Silicon Valley Advanced Water Purification Center and its benefits during climate change and droughts

Multi State Salinity Coalition

January 28. 2016

Santa Clara Valley Water District

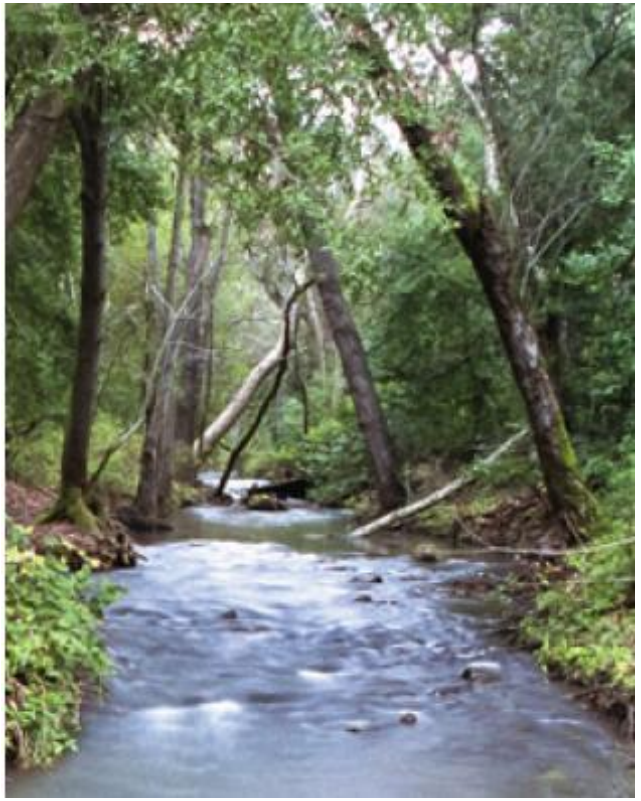
Silicon Valley Advanced Water Purification Center

Presentation will cover:

- Santa Clara Valley Water District & Water Supply Picture
- Silicon Valley Advanced Water Purification Center
- Monitoring, Lessons & Moving Forward

County's Water Resources Manager

- **Santa Clara Valley Water District**: Providing Silicon Valley safe, clean water for a healthy life, environment and economy



Headquarters in San Jose, California

Santa Clara Valley Water District Serves:

2 million people

15 cities

4,700 well owners

13 water retailers

Diversified portfolio for a reliable supply

Imported water

Local surface & groundwater

Conservation

Recycled Water

Water Shortages –Almaden Reservoir, San Jose

Need locally-controlled, drought-proof supply

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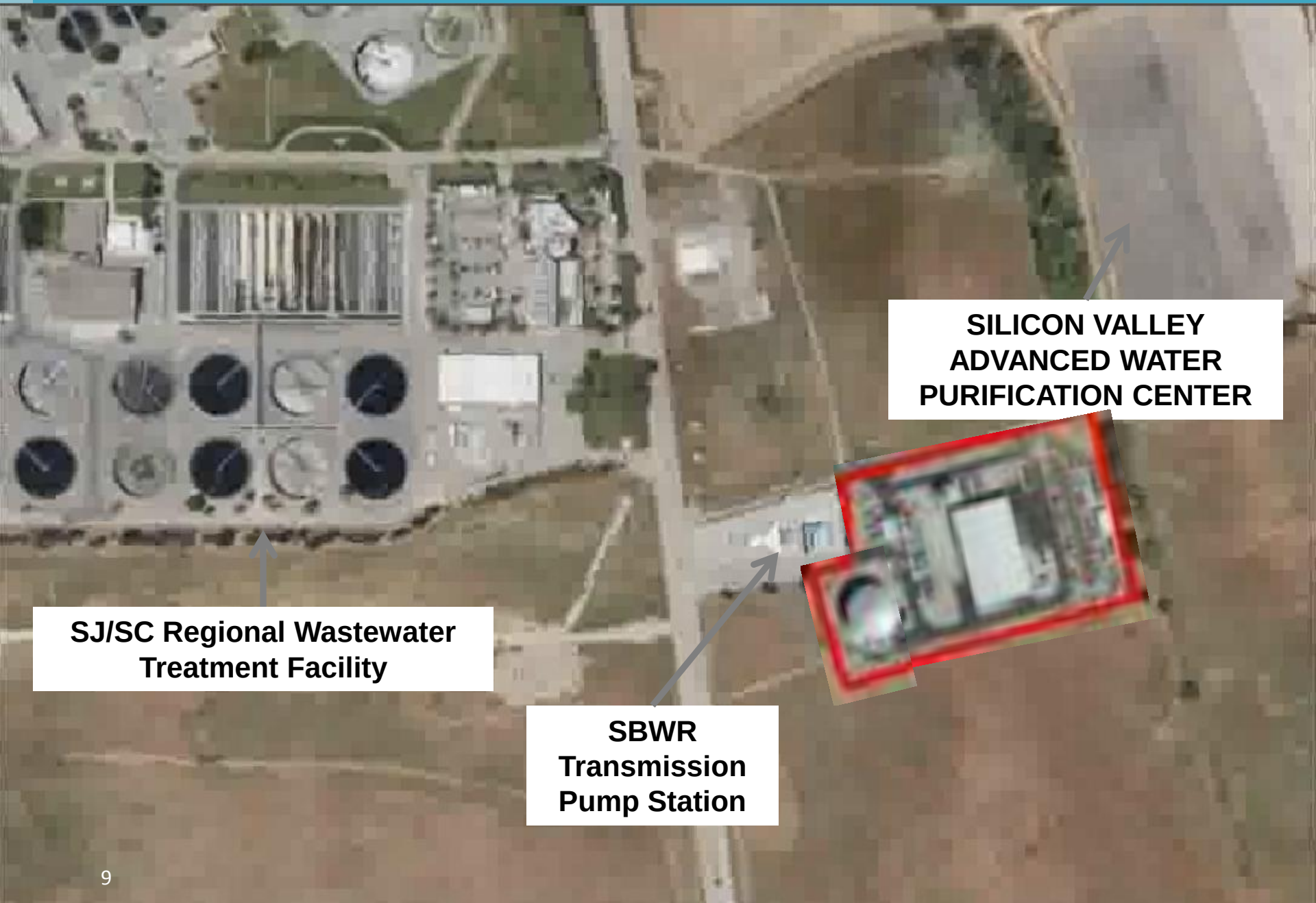

Santa Clara Valley Water District constructed & owns a new recycled water purification facility – completed in early 2014

- 8 million gallons per day of purified water
- Built in partnership – Santa Clara Valley Water District & the City of San Jose
- Serves Silicon Valley

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MICROFILTRATION

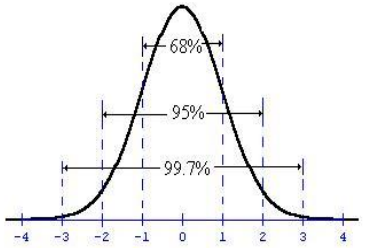
0.1 micron

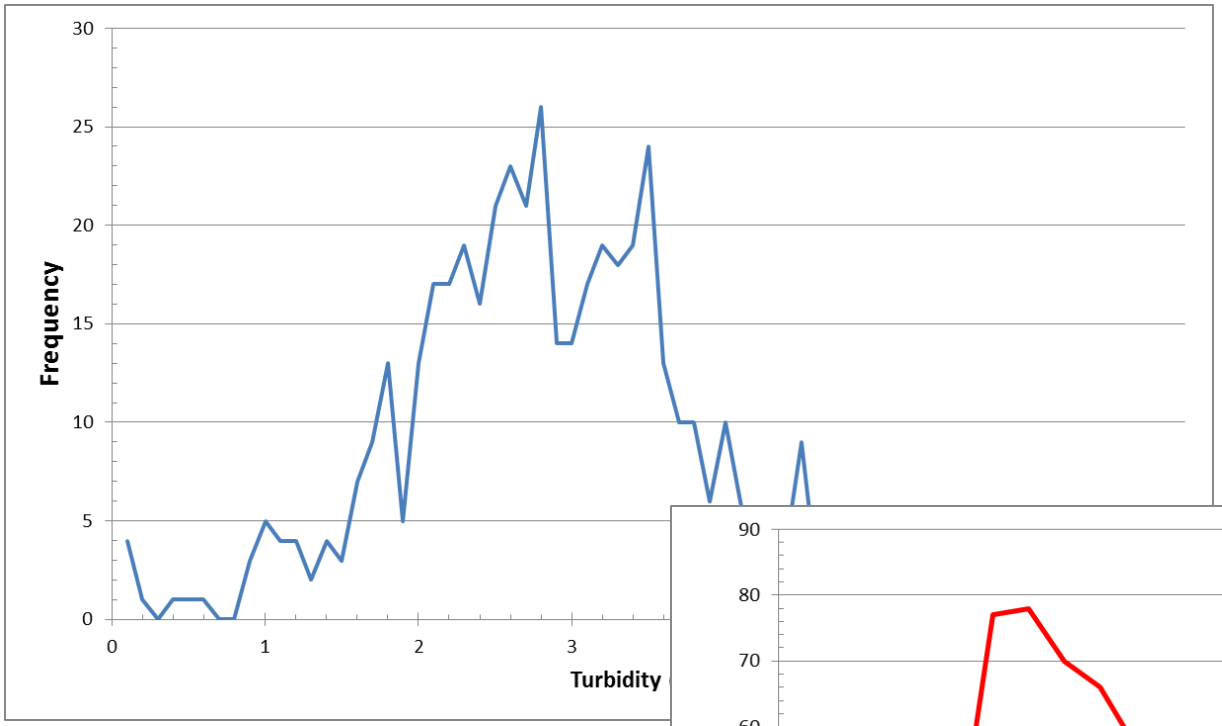
Incoming TDS = 900 ppm

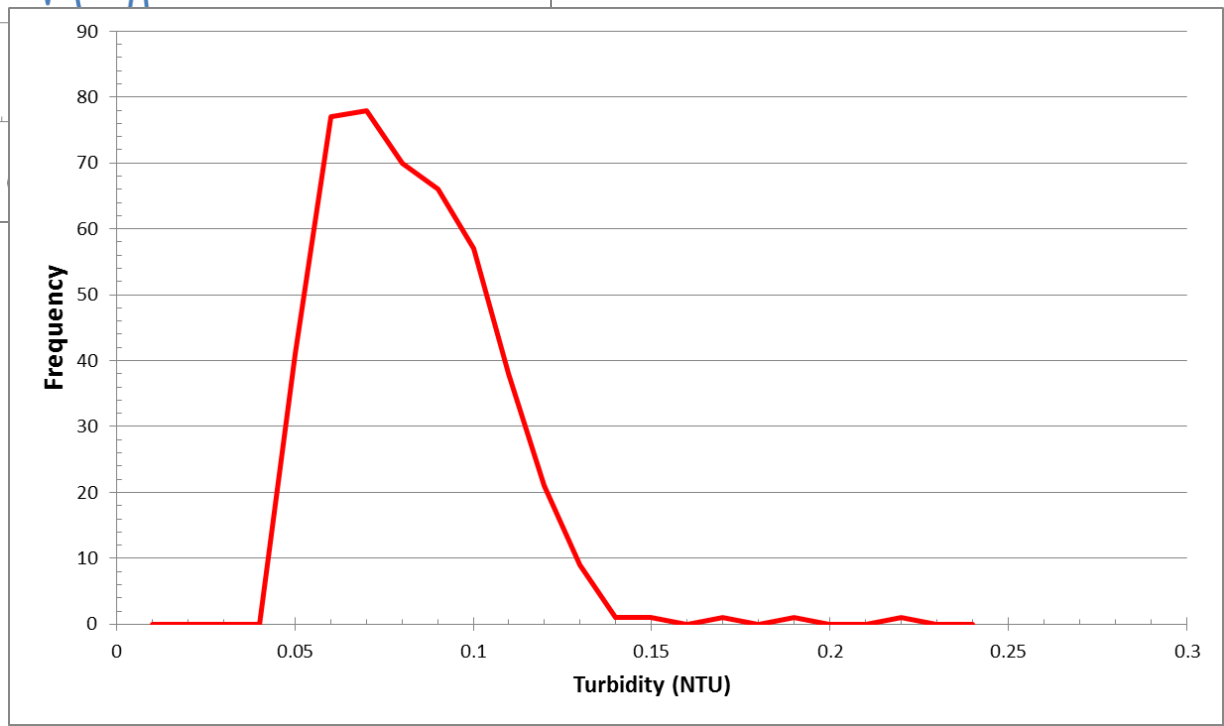
Critical Control Points for MF and RO

Process	CCP
MF	• Pressure Decay Test (PDT, online) determines membrane integrity
RO	• Reduction of electrical conductivity (EC, online) across RO • Reduction of total organic carbon (TOC, online) across RO
UV	• UV dose, which is a function of online UV transmittance (UVT), flow, and UV sensor intensity (UVI)

Turbidity Values Have a Predictable Distribution, Which Can Be Used for Improved Control







MF Long Term Summary

- Effluent turbidity met the permit requirement of 0.2 NTU
- Influent turbidity values do not correlate with effluent turbidity
- PDT results (<0.3 psi/min) demonstrate membrane integrity
- PDT results demonstrate 4-log protozoa removal
- Online and Bench-top turbidity readings are not sufficiently aligned.
- Extensive turbidity and PDT data sets allows for CCP programming control

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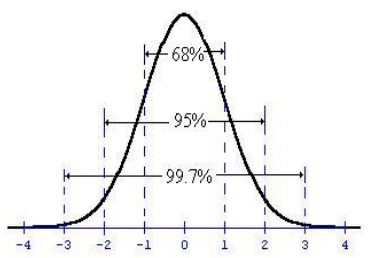
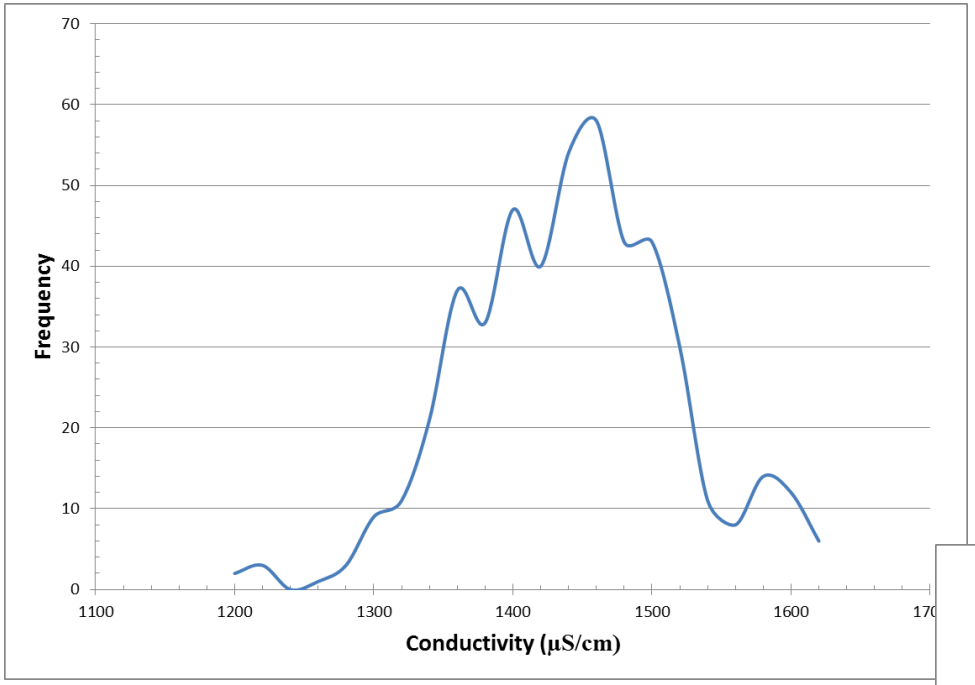
REVERSE OSMOSIS

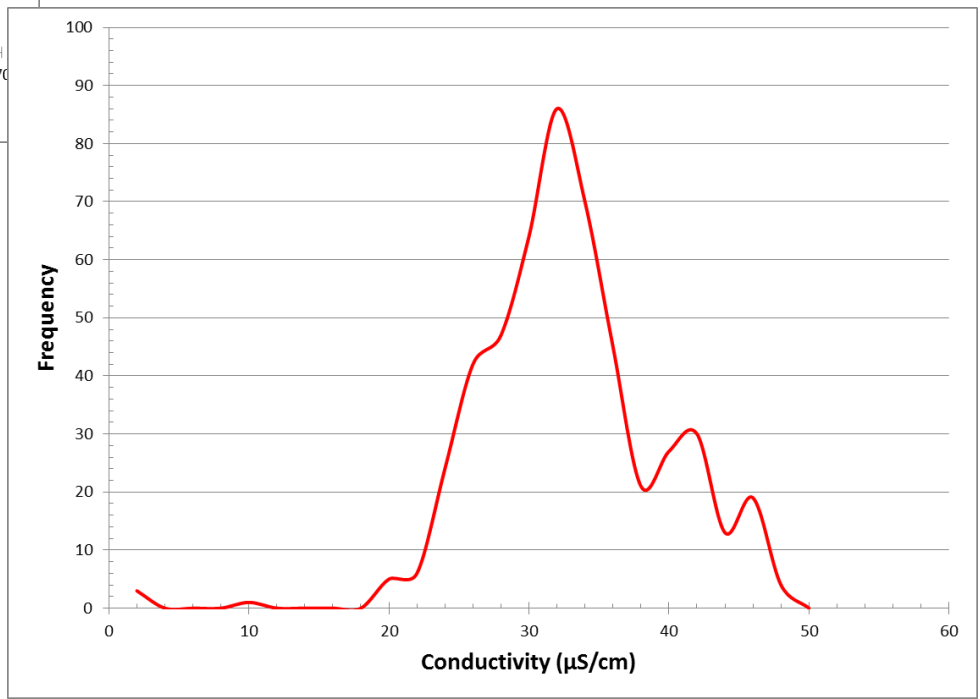
0.0001 micron

Outgoing TDS= 3-5 ppm

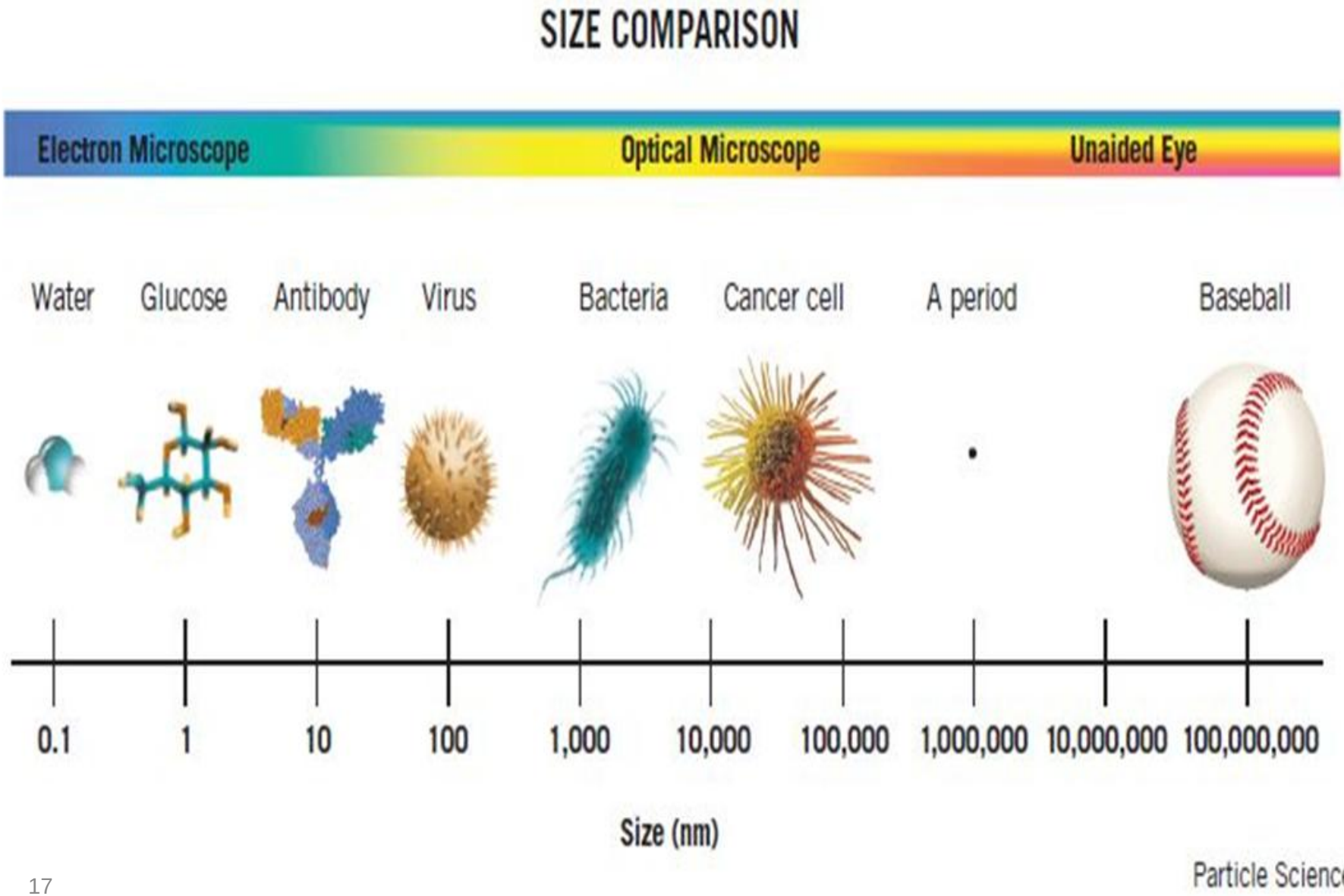
Influent EC is Well Distributed, Permeate EC Distributio Suggests Varying Performance







Filtration: Pore Size Matters



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Ultraviolet light disinfection

Pilot Scale Testing – UV AOP for Potable Reuse

Tested for…

- NDMA Destruction
- 1,4-dioxane Destruction
- Trace Pollutant Destruction
- AOP Oxidant Optimization
- Surrogate Analysis

Independent Advisory Panel Assures Quality

Nationally recognized experts review the District's approach to potable reuse testing efforts at the purification center – assess, review, and guide District's potable reuse efforts

April 30, 2013, May 29, 2014, December 11, 2015

SCVWD Operators

- Large internal candidate pool
- Career path mobility & cross-over training opportunities available
- SVAWPC operators are T operators

Current Training Program

Public tours at the new facility – increases public confidence and acceptance for future potable reuse

Potable Reuse

Indirect Potable

Percolation Ponds

Injection Wells

Direct Potable

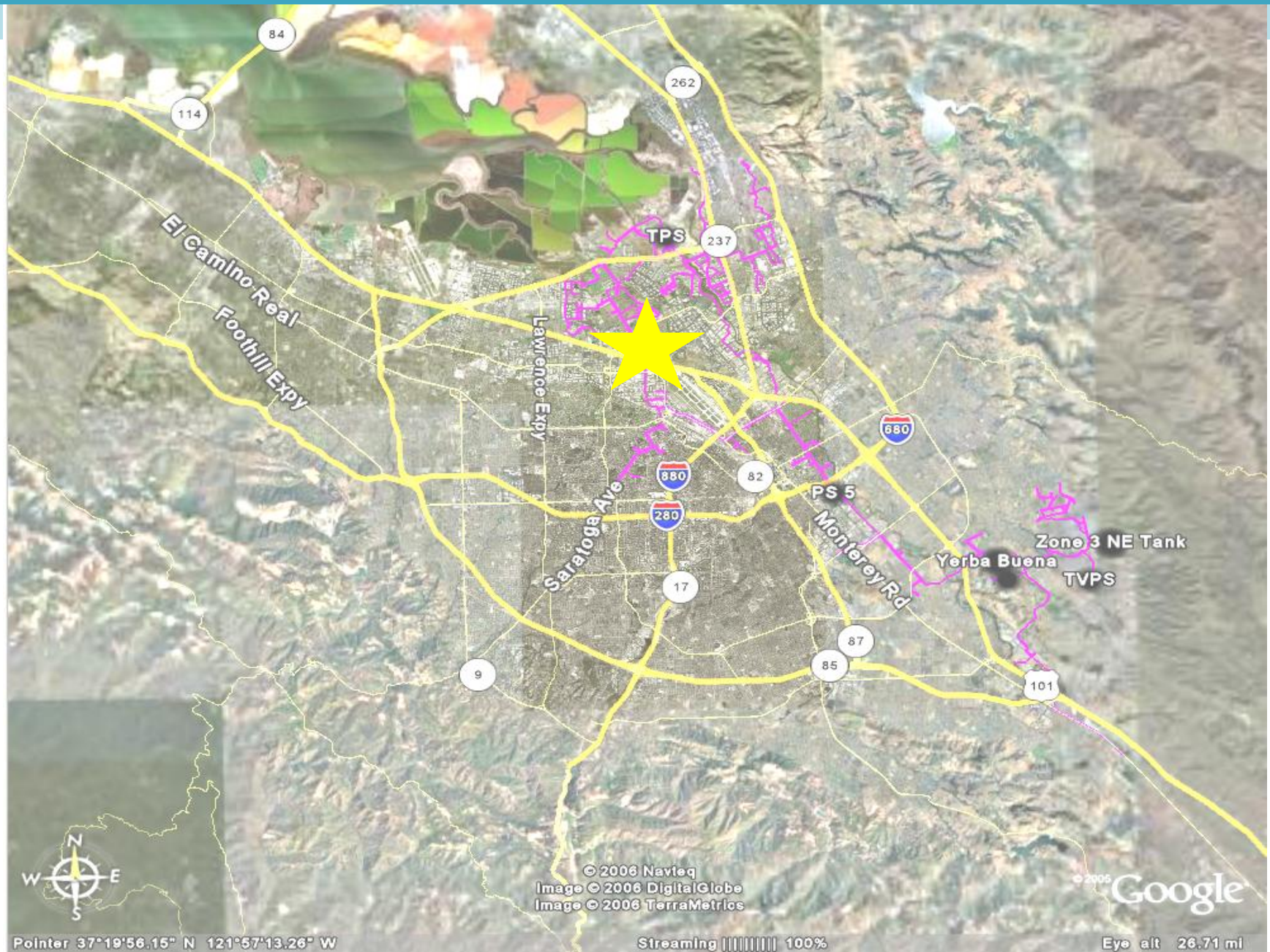
Before Conventional Drinking WTP

Drivers for Recycled and Purified Water

Overdrafting Groundwater
& Potential Subsidence

Potable reuse – Multiple locations available

Potable reuse – Mid Basin Injection



Future – Direct Potable Reuse Possibility ?

Preliminary Schedule

2015-2016

Operational Studies

Groundwater models

RO Concentrate

Public-Private Partnerships

Grants & Outreach

2016-2017

Expedited Design & CEQA

Construction Plans & Specs

2018-2020

Construction

POTABLE REUSE

SVAWPC Open House October 2015

Labor Intense

There is no “I” in TEAM !

Going forward

The highest quality water tomorrow

from the best available technology today

with the best qualified operators

Questions?