

Dr. David Jenkins Technical Series

**Relating Fundamentals of Biological Nitrogen
Removal to Retrofit Activated Sludge Plants**

WORKSHOP #1

August 29, 2024

**SF Bay Regional Water Quality Control Board
1515 Clay Street, Oakland, CA**



***This workshop will provide the technical knowledge
to retrofit conventional wastewater treatment plants
to accomplish nitrogen removal goals***

AGENDA

| Time Start | Time Finish | Minutes | Topic |
|------------|-------------|---------|--|
| 8:30 | 9:00 | 30 | Registration and Coffee |
| 9:00 | 9:10 | 10 | Introduction and Learning Goals |
| 9:10 | 9:30 | 20 | Nutrient Overview in SF Bay Area |
| 9:30 | 10:15 | 45 | <u>Developing a Nutrient Management Strategy or Roadmap:</u> Carbonaceous Activated Sludge Trickling Filter and Hybrid Activated Sludge Plants Intensification Facilities with Digestion or Codigestion Multi-Benefit and Regional Solutions |
| 10:15 | 10:30 | 15 | Break |
| 10:30 | 11:15 | 45 | <u>Nitrogen Removal Fundamentals</u> Forms and Transformations in Wastewater Ammonia Removal – Nitrification Nitrogen Removal – Denitrification N Removal Effects and Impacts on Sludge Production Nitrogen Removal Effects and Impacts on Recycle Nitrogen Removal Effects on Aeration and Energy Consumption Deammonification |
| 11:15 | 11:30 | 15 | Q&A or Panel Discussion |
| 11:30 | 12:15 | 45 | Lunch Break (Lunch Provided) |
| 12:15 | 12:55 | 40 | Carbonaceous Activated Sludge Case Studies |
| 12:55 | 2:15 | 80 | Hybrid and Intensification Case Studies |
| 2:15 | 2:30 | 15 | Break |
| 2:30 | 3:10 | 40 | Sidestream Case Studies |
| 3:10 | 3:50 | 40 | Multi-Benefit and Regional Solution Case Studies |
| 3:50 | 4:05 | 15 | Q&A or Panel Discussion |
| 4:05 | 4:15 | 10 | Wrap-up and Next Topics |
| 4:15 | | | Adjourn |

Learning Objectives

To familiarize the audience with:

- Nutrient regulations and impacts in the SF Bay
- SF Bay case studies for developing a nutrient strategy
- Fundamentals of nitrogen characteristics and forms in wastewater
- Nitrogen removal by activated sludge in BOD removal only plants
- Ammonia removal by nitrification
- Nitrogen removal by denitrification
- Nitrogen removal effects on sludge production
- Nitrogen removal effects on recycle streams
- Aeration and energy considerations in nitrogen removal

Ground Rules:

1. **Punctuality:** We have a lot of information to cover and a lot of learning to do together. We will start and stop on time for all breaks to ensure you get your full worth!
2. **No Disturbances:** Smart phones will actually play a role in this training but should be turned to vibrate so as to not disturb others during the workshop.
3. **Participation:** This is NOT intended be one-way communication to audience. To get the most from this workshop, you will need to be an involved and engaged participant in each module.
4. **Ask Questions:** If you do have a question you don't want to ask in front of others, ask it privately during a break. Please do not think any question you have is unimportant.