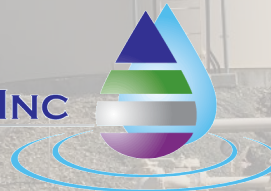


Pretreatment Design for Wildfire Runoff

Innovative Water Technologies for California

March 2018

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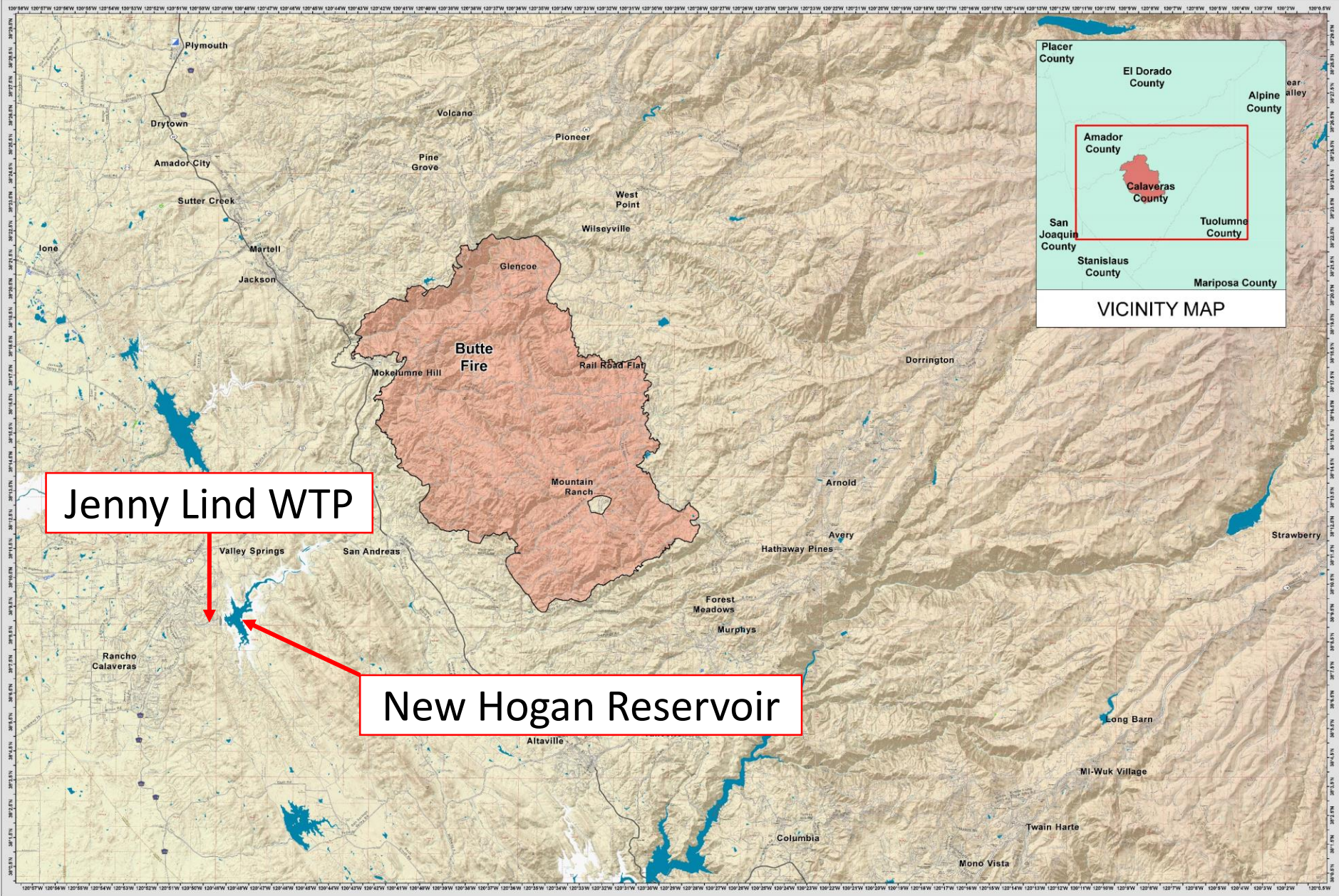
Mountain Counties
WATER RESOURCES ASSOCIATION

Presentation Overview

- I. 2015 Butte Fire Background
- II. Impacts to Raw Water Quality
- III. Impacts to Finished Water Quality
- IV. Pretreatment Alternatives
- V. Pretreatment Selection
- VI. Grant Funding

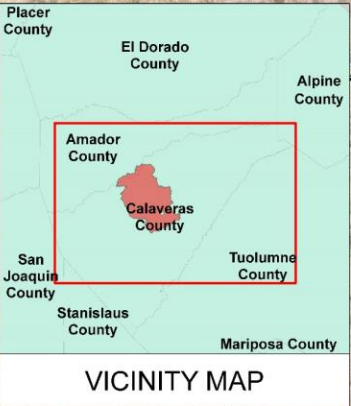
The 2015 Butte Fire

- ❖ Fire Began on September 9th, 2015
- ❖ Lasted until October 1st, 2015
- ❖ Spanned Across Amador and Calaveras Counties
 - ◆ Burned Approximately 70,868 Acres across
 - ◆ Destroyed 921 Structures
 - ◆ Significant Impact to New Hogan Reservoir



Jenny Lind WTP

New Hogan Reservoir



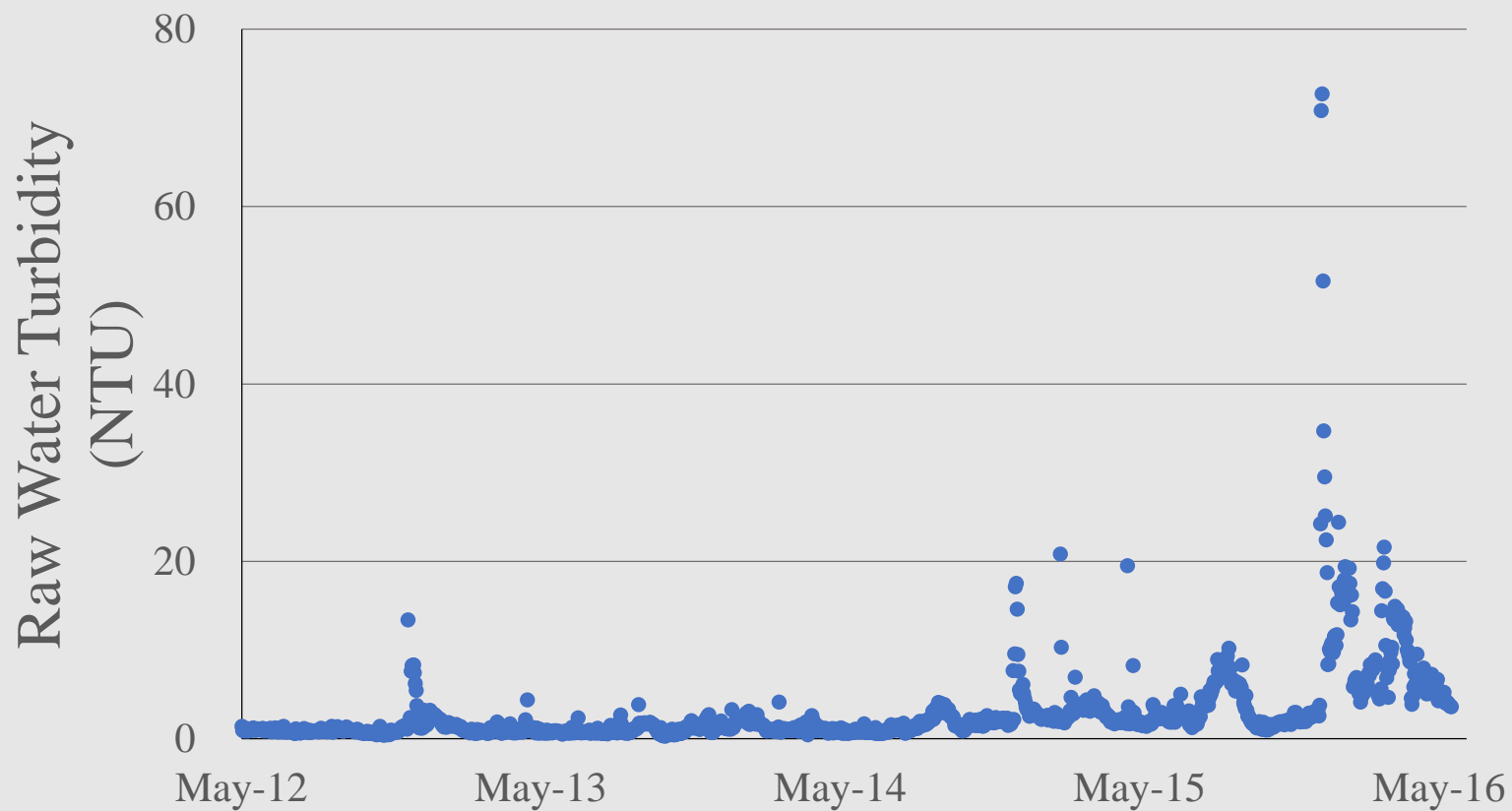
PUBLIC INFORMATION MAP
BUTTE INCIDENT
CA-AEU-024918



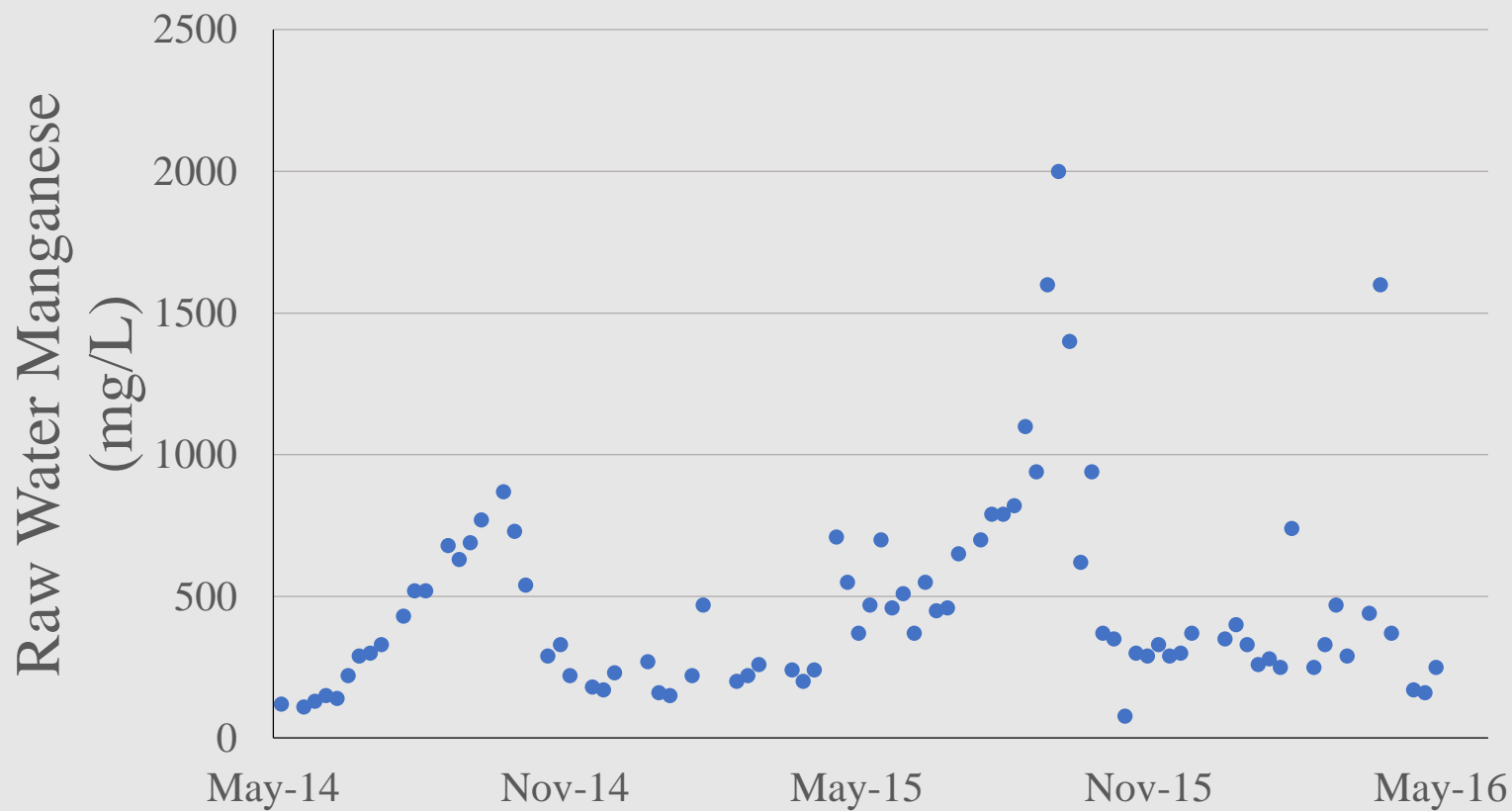
Water Quality Impacts

- ❖ Negatively Impacted Raw Water Turbidity, TOC & Manganese
- ❖ Impacts were Immediate and Long Lasting
- ❖ Impacts Centered Around Storm Events
- ❖ Ultimately Impacted Finished Water Quality

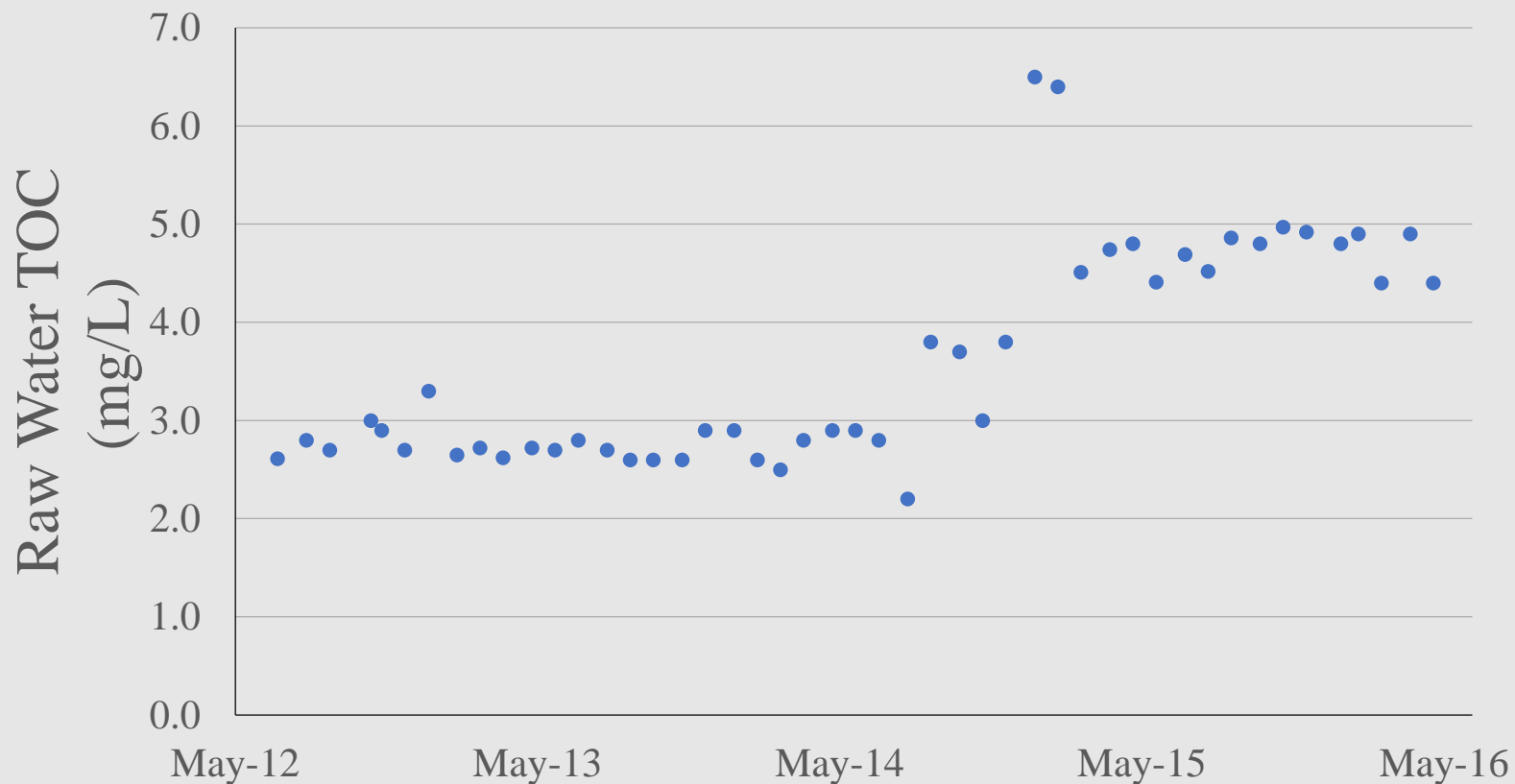
Raw Water Quality Impacts



Raw Water Quality Impacts



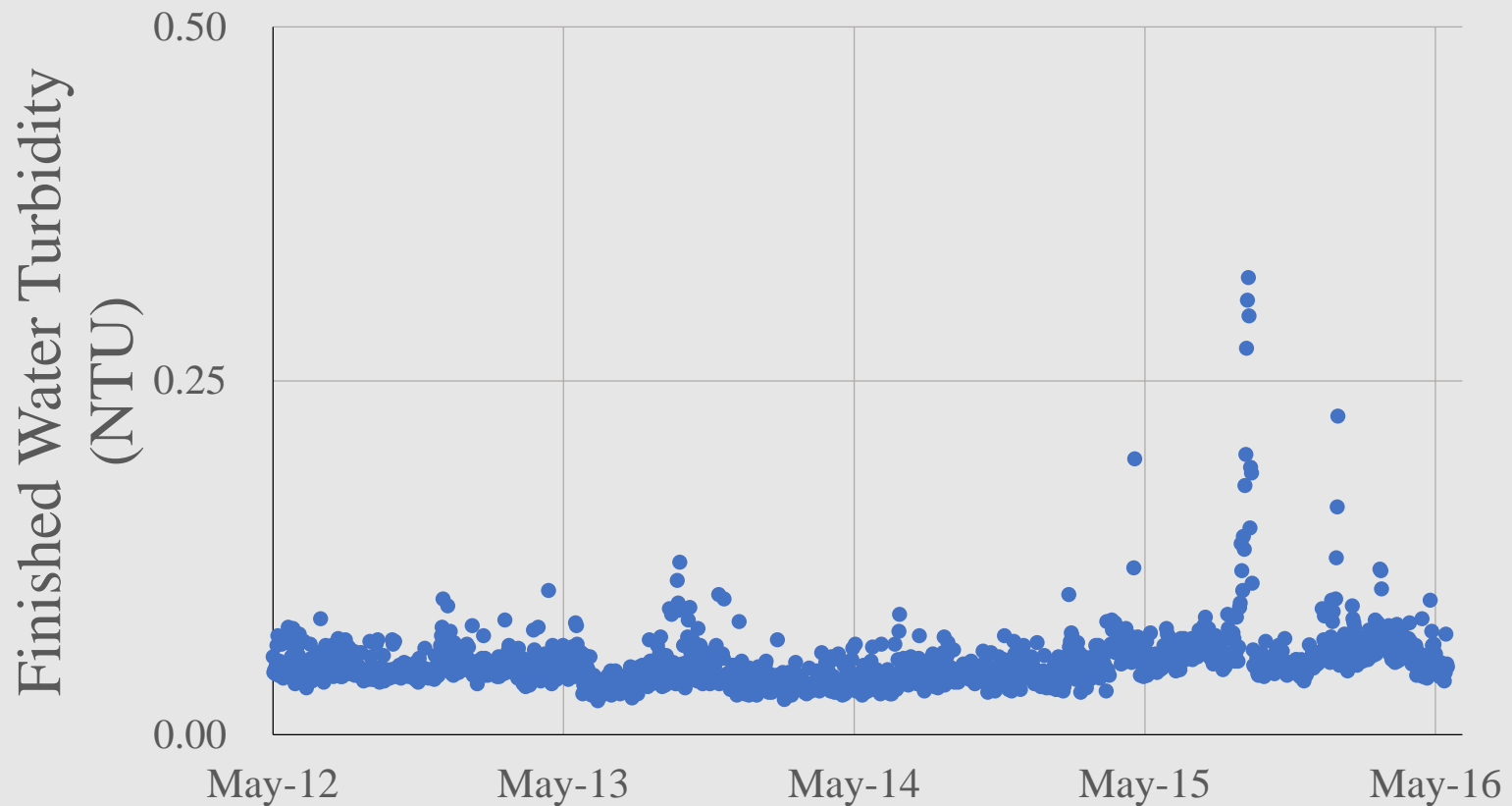
Raw Water Quality Impacts



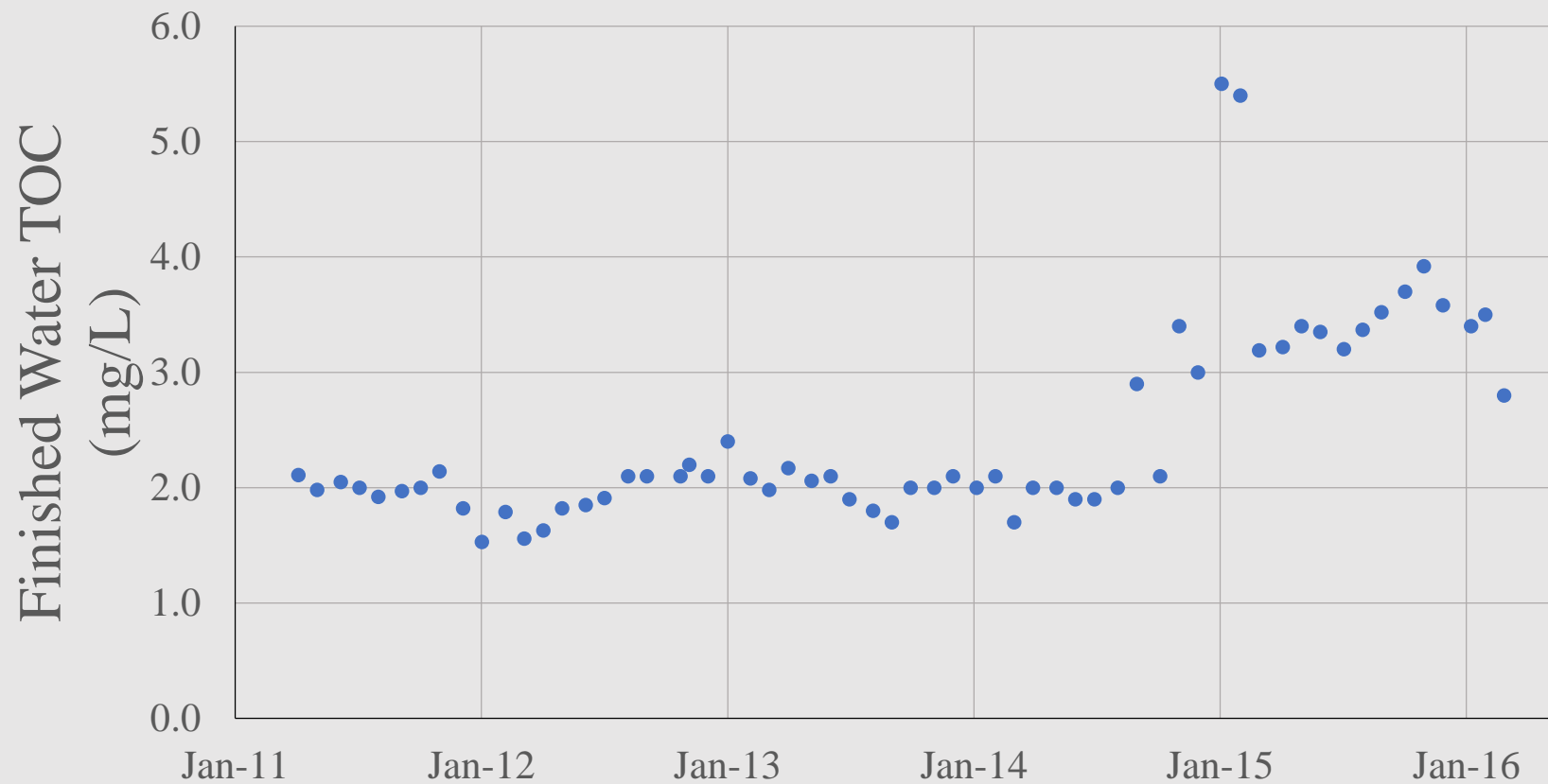
Finished Water Quality Impacts

- ❖ Long Lasting Drought and Fire Impacts Through 2016
- ❖ Operators Relied on Multiple Filters
- ❖ Increased Flush & Backwash Volumes
- ❖ Increased Polymer Use
- ❖ Ultimately Impacted Finished Water Turbidity, TOC & Manganese

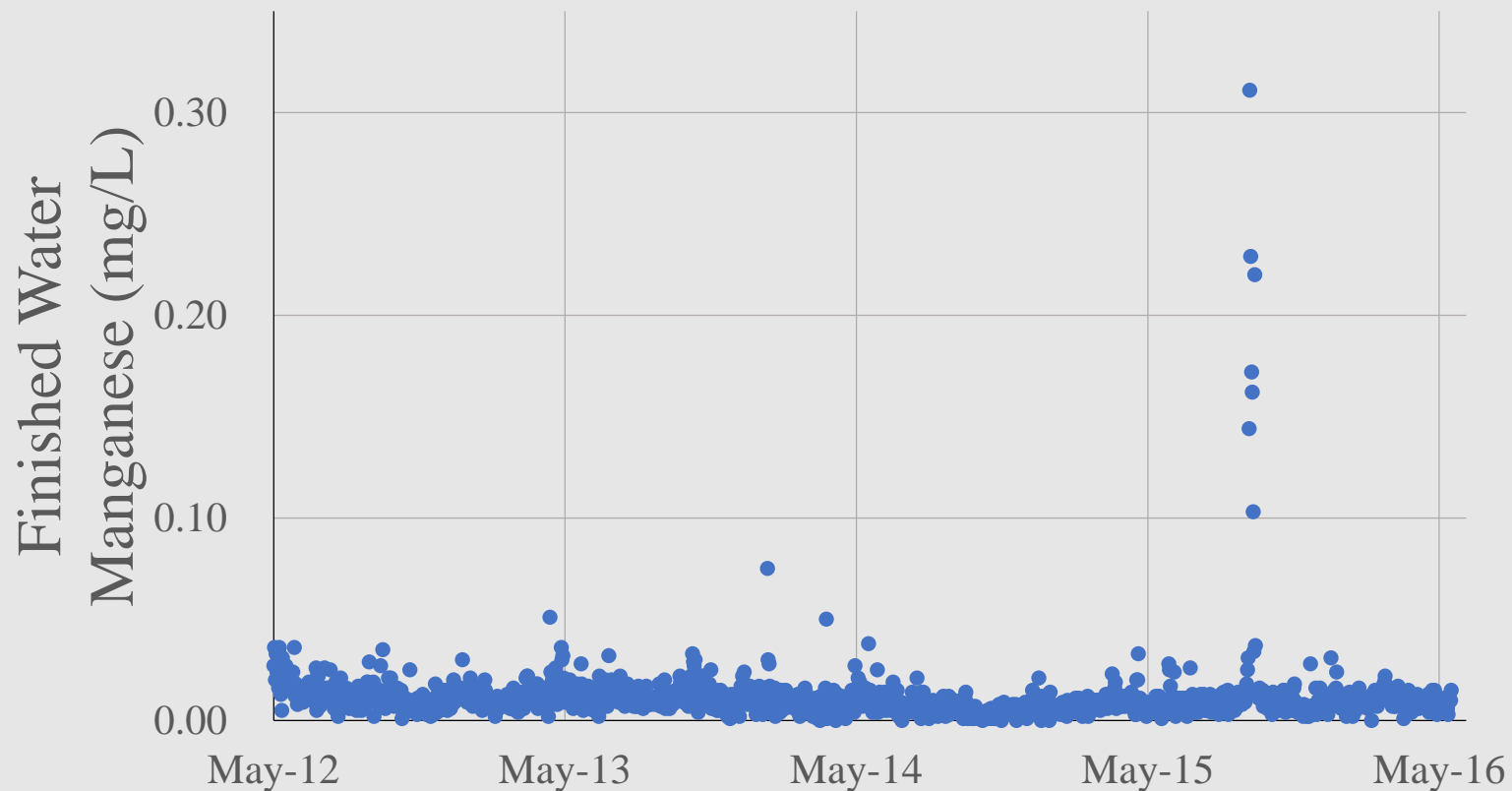
Finished Water Quality Impacts



Finished Water Quality Impacts



Finished Water Quality Impacts



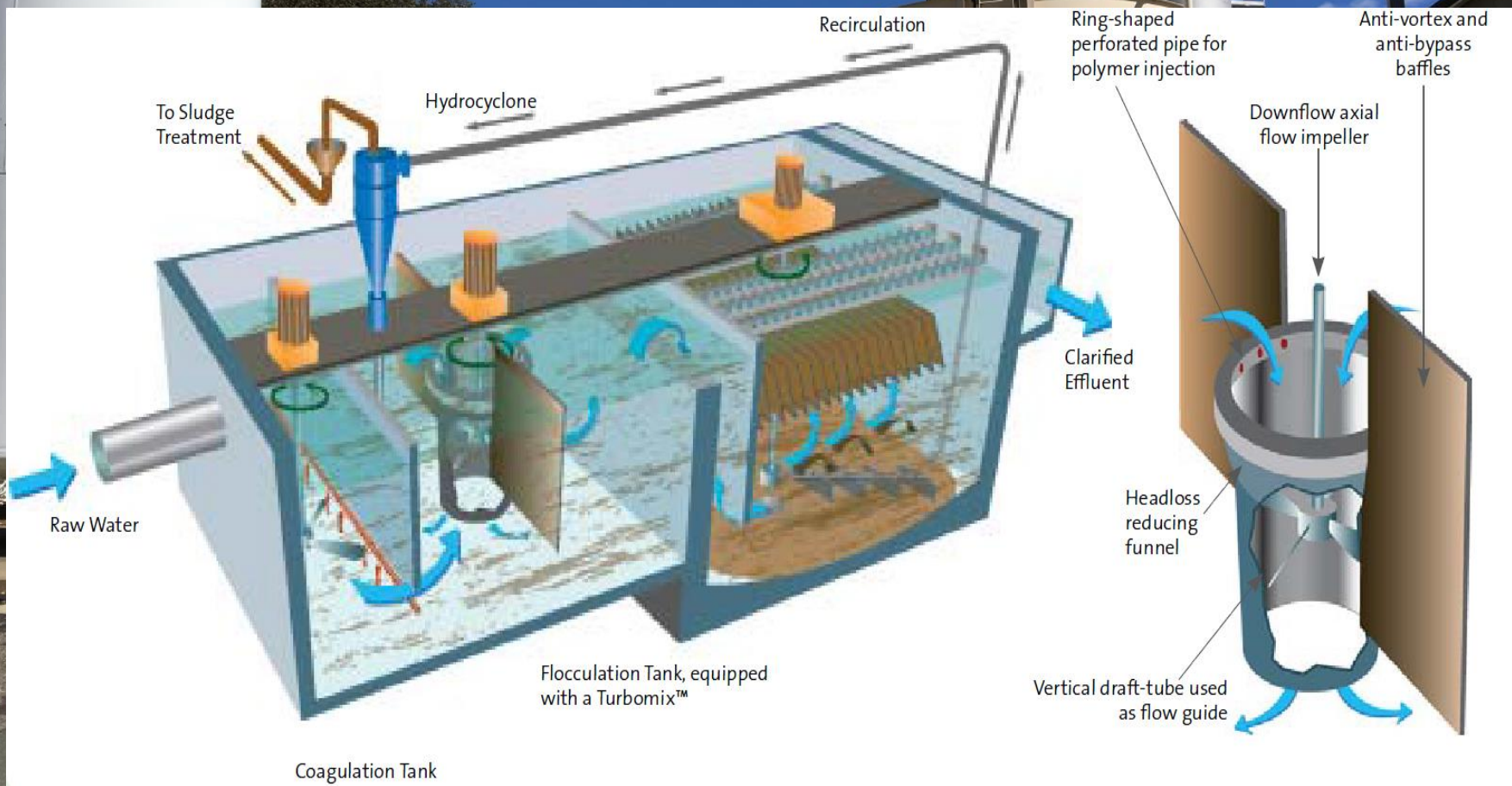
Pretreatment Alternatives

- ❖ Ballasted Sedimentation
 - ◆ Actiflo, CoMag, Rapisand
- ❖ Dissolved Air Flotation
 - ◆ SAF
- ❖ Pressure Filters
 - ◆ Vertical Pressure Filters

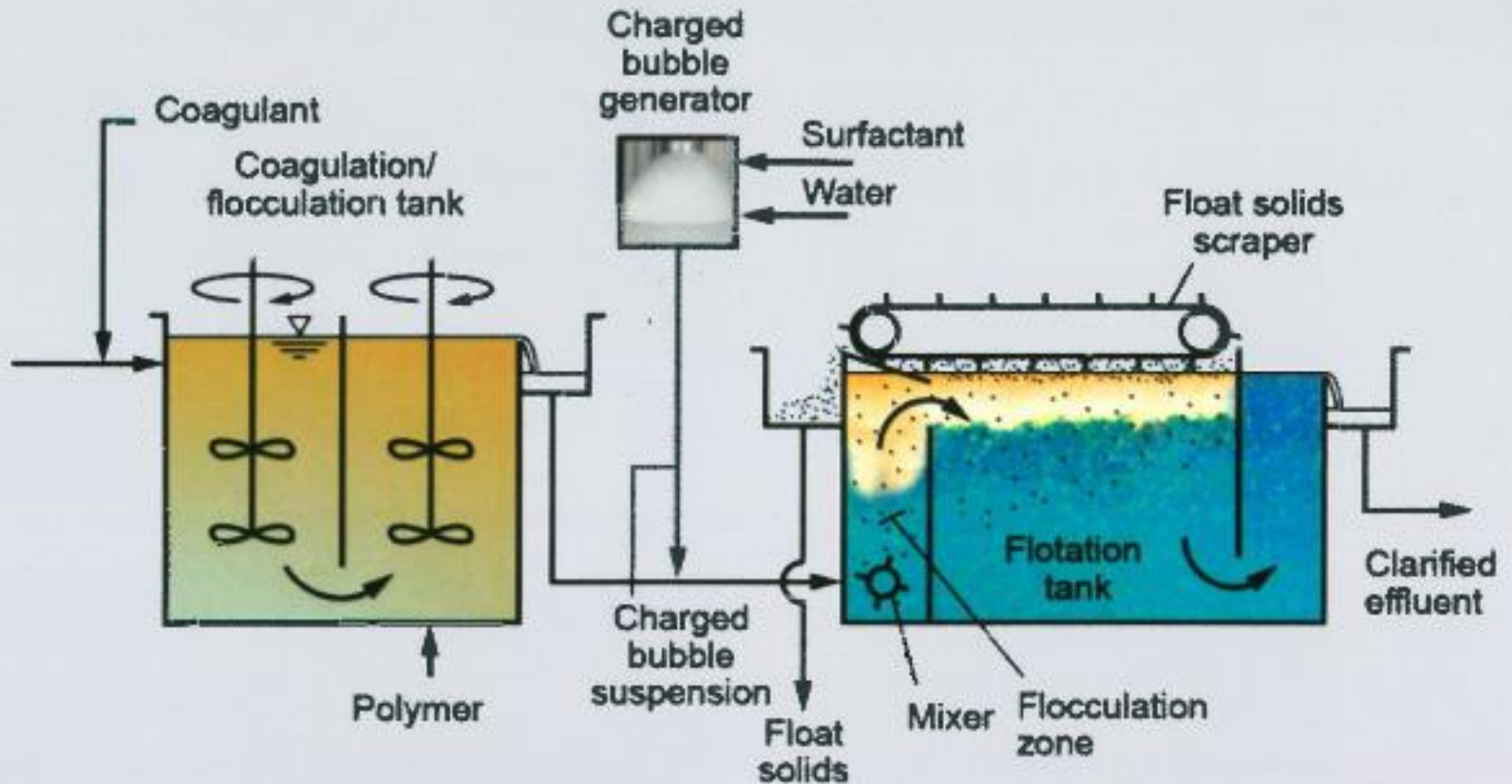
Treatment Process Guarantee

Contaminant	Actiflo	SAF	CoMag (Not Tested)
Turbidity	$< 10 \text{ NTU}$	$< 10 \text{ NTU}$	$\leq 10 \text{ NTU}$
TOC	$< 4 \text{ mg/L}$	NA	$\leq 4 \text{ mg/L}$
Manganese	$< 2 \text{ mg/L}$	NA	$\leq 2 \text{ mg/L}$

Actiflo – Ballasted Sedimentation



SAF – Dissolved Air Flotation



Pretreatment Selection

❖ Actiflo

◆ Advantages:

- Low Lifecycle Cost
- Small Waste Volume
- Small Footprint
- Proven Process

◆ Disadvantages:

- Added Chemical Use

❖ SAF

◆ Advantages:

- Low Lifecycle Cost
- Small Waste Volume
- Small Footprint

◆ Disadvantages:

- Lacked Process Guarantee
- Added Chemical Use
- High Headloss

Pretreatment Selection

- ❖ One 6-MGD Actiflo Unit
- ❖ Unit Cost = \$1.4M
- ❖ Total Project Cost = \$3.4M
- ❖ Available Grant Funding = \$2.8M

Funding Availability

❖ FEMA Funding

- ◆ Hazard Mitigation Grant Program (HMGP)
- ◆ Pre-Disaster Mitigation (PDM) Program

❖ Proposition 1 Funding

- ◆ Drinking Water (\$260M)
- ◆ Recommended for Small Disadvantage Communities
- ◆ Up to \$5M for Construction
- ◆ Up to \$500,000 for Planning
- ◆ Applications due by December 2018

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