

# Wastewater Treatment Review 101: Clean Water and Biosolids

## Abstract

This presentation will take a high level overview of wastewater treatment to produce clean water and biosolids. Treatment plants are usually out of site and out of mind but are the most important part of the community's pollution control. Treatment plants are also a part of the Earth's cycle systems. The Earth's cycle systems include Solids, Carbon, Nitrogen and Phosphorous. The discussion will focus on how bacteria transform Solids, Carbon, Nitrogen and Phosphorous from how they arrive as pollution in the plant influent to produce gases, clean water, and biosolids. Each cycle component will be discussed how operators control bacteria to provide the treatment needed. The presenter is just an old wastewater treatment operator looking to share 40 years of operating experience with fellow operators. The goal of this presentation is to remind operators and engineers of the treatment plant basics so they can be applied to produce clean water and biosolids.

## Presenter: Ken Windram

**Presenter:** Ken Windram  
**Title:** Administrator and Responsible Charger Operator  
**Organization:** Hayden Area Regional Sewer Board  
**Email:** [ken@harsb.org](mailto:ken@harsb.org)

**Professional Background:** 40 years of experience in wastewater operations and management working at over 50 wastewater treatment facilities from 50,000 gallons per day to 450 million gallons per day capacity. Wastewater licenses: New York Grade 2, Massachusetts Grade 7, Indiana Grade 4, Hawaii Grade 4, Washington Grade 4, Idaho Grade 4. I have worked for Envirotech Operating Service, Metcalf & Eddy, USFilter and Veolia Water. I was the project manager for the design, build, own and operate 13 MGD Honolulu Water Recycling Facility (largest water recycling project in Hawaii (2000)). My current position is administrator and responsible charge operator at the Hayden Area Regional Sewer Board. Ken also holds a degree in Environmental Technology for the State University of New York.

# City of Nampa's Sundried Class A Biosolids Story

## Abstract

In summer 2016, the City of Nampa Wastewater Treatment Plant (WWTP) conducted a biosolids pilot sampling study to determine if the solids treatment process could achieve Class A biosolids quality standards, as defined by 40 CFR Part 503. The goal of the City's biosolids sampling pilot study was to establish a thorough analytical testing method to determine if the existing solids treatment process can achieve Class A biosolids quality. This study is significant to the Treasure Valley because biosolids treatment is an innovative method to solids handling that is gaining interest among many municipalities. This study supports the City's interest in evaluating potential future opportunities for providing community benefit through beneficial reuse of Class A biosolids.

## Presenters: Andy Zimmerman and Shelby Smith

**Presenter:** Andy Zimmerman  
**Title:** Superintendent, Wastewater Division  
**Organization:** City of Nampa  
**Email:** [zimmermana@cityofnampa.us](mailto:zimmermana@cityofnampa.us)

**Professional Background:** Andy Zimmerman began working with the City of Nampa in October 2001 and was hired as an operator coming from an SBR system in Kansas. His breadth of experience at the Nampa WWTP has grown from operator, to operations supervisor, to assistant superintendent, to superintendent today. Andy has served as the Nampa WWTP Superintendent for 5 years and has experience with all aspects of wastewater and biosolids treatment.

**Presenter:** Shelby Smith, P.E.  
**Title:** Senior Engineer  
**Organization:** Brown and Caldwell  
**Email:** [sbsmith@brwncald.com](mailto:sbsmith@brwncald.com)

**Professional Background:** Shelby Smith has been a project manager and environmental engineer with Brown and Caldwell for 5 years primarily serving as the Assistant Program Manager to the Nampa Wastewater Program. Her focus has been on program management, capital improvement planning, permitting and compliance, public outreach, construction management and wastewater design.

# Lagoon Biosolids Removal and Disposal – Once and Done

## Abstract

The presentation will focus on general regulation overview and case studies for removing biosolids from lagoon systems. The case studies will include specific information related to the biosolids management plan requirements, practical considerations to include in the management plan and project specifications, and lessons learned along the way.

## Presenters: Stuart Hurley

**Presenter:**                    **Stuart Hurley, P.E.**  
**Title:**                            Co-Owner and Principal Engineer  
**Organization:**               Mountain Waterworks  
**Email:**                         [shurley@mountainwtr.com](mailto:shurley@mountainwtr.com)

Professional Background: Stuart Hurley, P.E. is a founding partner, co-owner, and Principal Engineer of Mountain Waterworks, with over 18 years of professional water and wastewater consulting experience. Mr. Hurley manages industrial and municipal utility design and construction projects, optimizes operation of water and wastewater facilities, and provides funding support to keep major upgrades affordable. He specializes in biological nutrient removal, advanced tertiary treatment, and zero-liquid discharge.

# Reuse Land Application: Basic Soil Plant Water Relationships

## Abstract

This presentation will cover the basic soil plant water relationship that must be managed with the land application of recycled water. In order to understand how to apply and manage water effectively in a plant's root zone, understanding the basic relationships between the soil, the plant, and the water is needed. A sound approach to management of irrigation systems that utilize recycled water employs a combination of irrigation scheduling (hydraulic loading) and nutrient management (nutrient loading) for the crop. The science of the soil, plant, water relationship will be discussed. The basic soil, water, and plant relationships are important to agricultural producers, but especially to irrigation users that desire to use best management practices such as irrigation scheduling. A main function of a land application system is to provide final treatment while protecting the quality of the land application environment. Another function is to provide beneficial reuse of the recycled water and nutrients to produce a crop.

## Presenter: Franklin Gaudi

**Presenter:** Franklin Gaudi, Ed.D., CID, CCA  
**Title:** Project Manager and Lecturer  
**Organization:** Cal Poly  
**Email:** [fgaudi@calpoly.edu](mailto:fgaudi@calpoly.edu)

**Professional Background:** Franklin Gaudi is a California Polytechnic State University (Cal Poly) alumnus and a Project Manager for the Irrigation Training and Research Center (ITRC). He teaches courses in Irrigation Water Management, On-Farm Irrigation Systems, Landscape Irrigation, AutoCAD, and Careers in Agriculture. He also teaches many of the irrigation short courses taught in the summer through the ITRC.

Franklin holds certifications through the Irrigation Association (IA) as a Certified Irrigation Designer (CID) in surface, drip/micro, and sprinkler, as a Certified Irrigation Contractor (CIC), and as a Certified Agricultural Irrigation Specialist (CAIS). He is currently serving as a member of the Irrigation Association Certification Board where he assists with maintaining existing certifications and developing new certifications. Franklin is also recognized through the American Society of Agronomy (ASA) as a Certified Crop Advisor.

Franklin's current areas of interest are utilizing domestic wastewater for agricultural forage crops and landscape irrigation design and auditing. Through research and projects at the ITRC, Franklin is able to bring experience including real-world problems and solutions into the classroom.

### Specialization:

- Landscape irrigation education and training
- On-farm irrigation management and scheduling
- Center pivot design for effluent projects
- Improving upstream water level control with ITRC Flap Gates
- Landscape auditing

### Additional Activities:

- Quarter Scale co-advisor
- Agricultural Engineering Society club advisor

Education:

- B.S., Agricultural Systems Management with a Minor in Agribusiness, emphasis in Mechanical Systems, Cal Poly State University, San Luis Obispo, CA
- M .S., Industrial and Technical Studies, emphasis in Irrigation, Cal Poly State University, San Luis Obispo, CA
- Ed.D., Educational Leadership/Educational Technology, University of Phoenix

# Reuse Land Application: Soils

## Abstract

This presentation will cover soils, soils sampling and testing and what the data means. With a basic understanding of soil physical and chemical properties and soil-water relations, the mechanisms by which the soil and its associated vegetation function as a treatment system can be understood. The soil-crop system treats or renovates all sources of water and their constituent. Along with its associated vegetation, the soil functions as a natural treatment system. Because many of the constituents in recycled water are nutrients that can be used productively by plants and microorganisms, well-managed land application systems can benefit the soil-crop system. The goal of soil testing is to learn enough about the soil to provide economically and environmentally sound nutrient recommendations and to help evaluate the operation and management of the land application site. In situations where land application is limited by nutrients rather than by hydraulics, soil tests can be used to help determine the land-limiting nutrient. The land-limiting nutrient is the nutrient most likely to cause an adverse environmental or plant health effect if more is applied than the plants can use. Generally, nitrogen is the most common land-limiting nutrient, and application rates are based on supplying crop nitrogen (N) needs. The idea is to not apply nitrogen at rates greater than the crop can use because the nitrate form of nitrogen can move through the soil and threaten ground water quality.

## Presenter: Mike Murray

**Presenter:** Mike Murray  
**Title:** Environmental and Resource Manager  
**Organization:** HDR Inc.  
**Email:** [mike.murray@hdrinc.com](mailto:mike.murray@hdrinc.com)

**Professional Background:** Mike Murray serves as Environmental and Resource Management Section Manager for HDR Engineering, Inc. in Idaho. He holds a Ph.D. in Soil Science from Penn State University. Mike moved to Boise in 1991 and has been involved in land application projects, wastewater facility planning, biosolids management, and soil and groundwater investigations of hazardous materials. Mike has 22 years of experience in environmental studies, hard rock and coal mine site closures and reclamation, soil and groundwater investigations and remediation, wastewater land application, statistical analysis and design, project management, and teaching. Mike responsibilities have included technical lead, project planning, field supervision, schedule and cost control, public relations, and expert witness support. Mike joined the Wastewater Land Application Program Technical Work Group in 1993 and has been actively involved with that group working with the IDEQ in the development of reuse guidance.

## Education:

- Penn State University
  - PhD, Soil Science
  - MS, Soil Sciences
- Colorado State University
  - BS, Soil Science and Agronomy

# Reuse Land Application: Practical Distribution Uniformity and Irrigation Efficiency Considerations

## Abstract

Proper land application involves using water management strategies to ensure that water is applied at the proper time and in the correct amounts. Distribution Uniformity and Irrigation Efficiency are important to managing a water reuse site. By understanding the components of the irrigation system, their layout and installation, and by using monitoring devices, the wastewater land application operator can effectively operate the irrigation system. Troubleshooting problems early can also prevent significant and expensive equipment malfunctions and possible negative impacts to the environment. Land application facilities consist of many components, from the influent pipe to the soil-crop system, and everything in between. The operator must understand the entire system for it to perform properly including the irrigation system.

## Presenter: Franklin Gaudi

**Presenter:** Franklin Gaudi, Ed.D., CID, CCA  
**Title:** Project Manager and Lecturer  
**Organization:** Cal Poly  
**Email:** [fgaudi@calpoly.edu](mailto:fgaudi@calpoly.edu)

**Professional Background:** Franklin Gaudi is a California Polytechnic State University (Cal Poly) alumnus and a Project Manager for the Irrigation Training and Research Center (ITRC). He teaches courses in Irrigation Water Management, On-Farm Irrigation Systems, Landscape Irrigation, AutoCAD, and Careers in Agriculture. He also teaches many of the irrigation short courses taught in the summer through the ITRC.

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## Course Title: Reuse Land Application: Irrigation Scheduling

### Abstract

Reuse land application involves using water management strategies to ensure that water is applied at the proper time and in the correct amounts. A responsible wastewater land application operator must understand how recycled water should be managed, have knowledge of the capacity of the system to store and apply recycled water when appropriate, and make prudent management decisions concerning when and how much recycled water to land apply. For a land application system, this decision-making process is called irrigation scheduling. Irrigation scheduling is the process of answering two questions: *When to irrigate?* and *How much to irrigate?*

Effective irrigation scheduling requires knowledge of soil properties, soil moisture content, crop type, climate, irrigation equipment, and estimated daily/weekly precipitation deficit.

### Presenter: Franklin Gaudi

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**Organization:** Cal Poly  
**Email:** [fgaudi@calpoly.edu](mailto:fgaudi@calpoly.edu)

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## Water Reuse Conference – Opening Session:

### The Circular Economy – Concepts and Practice: Can Reuse Play a Role?

#### Abstract

The challenges faced by our water and wastewater service industry in this 21<sup>st</sup> century resulting from population growth and urbanization, coupled with changing global climate patterns are unprecedented. The entanglement of water and energy is placing increasing pressure on economic growth, and environment continues to pay a price. A vision for this century is to move away from our “waste and dispose” economy to a circular “use and reuse” economy, one in which all waste streams will be seen for their economic value due to the intrinsic products that can be recovered. Critical to this circular economy concept is the practice of reclaiming treated wastewaters and promoting its reuse. This presentation will briefly overview water reuse in the Western United States to show that it is strong and growing including de facto, indirect, and direct potable reuse. Additionally, the presentation will overview several key technological approaches that achieve reuse safety and risk standards upon which the future of water reuse will depend.

#### Presenter: Art Umble

Presenter: **Art Umble, PhD, P.E.**  
Title: Global Practice Leader for Treatment  
Organization: Stantec  
Email: [arthur.umble@stantec.com](mailto:arthur.umble@stantec.com)

**Professional Background:** Dr. Art Umble is a certified wastewater operator and has managed a publicly owned water and wastewater utility. Dr. Umble leads the Global Wastewater Practice for Stantec Consulting, focusing on municipal and industrial wastewater treatment technologies, with an emphasis on converting waste streams to value streams. He provides technical analysis and support to design teams for new and rehabilitated wastewater treatment plants, with a focus on nutrient removal and recovery facilities, process optimization for treatment capacity and energy management, wet weather treatment, solids processing and disposal facilities, disinfection systems, reuse and emerging contaminant removal technology. In addition to consulting, Dr. Umble’s experience includes university teaching and managing a publicly owned water and wastewater utility.

Dr. Umble is a national leader in initiatives involving the promotion of environmental sustainable systems, from watershed planning to pollution prevention. He serves in numerous state and national forums and stakeholder work groups related to emerging treatment technologies, sustainability in treatment and environmental regulation. He serves on numerous steering committees for the Water Environment Federation including the Leaders Innovation Forum for Technology (LIFT), and serves as Community of Practice Director for Resource Recovery for the WEF. He is also engaged in research by serving as on the Research Advisory Council for the Water Research Foundation (WRF), provides peer review for several academic journals and collaborative research projects, and serves on several university Boards for curriculum development in environmental engineering.

Dr. Umble has a B.S. Civil Engineering from Kansas State University, and a Ph.D. Civil Engineering from the University of Notre Dame.

# City of Boise and Water Reuse

## Abstract

The City of Boise (City) will discuss what it means to be a sustainable city and identify the importance of water as a foundation for the future. Boise looks to be both innovative and pragmatic – identifying solutions that solve not only today’s problems but manage challenges we will face in the future. In 2016, the City completed a climate risk adaptation assessment to understand community impacts to our watershed, airshed and other natural resources from changes in climate. In that assessment, six out of the eight top challenges we face as a community are tied to water. As we plan for the next generation of growth and change, water planning is key. Because of this, the City of Boise is considering options for recycled water use. Knowing there is a gap in public acceptance of recycled water, the City embarked on a public education project to change the conversation about recycled water...using beer.

The City received the state of Idaho’s first direct potable reuse permit for water renewed from municipal sources. Inspired by the examples set by Clean Water Services (OR), and Pima County (AZ), the City completed a Pure Water Brew direct potable reuse demonstration project in 2018.. The City partnered with the Pima County (Arizona) Regional Wastewater Reclamation Department (RWRD) in a pilot project to demonstrate technology to produce purified water from municipally renewed water. The input source for the pure water production line was water renewed from the City of Boise’s Lander Street Water Renewal Facility (WRF). The Pima County WRWD mobile, purification facility was used to achieve final water quality.

The presentation will discuss how the Pure Water Brew project helps the city tell its water planning story and how we connected to the community in a new way. We will also discuss details of the project, including challenges and lessons learned, and a look to what’s next for reuse in Boise.

## Presenters: Mayor David Bieter, Steve Burgos, Haley Falconer

**Presenter:** Mayor David Bieter  
**Title:** Mayor  
**Organization:** City of Boise

Since Mayor David Bieter’s first day in office in 2003, his vision has been to make Boise the most livable city in the country -- a vision that continues to transform the city's government culture, drive its strategic initiatives and continue to build on Boise's reputation as a welcoming city. The work done at the City of Boise and in the Mayor's Office makes it a center of business, culture, education and outdoor recreation in Idaho.

**Presenter:** Steve Burgos  
**Title:** Director of Public Works  
**Organization:** City of Boise  
**Email:** [sburgos@cityofboise.org](mailto:sburgos@cityofboise.org)

**Professional Background:** Steve is the Public Works Director for the City of Boise. His experience includes over 20 years in the environmental industry as a private consultant and now public sector director. His department’s responsibilities include wastewater collection and treatment; trash collection, recycling and composting; management of sustainability planning; management of the city’s geothermal heating system; water resources planning, and providing engineering support for public streetlights, storm water drainage, hillside protection, flood plain review, construction management. Prior to joining the

city, Steve was an environmental consultant for Brown and Caldwell Environmental Engineers and Scientists, where he served as a vice president. Steve is a graduate of Duke University with a degree in civil and environmental engineering and a veteran of the U.S. Navy.

**Presenter:**                   **Haley Falconer**  
Title:                           Environmental Division Senior Manager  
Organization:               City of Boise  
Email:                         [hfalconer@cityofboise.org](mailto:hfalconer@cityofboise.org)

**Professional Background:** Haley Falconer is the Environmental Manager for the City of Boise. In this role, Haley oversees the water quality, water renewal planning, materials management, air quality, energy, and sustainability. Her role includes tracking and implementing environmental, economic, and community projects and programs throughout the city. Before joining the city, Haley worked as a wastewater project manager for HDR Engineering in Boise. She received her undergraduate degree in civil engineering from North Dakota State University and her M.S. in environmental engineering from Washington State University.

# Regenerative Design & Water Reuse: Lessons from Mars and Early Adopters on Earth

## Abstract

Increasing pressure on water resources has led to both greater water scarcity and more widespread de facto reuse of wastewater as discharges become an increasing proportion of drinking water supplies. As further investments are made to develop and upgrade water-wastewater infrastructure, regenerative design provides a fresh perspective, emphasizing planned, fit-for-purpose reuse of water and other resources contained within “waste” water. The presentation will review basic elements of regenerative design including the frame of reference of closed loop life support systems for space missions. A specific example of early adoption of a regenerative approach, on-site water reuse at the building or district scale, will be reviewed with a focus on the data gaps needed to facilitate safe implementation. As part of an ongoing collaboration with states/utilities, EPA ORD has provided information on a risk-based approach to define treatment requirements, examined the wastewater microbiome for novel surrogates to monitor treatment performance, and compared life cycle assessment of alternative approaches for on-site reuse. Indicator organisms, risk, exposure, and safety will be discussed within the context of the whole watershed. Lessons learned from this effort can be used as part of a broader design of a regenerative water future.

## Presenters: Jay Garland

**Presenter:** Jay Garland, Ph.D.  
**Title:** Division Director  
**Organization:** EPA  
**Email:** [garland.jay@epa.gov](mailto:garland.jay@epa.gov)

**Professional Background:** Dr. Jay L. Garland joined the EPA’s Office of Research and Development in 2011 after spending over 20 years working on NASA’s efforts to develop closed, bio regenerative life support systems for extended human spaceflight. Since receiving a Ph.D. in Environment Science from the University of Virginia, his research has addressed a range of topics, including methods for microbial community analysis, factors affecting survival of human associated pathogens, and various biological approaches for recycling wastes. His work is committed to the development of sustainable systems using ecological principles and innovative design.

# Recycled Water Program of the People, by the People, for the People

## Abstract

How does a recycled water program become the keystone to a wastewater facility plan? For the City of Nampa, it was about regulatory and growth challenges while ensuring the outcome supported community sustainability, economic development, and environmental stewardship. Mayor Debbie Kling and Nate Runyan, Public Works Deputy Director, will dive into how collaborative planning, strategic partnerships and engaged citizens culminated into a recycled water program for the benefit of current and future generations in the City of Nampa.

## Presenters: Mayor Deborah Kling and Nate Runyan

**Presenter:** Mayor Deborah Kling  
**Title:** Mayor of Nampa  
**Organization:** City of Nampa

**Professional Background:** Debbie Kling was sworn in as Mayor of Nampa, Idaho on January 2, 2018. Before taking office, Mayor Kling was most recently the President/CEO of the Nampa Chamber of Commerce, where she served from 2012 until taking office. Prior to joining the Nampa Chamber of Commerce, Debbie worked as the VP of Legal Management for Unity Media Group (a startup technology company), General Manager of the then Qwest Arena and Executive Director of Team Idaho, which organized the National Governors and Western Governors Association meetings hosted by then Governor Dirk Kempthorne in Idaho. Debbie has served in leadership roles on local and national industry and community boards, including the founding team for the National Academy of Venue Safety and Security. She was educated at MidAmerica Nazarene University and Boise State University.

Mayor Kling is currently serving on both the Executive Board and Board of Directors for Community Planning Association (COMPASS) and Valley Regional Transit (VRT).

**Presenter:** Nate Runyan, P.E.  
**Title:** Deputy Public Works Director  
**Organization:** City of Nampa  
**Email:** [runyann@cityofnampa.us](mailto:runyann@cityofnampa.us)

**Professional Background:** Nate started with Nampa's Public Works Department in 2012. He oversees the capital planning and operations of the Water, Wastewater, and Environmental Compliance Divisions. Before coming to Nampa, Nate was an engineering consultant providing design and management services for municipalities and utility companies.

Along with being a professional engineer, Nate holds his B.S. in Civil Engineering from Boise State University.

# Direct Potable Reuse: Managing Collection Systems, Treatment, and Operations

## Abstract

Direct Potable Reuse (DPR) it's not just a treatment process, it managing collections, treatment, as a whole, it's managing all the water resources within the urban environment more effectively. It is about building more resiliencies into water resources management, both on the supply and demand sides, including water for the environment. This presentation will cover direct and indirect potable (IPR) case studies. Water reuse, including potable reuse, is a large focus in some communities for sustainable integrated water management. That's where we look at ideas on how to manage water supplies holistically, and includes indirect potable reuse where we recharge the water into the ground or use it to augment drinking water reservoirs. There's also a trend toward direct potable reuse, in which the water is not put in an environmental buffer. It's also managing drinking water for source protection. We protect watersheds, reservoirs and rivers to keep pollutants out of the water supply. We can apply similar concepts to managing collection systems by building on our current wastewater pretreatment programs. With these case studies the operations will be discussed, such as how the operators are trained and certified with advanced treatment that is not just wastewater but drinking water treatment. That's part of what is going to ensure success by having great operators who are appropriately trained and experienced.

## Presenter: Jeff Mosher

**Presenter:**                    **Jeff Mosher**  
**Title:**                            Principal Technologist and Vice President  
**Organization:**                Carollo Inc.  
**Email:**                         [jmosher@carollo.com](mailto:jmosher@carollo.com)

**Professional Background:** Jeff Mosher has 25 years of experience in serving public and private-sector clients in the research and implementation of water, wastewater, and recycled water treatment systems. He serves as a Principal Technologist at Carollo Engineers and his experience includes water quality evaluations and assessment of advanced treatment technologies for water, wastewater, and recycled water. He is a nationally recognized expert in water reuse, including regulatory and permitting aspects of nonpotable and potable reuse. Previously, Mr. Mosher served as the Chief Research Officer of the Water Environment & Reuse Foundation and is former Executive Director of the National Water Research Institute.

# Crooked River Wetlands Effluent Reuse Project

## Abstract

The City of Prineville's successful Crooked River Wetland Complex is now complete and providing remarkable social, economic and environmental benefits to the community. Through this 120-acre, multipurpose project, the City is responsibly expanding its wastewater capacity, lowering residential and business System Development Charges, stabilizing monthly wastewater rates, created a new public hiking trail system with numerous educational opportunities and improving riparian and instream conditions in the Crooked River. Initially tasked with the construction of a \$62 million mechanical treatment facility, the City shifted to embrace a 120-acre wetland complex plan. The Crooked River Wetland project provides the following benefits:

- *Civic Improvements* - Future treatment costs were reduced from \$62 million to \$7.77 million. The City provided \$4.75 million of the funding and secured over \$3 million in grants to finance the project. Wastewater System Development Charge was reduced from \$9,147 per home to \$3,875 per home.
- *Recreational Opportunities* - Amenities abound with over 5.4 miles of new loop, and out and back, walking, running and hiking trails, 3.25 miles of which are paved for use year-round.
- *Educational Values* - Thirteen separate colorful kiosks present topics ranging from the Crooked River Watershed to macroinvertebrates. Local schools helped to design these informative kiosks.
- *Environmental Benefits* - Over two miles of riparian improvements to the Crooked River have been implemented, as well as the construction of over 120 acres of wetlands, benefitting many species of fish and wildlife, including lower river temperatures.

## Presenters: Eric Klann and Betty Roppe

**Presenter:** Eric Klann  
**Title:** City Engineer and Public Works Director  
**Organization:** City of Prineville  
**Email:** [eklann@cityofprineville.com](mailto:eklann@cityofprineville.com)

**Professional Background:** Eric Klann was born and raised in Prineville and currently holds the title of City Engineer/Public Works Director for the City. He graduated from Crook County High School in 1994 and after working for two years at the Les Schwab production facility to save funds for school, went to Oregon State earning a degree in Mechanical Engineering in 2000. He worked as the Plant Engineer at American Pine Products from 2000 to 2007 before accepting the position of Assistant City Engineer with the City of Prineville. He received his license as Professional Engineer in Civil Engineering from the State of Oregon in the fall of 2009. Eric has been married for 13 years to his wonderful wife Sarah, who works as a building educational coach for the Crook County School district (and has horrible taste in men). They have a daughter Eleanor who is 10 and a son Emmett who just turned 8.

**Presenter:** Betty Roppe  
**Title:** Previous Mayor of Prineville  
**Organization:** City of Prineville

**Professional Background:** Betty Roppe worked for the Forest Service in the 1960s then was the Clinic Administrator for the Monmouth/Independence Clinic and for the Prineville Medical Clinic. Betty and husband Jim are also proud parents and grandparents to seven children, thirteen grandchildren and nine great grandchildren. The short list of some of her achievements includes:

- Has served on City Council since 2004 with being President for four years and elected for Mayor in 2010 retiring on Dec. 31, 2018.
- Pioneer Hospital Foundation Board for 16 years.
- Crook County Foundation Board for 4 yrs.
- Deschutes Water Alliance
- Co-convenor of the U.S. Forest Service Collaboration
- Deschutes River Conservancy
- Central Oregon Cities Organization Chair
- Habitat Conservation Plan (Fish Re-Introduction)
- Crook County Commission on Children and Family
- Served on the Crook County School Districts Facilities Committee and remains interested in all activities of the local schools
- Serves on Governor's Regional Solutions Task Force
- Serves on Governor appointed State of Oregon Energy Facility Siting Commission
- Served on Oregon Mayor's Association Board
- Has earned many awards such as the Lifetime Achievement award, Oregon Mayors Association Leadership award and many others.

# Recycled Water Use Within a Hospital

## Abstract

Reclaimed Water: Harrison Medical Center - Silverdale Water District has implemented a program to optimize reclaimed water. The reclaimed Class A water will be generated from a regional wastewater facility owned and operated by Kitsap County. Silverdale Water District will receive the reclaimed water from the County wastewater facility and convey it 5 miles to users including purple piping within the YMCA and Harrison Medical Center.

## Presenter: John Poppe

**Presenter:** John Poppe  
**Title:** Water District Commissioner  
**Organization:** Silverdale Water District  
**Email:** [jpoppe@swd16.org](mailto:jpoppe@swd16.org)

**Professional Background:** John Poppe will present on the Reclaimed Water: Harrison Medical Center. John has 40 years' experience in the wastewater industry as a consultant, wastewater treatment plant manager with a variety of administrative functions. He served on the first Washington State Department of Ecology water reuse committee that developed the guidelines for the "ORANGE BOOK" and is currently a member of the Department of Ecology Rule Making Committee for water reuse.

In addition, he is a Water District Commissioner for Silverdale Water District that is currently installing thousands of feet of "purple pipe" to serve area school districts, hospital, and commercial entities.

## Navigating the Road to Reuse: How a Pint of Beer Sparked a Reuse Revolution in Oregon and Beyond

### Abstract

Learn how Clean Water Services and the Oregon Brew Crew sparked an international conversation about reuse by brewing beer with high purity water. Started in 2014, the project has inspired utilities, water quality professionals, brewers and beer lovers throughout the U.S. to jump start the conversation about the nature of water. In 2018, CWS, with the support of Jacobs Engineering, Black & Veatch, PNW WaterReuse, PNCWA, Xylem and others, commissioned the Pure Water Wagon—a mobile high purity water production trailer to take the story on the road.

The “crazy” idea of brewing beer from wastewater has spawned a nationwide Pure Water Brew movement. The thirst for Pure Water Brew quickly spreading to the Milwaukee Metropolitan Sewer District, Hillsborough County, Florida, San Diego, Arizona, Boise, Denver and beyond. In 2017, these early adopters and a pioneering group of utilities, consultants, professional associations and craft brewers formed the Pure Water Brewing Alliance who took this compelling clean water story on the road to the National Craft Brewers Alliance in 2018.

Beyond the beer and the bling, the Pure Water Brewing Alliance has been able to creatively tell the story about the nature, source and history of water while:

- Starting a conversation about reuse and the nature of water
- Demystifying water purification and the urban water cycle
- Showcasing innovative water technology to inform how water can be used

Did it work? It certainly started the conversation.

- While headline writers couldn’t resist potty humor, the majority of stories were fair, positive and conveyed our message.
- Regulators, who were initially hesitant to approve the project due to concerns about public response, agreed to move forward.
- It sparked a conversation and challenged the taboo of direct potable reuse

The Pure Water Brewing movement has shown that with a little creativity and a willingness to take a chance, we can start a conversation and begin overcoming the social and regulatory barriers to water reuse.

### Presenter: Mark Jockers

**Presenter:** Mark Jockers  
**Title:** Government and Public Affairs Manager  
**Organization:** Clean Water Services  
**Email:** [jockersm@cleanwaterservices.org](mailto:jockersm@cleanwaterservices.org)

**Professional Background:** Mark is the Government and Public Affairs Manager at Clean Water Services (Oregon) and Chair of Water Environment Federation (WEF) Public Communication and Outreach Committee. He has nearly 30 years of experience in communications and public affairs. Known to some as the godfather of Pure Water Brewing, Mark first introduced the concept of potable reuse for brewing beer in Portland in 2014.

## IPDES Laboratory & Facility/Permit Basics

### Abstract

IPDES Laboratory & Facility Basics covers what operators can expect during IPDES inspections and compliance monitoring activities regarding laboratory condition, equipment, and sampling/calibration records. Additionally, we will cover the basics of reading and interpreting permit requirements to ensure your facility is capable of obtaining the minimum data required by your IPDES permit.

Operators will learn: How to identify deliverables and data requirements within their permit, areas of the laboratory they should maintain and perform regular checks on, and permit record data entry and maintenance.

### Presenter: Tyler Fortunati

Presenter: **Tyler Fortunati**  
Title: IPDES Compliance, Inspection, and Enforcement Lead  
Organization: Idaho Department of Environmental Quality  
Email: [Tyler.Fortunati@deq.idaho.gov](mailto:Tyler.Fortunati@deq.idaho.gov)

Professional Background: Tyler has worked in the wastewater industry as a regulator for 13 years. He started as an environmental health specialist at Central District Health Department where he permitted and inspected on-site septic systems for 6 years. Tyler then moved to the Department of Environmental Quality where he served as the on-site wastewater coordinator for DEQ's wastewater program. For the last 3 years Tyler has worked for DEQ serving as the IPDES program's compliance, inspection, and enforcement lead.

#### Other Qualifications:

- M.S. in Industrial Hygiene
- B.S. in Biology w/emphasis in Ecology
- Registered Environmental Health Specialist

## Advanced IPDES E-Permitting and NetDMR

### Abstract

The Idaho Pollutant Discharge Elimination System (IPDES) program is utilizing two web-based applications to manage nearly all aspects of IPDES permitting and compliance: 1) the IPDES E-Permitting System, and 2) NetDMR. The IPDES program is utilizing these tools to help streamline the permitting and compliance processes, conform to EPA's e-reporting rule requirements, and reduce the paperwork burden for DEQ personnel and IPDES permittees. This session will include an overview of the IPDES E-Permitting System for permittees, including how to submit permit applications, provide required reporting information, and existing signatory options/responsibilities. We will also address the use of NetDMR, including the differentiation between the EPA Region 10 and Idaho DEQ service, the use of No Discharge (NODI) codes, amending discharge monitoring report (DMR) submittals, and entering minimum level (ML) and method detection limit (MDL) data.

### Presenter: Troy Smith

**Presenter:** Troy Smith  
**Title:** IPDES Rules and Guidance Coordinator  
**Organization:** Idaho Department of Environmental Quality  
**Email:** [Troy.Smith@deq.idaho.gov](mailto:Troy.Smith@deq.idaho.gov)

**Professional Background:** Troy is from Boise, Idaho and has a B.S. from the University of Idaho and M.S. from Oregon State University. He has been working in natural resource management for more than 16 years, including 7 years at Idaho DEQ. He is currently the IPDES Rules and Guidance Coordinator, which includes managing the development and maintenance of the IPDES E-Permitting System.

# Jar Testing for Phosphorus Removal at West Boise Water Renewal Facility

## Abstract

Total phosphorus (TP) removal at the City of Boise's West Boise Water Renewal Facility (WBWRF) has been challenged due to varying influent TP loads, varying volatile fatty acids generation, side-stream struvite removal, sludge dewatering (for two plants) and upcoming stringent effluent standards. All of these challenges have resulted in inconsistent treatment performance. The WBWRF will eventually have to meet discharge permit limits for TP of approximately 0.35 mg P/L.

WBWRF operates an enhanced biological phosphorus removal (EBPR) facility (Figure 1). WBWRF staff worked on optimizing the plant performance for biological phosphorus removal, however, the plant has not been consistently able to produce an annual average effluent TP meeting the biological treatment objectives (~ 0.6 mg/L TP). Based on model simulations, the recommendation was to reduce influent TP load between 200 and 250 lb/d (the facility currently discharges about 290 lb/d as shown in Figure 1). This has prompted the City to conduct jar testing of various phosphorus removal coagulants to balance the phosphorus load allowing the biological process to meet the treatment objectives.

## Presenters: Ron Gearhart and Brad Bjerke

**Presenter:**                    **Ron Gearhart**  
**Title:**                            Wastewater Process Manager  
**Organization:**                City of Boise  
**Email:**                           [RGearhart@cityofboise.org](mailto:RGearhart@cityofboise.org)

**Professional Background:** Mr. Ron Gearhart brings more than 30 years of experience, knowledge and expertise to the water and wastewater fields. I hold multiple wastewater certifications in Idaho; a Wastewater Treatment Operator Class IV, Collections Operator Class IV, Laboratory Analyst Class IV, a Wastewater Treatment Land Application endorsement, a Water Distribution Class I, and a Water Treatment Class I. I have spent 19 years with the City of Boise managing, operating, and maintaining three wastewater plants including two Advanced Activated Sludge treatment plants and a lagoon wastewater treatment plant. I am currently the Wastewater Process Manager for the City of Boise, responsible for evaluating the effectiveness and efficiency of all wastewater and associated treatment processes and developing and recommending policies, procedures, and methods to optimize overall plant performance.

Ron has earned many recognitions and awards during his 30+ years in the wastewater field. Some of his accomplishments include:

1997 Idaho Operator of the year, 1997 PNPCA Idaho Operator of the year;

- 1996 Southwest Idaho Operator of the year;
- 1993 Operations Challenge team member – Beginner Class – Overall 2nd place nationally;
- Successful completion of Ken Kerri correspondence course (wastewater treatment, collections systems, water systems, industrial waste);
- Sacramento St. University, 45 C.E.U.'s, 100+ C.E.U.'s directly related to Wastewater Treatment;
- SWIOS, past president, 1998;
- 15 years at West Boise includes 1 platinum, 11 gold, and 3 silver awards;
- PNCWA State Director Elect – 2009-2012

**Education & Training:**

- Certificate of Completion, Boise State University, Wastewater Technology, 1987.

**Registration:**

- Idaho Wastewater Treatment IV (WWT4-10603)
- Idaho Wastewater Collections IV (WWC4-14152)
- Idaho Wastewater Laboratory IV (WWL4-15601)
- Wastewater Treatment Land Application (WWTLA-14737)
- Idaho Drinking Water Distribution I (DWD1-14947)
- Idaho Drinking Water Treatment I (DWT1-15602)

**Presenter:**                    **Brad Bjerke, P.E.**  
Title:                              Professional Engineer  
Organization:                  HDR, Inc.  
Email:                             [Brad.Bjerke@hdrinc.com](mailto:Brad.Bjerke@hdrinc.com)

Professional Background: 35 years' experience in planning, design and operation of wastewater and water treatment systems. Work experience with miscellaneous consulting engineering firms – 6 years in MN, 7 years in OR, 22 years in ID.

Class IV wastewater operator in Idaho and South Dakota. Class A wastewater operator in Minnesota. Class III water operator in Idaho and South Dakota. Wastewater and water operations and maintenance experience 40 years.

**Education:**

South Dakota State University (SDSU)  
1979 – B.S., Microbiology  
1984 – B.S. and M.S., Civil Engineering

# The Fundamentals of Electrochemistry

## Abstract

The Thermo Scientific pH Seminar focuses on the essentials of practical pH measurement. pH is one of the most common and routine types of laboratory analysis, but in order to achieve good precision and accuracy, proper technique must be followed.

Each component of the pH system will be discussed with only a minimum of time spent on theory:

### Electrodes

- How electrodes function
- Different electrode reference and junction designs
- Matching suitable electrodes to specific applications

### Calibration

- One point and multi-point calibration
- Relationship between temperature and pH
- Proper buffer selection
- Discussion of the importance of electrode slope

### Care And Maintenance

- Cleaning procedures to enhance electrode performance
- Storage recommendations for different types of pH electrodes
- Techniques to rejuvenate electrodes

### Temperature

- Effects of temperature on the pH electrode
- Effects of temperature on the calibration
- Effects of temperature on buffers and samples

### Troubleshooting

- Common measurement problems
- Calibration and measurement hints
- How to isolate and troubleshoot individual components
- Correcting sources of measurement error

### New Technology

- LogR temperature compensation

## Presenters: Mark McElroy

<b>Presenter:</b>	<b>Mark McElroy</b>
Title:	Thermo Fisher Representative
Organization:	Thermo Fisher Scientific
Email:	<a href="mailto:mark.mcelroy@thermofisher.com">mark.mcelroy@thermofisher.com</a>

Professional Background: Mr. McElroy first entered the Scientific Products industry in 1988. He has a very diverse background in the industry and understands the importance of the chemistry as well as the business needs of his customer base.

Mr. McElroy has received extensive training and study in the field of electrochemistry as well as everyday application of these principles in the lab. He has also been a national presenter of these materials with consistently high ratings on content and delivery.

Additionally, Mr. McElroy has presented the Fundamentals of Electrochemistry to over 150 groups across the Northwest and Western Canada. As a presenter of this material he continues to get very positive reviews from each presentation.

Mr. McElroy was studying the pre-medical track at the University of Washington which involved over three years of intensive study in the sciences. After determining he was not going to be admitted into medical school, Mr. McElroy embarked on a career in sales that has spanned over 40 years.

# Use of On-Line Analyzers in the monitoring and control of Phosphorus Removal in Wastewater Treatment

## Abstract

Phosphorus removal is a primary concern in wastewater nutrient removal. Many wastewater treatment plants utilize biological treatment process or chemical precipitation process or both to remove phosphorus and achieve discharge limits.

The long-term regulatory trend is lower total Phosphorus limits. The substantial costs, both energy and chemical, have prompted wastewater treatment professionals to investigate methods of optimizing the treatment process. One effective method is through use of an on-line analyzers.

This presentation consists of:

- A review of on-line technology.
- A review of the biological and chemical phosphorus removal process using North America phosphorus removal case studies.

Both show the advantages and disadvantages of the different treatment methods.

Conclusion:

- On-line nutrient analyzers are an important tool to achieve the goal of treatment optimization and provide substantial cost savings.

## Presenters: David Roskwic

**Presenter:** David Roskwic  
**Organization:** ChemScan, Inc.  
**Email:** [david@chemscan.com](mailto:david@chemscan.com)

Professional Background: Chemical engineering. Wastewater and water industry for over 25 years. Biological nutrient removal focus.

# Data Management

## Abstract

We constantly rely on data to allow us to make fast and accurate decisions regarding our treatment process. The latest advancements in analytical instrumentation, software and controls is rapidly changing how we manage that data and more importantly how we act on it. These advancements give us the ability to treat more efficiently and ensure we are in compliance with regulations.

What operators will learn: In this presentation operators will learn about how we look at process, instrument and data management. We will discuss how different remote communication options can help us capture field and bench test results, understand the health of probe or even make process changes real time using smart devices.

## Presenters: Eric Lehmann

**Presenter:** Eric Lehmann  
**Title:** Regional Manager  
**Organization:** Hach  
**Email:** [elehman@hach.com](mailto:elehman@hach.com)

**Professional Background:** Eric Lehmann is a Regional Manager and has been with Hach for 15+ years. Prior to his time at Hach Eric worked as an analytical chemist for an environmental consulting firm in Ft. Collins, CO for six years. Eric lives in Rapid City, SD with his wife and three children.

# Method Detection Level and the 40 CFR 136 Method Update Rule

## Abstract

The Sept. 2017 Method Update Rule, Revision 2 for the 40 CFR 136 changed the way the Method Detection Level (MDL) is calculated. EPA promulgated changes to analytical test procedures that are used by industries and municipalities to analyze the chemical, physical, and biological components of wastewater and other environmental samples that are required by regulations under the Clean Water Act. This course will review the changes and updated requirements. Operators will learn the difference between Method Detection Level (MDL) and Minimum Level (ML). They will gain an in depth understanding of the new rule and how to apply it, as well as insights on how to adapt the new procedures for calculating the different forms of MDL.

## Presenter: Stephen Quintero

**Presenter:** Stephen Quintero  
**Title:** Quality Assurance/Quality Control Coordinator  
**Organization:** City of Boise; Water Quality Laboratory  
**Email:** [squintero@cityofboise.org](mailto:squintero@cityofboise.org)

**Professional Background:** Stephen is the Quality Assurance/Quality Control Coordinator for the City of Boise Water Quality Laboratory. He has a B.S. in Nutrition Science from University of California at Davis. He has 25 years' experience in environmental laboratories, working in the fields of drinking water, wastewater, and soils.

# An Overview of SCADA Systems for Operators and City of Bend's SCADA Upgrade Project

## Abstract

**Problem Statement:** SCADA systems are often complex, difficult to understand and maintain as they have progressed over the years. Understanding the role each component plays in SCADA system and how it relates to the day-to-day municipal wastewater treatment and collections system is important. Over the past 25 years, many capital projects with SCADA components have been completed using multiple consultants, design approaches, programming methodologies, controls and operations with minimal standardization. This has made it difficult to troubleshoot the SCADA system and thus difficult to maintain and operate.

**Approach:** The City of Bend operations, maintenance, engineering and consultant staff worked together to develop project teams to help develop SCADA standards to implement on near future large wastewater and water projects. What started with a SCADA base design, it soon became apparent that other parts of the asset management system needed to be understood and updated first to get the most out of the existing infrastructure. The team worked together to clarify and identify needed improvements, prioritize and implement the projects.

**Results:** This presentation will be helpful to project planning teams looking to:

- Provide better coordination between operators and the other members of design and maintenance project teams, consultants and program managers allowing the operators to get more out of their SCADA system.
- Address the existing SCADA system issues prior to adding additional assets to the system
- Establish Standards and Procedures
- Lessons Learned

**Conclusion:** Bend is presently integrating the SCADA improvements, and this presentation will describe lessons learned and how these results may be applied to other operating wastewater treatment facilities.

## Presenter: Jim Wodrich

**Presenter:** Jim Wodrich, P.E. PMP  
**Title:** Senior Project Manager  
**Organization:** HDR, Inc.  
**Email:** [James.Wodrich@hdrinc.com](mailto:James.Wodrich@hdrinc.com)

**Professional Background:** Jim Wodrich, PE. PMP is a senior project manager with the HDR managing water, wastewater and SCADA improvements. Jim has worked in the field for over 30 years. He has a Masters of Science Degree in Civil Engineering from the University of Washington and a Bachelors of Science Degree from Montana State University.

# Identifying Hazards Faced by Collection Technicians

## Abstract

This course deals with practical methods to identifying hazards associated with the daily activities of Collection Technicians. Topics will deal with areas such as; confined Space entry, 4-gas meters, hearing conservation and conducting basic Job Safety Analysis.

## Presenters: Laurelei McVey

**Presenter:** Laurelei McVey  
**Title:** Deputy Director Utility Operations  
**Organization:** City of Meridian  
**Email:** [tcampbell@meridiacity.org](mailto:tcampbell@meridiacity.org)

Professional Background:

### Education

5/06 BS Biology/Chemistry-College of Idaho, Caldwell, ID

### Qualifications/Credentials

Idaho Wastewater Laboratory IV WWL4-18331  
 Idaho Wastewater Treatment IV WWT4-19708  
 Idaho Wastewater Collection IV WWC4-19707  
 Idaho Drinking Water Distribution I DWD1-22642  
 Idaho Drinking Water Treatment I DWT1-22643  
 Idaho Land Application License WWTLA-21596

ICS 100, 200, 300, 400, 700

Member of Water Environment Federation (WEF)  
 Member of Pacific Northwest Clean Water Association (PNCWA)  
 Member of Southwest Idaho Operators Section of the PNCWA  
 Previously Nassco PACP, MACP, LACP Certified

### Work History

6/17-current Deputy Director Utility Operations- City of Meridian  
 6/15-6/17 Wastewater Superintendent-City of Meridian  
 11/12-6/15 Wastewater Assistant Superintendent- City of Meridian  
 9/09-11/12 Laboratory Supervisor- City of Meridian Wastewater Laboratory  
 5/06-09/09 Laboratory Analyst/Pretreatment Technician- City of Nampa Wastewater

### Previous Classes Taught

- Various Water Treatment Courses, approved 1.2 CEUs
- NPDES Permits, Various Courses, approved 2.0 CEUs
- Wastewater Process Microbiology, WWP10042355, 0.15 CEUs
- Overview of NetDMR, Approved in 2013 and 2015, 0.1 WW CEUs

# Identifying Hazards Faced by Collection Technicians

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 Idaho Wastewater Treatment IV WWT4-19708  
 Idaho Wastewater Collection IV WWC4-19707  
 Idaho Drinking Water Distribution I DWD1-22642  
 Idaho Drinking Water Treatment I DWT1-22643  
 Idaho Land Application License WWTLA-21596

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- Wastewater Process Microbiology, WWP10042355, 0.15 CEUs
- Overview of NetDMR, Approved in 2013 and 2015, 0.1 WW CEUs

# Life Cycle Cost for Wastewater Pumping Systems

## Abstract

This presentation will define LCC (Life Cycle Cost) and the benefits associated with wastewater pumping in modern times. Energy usage and efficiency are becoming more important every day and being able to identify the benefits is becoming an important factor in pumping systems.

## Presenter: Alden Meade

**Presenter:** Alden Meade  
**Title:** Applications Engineer  
**Organization:** Xylem Inc.  
**Email:** [Alden.Meade@xyleminc.com](mailto:Alden.Meade@xyleminc.com)

### Professional Background:

#### Education:

- B.S. Mechanical Engineering, University of Portland, Graduated 2009

#### Experience:

- Flygt Applications Engineer, 2015 – current
  - Certificate of Flygt training program, 2015
  - Certificate of Flygt Mixer Training, 2016
  - Certificate of Goulds Turbine pump Training, 2017
  - Advanced AE factory training – 2018
- Premier Pump & Power, Applications & Sales Engineer, 2010-2014
  - Certificate of Cornell Training program, 2012, 2013, 2014

Alden has been working in the pump industry since graduating college, working with Flygt pumps for the last 4 years. This year has been spent expanding his knowledge of the Flygt product lines, and gaining a more detailed understanding of their pumping & mixing applications; most notably supporting new product mixer pilots in Washington, working directly with the customer, engineers, and the factory in Sweden. This has included presenting at multiple engineering firms and training seminars throughout the US. Prior to joining Flygt/Xylem Alden worked at Premier Pump & Power for 4 years as their applications & sales Engineer. With Premier Pump & Power he worked in a variety of pumping applications and gained experience in the basics of pumping hydraulics with consistent advanced pump training.

# Variable Speed Wastewater Pumping: Challenges and Opportunities

## Abstract

This presentation will discuss the challenges and opportunities in variable speed wastewater pumping applications, Why variable speed pumping? Why now? What is special about wastewater pumping? And how the different pieces fit together.

## Presenters: Alden Meade

**Presenter:** Alden Meade  
**Title:** Applications Engineer  
**Organization:** Xylem Inc.  
**Email:** [Alden.Meade@xyleminc.com](mailto:Alden.Meade@xyleminc.com)

### Professional Background:

#### Education:

- B.S. Mechanical Engineering, University of Portland, Graduated 2009

#### Experience:

- Flygt Applications Engineer, 2015 – current
  - Certificate of Flygt training program, 2015
  - Certificate of Flygt Mixer Training, 2016
  - Certificate of Goulds Turbine pump Training, 2017
  - Advanced AE factory training – 2018
- Premier Pump & Power, Applications & Sales Engineer, 2010-2014
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## Why and How We Clean and CCTV Sewer and Storm Systems

### Abstract

Cleaning and inspecting sewer lines are essential to maintaining a properly functioning system. In the class, the operators will learn the latest ways of cleaning and televising the systems they are in charge of. Attendees will learn about the importance of pipe maintenance. It is also to educate the operators on cleaning and televising systems faster and safer by using the proper equipment for the job.

### Presenter: Victor Coles

<b>Presenter:</b>	<b>Vic Coles</b>
Title:	Collections Systems Consultant
Organization:	retired

Formerly on Idaho Board of Drinking Water and Wastewater Professionals

# Legally Required Standby Engine-Generation in Wastewater Treatment Plants

## Abstract

The Environmental Protection Agency (EPA) and the National Fire Protection Association (NFPA) have jurisdiction over wastewater treatment plants, and their standards are the primary drivers regarding the need for standby engine-generators in wastewater treatment plants.

The EPA technical bulletin Design Criteria for Mechanical, Electric, and Fluid System and Component Reliability provides minimum reliability design criteria for wastewater treatment works that discharge effluent into navigable waters that can be damaged by effluent quality degradations. The reliability criteria require that two separate and independent sources of electric power be provided from either two separate utility substations or from a single utility substation and a works-based generator to serve treatment plant vital components whose operation or function is required to:

1. Prevent a controlled diversion
2. Meet effluent limitations, or
3. Protect other vital components from damage.

The 2016 version of NFPA 820 Standard for Fire Protection in Wastewater Treatment and Collection Facilities requires ventilation systems used to reduce National Electrical Code (NEC) area classifications to have a means to accept power from an alternate source, and requires alarming due to failure of primary source of ventilation power. Previous versions had more prescriptive alternate power source requirements.

The National Electrical Code (NEC) deems standby generation systems required by these governmental agencies as “legally required”. The installation, operation, and maintenance requirements of these systems are defined in Article 701 in the NEC.

What operators will learn:

Electrical system design considerations such that no single power system element failure or a loss of a power source will result in extended disruption of electric service to vital components.

Legally required standby systems (e.g. engine-generator and transfer switch) installation, operation, and maintenance requirements include the following:

- Sizing
- Start up time
- Fuel capacity
- Acceptance testing
- Periodic testing
- Battery system maintenance
- Testing under load
- Written testing and maintenance records

Other standby system considerations include:

- Ensuring spare parts availability for electronic elements that frequently become technologically obsolescent (e.g. PLC processors and components, etc.).

- Providing standby power to SCADA battery backup systems if the SCADA system is required to operate during extended power outages.

### Presenters: John Barrutia and Craig Hartman

**Presenter:**                    **John Barrutia, P.E.**  
Title:                                Senior Project Manager  
Organization:                    DC Engineering  
Email:                               [jbarrutia@dcengineering.net](mailto:jbarrutia@dcengineering.net)

Professional Background: John Barrutia, P.E., is a senior project manager with DC Engineering managing a variety of industrial and utility related projects including wastewater, water, and cogeneration plant improvements. John has worked for CH2MHill, Idaho Power, and DC Engineering. He has a Bachelors of Science in Electrical Engineering (BSEE) from the University of Idaho, and a Master of Business Administration (MBA) from Boise State University.

**Presenter:**                    **Craig Hartman, P.E.**  
Title:                                Vice President of Operations and Engineering  
Organization:                    Energy Management Corporation  
Email:                               [chartman@emcsolutions.com](mailto:chartman@emcsolutions.com)

Professional Background: Craig Hartman, P.E. is Vice President of Operations and Engineering for Energy Management Corporation, a Generac Dealer specializing in Motors, Drives, Generators, and Power Quality. Craig has worked for Westinghouse Electric Corporation, Geneva Steel Corporation, and Energy Management Corporation. He has a Bachelor's of Science in Electrical Engineering (BSEE) from University of Utah, and a Master of Science in Electrical Engineering (MSEE) from University of Colorado.

# H<sub>2</sub>S Corrosion in Collection Systems

## Abstract

This presentation will review hydrogen sulfide (H<sub>2</sub>S) corrosion in collection systems including background, recognizing H<sub>2</sub>S corrosion, risk factors, mitigation and a case study / data summary review from an East Coast wastewater utility. The presentation uses a mix of industry publication references as well as specific project examples which demonstrate practical measurement and mitigation of H<sub>2</sub>S issues. One unique presentation feature will be to review the measurement and assessment of H<sub>2</sub>S within pressurized force mains, for which there are no industry standards.

Operators will learn about H<sub>2</sub>S corrosion mechanism, Risk factors related to H<sub>2</sub>S corrosion, construction materials vulnerable to H<sub>2</sub>S corrosion, ways to measure and quantify H<sub>2</sub>S, methods of hydraulic (turbulence) mitigation to reduce risk of H<sub>2</sub>S corrosion.

## Presenter: Daniel Porter

**Presenter:** Daniel Porter  
**Title:** Principal Engineer  
**Organization:** Brown and Caldwell  
**Email:** [DPorter@BrwnCald.com](mailto:DPorter@BrwnCald.com)

**Professional Background:** Dan Porter is a Principal Engineer in Brown and Caldwell's Cleveland, Ohio office. His experience includes assessment, planning, design, and construction of water, wastewater, and storm water infrastructure. Mr. Porter holds a Bachelor's Degree in Civil Engineering from Old Dominion University and is a U.S. Navy Veteran. He is licensed as a Professional Engineer in Ohio and Virginia.