



Wastewater Education

Blue Ridge Foothills District

March 30, 2017

Dan Theobald

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Dan Theobald

- 1987-Started Operating WWT Plants
- 1989-Initiated Training WWT
- 1997-Started working for Myself
- 2001-Launched Website
- 2002-Deliver Guarantee Cost Reductions
- 2011-Began Online Article Publication

Presentation Timing

- I Talk 35 Minutes
- Answer any of your Questions (8 Minutes)
- My concluding Remarks

Presentation Topics

- WWT Operator Licensing Process
- WWT Education Resource Options

WWT Operator License Process

- SC Environmental Certification Board
- <http://www.lir.state.sc.us/POL/Environmental/>

South Carolina Board of Environmental Certification

Board News

- **Online Applications Are Now Available**

You can now submit applications online! Online applications are a fast, easy, and secure way to submit for certification to the board. Please visit: <https://eservice.llr.sc.gov/NewAppsV2/Login/LoginPage?ReturnUrl=%2fNewAppsV2%2f> to start the application process.

You may also apply with a paper application. These applications are available at:

<http://www.llronline.com/POL/Environmental/Index.asp?file=pub.htm> Please note that these forms have been updated. The old forms will no longer be accepted.

- **Attention: OnLine Renewal Payments**

Renewal payments for 2016-2017 may be paid online through June 30, 2016. After that date the option to pay online will not be available. Any late payments for that renewal period, must be submitted with a paper renewal form: Renewal Forms

- **Administration Citations**

New Process-Administrative citations have been authorized by the Environmental Certification Board pursuant to S.C. Code of Laws Ann. §40-23-95 (1976, as amended). These administrative citations for unlicensed practice and aiding and abetting unlicensed practice may be issued by the LLR Office of Investigation and Enforcement (OIE).

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FAQ
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Change Your Address
Application status
Print copy of your license

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Laws and Policies
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Related Links

Complaints / Board Orders

File a Complaint
Board Orders
What can I expect when a complaint is filed against me?

Contact Us

Board Email: Contact.Environmental@llr.sc.gov
Board Phone: [\(803\) 896-4430](tel:(803)896-4430)
Administrator: Molly Price
Board Staff: Meredith Buttler
Advice Counsel: Hardwick Stuart **
Directions: 110 Centerview Dr, Columbia SC

**The Office of Advice Counsel is responsible for providing legal advice to all Boards, Commissions and Panels. These attorneys do not provide legal advice to parties outside LLR.

SCECB Web Site Features

- Board News-Online Application & Renewal
- Board Meetings-Calendar
- Licensure-License Lookup & Forms
- Licensure-Update your Location Status

WWT Education Resource Option

- Online Training
- <http://www.esdlt.com/online-training/>

BUNDLE GOLD

12 Hours of Training
w/CEU's File

\$100.00 download

Math Word Problems to Solve:

This Self-paced training provides Resources and Simulates alternate online Conversions to learn different applications for calculating **Detention Time**, **Efficiency**, **BOD Lab Calculation**, **Mean Cell Residence Time (MCRT)**, **Foam (Lbs.)**, **Total Dynamic Head (TDH)**, **Velocity**, **Volume** and more.

Also increases operator skill by examining the precise Step-by-Step Solutions for each **Math Word Problem to Solve** and by reviewing 115+ similar example Math Word Problems and pore over each Step-by-Step Solution & also by scanning thru 15+ detailed Wastewater Math articles.

Access to Online Resources:

Workbook Template includes...

- ✓ Formulas
- ✓ Conversions
- ✓ Sample Math Problems & Solutions

Template Bundles:

Workbook Template includes...

- ✓ Conversions
- ✓ Volume
- ✓ Lbs. Waste Stream Calculations
- ✓ Lbs. Percent Solutions Calculations
- ✓ Lbs. Tank Volume Calculations

Available for immediate download.

\$100.00 - Add to Cart

WWT Other Education Options

- Tonight's One Hour Presentation
- <http://www.esdlt.com/brfd-03302017/>

Questions & Answers

Are there Math Resources?

- Wastewater Dan's Math Solutions
- <https://www.wateronline.com/author/daniel-theobald>



Drinking Water ▾

Wastewater ▾

Industrial ▾

Utility Management ▾

Innovations



DANIEL THEOBALD ARTICLES



Math Solutions: Pump Performance And Efficiency Calculations



By *Daniel Theobald*, "Wastewater Dan"

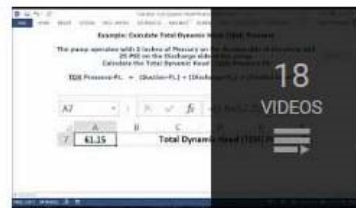
Water Online's "Math Solutions," presented by wastewater consultant and trainer Dan Theobald ("Wastewater Dan"), instructs operators on pump performance and efficiency calculations.

Pump performance and efficiency calculations, whether for certification exams or for operating your plant, may require various head pressure calculations, different horsepower calculations, or certain efficiency calculations.





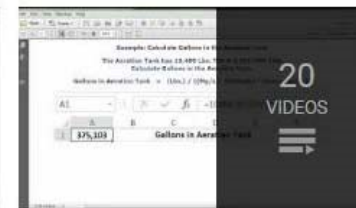
Wastewater Math Solutions



Pump Performance & Efficiency Calculations



Process Control-Wastewater Math Solutions



Volume-Wastewater Math Solutions



Conversions-Wastewater Math Solutions



Pounds-Wastewater Math Solutions



Published Articles



TV Appearances



Environmental Services

Are there Cost Reduction Resources?

- Dan's Cost Reduction Locator
- http://www.pollutionequipment-digital.com/pollutionequipment/april_2013/?pm=1&u1=friend&pg=8#pg8



Ellis manufactures a complete line of industrial wastewater treatment equipment, and specializes in customized equipment and packaged systems.



DMEC (Dissolved Air Flotation)

Removes TSS, Oil, TSS, BOD and COD
 • Compact design – small footprint
 • Flow rates from 10 to 1700 gpm
 • 75" bottom to sludge layer is standard
 • Advanced diatom design



OWS (Oil Water Separator)

Removes free & dispersed oils from water
 • Flow rates from 10 to 1000 gpm
 • Integral oil & sludge reservoirs
 • Easily removable media
 • No moving parts



IPC (Inclined Plate Clarifier)

Removes metals, turbidity and settleable suspended solids
 • Flow rates from 10 to 600 gpm
 • Sludge blanket + thickener is standard
 • Low headroom requirements

Contact: **John Schwane**
 Ellis Corporation

- Field service • Over the years
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The Cost Reduction Locator: Four Steps to Measurable Results!

The Four Steps to Measurable Results are as follows:

- 1.) Data Collection
- 2.) Analysis
- 3.) Identify/Recommend Solutions
- 4.) Execute Solutions & Specify/Document Measurable Results

You can utilize the Cost Reduction Locator by using these four steps as follows:

Data Collection

Collecting Data is to convert the overall project into specific questions. As an example, one of the questions would be, "What is the overall project?" Under that you might say, "What are the specific components of the project?" After you've identified the specific questions, the next thing you do is as follows:

- 1.) Conduct Interviews
- 2.) Retrieve Relevant Documentation
- 3.) Perform Necessary Observations

Analysis

Under analysis, the first thing is to determine that data collection is both reliable and relevant.

Working on the cost of a specific profit center, something is relevant if it is specifically a cost of that profit center. If it's a cost of another profit center it's not relevant. If it's got some component with something other than costs, or some other profit center, those are examples of something that's not relevant.

Also, the data collected must be reliable. Reliability can include confirming data with a second source or confirming the data with other documentation. Each data point must be both reliable and relevant to your specific questions.

Analyze relevant and reliable data which only satisfies project requirements.

For example, if you're dealing with costs, maybe looking for cost and efficiencies, you look at the unit and you look at the units used to see if there is an opportunity there to identify inefficiency. If you're looking at chemicals you look at the chemical type that's used ver-

sus the chemical type that's required for that particular task. It could very well be that on the chemical side it is an inefficient chemical. The only way that you can actually complete this is to have an understanding of the subject matter. If you don't have an understanding of the subject matter, you cannot satisfy this part of the task. This is where experience of the overall task requirements is necessary.

Identify/Recommend Solutions

The third step is to identify and recommend solutions. Start out by taking this data comparison aspect of the analysis and then identify those inefficiencies which then can be specific solutions. Go through the data collection, go through the analysis and then, based on that, identify the sources for solutions and put those solutions in specific items. Is it one solution? Is it multiple solutions? Identify solution or solutions, then develop the recommendation by documenting and communicating other solutions to the relevant decision makers.

Execute Solutions & Specify/Document Measurable Results

The fourth step to the cost reduction locator is to execute the solutions and specify/document measurable results. First develop, communicate, train and implement procedures for each solution. With one solution, there is one set of procedures. With multiple solutions, there are multiple sets of procedures. This is part of the documentation and can always go back to the steps to be specific with justifications. Of course, the final aspect of this executing and specifying/documenting is to document the measurable results. Track the execution of these procedures for each solution to document results.

This Cost Reduction Locator of Measurable Results is reported to the decision makers.

The home of the Cost Reduction Locator is www.WaterwaterAerators.com which was created and is operated by Waterwater. Dial 866/815-7679.

Circle 27 on CARD

Are there Tips to Manage Discharge Permit?

- Dan's Limits Page article
- <http://www.watertechonline.com/limits-page-is-key-to-discharge-permit-compliance/>

LIMITS PAGE IS KEY TO DISCHARGE PERMIT COMPLIANCE

Complying with a discharge permit requires careful examination of its limits page.

DAN THEOBALD MAY 5, 2016

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CATEGORY: 40 CFR (If Applicable)

PARAMETER	DISCHARGE LIMITATIONS		MONITORING FREQUENCY	SAMPLE TYPE
	Daily Maximum Mg/L (Lbs. /Day)	Monthly Average Mg/L (Lbs. /Day)		
BOD₅	300 Mg/L (7,500 Lbs. /Day)	M & R	Monthly	24 Hr. Composite
TSS	M & R	M & R	Monthly	24 Hr. Composite
Oil & Grease	100	100	Monthly	Grab
Ammonia Nitrogen	45 Mg/L (1,125 Lbs. /Day)	30 Mg/L (750 Lbs. /Day)	Monthly	24 Hr. Composite
FLOW	.0795 MGD (125 GPM)		3 Consecutive Days	
FLOW		3.0 MGD	Daily	Discharge Meter
pH	=>6.0 - <=11.0		Monthly	Grab

Are there WWT Process Controls Suggestions?

- Dan's Live Webinar Answers
- <https://drive.google.com/file/d/0B8X9ZwMLk3zJQUxRaW9nQVd0NHM/view>



Water

Technology

INSIGHTS TO IMPROVE WATER MANAGEMENT

ASK the EXPERT

Industrial Water Management Challenges

Speaker Bio



**Joseph Cotruvo,
Ph.D., BCES**

Water Technology
Technical Editor
Consultant & Former
Director of the EPA
Drinking Water Standards
& Risk Assessment
Divisions



Dan Theobald

Water Technology
Columnist
Wastewater
Consultant/Trainer



Slides

ASK THE EXPERT

INDUSTRIAL WATER MANAGEMENT CHALLENGES

Water
Technology



Why Maintain DO Level between 1.0 and 2.0 Mg/L in Aeration?

- Dan's Question 22 Min. in Live Webinar
- <https://drive.google.com/file/d/0B8X9ZwMLk3zJQUxRaW9nQVd0NHM/view>



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Media Player



Slides

AERATION & DISSOLVED GAS CONTROL CHALLENGES



Why must we maintain a DO level between 1 mg/L to 2 mg/L in an aeration tank?

- Maintain aerobic organisms to effectively remove organic matter.
- Affects oxygen transfer rate and indicates sufficient mixing.



Reasons for Slow Settling Sludge in Aeration Tank?

- Dan's Question 12 Min. in Live Webinar
- <https://drive.google.com/file/d/0B8X9ZwMLk3zJQUxRaW9nQVd0NHM/view>



Speaker Bio



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13:01/61:28



Slides

AERATION & DISSOLVED GAS CONTROL CHALLENGES



Why would sludge from an aeration tank not settle during a settling test with a reading at 960 ml?

Also, what is needed to achieve a settling volume of 400 to 500 ml?



- Because it is old sludge or because of filamentous microorganisms.
- Consider increased sludge wasting.



Dan Theobald



What are Tips for Optimizing Pump Metering WWT Chemicals?

- Dan's Empowering Pumps article
- <http://empoweringpumps.com/pump-metering-wastewater-chemicals-operationally-effective-and-cost-efficient/>

Pump Metering Wastewater Chemicals Operationally Effective and Cost Efficient

September 23, 2013  643  1

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Pumps are the heart of wastewater treatment systems and pump metering chemicals is critically imperative to required wastewater treatment!

What are Industrial Water Conservation Tips?

- Dan's interview Water Recycle & Reuse
- <http://www.waterworld.com/articles/iww/print/volume-13/issue-2/feature-editorial/safeguarding-the-supply-identifying-water-conservation-solutions-among-industries-worldwide.html>

Industrial WaterWorld®

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HOME BOILER FEEDWATER COOLING WATER HIGH PURITY PROCESS AND MAKEUP WATER PRODUCED WATER WASTEWATER WATER REUSE TECHNOLOGY

Home > Safeguarding the supply: Identifying water conservation solutions among industries worldwide

SAFEGUARDING THE SUPPLY: IDENTIFYING WATER CONSERVATION SOLUTIONS AMONG INDUSTRIES WORLDWIDE

By Art Haddaway
Assistant Editor



What are Trends in Future for Water?

- Dan's Flow Control Magazine Article
- <http://www.flowcontrolnetwork.com/5-key-trends-that-will-shape-the-future-of-water-wastewater/>

5 KEY TRENDS THAT WILL SHAPE THE FUTURE OF WATER & WASTEWATER

Today's industrial wastewater managers face an overflowing plate of immediate and long-range challenges.

DAN THEOBALD — SEPTEMBER 22, 2015

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Offer #2 Tonight

- Finders Fee between \$100 and \$1,000
- Refer me to either Training *On Site* or Consulting-*Guarantee Cost Reduction*

Concluding Remarks

- An Hour Education Presentation .1 CEU's
- OnLine Training Courses Discounted 25%
- Finders Fee-for Consulting & Training
- Wastewater Math Resources
- Wastewater Process Control Resources
- Share Insight on Future of Water