Instructor Background And Information Form

Thank you for filling out this form.

Presentation Title: Operator Math Workshop Level III and IV

Presenter: Quinn Behnke, P.E. Title: Principal Engineer

Employer: Brown and Caldwell Address: 4380 S Macadam Ave Suite 250 Portland, OR 97239

City: Portland State: OR Zip: 97239 Phone: 503-977-6614

Summary of Lesson content: Review of applied math theories including unit conversions, dimensional analysis, metric units conversions, and pie-chart math. Review of practice problems to support content understanding in preparation for certifications test.

Professional Background: (Note a brief - 2 page maximum - resume may be submitted in lieu of the following data. Please be sure the resume includes all requested information. Qualifications should be related to your presentation.) Use the reverse side of this form if more room is needed to fully answer the following questions.

Primary Knowledge/Skills/Abilities related to presentation: _____

Education (High School, Upgrades, Colleges and Degrees): _____

Professional Registration/Certification: _____

Related papers/instruction you have presented:

Title: Operator Math Workshop Level III an Date: 3/27/2024 Event: PNCWA UBOS WW Certification Test Prep

Title _____ Date: _____ Event: _____

Professional Organizations/Activities:

_____ Date: _____

_____ Date: _____

Course sponsor: PNCWA UBOS

Signature of Instructor: QBehnke@brwncald.com Digitally signed by QBehnke@brwncald.com Date: 2026.04.06 10:08:21-07'00' Date: 4/6/2026

DO NOT WRITE BELOW THIS LINE

Date Evaluated: _____ By: _____ Approved: Yes_____ No _____

Return Completed Form To:

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P.O. Box 577
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Email: info@oesac.org
Phone: 503-698-6486

Quinn Behnke, P.E.

Instructor

Quinn specializes in mechanical systems and equipment replacement for wastewater projects across the country.

Quinn brings experience performing evaluations, detailed design, field evaluation, and consultant services during construction for mechanical systems and equipment replacement projects. Quinn's technical focus is energy and fluid systems, including mechanical system sizing and layouts, digester gas systems, pipe support design, and interdisciplinary coordination for wastewater treatment systems.

Eugene Digester Heat and Gas Opt., Eugene, City of (OR), Eugene, OR

Mechanical Engineer. The City of Eugene contracted Brown and Caldwell (BC) to evaluate the MWMC WPCF's existing digester heating system, which was currently experiencing operational challenges. The facility operates a engine-generator, hot water boiler, renewable natural gas upgrading system, and two waste gas burners. BC evaluated the existing system and recommended operational improvements to address key challenges. The challenges investigated included: EG is unable to provide enough heat for the plant during the peak heat demand, which occurs during the coldest days of the year; while the boiler is running in tandem with the EG, the EG will occasionally waste heat to its radiator; the system will occasionally flare biogas while the boiler is operating on natural gas; biogas pressure drops at the EG when the boiler is started on biogas, resulting in shutdown of the EG; condensation issues inside the boiler; occasional insufficient building heat; boiler and EG three-way control valves not having sufficient control (i.e. due to improperly tuned PID control parameters or valve malfunction, resulting in too little or too much heat transfer). (2023-2025)

Quinn led the evaluation and documentation of current operational issues and potential solutions. He and another BC employee gathered field data, interviewed plant staff, and evaluated improvement options. Quinn oversaw documentation of the evaluation in a TM, including preparation of lifecycle cost estimates and preliminary system sizing for engine-generator replacement alternatives.

Alliance General Sewer Plan, Discovery Clean Water Alliance, Vancouver, Washington

Technical Lead. The Alliance is preparing a general sewer plan to identify capital improvement needs for the collection system and Salmon Creek Wastewater Treatment Plant. BC, as a subconsultant to Jacobs, is providing biosolids master planning services for SCTP. The planning will end with completion of a general sewer plan report and an engineering report for the Phase 6 plant expansion. (2025-Ongoing)

Quinn is the technical lead for the biosolids planning effort. He is overseeing the technical modeling of biosolids and biogas alternatives, capital cost development, and decision making process to identify the preferred alternative. He is closely coordinating with solids and energy practice specialists and presenting updates to the client at regular workshops.

EDUCATION
BS, Mechanical Engineering, University of Southern California, 2012

REGISTRATION
Engineer (Mechanical), No. 19110752, Washington (USA); Engineer (Mechanical), No. 94228PE, Oregon (USA)

YEARS OF EXPERIENCE
12

JOINED FIRM
2018

CERTIFICATION/TRAINING
LEED Green Associate; CSI Construction Document Technologist

SUBJECT MATTER SPECIALTIES
Process Mechanical (Piping/Valves/Equipment Design; Solids/Energy Design), Solids and Energy (General Solids and Energy; Energy; General Solids and Energy), Wastewater Treatment (General Wastewater Treatment; Preliminary/Primary Treatment; General Wastewater Treatment)

RELEVANT EXPERIENCE
- Boilers
- Digester Gas Systems
- Process Heating
- Fluid Mechanics
- Pipe Stress Analysis
- Pipe Support Design
- Steam Systems
- Mechanical Equipment Sizing and Selection

Gurnee Basis of Design, North Shore Water Reclamation District, Gurnee, Illinois

Biogas and Heating Lead. NSWRD will be installing a new thermophilic digestion system at the Gurnee WWTP. BC is providing preliminary design services and delivering the basis of design for the project. (2025-Ongoing)

Quinn is the biogas and heating task lead. He is overseeing two engineers preparing calculations and evaluations for various biogas and heating elements, including boilers, heat pumps, biogas conditioning, and overall hydronic and biogas system sizing. A BODR will be prepared along with preliminary P&IDs at the end of the project.

Unified Sewer Plan, Pierce County, University Place, WA

Process Mechanical Engineer. As part of the Unified Sewer Plan, BC conducted biosolids master planning for the Chambers Creek Wastewater Treatment Plant to identify a preferred path forward for continued resource recovery. During the master planning effort, BC identified representative biosolids and biogas alternatives for evaluation, conducted an alternatives analysis using multi-criterion decision analysis (MCDA) and led workshops to determine a recommended solution. The evaluation process and results were documented in a technical memorandum (TM). (2023)

Quinn assisted the biogas lead with analysis of existing plant data, identification and sizing of candidate biogas utilization systems, cost estimate preparation, and vendor coordination. Quinn contributed to the evaluation process and prepared content for the summary TM.

Wastewater Solids Renewal Planning, City of Vancouver, Vancouver, WA

Technical Lead. BC is conducting biosolids master planning for both wastewater treatment plants in the City of Vancouver. The existing sewage sludge incinerator is requiring increased maintenance and will be nearing its end of useful life in the next decade. This planning project is an important step in determining direction for managing wastewater sludge and considering benefits of resource recovery. The City asked BC to generate evaluation criteria and level of service goals, identify candidate biosolids management alternatives, evaluate the alternatives, and recommend an alternative. (2023-Ongoing)

Quinn is the technical lead for the second phase of the biosolids master plan. As part of this phase, Quinn is leading the development of BC's solids, water, and energy evaluation tool (SWEET) to compare alternatives. He contributed to an initial technical memorandum (TM) identifying existing conditions and potential evaluation assumptions. He presented technical evaluation results to the City's project team and led analysis documentation in the summary report.

Bend 32300472 SEAP Owners Advisory, City of Bend, Bend, OR

Project Manager, Construction Manager. The City is executing a progressive-design-build project to install a wastewater pump station, force mains, and associated gravity conveyance mains in the Southeast Expansion Area of the City's urban growth boundary. BC is providing owner's advisor services during the preconstruction and construction phases of the project. (2023-Ongoing)

In the Owner's Advisor role, Quinn is supporting project management and coordination activities led by City staff throughout the preconstruction phase. Quinn is coordinating technical reviews of design deliverables and independent cost estimating efforts. During construction, Quinn will lead construction management and administration through project completion.

Salmon Creek Treatment Plant Digester Gas Evaluation, Discovery Clean Water Alliance, Vancouver, WA

Mechanical Engineer. BC led an evaluation of the digester gas system at Salmon Creek Treatment Plant. The plant operates two dual-fuel boilers, digester gas booster blower, and a waste gas burner on the digester gas system. The recently installed booster blower experienced mechanical failure, leading the Alliance to review equipment setpoints and retune the boilers. (2022-Ongoing)

Quinn led the evaluation of the gas system by reviewing equipment setpoints, preparing an Applied Flow Technology (AFT) Arrow model, and investigating failure of and need for the booster blower, including recommending system setpoints for stable operation. Quinn is preparing a technical memorandum to summarize the evaluation and recommend improvements to the system.

**Project prior to BC*