



**West Central Oregon Section**  
***Microbiology and Laboratory Training***  
**November 6<sup>th</sup> & 7<sup>th</sup>, 2023**

**Agenda**

Designed for water and wastewater operators/laboratory technicians to demonstrate the essential function of the brightfield and phase contrast microscopes while identifying Protozoa, bacteria, and non-living items found in wastewater, along with methods for ensuring optimal functioning of wastewater system based on microscopic findings.

**Course Topics:**

- ✓ Demonstrate the basic principles and components of the microscope
- ✓ Optimize microscope optics
- ✓ Use biological and differential stains
- ✓ Identify non-living items in microscopic examination
- ✓ Explain the effect of various classifications of protozoa in a water system
- ✓ Recommend Control methods for filamentous bacteria
- ✓ Demonstrate proper cleaning and care for the microscope
- ✓ Prepare microscope slides
- ✓ Perform basic microscope troubleshooting
- ✓ Identify and classify protozoa in accordance with wastewater analysis
- ✓ Identify species of filamentous bacteria
- ✓ Perform objective and subjective analysis of wastewater

**Timeline**

**11-6-2023**

8:00- 9:45am	Lecture in Classroom
10:00- 12:00pm:	Microscopy Lab
12:00-1:00pm:	Lunch
1:00- 2:00pm:	Lecture
2:15- 3:30pm:	Microscopy Lab

**11-7-2023**

8:00- 9:45am	Lecture in Classroom
10:00- 12:00pm:	Microscopy Lab
12:00-1:00pm:	Lunch
1:00- 2:00pm:	Lecture
2:15- 3:30pm:	Microscopy Lab

**Total Training Time: 16.0 hours WW**



## Instructor Background And Information Form

Thank you for filling out this form.

Presentation Title: Wastewater Microbiology

Presenter: Victor Santa Cruz Title: Retired/Former Biologist

Employer: \_\_\_\_\_ Address: \_\_\_\_\_

City: Perris State: CA Zip: 92571 Phone: 951-230-8839

Summary of Lesson content: 1. Phase contrast microscope: Calibration, use, and maintenance 2. ID of WW organisms: Protozoans/Metazoans/Filamentous Bacteria 3. Use of lab techniques such as stains and morphology for corroborating microscopic id. 4. Understanding ecology/biology of WW bacteria and plant operation and conditions

Professional Background: ( Note a brief - 2 page maximum - resume may be submitted in lieu of the following data. Please be sure the resume includes all requested information. Qualifications should be related to your presentation.) Use the reverse side of this form if more room is needed to fully answer the following questions.

Primary Knowledge/Skills/Abilities related to presentation: See attached Resume

Education (High School, Upgrades, Colleges and Degrees): See attached resume

Professional Registration/Certification: \_\_\_\_\_

Related papers/instruction you have presented:

Title: \_\_\_\_\_ Date: \_\_\_\_\_ Event: \_\_\_\_\_

Title: \_\_\_\_\_ Date: \_\_\_\_\_ Event: \_\_\_\_\_

Professional Organizations/Activities: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_ Date: \_\_\_\_\_

Course sponsor: \_\_\_\_\_

Signature of Instructor: \_\_\_\_\_ Date: 18 September 2023

**DO NOT WRITE BELOW THIS LINE**

Date Evaluated: \_\_\_\_\_ By: \_\_\_\_\_ Approved: Yes \_\_\_\_\_ No \_\_\_\_\_

Return Completed Form To: OESAC CEU COMMITTEE  
P.O. Box 577  
Canby, OR 97013-0577  
Email: [info@oesac.org](mailto:info@oesac.org)  
Phone: 503-698-6486

# Victor M. A. Santa Cruz

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## Objective

To learn about the various interdisciplinary aspects of wastewater treatment and their relationship with one another.

## Experience

Note: Chino Basin Municipal Water District became Inland Empire Utilities Agency circa 1995-1997.

### *Laboratory Internship*

January-May 1987 Chino Basin Municipal Water District Ontario, CA

1. Learned about the various procedures and analyses performed in a wastewater treatment laboratory.
2. Performed both laboratory assistant and technician duties.
3. Developed new procedures, installed new equipment.

### *Laboratory Assistant (Part Time)*

June-November 1988 Chino Basin Municipal Water District Ontario, CA

1. Performed industrial waste sample collection, read meters, and other aspects associated with industrial waste.
2. Learned new more complex laboratory procedures.

### *Laboratory Technician/Bioassay Technician/Biologist*

1988-2020 Inland Empire Utilities Agency Ontario, CA

1. Increased responsibilities with increase in job titles.
2. Managed microbiology and bioassay sections, QA/QC as well as California State lab and NELAP certification.
3. Retired Jan 2021

## Education

California State Polytechnic University, Pomona 1987

Bachelor of Science---Animal Science: Pre-Veterinary Option. Minors in Chemistry and Microbiology

## Professional Conference/Workshop Presentations

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***Wastewater and Aquatic Microscopy Workshops:*** Water Quality Lab Analyst Section (W3QLAS) of Pacific Northwest Clean Water Association in conjunction with Peninsula College offer a Wastewater certification curriculum. 3 and 4 day annual training for laboratory professionals held in Port Angeles, WA in 2005, 2006, 2007, 2008, 2009, 2011. Responsible for presenting information relating to wastewater organisms and use of various types of microscopes and educating attendees.

***TriCounties Association of CWEA:*** June 2008. Nocardia, Microthrix, and Wastewater Organisms PowerPoint presentations

***CWEA Annual Conference:*** April 2008. Nocardia, Microthrix, Immunological and Genetic Assays PowerPoint presentations

***Wastewater Microscopy Workshop:*** February 2009. Sponsored by Eastern Municipal Water District. 2 days worth of presentation in regards to identification of wastewater organisms with hands-on approach. Fundamentals of microscopy and proper use and maintenance of microscopes. Staining basics

***CWEA Specialty Laboratory Preconference Workshop:*** April 2009. Protozoans and Metazoans, Alkalinity and Volatile Acids, and Multiple Tube and Colilert Analyses.

***San Francisco/Santa Clara Valley Sections of CWEA Wastewater Microbiology and Biology Workshop:*** July 2009. 2 day long workshop presenting biological, microbiological, and ecological aspects of wastewater

***Oregon Operators Conference:*** November 2009. 1 day of presentations dealing with biological, microbiological, and ecological aspects of wastewater.

***Aquatic Microscopy workshop:*** W3QLAS Section of PNCWA March 23-25, 2011. 3 day workshop with hands-on practical presentations in conjunction with Peninsula College, Port Angeles, WA

***Wastewater Microscopy:*** 29th Annual Eastern Oregon Short School, March 28, 2011 Pendleton, OR One day of presentation in regards to wastewater biology, microbiology and ecology of wastewater

***CWEA Specialty Laboratory Preconference Workshop:*** April 2011. 1 day of presentations in regards to wastewater biology, microbiology, and ecology of wastewater

***Microscopy Workshop:*** 2 days of presentations in regards to wastewater biology, microbiology, and ecology of wastewater, June 9-10, 2011, City of Redlands, CA

***Wastewater Microbiology/Biology:*** San Francisco Bay Area and Santa Clara Valley Sections Lab Committees of CWEA, San Ramon, CA July 28-29, 2011

### **Professional and Community Memberships**

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Member of California Water Environment Association, 1990 -2020

Member of Water Environment Federation, 1990-2020

Member of Santa Ana River Basin Section of CWEA 1990-2020

Member of Pacific Northwest Clean Water Association, July 2007-2020

CWEA Lab Committee, 2005-2020

Western Washington Water Quality Lab Analyst Section of PNCWA, 2005

### **Publications**

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Coauthor “*Control Strategies For Minimizing Bulking and Foaming in Denitrifying SBR's*” presented at Leeds University, England May 2003.

<http://www.box.net/shared/xc20v7judr>

Coauthor “*Bioselectors for Minimizing Bulking and Foaming in Denitrifying SBR's*”, presented as a poster in IWA SBR3 Conference in Australia, February

2004, <http://www.box.net/shared/h9hattmml4>

Wastewater Organisms Database photos included in “*Designed Ecosystem Services: Application of Ecological Principles In Wastewater Treatment Engineering*”, by David W. Graham and Val H. Smith, *Frontiers in Ecology and Environment*, 2004, 2(4), 199-206.

<http://www.box.net/shared/9lo1vzrhav>

“*A Comparison of the Multiple Tube Fermentation Technique and Colilert for Enumerating Fecal Coliforms and E. coli in Conventionally Treated Effluent and Anaerobically Digested Sludge.*” Study is to be used to change NPDES permit requirements from conducting multiple tube fermentation technique to enumerate total coliforms to utilizing Colilert to determine E. coli concentrations. <http://www.box.net/shared/p0o6mumvcp>

Wastewater Organisms Database photos included in Master's Thesis Angela Alexandra Valente de Abreu, “*Identificacion de Bacterias Filamentosas en Processos de Lamas Activadas Atraves de Tecnica FISH*”, Portugal, 2004. <http://www.box.net/shared/vzb2g6dk6e>