



Thomas G. Mossinger, P.E.

Thomas G. Mossinger, an associate vice president with Carollo Engineers, is a mechanical engineer with 35 years of experience in the design of major process, pumping, and odor control systems associated with water and wastewater treatment facilities as well as cogeneration and central plant facilities. As a mechanical engineer, he provides all aspects of design services associated with the design of air, heating, cooling, power production, chemical, odor treatment, gas handling, and process solids systems including all associated subsystems. His project experience includes:

Education

BS Mechanical Engineering, San Jose State University, 1985

Licenses

Professional Engineer, Hawaii, Illinois, Florida, Washington, Oregon

Mechanical Engineer, Nevada, New Mexico, California

Professional Affiliations

American Society of Mechanical Engineers

American Society of Heating, Refrigerating, and Air Conditioning Engineers

Water Environment Federation

California Water Environment Association

Mechanical Process Design

→ Mechanical engineer for the Preston and Hialeah Water Treatment Plant Improvements for Miami-Dade County, Florida. Carollo designed the world's largest nanofiltration (NF) facility (165-mgd) on a new site in the NW Wellfield. 3D design capabilities were used to facilitate review meetings with client managers and regulators, while improving clarity of design drawings.

→ Technical advisor for the Tampa Bay Water, Florida, Energy Management Program, Cypress Creek Water Treatment Plant (110-mgd) Energy Audit. Participated in pump testing and responsible for overall deliverable quality. Through historical data evaluation, pump testing, and inspections of the Chemical Building, Maintenance Warehouse, and Pump and Control Building, recommended five Energy Efficiency Measures anticipated to save \$68,600/yr. No capital cost operational changes, accounting for over \$30,000/yr. of savings, were immediately implemented by staff. Other improvements are being programmed into CIP.

→ Project manager for the design of an in conduit hydroelectric generation system for the City of Carlsbad, California. Provided construction documents for the installation of new 150 kW hydroelectric generator and all appurtenant equipment, piping, electrical, and controls. Provided licensing support for obtaining the FERC hydroelectric plant operating license.

→ Project mechanical engineer for the Miami-Dade County, Florida, South District Wastewater Treatment Plant High-Level Disinfection Improvements. Responsible for the mechanical design for the installation of seven 2.86-MW standby power generators (with provisions for a future 8th unit), diesel fuel storage system, compressed air starting

system, and HVAC systems associated with the generator building.

→ Project mechanical engineer for the \$30 million upgrade of the Union Sanitary District's Alvarado Wastewater Treatment Plant, Union City, California. This project increased the plant's average dry weather flow capacity to 30 mgd and its peak wet weather flow capacity to 85 mgd. This project involved more than \$1 million in site demolition work and hazardous materials cleanup for asbestos; coordination of structural, corrosion, and geotechnical subconsultants; and coordination with Pacific Gas & Electric and local building departments. The project included a 7.0-MBTU/hour dual-gas-fired hot water boiler, four Alfa-Laval sludge spiral heat exchangers, and extensive modifications to the plant's hot water heat and gas loops. Other elements included several chemical mist towers for odor control, a fine bubble aeration system, and a primary anaerobic digester.

→ Project manager for design of the 13.5-MW cogeneration plant for East Bay Municipal Utility District main wastewater treatment plant, California. Provided construction documents for the installation of two 4.5-MW gas turbine generators with space and appurtenances for a third identical unit. Documents included installation of siloxane removal, gas compression, and all appurtenant equipment, piping, electrical, and controls.

→ Project engineer for the preliminary cogeneration design study for the City of Davis Wastewater Treatment Plant, California. The purpose of the study was to determine type and size of new and/or replacement cogeneration equipment to meet near and future electrical and heat needs of the facility. The study recommended installation of a 1-MW solar system and a 300-kW fuel cell

Awards

Other Accomplishments

Open for Quote

Thomas G. Mossinger, P.E.

to operate in parallel with an existing 75-kW engine generator.

→ Project manager for the preliminary cogeneration study and project implementation of the resulting system for the City of Livermore, California, Wastewater Reclamation Facility. The study recommended installation of 500- to 600-kW of cogeneration using a design-bid-build-own-operate approach. Prepared Request for Proposals for the recommended project and are currently assisting the City implement the resulting 600-kW fuel cell project.

→ Quality assurance/quality control (QA/QC) for City of Sunnyvale, California, Wastewater Treatment Plant Digester Upgrade Projects. Performed QA/QC review of mechanical work associated with the digester upgrades.

→ Mechanical engineer for the Napa Sanitation District, California, Soscol Water Recycling Facility Expansion. This 8-mgd, \$47 million project was completed in two phases. Phase 1 included tertiary treatment for reclamation consisting of three-stage flocculation, a continuous backwash filtration system, a chlorine contact basin, a reclaimed water storage reservoir, and sodium hypochlorite chlorination, bisulfite dechlorination, chemical storage facilities.

→ Mechanical engineer for the City of Livermore, California, \$20 million WRP Solids Expansion Project. This project included the addition of new anaerobic digesters and replacement of an existing dissolved air floatation thickener with new gravity belt thickeners to increase the solids handling capacity of the plant. Responsibilities included evaluation and sizing of new sludge heating, mixing, and pumping facilities for the new digesters. Also evaluated the hot water and plant heat loop system to ensure sufficient heat will be available for future design and current operating and startup conditions during the winter months.

→ Project mechanical engineer for the California Department of Corrections and Rehabilitation Chuckawalla Valley State Prison Capacity Study Budget Package. The project evaluated treatment plant capacity and recommended replacing influent and effluent

pumps to meet current and anticipated flow conditions.

→ Project mechanical engineer for the California Department of Corrections and Rehabilitation Chuckawalla Valley State Prison Wastewater Treatment Plant Improvements. Project components included: CVSP influent pump station with pumps, piping, and VFDs; ISP pump station with pumps, piping, MCC, and VFDs; sludge drying beds; effluent pump station with pumps and piping; electrical/instrumentation equipment including standby power; and yard piping and flow control structures to accommodate proposed facilities.

→ Project engineer for design of cogeneration system procurement RFP for the City of Tulare, California. Produced RFP documents for installation of an approximately 750 kW cogeneration system.

→ Project manager for design of cogeneration system preparation contract and for cogeneration system procurement RFP for the City of Livermore, California. Produced RFP and construction documents for installation of an approximately 500 kW cogeneration system.

→ Lead mechanical engineer and technical advisor for the City of Livermore, California, \$2.3 million Unit Process Improvements Project. This project includes a new bar screen, ferric chloride facility, polymer facility, and three new digester pump mixing systems.

→ Mechanical engineer for the preliminary and final design and construction of the City of San Leandro's \$40 million Water Pollution Control Plant (WPCP) Rehabilitation Project in San Leandro, California. The main purpose of the project was to restore the capacity and function of the WPCP to its permitted capacity of 7.6 mgd with improvements to various existing facilities and by adding new facilities.

→ Technical advisor for the City of Turlock, California, Recycled Water Project, which included design of an acid phase digester, methane phase digester, and associated heating, recirculation, and pumping systems for operation of the digestion facility.

Awards

Other Accomplishments

Open for Quote

Thomas G. Mossinger, P.E.

→ Project engineer for design of a wastewater effluent cooling system for the City of Roseville, California. Produced construction documents for installation of cooling towers, vertical turbine pumps, and all associated controls and appurtenances.

→ Project manager for design of a biosolids cake pumping and storage system for the City of Santa Rosa, California, Laguna Subregional Wastewater Treatment Plant. Produced construction documents to install four progressive cavity sludge cake pumps and a 300-cubic-yard sludge cake storage hopper and truck loadout facility, including all piping subequipment, electrical, and controls.

→ Project engineer for design of digested sludge dewatering, digester retrofit modifications, compressed air and chemical systems, HVAC, and standby power system for the California Men's Colony wastewater treatment facility in San Luis Obispo, California. Produced construction documents to install a digested sludge dewatering centrifuge and conveying system and compressed air system, replace digester gas mixing with a pump mixing system, install new chemical storage, pumping, and distribution systems, and install a 1,000-kW standby generator, diesel fuel storage system, and HVAC systems.

→ Project engineer for the design of chemical storage and handling systems for the City of Petaluma, California, reuse facility. Produced construction documents for installation of chemical storage, pumping and distribution equipment, and HVAC modifications associated with the new chemical systems.

→ Project mechanical engineer for design of odor collection and treatment systems, HVAC systems, and hot water distribution systems for the cities of Reno and Sparks, Nevada, Truckee Meadows Water Reclamation Facility. This major wastewater treatment facility expansion project included the design of multiple odor control systems conveying and treating in excess of 20,000 cfm of foul air. Treatment processes included a mixed bed biofilter, a three-stage chemical packed bed scrubber, and a sin-

gle-stage chemical mist scrubber. Produced construction documents for ductwork, fans, odor treatment equipment, controls, HVAC systems, and hot water system modifications.

→ Project manager for design of two 800-kW standby diesel generating units for Napa Sanitation District's standby generator replacement project, California. Produced prepurchase documents for procurement of two standby generators and construction documents for their installation, including all associated equipment, piping, and controls.

→ Project engineer for design of compressed air, HVAC, and standby power generation systems for a major wastewater treatment plant expansion for the City of Vacaville, California. Produced construction documents for installation of a 2,000-kW standby generator, a diesel fuel storage system, and compressed air and HVAC systems associated with process, maintenance, administration, and laboratory buildings.

→ Project manager for design of odor treatment system additions for the City of Santa Cruz, California, Wastewater Treatment Plant. Produced construction documents for the addition of second-stage activated carbon adsorption odor control vessels and associated fans, ducting, and controls to treat 42,000 cfm of foul air.

→ Project engineer for the 81-mgd Hart Street Wastewater Pump Station rehabilitation design for the City and County of Honolulu, Hawaii. Responsibilities included producing construction documents for a pumping system consisting of five 450-horsepower vertical wastewater centrifugal pumps, associated piping, and controls. Also included design of HVAC systems and all associated equipment, piping, ducting, and controls.

→ Project engineer for design of a three-level booster pumping station and reservoir network serving a new hillside home subdivision for the Alhambra Highlands Water Facilities, Richland Development Corporation, Martinez, California. Provided construction documents for installation of multiple reservoirs and pumping stations containing horizontal split case pumps, a hydropneu-

Awards

Other Accomplishments

Open for Quote

Thomas G. Mossinger, P.E.

matic system, standby power generation equipment, air compressor, and all associated equipment, piping and controls.

→ Project engineer for the Reservoir No. 4 pump station reconstruction for the City of Daly City, California. Responsible for design of a booster pumping station and reservoir improvements for an existing water distribution system. Provided construction documents for installation of three vertical turbine pumps, standby power generation equipment, and all associated equipment, piping and controls.

→ Project engineer for the Contra Costa Water District, California, hydropneumatic booster pumping station. Responsible for design of a 2,250-gpm booster pumping station and a 2-million-gallon reservoir serving a 109-home subdivision. Provided construction documents for installation of three two-speed 750-gpm vertical turbine pumps, a hydropneumatic system, a 250-kW emergency generator, air compressor, and all associated equipment, piping, and controls.

→ Project engineer for a blending water booster pump station design for the Dublin San Ramon Services District, California. Responsible for design of a 5-mgd recycled blending water booster pumping station to allow reinjection of reclaimed water into a raw water aquifer. Provided construction documents for installation of air gap tank, a 5-mgd pumping system, flow metering equipment, and all associated equipment, piping, and controls.

→ Project engineer for design of HVAC and utility systems for a water treatment plant control and laboratory building. Utilities included potable hot and cold water, drainage for both chemical and sanitary wastes, natural gas, compressed air, and deionized water.

→ Design engineer for a Carson City, Nevada, HVAC and utility systems design for a 65,000-square-foot manufacturing facility. Utility systems included potable and non-potable water, sewage, natural gas, and compressed air.

→ Project engineer for design of utility systems for a refurbished employee locker fa-

cility and a new administration and laboratory facility for the City of San Luis Obispo, California. Utility systems included potable hot and cold water, drainage for both chemical and sanitary wastes, natural gas, compressed air, and deionized water.

→ Design engineer for a sodium hypochlorite facility for the Dublin San Ramon Services District, California. Responsible for design of a small ventilating and air conditioning system for the electrical MCC room of a new sodium hypochlorite facility.

→ Project engineer for design of a pumping station for the Bolinas Community Public Utility District, California. Responsible for design of piping and HVAC modifications, including pump replacement, for the renovation of an underground wastewater pumping station.

→ Design engineer for a pumping station for the City of Santa Rosa, California. Responsibilities included producing construction documents for a pumping system consisting of a duplex series pumping arrangement with one set of pumps being both engine-driven and motor-driven. Fuel system for engine-driven units was both natural gas and liquefied petroleum gas with the liquefied petroleum gas being used as a backup fuel source.

→ Design engineer for a 25-mgd raw water pump station for the City of Cordelia, California. Responsibilities included producing construction documents for a pumping system consisting of three 800-horsepower vertical turbine pumps, associated piping, and controls. Also included modifications to existing pumps and piping associated with the raw water supply system.

→ Staff engineer for preliminary design for the installation of a sewage sludge pasteurization facility for the Municipality of Metropolitan Seattle, Washington. Developed preliminary equipment sizing and layout for all equipment associated with a pasteurization process. Various heating alternatives included the use of direct steam injection, direct submerged combustion, and hot water heat exchangers utilizing hot water produced by heat pumps or hot water boilers.

Thomas G. Mossinger, P.E.

Awards

Other Accomplishments

Open for Quote

→ Project engineer for design of odor collection and treatment systems for a major wastewater treatment plant expansion for the Dublin San Ramon Services District, California. Produced construction documents for the installation of a foul air collection, conditioning and boosting system and sand bed biofilter including all associated equipment, piping, ducting, and controls.

→ Project engineer for the Hart Street Wastewater Pump Station rehabilitation for the City and County of Honolulu, Hawaii. Work included design of odor collection and treatment systems. Produced construction documents for the installation of a foul air collection, conditioning, and boosting systems and Phoenix catalytic carbon and deep-bed carbon treatment systems including all associated equipment, piping, ducting, and controls.

→ Project engineer for design of odor collection and treatment systems for a major wastewater treatment plant expansion for the City of Vacaville, California. Produced construction documents for the installation of a foul air collection, boosting, and conditioning systems for a mixed-bed biofilter including all associated equipment, piping, ducting, and controls.

→ Project engineer for a raw water pump station expansion Phase I project for the City of Antioch, California. Responsibilities included providing construction documents for replacement of an existing 400-hp split-case pump with a new 800-hp split case pump. Modifications included replacement of associated valving and installation of a high-capacity compressed air wash system for the existing intake screens. The project doubled the capacity of the pump station.

→ Project engineer for a raw water pump station expansion Phase II project for the City of Antioch, California. Responsibilities included producing construction documents for replacement of an existing 800-hp split-case pump with a new 1250-hp vertical turbine pump. Modifications included installation of the new pump into an existing intake screen. The project increased the pump station capacity by 50 percent.

→ Provided QA/QC for design of mechanical odor control systems associated with an odor control upgrade project for the Vallejo Sanitation and Flood Control District, California. Project included replacement of existing ventilation and odor control systems associated with plant secondary process equipment.

Feasibility Studies/Technical Evaluations

→ Project engineer for the digester gas utilization evaluation project for the City of Porterville, California. The project involved reviewing potential digester gas utilization system including scrubbing the gas to natural gas quality, for injection into the natural gas pipe line or for use as CNG to offset transportation fuel, or using the gas within various types of cogeneration technologies to generate power and heat for use at the WWTP. The recommended solution was to convert the digester gas into renewable CNG for use to augment the City's existing CNG bus fueling system.

→ Project engineer for the cogeneration system evaluation and implementation for the City of and County of Honolulu, Hawaii, Kailua WWTP energy-savings performance contract project. Provided construction documents for the installation of new hot water boiler and a reciprocating engine generator. Equipment included installation of siloxane and H₂S removal, gas compression, and all appurtenant equipment, piping, electrical, and controls.

→ Project engineer for the cogeneration system evaluation and implementation for the City of and County of Honolulu, Hawaii, Honouliuli WWTP energy savings performance contract project. Provided construction documents for the installation of new hot water boiler and a reciprocating engine generator. Equipment included installation of siloxane and H₂S removal, gas compression, and all appurtenant equipment, piping, electrical, and controls.

→ As project engineer, performed a cogeneration feasibility study for Eastern Municipal Water District, California, Moreno Valley Wastewater Reclamation Facility. The

Awards

Other Accomplishments

Open for Quote

Thomas G. Mossinger, P.E.

study reviewed the technical and economic feasibility of installing a cogeneration system at the wastewater treatment plant using reciprocating engine generators, fuel cells, and microturbines. These systems were sized to utilize the digester gas generated by the wastewater reclamation facility. The study recommended installation of a 1,200 kW cogeneration system using fuel cells. Also served as project engineer/project manager providing equipment procurement assistance and design services to install the recommended fuel cell system. The project included the installation of fuel cells, fuel treatment system, water treatment system, and all associated gas, electrical, and site work necessary to install the cogeneration system into the wastewater reclamation facility. The City is currently in negotiations with the installation contractor. The City expects to be generating renewable power in early fall 2007.

→ Lead discipline engineer for a comprehensive inventory/condition assessment of the Colorado Springs Utilities, Colorado, Mesa Water Treatment Plant. The assessment involved a comprehensive review of existing plant reports, plans, bid tabulations, and databases as well as physical inspection of more than 160 major assets of the plant. The results of the assessment were organized into a customized database and combined with repair/replacement costs to develop a prioritized list of repair/replacement projects for the utility.

→ Project engineer for the South Orange County Wastewater Authority Plant 3A Cogeneration Analysis for the Moulton Niguel Water District, in Laguna Niguel, California. The study included determination of digester gas and heating requirements and analysis for a microturbine cogeneration system installation.

→ Project engineer for an energy feasibility study for the West County Wastewater Agency in Richmond, California. Developed and analyzed, on a life cycle basis, various energy generation technologies to provide the treatment plant with 1 MW of electrical power. Technologies included solar, fuel cell, turbine, micro-turbine, and reciprocating engine.

→ Project Engineer for a cogeneration feasibility analysis for the South Treatment Plant for King County, Washington. Developed and analyzed, on a life cycle basis, numerous gas turbine and reciprocating engine cogeneration projects ranging from 4 MW to 25+ MW.

→ Project manager for an energy audit for the California Energy Commission. Managed a small team of engineers performing technical energy audits for several community college campuses throughout California. Reviewed existing mechanical and electrical systems associated with college buildings and developed and analyzed energy-saving projects associated with a domestic hot water system, HVAC, lighting systems, and other miscellaneous energy systems.

→ Assistant project manager for energy surveys in Northern California. Managed a small team of engineers performing energy surveys for several assembly industry companies throughout the San Francisco Bay Area. Surveyed assembly and manufacturing facilities to determine the distribution of energy usage associated with HVAC, lighting, and process systems.

→ Staff engineer for a technical and economic feasibility review for the California Pollution Control Financing Authority. The project included review of several biomass-fueled, waste-to-energy, power production projects ranging in size from 10 MW to 40 MW.

→ Project engineer for a power plant evaluation for the California Energy Commission. Work included technical evaluation of several power plant projects ranging in size from 40 MW to 60 MW. Conducted review of each facility to determine electrical power output for the California Energy Commission/Power Plant Evaluation Program.

→ Project engineer for a cogeneration feasibility study for the County of San Joaquin, California. The project involved assessing the feasibility of several alternative cogeneration systems utilizing natural gas-fueled power systems in combination with hospital infectious waste and municipal solid waste incineration to provide the electrical, cool-

Awards

Other Accomplishments

Open for Quote

Thomas G. Mossinger, P.E.

ing, and heating requirements of a hospital complex.

→ Project engineer for a cogeneration feasibility study for the County of Merced, California. The project involved assessing the feasibility of several alternative cogeneration systems utilizing natural gas-fueled power systems in combination with waste paper incineration to provide the electrical, cooling, and heating requirements of a printing plant.

→ Staff engineer for a technical and economic feasibility study for the installation of a compressed natural gas-fueling system to fuel 50 transit buses and 30 county vehicles and to provide a fueling station for local residents and businesses for the Sonoma County Transit District, California.

Construction Support

→ Project manager for construction support for the San Francisco State University, California, central plant replacement. Managed construction support services during installation of replacement central heating plant and campus building modifications. Managed a multi-disciplined, multi-company project team providing office engineering services associated with installation of a new hot water heating system, a 1250-kW cogeneration system, and all associated mechanical subsystems.

→ Resident engineer for construction support during installation of the Wet Weather Facilities Program Pump Station C and Storage Basin project for the East Bay Municipal Utilities District, California. Provided construction support services including submittal review, inspection, design clarification review, and change order preparation.

→ Process engineer for construction support services during installation of wet weather treatment facilities for the East Bay Municipal Utilities District, California. Provided office engineering services associated with the installation of new pumping, HVAC, and standby power generation systems.

→ Project engineer for mechanical inspection of a wastewater treatment plant expansion for the County of Maui, Hawaii, Wastewater Reclamation Division's Kihei

Water Reclamation Facility. Inspected installation and testing of self-cleaning bar screens, aeration air blowers, aerobic digesters, grit removal systems, and emergency power generation equipment.

→ Project engineer for construction support services during installation of cogeneration facilities for the Orange County Sanitation District, California. Provided office engineering services associated with the installation of cogeneration facilities producing 16 MW and 7.5 MW.

→ Project engineer for construction support services during installation of advanced primary treatment facilities for the City of Santa Cruz, California, Wastewater Treatment Plant. Provided office engineering services associated with the installation of new anaerobic digesters, an effluent pump station, miscellaneous support buildings, and a cogeneration facility producing 750 kW.

→ Project engineer for mechanical inspection of water pumping facilities for the Contra Costa Water District, California, Arbolado Pump Station. Inspected installation and testing of vertical turbine pumps and associated piping and valving.

Scheduling

→ Performed monthly construction schedule reviews for the Littleton/Englewood, Colorado, Wastewater Treatment Plant Phase 1B; City of Riverside, California, headworks project; Pinal Creek Wastewater Treatment Plant expansion; and City of Corvallis, Oregon, Capital Improvement Program.

→ Developed construction schedules for numerous projects including: Dublin San Ramon Services District, California, Stage 4 Expansion; City of Klamath Falls, Oregon, cogeneration cooling water pipeline and pumping station; City of Charlotte, North Carolina, Long Creek Pumping Station; San Francisco International Airport 5601L Utility Relocations Phase VIII; Orange County Sanitation District, California, Primary Clarifiers No. 16-31 and related facilities (Project P1-37); Cheyenne, Wyoming, Board of Public Utilities R.L. Sherard Water Treatment Plant;

Awards

Other Accomplishments

Open for Quote

Thomas G. Mossinger, P.E.

Toronto, Canada, main treatment facility design build project for Contracts No. 1 and No. 2; and Ryan Foods in Murray, Kentucky.

Process/Cogeneration/Central Plant Design

→ Project engineer/technical lead for a cogeneration and renewable natural gas (RNG) evaluation for the City of Longmont, Colorado, Digester Gas Utilization Project. Reviewed the feasibility of alternatives for beneficial use of digester gas, including combined heat and power, compressed natural gas (RNG) for a fueling station, pipeline injection, digester gas supply to local industries, and biosolids drying.

→ Technical lead and quality assurance/quality control reviewer for the City of Longmont, Colorado, Digester Gas Utilization Project renewable natural gas (RNG) system design. Provided technical oversight and direction for design of the compressed RNG system for a fueling station to fuel City fleet vehicles.

→ Project engineer/technical lead for the South Platte Water Reclamation Plant, Colorado, Digester Gas Utilization Project cogeneration and renewable natural gas evaluation. Reviewed the feasibility of alternatives for beneficial use of digester gas, including combined heat and power and compressed natural gas for a fueling station, pipeline injection, digester gas supply to local industries, and biosolids drying.

→ Technical lead and quality assurance/quality control reviewer for renewable natural gas (RNG) system design for the South Platte Water Reclamation Plant, Colorado, Digester Gas Utilization Project. Provided technical oversight and direction for design of the compressed RNG system for injecting RNG into the local natural gas transmission system.

→ Project manager for the development of a digester gas treatment system for the Truckee Meadows Water Reclamation Facility, Reno, Nevada. The project developed and implemented a project to meet the environmental restrictions recently placed on the facility which limited total sulfur emissions from the facility to the point

where all digester gas utilized, including flared gas, essentially have all H₂S removed. The project implemented an innovative treatment system consisting of a biological H₂S removal system followed by a traditional H₂S, moisture and siloxane removal system to treat 900 scfm generated at the facility.

→ Project manager/project engineer for the preliminary and final design of a 1.7-MW digester gas-fueled cogeneration system for the Union Sanitary District, California, Alvarado Main Treatment Plant. Provided construction documents for the installation of two 850-kW reciprocating engine generators, digester gas treatment system, and all required appurtenances and accessories. Design included installation of engine exhaust treatment equipment to meet stringent air permitting requirements, meeting utility interconnection requirements, and securing a \$3.4 million grant from the California Self-Generation Incentive Program.

→ Project engineer for the design of a 1.1-MW cogeneration system for the City of Hayward, California, Wastewater Treatment Facility. First phase of the project consisted of preparation and evaluation of a bid package to procure a design-build contract to install a nominal 1-MW reciprocating engine or fuel-cell cogeneration facility. Following unsuccessful negotiations with the selected design-build firm, assisted the City with developing construction documents for a 1.1-MW digester gas-fueled reciprocating-engine-based cogeneration system. System included installation of a single engine with space for a second unit, all appurtenant equipment, fuel treatment equipment, emission control equipment, and all electrical interconnection equipment. Services included securing a \$3 million California Self-Generation Incentive Grant for the City. Responsibilities included preparing design documents and providing engineering assistance during construction.

→ Project engineer for design of a 1.4 MW cogeneration system for the San Jose/Santa Clara Water Pollution Control Plant, California. Produced construction documents for the installation of a 1.4 MW fuel cell cogeneration system, digester gas treatment sys-

Awards

Other Accomplishments

Open for Quote

Thomas G. Mossinger, P.E.

tem and all ancillary equipment. Produced construction documents for the installation of a 1.4 MW fuel cell cogeneration system, digester gas treatment system and all ancillary equipment. Design included installation of a digester gas treatment system to remove H₂S, sulfur compounds, moisture, particulate, and siloxanes. In addition, design included recovery of waste heat for use by the plants digester hot water heating system. Was responsible for coordination with the interconnection requirements for all utilities; hot water, natural gas, digester gas, water, drainage, communications and electrical power. Secured \$5 million from California Self Generation Incentive Grant Program for the project. In addition, was responsible for obtaining the air permit and electrical and interconnection agreement from the local utility. Also provided engineering services during construction and startup assistance.

→ Technical advisor engineer for design of a digester gas treatment system for the City of Modesto, California, Sutter Avenue Primary Treatment Plant. Performed a condition assessment of existing facilities, and prepared a preliminary design report recommending interim and future facility improvements. Prepared construction documents for the installation of a new digester gas treatment system and booster blower.

→ Project manager/engineer for gas turbine replacement feasibility review and standby power assessment for the Central Contra Costa Sanitary District (CCCSD), California. Reviewed CCCSD generated economic feasibility documents and provided feedback as to appropriateness of assumptions and methodology. Also assisted with assessing requirements for standby power capacity at the facility.

→ Project engineer for the City of Camarillo, California, for a study to assess the feasibility of installing a cogeneration system for the City's WWTP. Several technologies, including fuel cells and engine generators will be evaluated on a 20-year life cycle cost basis to determine the most economical alternative.

→ Project manager for technical feasibility study to assess replacement of natural gas fueled engine driven pumps with fuel cell power cogeneration system for two water pump stations for Rancho California Water District.

→ Project engineer for the cogeneration system evaluation and cogeneration system design for the City of Chico Water Pollution Control Plant, Chico, California. Developed project economics for fuel cell, micro-turbine, and engine generated alternatives. Designed installation of selected alternative 335 kW engine generator system. Assisted with grant funding and all permitting work. Project integrates with plants 1-MW solar facility.

→ Project manager for design of a 1.2-MW fuel cell cogeneration system at the City of Turlock, California, Water Reclamation Plant for TID. Provided construction documents for the installation of a 1.2-MW fuel cell generator digester gas conditioning system and all appurtenances.

→ Project engineer for the Eastern Municipal Water District, California, Moreno Valley Wastewater Reclamation Facility. Project involved the installation of two 50-boiler hp ultra-low NO_x hot water boilers.

→ Project manager for design of the 13.5-MW cogeneration plant for East Bay Municipal Utility District main wastewater treatment plant, California. Provided construction documents for the installation of two 4.5-MW gas turbine generators with space and appurtenances for a third identical unit. Documents included installation of siloxane and removal, gas compression, and all appurtenant equipment, piping, electrical, and controls.

→ Project engineer for the preliminary cogeneration design study for the City of Davis Wastewater Treatment Plant, California. The purpose of the study was to determine type and size of new and/or replacement cogeneration equipment to meet near and future electrical and heat needs of the facility. The study recommended installation of a 1-MW solar system and a 300-kW fuel cell to operate in parallel with an existing 75-kW engine generator.

Thomas G. Mossinger, P.E.

Awards

Other Accomplishments

Open for Quote

→ Project manager for the preliminary cogeneration study and project implementation of the resulting system for the City of Livermore, California, Wastewater Reclamation facility. The study recommended installation of 500- to 600-kW of cogeneration using a design-bid/-build-own-operate approach. Prepared Request for Proposals for the recommended project and are currently assisting the City implement the resulting 600-kW fuel cell project.

→ Project engineer for cogeneration feasibility study to identify the economics of providing a cogeneration system for the West County Wastewater District, Richmond, California. The analysis considered reciprocating engine generators, fuel cells, microturbines, and a solar photovoltaic system using both digester gas and landfill gas from an adjacent landfill. The economic analysis determined the cost to generate electricity using each of these technologies while assuming varying costs of any purchased landfill gas. The study recommended installing an 1120-kW reciprocating engine generator system using both digester gas and purchased landfill gas. The study was later updated with new research resulting in recommendation to install 1,200-kW fuel cell installation.

→ As project engineer, designed the installation of a 1,100 kW engine generator cogeneration system for Eastern Municipal Water District, California, Perris Valley Wastewater Reclamation Facility. The project included the installation of two 560 kW engine generators with CO catalysts, a fuel treatment system, water treatment system, and all associated gas, electrical, and site work necessary to install the cogeneration system into the wastewater reclamation facility. We are currently assisting the District with evaluating whether or not to proceed with installation of the engine generator by including new selective catalytic reduction systems and continuous emission monitoring systems for the engines, or replacing the engine generator system with a 1,500 kW fuel cell system.

→ Project engineer for design of an 8-MW cogeneration plant for the South Treatment Plant for King County, Washington. Provid-

ed construction documents for the installation of two 3.5-MW gas turbine generators, a single 1.5-MW steam turbine generator, including all appurtenant steam, hot water, compressed air, and associated equipment, piping, and controls.

→ Project engineer for the preliminary cogeneration design study for the City of Tulare, California, Water Pollution Control Facility. The purpose of the study was to determine modifications needed to the existing IC engine cogeneration facility and to determine type and size of IC engines for on-site cogeneration of electric power and heat to best meet near-term and future needs of the facility.

→ Project engineer for the Microturbine Installation Project for the City of Novato, California's wastewater treatment plant. Provided construction documents for the installation of a single 30-kW microturbine and associated heat recovery and gas conditioning equipment, including piping and controls.

→ Project mechanical engineer for design of heating system modifications for the treatment facility improvement project for the City of Turlock, California. Produced construction documents for the installation of a new digester gas-fueled boiler, associated equipment, piping, and controls. Project included reconfiguring two existing independent heating systems as a new single heating system.

→ Project mechanical engineer for design of a heating system replacement for the City of Santa Maria, California. Produced construction documents for the replacement of a digester gas-fueled boiler, associated equipment, piping, and controls.

→ Project mechanical engineer for design and startup of a hot water boiler for the South Treatment Plant for King County, Washington. Provided construction documents and startup services for installation of a \$12 million Btu/hr. digester gas-fueled boiler including all associated equipment, piping, and controls.

→ Project engineer for design of heating, cooling, and digester gas systems for the

Awards

Other Accomplishments

Open for Quote

Thomas G. Mossinger, P.E.

Wastewater Treatment Plant Improvements Project for the Dublin San Ramon Services District, California. Produced construction documents for the installation of a low-pressure digester gas blending and boosting system and for plant heating and cooling system modifications including all associated equipment, piping, and controls.

→ Project engineer for design of mechanical systems associated with secondary treatment facility design for the City of Santa Cruz, California. Produced construction documents for the installation of odor treatment facilities, compressed air, chemical storage and feed systems, power generator systems, and heating, ventilating, and air conditioning (HVAC) systems associated with process, miscellaneous buildings, and laboratory ventilation.

→ Project engineer for design of a replacement heating system, gas management system, and heating, ventilating, and air conditioning (HVAC) systems for the Hanna Ranch Solids Handling and Disposal Facility Expansion Project for Colorado Springs Utilities, Colorado. Produced construction documents for installation of four new steam boilers, hot water distribution system, spiral sludge-to-water heat exchangers, digester gas blowers, digester gas flares, digester gas drying systems, and all associated equipment, piping, and controls.

→ Design engineer for heating/cooling plant modifications for the Sacramento Regional County Sanitation District, California. Produced construction documents for installation of a new variable flow hot water distribution system and modifications to the existing chilled water system at the Sacramento Regional Wastewater Treatment Plant. Work included installation of one 450-ton absorption chiller, steam turbine-driven variable speed hot water circulation pump, condensate handling facilities, and all necessary interconnections with existing systems.

→ Project engineer for design of a replacement heating system and gas management system for Camp Creek Wastewater Treatment Plant for the County of Fulton, Georgia. Produced construction documents for installation of a hot water

boiler, hot water distribution system, spiral sludge-to-water heat exchangers, digester gas blowers, digester gas flares, digester gas mixing systems, and all associated equipment, piping, and controls.

→ Project engineer for the San Francisco State University, California, Utility Master Plan. Performed site evaluation of the campus building mechanical systems, central heating plant, steam system, and natural gas distribution system. Developed, provided cost estimates for, and evaluated economic payback associated with five alternative central plant designs.

→ Project engineer for the central plant replacement project at San Francisco State University, California. Designed replacement of the central plant and campus building modifications. Produced construction documents for installation of new hot water heating system, chilled water system, 1,250-kW cogeneration system, and all associated mechanical subsystems. Work also included converting existing steam heated campus buildings to hot water.

→ Project engineer for the cooling water system modifications at San Jose State University, California. Designed modifications to the campus condenser cooling water system. Produced construction documents for modifying the system to allow greater temperature control of the cooling water serving two 1,180-ton absorption chillers.

→ Project engineer for evaluation and design for the central plant replacement project for San Joaquin Delta Community College, Stockton, California. Completed site evaluation, "as-built" drawing revision of campus building mechanical systems, preliminary design of campus central heating and cooling systems, and final design of a replacement central heating and cooling project.

→ Design engineer for cogeneration facilities design for the Orange County Sanitation District, California. Work included design of cogeneration facilities producing 16 megawatts and 7.5 megawatts. Produced construction documents for the installation of internal combustion engine generators, exhaust heat recovery steam generators,

Awards

Other Accomplishments

Open for Quote

Thomas G. Mossinger, P.E.

hot water and steam heat recovery systems, 1-megawatt condensing steam turbine, two 200-ton absorption chillers, large-capacity high-pressure compressed air systems (250 psig, 150 psig, and 80 psig), and all associated equipment and controls.

→ Design engineer for preliminary design of cogeneration facilities for Orange County Sanitation District, California. Developed equipment sizing criteria and assisted in the prepurchase selection of the engine generators, heat recovery equipment, fuel supply system, and related auxiliaries.

→ Project engineer for design of the campus central plant expansion for San Jose State University, California. Produced construction documents for modifying the chilled water distribution system, including connection of four additional buildings to the central distribution loop, modifying the condenser water/cooling tower system, installing two new 800-ton centrifugal chillers, refurbishing a 1,280-ton steam turbine-driven centrifugal chiller, and installing associated chilled water pumps and controls.

→ Project engineer for design of the campus central plant for the University of California, Davis, Medical Center in Sacramento, California. Produced construction documents for all equipment associated with the 25-megawatt gas turbine cogeneration system with heat recovery and the centralized heating and cooling system; hot and chilled water distribution systems, including connection to most campus buildings; 10-megawatt standby power system; high-capacity, high-pressure compressed air systems (250 psig and 150 psig); and all appurtenant piping, equipment, and controls.

Publications/Presentations

→ Mossinger, T. "Registering Renewable Energy Generation for Tracking and Ultimate Sale of Renewable Energy Credits (RECs)." Paper presented at the Southern California Alliance of Publicly Owned Treatment Works Energy Management Committee Meeting, April 28, 2011.

→ Mossinger, T. "Future of Green Energy Technologies." *World Water*, Volume 33, Issue 3, May/June 2010.

→ Mossinger, T. "Pumping Water with Fuel Cells – Rancho California Water District's Fuel Cell Project at the ACE Bowen Pump Station." Paper presented at the California/Nevada American Water Works Association Spring Conference, Long Beach, California, March 28-31, 2011.

→ Mossinger, T. "Energy Management Case Study – The Greenest Use Of Digester Gas: Eastern Municipal Water District's Success with Fuel Cells." *Water Environment & Technology*, December 2010.

→ Mossinger, T. "The Future of Green Energy Technologies for Municipalities: Fuel Cells, Solar, Wind & Algae." Paper presented at the 2010 Pacific Northwest Clean Water Association Annual Conference, Bend, Oregon, October 24-27, 2010.

→ Parker, D., Mossinger, T., Crotwell, C., Lynch, K., Vinent, D., and McGougan, V. "Taking Green Steps Forward: Renewable Energy Projects for the City of Fayetteville, NC, Public Works Commission." Paper presented at the 83rd Annual Water Environment Federation Technical Exhibition and Conference, New Orleans, Louisiana, October 4-6, 2010

→ Mossinger, T. "Implementing Renewable Fuel Cells for Municipalities" Paper presented at the Renewable Hydrogen Workshop, Long Beach, California, May 3, 2010.

→ Mossinger, T., and Crotwell, C. "The Future of Green Energy Technologies for Municipalities: Fuel Cells, Solar, Wind & Algae." Paper presented at the North Carolina American Water Works Association/Water Environment Association 2010 Spring Conference, New Bern, North Carolina, April 18-20, 2010.

→ Mossinger, T. "The Future of Green Energy Technologies for Municipalities: Fuel Cells, Solar, Wind & Algae." Paper presented at the Water Environment Association Utah Midyear Conference, November 2009.

→ Mossinger, T., Nelson, L., and Ahmadpour, J. "Renewable Fueled Fuel Cell Success Stories." Paper presented at the 2009 Fuel Cell Seminar & Exposition, Orlando, Florida, November 17-19, 2009.

Awards

Other Accomplishments

Open for Quote

Thomas G. Mossinger, P.E.

- Mossinger, T. "Fuel Cells Boost Digester Gas Solutions for Distributed Generation." World Water, October 2009.
- Razavi, R., Mossinger, T., and Wason, S. "The Cleanest, Most Efficient and Cost Effective Cogeneration Technology and Renewable Green Energy Technologies for WWTPs." Paper presented at the American Public Works Association Northern California Chapter - Public Works Conference, September 2009.
- Mossinger, T. "The Future of Green Energy Technologies for Municipalities." Paper presented at the Texas Association of Clean Water Agencies Meeting, Corpus Christi, Texas, July 31, 2009.
- Mossinger, T., and Wason, S. "The Future of Green Energy Technologies for Municipalities." Paper presented to the Central Valley Clean Water Association, July 15, 2009.
- Mossinger, T. "Economic and Non-Economic Benefits of Implementing Cogeneration at the City of Yuma's Figueroa WPCF." Paper presented at the Arizona Water Association 82nd Annual Conference and Exposition, May 6-8, 2009.
- Mossinger, T. "Fuel Cells – Ultra Clean, Ultra Efficient, Renewable Energy Success Stories." Paper presented at the Arizona Water Association 82nd Annual Conference and Exposition, May 6-8, 2009.
- Mossinger, T., and Wason, S. "The Future of Green Energy Technologies for Municipalities: Fuel Cells, Solar, Wind & Algae." Paper presented at the 81st Annual California Water Environment Association Conference, Palm Springs, California, April 28-May 1, 2009.
- Mossinger, T., Wason, S., Nelson, L., and Ahmadpour, J. "Fuel Cell Success Stories: Operating Success at the City of Tulare, Eastern Municipal Water District, and City of Turlock/TID." Paper presented at the 81st Annual California Water Environment Association Conference, Palm Springs, California, April 28-May 1, 2009.
- Mossinger, T., Hart, V., and Crotwell, C. "Cogeneration with Less Noise, Low Emissions, Smaller Carbon Footprint and Higher Energy Efficiency – Fuel Cells." Paper presented at the Paper presented at the North Carolina American Water Works Association/Water Environment Association 2009 Spring Conference, Sunset Beach, North Carolina, April 26-28, 2009.
- Mossinger, T., "Fuel Cells Offer the Ultimate Green Energy Source for Wastewater Treatment." Arizona Water Association, The Kachina News, Volume 26, No. 1, January 2009.
- Mossinger, T., Lanning, D., and Ahmadpour, J. "Fuel Cells - The Ultimate Green Energy Source." Paper presented at the California Water Environment Association Annual Conference, Sacramento, California, April 13-16, 2008.
- Gomes, L., and Mossinger, T. "Saving Nemo: Utilizing a Cooling Tower to Prevent Effluent Thermal Pollution." Paper presented at the California Water Environment Association Annual Conference, Sacramento, California, April 13-16, 2008.
- Mossinger, T. "Digester Gas Utilization and Cogeneration." Paper presented at the Nevada Water Environment Association 2006 Annual Conference, Reno, Nevada, March 22-24, 2006.
- Mossinger, T. "King County South Treatment Plant Cogeneration Facility." Paper presented at the Pacific Northwest Clean Water Association 2005 Annual Conference in Tacoma, Washington, September 25-28, 2005.
- O'Brien, A., Suto, P.J., Marks, K.J., and Mossinger, T.G. "A Cool Idea for Wastewater Effluent." Paper presented at the California Water Environment Association 2003 Annual Conference, Ontario, California, April 22-25, 2003.