



# Advanced Water Treatment Operator Certification Development

Gordon Williams, East Bay Municipal Utility District



*A joint effort - CA/NV Section AWWA and CWEA*

**Why do we need another operator certification program?**

# Current Water and Wastewater Certification Does Not Include “Advanced Treatment”

- More complex treatment train
- Unique O&M
- Potable reuse = Enhanced risk

**State Water Resources Control Board**

**EXAMINATION APPLICATION  
FOR WASTEWATER TREATMENT PLANT OPERATOR**

**USE THIS FORM ONLY FOR EXAMINATION APPLICATIONS**

**I. APPLICANT INFORMATION:**

Name: Last \_\_\_\_\_ First: \_\_\_\_\_ Middle: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_ Apt. # \_\_\_\_\_ City: \_\_\_\_\_  
County: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
☐ Check box if your address has changed.  
Telephone: Cell: (\_\_\_\_) \_\_\_\_\_  
Telephone: Home: (\_\_\_\_) \_\_\_\_\_  
Last four digits of your Social Security Number: \_\_\_\_\_  
Email Address: \_\_\_\_\_ Date of Birth: \_\_\_\_\_  
☐ Check box to receive public notices from the Wastewater Operator Certification Program.  
Are you presently a certified Wastewater Treatment Plant Operator in California?  
If YES, Grade \_\_\_\_\_ Certificate Number \_\_\_\_\_ ☐ YES ☐ NO  
Employer Name: \_\_\_\_\_  
Employer Address: \_\_\_\_\_  
Employer Telephone: (\_\_\_\_) \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

**II. EXAMINATION GRADE AND FEES:**

(Check appropriate box)

| GRADE I                  | GRADE II                 | GRADE III                | GRADE IV                 | GRADE V                  |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| \$100                    | \$183                    | \$353                    | \$440                    | \$440                    |

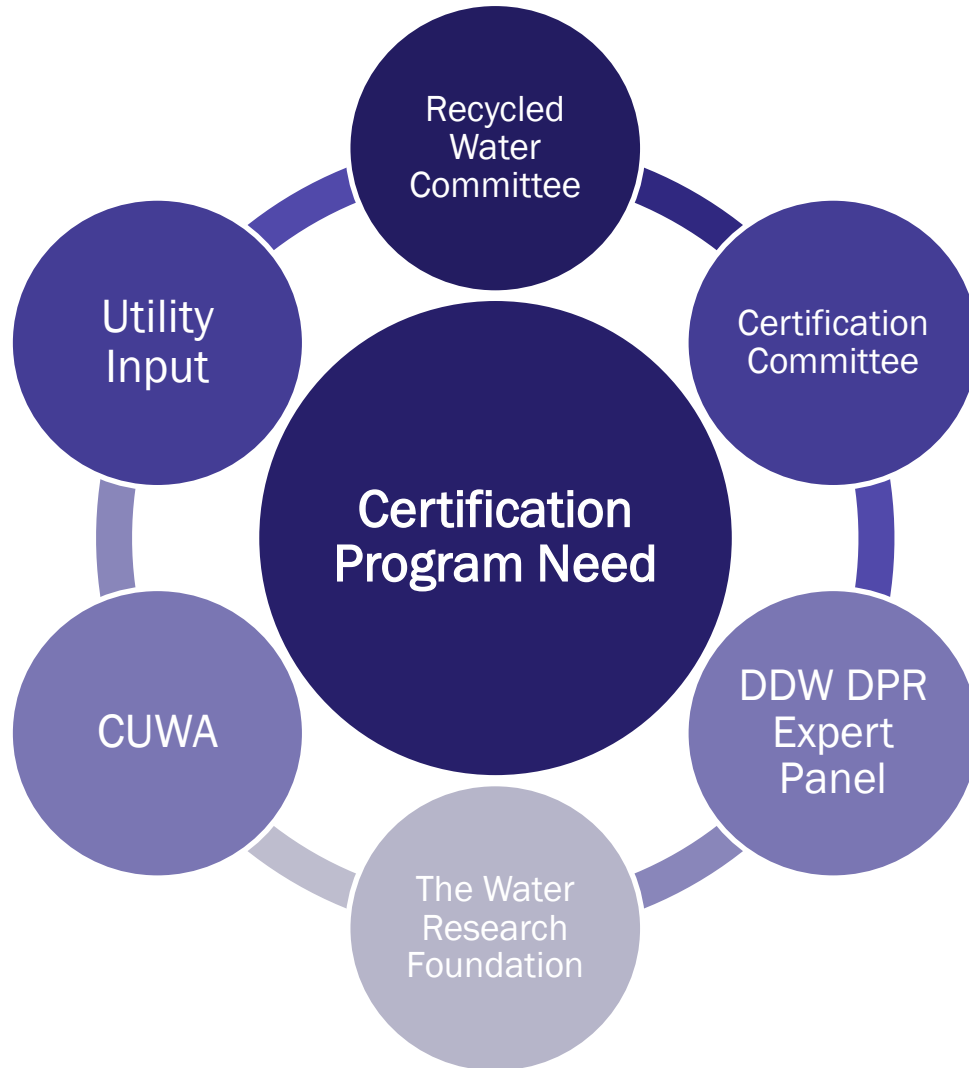
(With the exception of certain examination fees, fees are non-refundable. Please see instructions for more information.)

**OFFICE USE ONLY:**

Examination Date: \_\_\_\_\_  
Total educational points: \_\_\_\_\_  
Signature of Applicant: \_\_\_\_\_  
Approved/Denied for grade: \_\_\_\_\_  
Reason for Denial: \_\_\_\_\_  
Date: \_\_\_\_\_

Page 4115

# Confluence of Many Groups



- 2013: SB322 requires state to investigate DPR feasibility
- WaterReuse CA DPR initiative
- Various industry surveys
- Joint CA-NV Section AWWA/CWEA Committee embarks on program development

# CUWA White Paper Workshop Participation by AWT Committee Member Agencies and Associations

A WHITE PAPER

## Potable Reuse Operator Training and Certification Framework

January 2016



### table of contents //

1. Executive Summary
2. Introduction
3. Operator Certification Survey
4. Current Operator Certification Practices
5. Existing Operator Training Opportunities
6. Advanced Water Treatment Processes Used in Potable Reuse
7. Gaps in AWT System Operator Skill Needs
8. Exploring Possible Paths Forward
9. CUWA Potable Reuse Operator Certification Workshop Outcomes
10. Conclusions & Recommendations
11. References
12. Acronyms



## Recommendations

1. Centered on AWT technologies
2. Stand-alone or "add-on" to both water or wastewater operator certification
3. One test per level of certification
4. Broad program to ensure adequate population of operators

# California SWRCB DPR Expert Panel

- Expert panel calls out the need for a new operator certification that bridges the boundary between water and wastewater operators





# The Water Research Foundation Projects

- **WRF 13-03:** Critical Control Point Assessment to Quantify Robustness and Reliability of Multiple Treatment Barriers of DPR Scheme (Hazen and Sawyer/SPI)
- **WRF 13-13:** Development of Operation and Maintenance Plan and Training and Certification Framework for Direct Potable Reuse (DPR) Systems (Hazen and Sawyer/SPI)
- **WRF 15-05:** Developing Curriculum and Content for DPR Operator Training (Hazen and Sawyer/SCVWD/Carollo)

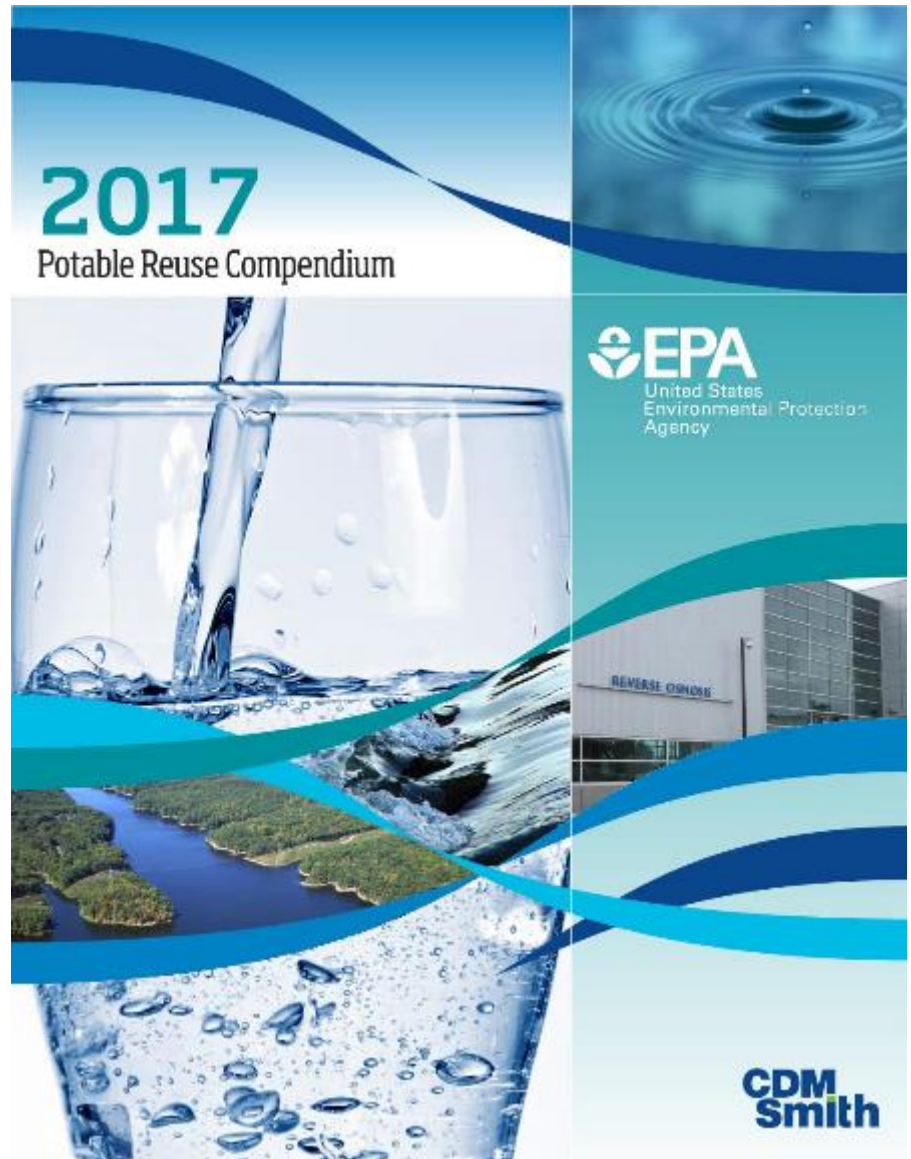
# WRF 13-03 and 13-13 Recommendations

1. **“Bolt-on”**: Certification should be a “bolt-on” to either a wastewater or water treatment operator certification
2. **More than just technologies**: Certification should include regulatory framework, source water understanding, and advanced monitoring, sampling, and analysis
3. **Bridging the divide**: efforts should be made to bridge the water and wastewater components, potentially including both under the same permit



# A New AWT Certification Program Is Needed

- AWT is integral to potable reuse
  - Operator training and certification identified as a concern for DPR
- AWT is increasingly a part of WTPs

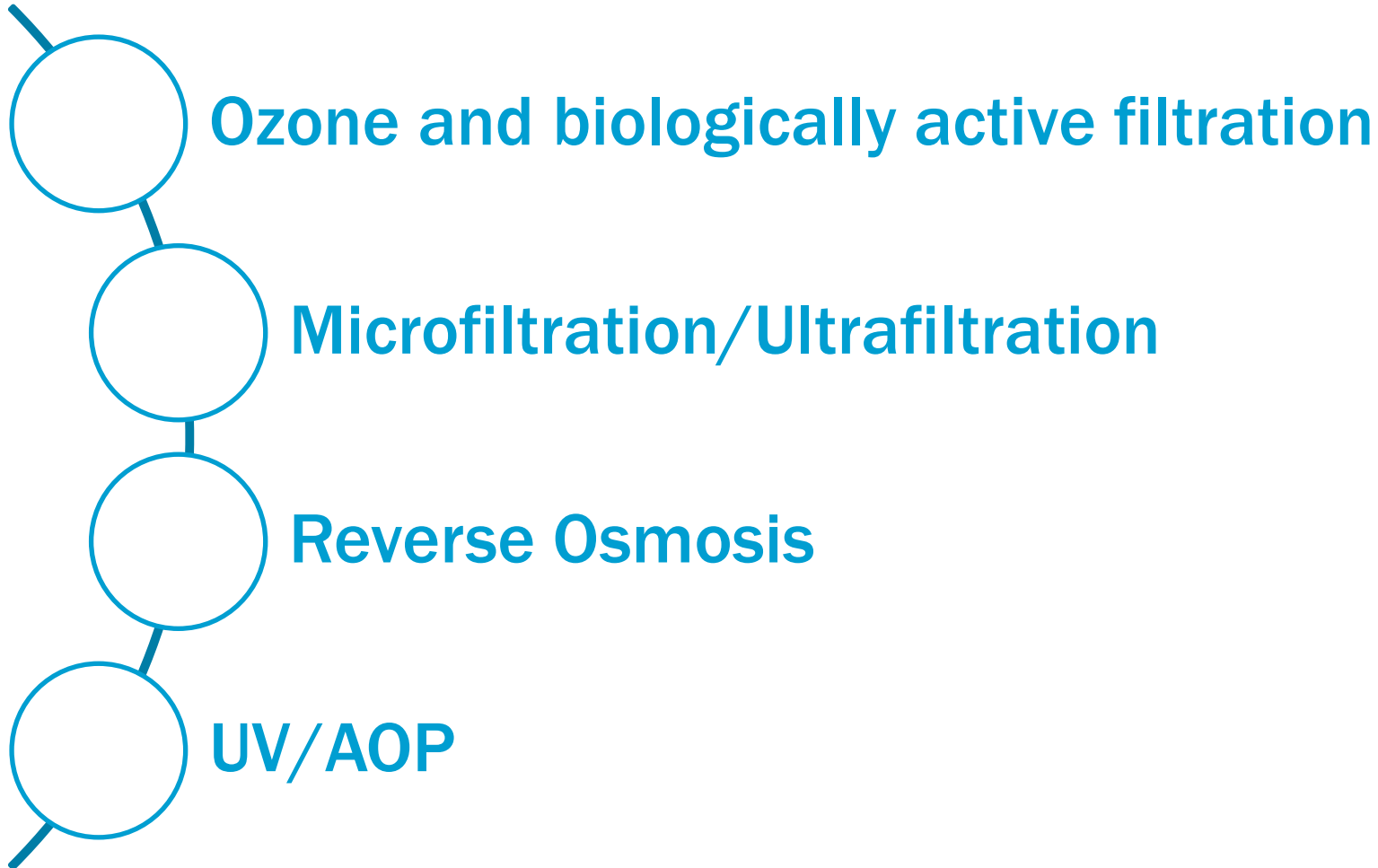


# **There Is Also a Regulatory Issue with T operators at RW plants**

- Recycled water plants are allowed to use T or W operators
- State-wide 14,000 T operators vs. 6,000 W operators
- T operators can't use experience at recycled water plant to qualify for higher certification
- Similar issues for RW distribution systems that use D operators

# **What is Advanced Water Treatment?**

# What Does “AWT” mean?





# Microfiltration – Reverse Osmosis – UV or UV/AOP



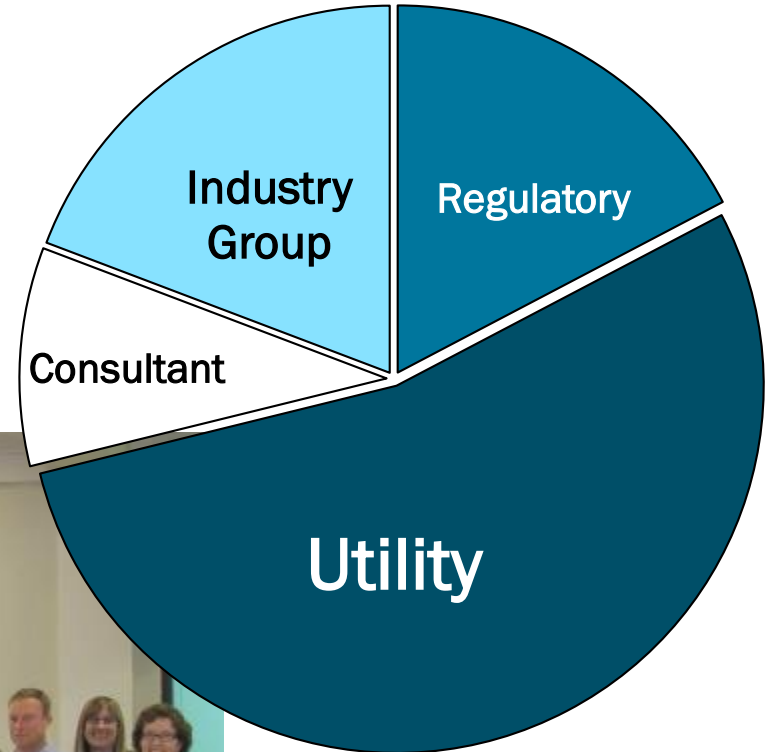
# A committee is formed....





# AWT Ops Cert Committee Makeup

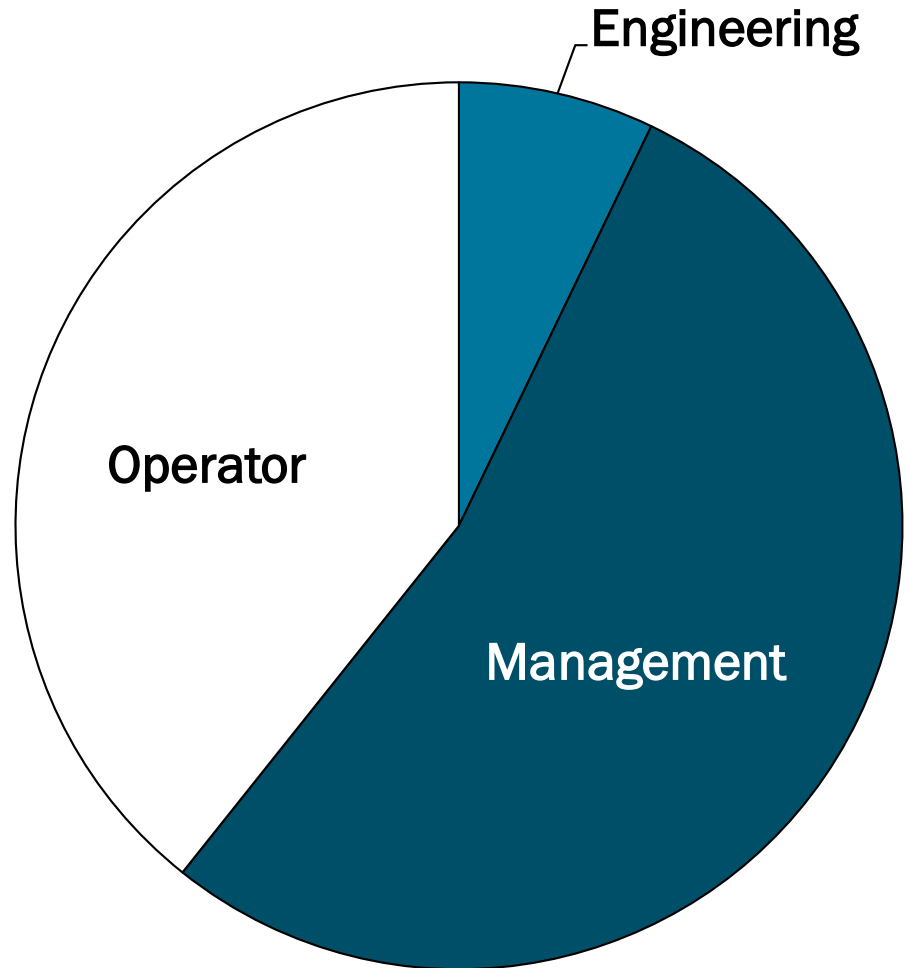
- 30 Committee Members
- 31 Public Participants
- CA-NV Section, AWWA Staff
- CWEA Staff



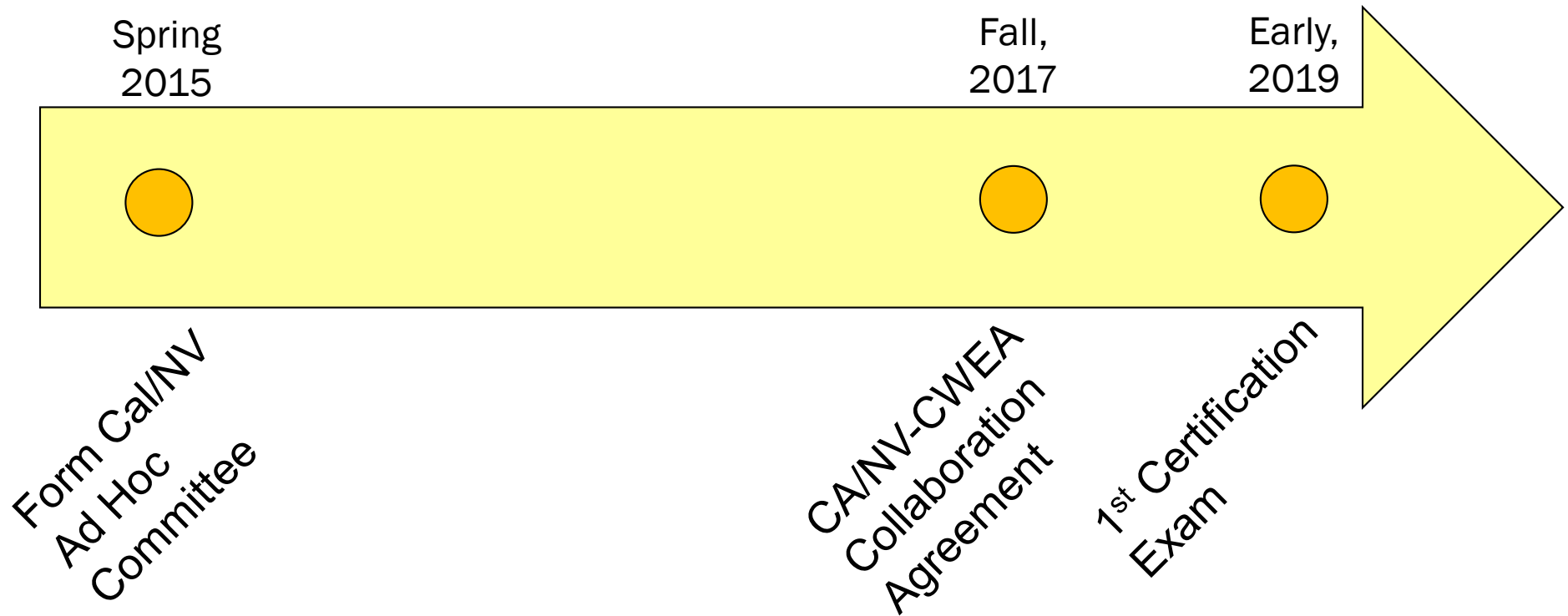


# AWT Ops Cert Committee Utility Representation

- 15+ utilities represented, including 5 from San Diego
- Majority in operations or operations management
- Participation by State Water Board staff



# Cal/Nevada Section AWWA Ad Hoc Committee formed in 2015 to Investigate Developing a Voluntary AWT Certification Program

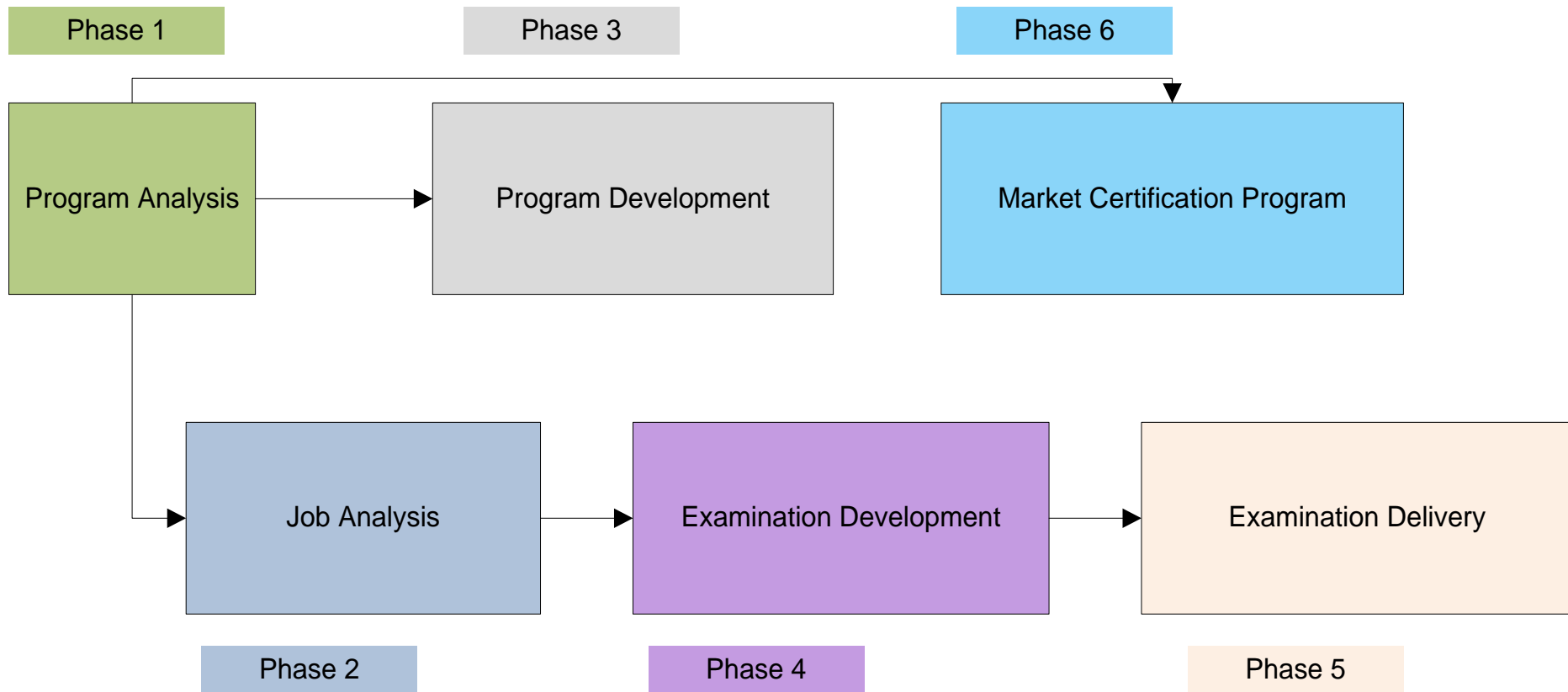


# Certification Program/Committee Goals

- Craft an AWT operator certification program that works for agencies big and small
  - Provides benefit without being overly restrictive and affecting future qualified operator pool
- Address potable reuse operator training and certification concern – remove potential roadblock for DPR
- Address current regulatory issues with T operators at RW facilities

# **What Is Required to Develop a Certification Program?**

# It's Complicated, Rigorous and Proscribed



**Step 1 – Confirm Interest**

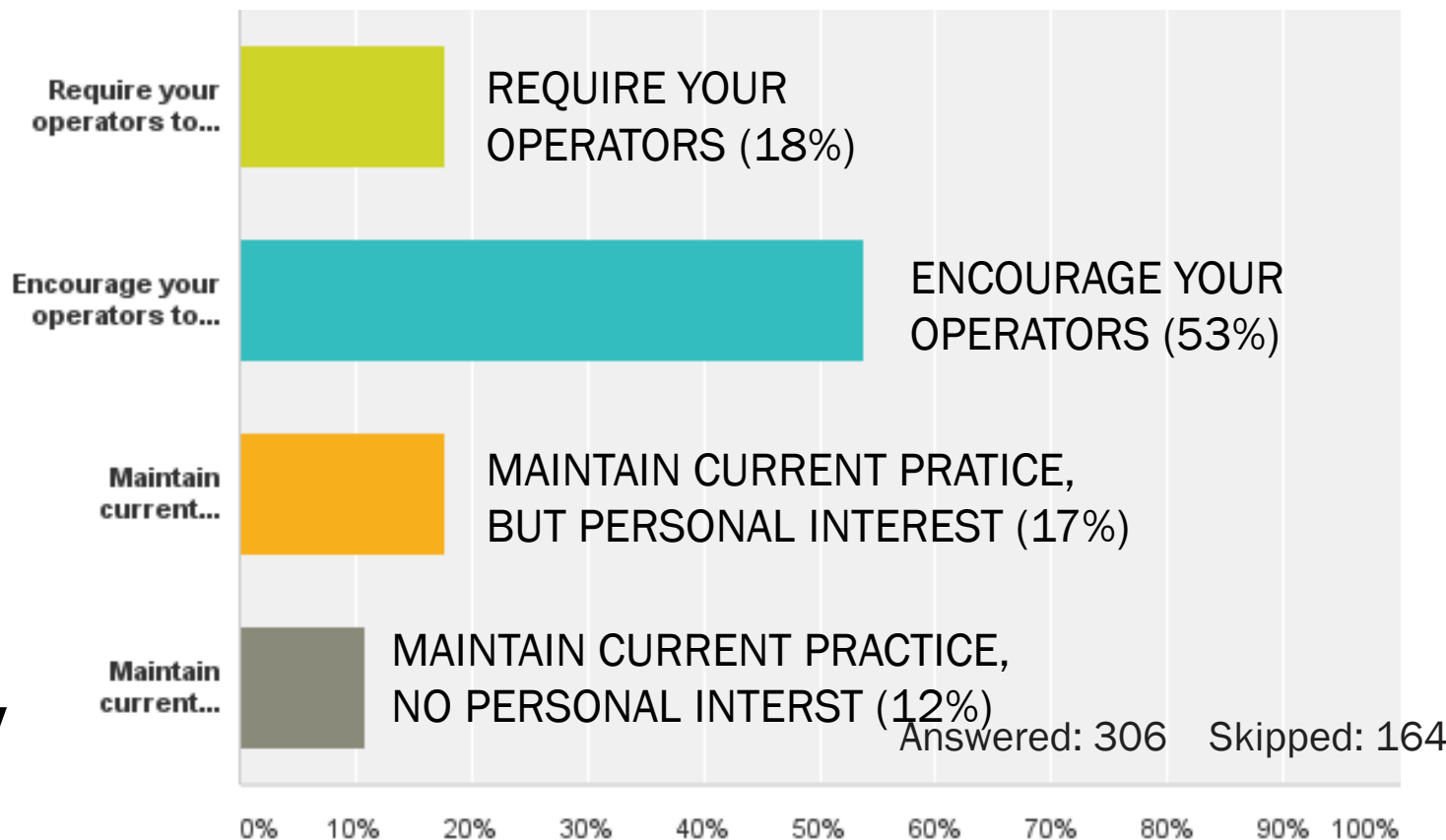
**Step 2 – Define Certification Program  
Target**

# Industry Supportive of Certification Program

88% overall favorable

71% would look to include at their facility

Q14: If an AWT Certification program were offered, would your company / agency likely

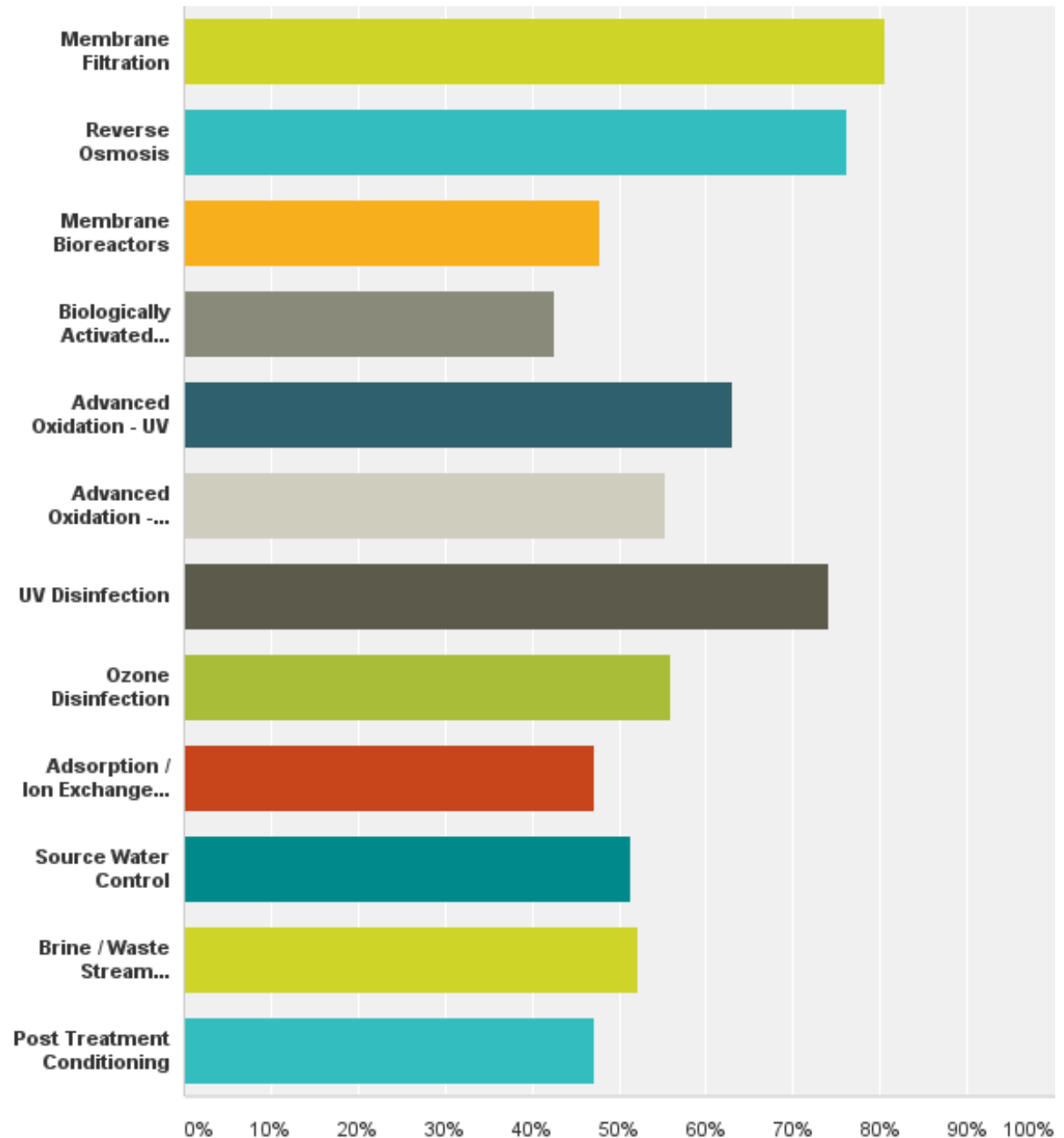


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# Q12: What treatment technologies would you want included in an Advanced Water Treatment Program (Select all that apply)?

- Answered: 282  
Skipped: 188



# **Step 3 – Job Analysis**

# Job Content Domains

| Content Domain                             | AWT 3 | AWT 4 | AWT 5 |
|--|-------|-------|-------|
| Source Water                               | 3%    | 4%    | 3%    |
| Advanced Water Treatment Processes         | 40%   | 40%   | 24%   |
| Advanced Water Treatment Support Processes | 11%   | 14%   | 4%    |
| Advanced Treated Water Management          | 3%    | 4%    | 3%    |
| Operations and Maintenance                 | 16%   | 18%   | 14%   |
| Controls and Monitoring                    | 6%    | 6%    | 13%   |
| Laboratory                                 | 12%   | 7%    | 1%    |
| Regulations and Reporting                  | 2%    | 2%    | 10%   |
| Safety                                     | 6%    | 6%    | 29%   |

# Task & Knowledge Statements

## Sample Task Statements

### Membranes

Recognize and correct problems in membrane systems

Calculate membrane surface area

Calculate daily membrane water production

### Advanced Oxidation

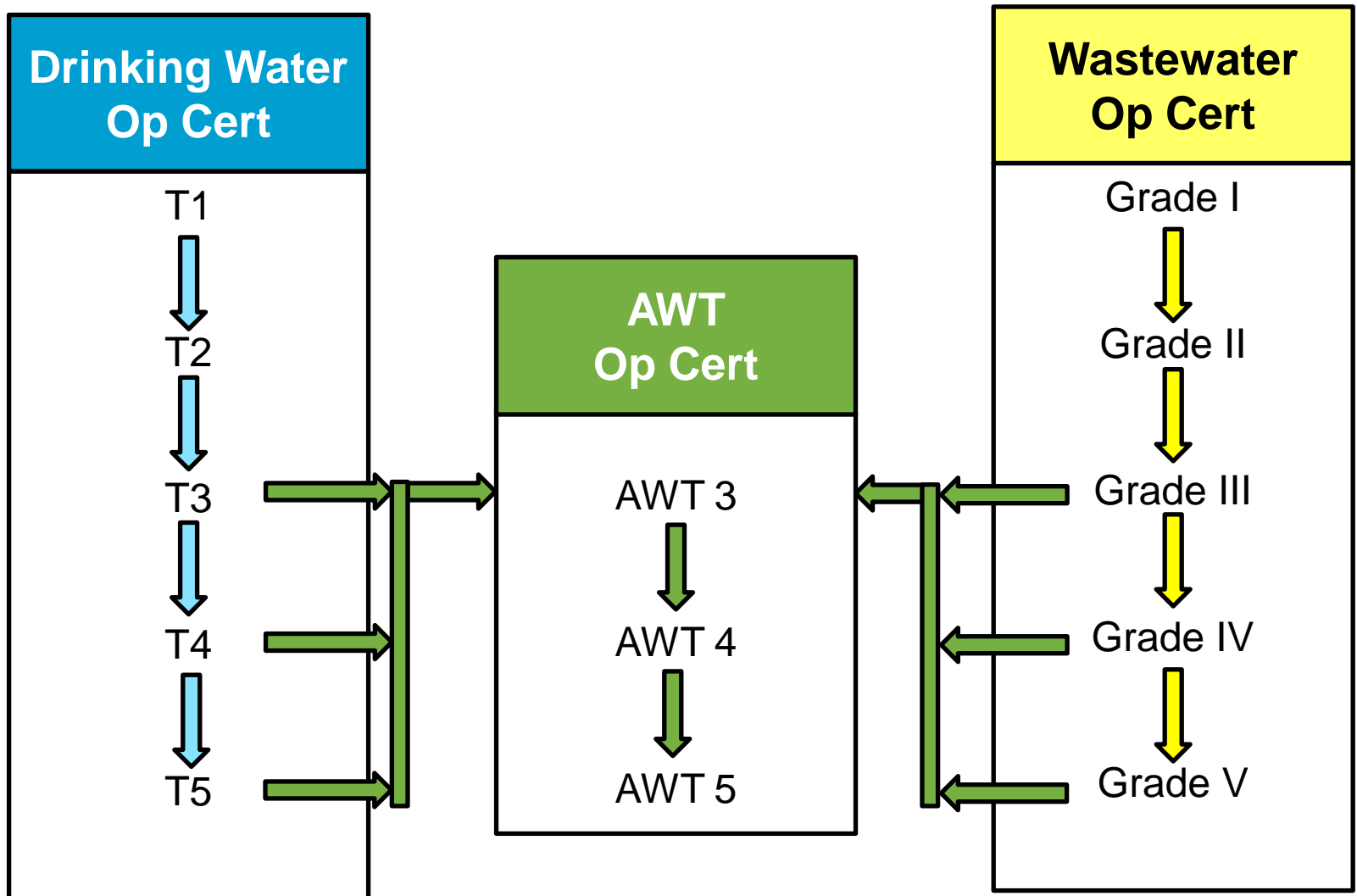
Calculate oxidant dosing

Measure oxidant residual

Track major process control inputs

# **Minimum Qualifications and Structure**

# A Supplement to Existing Operator Certification



# Where Are We Now?

In  
Progress

- ✓ Exam Development
- ✓ Funding Support Program
- ✓ Marketing and Outreach



WW and DW Operators  
at Grade 3 level or higher  
(T3 or G3) can apply to  
take AWT Grade 3 exam

Starting:

**Spring 2019**



**Funding Goal: \$200,000**  
**Funding Status: \$180,000**

## **Need to Invest in**

- SME workshops
- Question bank for 3 exams
- Psychometricians
- Professional exam writers
- Publishing the exams
- AWT website/marketing/communications





# Supporters



*(Contributors so far)*



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