respirometry to the point of production of a commercial instrument. This work involved design, construction, and testing of prototype units, evaluation of the application and investigation of limits of application, and securing of a patent covering critical design elements of key components. This device, originally manufactured by ARF Products, Inc. of Raton, NM, is now produced and marketed by Bioscience Inc., of Bethlehem, PA.**

2) **1987 - 1992: Developed, with Mark Kuss, an aerobic/anaerobic respirometer in 1990 based on the use of bubble volume for measuring the gas produced in laboratory scale anaerobic reactors and test units. A patent was issued in 1992 for the flow measuring cell for this instrument. This system is manufactured and marketed by Challenge Environmental Systems, Inc., Fayetteville, Arkansas, under an exclusive license from the University of Arkansas.**

3) **1998 - Developed, with Mark Kuss, an on-line respirometer for continuous monitoring of the response of wastewater treatment plants to input of industrial wastewaters. A patent was issued in May of 2000. This system currently is under development for marketing by Challenge Environmental Systems, Fayetteville, AR.**

Wastewater Filtration

1972 – 1999: Developed the technology of using air and water simultaneously when backwashing wastewater filters so that any type and size of granular filter media can be used. This work involved development of a method of separating the water-entrained media prior to discharge of the backwash water into collection troughs, development of criteria and procedures for designing these units, and securing a patent covering the critical elements of the design. Considerable time was spend in providing assistance with marketing this design. This design was later extended to the use of simultaneous air and water wash of multiple-media filters and led to the granting of a two additional patents. The design and its variations are now manufactured and marketed by Siemens/General Filter Division, Ames, Iowa.

Trickling Filter Distributor

1972 – 1982: Developed the configuration, design procedure, and hydraulic model for a trickling filter distributor for high rate applications such as plastic media towers. This unit is manufactured and marketed by Siemens/General Filter Division, Ames, Iowa.

Anaerobic Fixed-Film Reactors

1968 – 1990: Developed and tested the anaerobic filter process for treatment of relatively low-strength industrial wastewaters. This work involved conceptual design of the process, testing under various design and operating conditions, and later development of design criteria for sizing full-scale units and selection of media for use as a reactor packing. JCY has been a consultant to a number of engineers and manufacturing firms who marketed this process. This process and a number of its variations are now marketed worldwide through a number of companies or design engineers.

Nitrification Inhibition in BOD Tests

1968 – 1975: Developed a method of chemically inhibiting the biological nitrification reaction in Biochemical Oxygen Demand tests. This work involved testing of a commercial product, 2-Chloro-6-(trichloro -methyl)pyridine, as an inhibitor of the nitrification reaction, promoting its use, assisting with setting up procedures, and initiating commercial marketing efforts. The procedure is now accepted as a standard for application throughout the U. S. and the product is available commercially from Hach Chemical Co., Loveland, CO.

Two-Stage Cyclic Process for Biological Waste Treatment

1982 – 1987: Developed the two-stage, cyclic process for biological treatment of wastewaters that produces higher effluent quality than conventional single-stage processes with less waste sludge production. A patent was received on this process in 1990 and is now being licensed from the University of Arkansas by ADI Systems, Inc. of Fredericton, New Brunswick, Canada. JCY has served as a consultant to the designers of most of the full-scale application of this process.

Iron and Manganese Removal From Drinking Water

Developed a process for coating granular sand and coal so that it will be effective in the removal of oxidized manganese from water supplies. This work involved development of a method for coating the media, evaluating the limits of the process, and developing criteria for designing full-scale filtration units using this media. The coated media is manufactured and marketed by Siemens /General Filter Division, Ames, Iowa.

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EXPERIENCE

ACADEMIC BACKGROUND

- **B.S., M.S. Civil Engineering, New Mexico St. University, 1963, 1964**
- **Ph.D., Environmental Engineering, Stanford University, 1968**

ENGINEERING EXPERIENCE

- **39 years teaching and research in areas related to municipal and industrial water and wastewater treatment**
- **Consultation with municipalities, industries, and engineering firms concerning water and wastewater treatment plant design and operation (Coincident with academic experience).**
- **Operator training for pollution control processes**
- **Process experience**
  - **Anaerobic biological treatment**
  - **Aerobic biological treatment**
  - **Physical/chemical treatment**
  - **Solids separation: filtration and clarification**
  - **Composting**

LABORATORY EXPERIENCE

- **Treatability of Industrial wastes**
- **Assessment of oxygen uptake reactions**
- **Use of respirometers for process diagnostics**
- **Design and operation of laboratory- scale pilot plants**

QUALIFICATIONS

PROCESS DESIGN

- **Selection of appropriate treatment technology**
  - **Biological treatment processes**
  - **Physical/chemical processes**
  - **Combined physical/chemical processes**
- **Sizing of anaerobic and aerobic processes for municipal and industrial waste treatment**

TREATABILITY TESTING

- **Assessing treatability of organic and inorganic wastes**
- **Assessing anaerobic/aerobic biodegradation of specific organic chemicals**
- **Assessing treatability of inorganic wastes**
- **Design and operation of laboratory-scale and on-site pilot plants**
- **Skilled in conducting respirometric tests**

PILOT PLANT DESIGN AND OPERATION

- **Design and operation of field-scale pilot plants**
- **Assistance with operation of pilot plants**

FORENSIC EVALUATIONS

- **Evaluation of existing treatment plants with view toward optimization of performance**
- **Assessment of process failures**

OPERATIONS ASSISTANCE

- **Preparation of process operating manuals**
- **Operator training**
- **Laboratory analyst training**

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Partial Client List: March 2007
(Industrial Wastewater Treatment)

Engineering Firms	Location	Wastewater Type
Stanley Consultants	Muscatine, IA	Grain Processing
Montgomery Watson Engineering	Mexico City, Mexico	Mixed Industries
ERM, Inc.	Exton, PA	Cereal Manufacturing
J.M. Smith and Associates	Cincinnati, OH	Baking
JINDO Engineering	Seoul, Korea	Distillery, thermophilic
ADI Systems, Inc.	Fredericton, NB, Canada	Various industrial wastes
Engineering Science	Atlanta, GA	Bottling wastewaters
UltraSystems	Irvine, CA	Various industrial wastewaters
Shell Oil Co.	Houston, TX	Refinery wastewater
UEM, Inc	West Palm Beach, FL	Various industrial wastewaters
Bolton and Menk	Ames, Iowa	Dairy wastewater
Parsons, Inc.	Pasadena, CA	Dairy wastewater
Zaragoza Company, Inc.	Redlands, CA	Ethanol production

Industries	Location	Wastewater Type
Farmland Foods	Denison, IA	Meat packing wastewaters
Eastman Chemical Co.	Kingsport, TN	PET wastewaters
SmithKline Beecham	King of Prussia, PA	Pharmaceutical wastewaters
Hoechst-Celanese Corp.	Bishop, TX	Pharmaceutical intermediates
Hoechst-Celanese Corp.	Wilmington, NC	DMT wastewater
Miller Brewing Co.	Milwaukee, WI	Brewery wastewaters
Procter and Gamble	Cincinnati, OH	Cosmetics mfg. wastewaters
NutraSweet, Co.	Augusta, GA	Aspartame manufacturing
LG Caltex	Daejon and Yeosu, Korea	Refinery wastewater
Monsanto	St. Louis, MO	Nitrification and denitrification
DuPont	Wilmington, DE	Plastic intermediate wastewaters
Kroger Foods/Tamarack Farms	Newark, OH	Dairy wastewater
Dow Chemical Company	Midland, MI	Chemical industry wastewater
Danisco Sweeteners	Thomson, IL	Sugar-alcohol sweeteners
ConAgra	Greeley, CO	Meat packing wastewaters
Dean Foods	Lynn, MA	Meat processing wastewater

Manufacturing and Others	Location	Processes involved
Siemens/US Filter	Ames, IA	Granular media filters, Ballasted flocculation Chemical precipitation, Membrane bioreactors
Leopold Corp.	Zelienople, PA	Biological denitrification
US EPA	Cincinnati, OH	Soil remediation projects, pesticide biodegradation

MAJOR CONSULTING ASSIGNMENTS

1969 - 1982	**City of Ames, Iowa** **Investigated expansion alternatives for the Ames, Iowa water pollution control plant.**
1971 - 2001	**General Filter Company, Ames, Iowa (Now a Siemens Company)** **Evaluated water and wastewater treatment plant design and operation, evaluated process performance capabilities, developed new water and wastewater treatment processes and equipment and related design procedures, assessment of hydraulic characteristics of filter underdrains.**
1971 - 1972	**Stanley Consultants, Muscatine, Iowa** **Developed pilot plant study for treating grain processing wastewaters**
1971 - 1972	**Dewild, Grant, Reckert and Associates, Rock Rapids, Iowa** **Assisted with design and layout of Cherokee, Iowa and New Ulm, Minnesota wastewater treatment plants; Conducted waste flow and load analysis for Yankton, SD; supervised startup of the Cherokee, IA, wastewater treatment plant.**
1972	**Robert L. Rice, Des Moines, Iowa** **Designed Madison-Warren Sanitary Landfill**
1972	**City of Knoxville, Tenn. (with E. R. Baumann)** **Investigated Municipal Wastewater treatment plant performance and factors affecting that performance.**
1972	**A.R.F. Products, Inc., Raton, New Mexico** **Assisted with the design of electrolytic respirometer for measurement of biochemical oxygen demand.**
1972	**Maytag Dairy Farms, Newton, Iowa** **Designed septic tank and leaching field system for treating and disposal of washdown waters from a cheese-making operation.**
1972	**Culver Engineering, Jefferson, Iowa** **Assisted with the design and layout of the Jefferson, Iowa, Wastewater treatment plant.**
1973	**Farmland Foods, Inc., Denison, Iowa** **Prepared final project report for packing house wastewater treatment demonstration study sponsored by the U. S. Environmental Protection Agency.**
1974	**Schoor Engineering, Inc., Matawan, New Jersey** **Assisted with the selection of a treatment process to provide nitrogen removal in a regional wastewater treatment system.**
1975	**The Procter and Gamble Company, Cincinnati, Ohio** **Helped assess data and establish criteria for setting standards for grease discharge to municipal wastewater treatment plants.**
1975 - 1981	**Exidyne, Inc., Colorado Springs, Colo.** **Assisted with the design of electrolytic respirometer for water and wastewater analysis and provided recommendations for marketing and promotion.**
1984- 1996	**EnviroSystems Supply Inc., Fort Myers, Florida** **Assisted with design and operation of modular (pre-fabricated) anaerobic filter reactors for industrial waste treatment**
1982- 1985	**Engineering-Science, Atlanta, Georgia** **Assisted with the design of a full-scale anaerobic filter for treating wastewater from a chemical processing plant followed by assisting with the startup and stabilization of performance of the process**

MAJOR CONSULTING ASSIGNMENTS, Cont

1987-1991	**Ultrasystems, Inc., Irvine, California** **Assisted with application of anaerobic processes to treatment of industrial wastes**
1987	**Clark Dietz, Inc., Urbana, IL** **Reviewed filter operating problems at Bloomington/Normal, IL, wastewater filtration plant.**
1989 - 1991	**Engineering Science, Inc., Atlanta, GA** **Assisted with design of anaerobic filter process for treating soft drink bottling wastes**
1989-1991	**Lancy Environmental Systems, Inc., Warrendale, PA (Now a U. S. Filter Company)** **Assisted with design of anaerobic treatment process for landfill leachates.**
1990	**Shupe and Associates, Little Rock, AR** **Reviewed the design of granular activated carbon filters for treating Arkansas River water for drinking water supply.**
1991	**Shell Oil Company** **Conducted an evaluation of the performance of a full-scale anaerobic process for wastewater treatment at the Deer Park refinery, Houston, TX.**
1992 - 1993	**Environmental Resources Management, Inc., Exton, PA** **Assisted with the design of a two-stage, cyclic reactor for a food processing industry**
1993 - 1995	**Greeley and Hansen, Engineers, Chicago, IL** **Reviewed -- as part of an Engineering team -- the performance of Chicago's South Water Filtration Plant in view of expansion from 480 MGD to 900 MGD.**
1993	**ADI Systems, Inc., Fredericton, New Brunswick, Canada** **Assisted with design of anaerobic treatment process for a chemicals manufacturing plant for Sam Nam Petrochemicals Co. in Yeoh Cheon Industrial area, S. Korea.**
1994-1995	**McNamee, Porter and Seeley, Ann Arbor, MI** **Assisted MPS with the design for rehabilitation of the wastewater filters for the City of Ann Arbor, MI.**
1994 - 1997	**JINDO Engineering, Seoul, Korea** **Assist JINDO with design of a thermophilic anaerobic process for industrial waste treatment.**
1995 - 1996	**DuPont Engineering, Wilmington, DE** **Assisted with the evaluation of anaerobic processes for industrial waste treatment in Dordrecht, The Netherlands.**
1995 - 1998	**Hoechst-Celanese Polyester Intermediates, Wilmington, NC** **Assisted with evaluation of anaerobic processes for industrial wastewater treatment. design and operation of an on-site pilot plant, and design and start-up of a full-scale reactor**
1997	**Tamarak Farms Dairy, Newark, OH (Division of Kroger Foods Co.)** **Reviewed wastewater production records for Tamarak Farms Dairy and made preliminary design calculations for aerobic and anaerobic treatment process alternatives.**
1996 - 1999	**ADI Systems, Inc., Fredericton, New Brunswick, Canada** **On call as consultant for design of anaerobic processes for industrial wastewater treatment processes throughout the world.**

MAJOR CONSULTING ASSIGNMENTS, Cont

1998 - 1999 **Montgomery/Watson Engineering, Mexico City, Mexico/Pasadena, CA**
Reviewed the performance of a regional anaerobic treatment plant in Orizaba, Mexico and made recommendations for correction through modifications of design and operation.

1999 - 2001 **Miller Brewing Co., Milwaukee, WI.**
Assisted with diagnosing problems with an anaerobic treatment process at MBCO's Ft. Worth, Texas brewery, made recommendations for correction, and assisted with re-start after a period of inoperation.

2001 **Miller Brewing Co., Irwindale, CA**
Made complete evaluation of the feasibility of adding biological wastewater treatment at Miller's Irwindale, CA brewery

2002 **Danisco Sweeteners, Thomson, IL**
Assisted with diagnosing problems with an aerobic treatment process at Danisco's Thompson, IL plant.

2002 **DOW Chemical Co., Midland, MI**
Reviewed operation of a ballasted flocculation process at Dow's Midland, MI, facility. Made recommendations for changes in chemical feed and dissolved oxygen control

2002 + 2002 **Miller Brewing Co., Milwaukee, WI**
Made complete evaluation of the feasibility of adding anaerobic wastewater treatment at Miller's Trenton, OH brewery

2005 Reviewed proposals for anaerobic treatment at Miller's Irwindale, CA brewery

2006 Reviewed proposals for aeration equipment at Miller's Trenton, OH brewery

2007 Reviewed startup problems with installed anaerobic treatment plant

2007 Reviewed sulfide odor problem at MBCO's Ft. Worth, TX brewery

2006 **BP, Inc., Chicago, IL**
Conducted workshop on anaerobic treatment fundamentals and process technologies at BP's Cooper River plant in SC and CAPCO plant in Taiwan

2006 2007 **PARSONS, Inc, Pasadena, CA**
Assisted with design of 12 MGD anaerobic/aerobic treatment system to treat dairy wastewaters in Tulare, CA

2006 **Durman Esquivel Group, Queretaro, MEXICO**
Assisted with design of a 5.6 MGD domestic wastewater treatment plant for Tapachula, Mexico that used anaerobic reactors for primary treatment.

2006 - 2007 **Larson Design Group, Williamsport, PA**
Assisted with evaluation of requirements for designs to retrofit conventional municipal treatment plants for biological nitrogen and phosphorus removal.

2007 **City of Massillon, OH.**
Evaluated the performance of a non-functional tertiary wastewater filter system with recommendations for correction.

2007 **Zaragoza Company, Redlands, CA.**
Assisted with evaluation of water and wastewater related requirements for a large biomass-to-ethanol fermentation plant

2007 **Eastman Chemical Company, Kingsport, TN**
Conducted an evaluation of performance problems with an anaerobic reactor at Eastman's polymer plant in Zarate, Argentina