

Statement Of Engineering Qualifications:
**COMPARATIVE ANALYSIS OF
GREY WATER RECYCLING SYSTEMS**

Wednesday, January 15th, 2020

Point of Contact:

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Image: eugene Cascades coast.org

TRANSMITTAL LETTER

Dennis Todd, Ph.D.
Land Use Management Planning Committee
Oregon Country Fair
442 Lawrence Street
Eugene, Oregon 97401
(541) 554-0359

**TRANSMITTAL: STATEMENT OF ENGINEERING QUALIFICATIONS - COMPARATIVE ANALYSIS
OF GREY WATER RECYCLING SYSTEMS**

Dear Dennis:

Sherwood Design Engineers, Inc. (Sherwood) is pleased to provide our Statement of Qualifications to the Oregon Country Fair to conduct a comparative analysis of greywater recycling systems for the fair. Sherwood understands the long history, cultural and environmental ethos of the fair and is excited to have this opportunity to assist the fair to advance environmental stewardship at the fairgrounds.

Sherwood is a leader in sustainable, green infrastructure, including innovative water management and reuse . Our team of civil, environmental and ecological engineers focuses on providing appropriate solutions to address complex environmental problems in sensitive or impacted environmental settings. In addition to deep expertise and commitment to water reuse applications, Sherwood has unique cultural suitability to the project. Members of our team have managed multiple large construction projects including greywater and composting toilets at Burning Man. We have planned, designed and installed greywater and blackwater systems in very sensitive environmental settings, such as at the Tassajara Zen Mountain Center in the Ventana Wilderness and Esalen Institute on the rugged Big Sur Coastline. Over the past several years Sherwood has also been assisting Breitenbush Hot Springs construct new staff housing and the related water and wastewater infrastructure on their beautiful and sensitive landscape.

Sherwood has assembled a multi-disciplinary team including our in-house water engineers and Laura Allen, a local Oregon greywater specialist, to complete this project. Laura and Sherwood have been working collectively on greywater projects and policy for many years. We are excited to present a highly qualified team that is authentically passionate about providing our collective wisdom and experience at this early stage of planning for an appropriate and ecologically based, long-term greywater management strategy for the Oregon Country Fair.

Sherwood has a design office based in Santa Cruz, California, which includes our Water Treatment & Reuse team; as such this office will primarily service this project. Collectively our staff have planned, designed and installed dozens of greywater systems, at a variety of scales, including securing difficult first time permits in several local, and state jurisdiction. Sherwood has worked directly with the Oregon Department of Environmental Quality to secure wastewater permits and is familiar with the Oregon code, and we believe the proposed project goals are consistent with the State's water reuse policies and regulations.

I will be the Principal-In-Charge and I am a registered engineer in Oregon and California. I have over 35 years of experience working on complex water treatment and reuse systems, including greywater, blackwater, industrial and

rainwater harvesting to meet various water demands. I have had the unique opportunity to work both in the US and internationally on a wide variety of wastewater projects. Through this experience I have a keen understanding that the success of any water management strategy must consider not only the selection of the appropriate technology, but also a clear understanding of the capacity and resources available to operate and maintain the system.

We find this project and client to be closely aligned from a values standpoint, and are excited about this unique and compelling opportunity to provide a sustainable water management engineering solution.

Sherwood is proud of our reputation as a leader in sustainable engineering, delivering a combination of technical competence and innovative engineering. Our collaborative approach to engineering is proven to anticipate and solve challenges resulting in plans that save time and money, are approved and get built.

Please review the attached qualifications. We look forward to discussing how the Sherwood Team can support Oregon Country Fair in this important endeavor.

Sincerely,



Peter Haase, M.S., P.E.
Principal

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Image: oregoncountyfairbood.com

1 PROJECT TEAM INFORMATION

Sherwood Design Engineers has over 25 years of environmental engineering experience specializing in water and wastewater treatment and reuse. Our design-integrated approach creates high-performance projects that are resilient, economical, approvable and buildable.

Sherwood has a multi-disciplinary team of talented engineers and experts in the field of greywater management and reuse. Internally our key senior staff have broad experience with greywater treatment and regulatory permitting and compliance. We are also very excited to include Laura Allen to our team. Laura is a locally-based greywater expert that brings many years of advocacy and technical know how to the project.

Sherwood relevant experience for the project will include:

- Data compilation, analysis and project planning;
- Site assessment (soil and groundwater investigations);
- Cost estimation; and
- Feasibility studies.

Sherwood is a full-service engineering firm that provides comprehensive design services to prepare complete construction documentation, permitting assistance, and construction bid and supervisory services.

Sherwood will be Prime Consultant, Project Manager and the Engineer of Record of the project. Sherwood will prepare the greywater recycling feasibility study.



Image: Tara Mandala

Sherwood's Key Staff will include:

Peter Haase, M.S., P.E. Principle-In-Charge - Peter will be responsible for the overall administrative and technical aspects of the project. Peter will provide technical assistance to the engineering team responsible for preparing the comparative analysis study and he will be responsible to review and approve the scope of work, the contract and invoices for the work. Peter will also be available to the Client to discuss the status and any potential issues that may arise during the course of the project.

Carina Chen, M.S., P.E., Project Manager - Carina will be the Project Manager and will be responsible to coordinate and direct the technical aspects of the project and the deliverables. Carina will also be the point of contact for the Client on all technical and schedule related matters. Carina will support our small team of engineers and greywater professionals to complete the comparative analysis of greywater recycling systems. Carina has over 20 years of professional experience and has worked for Sherwood for over 13 years specializing in her work on alternative water supply including fresh, greywater, stormwater and black water treatment and reuse. Carina will work with the Peter to develop the scope of work, fees, and project schedule. Once these have been approved by the Client she will coordinate her engineering team to complete the scope of work within the agreed to budget and schedule. Carina will develop and manage a communication plan to maintain regular communication with the client via emails, telephone calls and periodic meetings, as required.

Courtney King, M.S., P.E., Design Engineer III - Courtney is a staff environmental engineer at Sherwood and she will be responsible to prepare the comparative analysis report. Courtney will work closely with OCF staff to research and compile critical site information to identify and screen potential locations for the greywater treatment system(s), including the treated water storage and pumping equipment. Courtney will solicit any information for all of the site zones, that may be potential constraints related to environmental, cultural, geologic or hydrologic conditions. Courtney will also compile and screen alternative greywater treatment as part of the comparative analysis based on economic, technical and operational factors.

Kelly Archer, EIT, Design Engineer II - Kelly is a staff environmental engineer at Sherwood and she will support Courtney and Carina to prepare the comparative analysis

report. Kelly will assist Courtney to research and compile information critical for the successful completion of the study. Kelly will also assist Courtney to prepare any site maps or conceptual plans for the study report.

Laura Allen, B.S., M.ED., - Laura is a founding member of Greywater Action and has spent the past 15 years exploring low-tech, urban, sustainable water solutions. She is the lead author of the San Francisco Greywater Design Guidelines for Outdoor Irrigation, and authored *The Water-Wise Home: How to Conserve and Reuse Water in Your Home and Landscape* (Storey Press, 2015) and *Greywater, Green Landscape* (2017). She's participated in state greywater code developments in California and Washington State and is on the technical advisory committee for IAPMO's Water Efficiency Standard (We-Stand). Laura was featured in an Ask This Old House episode on greywater and was the 2014 recipient of the Silicon Valley Water Conservation Award of Water Champion. She has a BA in environmental science, a teaching credential, and a master's degree in education. Laura is based in Eugene, Oregon and will be a critical local team member to conduct site visits, as required, to understand site issues or concerns that may arise during the completion of the comparative analysis. Laura will also provide input on the selection and analysis of alternative greywater treatment schemes and provide technical review of the study report.

SHERWOOD INTERNAL PEER REVIEW STAFF

Sherwood may also include two of our senior level staff to provide a peer review of the draft and final comparative analysis study reports. **Josiah Cain** is a Principal and Director of Innovation and has been instrumental in the advancement of alternative water supplies over his 20 plus year career. Josiah has designed numerous greywater systems throughout the West Coast and Internationally and he will provide thoughtful and constructive input into the analysis. **Amelia Luna** is a Senior Project Engineer and runs our urban and district water reuse team at Sherwood. Amelia has been involved in numerous greywater projects for many years both before and during her tenure at Sherwood. Amelia's review and input to the study will also be valuable addition to the effort.

2 RELEVANT PROJECT EXPERIENCE

Sherwood Design Engineers has completed a wide range of greywater and blackwater recycling projects in the United States and Internationally. The following projects represent the breadth of alternative water recycling systems we have completed for a wide array of clients.

GORILLA KARISOKE RESEARCH CENTER

The Dian Fossey Gorilla Fund is the world's longest-running and largest organization dedicated solely to gorilla conservation, and on February 12, 2019, they broke ground on a new permanent home for all of our activities in Rwanda. work has begun on a transformative

new space for their 130 staff in Rwanda, to support their ongoing gorilla protection and research programs, and outreach to more than 14,000 Rwandans each year through education training, and other community programs. Full construction on the Ellen DeGeneres Campus of the Dian Fossey Gorilla Fund, named in honor of a lead gift by American celebrities and conservationists Ellen DeGeneres and her wife Portia de Rossi, is planned to start this summer, with completion expected in 2021. Sherwood Design Engineers collaborated with the MASS Design Group in assisting with the design of an ecologically-based multi-stage constructed wetland treatment system to treat all of the wastewater at the new 30-acre research campus.



Image: MASS Design Group

Location: Rwanda, Africa

Design Partners: MASS Design Group

Client: Dian Fossey Gorilla Fund

Size: 30 Acres

TARA MANDALA RETREAT CENTER



Image: Tara Mandala

Tara Mandala is a female led and feminine focused tibetan buddhist retreat center located on a large and remote rural property in Southwestern CO. They expressed concerns over odor associated with an existing sewage treatment lagoon intended for tertiary polishing, infiltration, and evaporation. Because silent, walking meditation on the grounds is a common activity, the consulting engineer dismissed the issue as “heightened sensitivity.” Our staff suggested a pre-treatment subsurface wetland to intercept flows and provide additional treatment prior to the exposed lagoon. This simple, gravity fed solution proved effective and remains in use several years later with no known issues.

Location: Pagosa Springs, Colorado
Client: Tara Mandala

Design Partners: Native Systems
Size: 700 Acres

BERKELEY ECOHOUSE

EcoHouse is a demonstration home and garden located in a North Berkeley residential neighborhood. Classes, workshops, and tours of the house and garden are designed to teach people from all walks of life how to



make their living spaces healthier, more productive, energy and water efficient, and ecologically friendly. EcoHouse demonstrates ecological ways of living that are accessible and affordable to people of all ages, ethnic/ racial backgrounds, and income levels. Our staff designed a custom subsurface wetland treatment system, with a gravity flow “branched drain” irrigation system to supply the landscape. The system was the first residential greywater permit in Berkeley and has been used as a demonstration and educational site for over a decade.

Location: Pagosa Springs, Colorado
Client: Tara Mandala

Design Partners: Native Systems
Size: 700 Acres

SLIDE RANCH EDUCATION CENTER



Slide Ranch is located on the Marin coast, on land that has a rich history in connecting people to food. In 1969, 134 acres of this fertile coastline were rescued from commercial development and purchased by the Nature Conservancy. The Slide Ranch nonprofit organization was established in 1970, becoming one of the first Park Partners in the Golden Gate National Recreation Area. In fact, Jerry Garcia of the Grateful Dead was one of the first donors, and the band were supporters for many years. The first permitted greywater system in Marin County, a simple gravity flow system was designed and installed to redirect household water from showers and sinks to fruit trees, protecting sensitive coastal bluffs from concentrations of mixed wastewater. This system is still in operation after over 15 years, and served as the basis for a recent masterplan which proposes a similar greywater approach from proposed new buildings to a proposed orchard expansion.

Location: Marin County, California
Client: Slide Ranch

Design Partners: Native Systems
Size: 134 Acres

JEAN-MICHEL COUSTEAU FIJI ISLANDS RESORT



The award-winning, five-star Jean-Michel Cousteau Fiji Islands Resort is one of the most renowned vacation destinations in the South Pacific. The resort is situated in a sensitive environmental setting adjacent to pristine coral reefs. To protect the reefs, Sherwood designed and supervised the construction of an advanced wastewater treatment and reuse system for the resort. The treatment system utilizes a two-stage trickling filters and two-stage constructed wetland pond system to achieve tertiary level treatment of the wastewater, reducing BOD, nitrogen and suspended solids to less than 10 mg/L. Treated wastewater is used for landscape irrigation on the property.

Location: Savu Savu, Lanua Levu, Fiji **Size:** 17 Acres
Client: Passport Resorts **Project Type:** Wastewater and Water Reclamation

TASSAJARA ZEN MOUNTAIN CENTER



Over the past 15 years Sherwood has assisted the Zen Center in completing a variety of water projects for the property. Sherwood designed and supervised the

construction of a multi-barrier surface water treatment plant to treat all of the domestic water. The treatment system includes a sand media pre-filter, a slow-sand biological treatment system and a water powered chlorination system. Sherwood recently designed the "Dharma Rain" fire water distribution and sprinkler system and is assisting the Zen Center install a new supplemental irrigation supply system.

Location: Savu Savu, Lanua Levu, Fiji **Size:** 17 Acres
Client: Passport Resorts **Project Type:** WW & Water Reclamation

NATIONAL AUTONOMOUS UNIVERSITY BENITO JUÁREZ



Sherwood designed and supervised the construction of an advanced wastewater treatment system for the main public university campus in the City of Oaxaca, in the Central Valley of Oaxaca in Southern Mexico. The project was constructed as a demonstration project using a three stage wastewater treatment system employing an upflow anaerobic sludge blanket digester (UASB), and an integrated pond and constructed wetland treatment system. Treated effluent is used to irrigate ornamental landscaping and turf on the campus. The facility is managed by the School of Science and used as a living laboratory for several environmental studies related courses offered at the university and as a training facility for local communities.

Location: Oaxaca, Mexico **Project Type:** Wastewater and Water Reclamation
Client: Benito Juárez Autonomous University of Oaxaca

BEAR CREEK WINERY



Sherwood designed an advanced wastewater treatment system to treat process water for the bulk winery located in Lodi, California. The winery produces high strength process water (BOD in excess of 5,000 mg/L) with flows ranging from 40,000 gallons per day (gpd) during normal operational periods and up to 200,000 gallons during peak flows occurring during the crush. The advanced wastewater treatment system includes a multi-stage treatment system that includes an innovative pond design that includes both anaerobic zones and aeration zones followed by a two-stage trickling filter system and a final shallow aeration basin. Treated process water is reused for drip irrigation of vines and dust control at the neighboring vineyards.

Location: Lodi, California

Client: Bear Creek Winery

BREITENBUSH HOT SPRINGS



Sherwood completed a site investigation with the Oregon Department of Environmental Quality (ODEQ) and designed an onsite wastewater system for new employee housing at the property. The wastewater system includes a septic system that includes two new 3,000

gallon septic tanks and gravity flow leachfields designed to meet the strict requirements of the ODEQ. Sherwood assisted Breitenbush with the permitting and completion of the project.

Location: Detroit, Oregon

Client: Breitenbush Hot Springs and Conference Center

REDEMPTION DISTRICT HOSPITAL



Sherwood designed an onsite wastewater treatment and reuse system for the district hospital campus. The system is designed to treat up to 30,000 gallons per day and includes a multi-stage treatment system that includes an anaerobic baffled reactor, a two-stage trickling filter and a two stage fre wet constructed wetland. Treated wastewater will be reused to irrigate an orchard, landscape plant nursery and landscaped areas around the hospitals.

Location: Monrovia, Liberia

Client: Ministry of Health (through MASS Design Group)

3 PRELIMINARY SCOPE OF WORK

Sherwood Design Engineers has completed a wide range of greywater and blackwater recycling projects in the United States and Internationally. The following projects represent the breadth of alternative water recycling systems we have completed for a wide array of clients.

Phase 1 - Review of Existing Information and Site Visit

As the initial task, Sherwood will compile and review existing site information relevant to the siting of the greywater treatment and storage system. During this initial phase, Sherwood staff will also complete a site visit to better understand the site and various zones as map in the OFC Land Use Management Planning Zone Map. Sherwood anticipates that we will use this map or a similar map to identify and potential screen facility locations. Sherwood will also review any existing environmental documents and technical studies that may be relevant to the study.

Phase 2 - Greywater Generation Calculations

Sherwood will review existing water demand and pumping records to estimate the greywater generation rates on a monthly basis and during the fair days. Our analysis will be conducted to verify estimates already completed by OCF and to support the sizing of the greywater system(s) for the property.

Phase 3 - Draft Comparative Analysis of Greywater Recycling Systems

Sherwood will conduct the comparative analysis of alternative greywater treatment systems. As requested, Sherwood will analyze five to six alternative treatment systems. The comparative analysis will screen each treatment system based on economic (capital and long-term operation and maintenance costs), technical (reliability, complexity, performance, area requirements), operational requirements (complexity and operator skill level, maintenance requirements, energy and carbon (footprint) demand) and regulatory requirements. Based on the comparative analysis, Sherwood will recommend the preferred solution and prepare a more detailed description of the system, a cost estimate for the engineering, permitting and overall installation of the treatment and storage system, and a schematic plan of the system. Sherwood will provide a draft report to OCF for your review and comments.

Phase 4 - Final Comparative Analysis of Greywater Recycling Systems

Sherwood will prepare a final Comparative Analysis Report that will address any comments or additional information provided by OCF.

4 REFERENCES

1. San Mateo County Parks (Surface Water Treatment System Design, Memorial Park; On-Call Engineering Services)
455 County Center
Redwood City, CA 94063
Samuel Herzberg
T: (650) 363-4020
E: sherzberg@smcgov.org
2. Bay Area Builders (Surface Water Treatment System Design - Lockheed Martin Facility)
3360 De La Cruz Boulevard
Santa Clara, CA 95054
Lloyd Bennett
T: (408) 396-5091
E: lbennett@ba-builders.com
3. Post Ranch Inn (Various Water and Wastewater Engineering Services)
State Highway One
Big Sur, CA 93920
Mike Higgins
T: (415) 971-8429
E: mhiggins@postranchinn.com
4. Sares Regis Group of Northern California (Google Bayview Recycled Water)
901 Mariners Island Boulevard
San Mateo, CA 94404
Yayu Lin, Senior Vice President
T: (650) 378-2800
E: YLin@srgnc.com
5. Bishop O'Dowd High School (Bishop O'Dowd Center for Environmental Studies)
9500 Stearns Avenue
Oakland, CA 94605
Annie Prutzman, Environmental Science Teacher,
Director of the Living Lab
(510) 703-4156
APRUTMAN@bishopodowd.org

5 APPENDIX (RESUMES)



Image: Dennis Wiancko



PETER HAASE M.S., P.E.
PRINCIPAL | SHERWOOD DESIGN ENGINEERS

Peter Haase is the Managing Principal of Sherwood's Santa Cruz office. He specializes in water related sciences and engineering projects throughout California and Internationally.

Peter is a Registered Professional Civil Engineer in the State of California with over 35 years of professional experience in the field of civil, environmental, and water resources engineering and international development in the water, sanitation and hygiene (WASH) sector. Peter has completed a broad range of engineering design and planning studies throughout California, China, Mexico, Hawaii, Fiji, Honduras, Costa Rica, Granadines (West Indies), Liberia, Rwanda, and Haiti.

Peter specializes in small community water and wastewater system design, surface water hydrology, water resource planning and management, surface and ground water pollution control, and water quality/quantity monitoring system design. Peter has successfully designed and supervised the implementation of projects domestically and internationally.

Peter is a recognized leader in the field of decentralized water, wastewater and stormwater management and low impact development. Peter is also an expert in ecological engineering and constructed wetland treatment systems.

Peter conducts short courses and presents at international conferences on ecological engineering and small community water and wastewater management strategies and solutions. Peter participates on several technical advisory committees pertaining to decentralized water and wastewater treatment and reuse in California. Peter is the principal author of a technical note for the World Bank - Guide for Wastewater Management for Rural Villages in China and has been a lead technical consultant for the World Bank's New Socialist Countryside Project in Ningbo, China. Over the past few years Peter has consulted with the MASS Design Group and Partners in Health to develop appropriate water and wastewater treatment solutions for health care facilities in Liberia, Rwanda and Haiti.

YEARS OF EXPERIENCE

35 years

EDUCATION

Humboldt State University
Master of Science, Environmental
Systems, Emphasis in International
Development and Technology, in Civil
Engineering, 2009

Humboldt State University
Bachelor of Science, Environmental
Resource Engineering, Emphasis in
Water Quality and Ecological Engineering,
1985

**PROFESSIONAL
REGISTRATION**

Registered Professional Engineer
State of California (No. C055605)

**PROFESSIONAL
AFFILIATION**

American Water Works
American Society of Civil Engineers
International Water Association
Water Environment Federation
California Environmental Health
Association



CARINA J. CHEN M.S., P.E., LEED AP
PROJECT MANAGER | SHERWOOD DESIGN ENGINEERS

Carina Chen is a Project Manager at Sherwood Design Engineers, a Registered Professional Engineer in the State of California and also a LEED Accredited Professional. Carina has over 13 years of experience working in the areas of civil and environmental engineering with a focus in water and wastewater treatment and engineering. Her career has included a broad range of civil and environmental projects, related to water and wastewater treatment, erosion and sediment control, fire protection, storm water management, groundwater analysis and hazardous waste remediation. At Sherwood, Carina has focused on projects involving alternative water and wastewater treatment systems including surface water treatment, constructed wetlands, wastewater disposal and reclamation. Carina has also performed hydraulic modeling, data collection, construction oversight, and water quality sampling and monitoring.

Carina holds a B.S. in Civil Engineering from the University of California Los Angeles and a M.S. in Environmental Engineering from University of California Berkeley.

YEARS OF EXPERIENCE

20 years

EDUCATION

University of California, Berkeley
Master of Science in Civil Engineering
(Emphasis: Environmental Engineering)

University of California, Los Angeles
Bachelor of Science in Civil Engineering
(Emphasis: Water Resources and
Environmental Engineering)

**PROFESSIONAL
REGISTRATION**

Registered Professional Engineer
State of California (No. C125041)

LEED Accredited Professional, US Green
Building Council



COURTNEY KING M.S., P.E.

DESIGN ENGINEER | SHERWOOD DESIGN ENGINEERS

Courtney's work experience has been focused on the planning and design of water infrastructure. These projects including water and wastewater treatment, distribution & collection, recycled water, urban & green infrastructure, water resources, and technical training programs. Prior to working at Sherwood, Courtney was working at the East Bay Municipal Utility District (EBMUD) as an associate engineer in the inflow/infiltration control program (which included investigating increased levels of stormwater in the wastewater collection system) and in the water service planning department (which included hydraulic modeling of the water distribution system and water storage facility improvement planning). She has also worked as a professional civil engineer at MWH and Arup, and as a business manager for the artist Zach Coffin.

YEARS OF EXPERIENCE

8 years

EDUCATION

University of California, Berkeley
Master of Science in Civil and
Environmental Engineering

University of California, Berkeley
Bachelor of Science in Civil &
Environmental Engineering

PROFESSIONAL REGISTRATION

Registered Professional Engineer
State of California (No. 82037)



KELLY ARCHER E.I.T.

DESIGN ENGINEER | SHERWOOD DESIGN ENGINEERS

Kelly's work at Sherwood focuses on civil, environmental, and water resources engineering and design. Her projects include hydraulic and hydrologic analysis, stormwater management, water and wastewater treatment design and permitting, and low-impact development design. She has many tools in her toolbox, including AutoCAD Civil3D, WaterCAD, ArcGIS, GRASS GIS, HEC-RAS, and other helpful pieces of software. Kelly joined Sherwood in October 2018.

YEARS OF EXPERIENCE

2 years

EDUCATION

University of California, Berkeley
Bachelor of Science in Environmental
Engineering Science

PROFESSIONAL REGISTRATION

California Engineer-in-Training
State of California (No. 84869)

Kelly has experience working in academic, public and private sectors as an environmental engineer. She spent two years supporting various research teams at Lawrence Berkeley National Lab in lab, field, and shop settings. During 2017-2018, she worked as an engineer for the San Francisco Bay Regional Water Quality Control Board, where she provided regulatory oversight to groundwater remediation cases.

Outside of formal engineering roles, she has also spent her working hours at various places such as the UC Berkeley Law School, Solano Land Trust, bay area farms, KALX radio station, and at UC Berkeley's Student Organic Garden. She has publications on the subjects of California groundwater law as well as efforts to end student hunger and homelessness at UC Berkeley.



LAURA ALLEN B.S., M.ED.
SUBCONSULTANT

PROFESSIONAL EXPERIENCE

Co-founder and Director; Greywater Action — 1999 - Present

Designs and implements sustainable water management programs, including classes, workshops, trainings, and presentations to the public about greywater reuse and rainwater harvesting.

Board President, California On-site Water Association — 2019- present

Assists with development of alternate water education programs through COWA.

Independent Consultant — 2009- present

Greywater education and incentive program developer: Works with cities and water agencies to offer greywater education including Cal American Water, SFPUC, the City of Santa Rosa, Willits, West Basin, Pasadena Water and Power, and Palo Alto.

Code developer: Worked on alternate water codes with Washington State and California. Worked with Oregon's Department of Environmental Quality, City of Oakland and San Francisco to streamline permitting process for greywater systems. Technical advisory member of IAPMO's Water Efficiency Standard.

Policy consultant: Consults on greywater regulations for state legislation.

Curriculum developer for certification and technical programs:

Developed and implemented green jobs training curriculum for Laney College and Cabrillo College.

Teacher, Lane Community College — 2019 - Present

Developing classes and teaching with Lane Community College's 2 year technical program titled Water Conservation Technician.

Technical Writer and Author

Authored the how-to books Greywater, Green Landscape (2017) and The Water Wise Home: How to Conserve, Capture, and Reuse Water in Your Home and Landscape (2015) Storey Press, lead author of study "Residential Greywater Irrigation Systems in California: An Evaluation of Soil and Water Quality, User Satisfaction, and Installation Costs" (2012), lead author of *San Francisco's Greywater Design Guidelines for Outdoor Irrigation*.

YEARS OF EXPERIENCE

21 years

EDUCATION

New College of California
Teaching Credential and Masters in
Education, 2001 and 2007

University of California, Berkeley
Bachelor of Science, Environmental
Science, 1998

**INVITED PRESENTATIONS
AND AWARDS**

Including: California Directors of
Environmental Health, California
Landscape Contractors Association,
Bioneers, Stanford University, many city
governments and building departments,
many green festivals, Google Tech Talk

Recipient of the 2014 Silicon Valley Water
Conservation Award of Water Champion



JOSIAH CAIN

PEER REVIEWER | SHERWOOD DESIGN ENGINEERS

Josiah Cain serves as Sherwood Design Engineers' Director of Innovation. A student of design, ecology, and technology, his deep sustainable design experience and multi-disciplinary approach provide insight and opportunities for optimization of site and structure. His informed drive for ecology, enhanced systems performance, and integrated design has led to first of a kind permits in over a dozen jurisdictions; his work has advanced the public dialogue and application of rain harvesting, graywater, blackwater reuse, living roofs and walls, native plants, sustainable stormwater management, food systems, and sustainable materials.

In addition to managing Sherwood's Innovation Program, Josiah provides strategic leadership on influential projects with a focus on campus and large-scale urban systems. His project credits include on-site water reuse systems for high-density corporate and university campuses, urban farm applications, and urban ecological approaches for museum, mixed use, transit, and commercial clients.

YEARS OF EXPERIENCE

20 years

EDUCATION

Harvard University
Master of Design Studies (MDesS)
Design, Technology, & Environment

University of California, Davis
Bachelor of Science, Sustainable
Community Planning, Landscape
Architecture (BSLA)



AMELIA LUNA M.S., P.E., LEED SP, ENV SP

PEER REVIEWER | SHERWOOD DESIGN ENGINEERS

Amelia Luna is a Professional Engineer, Envision SP and LEED AP, with more than eight years of civil and environmental engineering experience. She spearheads Sherwood's water reuse projects including wastewater treatment, net-zero and net-positive water systems as well as water quality improvements on urban planning developments and corporate campuses. Her expertise in the process engineering, detailed design, and permitting of onsite nonpotable water systems bolsters Sherwood's integrated water management projects including those which fall under San Francisco's Non-Potable Ordinance.

Amelia earned her Master's of Science in Civil & Environmental Engineering from UC Davis, where she spent two years post-graduation conducting research and developing design criteria for Caltrans onsite water reuse pilot projects. Prior to joining Sherwood, Amelia was part of the HDR Inc. wastewater process engineering group, where she worked with water and wastewater utilities, including the City of Las Vegas, the City of San Mateo, the Santa Clara Valley Water District's Expedited Potable Reuse Program, and the Bay Area Clean Water Agency's Nutrient Study. She has also contributed to numerous green roof projects in Northern California, including the Microsoft Silicon Valley Campus, California Pacific Medical Center's Van Ness and Geary Campus and the Transbay Transit Center in San Francisco.

YEARS OF EXPERIENCE

10 years

EDUCATION

University of California, Davis
Master of Science, Civil and
Environmental Engineering

PROFESSIONAL REGISTRATION

Registered Professional Engineer
State of California (No. 84869)

LEED Accredited Professional, US
Green Building Council
Envision Sustainable Professional,
Institute for Sustainable Infrastructure

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ATLANTA

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Atlanta, GA 30318
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