

Operator Facts

TECHNICAL FACTS FOR WASTEWATER TREATMENT PLANT OPERATIONS

New York State Department of Environmental Conservation

Trickling Filter Optimization Tips

Trickling filters are one of the older technologies still used for wastewater treatment. It is a member of the fixed film family along with rotating biological contactors (RBCs). The treatment process utilizes a biomass or biofilm that attaches or “fixes” itself to a support medium. Trickling filters apply the wastewater to fixed media via a distributor arm with discharge ports on the trailing edge. The advantage of fixed film processes is their relatively low cost to operate. One of the primary disadvantages is a cloudy, turbid effluent. Often the organic and hydraulic loads increase over the years. This can result in the most common problem relating to trickling filters referred to as “ponding.” Ponding is a result of plugging the void spaces between the media and impeding the passage of the distributed wastewater.

The primary detriment to ponding is that a portion of the filter has the air flow through it blocked. Over the long term, this can generate an anaerobic environment, odors, and a dramatic reduction in treatment efficiency. The first step in addressing this problem is to assess the performance of the primary clarifiers by evaluating the effluent. A total BOD₅ with a soluble BOD₅ fraction, and a total suspended solids test can give the operator an indication of the clarifier’s perfor-



An example of ponding.

mance. Many times hydraulic surges, (i.e., wet weather events), can flush particulates out of the clarifier onto the filter plugging the voids in the media. Also, high strength side streams often return from solids handling units through the primaries, increasing organic loadings.

If the clarifiers are not identified as a problem, the second easiest thing to check is the distribution of the wastewater through the filter. This can be done by performing a “pan” test. Place three or four inexpensive aluminum roasting pans in line from the center well to the outside perimeter of the filter. After the distributor arms make a couple of revolutions, measure the volume of the water collected in each pan. Reset the pans along the same line but in different locations and repeat. By recording the pan location and the volume of water, the distribution of the wastewater can be quickly

determined. An imbalance in the distribution of the wastewater can have a negative effect on filter performance. We would agree the arm travels faster at the outer perimeter than towards the center. Wherever the arm spends the least amount of time, (i.e., travels the fastest), is where the most wastewater needs to be distributed. As you move away from the center well towards the end of the distributor arm, increasing volumes need to be discharged for proper balancing. The benefit of balancing the flow is that this controls how our biological worker friends get fed. Too much food in one spot is as bad as not enough food

(continued on Page 3)

Future ABC Exam Dates

Applications for ABC exams must be postmarked by the filing deadline. Those people retaking the ABC exam must have their checks for \$35.00 postmarked by the filing deadline. Applicants who miss the deadline will be scheduled for the next exam.

<u>Exam Date</u>	<u>Filing Deadline</u>
February 23, 2005	January 12, 2005
August 31, 2005	July 20, 2005

Fall 2004

Operator Facts

The purpose of this technical bulletin is to inform wastewater operators about various operational practices, problem-solving approaches, technical developments and certification and training issues.

The bulletin is produced by:

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You are invited to submit technical articles or other information of interest to operators for publication in *Operator Facts*.

Be sure to notify us of a change of address if you wish to continue to receive *Operator Facts* and training notices. Please include your certificate number.

The mention of any product or listing of any company's seminar is not an endorsement by this department.

Send all correspondence to: *Operator Facts*, NYSDEC, 625 Broadway, Albany, New York, 12233-3506, Phone (518) 402-8089 or Fax (518) 402-8082. Visit our website at: http://www.dec.state.ny.us/website/dow/bwcp/foas_main.html



Panel on Wastewater for Local Representatives

Wastewater informational sessions for local representatives including mayors, supervisors, administrators, clerks, and sewer board members are planned for the fall, at no cost to participants. The *Panel on Wastewater for Local Representatives* will be hosted by the Environmental Finance Center at Syracuse University in collaboration with the NY Water Environment Association, the NY Rural Water Association, and the NYS Department of Environmental Conservation.

Municipal wastewater treatment plants represent a huge capital investment that provides a critical public service. The *Panel on Wastewater for Local Representatives* will enable participants to better understand and manage this investment.

The interactive agenda includes speakers from various agencies that fund wastewater facility improvements. Participants will hear firsthand about where grants and loans can be obtained from the NYS Environmental Facilities Corporation, and the USDA Rural Development of State Appalachian Regional Commission.

Additionally, participants will leave with an enhanced understand-

ing of wastewater treatment, including the financial, administrative and environmental responsibilities of elected representatives in relation to wastewater management.

The evening begins with a light buffet-style dinner (included at no charge) and ends with a facilitated roundtable discussion to provide participants with an excellent forum for asking questions and voicing concerns.

Sessions will be held from 5:30 p.m. to 8:00 p.m.:

September 28, 2004

Chenango Valley State Park
Chenango Forks, NY

September 29, 2004

Jamestown Community College
North Campus Center
Dunkirk, NY

October 18, 2004

Thatcher Hall at SUNY Potsdam
Potsdam, NY

Registration will be limited to 25 people for each session so register early!

For more information, contact Amy Santos at the Environmental Finance Center at ascicar@maxwell.syr.edu or at (315) 443-1979.



Visit Our
Website at:
http://www.dec.state.ny.us/website/dow/bwcp/foas_main.html

Trickling Filter Tips

(Continued from Page 1)

in another. Many times the discharge ports in the distributor arms have plates that can be adjusted to increase or decrease flow to a certain area of the filter.

Once ponding has occurred, a common remedy is to flush the area by tying off the distributor arm centered over the affected area with a rope. The additional concentrated hydraulic loading often washes away excess biofilm and/or sludge that may be plugging the void areas in the media. Treatment efficiency is again sacrificed as the operator attempts to free the void areas.

Most older plants were designed to use recirculation. This is often returned to the head of the plant where it may hydraulically overload the primary clarifiers. Not only does one need to be aware of what the recirculation pattern is, but also what impacts it might have on the detention time for the primaries if applicable. As a result of diurnal flow variations, recirculation is generally least detrimental during the low flow time periods where detention times are not adversely affected.

The final recommendation is to upgrade the plant with newer technology media. The replacement of the rock media with plastic media allows the facility to treat higher waste strengths without the ponding problems. Media is rated by a term known as specific surface area which is the square feet of surface area in a cubic foot of volume. In the case of rock, the specific surface area is estimated to be approximately 13 ft²/ft³. This is in contrast to plastic media which can range

from 32 to 66 square feet of area per cubic foot of volume. Rock inherently wastes much of the potential area due to contact with itself, while plastic media has been designed to maximize the surface area for the same given volume. To envision what this means, a standard sheet of plywood is 4 feet by 8 feet, or 32 square feet. Rock is less than half of a sheet on one side, as compared to plastic which can be as high as a full sheet on both sides. The additional surface area of plastic has the theoretical effect of doubling or tripling the existing rock filter volume available for treatment.

A second advantage to plastic media is that volumetric void ratios are 95% or higher. This number states that for a cubic foot of volume, the plastic media only takes up about 5% of that volume. For rock it is a function of the stone size, smaller will pack tighter and reduce void ratios. Rock can have a void ratio as low as 30%. This makes rock media prone to ponding problems since a healthy biofilm will rapidly deplete the already limited void space. Since biofilm thickness is related to organic loading, ponding problems often can be directly proportional to this criteria. This can also limit nitrification as soon as ponding reduces treatment efficiency. Filters cannot nitrify unless the filter removes the majority of BOD₅ allowing a nitrifying bacteria population to become established. The benefits of the new plastic media may allow you to remove a higher percentage of BOD₅ so nitrifiers can become established.

If effluent is marginal try the optimizing tips. If you are frequently out of compliance, do your homework and see if switching to plastic media is for you!

SUNY Ulster Online WW Courses

The Mid-Hudson Health and Safety Institute at SUNY Ulster (Ulster Co. Community College) in Stone Ridge offers a variety of wastewater courses online that are pre-approved for renewal contact hours. Online courses include -

- * **Wastewater Treatment I (64 contact hours): Based upon Volume 1**
Operation of Wastewater Treatment Plants, CSUS Foundation.
- * **Wastewater Treatment II (64 contact hours): Based upon Volume 2**
Operation of Wastewater Treatment Plants, CSUS Foundation.
(*Note that completion of both courses is acceptable for Grade 1/1A certification.)
- * **Wastewater Collection Systems (64 contact hours): Based upon Volumes 1 and 2**
Operation and Maintenance of Wastewater Collection Systems, CSUS Foundation. Note that this course is acceptable for NYWEA's Wastewater Collection System Certification.
- * **Wastewater Analysis (48 contact hours): Volume 2**
Operation of Wastewater Treatment Plants, CSUS Foundation.
- * **Wastewater Treatment-Industrial (48 contact hours): Based upon Industrial Waste Treatment, CSUS Foundation.**

Call 845-339-2025 to get the *Continuing Education Course Offerings* catalog and check out the Environmental Technology Online section at: ceinfo@sunyulster.edu.

RENEWAL TRAINING & UPCOMING MEETINGS



NYWEA News and Events

NYWEA, Inc.
126 North Salina Street - Suite 200
Syracuse, NY 13202
(315) 422-7811
<http://www.nywea.org>

National Events

WEFTEC

95 Technical Sessions, 23
workshops and over 800
exhibiting companies
New Orleans, Louisiana
October 2 - 6, 2004

State Events

77th Annual Meeting
Marriott Marquis
New York City, NY
February 6 - 9, 2005

6 Hour Confined Space
Awareness
(meets part of the Collection
System certification training
requirement)
Fishkill
October 13, 2004 and
Little Falls
October 27, 2004

Genesee Chapter

Winter Meeting
DiPacifics
Canandaigua
December 17, 2004

Long Island Chapter

Controlotron - Flow
Measurement Seminar
Long Island
November 3, 2004

Lower Hudson Chapter

Technical Session
IBM Watson Center
Yorktown Heights
November, 2004

Troubleshooting Guides

There are three excellent, inexpensive posters that are available from the National Environmental Training Center for Small Communities (NETCSC). The posters are set up with various observations, probable causes, what to check or monitor, and solutions.

To order:

- Troubleshooting Guide for Rotating Biological Contactors, Item # TRPSOM09, \$2.15 each.
- Troubleshooting Guide for Trickling Filters, Item# TRPSOM15, \$2.60 each.
- Troubleshooting Guide for Lagoons, Item# TRPSOM08, \$3.05 each.

The posters can be obtained from: NETCSC (West Virginia University) at (800) 624-8301, or you can email them at: www.netc.wvu.edu

Where Have We Been ???

Sorry that *Operator Facts* hasn't been published on our regular quarterly schedule. We apologize for the confusion that we caused some of you.

This issue is our fall issue and will be followed by, as in the past, the winter, spring and summer editions.

We thank you for your patience. Those who have signed up for the electronic version will be receiving issues on a regular basis, via e-mail.

Looking for Some Training?

November 17, 2004
Optimizing SBR Performance
Location: Syracuse
Trainer: NEIWPC
Cost: \$90
Contact: NEIWPC, (978) 323-7929

November 18, 2004
Manager's Forum
Location: Syracuse
Trainer: NEIWPC
Cost \$90
Contact: NEIWPC, (978) 323-7929

December 15-17, 2004
O&M of Collection Systems
Location: Saratoga Co. Fire
Training Center
Trainer: NEIWPC
Cost: \$160
Contact: NEIWPC, (978) 323-7929

March 20-25, 2005
**Troubleshooting Activated
Sludge Problems**
Location: Waters Edge Confer-
ence Center, Old Forge, NY
Trainer: NYSDEC
Cost: \$ 402.00
Contact: Mike Coley (518) 402-8086



Merchandise



Voice Dialers For Sale

The Town of Montgomery has two voice dialers for sale.

A Sensaphone 1104 and a DialStat by Microtel. Both units come with directions.

For more information, contact Michael J. Aiello, Jr., P.E., Engineer for the Town of Montgomery, 110 Bracken Road, Montgomery, NY 12549, or you may call Mr. Aiello at (845) 457-2642.

Employment



The City of Dunkirk is looking for a Wastewater Treatment Plant Operator.

The position is full time and requires a 3A Operators License.

Salary for the position ranges from \$36,739 - \$41,487 plus full benefits.

You should send your resume or apply in person at the City of Dunkirk Personnel Department, c/o Paul Renckens, 342 Central Avenue, Dunkirk, NY 14048.

Interested candidates may also call Mr. Renckens at (716) 366-9872 or email: paulr@dunkirkny.com

Certification Courses

Basic Operations

October 18-29, 2004
Great Lakes Laboratory - Buffalo
(716) 878-5422

November 29-December 10, 2004
SUNY at Morrisville
(315) 684-6670

January 2005
Hudson Valley Community College - Troy
(518) 629-4830

Basic Laboratory

October 4-8, 2004
Great Lakes Laboratory - Buffalo
(716) 878-5422

October 4-8, 2004
SUNY at Morrisville
(315) 684-6670

Activated Sludge

November 1-4, 2004
SUNY at Morrisville
(315) 684-6670

November 8-11, 2004
Great Lakes Laboratory - Buffalo
(716) 878-5422

Supervision and Technical Operations Course

November 15-19, 2004
Great Lakes Laboratory - Buffalo
(716) 878-5422

Management Course

October 18-21, 2004
SUNY at Morrisville
(315) 684-6670

November 29-December 1, 2004
Great Lakes Laboratory - Buffalo
(716) 878-5422



PUBLICATIONS OF INTEREST

Free USEPA publications. The office of Research and Development has manuals, capsule reports, seminar publications, brochures, handbooks, guides to pollution prevention, summary reports, executive briefings, environmental regulations, technology publications, and software at no cost. For a complete listing of publications available write to: ORD Publications (G-72), 26 West Martin Luther King Drive, Cincinnati, OH 45268-1072 or call (513) 569-7562.

Clean Water for Today: What is Wastewater Treatment?, published by the Water Environment Federation, gives a general description of typical wastewater

treatment plant processes. Topics discussed include primary and secondary treatment, physical and biological processes, typical treatment trains for sludge handling, plant management, monitoring and permitting requirements, and inflow and infiltration. The 18-page booklet could serve as a resource for local and state officials and the general public.

The cost for the booklet is \$1.00 and it is available from National Small Flows Clearinghouse, West Virginia University, P.O. Box 6064, Morgantown, WV 26506-6064, (800) 624-8301 or contact their website at:

www.nsfcc.wvu.edu



Grade 1

Roger Bishop New York City
 Ronald P D' Alessio New York City
 Robert E Flynn New York City
 Michael Friscia New York City
 Thomas MGwillym New York City
 Stefanis Hatjstefanis New York City
 Brian J Healey New York City
 Rafael Ignacio New York City
 Edward S Mahlstadt New York City
 Robert A May Westchester
 Rohitkumar A Mistry Westchester
 Anthony E Mitchell Westchester
 Michael R Pierre Yates
 Terence K Rhett Westchester
 Francis Rufrano New York City
 Sergey Shramko New York City
 Richard C Small Westchester
 Milagros Soriano New York City
 Jesse M Streeter New York City
 Joshua R Vital Greene
 Yunju Xia New York City

Grade 1A

Timothy Brown Ulster
 Jason N Craig Delaware
 Daniel F Gordon Jr Westchester
 Paul J Kadlec Jr Westchester
 Bryan W Moraski Schenectady
 Philip R Nikolaus Schoharie
 Caitlin A Parker Otsego

Grade 2

Alan C Aldi Schenectady
 Dennis M Armes Erie
 Douglas J Attridge Suffolk
 Larry R Bishop Chenango
 Timothy B Clark Delaware
 John Ingrassia Ulster
 Charles W Jaeger Nassau
 Thomas J Lee Broome
 Michael GRyman Ulster
 Stanley Smith Montgomery

Grade 2A

Md N Ahsan New York City
 John Anderson Delaware
 Anthony R Avery Ulster
 Thomas Bittler Genesee
 Mike Brady Delaware
 Isaiah Collins Madison
 Stephen J Condon Delaware
 Glenn F Curley Delaware
 Michael D' Agati Delaware
 Kevin J Davis Oswego
 David A DeWolf Wayne

Congratulations
**To Our New
 Certified
 Operators!**



Frederick J Doyle Delaware
 Paul Durgin Greene
 Robert E Foley Greene
 George M Hartling New York City
 Robert Heyward Out Of State
 Michael R Hoke Cortland
 Eric Jones Otsego
 Keith Kinnicutt Schenectady
 Ralph W Kirschkel Rockland
 Woodrow E Kissel Clinton
 Philip T Miller New York City
 Michael F Milone Westchester
 Peter Navas New York City
 Robert Payne Delaware
 Mary Radcliffe Out Of State
 Kevin L Rudes Jefferson
 Lawrence P Salvagni Albany
 Antonio R Santana New York City
 Dawn St. Louis Essex
 John Tekula Out Of State

Grant E Thomas Yates
 William L Troost Delaware
 Dana W Williams Jr Chautauqua

Grade 3

Jonathan M Bardo Chautauqua
 David A Burt Chemung
 Richard Johnson Jr Steuben

Grade 3A

Catherine Aingworth Tioga
 James D Buchan Ulster
 Frederick Delaney New York City
 Alan R Ducatte Clinton
 Anthony Firriolo New York City
 Brian L Gifford Out Of State
 Patrick T Hall Erie
 Michael Jonker Schoharie
 Douglas L Kinsley Tioga
 Camilo Madadsec New York City
 Andrew K McBride Ulster
 Kiah Miller New York City
 Gary Payne Delaware
 Linda J Podeszedlik Dutchess

Grade 4

David A Scott Niagara

Grade 4A

Richard L Boyd Onondaga
 Raymond P DeSantis Warren
 John T McCormick Steuben
 Luxman C Paul New York City
 Michael Reichel Suffolk
 Amilcar Rodriguez New York City
 William Schroder, Jr New York City
 Leonard R Young Onondaga

ABC Exam Statistics

<u>Grade</u>	<u>% Passing</u>	<u>% of Exams</u>	<u>Average Score</u>
1	51	41	70
1A	100	7	79
2	71	14	76
2A	79	39	79
3	43	7	66
3A	50	28	71
4	53	3	67
4A	62	17	71



for
**February 25, 2004
 Exam**

DEC Honors Outstanding Wastewater Treatment Facility

The Village of Waterville, located in Oneida County, is the year 2003 winner of the Region 6 Operations and Maintenance (O&M) Award for their wastewater treatment facility.

The Region 6 award program is open to wastewater treatment facilities located in Oneida, Herkimer, Lewis, Jefferson and St. Lawrence counties. The award program is designed to heighten public awareness about the importance of New York State's waters and recognizes the staff at wastewater treatment facilities for their fine work and dedication to protecting public health, the environment, and the public's investment.

Highlights from the Village of Waterville award application include a number of outstanding and innovative approaches to the facility's O & M, including a strong public education program and an exceptional land spreading operation and composting facility. The operators also do an outstanding job of keeping the facility running at a high degree of wastewater treatment while discharging a very good quality effluent to Big



Waterville Mayor Nora Keating and Chief Operator Louie Langone accept awards from the DEC's Sandra LeBarron in a ceremony at the village wastewater treatment plant.

Creek.

Mr. Louis Langone, chief operator, has always had a willingness to share what he's learned. The facility has participated in numerous open houses and every year the students (7th grade class) from the Village of Waterville School District tour the facility and the chief operator describes the operational phases of the facility. The tour is an educational tool that helps students understand wastewater treatment and the sludge composting facility. This educational program also provides posi-

tive public relations and promotes public awareness.

As with most wastewater treatment facilities, sludge handling and disposal are a big part of the annual operating budget. The Village of Waterville began composting its sludge in October of 2000 and has successfully land applied its sludge since 1993. The facility enjoys substantial savings through beneficial reuse that makes a positive contribution to the environment. Land application saves the village approximately \$ 35,000 per year.

In October 2000, Waterville began composting the sludge with the village's green waste and produced a product that local residents can use. Since the village has been composting the sludge, numerous other municipalities expressed interest in taking its plant tour. Tours are great public relations tools.

A committee of DEC Water Division staff selected winning facilities based upon outstanding wastewater treatment performance, innovation and management efforts that resulted in high levels of regulatory compliance.

Wastewater Collection System Survey Update

Thanks to all who have completed the Wastewater Collection System Survey. We have received and processed 95% of the 610 surveys sent to municipal SPDES permittees! Results of the survey compiled thus far account for over 22,000 miles of sewers and 2,500 pump stations serving 7.2 million New

Yorkers (not including an additional 400 municipal satellite collection systems). Initial evaluation of the data has produced some very interesting findings: 1) Approximately one-third of the state's sewers pre-date 1950; 2) 36% of the pump stations in the state have on-site auxiliary power; 3) The average

annual residential sewer user rate is \$306. Results of the survey are being used to evaluate where, why and how many SSOs occur on average each year and how an SSO rule would impact the state. A comprehensive report should be available this fall.

FOAS Mourns Wastewater Advocate

It is with great sadness that we report the passing of N.G. Kaul on February 25, 2004.

N.G. had retired in March 2002 from the New York State Department of Environmental Conservation to manage the EPA Hudson River dredging project.

He had 27 years of service with DEC and retired as the former Director of the Division of Water.

Well known for his management and engineering skills, he is more fondly remembered for his people skills. Blessed with an uncanny knack for negotiating, N.G. had the ability to bring opposing views to middle ground, fostering a spirit of cooperation. His quick wit and humor was his trademark.

“N.G. Kaul was a gifted leader



N.G. Kaul at his retirement celebration in 2002.

in environmental protection in New York,” said Jane M. Kenny, the EPA’s regional administrator. “His commitment to his work and the mission of protecting public health and the environment was unmatched.”

“He did so with intelligence, sophistication, grace and charm,” she said.

Recognizing the critical role that wastewater treatment plays, N.G. was an avid supporter of operators and the strict training program required to maintain their level of professionalism. He worked to assure that funding and support was available to maintain these high standards.

We will sorely miss this mentor, leader and advocate for the environment.

Visit FOAS' Website:
http://www.dec.state.ny.us/website/dow/bwcp/foas_main.html

New York State DEC
Facility Operations Assistance Section
625 Broadway - 4th Floor
Albany, New York 12233-3506

