

# Carlos De León, Ph.D., P.E.

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## OBJECTIVE

I am seeking a position with an environmental engineering firm which would allow me to undertake design work and potentially research. My ideal position would allow me to work on process design of wastewater treatment facilities, with an emphasis on anaerobic solids treatment and handling, while potentially pursuing research on innovative wastewater treatment methods.

## EDUCATION

Ph.D. **University of California, Berkeley** (6/97 – 12/03)

*Major:* Environmental Engineering

*Minors:* Biochemistry and public health with an emphasis on advanced statistical methods

*Dissertation Title:* Pathogen Destruction in Thermophilic Anaerobic Digestion

*Advisor:* Prof. David Jenkins, former Chair of Civil & Environmental Engineering (currently Emeritus),  
Graduate School, U.C., Berkeley

M.S. **University of California, Berkeley** (8/96 – 5/97)

*Major:* Environmental Engineering

B.S. **Universidad Iberoamericana, Mexico City, Mexico** (8/90 – 10/95)

*Major:* Civil Engineering

*Minor:* Design of Civil Engineering Projects

*Thesis:* Pollution (Air and Noise), Economic and Traffic Flow Effects of Speed Bumps in a Southwestern  
Section of Mexico City

*Awards:* Best Engineering Thesis of the Year, 1994

## DISSERTATION RESEARCH

### *Objectives*

- Determine the operating conditions necessary to reach U.S. E.P.A. Class A pathogen concentrations using thermophilic anaerobic digestion for municipal wastewater sludge.
- Gather sufficient evidence through primary research to present thermophilic anaerobic digestion to the U.S. E.P.A. Pathogen Equivalency Committee as a candidate for Process to Further Reduce Pathogen status.

### *General Findings*

- Thermophilic anaerobic digestion can achieve Class A pathogen concentrations in municipal wastewater sludge.
- Most municipal wastewater treatment facilities with existing anaerobic digesters can achieve Class A pathogen concentrations in their sludge by making a series of relatively minor changes in plant operation and equipment.

### *Potential Benefits and Applications*

By producing Class A sludge, municipal wastewater treatment facilities can:

- lower sludge disposal costs
- be prepared to satisfy more stringent sludge disposal restrictions (e.g. all land applications must satisfy Class A pathogen concentrations and sludge characteristics).

## EXPERIENCE

**Damon S. Williams and Associates, LLC.**

**Oakland, CA**

*Design Engineer (9/03 – present). The following is a concise list of duties for specific projects:*

- **Design of Richmond Advanced Recycled Expansion (RARE) Water Project, EBMUD, CA (2007 to present)**- Carried out design and coordination duties as Project Engineer for an advanced water recycling facility with a flow of 3.5 mgd. Secondary Effluent from the West County District Water Pollution Control Plant was pumped and filtered through a set of Microfiltration membranes, to be further purified using Reverse Osmosis. The product water is intended to be used by the Chevron Richmond Refinery as feed to their secondary-pass membranes and their low-pressure boilers. Coordinated the architectural, civil, mechanical, structural, building mechanical, electrical and I&C disciplines to form the final set of drawings and specifications.
- **Design of DAFT Polymer Feeding Facility, CCCSD (2006)**- Designed a polymer feeding facility for the DAF Thickeners with the ability to use a dissolved solids analyzer in the feed splitting weir as a means of dosing the flow of polymer. Wrote the Control Narratives and drafted the structural, mechanical and control drawings for the project. Developed costs, and different layout options for the client.

**EXPERIENCE (continued)**

- **Design and Construction Administration for East Bayshore Recycled Water Facility Project, EBMUD, CA (2003-2006)**- Carried out hydraulic calculations and equipment selection, developed design details, costs and drafted specifications for a new 2,500 gpm water recycling facility. Duties include submittal review and response of Request for Information letters from both contractor and membrane manufacturer.
- **Preliminary Design, Avondale WWTP, City of Avondale, AZ (2006)**- Drafted an extensive comparison of the advantages and disadvantages of Egg-Shaped Digesters vs. Conventional Digesters for final implementation in the treatment plant, including qualitative and quantitative differences with an emphasis on Operation and Maintenance cost differences in the long term. Drafted a comparison of four different cogeneration alternatives to be implemented in Avondale, including regulatory requirements, sources of funding, existing funding programs, and a cost comparison that considered inflation and a 25-year lifetime. The four technologies analyzed were: microturbines, internal combustion generators and both molten carbonate and phosphoric acid fuel cells.
- **Master Plan, Avondale WWTP, City of Avondale, AZ (2005)**- Developed a master plan for an existing 4 MGD treatment plant, focusing on the solids treatment and support facilities (chlorination and dechlorination, odor control, chemical storage and dosing). The aim of the solids treatment was to find technologies that could adapt easily and quickly for Class A sludge production. Duties included technology analysis, determination of costs, preliminary site layout and drafting of a memorandum stating the findings and final recommendations to the City.
- **Basis of Design, Chino Basin Arsenic Removal Plant, City of Prescott, AZ (2005)**-Developed an economic model that identified the most affordable means of removing Arsenic from six different underground water wells with a combined flow of 10,300 gpm, and achieve the upcoming 10 µg/L Arsenic limit. Variables included: technology (adsorption, coagulation & filtration, coagulation & membrane filtration and ion exchange), location (centralized or well-head treatment), flow and bypass optimization. Results of the findings were drafted for a presentation to the board of directors and consecutive detailed design.
- **Basis of Design, El Dorado Hills WWTP Phase III Expansion, El Dorado Irrigation District, CA (2004-2005)**- Determined flows and loads required for the different design scenarios, carried out hydraulic calculations, preliminary site layout and equipment selection, determined costs and drafted reports for the expansion of the existing 4.5 MGD nitrification-denitrification and biological phosphorous-removal wastewater treatment plant whose capacity has to double in the next five years.
- **Sludge Hauling Option Analysis and Hauling Contract Renewal, 91<sup>st</sup> Ave. WWTP, AZ (2004)**- Analyzed all the options available for the City of Phoenix to haul their sludge, focusing on new and innovative alternatives. The findings were presented to the City for comment.
- **Cost Allocation of Liquid and Solid Wastes for Septage Receiving Program, EBMUD, CA (2004)**- Developed a complete mass balance model of the SD-1 WWTP and added the different wastes being received by their new Septage Receiving Program. The model considered the physical and chemical characteristics, with an emphasis on COD breakdown of each waste, the point of insertion to the treatment train and the effects on the overall process. Advantages (e.g. increased gas production) and disadvantages (e.g. difficulty of removing scum in primary clarifiers) of particular wastes at specific disposal locations were also determined and quantified as economic benefits or losses. The results were presented to the District in order to determine their rate schedule as a function of waste.
- **NPDES Pollutants and its Effects on the Hyperion Treatment Plant Effluent for the Low Flow Diversion Program, City of Los Angeles, CA (2004)**- Developed a chemical model that would predict the effluent concentration of a particular NPDES contaminant by using its physico-chemical properties and its incoming concentration to the plant. The model was based on 12 measured compounds with a strong statistical correlation to the model, which was used to determine the behavior of 70 other chemicals, 16 of which were identified to potentially exceed regulatory limits. The results were drafted in a Memorandum and Presented to the City.
- **Arsenic Removal Technology Options Memorandum, Copper Mountain Ranch Development, Entellus Inc., AZ (2004)**- Drafted a memorandum covering the technologies that could remove Arsenic and Fluoride from waters with a high total dissolved solids concentration for a development in the outskirts of Phoenix. Economic analyses were developed for the following technologies: Reverse Osmosis, Electrodialysis, Coagulation/Filtration and Coagulation/Membrane Filtration (in case the utility was able to utilize surface water).

## EXPERIENCE (continued)

- **Arsenic Treatment Compliance and Mitigation Program, City of Peoria, AZ (2004)**- Worked with the City, looking for a reduction of Arsenic concentrations in their source water and compliance with the upcoming Arsenic rule. Duties included regulatory and technology review, in addition to development of treatment scenarios focusing on cost minimization.
- **Operations and Maintenance Manual, Reservoir 1 WTP, El Dorado Irrigation District, CA (2004)**- Helped develop an on-line O&M manual for the operators of the Reservoir 1 WTP. Duties included process analysis and determination of equipment and chemical requirements, identification of potential problems and procedures required for solving them.
- **Treatment Facilities Analysis and Upgrades, Gold Canyon Water Recycling Facility, Algonquin Power, AZ (2003-2004)**- Developed design details, costs, preliminary site layout and selected equipment necessary for the thickening, dewatering and storage of Waste Activated Sludge for an existing wastewater treatment plant expanding from 1 to 1.7 MGD capacity. Carried out hydraulic calculations of all existing and future facilities, with a focus on hydraulic limitations and points for potential overflows during peak hour flows. Design was carried out in a compressed timeline in order to follow the requirements of the CM@Risk construction model.
- **Clearwell Upgrades and Modeling Report, Bollman Water Treatment Plant, CCWD, CA (2003-2004)**- Carried out hydraulic modeling, with the intention of improving mixing of Ammonia for the formation of chloramines as a residual disinfectant. Mixing and hydraulic issues were identified, drafting a set of recommendations for the District on how they could improve the chemical and hydraulic issues inside and downstream of the clearwell.

**University of California, Berkeley, Department of Civil and Environmental Engineering** **Berkeley, CA**  
*Research Assistant (2/01 – 6/02)*

- Designed and constructed two parallel activated sludge systems designed to evaluate the impact of reactor configuration on filamentous foaming.
- Operated and maintained reactors daily.
- Analyzed samples to maintain predetermined biological conditions (MCRT).

**East Bay Municipal Utilities District in cooperation with U.C., Berkeley** **Oakland, CA**  
*Research Assistant (6/98 – 11/00)*

- Designed and constructed two different thermophilic anaerobic digestion pilot plants to study their pathogen removal efficiency at a range of temperatures, residence times and configurations.
- Operated and maintained reactors daily.
- Analyzed samples for various physical, chemical and biological parameters.
- Performed statistical analyses on results and reported findings to the research team and the Water Environment Research Foundation (WERF).

## PROFESSIONAL AFFILIATIONS

Member of the Standard Methods Committee: Co-author of Section 5560D *Volatile Acid Speciation by Gas Chromatography*.

Engineer in Training, April 2004

Professional Engineer, April 2006 License #70427

## PUBLICATIONS

- *Comparison of Thermophilic Anaerobic Digestion Processes for Meeting the USEPA Class A Pathogens in Biosolids*; Proceedings, IWA Sludge Management Specialized Conference, Acapulco GRO, México Nov. 2001.
- *Comparison of Thermophilic Anaerobic Digestion Processes for Meeting Biosolids Class A Pathogen Standards*; Proceedings, WEFTEC, Atlanta, GA, Oct. 2001.
- *Comparison of Thermophilic Anaerobic Digestion Processes for Meeting Biosolids Class A Pathogen Standards*; Proceedings, WEF Residuals Biosolids Management Conference, San Diego, CA, Oct. 2001.
- *Comparison of Thermophilic Anaerobic Digestion Processes for Meeting Biosolids Class A Pathogen Standards*; Proceedings, WEFTEC, Anaheim, CA, Oct. 2000.
- *Pathogen Destruction Efficiency in High Temperature Anaerobic Digestion*; Biosolids Technical Bulletin, WEFTEC, New Orleans, LA, Oct. 1999.

**PRESENTATIONS**

- IWA Sludge Management Specialized Conference, Acapulco, GRO, México Nov. 2001.
- CWEA Annual Conference, Sacramento, CA, April 2000.
- CWEA Emerging Technologies Seminar, Berkeley, CA, Sept. 2000.

**LANGUAGES**

Completely Fluent in English and Spanish

**REFERENCES**

Jim Geselbracht, M.Sc, P.E., Principal, Water Works Engineers, Oakland, CA.

Sanjay Reddy, M.Sc, P.E., Associate, Black & Veatch Engineers, Walnut Creek, CA.

David Jenkins, Professor in the Graduate School, UC Berkeley, Berkeley, CA.

B. Narayanan, Ph.D., P.E., Principal, Carollo Engineers, Walnut Creek, CA.