2017 WateReuse Chapter Meeting

Mitchell Park Community Center, Palo Alto

August 18, 2017

Potable Reuse Demo Testing at the Silicon Valley Advanced Water Purification Center

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ADVANCED WATER PURIFICATION CENTER

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Santa Clara Valley Water District

Presentation Outline

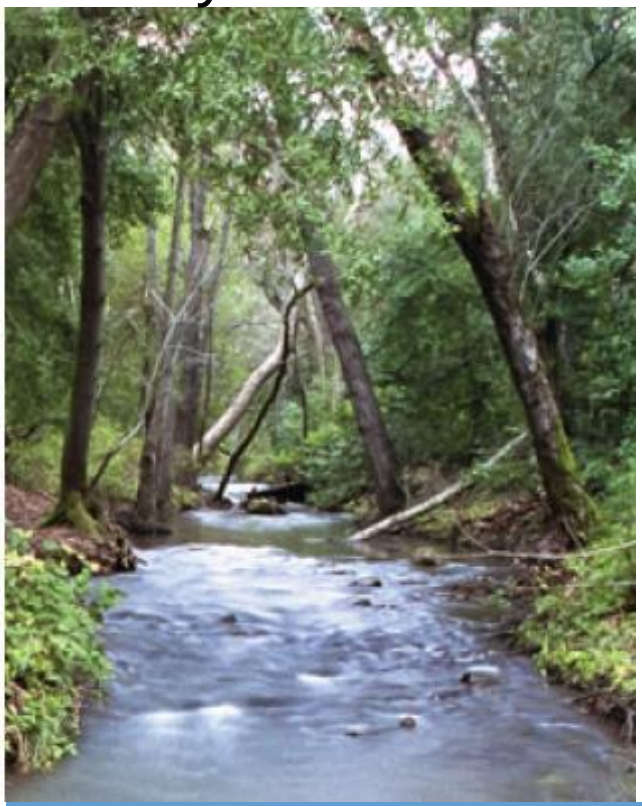
- Background
- Challenges for Water Resources
- Silicon Valley Advanced Water Purification Center
- Potable Reuse Demonstration Testing
- District's Next Steps

An Integrated Approach

Providing Silicon Valley safe, clean water for a healthy life, environment and economy

CLEAN, RELIABLE WATER

FLOOD PROTECTION



HEALTHY CREEKS & ECOSYSTEMS

Santa Clara Valley Water District Serves:

2 million people

15 cities

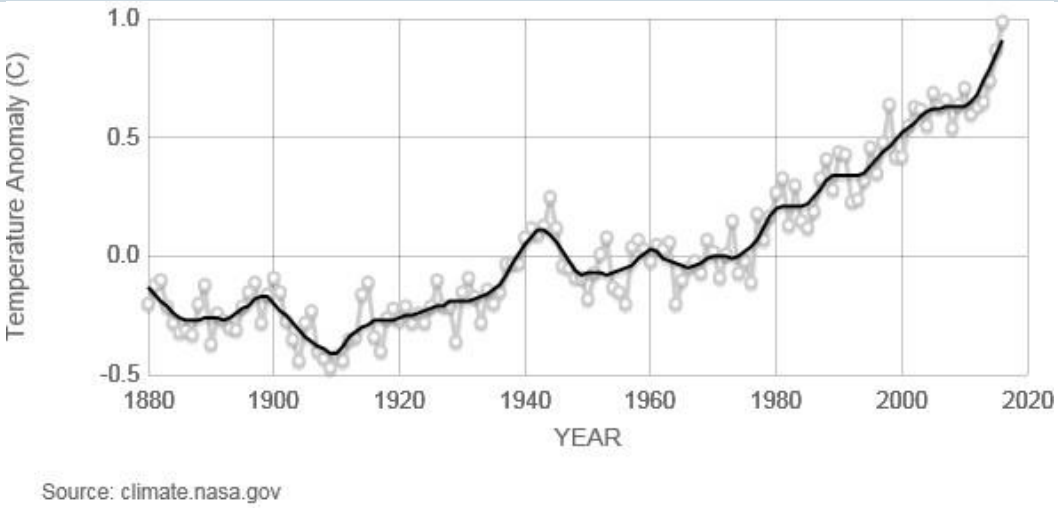
4,700 well owners

13 water retailers

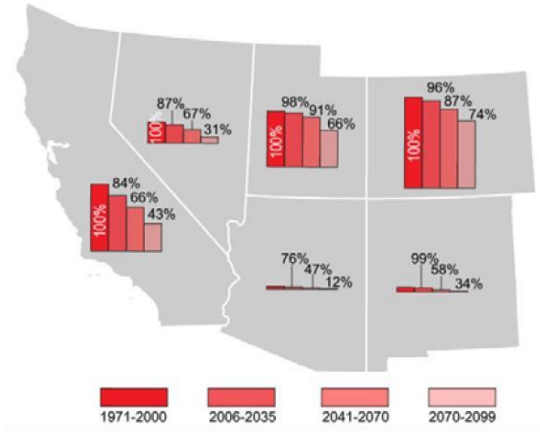
5 watersheds

Economic Impact of Water Shortages

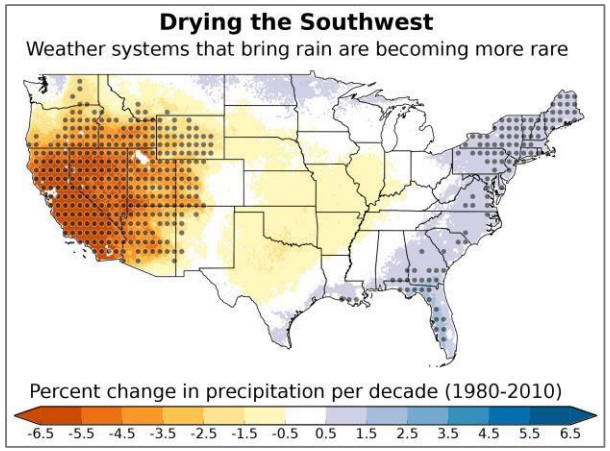
Challenges for Water Resources



Increasing temperatures



Decreasing snowpack



Changes in precipitation

Silicon Valley Advanced Water Purification Center

- Online in March 2014
- Produces 8 MGD of purified water from secondary effluent
- Advanced treatment technologies:

Microfiltration

Reverse Osmosis

UV Disinfection

Silicon Valley Advanced Water Purification Center

- Benefits:
  - Platform to conduct potable reuse studies and pilot projects.
  - Demonstrates advanced treatment technology.
  - Engage the public.

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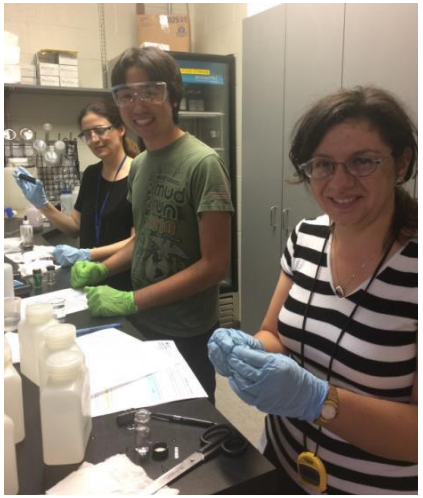
Potable Reuse Demonstration Test Plan

Goals:

- Demonstrate treatment performance in compliance with Indirect Potable Reuse (IPR) regulations
- Demonstrate treatment performance based upon future expectations of Direct Potable Reuse (DPR) regulations
- Gain approval of potable reuse operations, internally (District), externally (public) and with the regulators.
- **…Understand changes to operation and maintenance necessary for future potable reuse projects**



Overview: Three Phases of Testing

- **Long Term Testing (Standard Process Monitoring)**
  - MF: filtrate turbidity, cleaning intervals, integrity tests
  - RO: permeate EC, specific flux
  - UV: UVT, sensor intensity
  - Quarterly analysis of water quality
- **Full Scale Challenge Testing**
  - Virus removal
  - CECs removal
  - Surrogates
- **Pilot Scale Testing**
  - UV AOP
  - Ozone and Biologically Active Filtration

Key Findings

4000 water quality samples analyzed for primary and secondary drinking water regulatory standards, compounds with notification levels, pathogens, and CECs

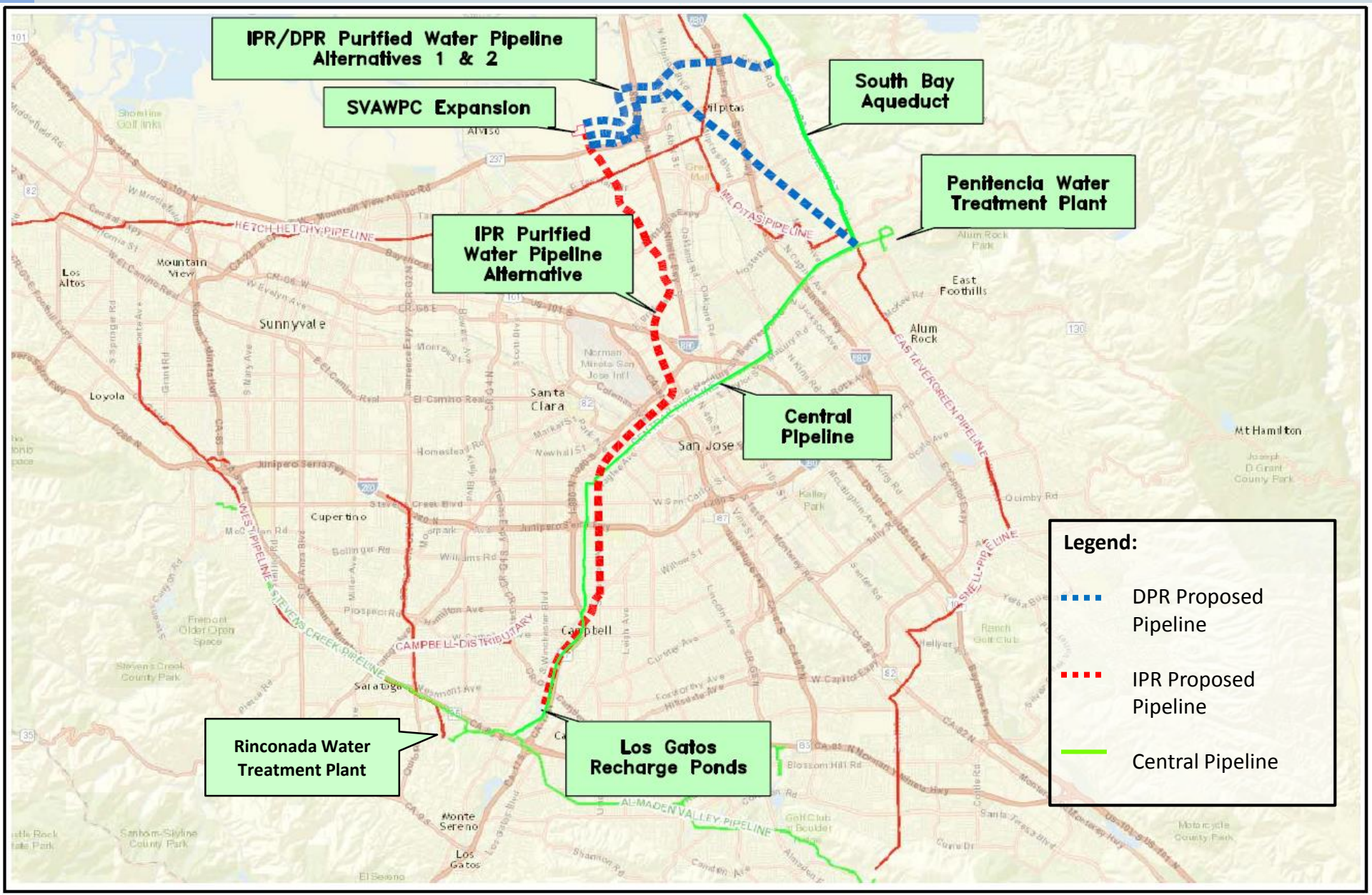
Of more than **284** CECs tested, **NDMA** was the only contaminant to be above a health-based levels of 10 ng/L (3.8-29 ng/L)

Critical Control Points (CCPs) were identified

District gained valuable information for future production of purified water

Purified water with advanced oxidation **meets or exceeds all California drinking water standards**, including all potable reuse regulations for groundwater replenishment

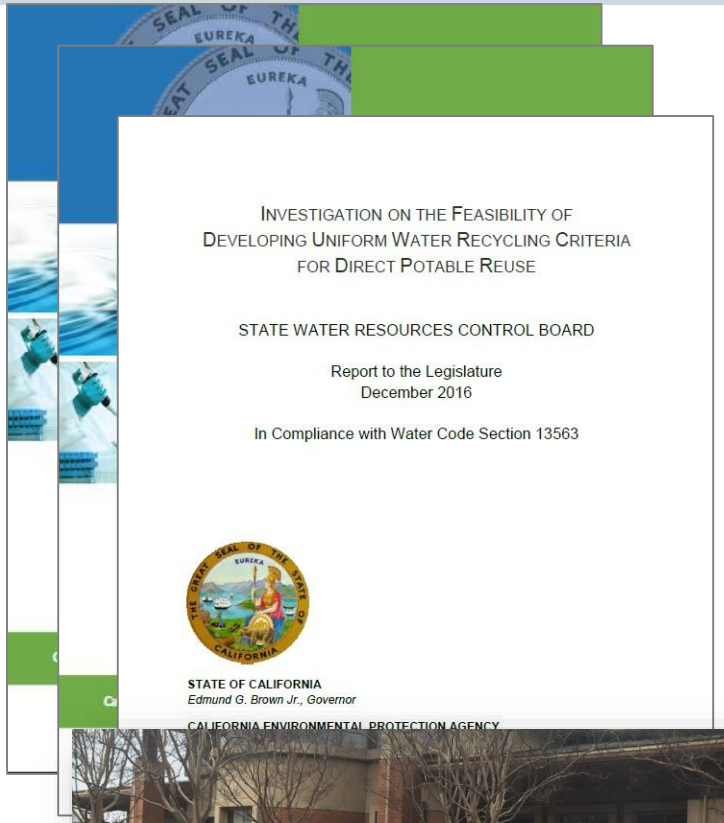
Potable Reuse Options (DPR vs IPR)



District's Interest in DPR Findings

- December 2016, DDW released final feasibility report to legislature
- Expert Panel found:

  "… that it is **technically feasible** to develop uniform water recycled criteria for DPR in California,…" (DDW, pg iv)



DPR Could Be Future Complement to IPR

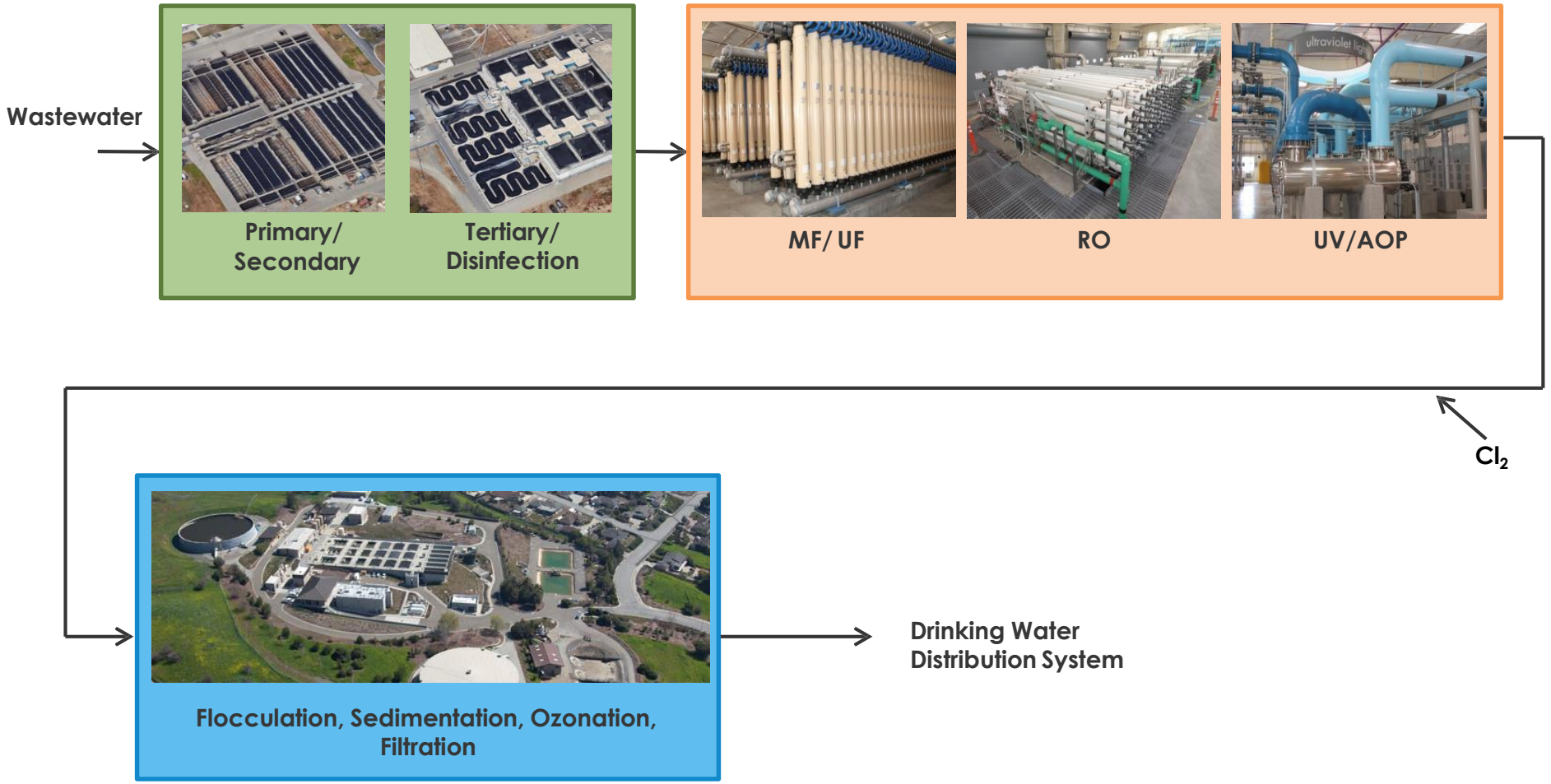
How would DPR work?

- Purified water pumped into raw water line
- Treated at drinking water treatment plants

Program Benefits

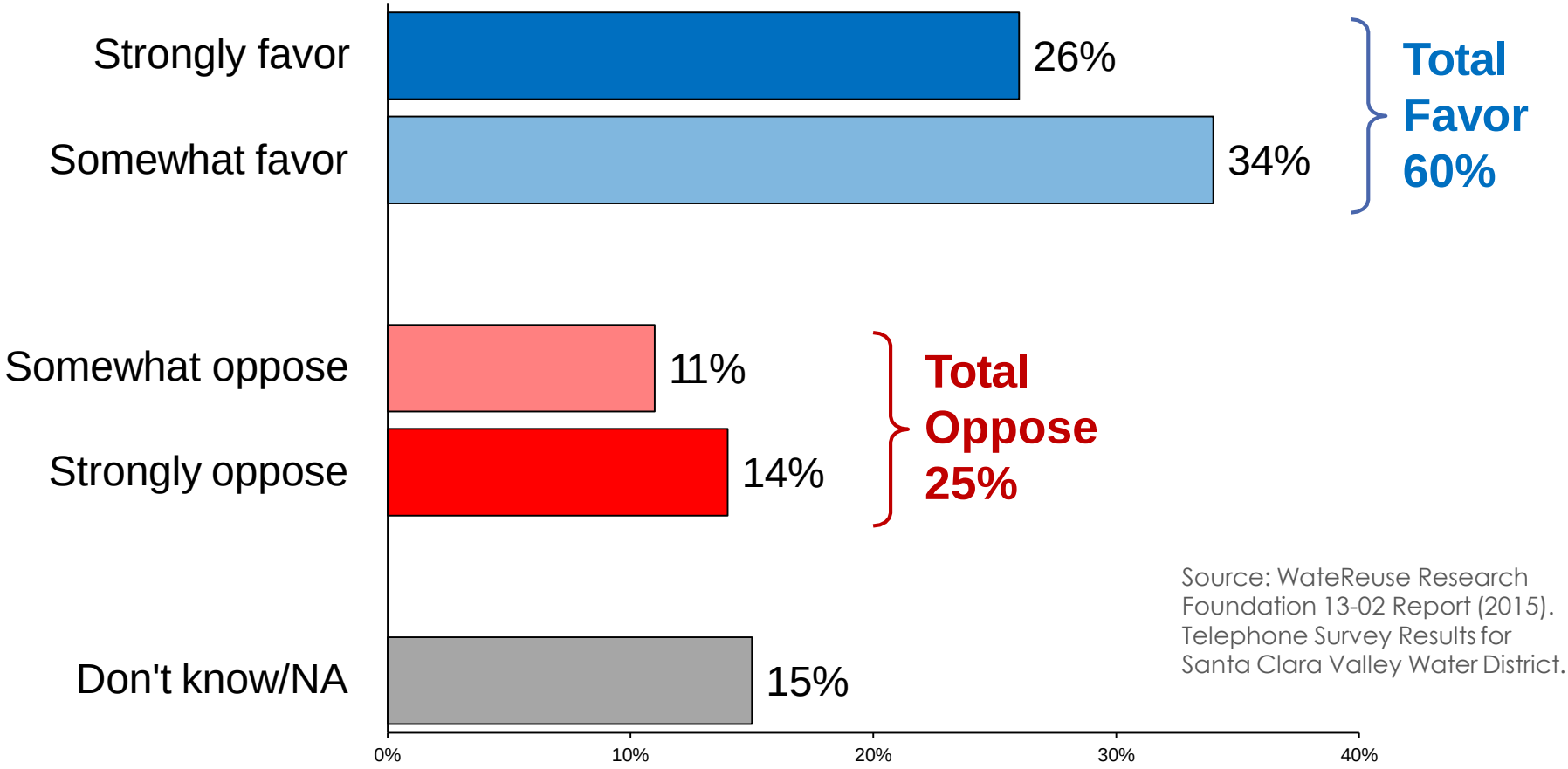
- Less infrastructure required:
  - Shorter pipelines
  - No injection wells
  - Capitalizes on drinking water treatment plant ozonation/ BAF
- Simpler operations

DPR Could Be Future Complement to IPR



Even a basic description of the process involved in direct potable reuse inspires confidence

How would you feel about using advanced treated recycled water as an addition to the supply of drinking water, that is water treated with ultra-filtration, reverse osmosis, and advanced oxidation?



Source: WateReuse Research Foundation 13-02 Report (2015). Telephone Survey Results for Santa Clara Valley Water District.

Summary

- Public response to purified water is positive
- Ongoing potable reuse efforts:
  - **Operational Studies – 2015 to 2017**
    - Groundwater models
    - RO Concentrate
    - Non-Potable Network Operations
  - **Design/ CEQA/ Permits – 2017 to 2020**
    - Construction plans and specs
  - **Construction – 2020 to 2022**
- DPR has potential for Santa Clara County Water Supply