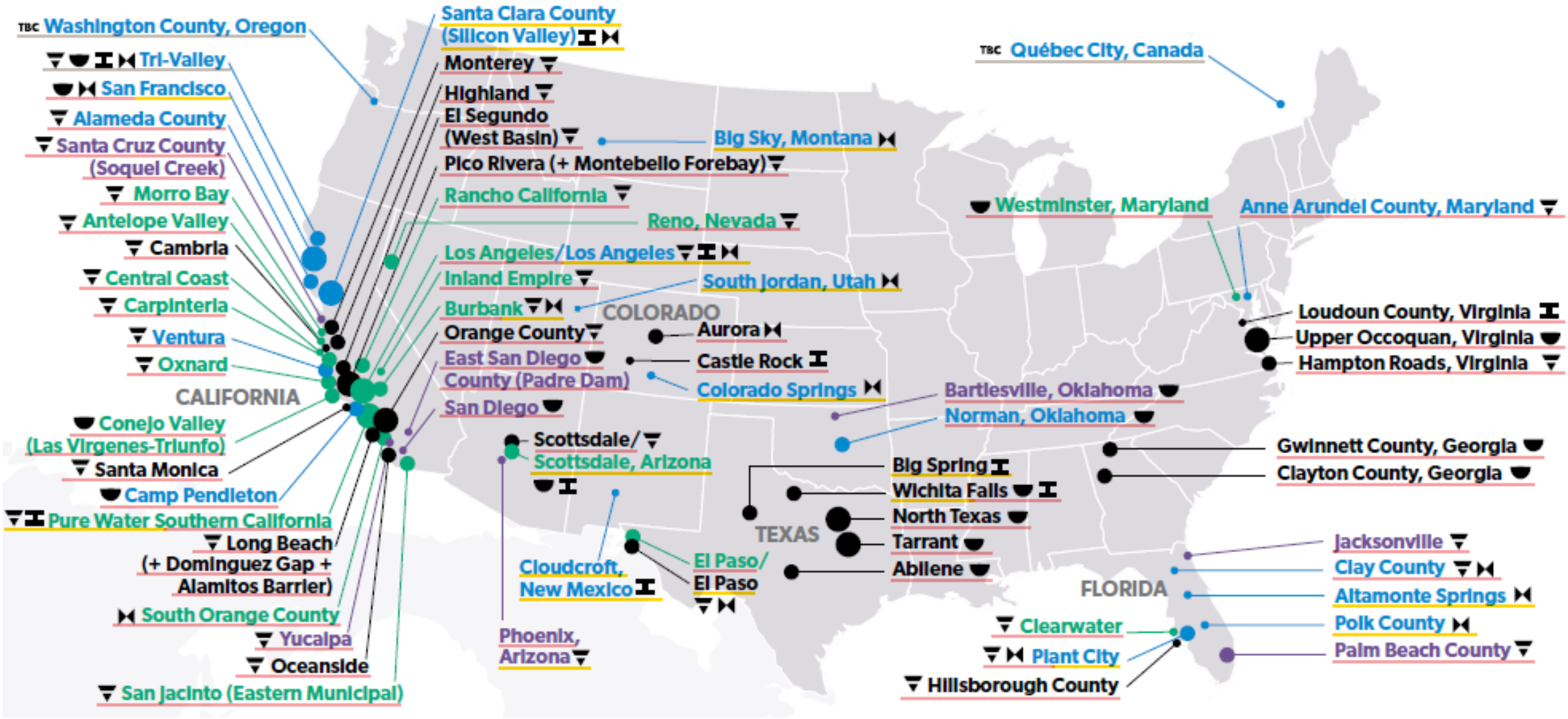
Proactive Development of Potable Reuse Guidelines in Hawaii

Stakeholder Survey Results and Path Forward

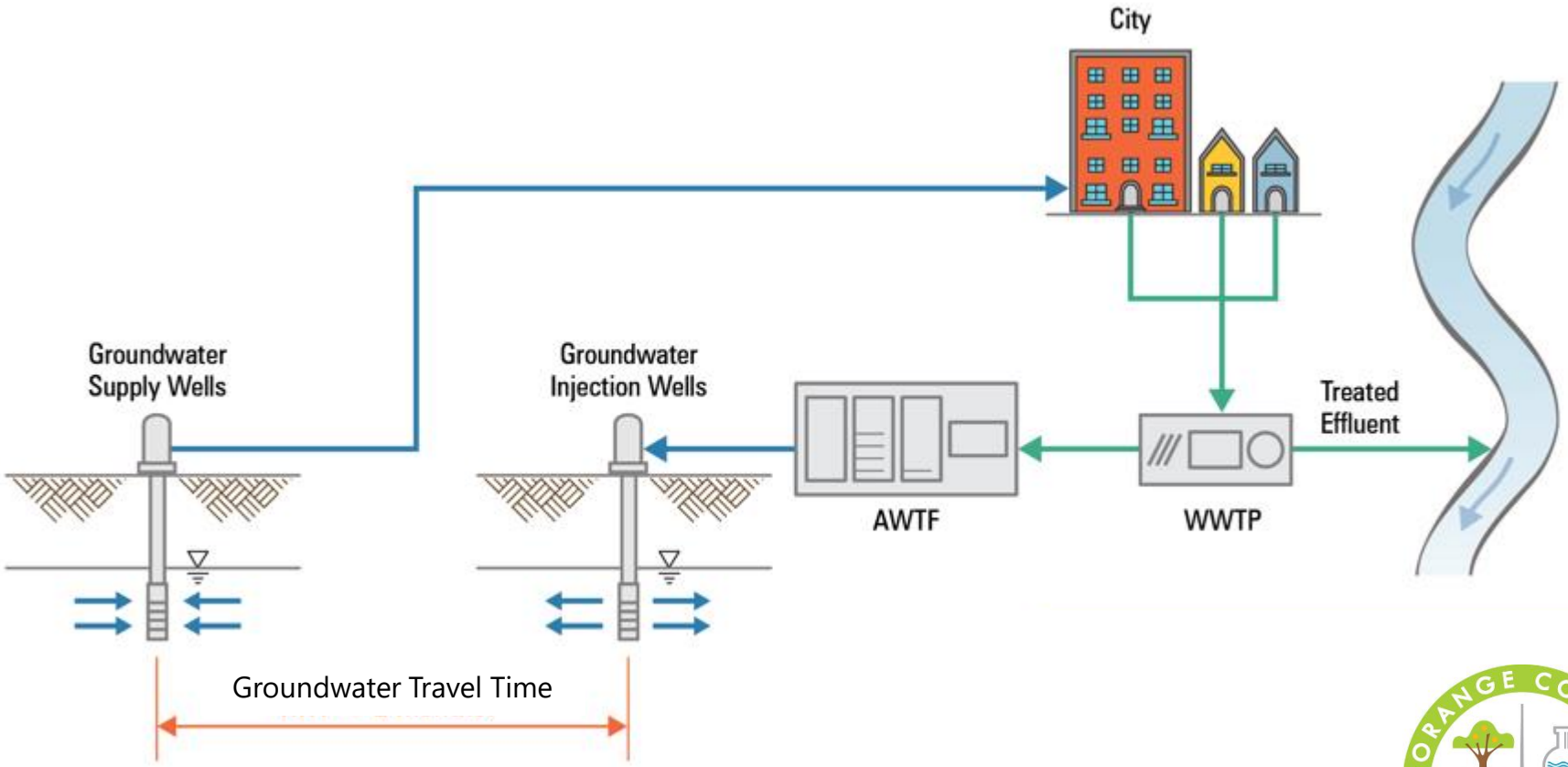
Andy Salveson PE (Carollo)
Mike Miyahira PE (Carollo)

61st Annual Hawaii Water Works Association Conference
October 15-17, 2025

US Potable Water Reuse (Purified Recycled Water)



One Example is Indirect Potable Reuse (IPR) via Groundwater Injection



All current IPR projects in CA are GW recharge projects
~200 mgd of total capacity
OCWD, LA, West Basin, WRD, Oceanside, Monterey, IEUA

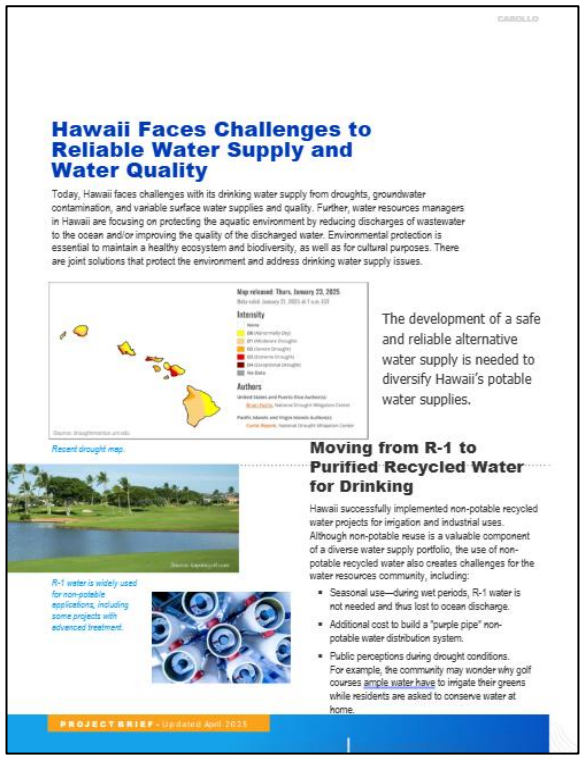
01

The Pure Water Hawaii Initiative

A "Brief" Concept of Pure Water Hawaii

Key Messaging

1. The development of a safe and reliable alternative water supply is needed to diversify Hawaii's potable water supplies in a climate changed, drought-prone future
2. Developing advanced purified water avoids potentially harmful discharges to the environment.
3. Purified water provides a locally controlled, drought-resistant water supply.



Hawaii Faces Challenges to Reliable Water Supply and Water Quality

Today, Hawaii faces challenges with its drinking water supply from droughts, groundwater contamination, and variable surface water supplies and quality. Further, water resources managers in Hawaii are focusing on protecting the aquatic environment by reducing discharges of wastewater to the ocean and/or improving the quality of the discharged water. Environmental protection is essential to maintain a healthy ecosystem and biodiversity, as well as for cultural purposes. There are joint solutions that protect the environment and address drinking water supply issues.

The development of a safe and reliable alternative water supply is needed to diversify Hawaii's potable water supplies.

Recent drought map.

Moving from R-1 to Purified Recycled Water for Drinking

Hawaii successfully implemented non-potable recycled water projects for irrigation and industrial uses. Although non-potable reuse is a valuable component of a diverse water supply portfolio, the use of non-potable recycled water also creates challenges for the water resources community, including:

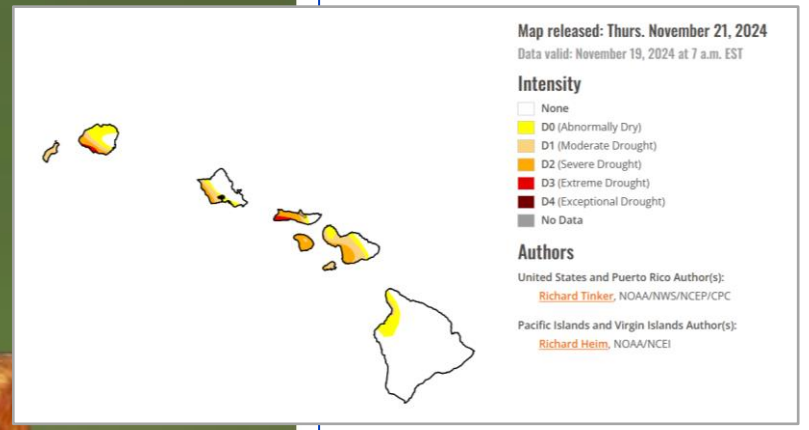
- Seasonal use—during wet periods, R-1 water is not needed and thus lost to ocean discharge.
- Additional cost to build a "purple pipe" non-potable water distribution system.
- Public perceptions during drought conditions. For example, the community may wonder why golf courses ample water have to irrigate their greens while residents are asked to conserve water at home.

R-1 water is widely used for non-potable applications, including some projects with advanced treatment.

PROJECT BRIEF • Updated April 2025

What Problems are We Trying to Solve? **Drought Resiliency**

Leaderboard Watch & Listen **News** FedExCup Schedule Players Stats Fantasy & Betting Signature Ev

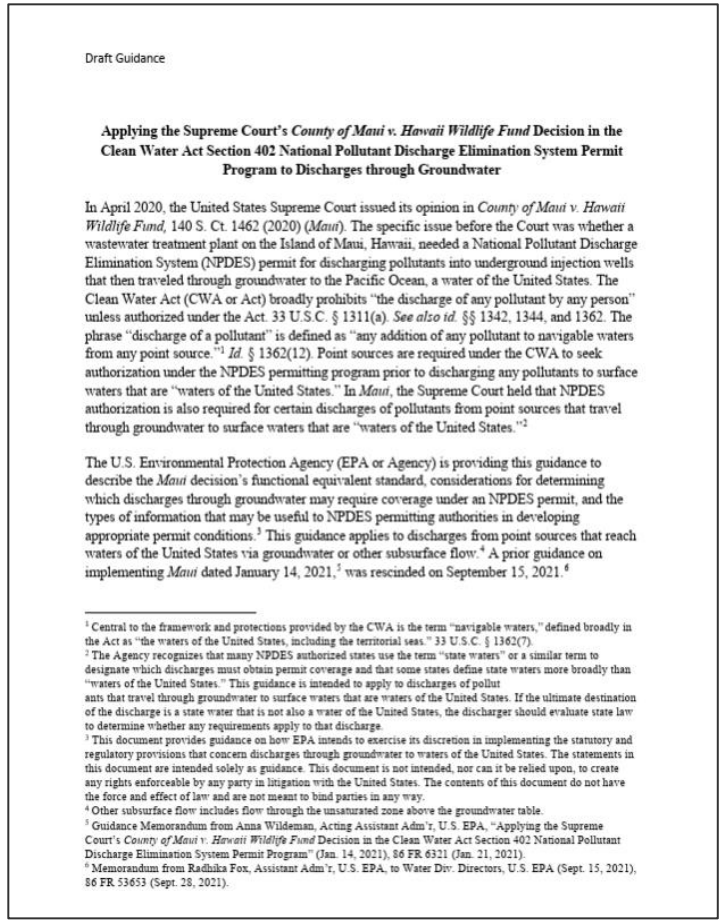


The PGA TOUR announced that the 2026 playing of The Sentry will not be contested at The Plantation Course at Kapalua because of ongoing drought conditions and related challenges on the island of Maui. (Sarah Stier/Getty Images)

What Problems are We Trying to Solve? Discharge Avoidance

The Hawaii DOH Clean Water Branch is developing a permitting strategy that incorporates the Functional Equivalent (FE)concept.

- Promotes "no discharge" alternatives, such as *wastewater reuse*.
- Identifies the need to develop *guidance* (HRS, HAR too!)
- Long-term Goals (5+ years)
  - Address all functional equivalent discharges statewide…and *promote water reuse*.
  - …Program implementation to *protect aquatic life, human health and the beneficial uses of State waters*.



Draft Guidance

Applying the Supreme Court's *County of Maui v. Hawaii Wildlife Fund* Decision in the Clean Water Act Section 402 National Pollutant Discharge Elimination System Permit Program to Discharges through Groundwater

In April 2020, the United States Supreme Court issued its opinion in *County of Maui v. Hawaii Wildlife Fund*, 140 S. Ct. 1462 (2020) (*Maui*). The specific issue before the Court was whether a wastewater treatment plant on the Island of Maui, Hawaii, needed a National Pollutant Discharge Elimination System (NPDES) permit for discharging pollutants into underground injection wells that then traveled through groundwater to the Pacific Ocean, a water of the United States. The Clean Water Act (CWA or Act) broadly prohibits "the discharge of any pollutant by any person" unless authorized under the Act. 33 U.S.C. § 1311(a). *See also id.* §§ 1342, 1344, and 1362. The phrase "discharge of a pollutant" is defined as "any addition of any pollutant to navigable waters from any point source."[1] *Id.* § 1362(12). Point sources are required under the CWA to seek authorization under the NPDES permitting program prior to discharging any pollutants to surface waters that are "waters of the United States." In *Maui*, the Supreme Court held that NPDES authorization is also required for certain discharges of pollutants from point sources that travel through groundwater to surface waters that are "waters of the United States."[2]

The U.S. Environmental Protection Agency (EPA or Agency) is providing this guidance to describe the *Maui* decision's functional equivalent standard, considerations for determining which discharges through groundwater may require coverage under an NPDES permit, and the types of information that may be useful to NPDES permitting authorities in developing appropriate permit conditions.[3] This guidance applies to discharges from point sources that reach waters of the United States via groundwater or other subsurface flow.[4] A prior guidance on implementing *Maui* dated January 14, 2021,[5] was rescinded on September 15, 2021.[6]

[1] Central to the framework and protections provided by the CWA is the term "navigable waters," defined broadly in the Act as "the waters of the United States, including the territorial seas." 33 U.S.C. § 1362(7).
[2] The Agency recognizes that many NPDES authorized states use the term "state waters" or a similar term to designate which discharges must obtain permit coverage and that some states define state waters more broadly than "waters of the United States." This guidance is intended to apply to discharges of pollut
ants that travel through groundwater to surface waters that are waters of the United States. If the ultimate destination of the discharge is a state water that is not also a water of the United States, the discharger should evaluate state law to determine whether any requirements apply to that discharge.
[3] This document provides guidance on how EPA intends to exercise its discretion in implementing the statutory and regulatory provisions that concern discharges through groundwater to waters of the United States. The statements in this document are intended solely as guidance. This document is not intended, nor can it be relied upon, to create any rights enforceable by any party in litigation with the United States. The contents of this document do not have the force and effect of law and are not meant to bind parties in any way.
[4] Other subsurface flow includes flow through the unsaturated zone above the groundwater table.
[5] Guidance Memorandum from Anna Wildeman, Acting Assistant Adm'r, U.S. EPA, "Applying the Supreme Court's *County of Maui v. Hawaii Wildlife Fund* Decision in the Clean Water Act Section 402 National Pollutant Discharge Elimination System Permit Program" (Jan. 14, 2021), 86 FR 6321 (Jan. 21, 2021).
[6] Memorandum from Radhika Fox, Assistant Adm'r, U.S. EPA, to Water Div. Directors, U.S. EPA (Sept. 15, 2021), 86 FR 53653 (Sept. 28, 2021).

From: DOH-FE-Discharge-Strategy-May-21-2024-Stakeholder-Meeting-No.-1.pdf

What Problems are We Trying to Solve? Smart Investment

- ❑ Purple Pipe Challenges
  - Costly to connect multiple sources to attain high water recovery
  - Seasonal use impacts total annual recovery
  - Distributed permitting and oversight

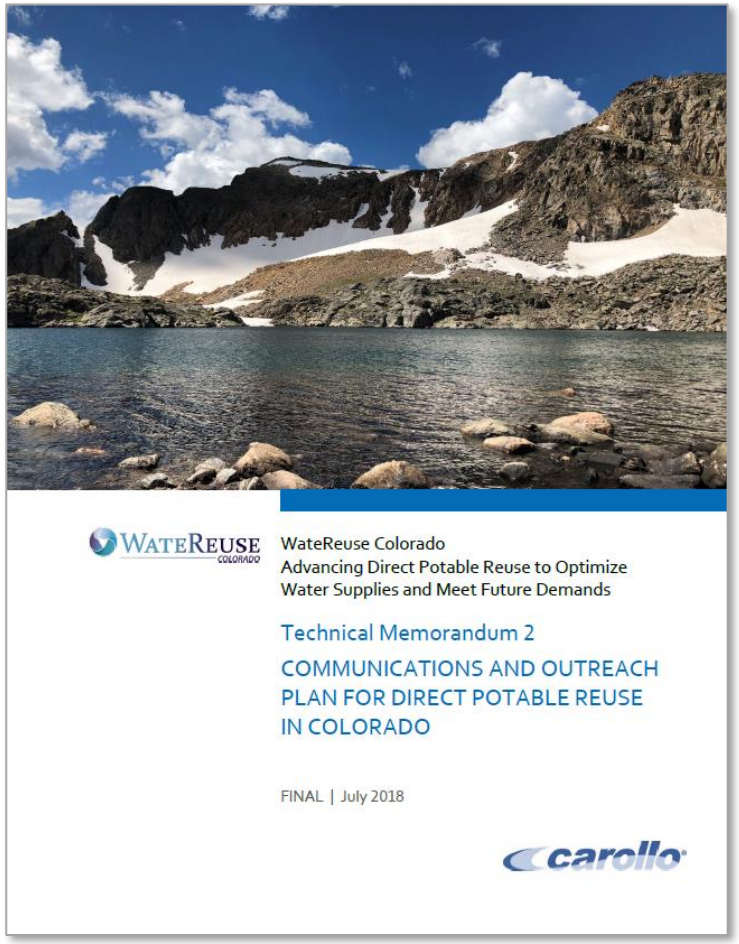
- ❑ What some agencies are doing…
  - **San Francisco**
  - **Las Virgenes MWD**
  - **Santa Barbara**

02

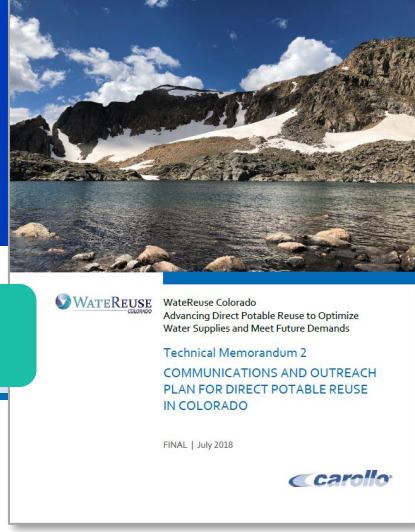
Stakeholder Engagement

A Stakeholder Process Was Used in Colorado to Develop Potable Reuse (Purified Recycled Water) Guidance

Communications and Outreach Preceded, then Ran in Parallel, to Technical Efforts



Clearly defined stakeholders and priority



Stakeholder	Priority	Category
Colorado Department of Public Health and Environment	High	Regulator/Agency
Industry (food and beverage, manufacturing, etc.)	High	User
Environmental groups	High	Influencer
State legislators	Medium	Influencer
Water associations and organizations (CFWE, AWWA, CWC, etc.)	Medium	Influencer
Basin Roundtables and Inter-Basin Compact Commission	Medium	Influencer
Schools (K-12)	Medium	Influencer
Secondary education academic staff	Medium	Influencer
Water providers' leadership (Front Range	Medium	Influencer

03

Survey Methodology & Results

Important Survey First Steps and Questions…

❑ What kinds of stakeholders would need to be involved?

- *Leaders or stewards* of reuse guidelines (Regulators? Counties? Others?)
- *SMEs* (consultants, scientists, medical community)
- *Influencers* (legislators, environmental groups, professional orgs, county/stage agencies, etc.)
- *Implementers* (utilities, operators) and *Users* (utility customers)

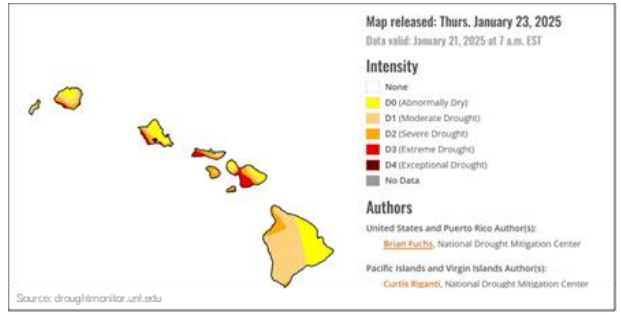
❑ What do we want to identify from this survey?

- *Consensus and disparity* topics
- *Patterns,* consistency of perspectives
- …A potential *path forward* on guidelines development

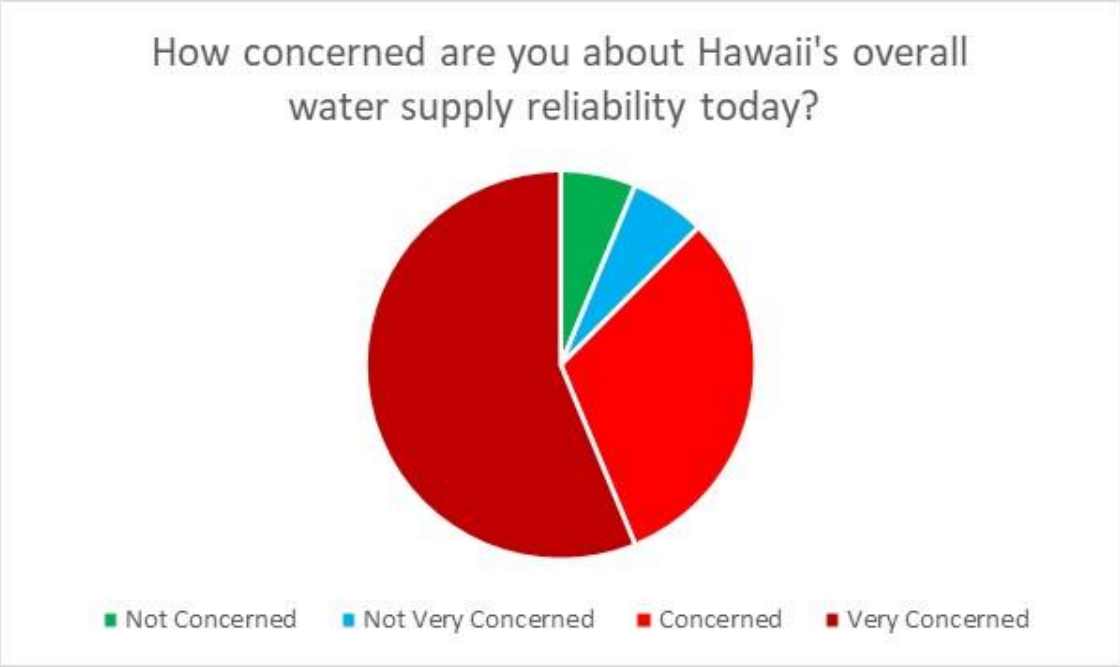
The Concept of Pure Water Hawaii

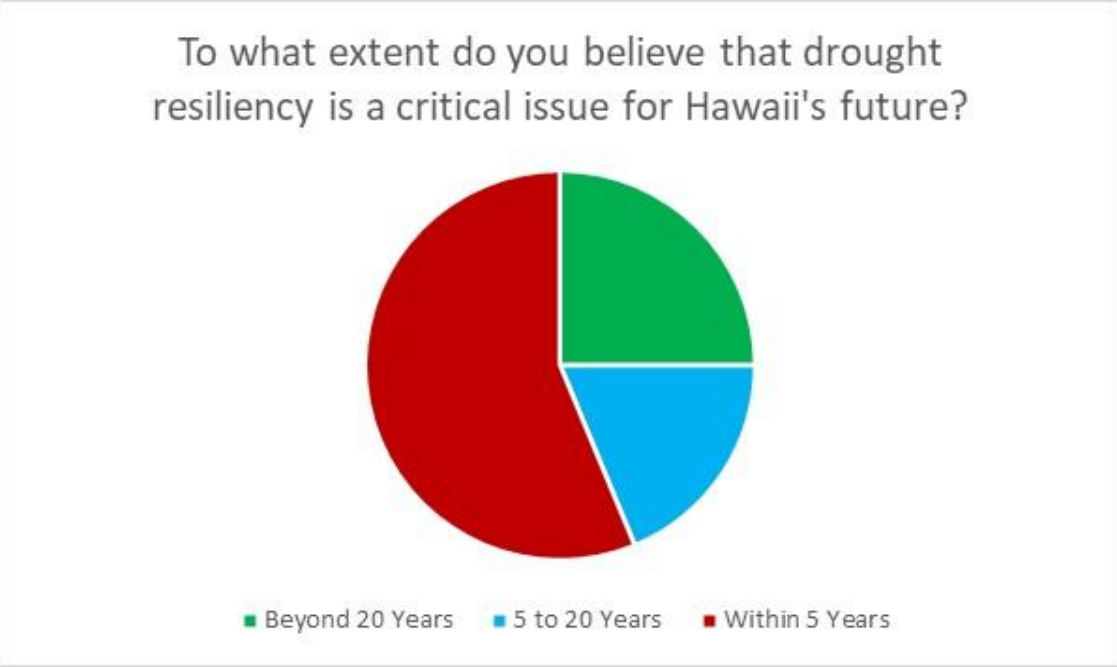
So, we asked our Hawaii stakeholders…

- Their concerns about Hawaii's *overall water supply reliability* today?
- Whether *drought resiliency* is a critical issue for Hawaii's future?
- The importance of *potable water reuse concentrate discharge* detrimentally impacting receiving waters
- What *priority* should be given to potable water reuse relative to other water supply needs in Hawaii?
- What is the *VALUE of ensuring a reliable and sustainable water supply* - to maintaining or improve a community's quality of life for its people, agriculture, the environment, and the local economy



Water Supply

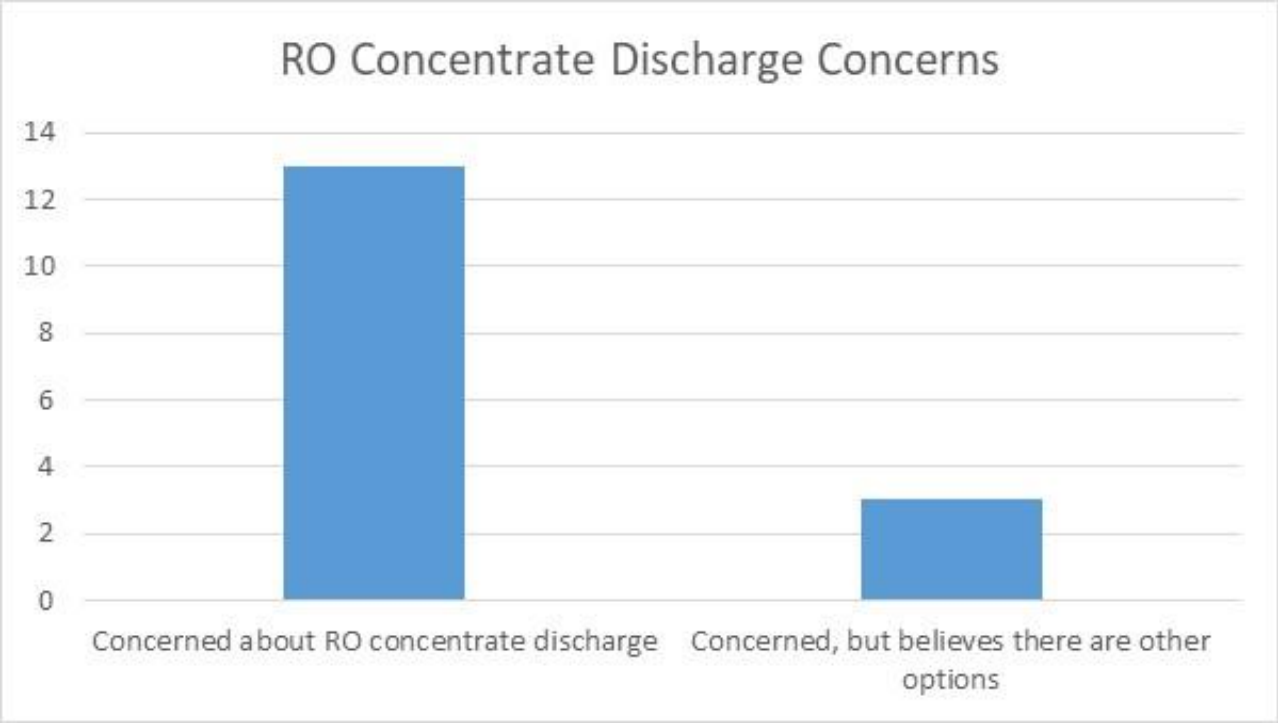




Water Supply Concerns

Needs Addressing Near Term!

Environmental Concerns

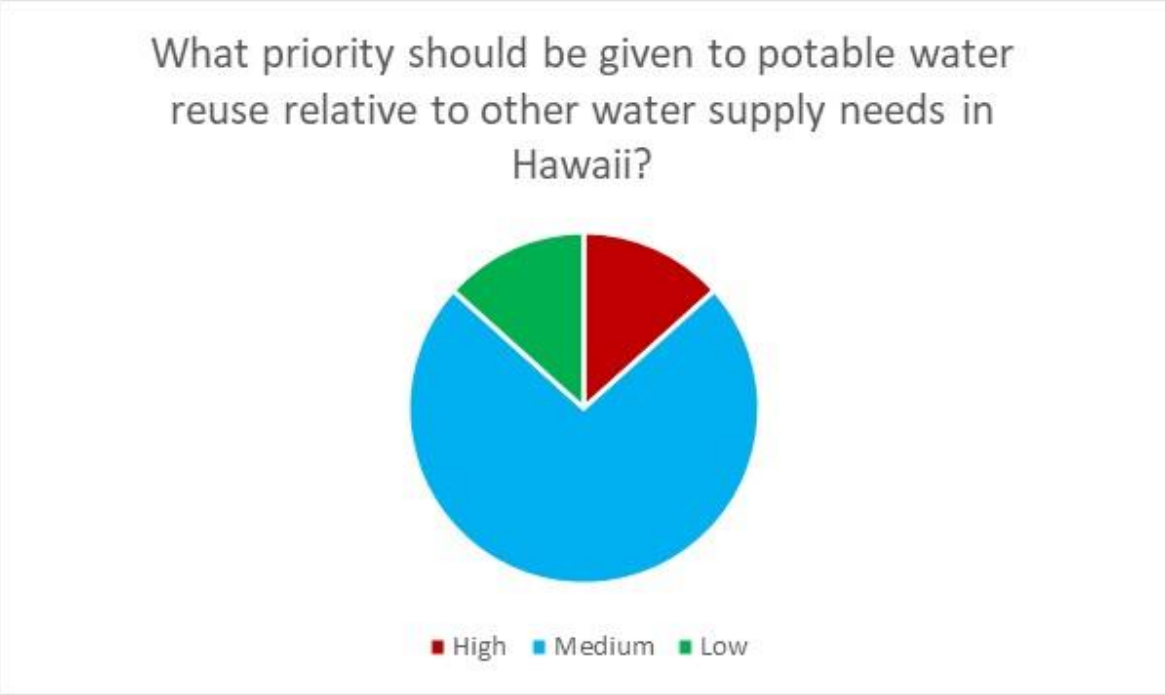


"I don't believe effluent discharge is causing significant harm to Hawaii's coastal environment"

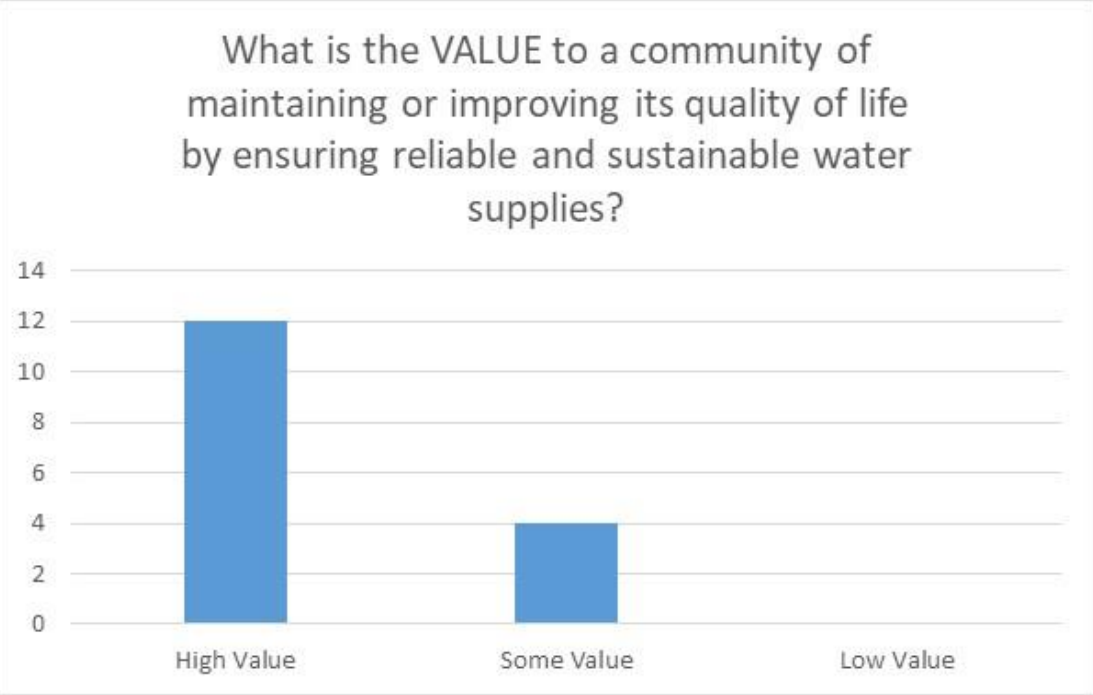
"I believe there are strategies to alternative disposal that can meet drought resiliency and environmental goals"

Concentrate Discharge a Concern

Water Supply Considerations



All Options Should Be On the Table



Sustainable Water a Core Community Value

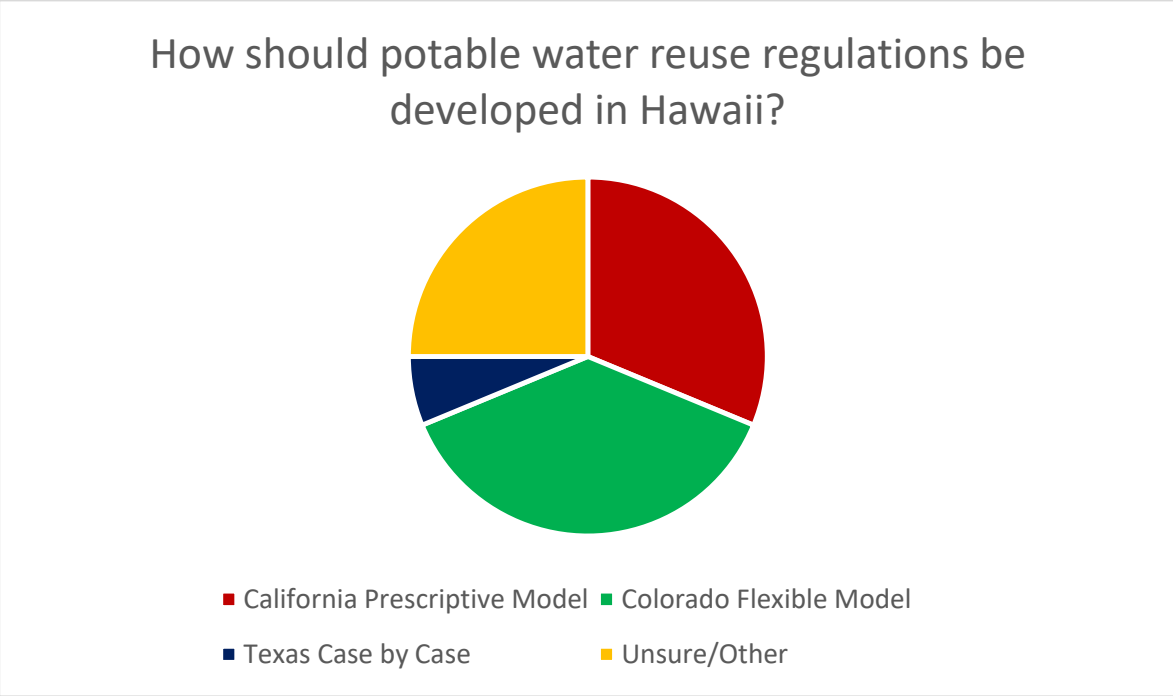
The Concept of Pure Water Hawaii

The Challenge of Time - because of the time and cost of Potable Reuse implementation, a proactive and flexible regulatory approach is needed.

So, we asked our Hawaii stakeholders…

- How should potable water reuse regulations be developed in Hawaii?
- What existing regulatory structure should be considered when developing potable water reuse regulations?
- What external guidance from other entities should Hawaii consider when developing potable water reuse regulations?
- What is a reasonable timeline to develop at least potable reuse guidelines, considering the urgency of water needs?

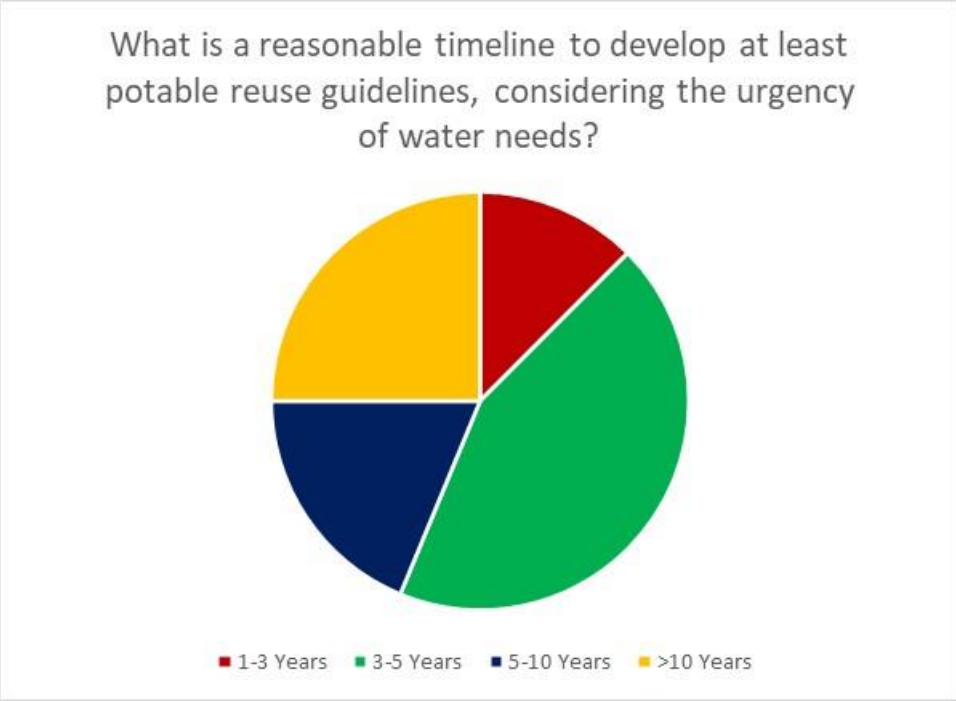
Regulations Development



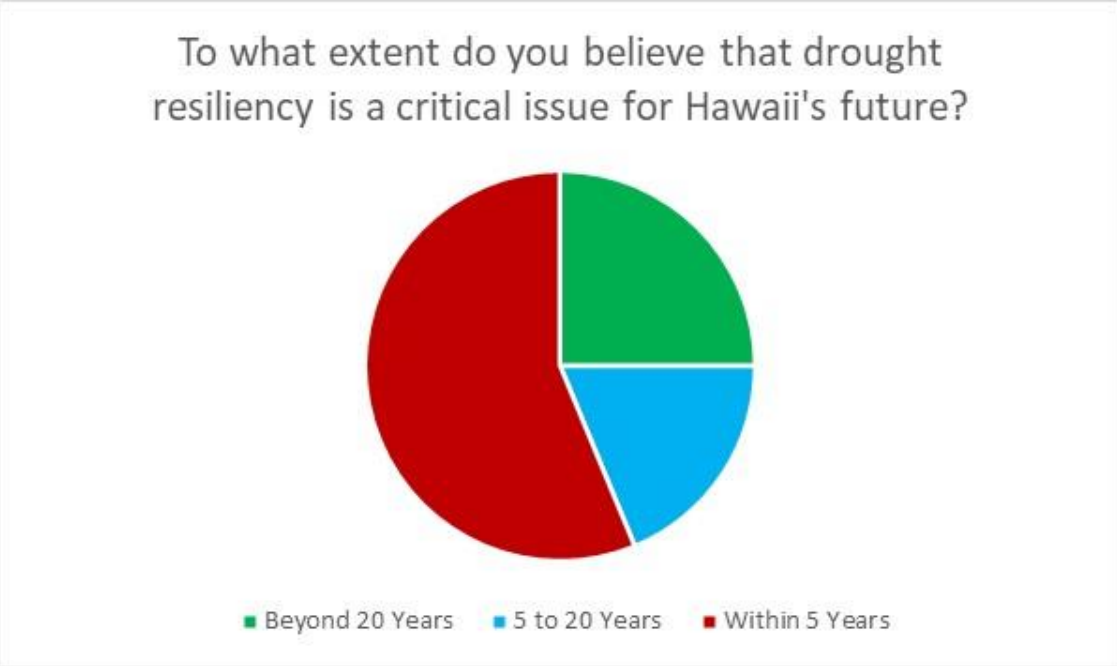
"We should review the various approaches and expand discussion to include all stakeholders. Too early to select."

No Consensus! Work Needed Here!

Regulations Development



3 to 5+ Years



Resiliency Needed in <10 years

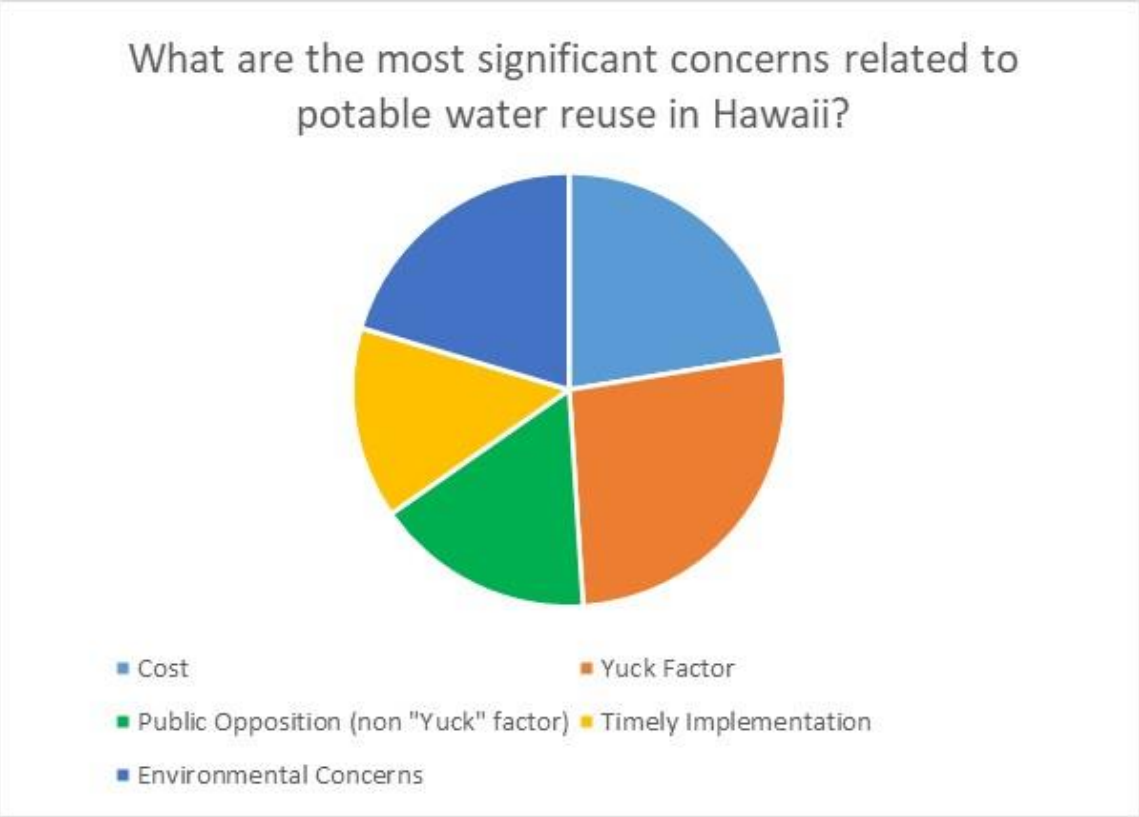
The Concept of Pure Water Hawaii

A variety of related societal topics were also broached

So, we asked our Hawaii stakeholders…

- What are the most significant political concerns related to potable water reuse in Hawaii?
- How do you perceive the "yuck factor" influencing public acceptance of potable water reuse?
- How do generational perspectives on existing “pure” water supplies affect the acceptance of potable reuse?
- What are the main institutional concerns within agencies/utilities regarding potable reuse?

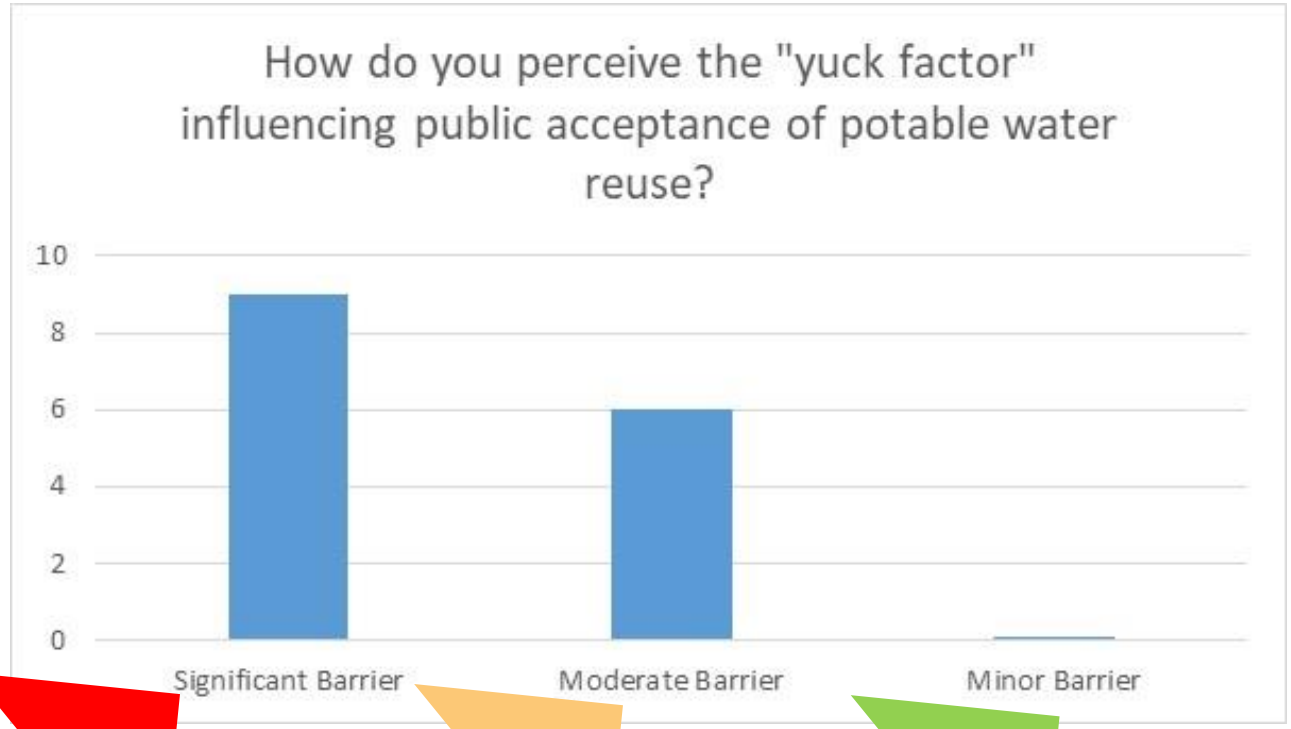
Implementation Concerns



"Has enough alternative analysis been performed to determine if this is the next best cost benefit option available to address possible future shortages?"

Many Concerns…and Many Reasons to "Rubberneck"

Implementation Concerns



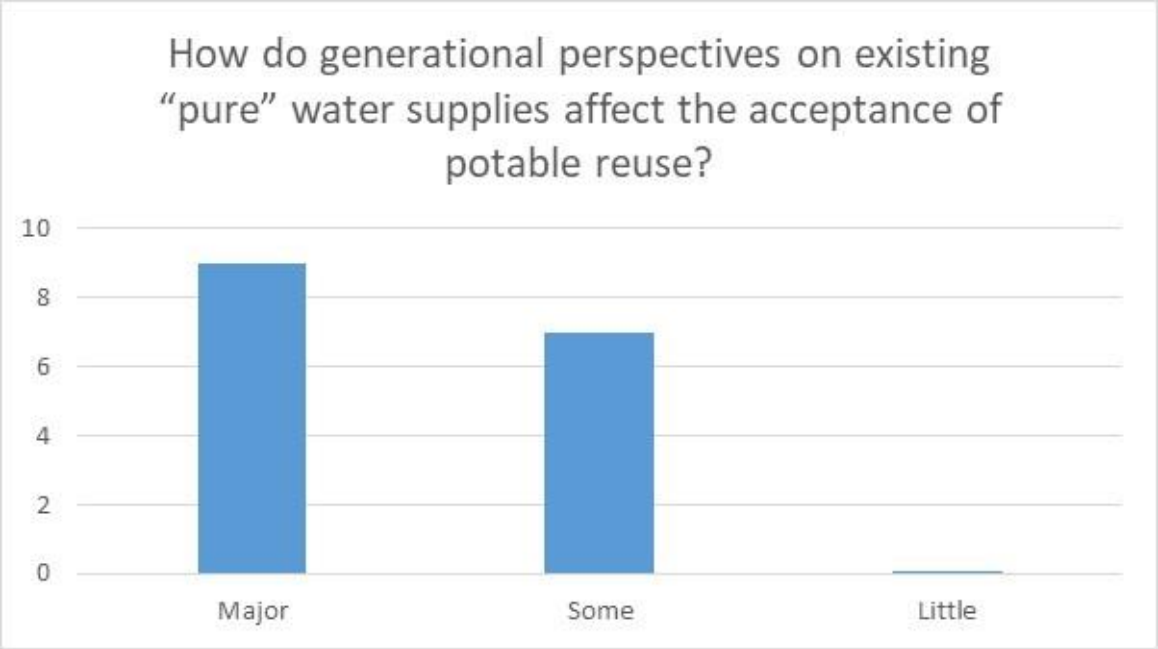
"Cannot be overcome at this time"

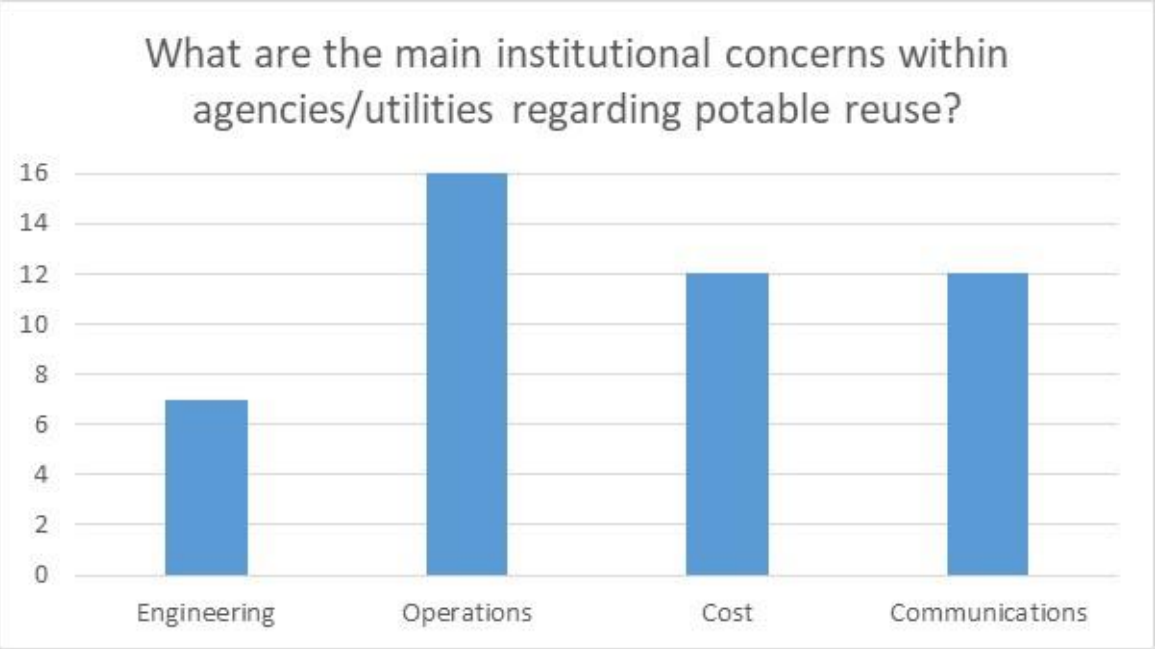
"Issue can be overcome with political and regulatory will"

No Votes!

Implementation Concerns

Operations winner winner chicken dinner





Educate the Youth!

Survey!

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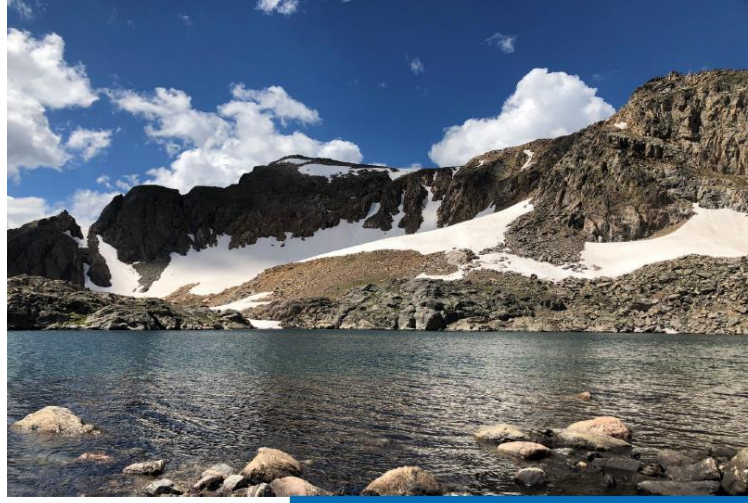
A Proposed Way Forward



WateReuse Colorado
Advancing Direct Potable Reuse to Optimize Water Supplies and Meet Future Demands

Technical Memorandum 1

DEVELOPMENT OF DPR REGULATIONS IN COLORADO

FINAL | July 2018

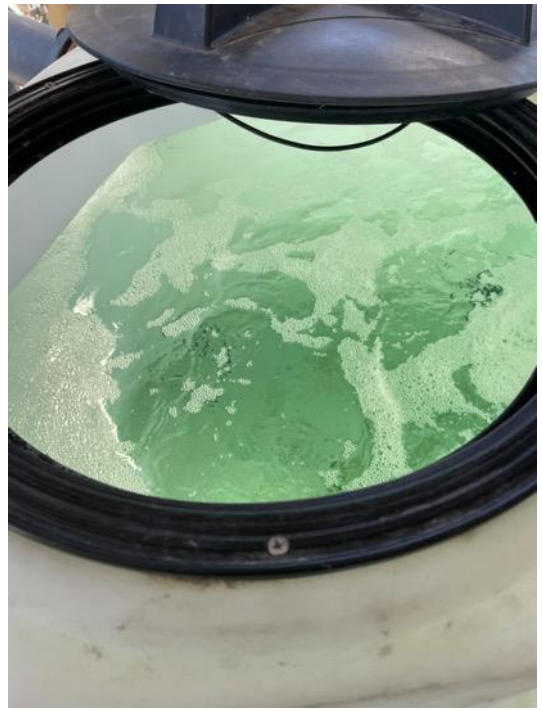
carollo

ROC Quality

- 5X to 7X the concentration of metals, chemicals, solids, PFAS
- Acceptable even if it meets NPDES permit?
- Costly to treat

Brine without Ozone/BAC

Brine with Ozone/BAC

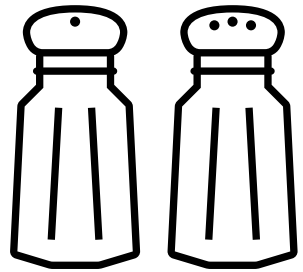


Survey Says:
Most people are concerned by ROC discharge

Action:
Document the cost and benefit of ROC Treatment

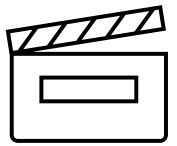
Regulatory Model

Model	Type	Treatment Technology
California	Rigid	RO Based
Texas	Case by Case	Unspecified
Colorado	Flexible	RO Based or Ozone/BAC Based

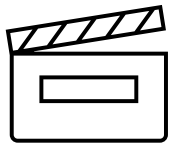


Survey Says:
Split between California Model and Colorado Model

Action:
Determine if there is any real possibility of a non-RO solution

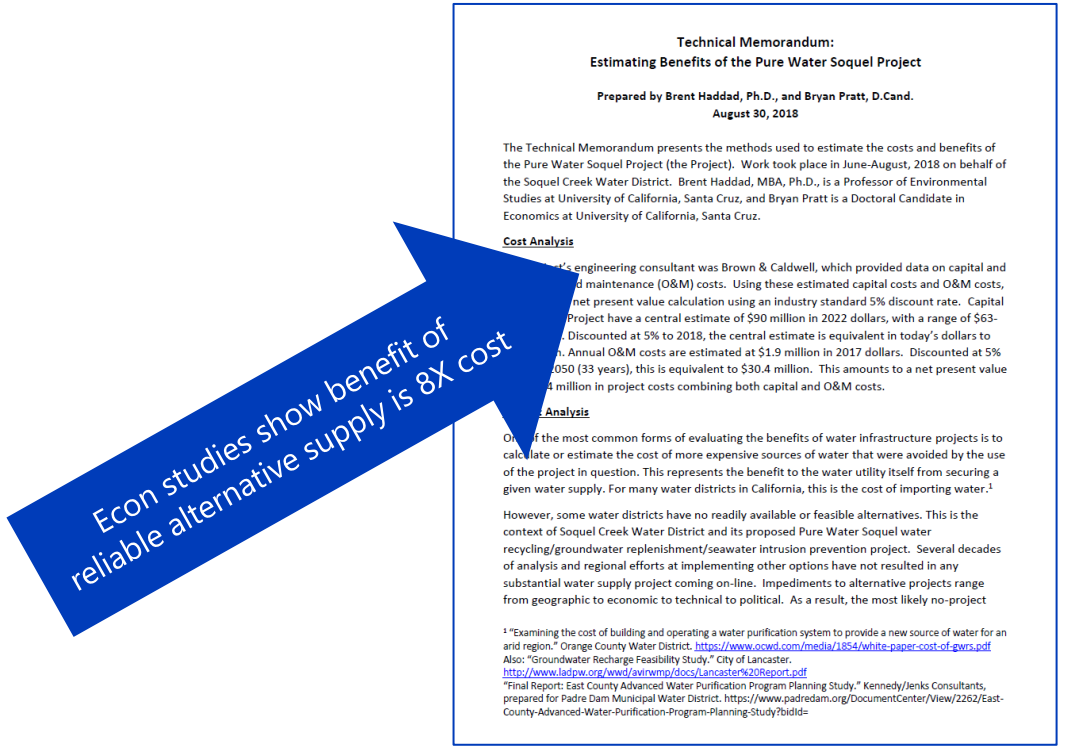


Action:
Develop Hawaii specific guidelines using CA and CO risk models



Documenting Value and Need

- Develop Options (not just potable reuse)…*developing Guidance is not an endorsement of potable reuse*
- Document Value, because $/gal will be very high!



Technical Memorandum:
Estimating Benefits of the Pure Water Soquel Project

Prepared by Brent Haddad, Ph.D., and Bryan Pratt, D.Cand.
August 30, 2018

The Technical Memorandum presents the methods used to estimate the costs and benefits of the Pure Water Soquel Project (the Project). Work took place in June-August, 2018 on behalf of the Soquel Creek Water District. Brent Haddad, MBA, Ph.D., is a Professor of Environmental Studies at University of California, Santa Cruz, and Bryan Pratt is a Doctoral Candidate in Economics at University of California, Santa Cruz.

Cost Analysis

…t's engineering consultant was Brown & Caldwell, which provided data on capital and …d maintenance (O&M) costs. Using these estimated capital costs and O&M costs, …net present value calculation using an industry standard 5% discount rate. Capital …Project have a central estimate of $90 million in 2022 dollars, with a range of $63-… Discounted at 5% to 2018, the central estimate is equivalent in today's dollars to …. Annual O&M costs are estimated at $1.9 million in 2017 dollars. Discounted at 5% …2050 (33 years), this is equivalent to $30.4 million. This amounts to a net present value …4 million in project costs combining both capital and O&M costs.

… Analysis

O… of the most common forms of evaluating the benefits of water infrastructure projects is to calc…late or estimate the cost of more expensive sources of water that were avoided by the use of the project in question. This represents the benefit to the water utility itself from securing a given water supply. For many water districts in California, this is the cost of importing water.[1]

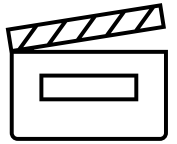
However, some water districts have no readily available or feasible alternatives. This is the context of Soquel Creek Water District and its proposed Pure Water Soquel water recycling/groundwater replenishment/seawater intrusion prevention project. Several decades of analysis and regional efforts at implementing other options have not resulted in any substantial water supply project coming on-line. Impediments to alternative projects range from geographic to economic to technical to political. As a result, the most likely no-project

[1] "Examining the cost of building and operating a water purification system to provide a new source of water for an arid region." Orange County Water District. https://www.ocwd.com/media/1854/white-paper-cost-of-gwrs.pdf
Also: "Groundwater Recharge Feasibility Study." City of Lancaster.
http://www.ladpw.org/wwd/avirwmp/docs/Lancaster%20Report.pdf
"Final Report: East County Advanced Water Purification Program Planning Study." Kennedy/Jenks Consultants, prepared for Padre Dam Municipal Water District. https://www.padredam.org/DocumentCenter/View/2262/East-County-Advanced-Water-Purification-Program-Planning-Study?bidId=

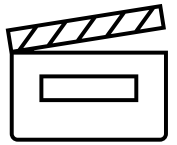
Econ studies show benefit of reliable alternative supply is 8X cost

Survey Says:
Consider multiple options for reliable supply

Action:
Pursue multiple paths to reliable water



Action:
Document value of reliable water



Address Institutional Concerns

Concern	Example	Mitigation
Engineering	Undefined treatment leading to non-uniform analysis	Develop treatment and monitoring guidelines
Operations	No advanced trained staff	Develop demonstrations and related training program
Cost	Undefined systems, costly examples	Risk based guidance, do what is needed (and not further)
Communications	Lack of experience, lack of trust	Demonstrate Demonstrate Demonstrate

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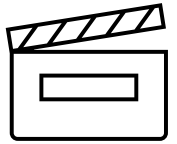
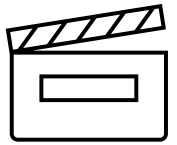
Survey Says:
There are a lot of items to work through!

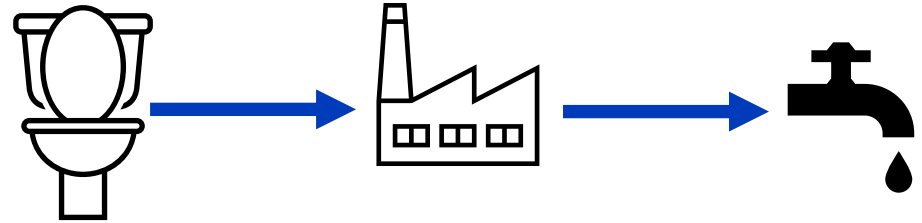
Action:
Develop guidelines



Action:
Build demonstrations, develop training programs



Listen and Educate



Survey Says:
Significant concern on public comfort and support

Action:
Listen to all stakeholders, understand their concerns

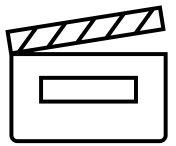
Action:
Build demonstrations, show don't tell

Careful Progress

	Month													
Phase 1 - Framework	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Goal Setting														
Stakeholders														
Surveys														
Workshops/Interviews														
Regulatory History														
Regulations in Hawaii														
Regulations Nationally and Globally														
Case Studies and Precedent														
Development of Potential Regulatory Matrix														
Regulation														
Guidance														
Policy														
Workshops														
Communications and Outreach														
Goals and Objectives														
Identification of Audiences														
Messaging														
Strategies and Tactics														
Implementation Timeline														
Method to Evaluate Performance														
Workshops														

Survey Says:
3-5 Years to develop regulations

Action:
Develop Regulatory and Outreach Guidelines



Pure Water Hawaii Needs Your Support

carollo

This project happens only with your support!

Confirmed Project Partners

- National Water Research Institute (NWRI)
  - » NWRI would manage the project
  - » NWRI is an internationally respected water science non-profit committed to protecting and extending our country's water resources
  - » Direct experience on similar projects in California, Nevada, New Mexico, and Colorado
- Kauai Department of Water
- Honolulu Board of Water Supply
- Maui Department of Water Supply
- Hawaii Department of Water Supply
- Carollo Engineers
- Brown and Caldwell

Confirmed Project Partners

- Hawaii Department of Health (DOH) Environmental Management Division
- DOH Safe Drinking Water Branch
- DOH Wastewater Branch
- City & County of Honolulu Department of Environmental Services

Potential Project Partners

- DLNR Commission on Water Resource Management
- Private water/wastewater utilities (various)
- Private contract operators
- NGOs
- Additional consultants
- Institutional support (e.g., UH-Manoa WRRC)

Proactive Develoment of Potable Reuse Guidelines in Hawaii – Stakeholder Survey and Path Forward

Questions?

ASalveson@carollo.com
Mmiyahira@carollo.com