



Northern California Chapter Meeting

May 19, 2017

Recycled Water: Food, Ag, & Bev

Welcome:

Rhodora Biagtan, *Nor CA Chapter WaterReuse*

Ben Horenstein, *Santa Rosa Water Department*

Speakers:

Chris Nally, *Cloacina*

Andrew Damron, *Napa Sanitation District*

Sam Jamison, *Jackson Family Wines*

Doug Beretta, *Beretta Dairy*

Andria Loutsch, *Nor CA Chapter WaterReuse*

Closing:

Rhodra Biagtan, *Nor CA Chapter WaterReuse*



Meeting Sponsors:





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Recycled Water: Food, Ag, & Bev

Welcome

Rhodora Biagtan, Nor CA Chapter WaterReuse
Ben Horenstein, Santa Rosa Water Department



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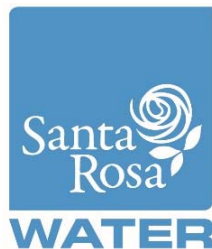
Recycled Water: Food, Ag, & Bev



Treatment of Winery Process Wastewater for Reuse

Chris Nally, *Cloacina*

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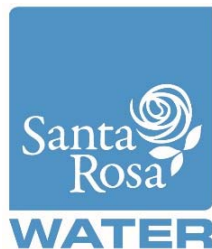
Recycled Water: Food, Ag, & Bev



Chloride in Recycled Water of Napa Wine Grapes: Identification of Solutions

Andrew Damron, Napa Sanitation District

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Chloride in Recycled Water for Napa Wine Grapes





NapaSan by the Numbers

- Founded in 1945
- NapaSan serves a population of 82,000 in Napa area
- 270 miles of sewer mains; 36,900 service connections
- 25 miles of recycled water mains





NapaSan Operations

- Sewer Collection System
- Wastewater Treatment
- Recycled Water
- Engineering
- Pollution Prevention





Soscol Water Recycling Facility

- Dry weather flow = 6.0 mgd
- Average treatment = 10 mgd
- Wet weather flow = 50+ mgd
- Physical, biological & chemical processes
- 340 acre pond system

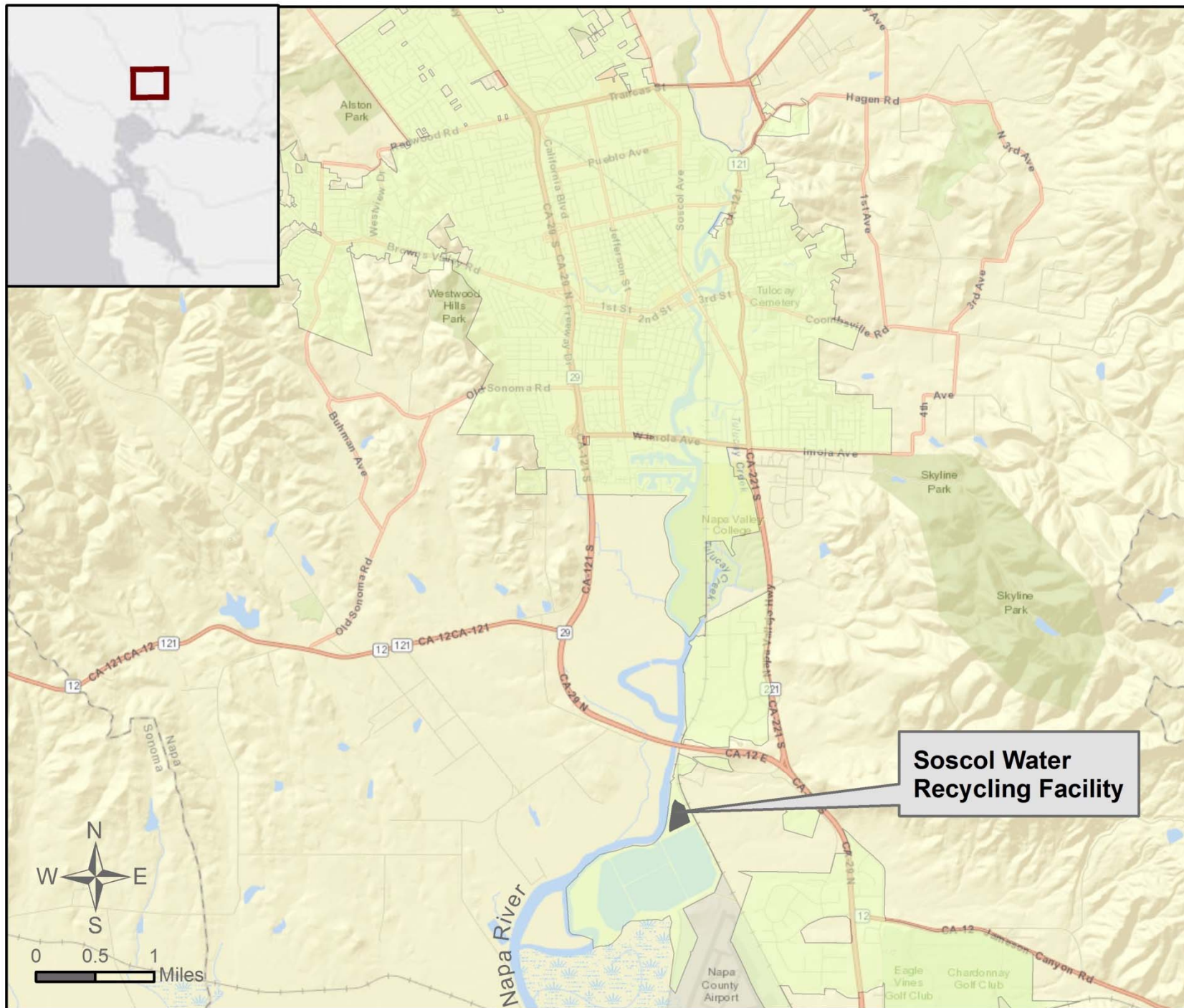


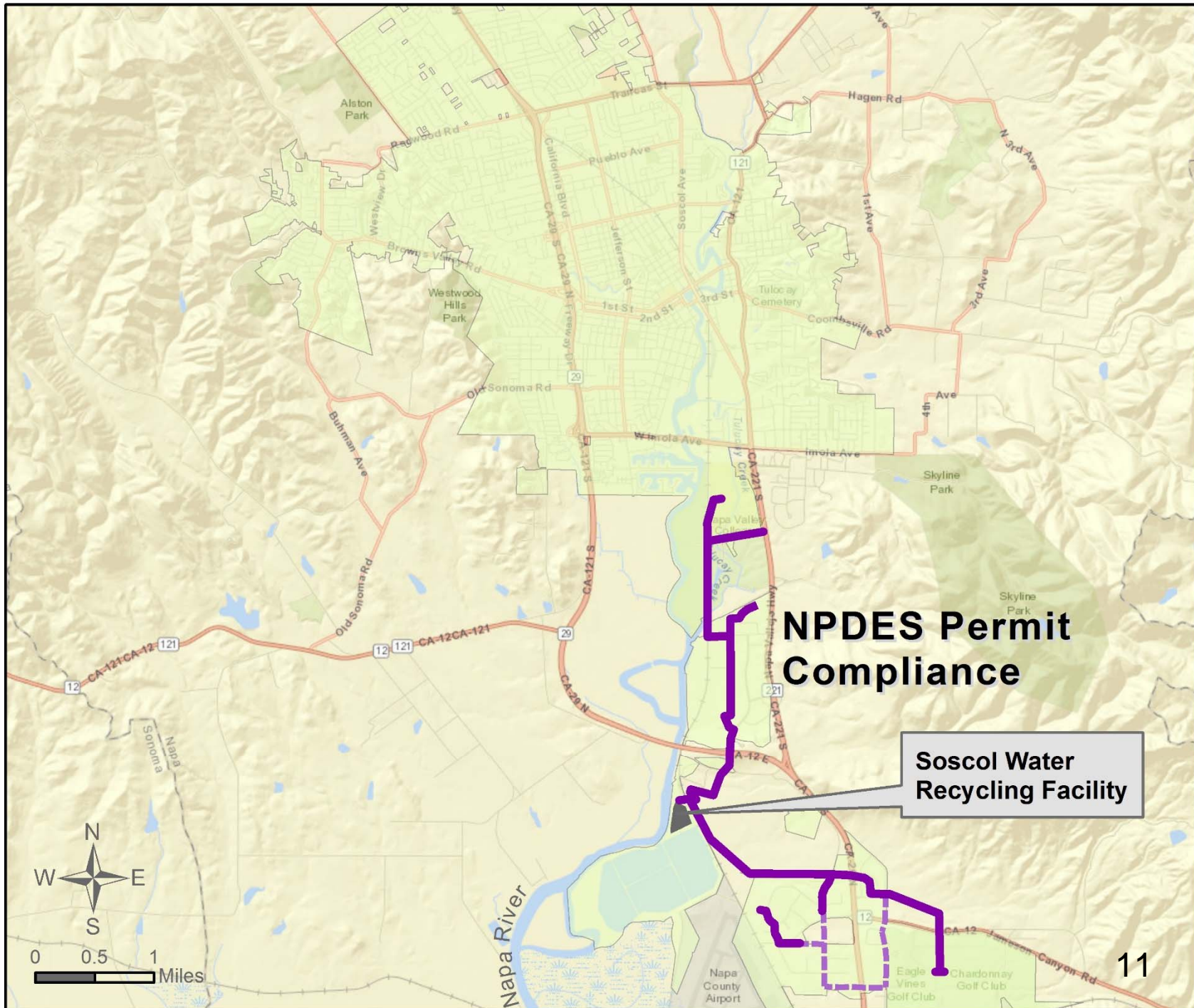


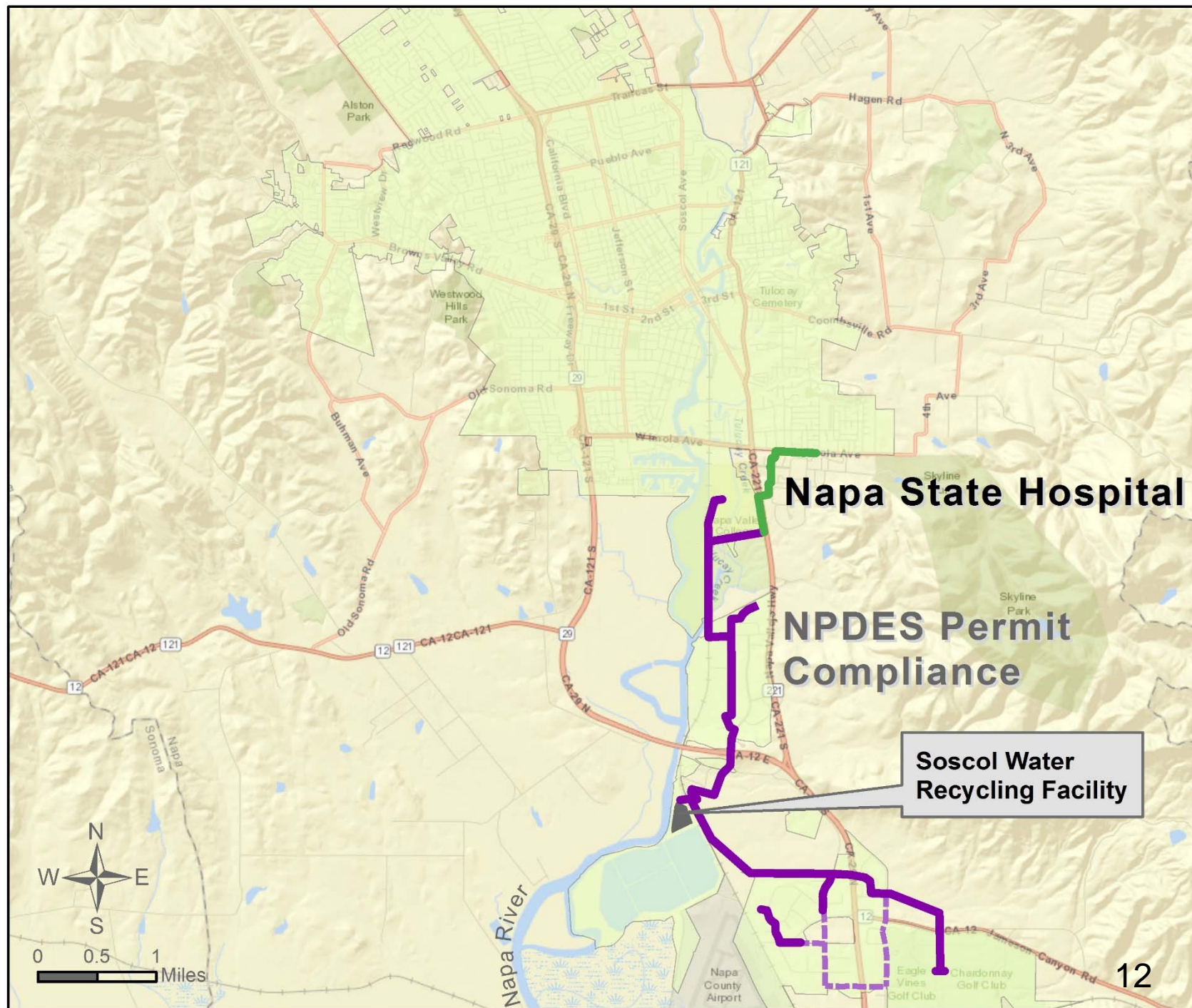
History of Recycled Water

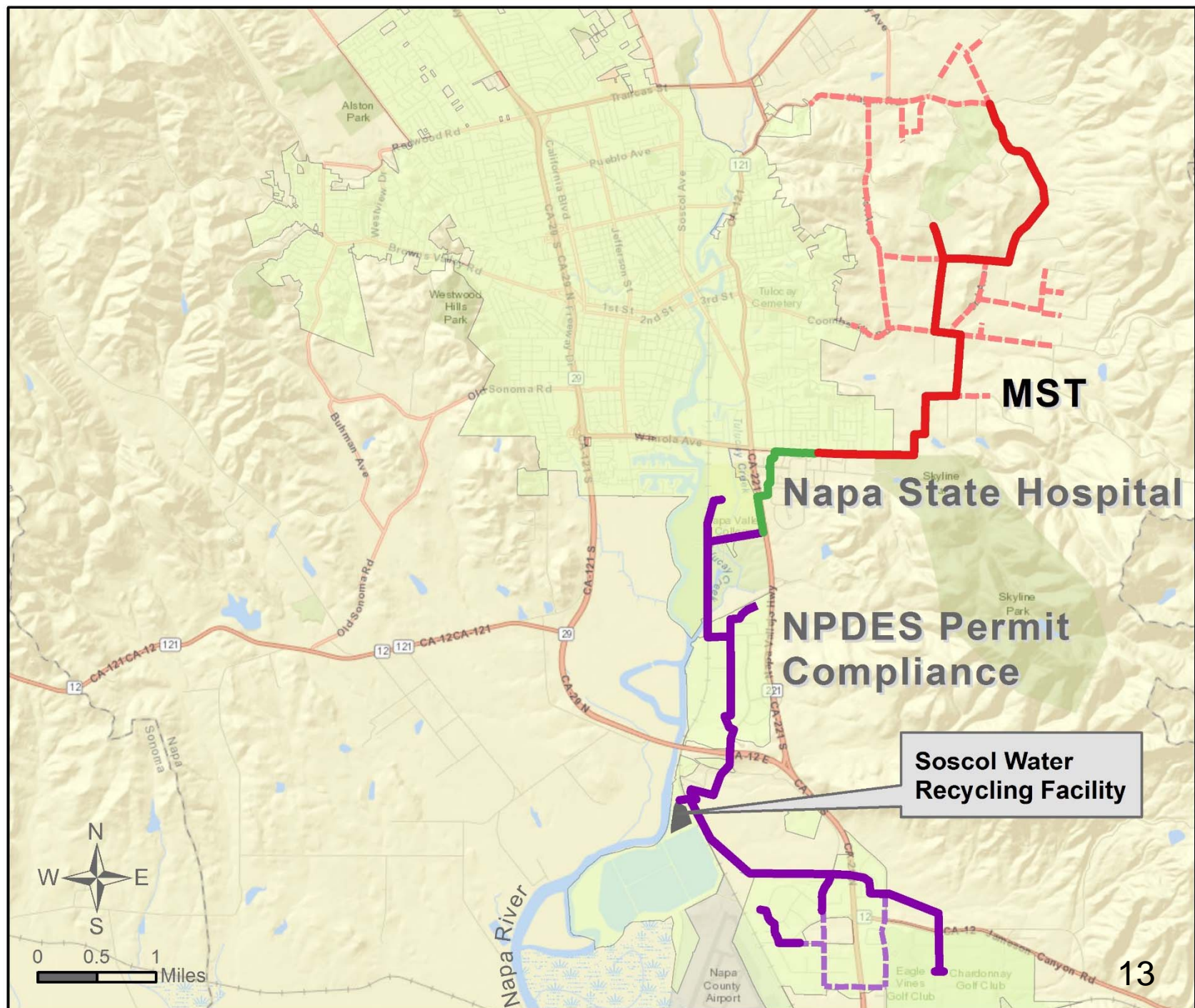
- Discharge permit dry-season discharge prohibition
- 1985 Kirkland pipeline - secondary disinfected
- 1997 WWTP expansion Title 22 water
- 2004 Kennedy pipeline
- 2013-2016 Expansion

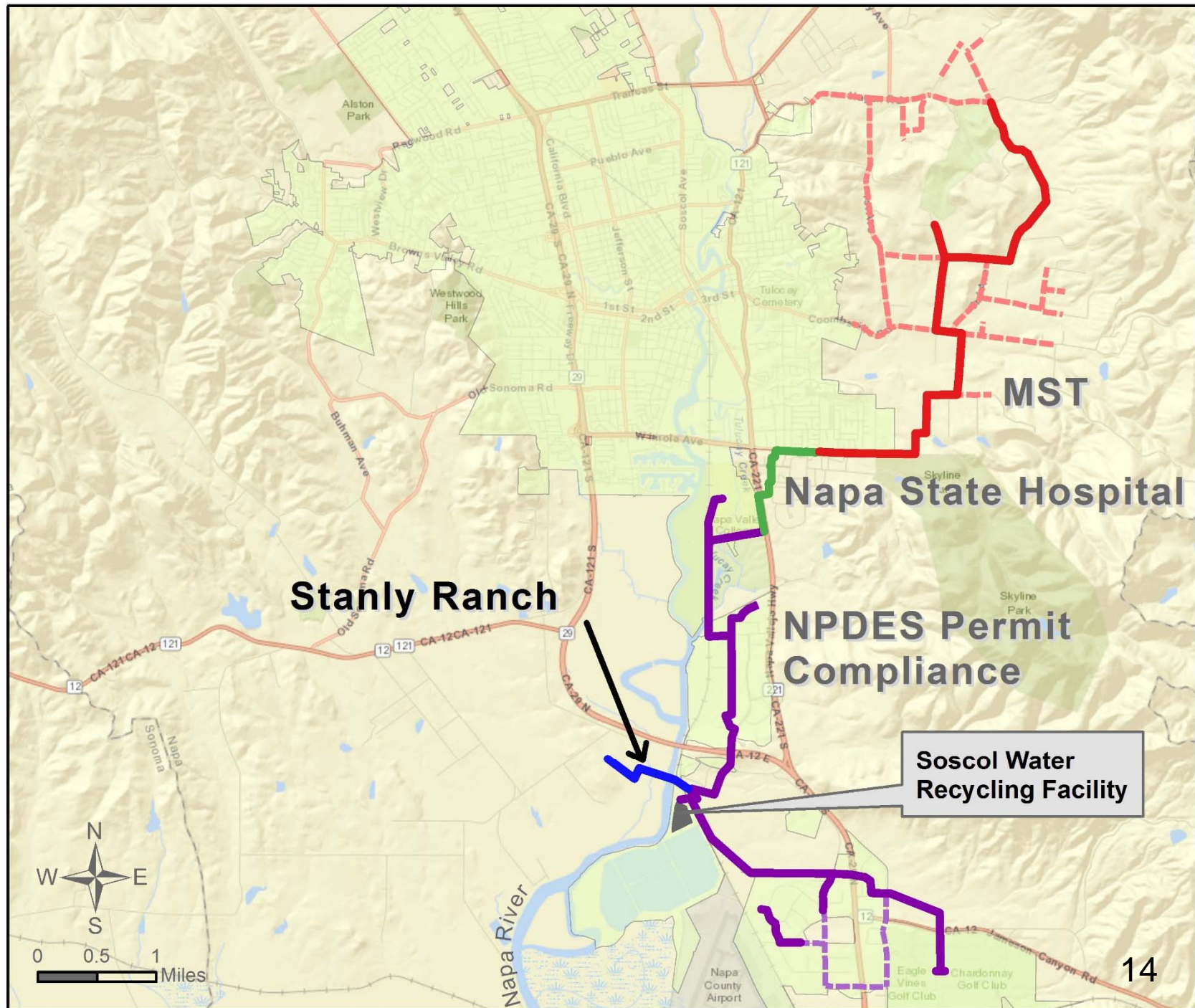


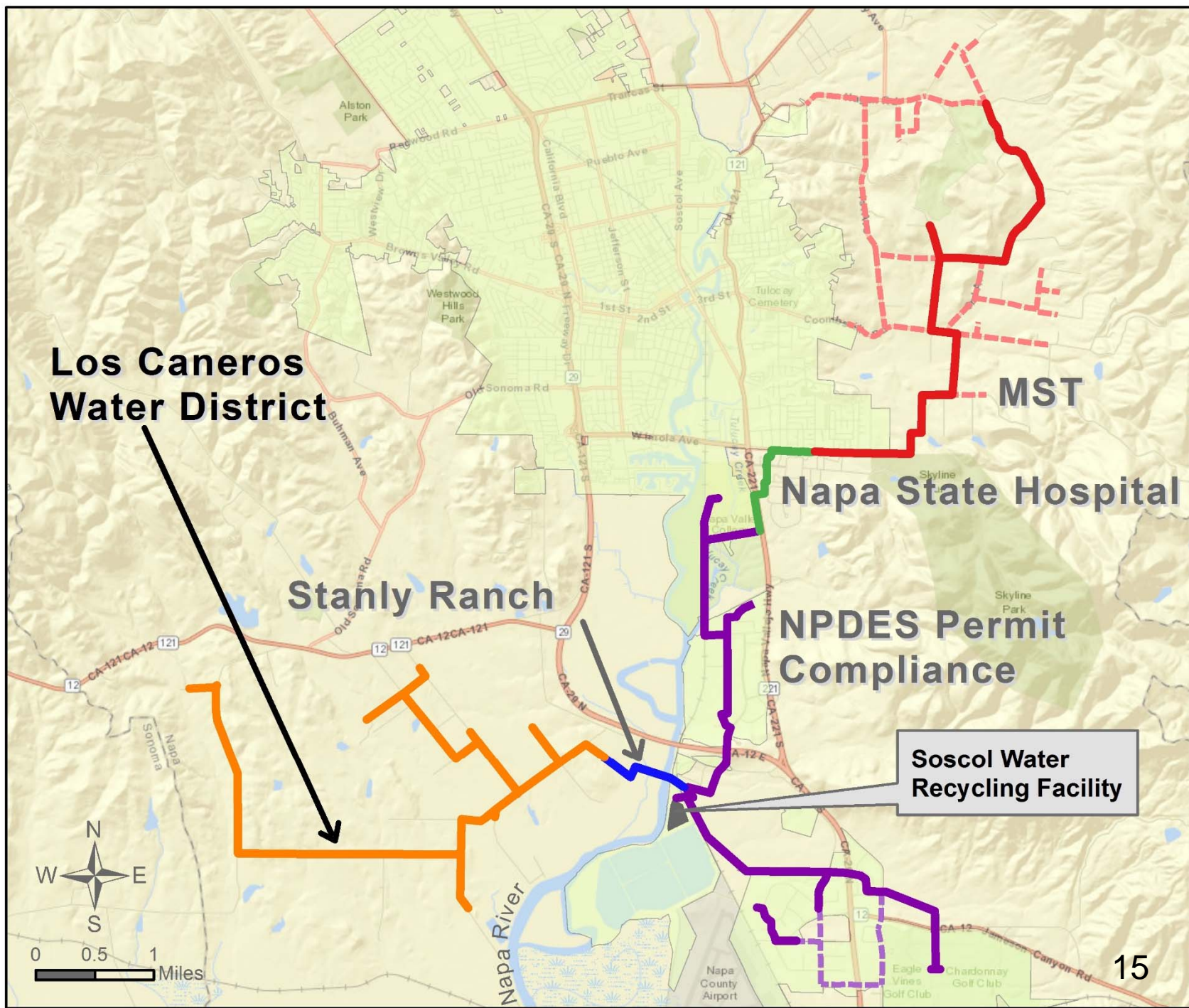














NapaSan RW Expansion

- 2014 – 14 miles of recycled water
\$20 million in construction cost
 - Paid for by customers
 - Vineyard irrigators
- Assessment Districts
- Voluntary participation
- 1,500 ac-ft / yr of demand

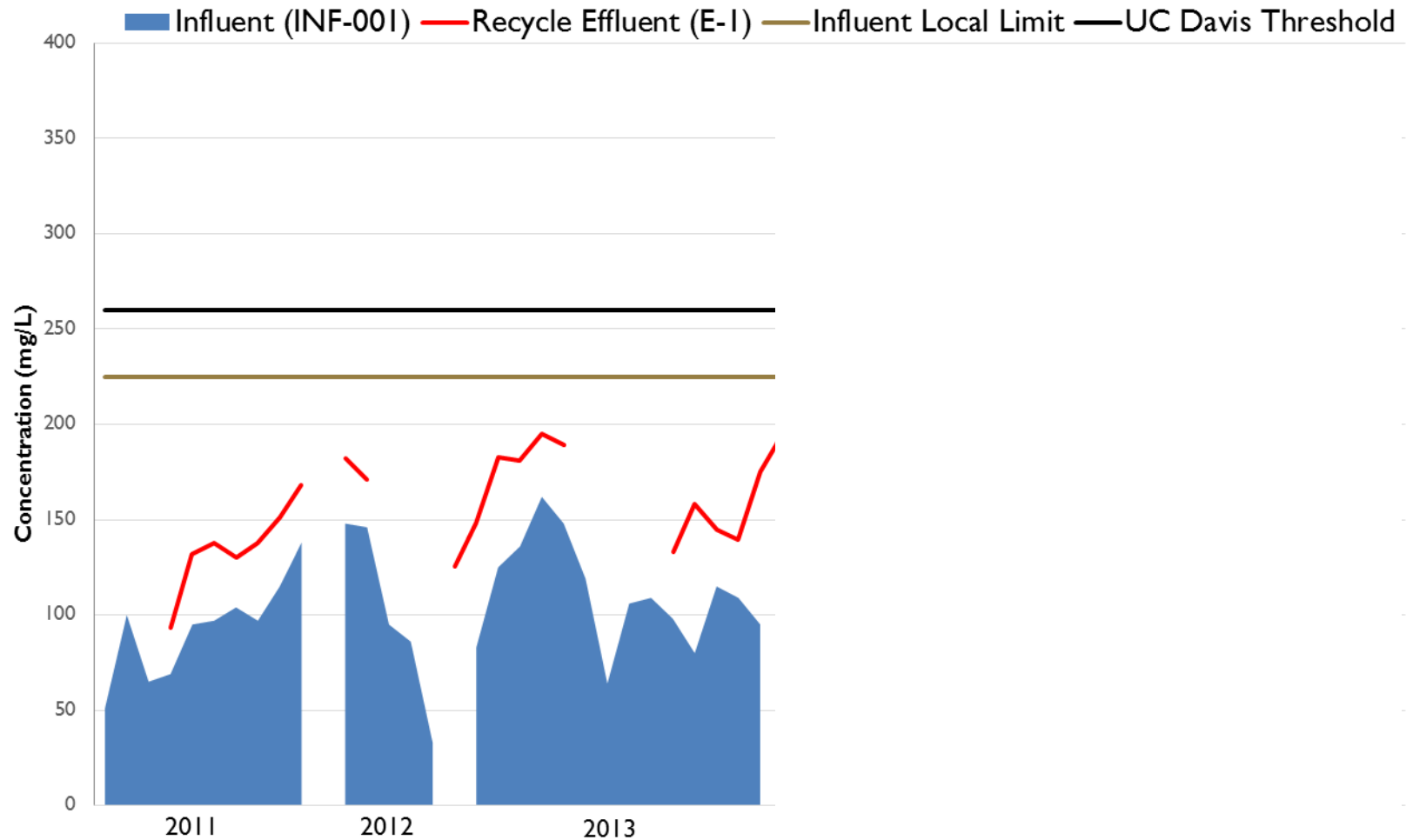


Water Quality for Wine Grapes

- 2006 UC Davis study
 - Chloride threshold for wine grapes
 - $7.4 \text{ meq/L} = 262.7 \text{ mg/L}$
- NapaSan recycled water is used for vineyard irrigation and high chloride levels can cause leaf burn
- Inhibited growth or crop yield
- NapaSan treatment process does not remove chloride

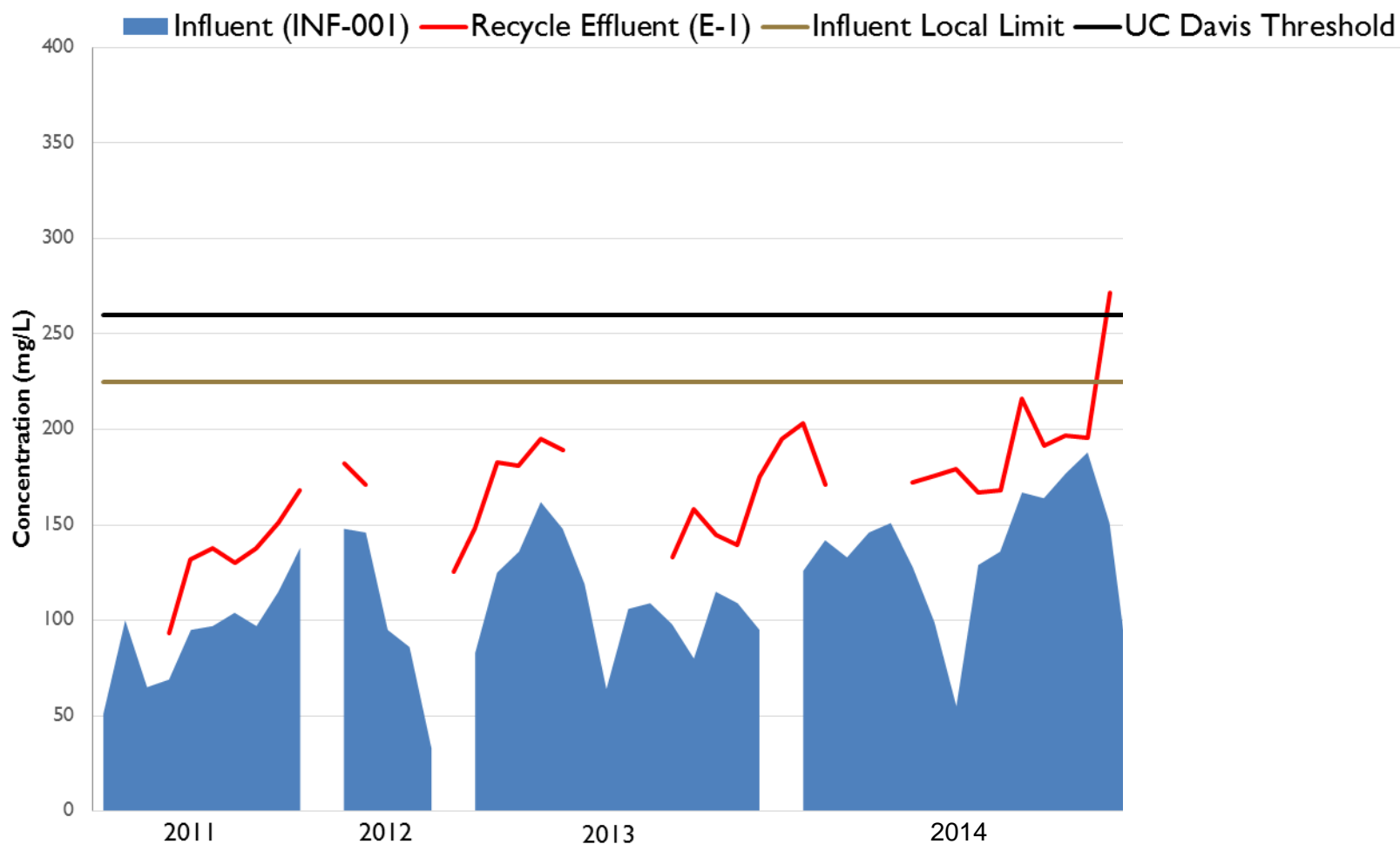


Chloride Concentrations 2011-2013



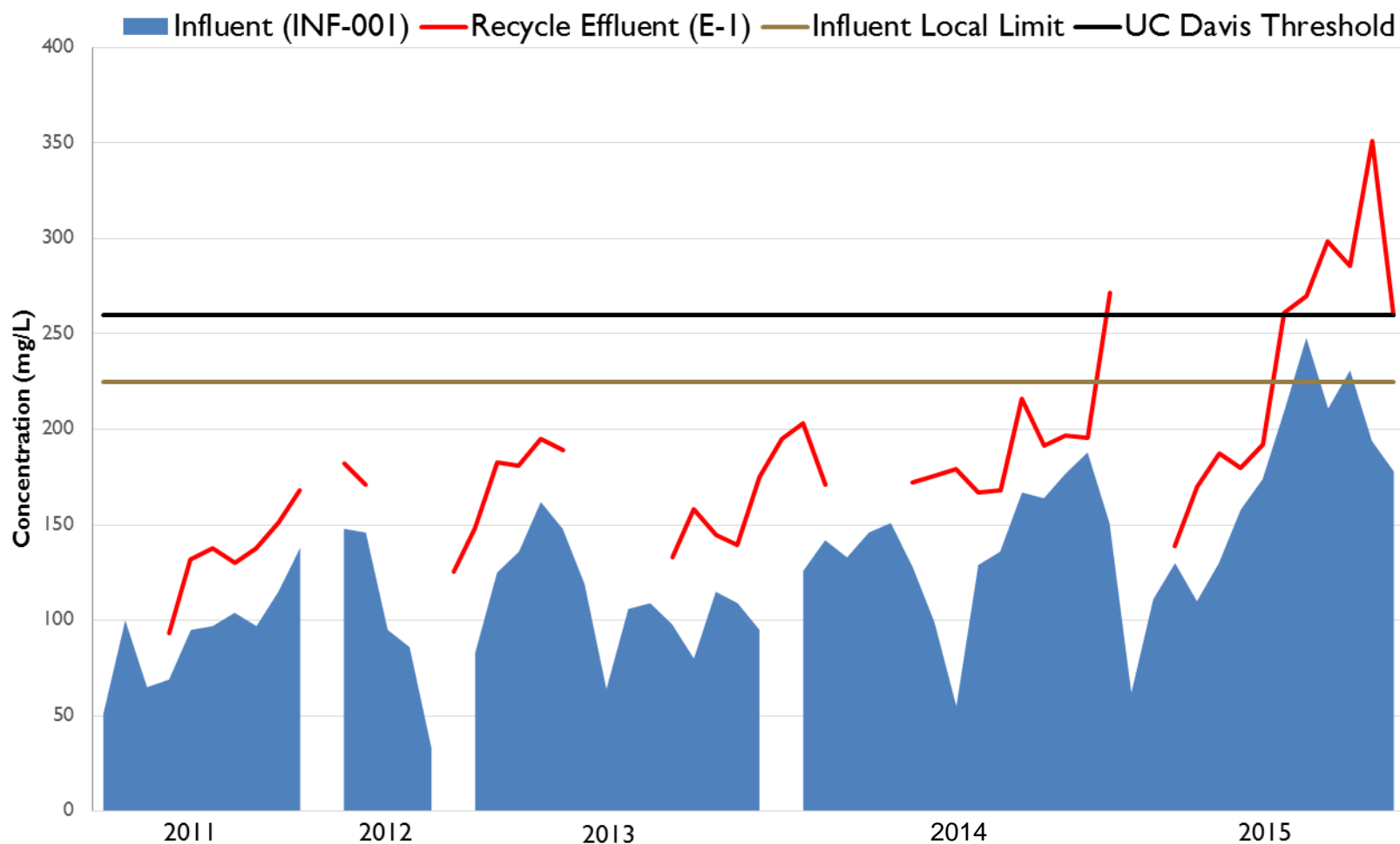


Chloride Concentrations 2011-2014





Chloride Concentrations 2011-2015





Sources of Chloride

- Potable water
- Water softeners
 - Discharge a concentrated salt solution
- Boilers/Cooling towers
 - Condense potable water which concentrates the chloride in the system's wastewater
- Bleach/soap
 - Contain chloride
- Medical facilities
 - Dispose of salt solutions, operate boilers/cooling towers, and operate water softeners
- Pool filters
 - Discharge high levels of chloride during backwash



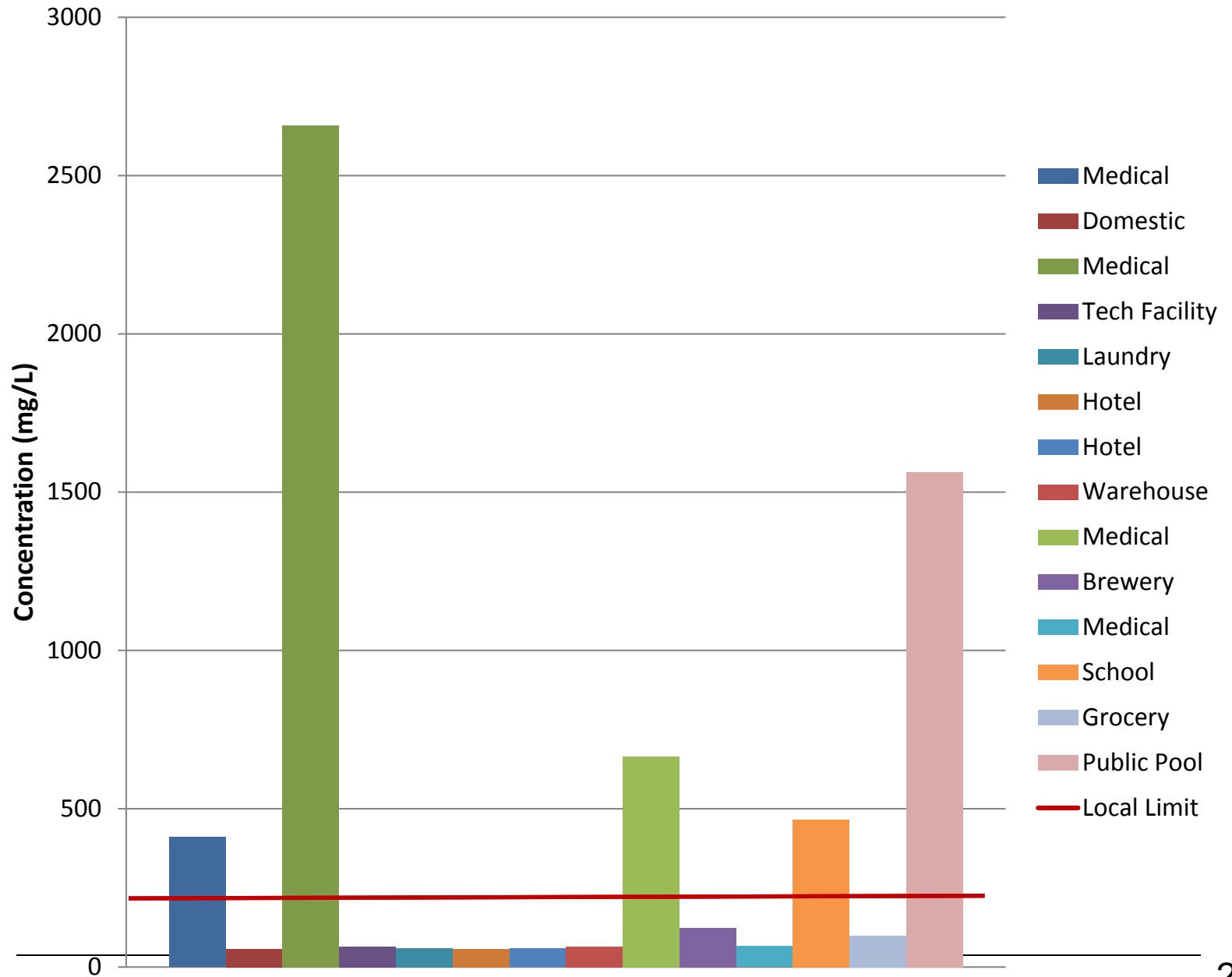


Initial Research

- Spoke with and visited Top 50 water users regarding potential chloride discharges
- Reviewed business licenses and building permits issued in the last 2 years
- Collected 500+ grab samples at approx. 30 locations



Initial Chloride Site Monitoring





Chloride sources (as a % of UC Davis Threshold)

Source	Chloride Load (% of UCD Threshold)
Residential wastewater (based on 50 mg/L chloride)	19%
Medical facility	1 - 2%
20 Commercial water softeners (based on data from a commercial laundry facility)	1%
Hospital	0.5 - 1%
Public pool (one pool; school location)	0.5 - 1%

Notes: All values based on ADWF = 6.0 MGD

UC Davis threshold = 262.7 mg/L

What is the source of chloride?





Napa River

- Influence by tide
- Less fresh water due to drought



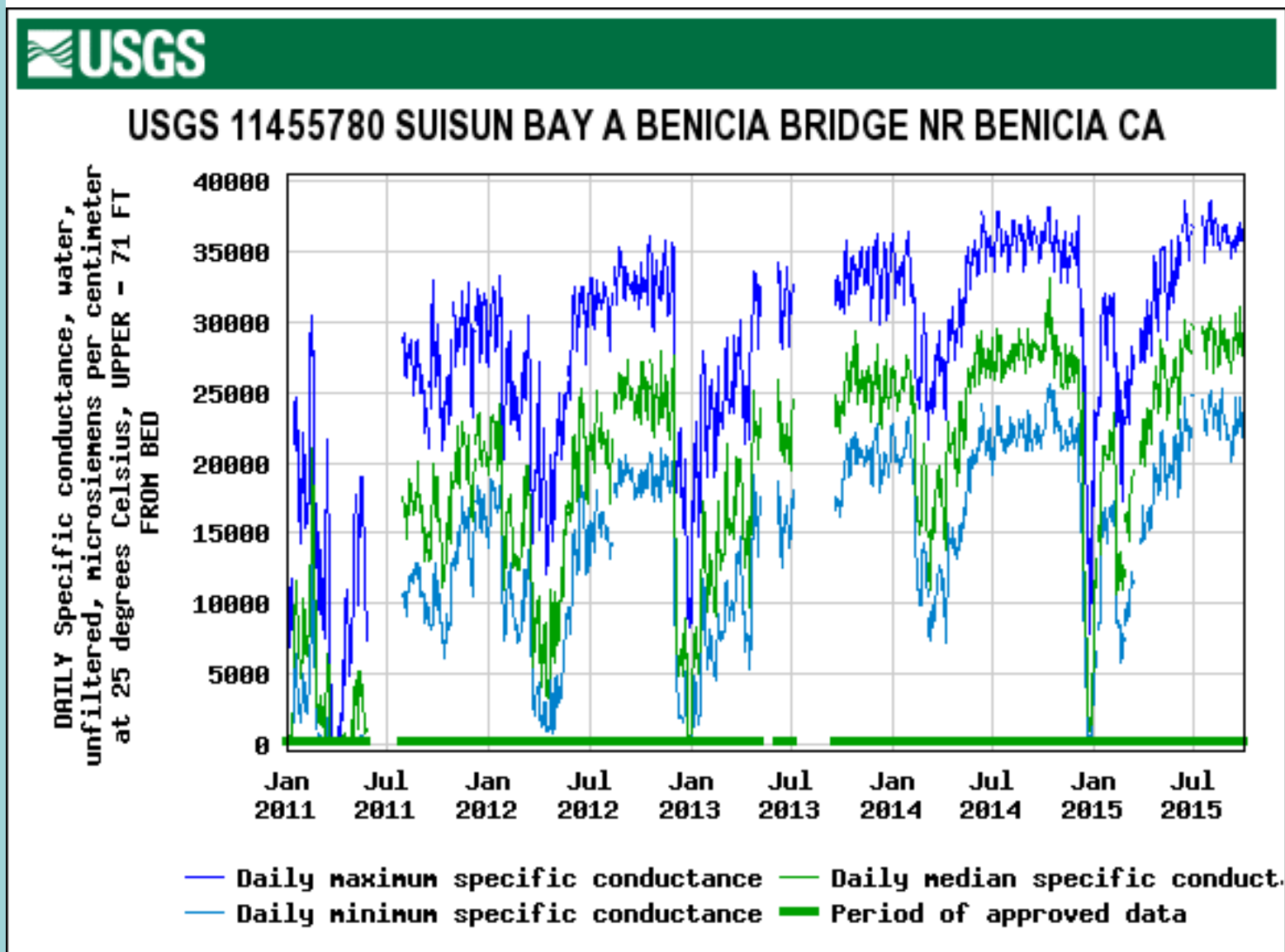


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Public pool (one pool; school location)	0.5 - 1%
Leak in a manhole near the Napa River (based on a 5 gpm leak at 800 mg/L chloride)	0.5%

Notes: All values based on ADWF = 6.0 MGD
UC Davis threshold = 262.7 mg/L

Suisun Bay Conductivity 2011-2015





Collection System Evaluation

- Grab samples vs composite samples
- Analysis of chloride levels
- Costly and time consuming
- Inspected over 100 manholes
 - Deep pipes, near river

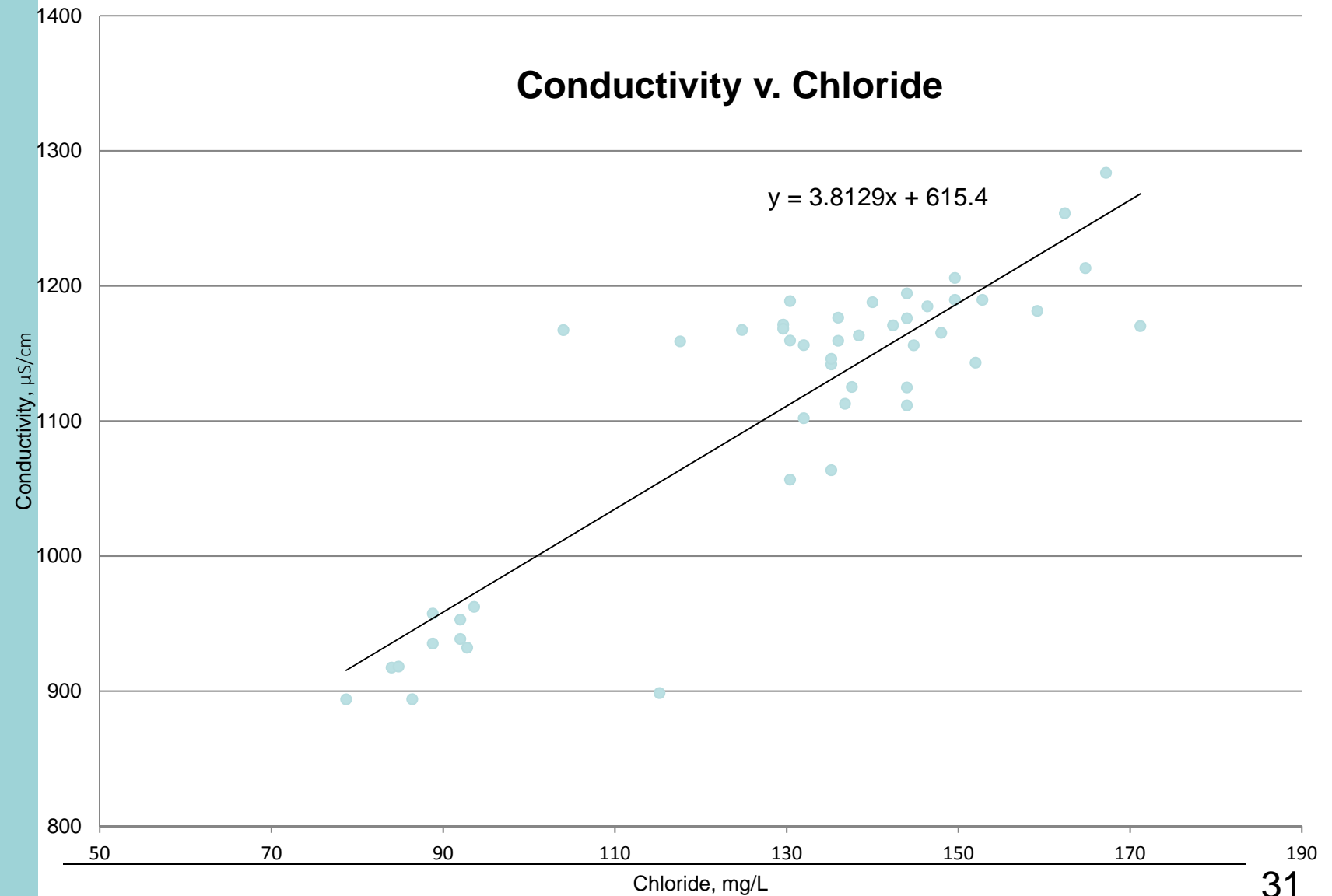


Conductivity Monitoring

- Conductivity is relatively easy to measure and is used to estimate chloride concentration
- Data loggers measure and record conductivity at 5 minute intervals
- NSD studied the correlation between conductivity and chloride in site specific samples

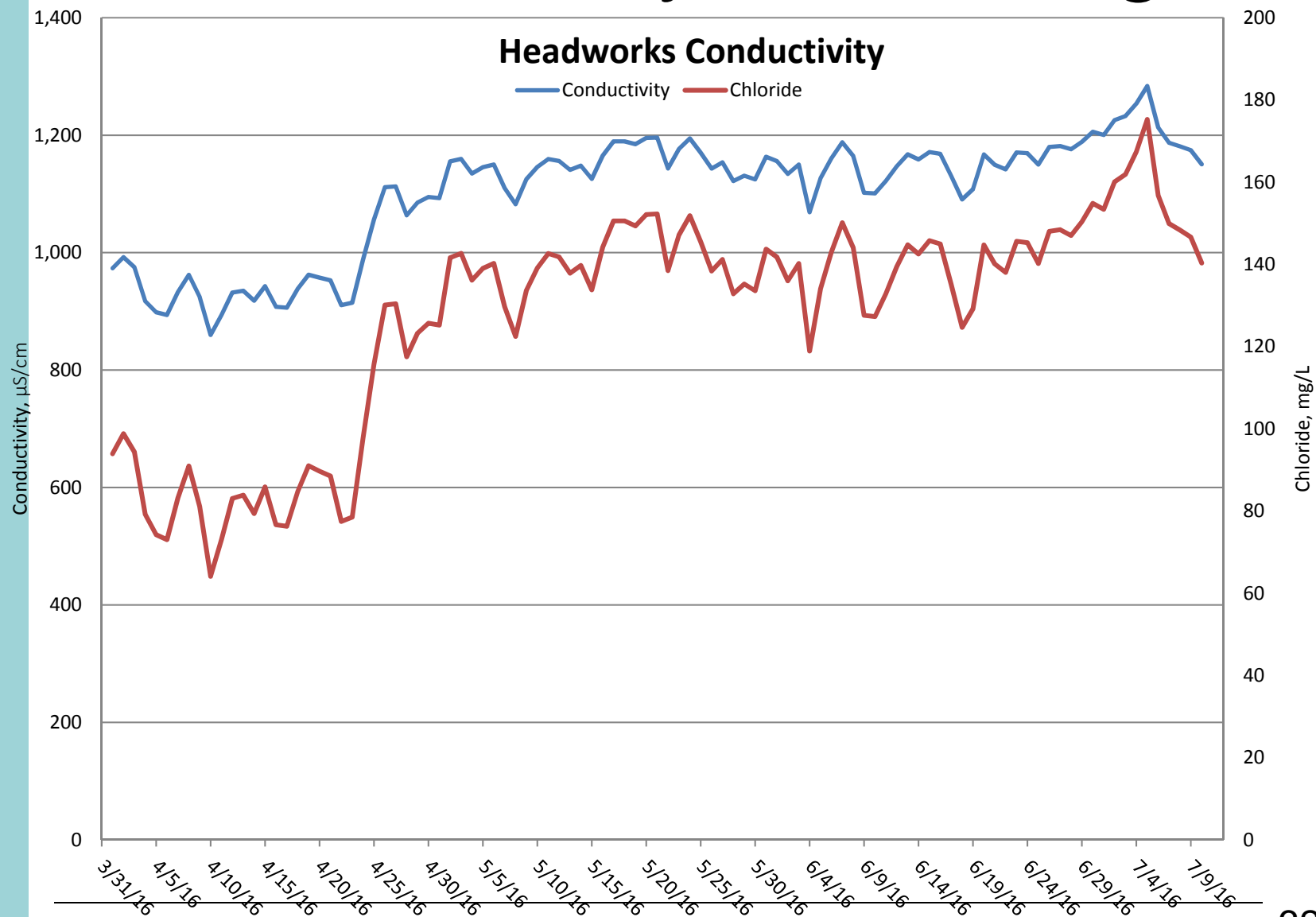


Conductivity Monitoring





Conductivity Monitoring





Conductivity Monitoring

- 8 Fixed Monitoring Locations
 - Track changes in conductivity over time
 - Correlate conductivity to tide stage, river salinity, rainfall, temperature, etc.
 - Strategically located to isolate areas within the collection system
- 3 “Roving” Data Loggers
 - Trace high levels of conductivity upstream from fixed monitoring locations to pinpoint sources

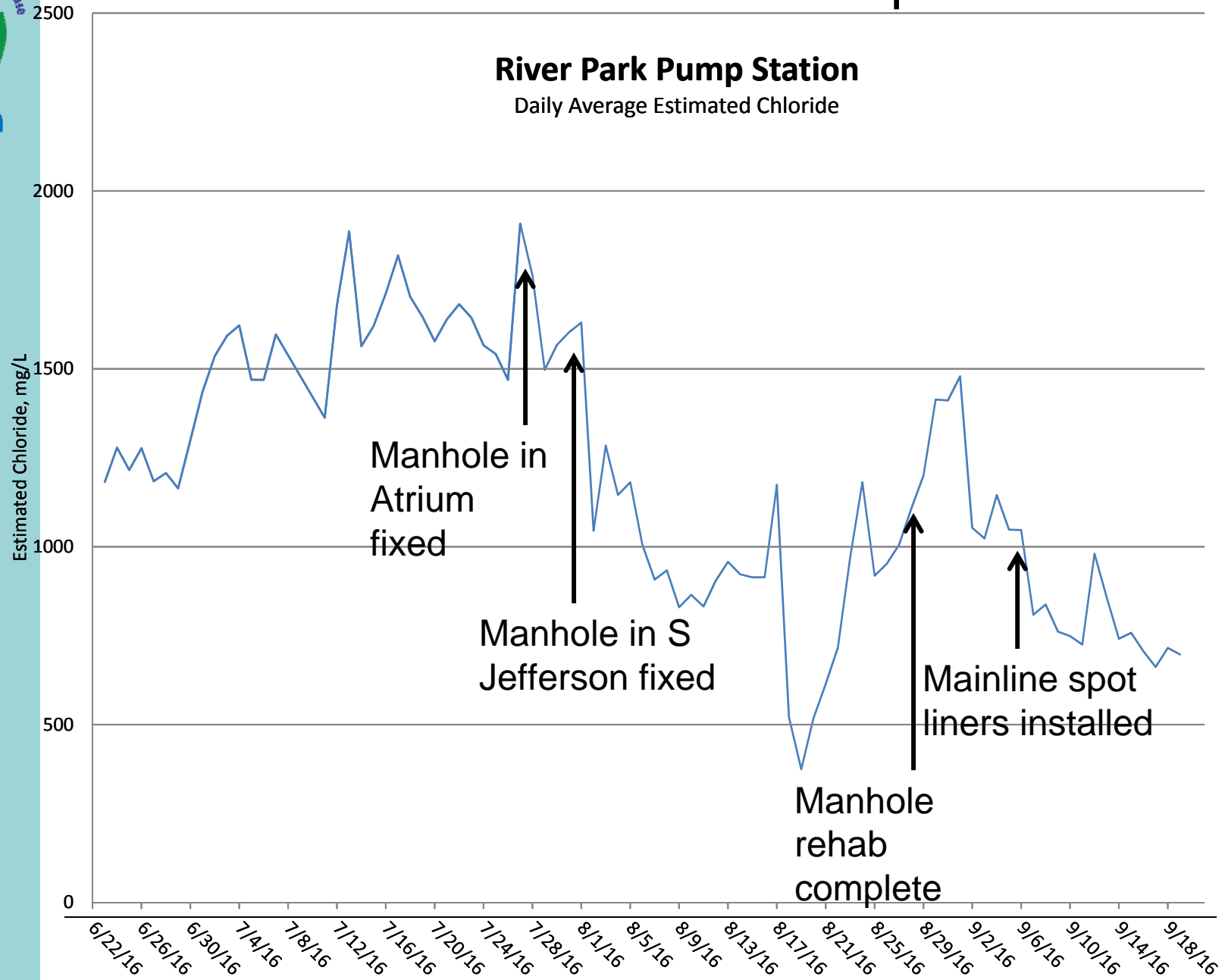


Mainline Spot Liner – South Newport Drive



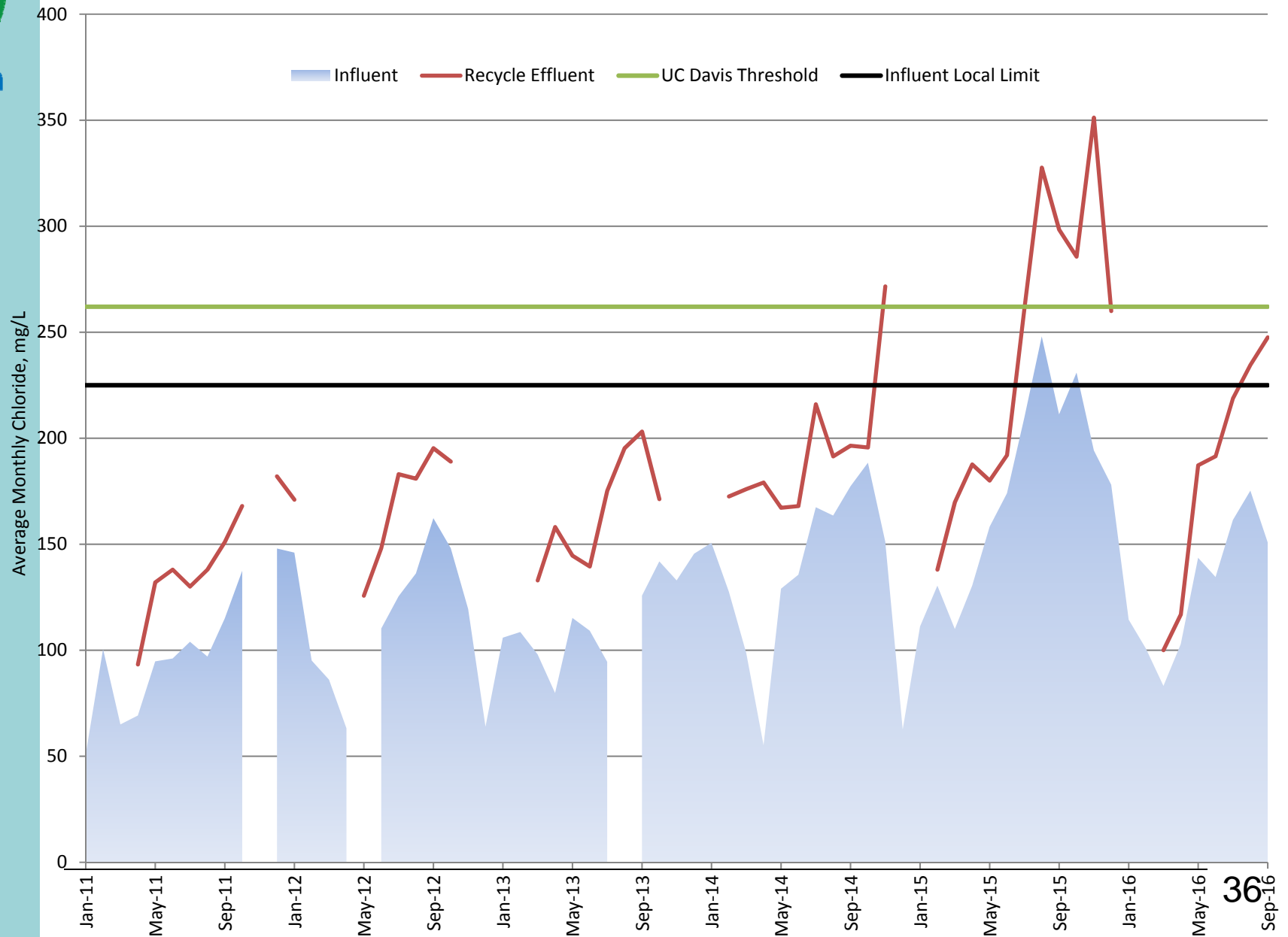


Chloride at River Park Pump Station





NSD Chloride Concentrations 2011-2016





Questions

Andrew Damron, PE

Technical Services Director

adamron@napasan.com

(707) 258-6000



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From Water to Wine Sam Jamison, *Jackson Family Wines*

Meeting Sponsors:





Water to Wine

Sam Jamison
Vice-President of Engineering

Jackson

FAMILY WINES

MATANZAS
CREEK
WINERY

ARROWOOD

Cambria
ESTATE WINERY

KENDALL-JACKSON

LA CREMA

FREEMARK ABBEY
NAPA VALLEY

MURPHY-GOODE

BARRYMORE

BYRON
ESTATE BOTTLED & PRODUCED

STONESTREET
ESTATE VINEYARDS

HARTFORD FAMILY WINERY

VÉRITÉ

CARMEL ROAD
MONTEREY

YANGARRA
ESTATE VINEYARD

SILVER PALM

CHÂTEAU LASSÈGUE

La Jota Vineyard Co.
HARVEST. RESERVE. DELIVER.

CAPENSIS

LOKOYA

SIDURI

WILD RIDGE

Mt.
BRAVE

HICKINBOTHAM
CLARKSON VINEYARD

GALERIE

MAGGY HAWK

CARDINALE

CHARDENET

CARNEROS HILLS
WINERY

ANAKOTA

CALINA

CAPTURE

EDMEADES

NOVY
FAMILY WINERY

ATALON
NAPA VALLEY

CHAMP DE RÊVES

FORTRESS

BOOTLEG

Wind River

Cenyth

TENUTA DI ARCENO

ARCANUM

BENVOLIO
ITALIA

Unfiltered

GRAN
MORALINE

Brewer-Clifton

Copain Wines

WILLAKENZIE ESTATE

penner-ash
WINE CELLARS

ZENA CROWN
VINEYARD



**Family
Owned**



Inaugural Family Responsibility Report & Goals



Selected 5-Year Goals:

- 25% GHG intensity reduction
- **33% water intensity reduction**
- 50% electricity offset from solar
- 50% solid waste reduction
- 85% sustainable grower fruit



Jackson Family Wines Unveils New Report, Goals Aimed at Advancing Field of Sustainable Wine



Dirty little secret of the Wine Industry



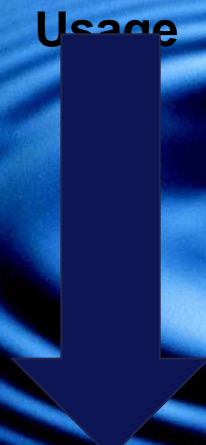
Conserving Every Drop

Water
Intensity
(gal/gal)



%

Total
Water
Usage



31
%



Water Intensity Reductions since 2008

Retrofits, behavior changes, and various investments in water conservation and reuse technologies, have allowed us to reduce our water intensity and total water usage across the board



What Makes Wine Unique?

1. Are we Agriculture? Or Industrial? Or Commercial/Retail?
2. Seasonal – we aren't making beer after all
3. And then there's this little thing called HARVEST





*Winery Water Conservation
& Reuse*



Tank Wash Water Recycling

We developed a water recycling system for our stainless cellars that reuses pH balanced cleaning solution for consecutive tank washes, saving ~150 gallons of water per tank wash.



Opportunities – Tank Wash Water Recycling





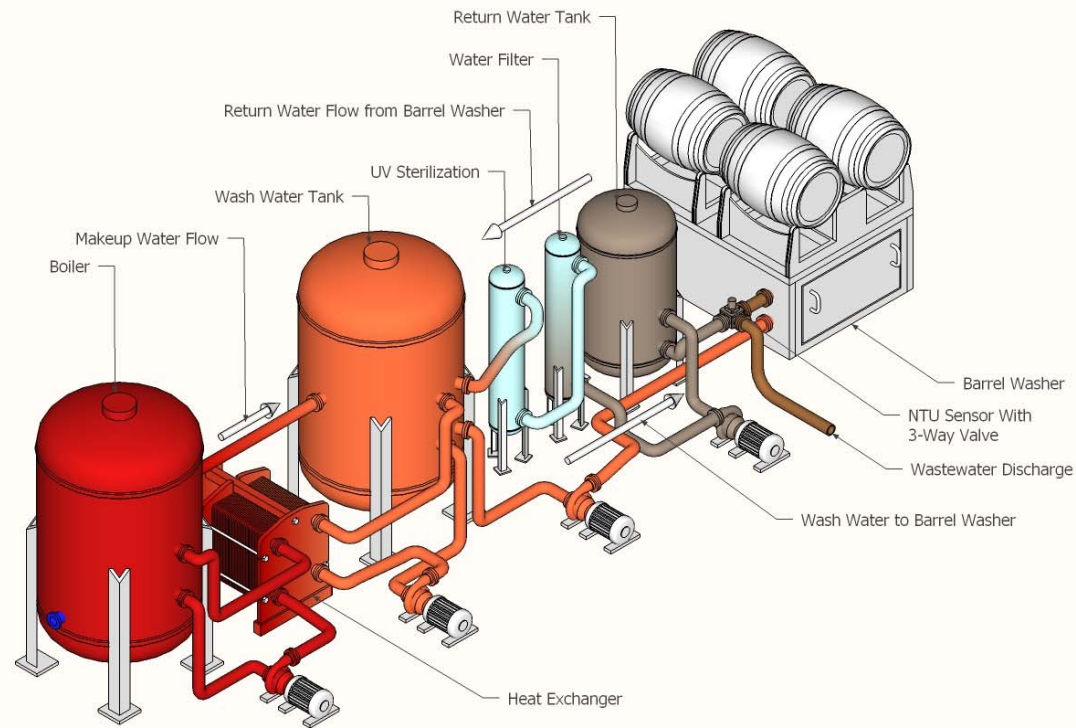
Barrel Wash Water Recycling

We reuse barrel wash water (and the embodied energy needed to heat it) 3x, saving ~700K gallons of water per year in our Monterey, CA winery. This technology received Top Project of the Year honors from *Environmental Leader* in 2015.

TomBeard
COMPANY
The Innovative Barrel Processing Source Since 1983

Jackson
FAMILY WINES

Opportunities – What about Small Barrel Washers?



Opportunities – Must Piping



Opportunities – A Bin is a Resource!



Opportunities – Cleaning Floors



Opportunities – Showering your Barrels?





Reducing Cooling Tower Water use by increasing Cycles of Concentration

In partnership with ChemSearch, we installed smart controllers on our cooling towers that enable our systems to **reuse water up to 6 times per cycle**. This will save us nearly **5 million gallons** of water per year.



Rainwater Harvesting

We are leveraging existing fermentation tank infrastructure to store water for feeding cooling towers & offset well water usage. But what other opportunities exist for use of this high quality water?





Waterless UV Tank Sanitation

It's not reuse of water, but it does conserve water, to the tune of 250k per unit installed..





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*Vineyards
The Next Frontier?*



Closing the water loop

By irrigating our vines with recycled process water from our wineries, we ensure that our water resources are repurposed multiple times.





FRUITON
SCIENCES

Sap Flow Monitoring

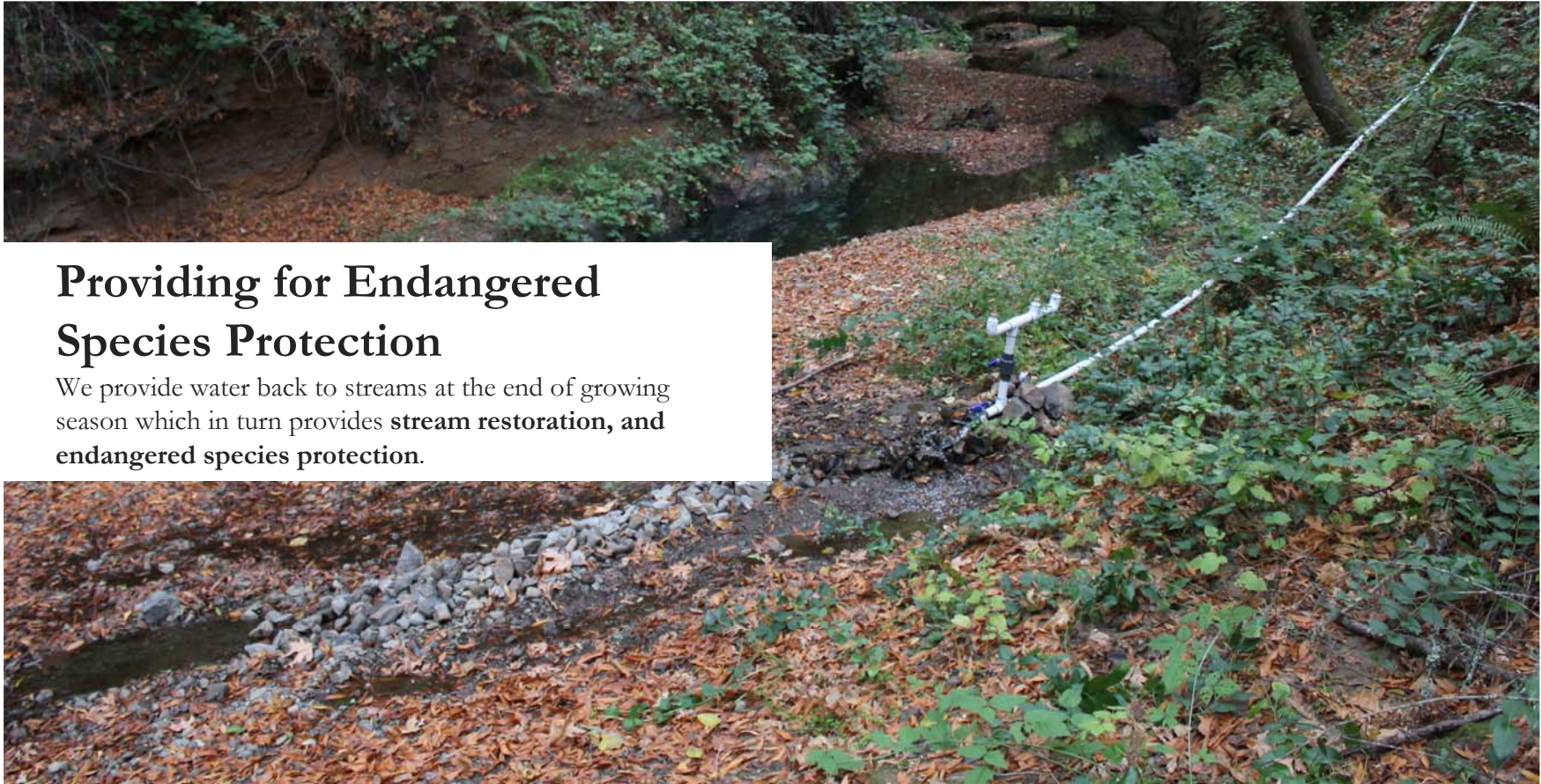
We have been working with **Fruition Sciences** since 2012 to measure the level of sap activity in our vines. This lets the plant tell us when it is thirsty and has led to **a greater than 20% decrease in water usage** on our test sites, as well as a marked increase in grape quality.

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FAMILY WINES

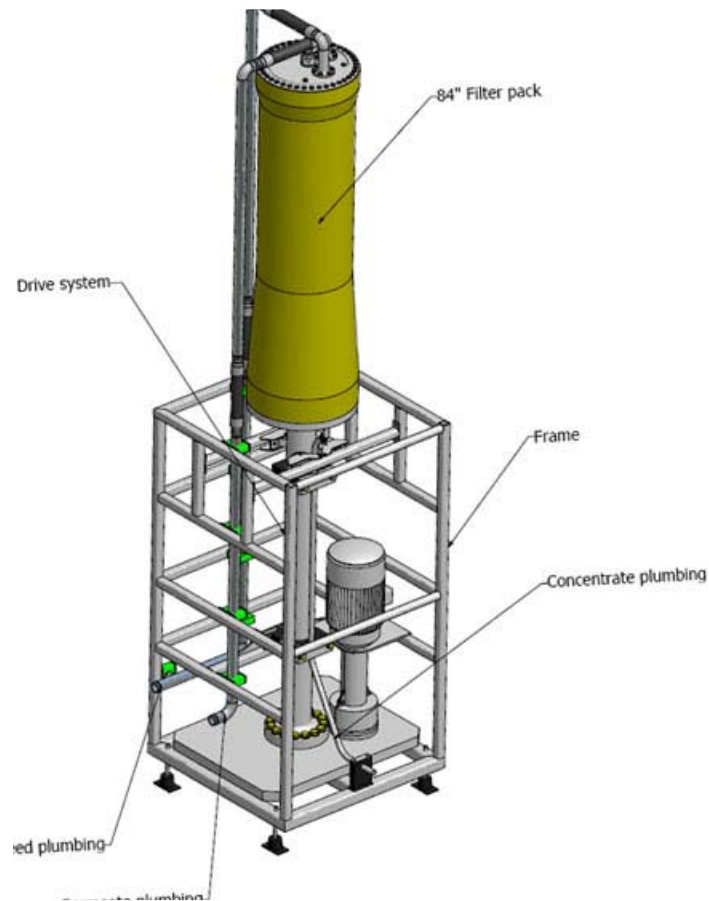


Providing for Endangered Species Protection

We provide water back to streams at the end of growing season which in turn provides **stream restoration, and endangered species protection.**



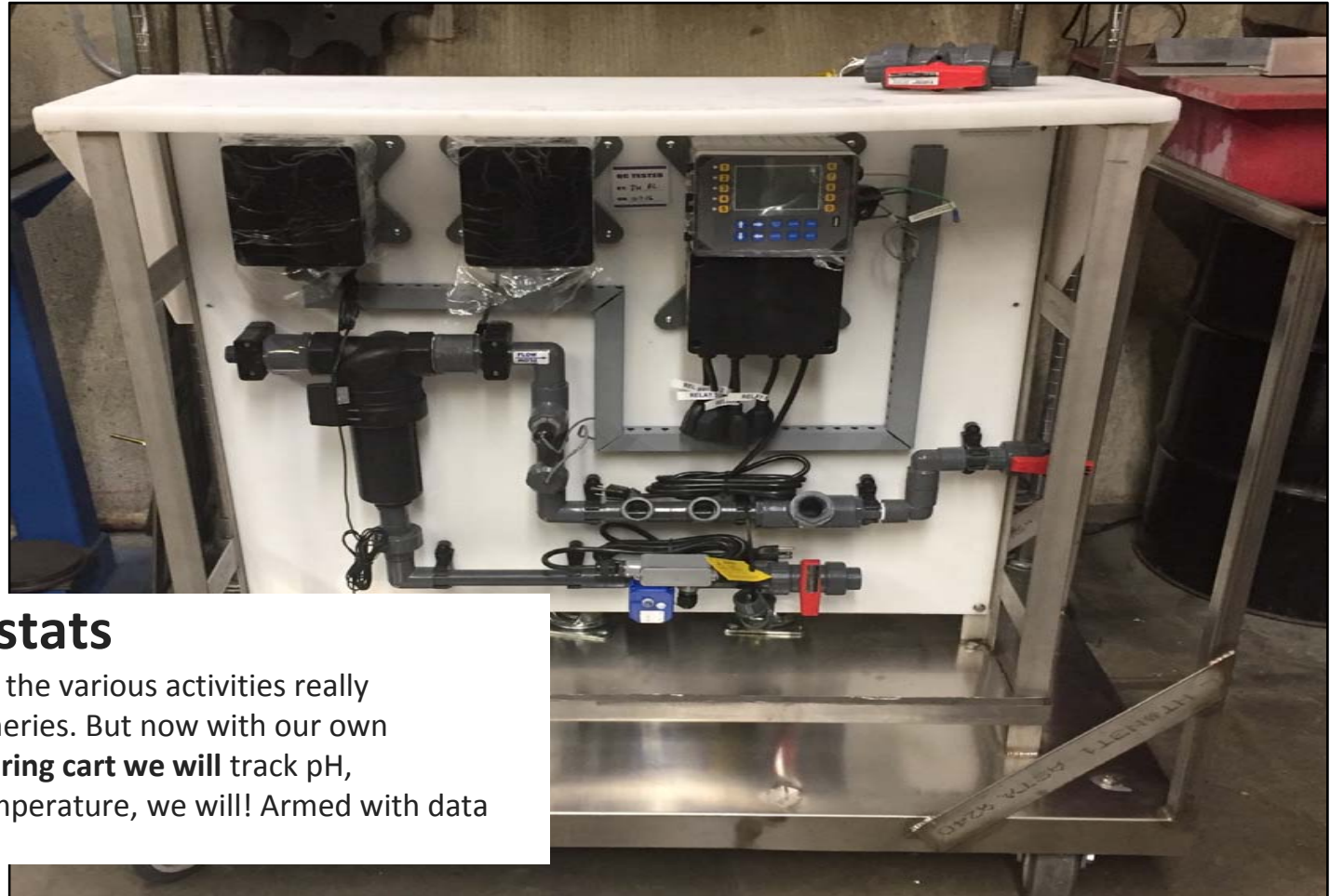




Promising Reuse Technologies

We continue to research other innovative water conservation and reuse technologies for deployment in our wineries, such as **VSEP**, a vertical RO system and **Porifera FO**, potentially capable of recycling water up to 10x





Know your stats

We don't know what the various activities really contribute at our wineries. But now with our own **Wastewater Engineering cart** we will track pH, Conductivity and Temperature, we will! Armed with data we can

Unpredictability of Water

How quickly this winter's **Atmospheric River** events allow us to forget the big Drought. Are there opportunities to capture additional water resources for later reuse.



Photo Credit: Kent Porter, Press Democrat



Water Conservation & Reuse Best Practices

The JFW Roadmap

- Conduct audits - know when & where you use water
- Assign a price to every gallon you use
- Set reduction goals now!
- Integrate water conservation into annual strategic planning & bonuses (e.g. water reduction awards)
- Train seasonal/temporary employees
- ***Share new ideas – internally & with the world!***



The Challenge

Calling on the Experts...

- Water has great value, but doesn't cost very much
- Regulation that makes it easy
- More and cheaper solutions for treatment and reuse
- What to do with the reject stream
- Employee engagement and community acceptance of water reuse







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Recycled Water: Food, Ag, & Bev

Agriculture Reuse: Then and Now

Doug Beretta, *Beretta Dairy*



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Legislative and Committee Updates

Andria Loutsch, Nor CA WaterReuse

Meeting Sponsors:



Leg/Reg Update

Northern California WaterReuse Chapter
Santa Rosa

Andria Loutsch

May 19, 2017



**CDM
Smith.**

Agenda

- Bills
- CWSRF Intended Use Plan
- Recycled Water Policy
- Upcoming Events

AB 574 (Quirk)

- Potable reuse
- Updates the definition of potable reuse to specify 4 types: groundwater augmentation, reservoir augmentation, raw water augmentation, treated water augmentation
- On suspense – high costs

SB 740 (Weiner)

- Onsite treated water
 - WRCA & CASA asked for same amendments
 - More local control
 - Local agencies can opt out
- SFPUC is still working on it

SB 5 (De León)

- Bonds for drought/water/parks/climate/coastal protection
- Recently amended - \$165 M for recycled water, down from \$250 M
- Unlikely to get passed this year

AB 2282

- Dual-plumbing regulations
- 15-day comment period on proposed changes, due 5/24
- CBSC hearing in June

CWSRF Intended Use Plan Changes

- Division of Financial Assistance asked WRCA for criteria for Group 3 projects
- State Board considering changes, goes before State Board in the fall
- Comments on draft IUP due 5/22

Recycled Water Policy Update

- Next steps on policy development
 - CEC Expert Panel
 - Final policy adoption in July 2018
- July 2017
 - First CEC Expert Panel meeting
 - Formation of stakeholder group

Upcoming Events

- June 9, 12:30-2 pm – WRCA Leg/Reg Committee call/meeting
- July 13, 1-3 pm – CWSRF Policy & Prioritization Workshop @ EBMUD

Thank You to our Sponsors!

JB

**Water & Wastewater
Equipment**



CDM Smith