



American Water Works Association

California-Nevada Section

Advanced Water Treatment Operator Certification Development

Panel Discussion – Annual Spring Conference 2016

Sacramento, CA

March 22, 2016

Session Overview

A Utility's Perspective	Angela Cheung <i>Santa Clara Valley Water District</i>
AWT Technologies	Erin Mackey <i>Brown and Caldwell</i>
AWT Certification Committee Progress	Gordon Williams <i>East Bay Municipal Utility District</i>
Creating a New Certification Program	Steven Garner <i>AWWA California-Nevada Section</i>
Panel Discussion	ALL

A Utility's Perspective on Advanced Water Treatment Operator Certification

Angela Cheung, P.E., T5

Santa Clara Valley Water District



American Water Works Association

California-Nevada Section

Who we serve

2 million people

15 cities

4,700 direct well owners

owners

13 local water providers



Imported water provides 55% of our supply



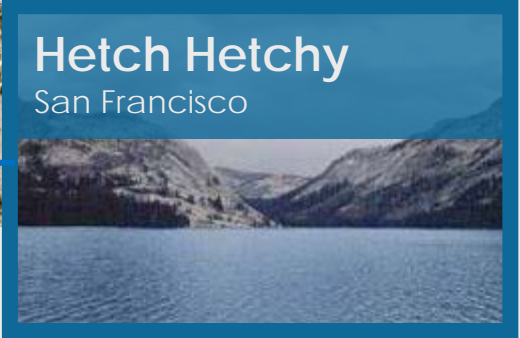
Shasta Lake
Federal Central Valley Project



Lake Oroville
State Water Project

Water supply*
55% Imported
30% Local
5% Recycled
10% Conservation savings
** in average year*

**Sacramento-San Joaquin
River Delta**



Hetch Hetchy
San Francisco



A comprehensive water system

SANTA CLARA COUNTY GROUNDWATER AT-A-GLANCE

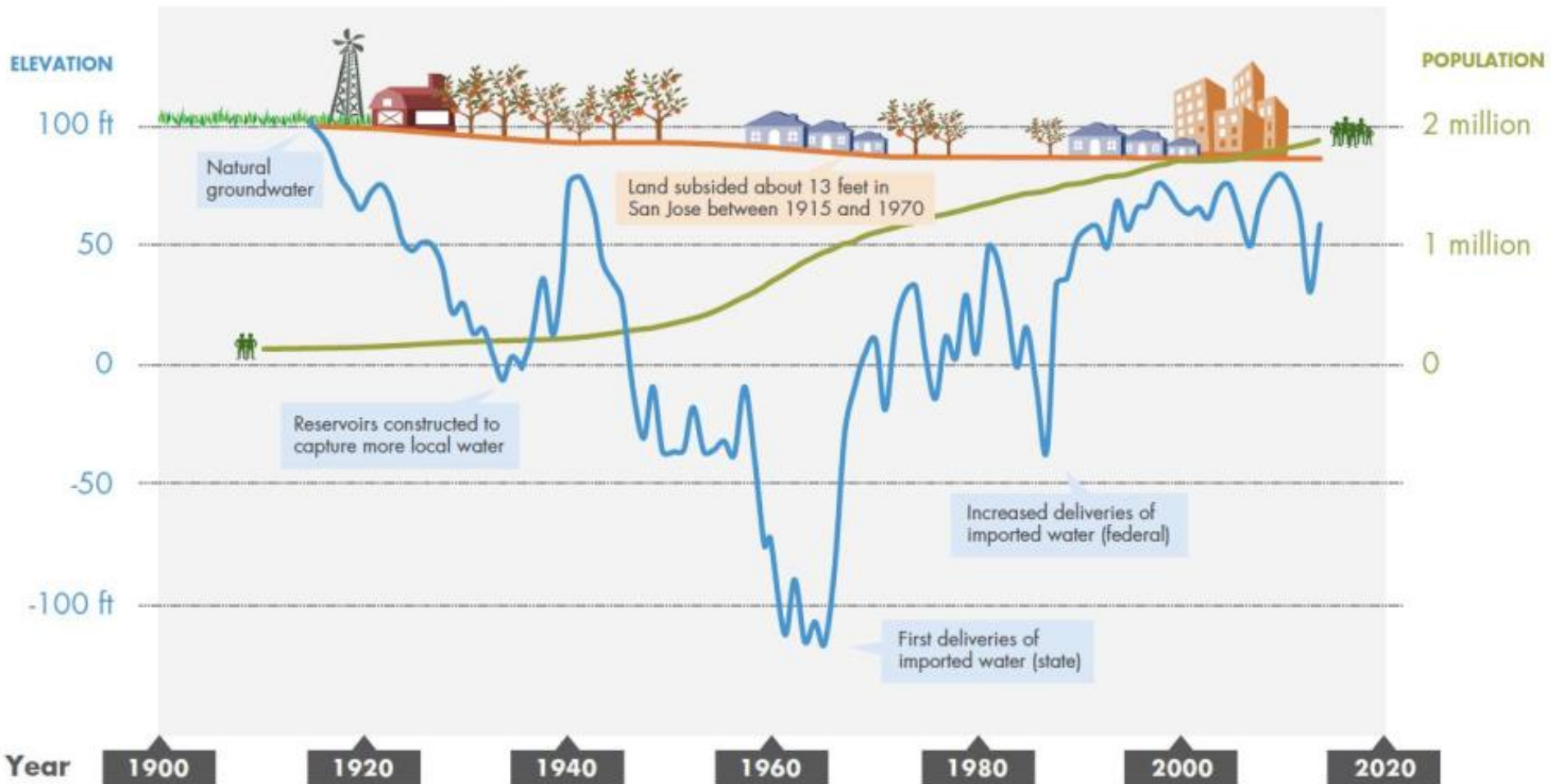
a graphic representation not intended as a technical exhibit



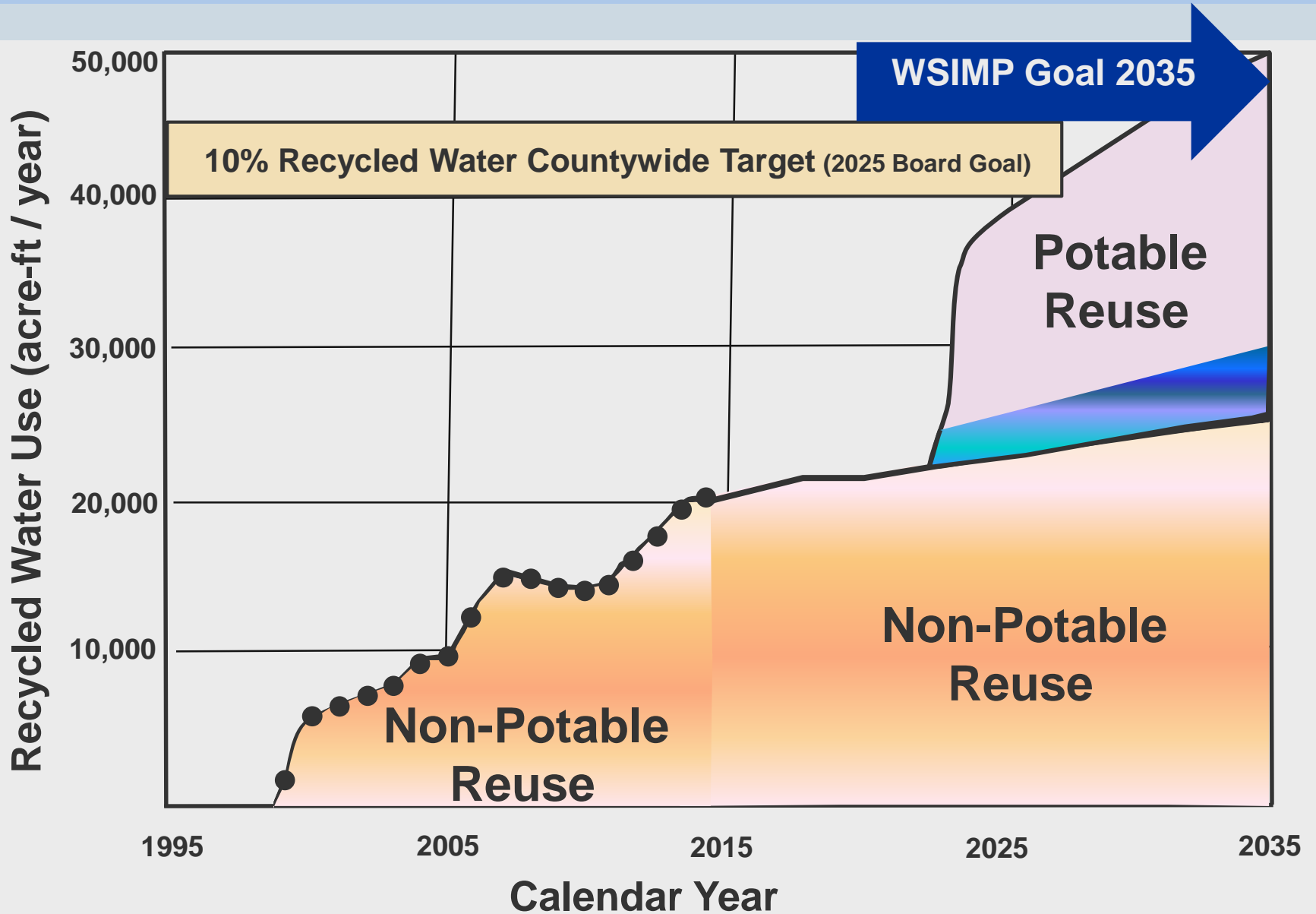
Land Surface Elevation

Groundwater Elevation

Population



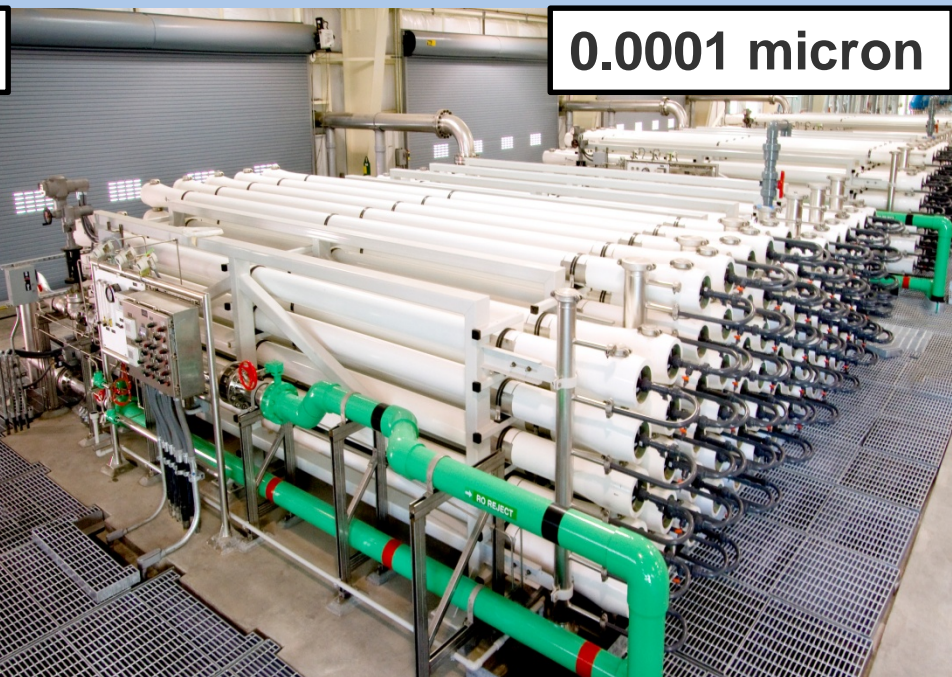
Recycled Water Goals and Targets



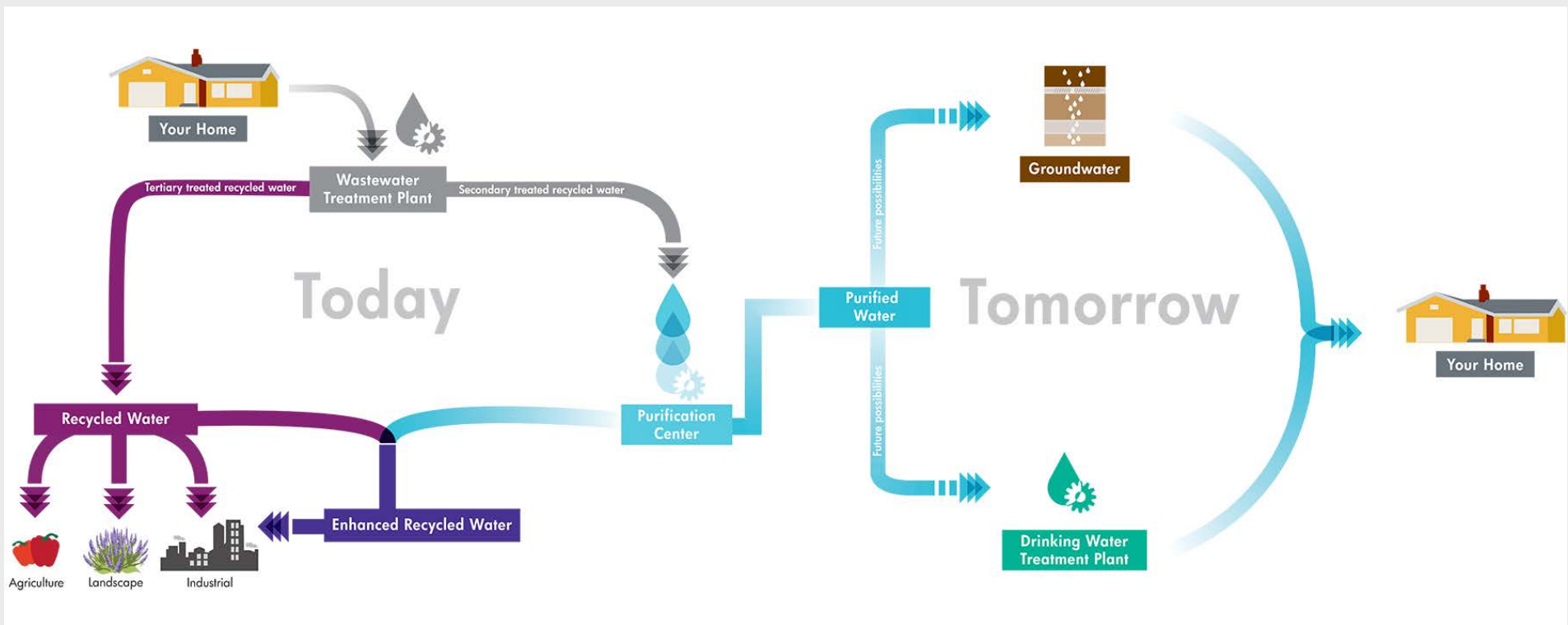
Silicon Valley Advance Water Purification Center 8 MGD Facility



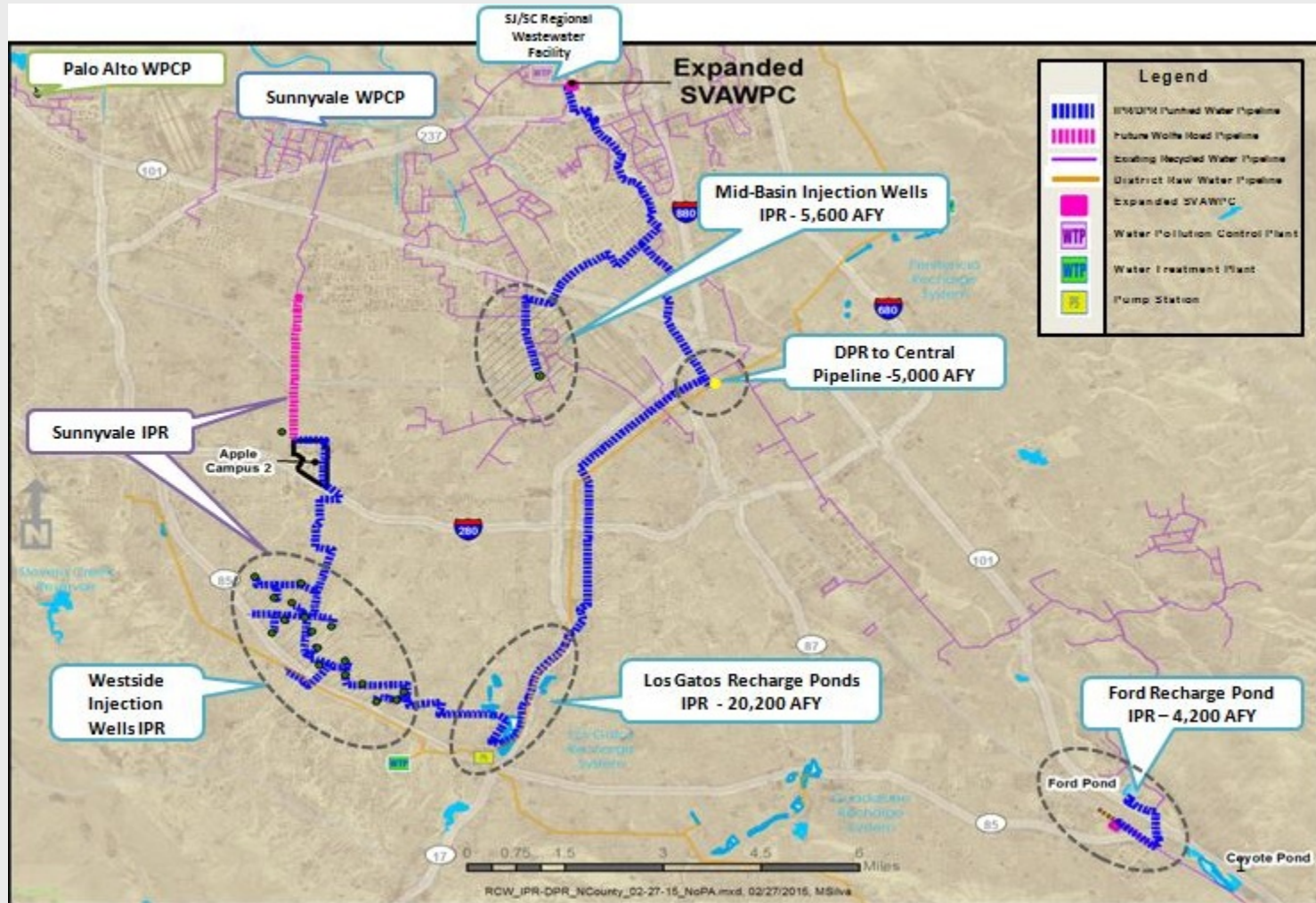
Microfiltration – Reverse Osmosis – UV Disinfection



Pathways to potable reuse



Purified Water Program-Potential Projects



SCVWD Operator Composition

- ▶ 50-year history with water treatment operators holding T licenses
- ▶ 32 operators T2 – T4, a few with T5s at WTPs
- ▶ 3 supervisors T5
- ▶ SVAWPC- allows both T & W operators but currently has only T operators
- ▶ State-wide 14,000 T operators vs. 6,000 W operators

Reg issue with T operators at RW plants

- ▶ Recycled water plants are allowed to use T or 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

Potable Reuse Operator Training & Certification

- ▶ DDW to determine feasibility of DPR
 - ▶ Expert Panel formed in 2013
 - ▶ Expert Panel report due end of 2016
 - ▶ Advisory Group to Expert Panel
- ▶ Operator training and certification identified as a concern for DPR
- ▶ Ah hoc AWT Operator Certification Committee formed in 2015

Desired Outcome for SCVWD

- ▶ Address DPR operator training and certification concern – remove potential roadblock for DPR
- ▶ Help craft an AWT operator certification program that works for agencies big and small
- ▶ New certification provides benefits without being overly restrictive and affecting future qualified operator pool
- ▶ New certification required only for DPR facilities, voluntary for IPR and other facilities with AWT technologies
- ▶ Address current reg issues with T operators at RW facility

AWT Technologies – What technologies might be included in the certification program

Erin D. Mackey, Ph.D., P.E.

Brown and Caldwell



American Water Works Association

California-Nevada Section

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

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

The image shows a form titled "EXAMINATION APPLICATION FOR WASTEWATER TREATMENT PLANT OPERATOR" from the State Water Resources Control Board. The form includes sections for applicant information, employer details, and examination grade selection. A large watermark "FOR EXAMINATION ONLY" is overlaid on the form.

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: _____
County: _____ Apt. # _____ City: _____
 Check box if your address has changed. State: _____ Zip: _____
Telephone: Cell: (____) _____
Telephone: Home: (____) _____
Last four digits of your Social Security Number: _____
Email Address: _____
 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: _____ 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	\$303	\$400	\$480

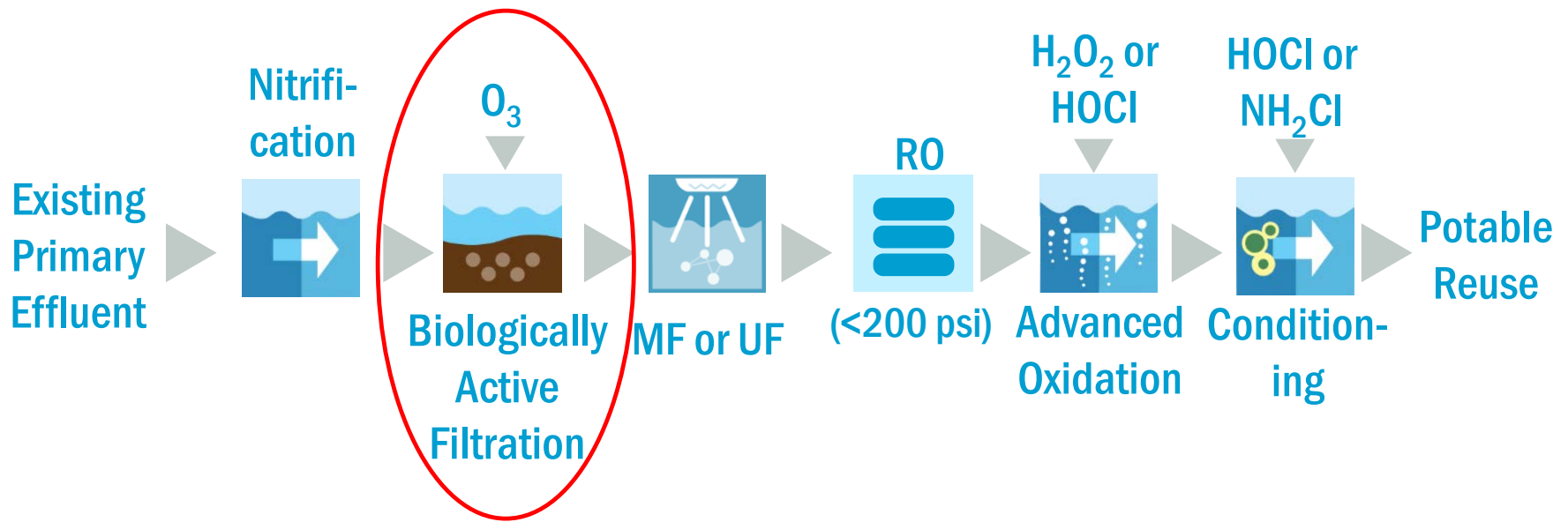
(With the exception of certain examination fees, fees are non-refundable. Please see instructions for more information.)

OFFICE USE ONLY:

Examiner Date: _____
Total educational points: _____
Signature of Reviewer: _____
Approved/Denied for grade: _____
Reason for Denial: _____
Date: _____

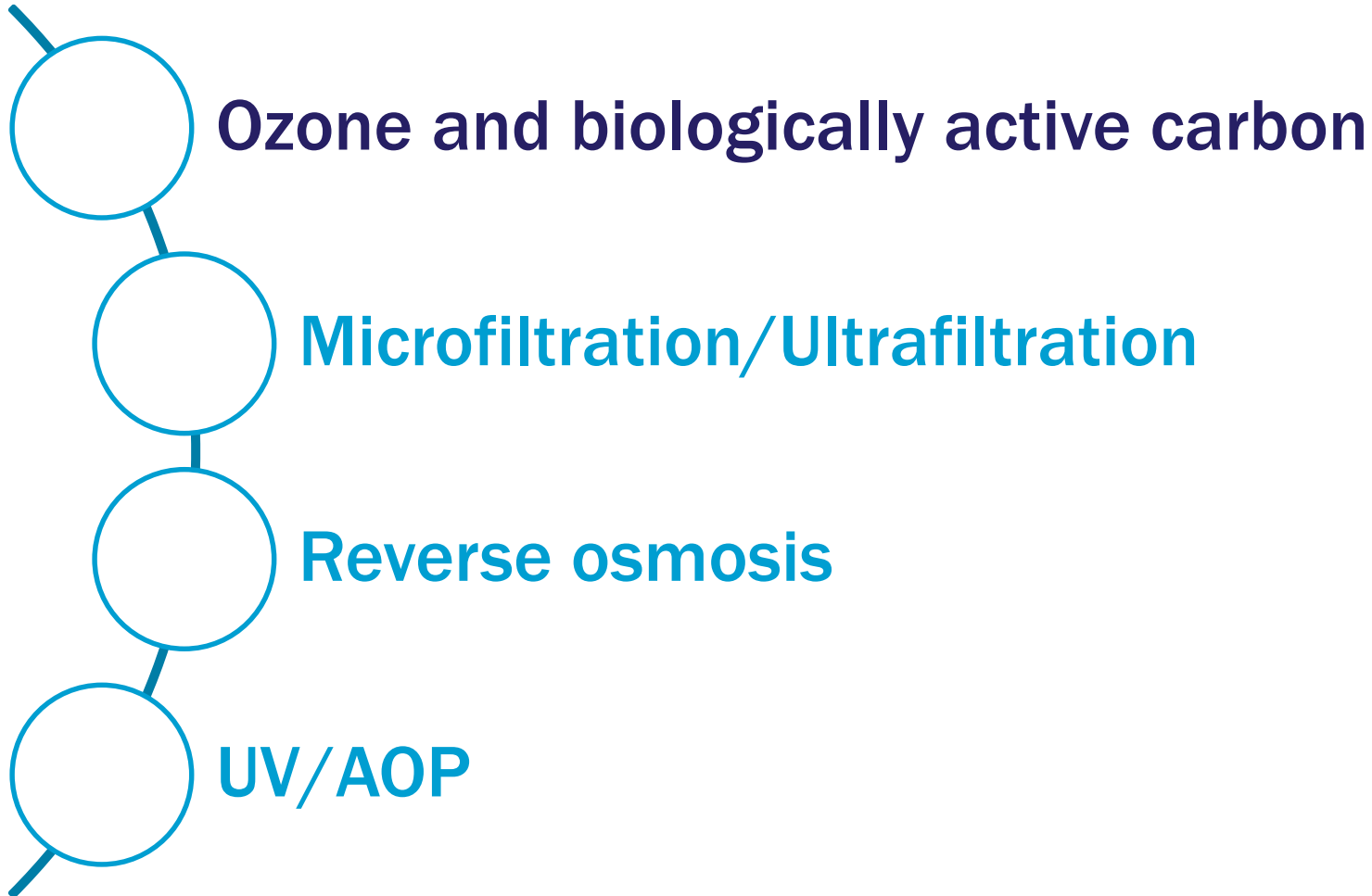
Form 415

Potable Reuse Is Based on Advanced Water Treatment for Wastewater Effluent Purification



*Different processes and enhanced focus on
Critical Control Points*

What Do these Systems Look Like Compared to Conventional WTPs?



Update on the AWT Certification Committee Progress

Gordon Williams, Ph.D., PE
East Bay Municipal Utility District



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Confluence of Many Groups



- * 2013: SB322 requires state to investigate DPR feasibility
- * WaterReuse CA DPR initiative
- * Various industry surveys
- * CA-NV Section, AWWA ad hoc group explores AWT operator certification

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



WaterReuse Research Foundation Projects



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

WRRF 13-03 and 13-13 Recommendations

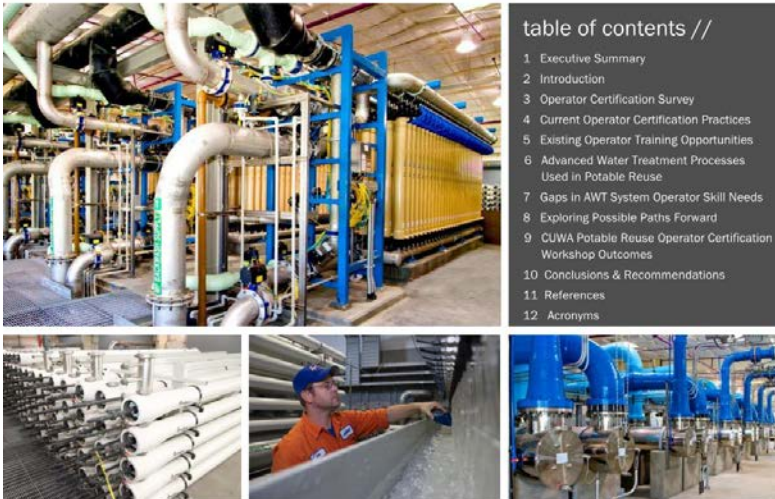
1. **“Bolt-on”**: Certification should be a “bolt-on” to either a wastewater or water treatment operator certification
2. **More than just technologies**: Certification should include regulatory framework, source water understanding, and advanced monitoring, sampling, and analysis
3. **Bridging the divide**: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

CUWA White Paper Development

A WHITE PAPER

Potable Reuse Operator Training and Certification Framework

January 2016



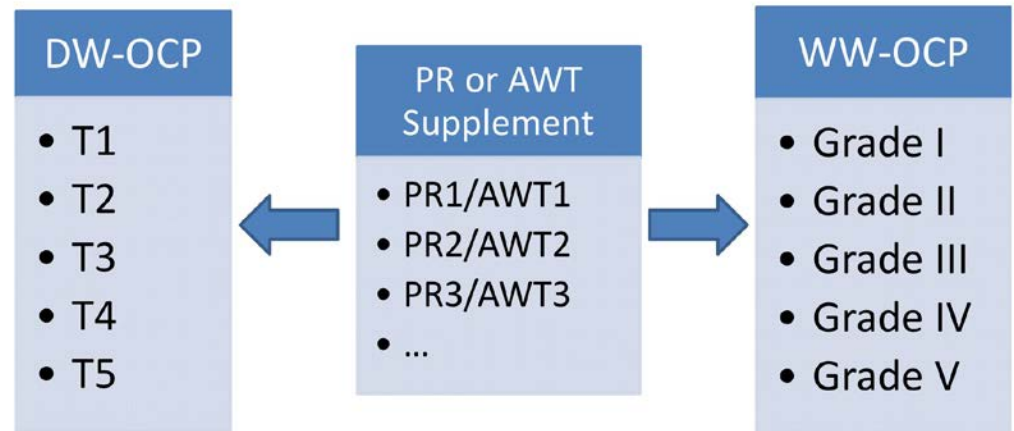
Recommendations

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

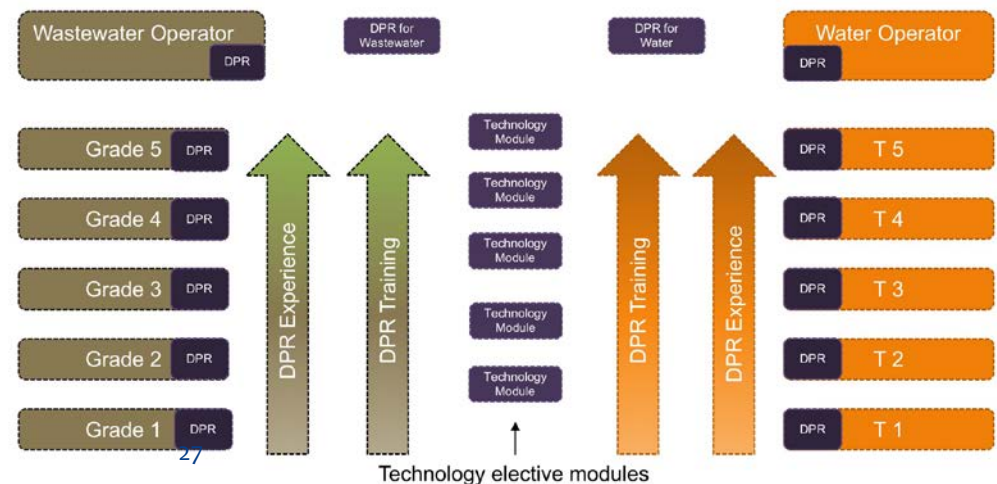


Other Possible Frameworks

CUWA proposed framework

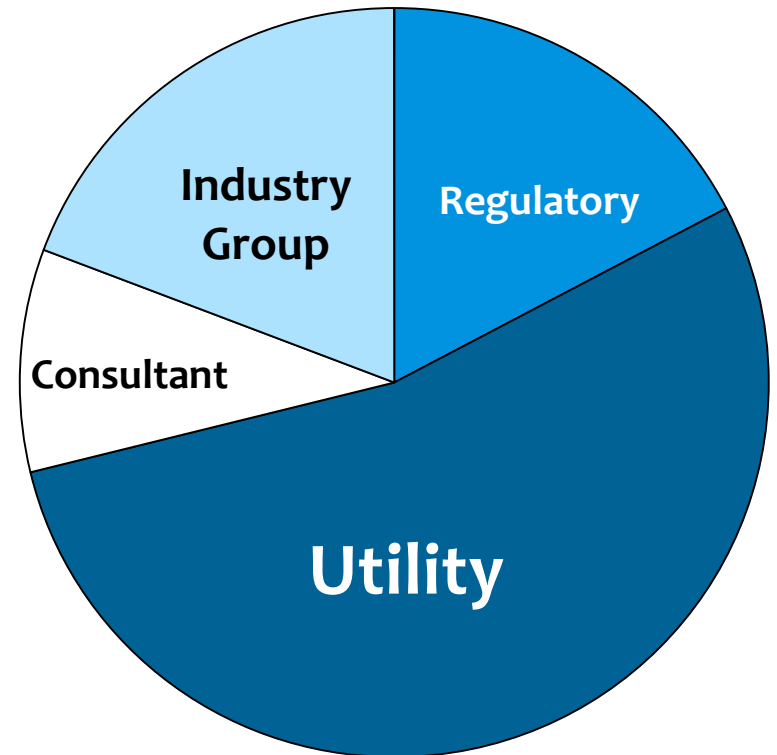


WRRF 13-13 proposed framework



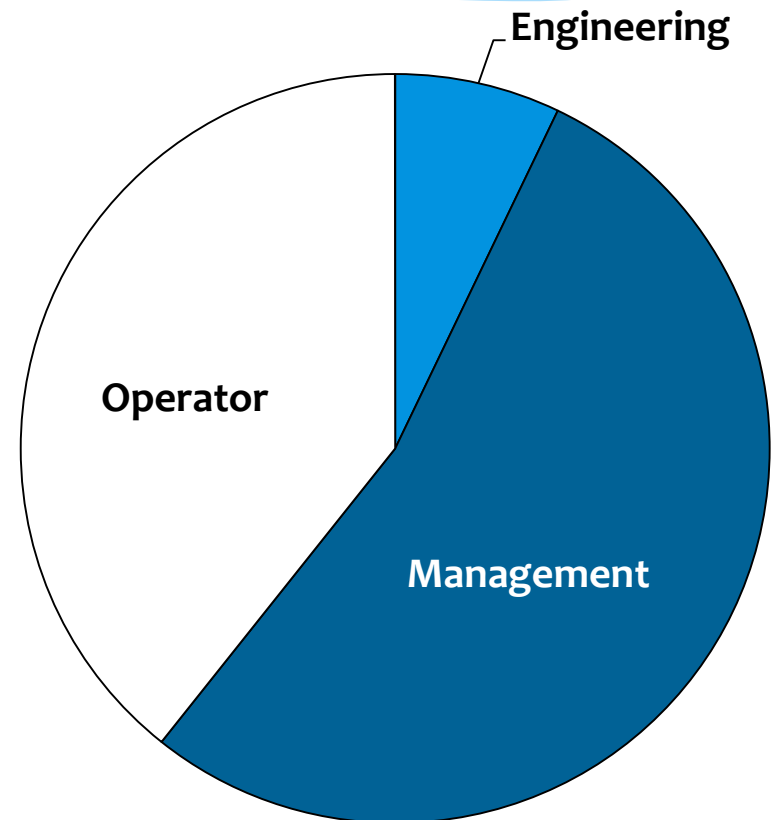
AWT Ops Cert Committee Makeup

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



AWT Ops Cert Committee Utility Representation

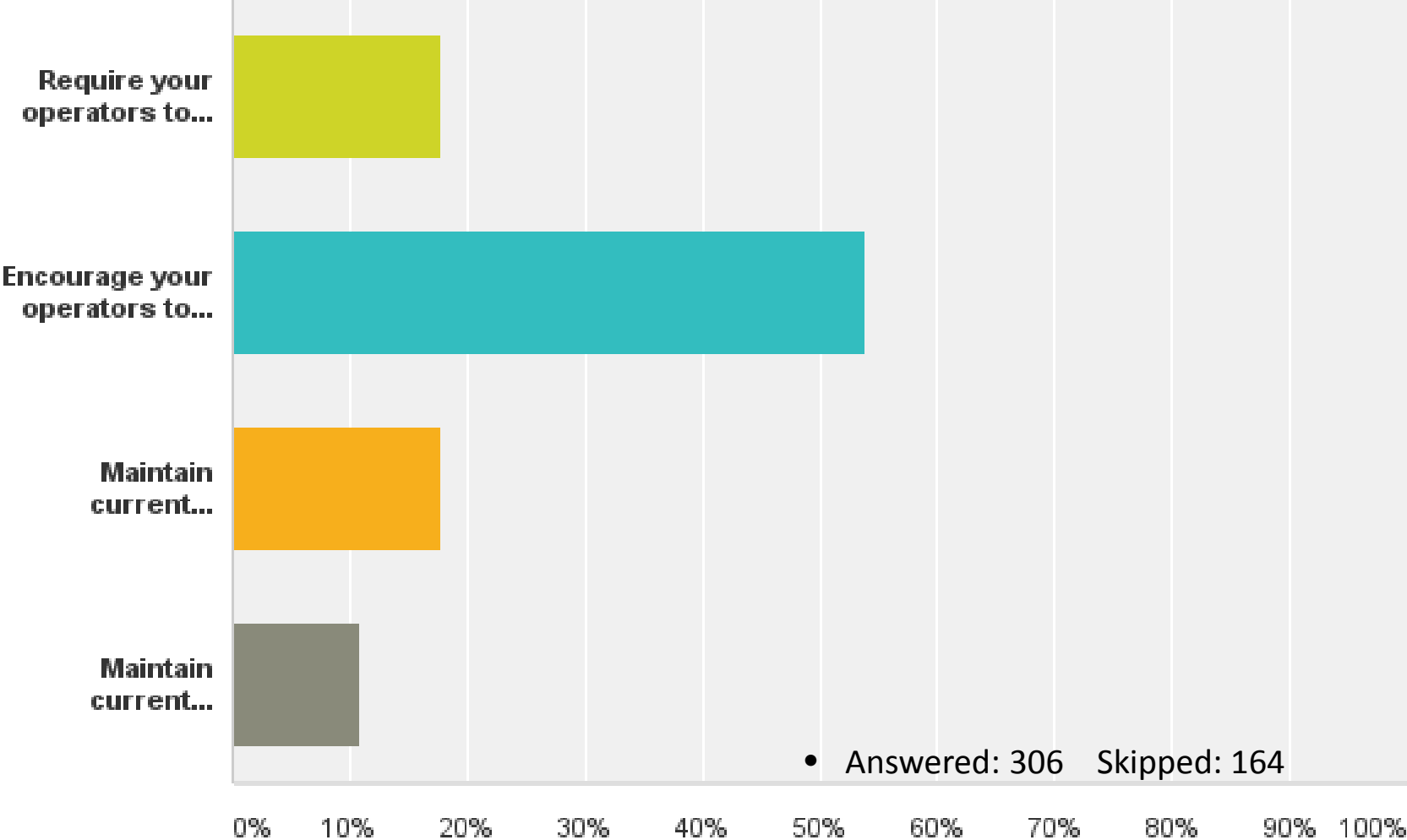
- * 15 different utilities represented
- * Majority in operations or operations management



Committee Tasks To-Date

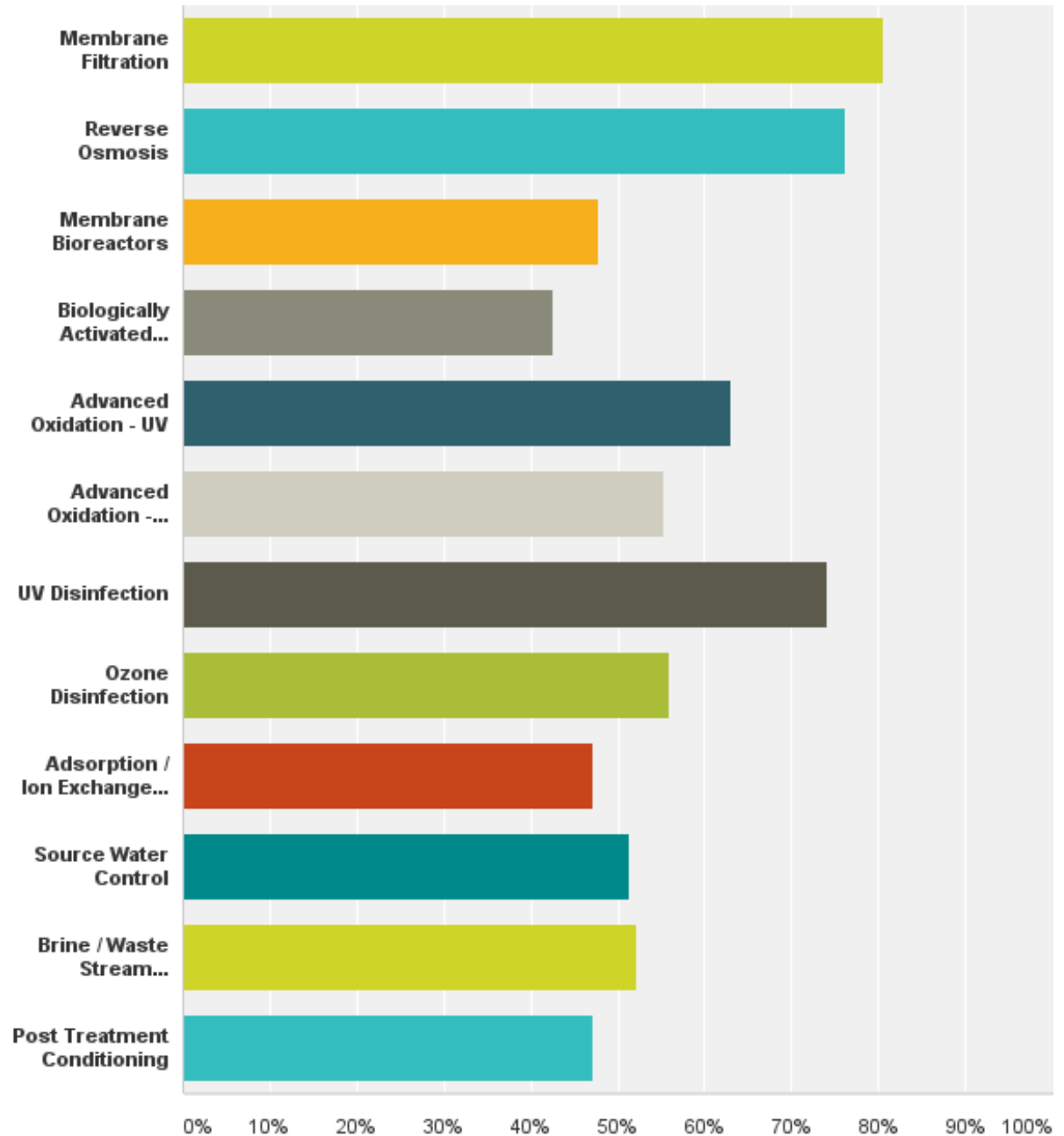
- * Research available training materials
- * Conduct Stakeholder Survey to focus committee scope and confirm market receptivity
- * Research background for job

Q14: If an Advanced Water Treatment Certification program were offered, would your company / agency likely ...



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

- Answered: 282
- Skipped: 188



Recommendations to date

- * Recommended to CA-NV Section, AWWA to move forward with certification development
- * Voluntary certification program
- * Use a broad definition for the job function
- * Include three focus areas for certification:
 1. Advanced Separation Processes (low and high pressure membranes)
 2. Advanced Disinfection/Oxidation (UV/Ozone)
 3. Advanced Monitoring, Controls, and Response
- * Use a facilitated subject matter expert (SME) workshop format for the job analysis

Creating a New Certification Program

Steven Garner

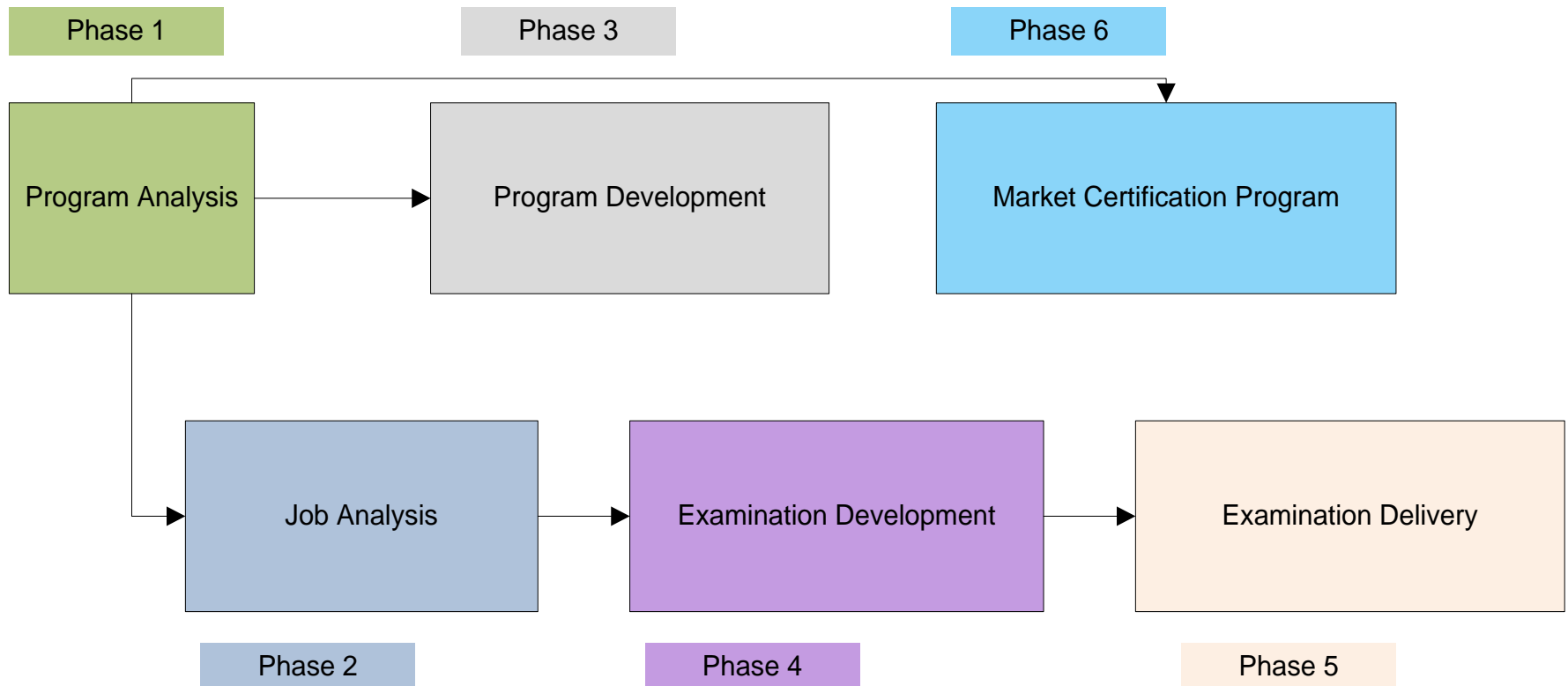
California-Nevada Section, AWWA



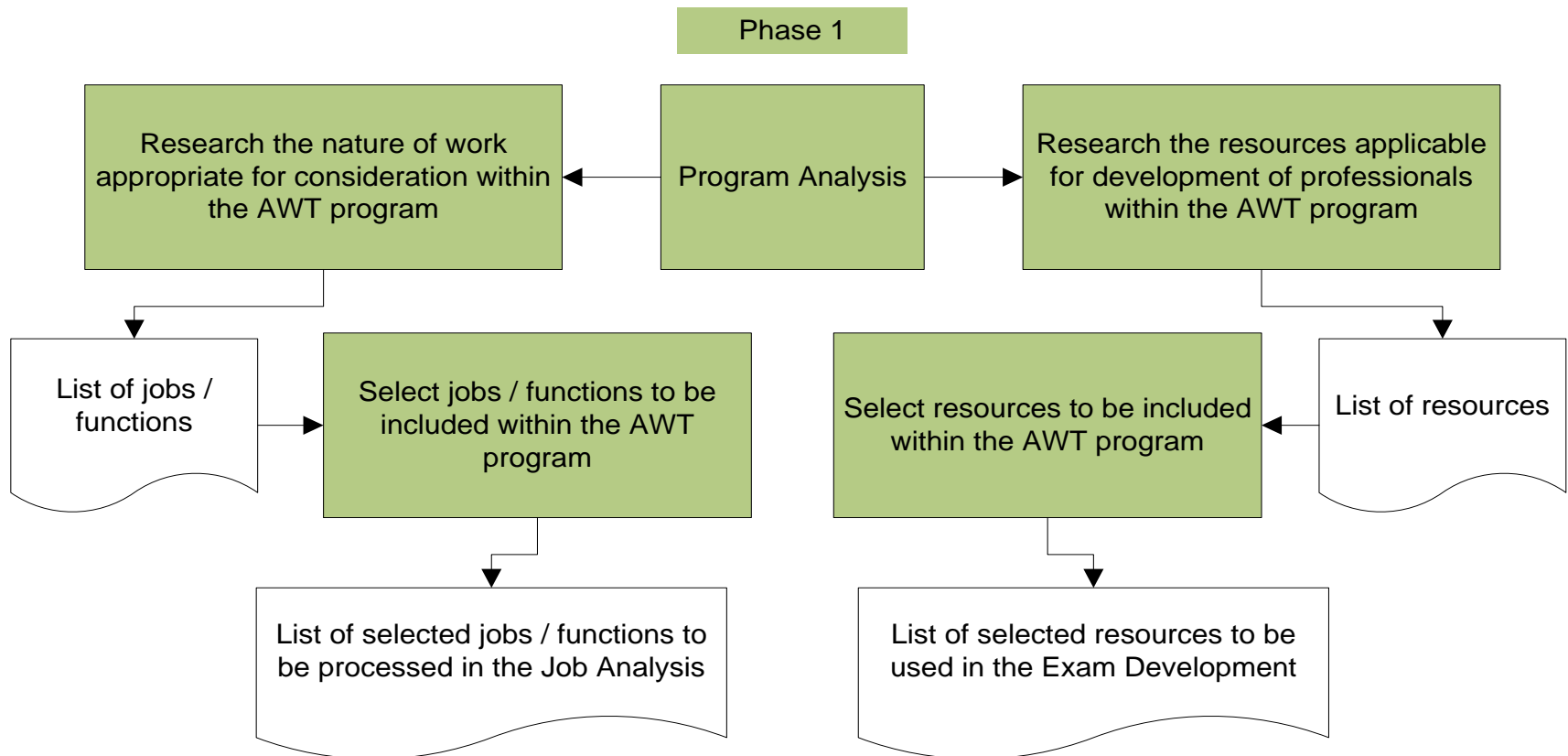
American Water Works Association

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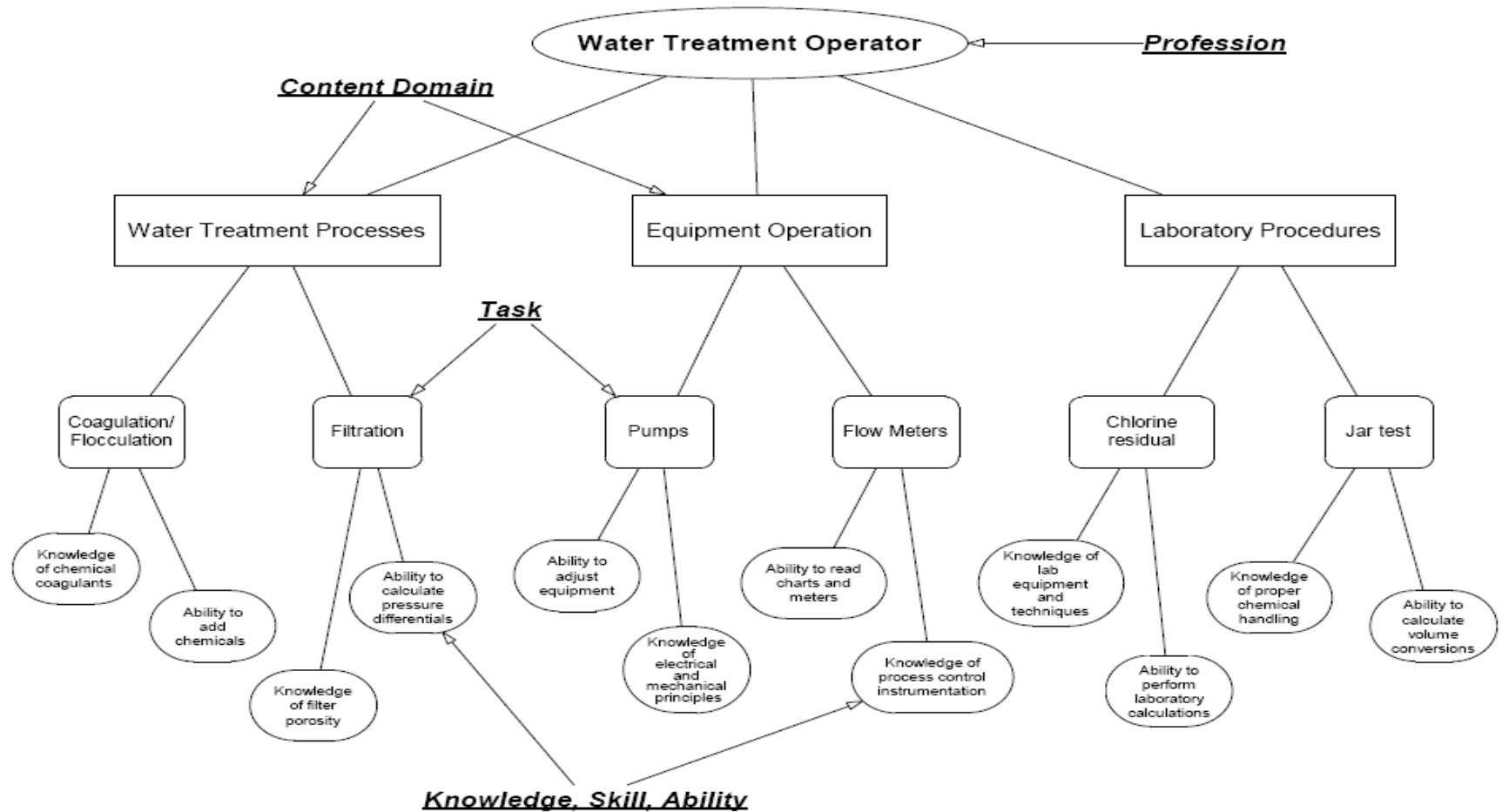
CA-NV Section, AWWA Advanced Water Treatment Certification Program Simplified Process Flowchart



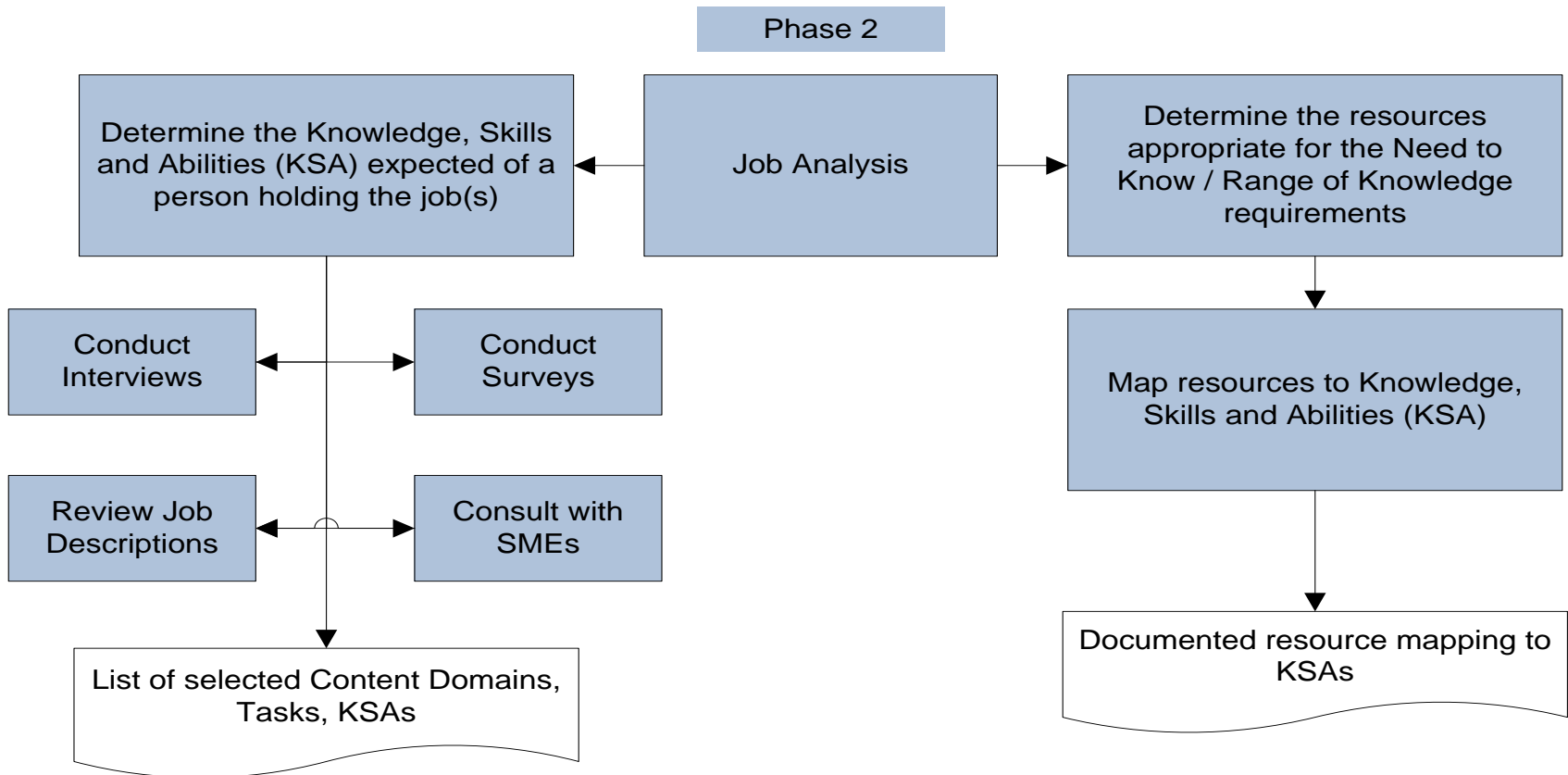
CA-NV Section, AWWA Advanced Water Treatment Certification Program Phase 1 Program Analysis Flowchart



Example of a Job Analysis

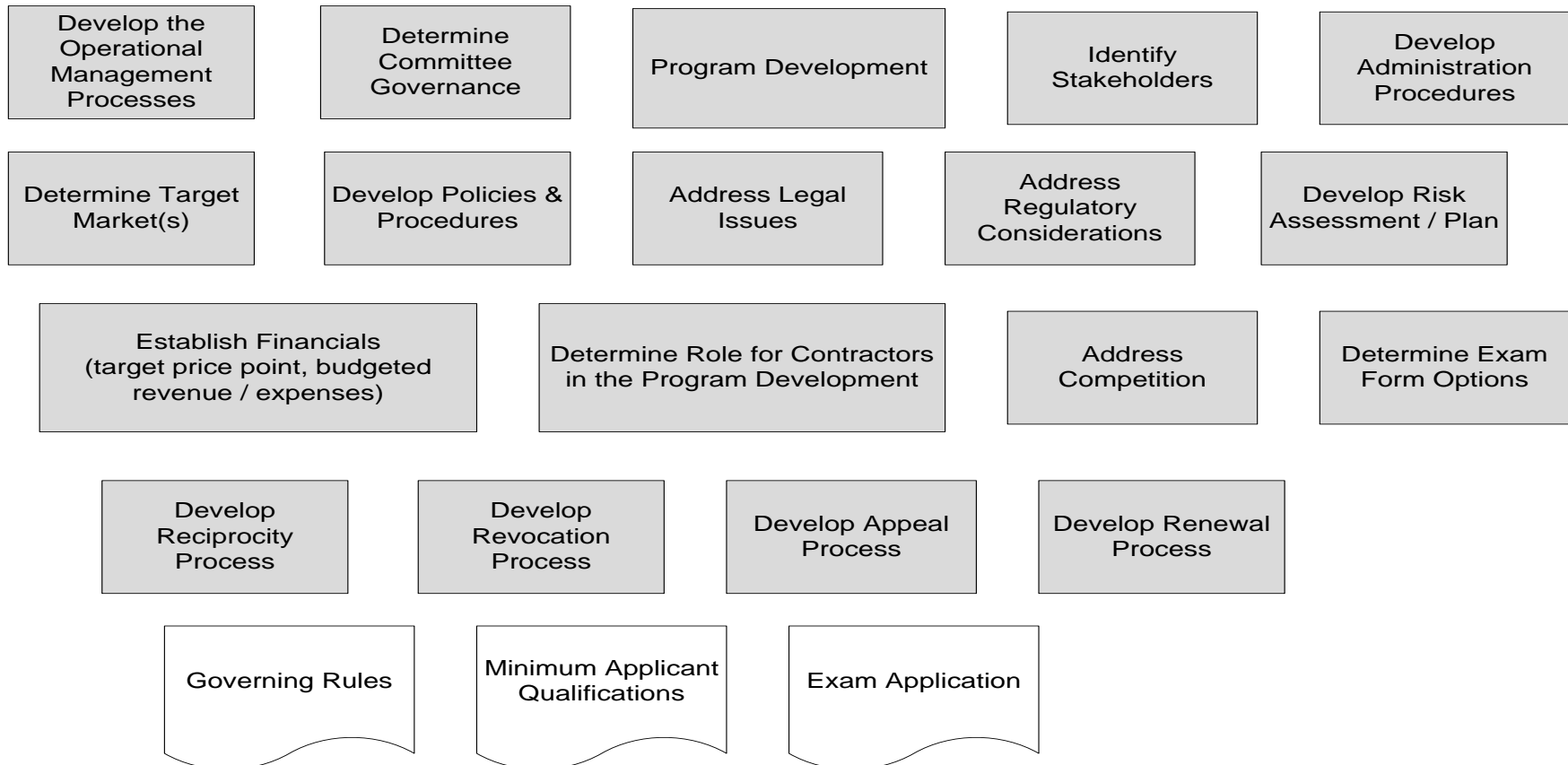


CA-NV Section, AWWA Advanced Water Treatment Certification Program Phase 2 Job Analysis Flowchart

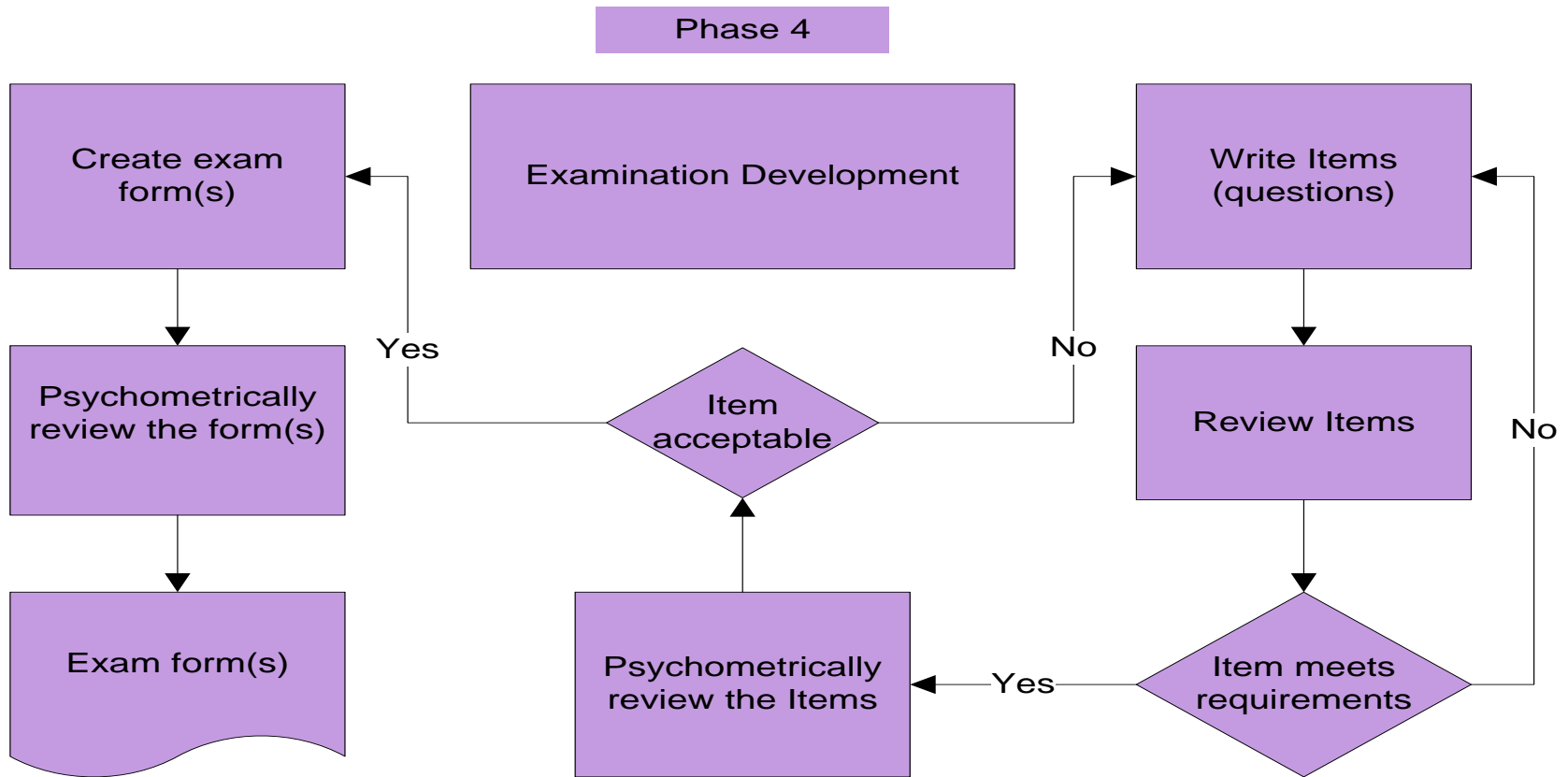


CA-NV Section, AWWA Advanced Water Treatment Certification Program Phase 3 Program Development Flowchart

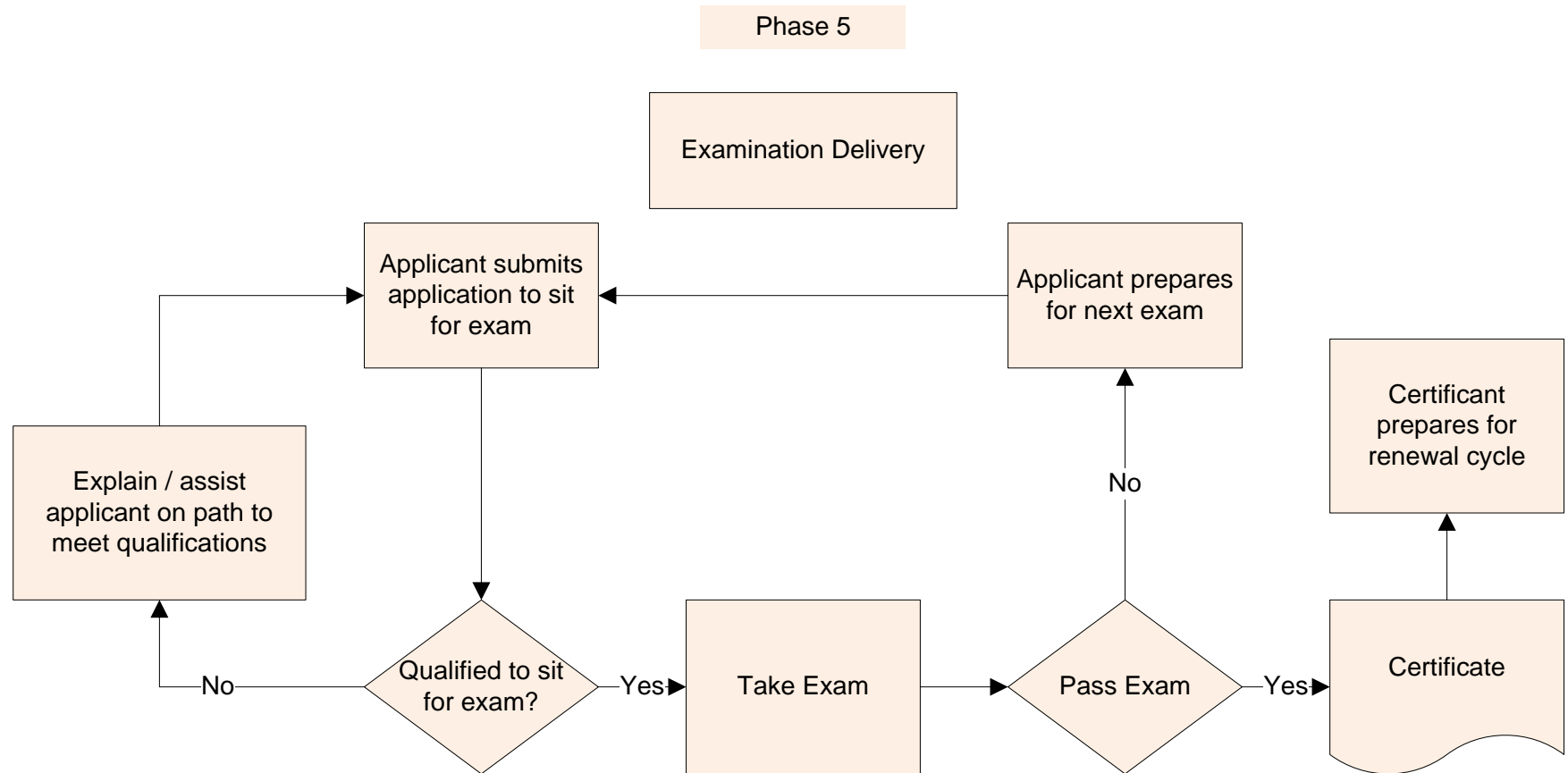
Phase 3



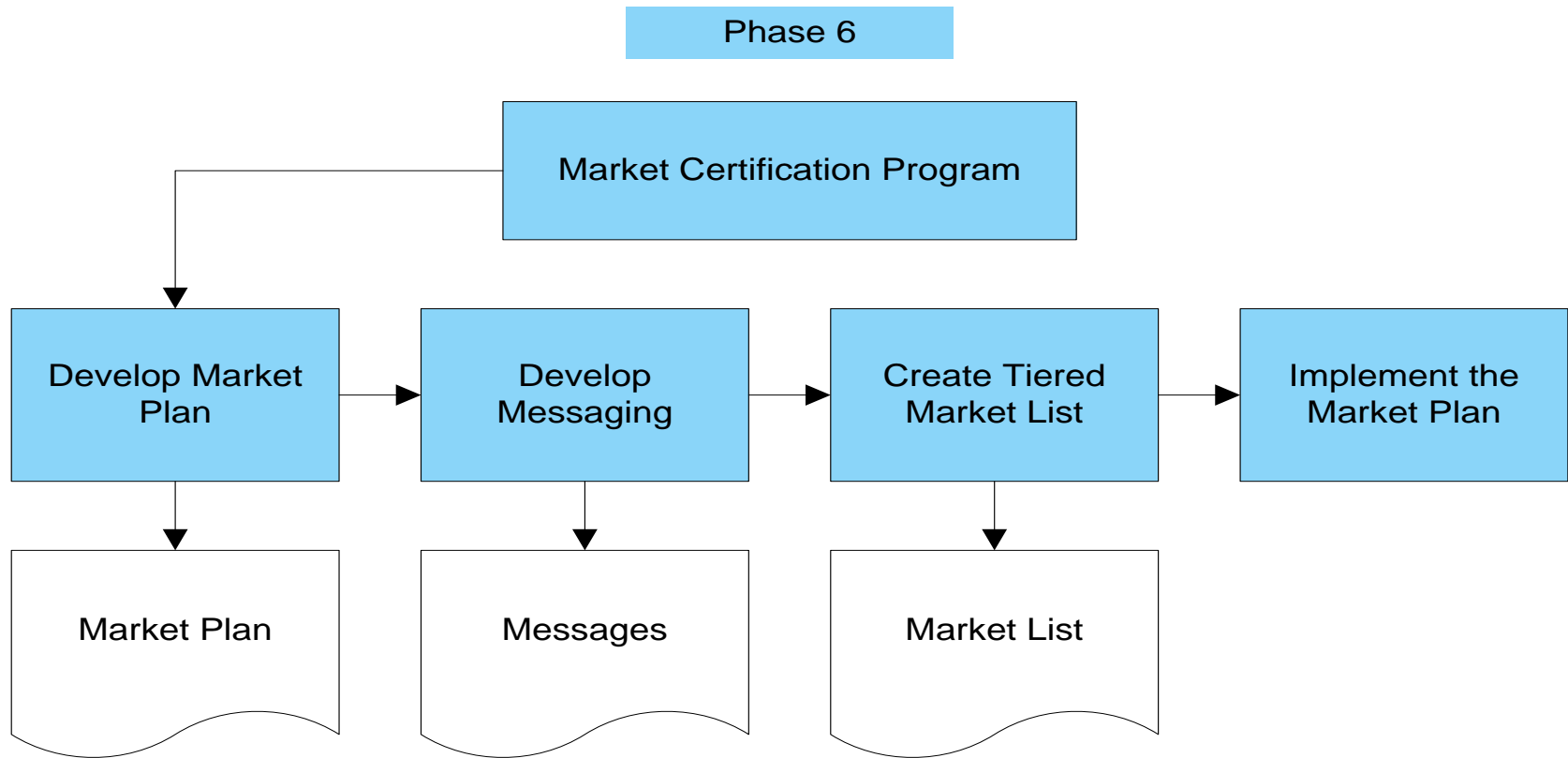
CA-NV Section, AWWA Advanced Water Treatment Certification Program Phase 4 Examination Development Flowchart



CA-NV Section, AWWA Advanced Water Treatment Certification Program Phase 5 Examination Delivery Flowchart



CA-NV Section, AWWA Advanced Water Treatment Certification Program Phase 6 Market Certification Program Flowchart



Status: Advanced Water Treatment Certification

CA-NV Section, AWWA

- Phase 1: Program Analysis **COMPLETED**
 - + Education options in the market discovered and summarized
 - + Job descriptions gathered and summarized
 - + Survey = needs analysis and certification interest
- Phase 2: Job Analysis **IN PROGRESS**
 - + Subject matter experts selected
 - + Facilitated workshop conducted
 - + Validation steps underway
- Phase 3: Program Development **IN PROGRESS**
- Phase 4: Examination Development **PENDING Phase 3**

Panel Discussion

What are your thoughts?

Questions? Contact Steven Garner

SGarner@ca-nv-awwa.org

(916) 889-8465



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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

Answer Choices	Responses
Membrane Filtration	80.50% 227
Reverse Osmosis	76.24% 215
Membrane Bioreactors	47.87% 135
Biologically Activated Carbon	42.55% 120
Advanced Oxidation - UV	63.12% 178
Advanced Oxidation - Ozone	55.32% 156
UV Disinfection	74.11% 209
Ozone Disinfection	56.03% 158
Adsorption / Ion Exchange Processes	47.16% 133
Source Water Control	51.42% 145
Brine / Waste Stream Management	52.13% 147
Post Treatment Conditioning	47.16% 133
Total Respondents: 282	

Q14: If an Advanced Water Treatment Certification program were offered, would your company / agency likely ... Answered: 306 Skipped: 164

Answer Choices	Responses
Require your operators to pursue this certification, in addition to what they currently hold	17.65% 54
Encourage your operators to pursue this certification, but not require it	53.92% 165
Maintain current business practices, however, I would be interested in obtaining the certification for my personal benefit	17.65% 54
Maintain current business practices, and I would not obtain the certification	10.78% 33
Total	306