
Ronald Schuyler, P.E., BCEE, WEF Fellow, CWP

Colorado Water and Angling Consultants
Owner and Process Specialist

Mr. Schuyler specializes in the activated-sludge process including design, process and operability troubleshooting and optimization, and microorganism identification. He has more than 40 years of experience in reviewing and evaluating operating facilities and their expansion/upgrade plans. He has conducted WWTP evaluations for more than 85 facilities for domestic and industrial clients. Ron spent nearly 23 years with CDPHE before joining Tetra Tech, and was at some time responsible for each aspect of Colorado's water quality control program.

Process Evaluation and Optimization

Ron is responsible for the Facility Evaluation and Troubleshooting Program which focuses on defining actual plant capacity under today's operating conditions. Clients have been able to reduce costs for construction after determining exactly what their plants can process while meeting discharge limitations. Many have also found that they have more capacity than originally thought. Optimization of operations often provides significant electrical and chemical cost savings. The following represent a few of the facility evaluation and optimization projects completed by Ron.

Municipal Facility Optimization, Montrose, CO - The first optimization program was initiated at the 2.88 MGD capacity Montrose plant in 1997 to utilize simple operational techniques to reduce energy costs. One brush-aerator in each oxidation ditch was turned off, and the aerobic digester aerator was cycled on/off. This resulted in a \$34,000 (23%) saving for the first year.

Municipal Facility Evaluation, Rockaway Valley Regional Sewerage Authority, Boonton, NJ - Evaluation suggested that RVRSA really had a 16 MGD capacity rather than the original 12 MGD design capacity. The Optimization Programs, started after the plant evaluation, included process control training. Once trained, the staff could focus on saving operational costs and improving effluent quality. Today, the plant's operations staff treats all the flow while running just half the plant at 35% above rated capacity. This not only saves significant costs by delaying construction, but it also saves operational costs, e. g., nearly \$200,000 in electrical costs per year plus significant chlorine savings. All of this is accomplished while meeting all permit limits, including BOD and TSS in single digits, ammonia less than 1.0 mg/L and phosphorus less than 1.5 mg/L with no chemical addition or effluent filtration.

Industrial Facility Evaluation, Hercules (Missouri Chemical Works) WWTP, Louisiana, MO - The Missouri Chemical Works manufactures several commercial chemicals and operates various utilities to support chemical production. The company also operates this plant to treat all production wastewater, potentially contaminated stormwater, and all non-domestic wastewater at the plant. Although the plant had generally met all discharge permit limitations for two years prior to the evaluation, it was increasingly difficult, and required high polymer use, a routine need to store and retreat water, and high costs associated with these. Tetra Tech performed a CPE on the plant to review capabilities and capacity of the plant and the approach to plant operations. Of the resulting recommendations, several were implemented immediately: one clarifier was taken off-line, an EQ tank was converted to aeration, aeration suspended solids concentration was reduced by 50%, and the suspended solids load to the clarifiers was reduced by about 75%. These actions saved \$150,000/year in polymer costs at a 1-MGD facility for over 10 years.

Education:

M.S., Water Microbiology,
Colorado State University,
1970

B.S., Civil Engineering,
Colorado State University,
1967

Other Education:

Assistant Professor
Adjunct, University of
Colorado, Department of
Civil and Environmental
Engineering, August, 2009

Registrations:

Professional Engineer:
Colorado
Board Certified
Environmental Engineer
(BCEE)
Colorado Class C
Wastewater Treatment
Plant Operator
Colorado Class C Water
Treatment Plant Operator

Professional Affiliations:

Water Environment
Federation - Task Force
Leader for Revision of the
Wastewater Biology: The
Microlife; Reviewer of Six
WEF Publications.
Member, Various
Committees; Past
Chairman, Plant
Operations Committee,
Preconference Workshop
Chair
Rocky Mountain Water
Environment Association -
Director, Past President;
Chair Various Committees.
American Academy of
Environmental Engineers

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Years of Experience:

47

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Municipal Facility Evaluation, Fresno–Clovis Regional Wastewater Reclamation Facility, Fresno, CA - Ron led the Tetra Tech Team that performed a limited onsite evaluation of the existing 80-MGD plant, which had been experiencing sludge settling problems. Plant staff wanted help to determine what could be done in the immediate future to improve plant effluent quality. Microscopic examination determined that excess extracellular polysaccharide was the most significant cause of the poor settleability rather than the presence of filamentous microorganisms, as had originally been thought. The team examined unit capacities and loadings and evaluated process control through the plant. Precise process control and operator training helped remedy the immediate problem. The non-traditional approach of using very low DO (0.1 mg/L) improved SVIs from 600 to 200 mL/g while increasing oxygen transfer efficiency by approximately 29%, significantly reducing operating costs. A unique approach of “rocking” the aeration along aeration tanks also allowed improved secondary clarifier performance under severely overloaded conditions. The plant has now been in compliance for nearly 10 years.

Messerly Water Pollution Control Plant, Evaluation, Expansion and Upgrade, Augusta, GA - Ron led RTW’s original process evaluation at Augusta to reduce the need for polymer addition to control secondary clarifier blanket loss. Approximately \$1,000/day in polymer savings were realized. Ron then participated in the secondary plant process design for upgrade and expansion to the 40 MGD facility. The upgrade included provision for nitrification and denitrification of the full flow and expansion of flow capacity to 48 MGD. Ron also wrote portions of the facility O & M Manual, focusing on process control philosophy and daily process control activities.

Industrial Facility Evaluation, British Petroleum (BP), Texas City, TX - Ron’s team performed a comprehensive performance evaluation of the British Petroleum (BP), Texas City wastewater treatment plant to investigate steps that could be taken to improve plant performance. The team spent one week onsite evaluating the 20-MGD treatment plant and talking with staff and managers to determine the capacity of the facility and to make recommendations for improvements. In order to successfully evaluate the facility, considerable attention was made to refinery-specific constituents of the wastewater including chromium, phenols, benzene, sulfides, and MEA. The evaluation highlighted several improvements, including process control training and treatment design, many of which have been implemented.

Municipal Facility Evaluation, Strategic Plan Near-Term Goals 1 & 2, Denver, CO - Tetra Tech completed an evaluation for the Metro Wastewater Reclamation District (Metro) entitled "The Treatment and Transmission System Detailed Analysis Report". This report satisfied Metro's Strategic Plan Near-Term Goals 1 & 2. Goal 1: examine Metro's existing wastewater transmission and treatment facilities, determine what capacities exist for future service requirements, and develop a system to maintain an ongoing process of examination and determination. Goal 2: examine Metro's wastewater transmission and treatment facility plans, determine ..., and develop a system to maintain and update the document on an ongoing basis. Most of the facility recommendations were implemented.

Industrial Facility Evaluation, Maple Lodge Farms, Mississauga, Ontario, CA - Ron evaluated the 1.0 MGD wastewater treatment plant for this poultry processing facility to optimize electrical usage. Modified use of aerobic digestion allowed the reduction of 200 hp/day and provided a cost saving of approximately \$180,000/year even though it was based on the low electrical rate of \$0.04/kWh.

Training Programs for Process Control and Optimization

As a world-recognized expert on activated sludge process control and its microbiology, Ron has conducted process control and wastewater microbiology courses across the U.S., and in Canada, China and South America. The following represent just a few of those courses.

Operator Training, Colorado State University, Boulder, CO - Ron Schuyler has supervised and presented at the activated sludge process control training short-schools for 41 years. The classes are typically for 20-30 people and cover the detailed process control requirements for activated sludge systems. They focus on proper data collection, interpretation of data, setting return activated sludge flow rates and wasting rates, setting appropriate DO, and establishing testing and decision protocols to define an effective process control program.

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Engineer/Operator Training, Colorado State University, Fort Collins, CO - Similar to the CU short-school, Ron has co-coordinated and presented at the Colorado State Activated Sludge Process Control Course for 18 years. However, this course is aimed more at engineers, managers, and high-level process controllers.

Operator Training, Tri-State Seminar, Prim, NV - Operator training has been provided since 1992 to as many as 250 operators per session. Ron's focus has always been improving operator's abilities to control their processes upon return home.

Wastewater Professional Training, WEFTEC - For 31 years Ron has chaired and presented at the Wastewater Treatment Microbiology Preconference Workshop. This workshop has nearly sold-out for two sessions each year. Ron also presented at the Preconference Workshop on Activated sludge Process Design and Control in a BNR World for six years.

BNR Microbiology Training, University of Wisconsin - Along with John Esler, Dr. Glen Daigger, Dr. Julian Sandino and Dr. Dimitrios Katehis, presented at a number of BNR design and operation courses sponsored by the University of Wisconsin. Ron was responsible for the BNR Microbiology and Process Control sections.

RTW/Tetra Tech Activated Sludge Training Courses - Ron developed courses for basic activated sludge process control; microbiology, including filament ID; process troubleshooting and optimization; and BNR for 24 years. These have been presented yearly across the United States at various places and for a number of specific clients, and periodically in Canada, China, and Brazil.

Tetra Tech (RTW) Products - Tetra Tech supports professional development with a group of process control and troubleshooting products, all developed by Ron and the Tetra Tech Team. These include the *Tetra Tech/RTW Activated Sludge Process Troubleshooting Chart and Manual, 2nd Ed.*; *BNR Troubleshooting Chart and Manual*; *Chart of common Activated sludge Microorganisms*; *Filamentous Microorganism Staining Kit*; and the *Activated Sludge Process Control Tool-Set* spreadsheet. Ron was responsible for the development of each of these products.

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REPRESENTATIVE ENGINEER/OPERATOR TRAINING INCLUDES:

- Amoco Oil Company
- Beijing and Shanghai, China
- Betz Chemical
- California SARBS, Los Angeles, CA
- Casper College, WY
- Central Davis Sewer District, UT
- Colorado State University
- Crow Indian Reservation, Billings, MT
- Denver Metro
- Dow Chemical, TX
- Edmonds, WA
- Empire, CO
- Flathead Indian Reservation,
- Polson, MT
- Hawaii Water Pollution Control Association
- Indian Hills Community College, IA
- Johnson County, Kansas City
- Kentucky Environmental Training Center
- Lower Brule Indian Reservation, SD
- Merck Pharmaceutical, PA
- Montana Environmental Training Center
- Montana State University
- Moroni, UT
- Morrison, CO
- Neola, UT
- New York City, NY
- Nalco Chemical Company
- National Operator Training Conferences
- National Park Service, Grand Canyon NP
- National Park Service, Yellowstone NP
- Nebraska Environmental Training Center
- Ohio Environmental Training Center
- Pima County, AZ
- Red Rocks Community College, CO
- Region VIII EPA, Municipal Facilities Branch
- Richfield, UT
- Rockaway Regional Valley Sewerage Auth., NJ
- Rocky Mountain Water Environment Assoc.
- Rosebud, SD
- South Dakota Operator's Association
- State of New Jersey
- State of Tennessee
- Sumter Technical College, SC
- Texas A&M
- Total Petroleum, CO
- Toyota, IN
- Tyson, AR, SD, MS
- Union Carbide, So. Charleston, WV
- University of Florida TREEO Center
- University of Colorado – Boulder
- University of Wisconsin – BNR Course
- US Poultry and Egg Association
- Utah Department of Environmental Protection
- Water Environment Federation
- Wayne Farms, Mount Airy, NC
- Wayne Farms, Enterprise, AL
- West Virginia Environmental Training Center
- Western Canada Operator's Association

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Treatment Facility Evaluations/Facility Plan Development (*Nutrient Removal Evaluated)

Domestic

- Aspen Consolidated San. District, Aspen, CO *
- Augusta, GA
- Aztec, NM
- Berkeley County, WV
- Black Hawk / Central City, CO
- Copper Mountain Consolidated
- Crested Butte, CO *
- DeBeque, CO
- Durango, CO *
- Eagle Valley Sanitation District, Vail, CO *
- Elko, NV
- Empire, CO
- Flagstaff, AZ
- Fresno, CA
- Fruita, CO
- Grand Junction, CO
- LaJunta, CO
- Longmont, CO
- Louisville, CO *
- Loveland, CO
- Metro Wastewater Reclamation Dist., Denver, CO *
- Mobile, AL
- Moroni, UT
- Morrison, CO *
- Mt. Crested Butte Water & Sanitation District, CO *
- Neola, UT
- Plum Creek Wastewater Authority, CO *
- Richfield, UT
- Rockaway JSA, NJ
- Rosebud, SD
- S. Charleston Sewage Treatment Company, WV *
- Tri-Lakes SC, Monument CO*
- West Jefferson Co., Evergreen, CO *
- Union Sanitary District, CA
- Windsor, CO *
- Woodmoor Water & Sanitation District, CO *
- Walden, CO

Industrial

- Alcoa, Evansville, IN
- Bayer Crop Science, Institute, WV
- Boulder Valley Poultry, Roggen, CO
- BP – Amoco Refinery, Toledo OH
- BP – Amoco Refinery, Texas City, TX
- Cargill, Eddyville, IA
- Colorado Refining Company, CO *
- DOW Chemical, Freeport, TX
- Goldkist Poultry, Sanford, NC
- Eastman Chemical, Longview, TX
- Farbest Foods, Huntingburg, IN
- Hercules Inc., Louisiana, MO
- Leprino Foods, CO
- Maplelodge Farms, Toronto, Ontario, Canada
- Merck, Danville, PA
- Monsanto, Muscatine, IA
- Pilgrim’s Pride, Elberton, GA
- Sanderson Farms, College Station, TX
- Tropicana, Inc., Fort Pierce, FL
- Tropicana, Inc., Bradenton, FL
- Tyson, Dakota City, NE
- Tyson Foods, Multiple Facilities
- Staley Mfg. (Starch), Alamosa, CO
- Union Carbide, SO Charleston, WV

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LIST OF PUBLICATIONS / PRESENTATIONS

Ron has authored or co-authored more than 50 publications and numerous operator training materials. He developed the *Tetra Tech RTW Activated Sludge Troubleshooting Chart* and *Tetra Tech RTW BNR Troubleshooting Chart* with accompanying manuals: the *Tetra Tech RTW Chart of Common Activated Sludge Organisms*; and the *Tetra Tech RTW Stain Kit* and accompanying manual. He has compiled Activated-Sludge Process Control Course Manuals for the National Environmental Training Center for Small Communities. He coordinated and developed the Water Environment Federation's 2nd Ed. Manual, *Wastewater Biology: The Microlife*, and has chaired and presented at WEF's Preconference workshops on Wastewater Treatment Microbiology for 26 years. He has coordinated and taught at the University of Colorado's Activated Sludge Process Control short-course for operators for 35 years and the Colorado State University short-course on Activated Sludge Process Control for engineers for 18 years.

Schuyler, R. 2017. Chapter primary author in *Activated Sludge and Nutrient Removal*, Water Environment Federation, Alexandria, VA, 2017.

Schuyler, R. 2016. Activated Sludge Microbiology. Presented at Preconference Workshops W05 and W17 on Wastewater Treatment Microbiology at the 89th Annual Water Environment Federation Technical Exhibition and Conference, New Orleans, LA, Sep. 24-28, 2016.

Schuyler, R. 2016. Presentation – Designing for Filament Control. 2016 Joint Annual RMAWWA/RMWEA Conference, Copper Mtn., Sep. 11-14, 2016.

Schuyler, R. 2016. Presentation – Operating for Filament Control. 2016 Joint Annual RMAWWA/RMWEA Conference, Copper Mtn., Sep. 11-14, 2016.

Schuyler, R. 2015. Activated Sludge Microbiology. Presented at Preconference Workshops W06 and W18 on Wastewater Treatment Microbiology at the 88th Annual Water Environment Federation Technical Exhibition and Conference, Chicago, IL, Sep. 26-30, 2015.

Schuyler, R. 2015. Presentation – Microbiological Considerations When Setting Return Rates. 2015 RMSAWWA /RMWEA Joint Annual Conference, Loveland, CO.

Schuyler, R. 2014. Presentation – Activated Sludge Microbiology. RMWEA Red & Jerry's Operator Seminar, Feb. 13, 2014.

Schuyler, R. 2014. Activated Sludge Microbiology. Presented at Preconference Workshops W03 and W19 on Wastewater Treatment Microbiology at the 87th Annual Water Environment Federation Technical Exhibition and Conference, New Orleans, LA, Oct. 27-31, 2014.

Schuyler, R. 2013. Reviewer, *MOP 29, Operation of Nutrient Removal Facilities*, Water Environment Federation, Alexandria, VA, 2013.

Schuyler, R. 2013. Presentation – Activated Sludge Microbiology. RMWEA Estes Park Operator Seminar, Dec. 19, 2013.

Schuyler, R. 2013. Activated Sludge Microbiology. Presented at Preconference Workshops W03 and W19 on Wastewater Treatment Microbiology at the 86th Annual Water Environment Federation Technical Exhibition and Conference, Chicago, IL, Oct. 5-9, 2013.

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Schuyler, R. and S. Scuras. 2012. Presentation – Training the Next WWTP Workforce. 2012 Joint Annual RMAWWA/RMWEA Conference, Copper Mtn., Sep. 9-12, 2012.

Schuyler, R. 2012. Activated Sludge Microbiology. Presented at Preconference Workshops W104 and W203 on Wastewater Treatment Microbiology at the 85th Annual Water Environment Federation Technical Exhibition and Conference, New Orleans, LA, Oct. 15-19, 2012.

Schuyler, R., Tamburini, S, and Tamburini, J. R. 2011. Using the Oxidation Index (OXI) as an Activated Sludge Process Control Tool. Presented at the 84th Annual Water Environment Federation Technical Exhibition and Conference, Los Angeles, CA, Oct. 15-19, 2011.

Schuyler, R. 2011. Activated Sludge Microbiology. Presented at Preconference Workshops W103 and W204 on Wastewater Treatment Microbiology at the 84th Annual Water Environment Federation Technical Exhibition and Conference, Los Angeles, CA, Oct. 15-19, 2011.

Schuyler, R. 2011. Oxidation Index for Process Control. Presented at the 27th Annual Tri-State Seminar on the River, Primm, NV, Sept. 27-29, 2011.

Schuyler, R. 2011. Using the Oxidation Index (OXI) as an Activated Sludge Process Control Tool. Presented at the 2011 Joint Annual Rocky Mountain WEA Conference, Loveland, CO, Sept. 18-20, 2011.

Schuyler, R. 2011. Using the Oxidation Index (OXI) as Activated Sludge Process Control Tool. Presented at the Arizona Water Association 84th Annual Conference and Exhibition, Glendale, AZ, May 4-6, 2011.

Schuyler, R., 2010. A Case for Lower Return Sludge Flow Rates. Presented at the 83rd Annual Water Environment Federation Technical Exhibition and Conference, New Orleans, LA, Oct. 2-6, 2010.

Schuyler, Ronald G. 2010. Activated Sludge Microbiology. Presented at Preconference Workshops W104 and W205 on Wastewater Treatment Microbiology at the 83rd Annual Water Environment Federation Technical Exhibition and Conference, New Orleans, LA, Oct. 2-6, 2010.

Schuyler, R. 2010. DO, AOTE, SOUR, and ORP Relationships. Presented at the 26th Annual Tri-State Seminar on the River, Primm, NV, Sept. 28-30, 2010.

Schuyler, R. 2010. DO, AOTE, SOUR, and ORP Relationships. Presented at the 2010 RMSAWWA/RMWEA Joint Annual Conference, Keystone, CO, Sept. 12-15, 2010.

Schuyler, R. 2010. A Case for Lower Return Sludge Flow Rates. Presented at the Arizona Water Association 83rd Annual Conference and Exhibition, Glendale, AZ, May 5-7, 2010.

Schuyler, R. G. 2010. Big Savings and Energy Conservation at Wastewater Treatment Plants through Operational Control of Biological Processes. Presented at the National Defense Industrial Association's Environment, Energy Security and Sustainability Symposium and Exhibition, Denver, CO, June 14-17, 2010.

Schuyler, Ronald G. 2009. Activated Sludge Microbiology. Presented at Preconference Workshop W101 on Wastewater Treatment Microbiology at the 82nd Annual Water Environment Federation Technical Exhibition and Conference, Orlando, FL, Oct. 10-14, 2009.

Schuyler, Ronald G. 2009. Activated Sludge Microbiology. Presented at Preconference Workshop W201 on Wastewater Treatment Microbiology at the 82nd Annual Water Environment Federation Technical Exhibition and Conference, Orlando, FL, Oct. 10-14, 2009.

Schuyler, R. G. 2009. Using the Comprehensive Performance Evaluation Approach to Optimize Industrial Waste Treatment Facilities. Presented at the National Petroleum Refiners Association Conference, Denver, CO, Sept 21-22, 2009.

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Schuyler, R. G. 2009. The Non-Conventional Approach to Energy Conservation at Wastewater Treatment Plants. Presented at the Colorado Special Districts Association Conference, Keystone, CO, Sept. 23-25, 2009.

Schuyler, R., Tamburini, J.R., Hogg, S., and Staggs, R. 2009. How Low is Too Low? Several Years of Low-Dissolved-Oxygen Improve Effluent Quality. *Water Environment & Technology (WE&T)*, June, Vol. 21, No. 6.

Schuyler, R. 2008. Controlling Activated Sludge Settleability, presented at the 24th Annual Tri-State Seminar on the River, Primm, NV, Sept. 2008.

Schuyler, R., Tamburini, J. R., Hogg, S., and Staggs, R. 2008. How Low is Too Low for DO? Six Years of Unique Operating Experience. Presented at the 81st Annual Water Environment Federation Technical Exhibition and Conference, Chicago, IL, October 13-22, 2008.

Schuyler, R., Tamburini, J. R., Hogg, S., and Toepfer, K. 2008 “Simultaneous Nitrification and Denitrification at Fresno.” Presented at the City of Fresno, 2008.

Schuyler, R., 2008. Workshop on “Activated Sludge Process Control Microbiology,” presented at the TriState Operator’s Conference, Primm NV, Sept. 25 – 27, 2008.

Schuyler, R., 2008. Biological Nutrient Removal. Presented at West Virginia Environmental Training Center, WV, 2008.

Schuyler, R., 2007 “Wastewater Microbiology” presented at Water Environment Federation. Preconference Workshops: Oct. 13-14, 2007. “W108 Wastewater Microbiology”.

Schuyler, R., 2007 Water Environment Federation. Workshop: Oct. 13, 2007 “W111 Activated Sludge Design and Process Control in a BNR World; A Companion Program to W210”.

Schuyler, R., 2007. Microbiology/Control of BNR Systems. Presented at 23rd Tri-State Seminar-on-the-River, Primm, Nevada, Technical Session, 2007.

Schuyler, R., 2006. Developed *Tetra Tech RTW Activated Sludge Process Control Troubleshooting Chart & User Guide (Second Edition)*, Rothberg, Tamburini & Winsor, Inc., Denver, CO.

Schuyler, R., 2005. Developed *Tetra Tech RTW Biological Nutrient Removal Troubleshooting Chart & User Guide* for Suspended Growth Systems, Rothberg, Tamburini & Winsor, Inc., Denver, CO.

Davel, J.; Schuyler, R.; Narayanan, B.; Demur, J.; Swanback, S.; Hogg, S.; Toepfer, K., 2004. Innovative Operational Strategy Provides Relief for Problems with Poor Sludge Settleability. Presented at the 77th Annual WEFTEC Conference, New Orleans, LA, 2004.

Schuyler, R.; Hogg, S.; and Toepfer, K., 2004 Simultaneous Nitrification/ Denitrification Operation in the Activated Sludge Process and the City of Fresno. Presented at 76th Annual California Water Environment Association Conference, Fresno, CA, April 2004.

Schuyler, R., 2004 Using ORP in Control of the Activated Sludge Process. Presented at the 21st EPA National Operator Trainers Conference, Reno, NV, June 7-10, 2004.

Schuyler, R. 2003. What’s Buggin’ You, Part I. *Footnotes*, Feb. 2003, Rothberg, Tamburini and Winsor, Denver, CO.

Schuyler, R. 2003. What’s Buggin’ You, Part II. *Footnotes*, May 2003, Rothberg, Tamburini and Winsor, Denver, CO.

Schuyler, R., 2002. Activated Sludge Microbiology. Presented at the Nevada WEA Conference, Reno, NV, March 21, 2002.

Schuyler, R., 2002. Activated Sludge Microbiology. Presented at Schreiber’s The 2002 Happening, Raleigh, NC, April 4, 2002.

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Schuyler, R., 2002. Activated Sludge Process Control - Data Collection, ORP and Microscopic Examination. Presented at the 18th Annual Tri-State seminar on the River, Laughlin, NV, Sept. 26, 2002.

Schuyler, R., 2002. Activated Sludge Process Control on a BNR World. Presented at the WEF Preconference Workshop, Chicago, IL, Sept. 28, 2002.

Schuyler, R., 2002. Data Collection: Consider the Source. Presented at the 19th Annual National Environmental Trainers Conference, Cleveland, OH, June 11, 2002.

Schuyler, R., 2002. Filaments: Identification and Control. Presented at the WEF Industrial Preconference Workshop, Atlantic City, NJ, Aug. 11, 2002.

Schuyler, R., 2002. History and Development of the Activated Sludge Process. Presented at the Nevada WEA Conference, Reno, NV, March 21, 2002.

Schuyler, R., 2002. Key Note Address "Got Water?" Presented at the 19th Annual National Environmental Trainers Conference, Cleveland, OH, June 9, 2002.

Schuyler, R., 2002. Microbiology of Biological Nutrient Removal. Presented at the 75th Annual WEF Preconference Workshop on Activated Sludge in a BNR World, Chicago, IL, Sept. 28, 2002.

Schuyler, R., 2002. Types of Microorganisms and Bacterial Growth and Nutrient Cycles. Presented at the 75th Annual WEF Preconference Workshop on Wastewater Treatment Microbiology, Anaheim, CA, Oct. 28-29, 2002.

Schuyler, R., Rothberg, M., Skirvin, D., Hamilton, S., and Peters, K. 2002. Using the Comprehensive Performance Evaluation Approach to Optimize Industrial Waste Treatment Facility. Presented at the WEF Industrial Preconference Workshop, Atlantic City, NJ, Aug. 12, 2002.

Schuyler, R. 2002. Developed the *Tetra Tech RTW Ciliated Protozoa Micro-Identification Keys*, Rothberg, Tamburini & Winsor, Inc., Denver, CO.

Schuyler, R. 2001. Effective Activated Sludge Process Control in the Poultry and Egg Industry. Presented at the 2001 Environmental Management Seminar, US Poultry & Egg Association, Birmingham, AL, March 8, 2001.

Schuyler, R. 2001. Types of Microorganisms and Bacterial Growth and Nutrient Cycles. Presented at the 74th Annual WEF Preconference Workshop on Wastewater Treatment Microbiology, Anaheim, CA, Oct. 13-14, 2001.

Schuyler, R. 2001. Developed the *Tetra Tech RTW Bacteriological Stain Kit: A Guide to Microscopy and Staining of Activated Sludge*, Rothberg, Tamburini & Winsor, Inc., Denver, CO.

Schuyler, R. 2000. Filaments, Identification and Control. Presented at the WEF Industrial Waste Preconference Workshop, Anaheim, CA, Oct. 14, 2000.

Schuyler, R. 2000. Oxygen, Wasting and Oxygen Control. Presented at the Tri-State Seminars on the River, Laughlin, NV, Sept. 28, 2000.

Schuyler, R. 2000. Representative Sampling. Presented at the WEF Preconference Workshop on Activated Sludge, Anaheim, CA, Oct. 15, 2000.

Schuyler, R. 2000. Developed *The Tetra Tech RTW Bacteriological Stain Kit*, Rothberg, Tamburini, & Winsor, Inc., Denver, CO.

Schuyler, R. 2000. Developed *The Tetra Tech RTW Chart of Common Activated Sludge Microorganisms*, Rothberg, Tamburini, & Winsor, Inc., Denver, CO.

Schuyler, R. 1999. Biological Nutrient Removal. Presented at RMWEA Seminar, Vail, CO, Oct. 1, 1999.

Schuyler, R. 1999. Filament Identification and Control. Presented at 72nd Annual Water Environment Federation Exhibition & Technical Conference, New Orleans, LA, Oct. 9, 1999.

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- Schuyler, R. 1999. Nitrification & Denitrification, Oxygen Uptake & Representative Sampling. Presented at Tri-State Seminar on the River, Laughlin, NV, Sept. 24, 1999.
- Schuyler, R. 1999. On/Off Aeration Energy Savings, (co-author). Presented at Energy Efficiency Forum, San Diego, CA, Aug. 30, 1999.
- Schuyler, R. 1999. On/Off Aeration Energy Savings, (co-author). Presented at RMWEA/RMAWWA Joint Technical Conference, Jackson, WY, Sept. 13, 1999.
- Schuyler, R. 1999. Types of Microorganisms and Bacterial Growth and Nutrient Cycles. Presented at 72nd Annual Water Environment Federation Exhibition & Technical Conference Preconference workshop, New Orleans, LA, Oct. 9–10, 1999.
- Schuyler, R. 1999. Data Collection for Activated Sludge Process Control. Presented at the 16th Annual EPA National Operator Trainers Conference, Providence, RI, June, 1999.
- Schuyler, R. 1999. On-Off Aeration. Presented at the WEF Plant Operations Conference, Milwaukee, WI, June, 1999.
- Schuyler, R. 1998. Filaments: Identification and Control. Presented at WEF Industrial Waste Treatment Conference, Nashville, TN, March 1, 1998.
- Schuyler, R. 1998. Off the Beaten Path, (co-author), *Operations Forum*, May 1998.
- Schuyler, R. 1998. On/Off Aeration. Presented at RMWEA Mid-Year Conference, Northglenn, CO, June 19, 1998.
- Schuyler, R. 1998. Oxidation Reduction Potential: Optimizing the Activated Sludge System, (co-author). Presented at 15th Annual Operator Training Conference, Tucson, AZ, June 9, 1998.
- Schuyler, R. 1998. Types of Microorganisms and Bacterial Growth and Nutrient Cycles. Presented at the 71st WEF Conference, Preconference Workshop on Wastewater Treatment Microbiology, Orlando, FL, Oct. 3-4, 1998.
- Schuyler, R. 1998. Using Step Feed to Gain Compliance and to Increase Capacity of Activated Sludge Plants. Presented at 15th Annual Operator Training Conference, Tucson, AZ, June 9, 1998.
- Schuyler, R. 1998. Using the Centrifuge and Settleometer for Activated Sludge Process Control. Presented at preconference workshop, Minnesota Pollution Control Agency, March 17, 1998.
- Schuyler, R. 1997. Biomass Quality Management as a Process Control Tool for the Activated Sludge Process, (co-author). Presented at TAPPI Conference, Minneapolis, MN, May 1997.
- Schuyler, R. 1997. Mass Balance by Centrifuge. Presented at 15th Annual National Operator Conference, Lafayette, May 1997.
- Schuyler, R. 1997. On/Off Aeration at Existing Wastewater Treatment Plants Can Conserve Energy, Save Operation Costs and Improve Effluent Quality, (co-author). Presented at WEF conference, Dallas, TX, Sept. 1997.
- Schuyler, R. 1997. Types of Microorganisms and Bacterial Growth and Nutrient Cycles. Presented at the 70th WEF Conference, Preconference Workshop on Wastewater Treatment Microbiology, Chicago, IL, Oct. 18-19, 1997.
- Schuyler, R. 1996. Achieving Complete Nitrification with Ohio Department of Transportation Roadside Rest Area Treatment Systems. Presented at 69th Annual Conference & Exposition of the Water Environment Federation, 1996. (Co-author, Ohio Department of Transportation).
- Schuyler, R. 1996. On/Off Aeration at Existing Wastewater Treatment Plants Can Conserve Energy, Save Operation Costs, and Improve Effluent Quality. Presented at 69th Annual Conference & Exposition of the Water Environment Federation, 1996.
- Schuyler, R. 1996. Problems with Protozoa and Metazoa Counts. Presented at the 12th Annual Tri-State Seminar on the River, Laughlin, NV, Sept. 1996.

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Colorado Water and Angling Consultants
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- Schuyler, R. 1996. Activated Sludge Troubleshooting Guide. Presented at 13th Annual National Operator Trainer's Conference, Chicago, IL, June 10-11, 1996.
- Schuyler, R. 1996. Developed *Tetra Tech RTW Activated Sludge Process Control Troubleshooting Chart & User Guide (First Edition)*, Rothberg, Tamburini & Winsor, Inc., Denver, CO.
- Schuyler, R. 1995. On/Off Aeration Saves Money and Improves Effluent Quality. Presented at 12th Annual National Operator Trainers' Conference, Kansas City, KS, June 1995.
- Schuyler, R. and Weigand, R. 1995. RBC Microlife: A Community Photo Album, *Operations Forum*, February 1995.
- Schuyler, R.; Ramey, W.; Wallace, G.; and Torres, A. 1994. Aeration Cycling Benefits: Conserve Energy, Save Operation Costs. Presented at RMWPCA Conference, Albuquerque, September 1993, at HWPCA Conference, Honolulu, February 1994; and at RMWPCA Mid-Year Conference, Northglenn, CO, April 1994.
- Schuyler, R. and Weigand, R. 1994. RBC Microlife: A Community Photo Album. Presented at WEF Conference, Chicago, IL, Oct. 1994.
- Schuyler, R. 1994. Wastewater Microorganisms. Presented at the WEF Wastewater Microbiology Preconference Workshop, New Orleans, LA, September 1992; Anaheim, CA, October 1993; Chicago, IL, October 1994.
- Schuyler, R. 1993. Bacterial Metabolism. Presented at the WEF Wastewater Microbiology Preconference Workshop, New Orleans, LA, September 1992; Anaheim, October 1993; and Chicago, October 1993.
- Schuyler, R. and Schuyler, S., 1993. Microscopic Identification of Ciliated Protozoa, *Operations Forum*, Aug. 1993.
- Schuyler, R. 1992. Identifying Ciliated Protozoa for Control of the Activated Sludge Process. Presented at WEF conference, New Orleans, LA, September 1992.
- Schuyler, R. G. 1992. Microbiological Evaluation – Microscopic and Oxygen Uptake Tests. Presented at the Workshop on Activated Sludge Process Control Testing, 65th Annual Water Environment Federation Conference and Exposition, New Orleans, LA, 1992.
- Schuyler, R. 1991. Identifying Ciliated Protozoa for Control of the Activated Sludge Process. Presented at Poster Session, WPCF conference, Toronto, Ontario, Canada, October 1991.
- Schuyler, R. 1991. Oxygen Uptake and Microscopic Observation. Presented at the WPCF Preconference Workshop on Activated Sludge Process Control, Toronto, Ontario, Canada, October 1991.
- Schuyler, R. 1991. Wastewater Treatment Processes. Presented at the Colorado Science Association Conference, Denver, CO, April 1991.
- Schuyler, R. 1991. Wastewater Treatment Standards. Presented at the Colorado Science Association Conference, Denver, CO, April 1991.
- Schuyler, R. 1991. What is Sludge Quality? Presented at the RMWPCA mid-year Conference, Denver, CO, May 1991.
- Schuyler, R. and Misbach, G. 1991. What-da-ya Mean, a Two-Sludge System, *Operations Forum*, 1991.
- Schuyler, R. 1991. Instructor for Activated Sludge Process Control, compiled and presented at Red Rocks Community College.
- Schuyler, R. 1989. Colorado's Biomonitoring Program. Presented at the Water Pollution Control Federation's Annual Conference, San Francisco, 1989.
- Schuyler, R. 1989. Microbial Evaluation Using a Microscope/Television System. Presented at the EPA National Operations Conference, New Orleans, June 1989.

Ronald Schuyler, P.E., BCEE, WEF Fellow, CWP

Colorado Water and Angling Consultants
Owner and Process Specialist

- Schuyler, R. 1988. Process Control for Oxidation and Treatment. Presented at the EPA National Operations Conference, Kansas City, 1988.
- Schuyler, R. 1988. Water and Wastewater Issues Facing Local Government. Presented at the Colorado Special Districts Association Conference, Sept. 1988.
- Schuyler, R. 1987. Colorado Water Quality Issues. Presented at Colorado State University Water Symposium, February 1987.
- Schuyler, R. 1987. Filamentous Microorganisms and Activated Sludge Operations in Colorado, (co-author), Presented at RMWPCA Conference, Sept. 1987.
- Schuyler, R. 1987. Summary of Colorado Water Quality Issues. Presented at the RMWPCA Water Quality Awareness Week, May 1987.
- Schuyler, R. 1984. Training and Compliance. Presented at National Environmental Trainer's Association Conference, Washington, D.C., August 1984.
- Schuyler, R. 1984. Wastewater Reuse in Colorado. Presented at CH2M-Hill seminar on Wastewater Reuse, Denver, CO, July 1984.
- Schuyler, R. 1983. Use of the Microscope in Operator Training. Presented at Beijing, Dalian, Shenyang, and Shanghai, People's Republic of China, 1983.
- Schuyler, R. 1983. Power Conservation in Water and Wastewater Utilities. Presented at RMWPCA Conference, Jackson, WY, September 1983.
- Schuyler, R. 1981. Colorado's Approach to Operator Training. Presented at the Rocky Mountain WPCA Conference, Santa Fe, 1981.
- Schuyler, R. 1981. Treatment Plant Energy Analysis. Presented at RMWPCA Conference, Santa Fe, 1981.
- Schuyler, R. 1973. Thoughts on Home Waste Disposal Systems. Presented at the Second Annual Governor's Environmental Geology Conference, 1973.