EAST BAY MUNICIPAL UTILITY DISTRICT

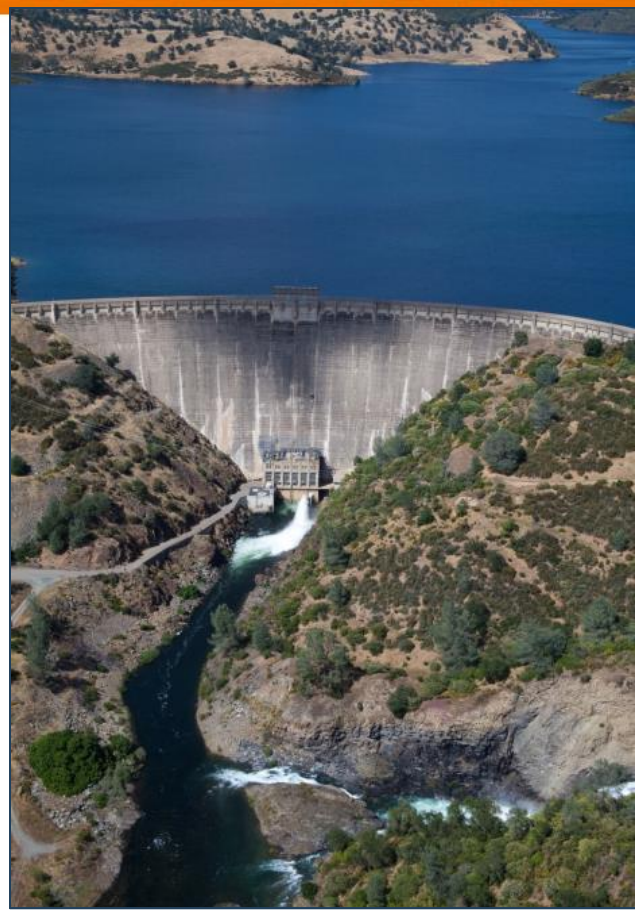
2017 Dam Safety Program Annual Report

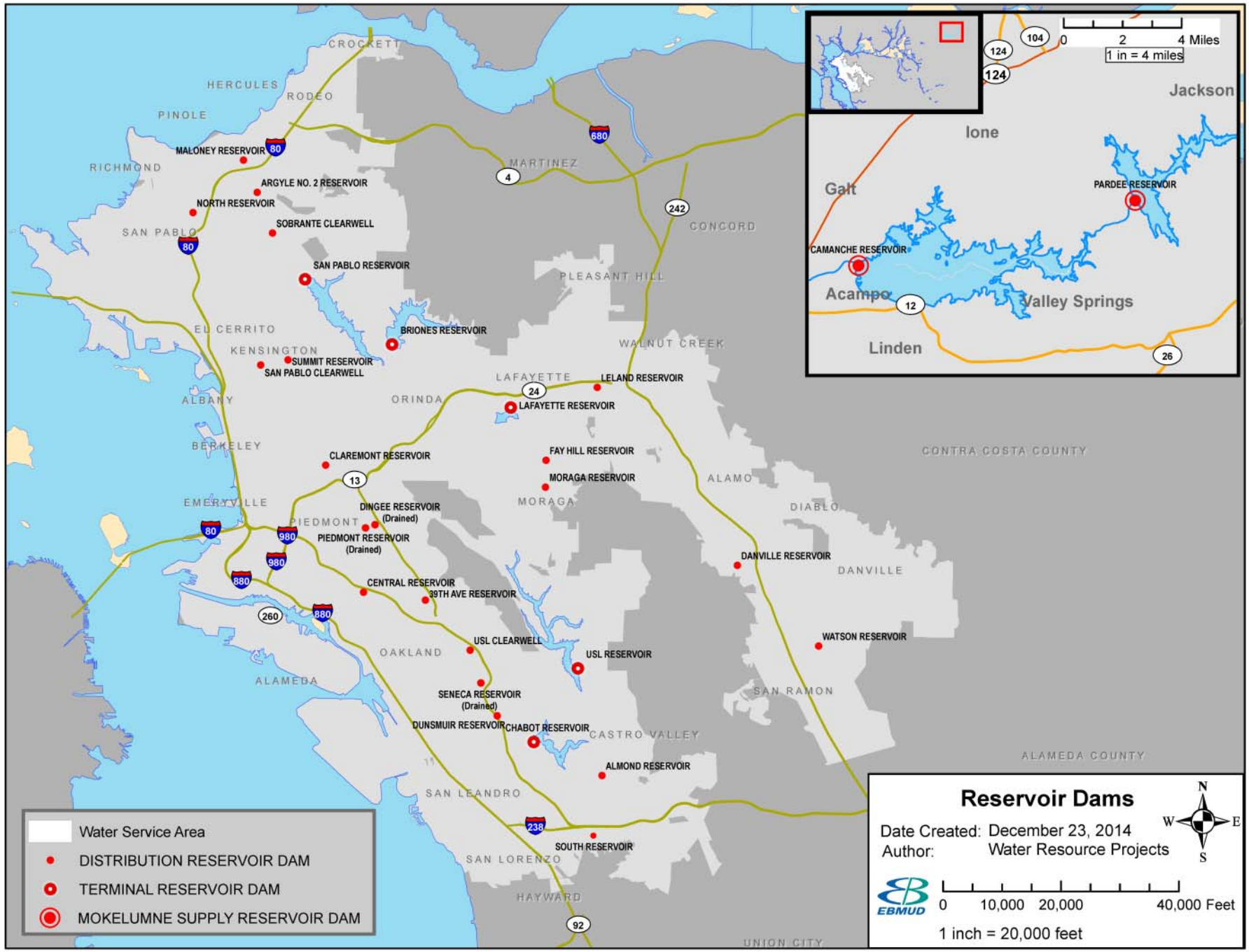
Planning Committee

August 8, 2017

Outline

- Overview of District Dams
- Dam Safety Program
  - Policy and regulatory framework
  - Elements of the program
  - Recent and upcoming activities within each element
- Summary & next steps





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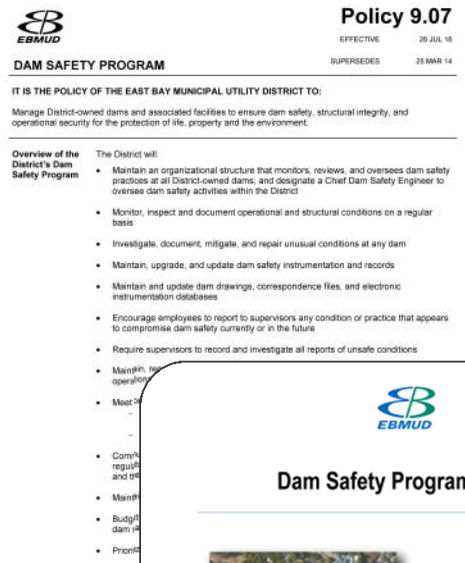
Policy and Regulatory Framework

Regulatory Framework

- Federal oversight of Pardee and Camanche
- State oversight of all but five small dams

Recent Changes

- 2014 FERC mandate required formal policy and documentation of dam safety program
- District **Policy 9.07** and **Dam Safety Program Guide** created in response
- Post-Oroville spate of new regulations and stepped-up scrutiny of ongoing work



EBMUD

Policy 9.07

EFFECTIVE 26 JUL 16

SUPERSEDES 25 MAR 14

DAM SAFETY PROGRAM

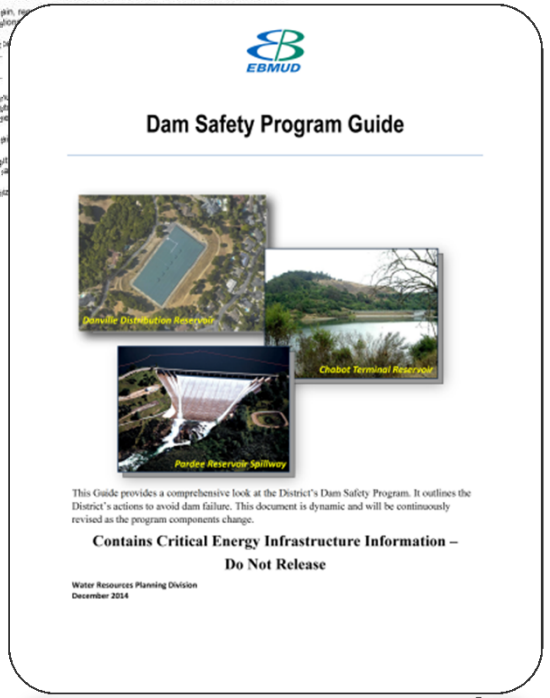
IT IS THE POLICY OF THE EAST BAY MUNICIPAL UTILITY DISTRICT TO:

Manage District-owned dams and associated facilities to ensure dam safety, structural integrity, and operational security for the protection of life, property and the environment.

Overview of the District's Dam Safety Program

The District will:

- Maintain an organizational structure that monitors, reviews, and oversees dam safety practices at all District-owned dams, and designate a Chief Dam Safety Engineer to oversee dam safety activities within the District
- Monitor, inspect and document operational and structural conditions on a regular basis
- Investigate, document, mitigate, and repair unusual conditions at any dam
- Maintain, upgrade, and update dam safety instrumentation and records
- Maintain and update dam drawings, correspondence files, and electronic instrumentation databases
- Encourage employees to report to supervisors any condition or practice that appears to compromise dam safety currently or in the future
- Require supervisors to record and investigate all reports of unsafe conditions



EBMUD

Dam Safety Program Guide

This Guide provides a comprehensive look at the District's Dam Safety Program. It outlines the District's actions to avoid dam failure. This document is dynamic and will be continuously revised as the program components change.

Contains Critical Energy Infrastructure Information – Do Not Release

Water Resources Planning Division
December 2014

Dam Safety Program Elements

Training

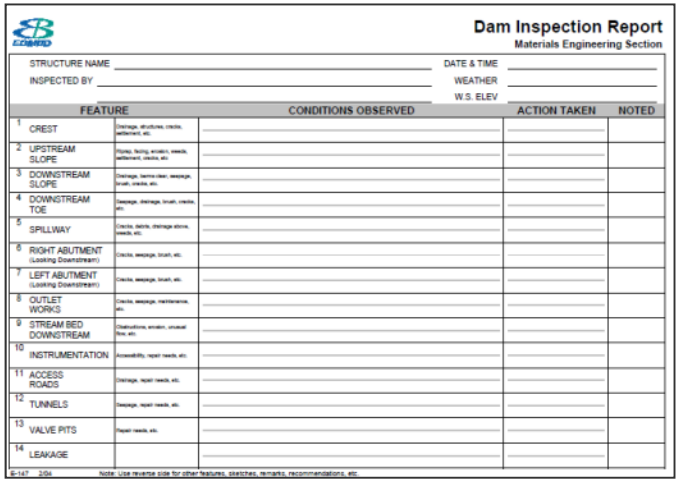
Emergency Plans, Drills and Exercises

Inspections and Surveillance

Safety studies and improvements

Dam Safety Training

- Historically provided to inspectors and dam safety engineers
- Now being extended to broader range of staff, documentation being improved
- Goals: reinforce dam safety, regulatory compliance, policy awareness, institutional knowledge
- 21dam training modules identified, 4 developed, phased rollout in 2018



Dam Inspection Report
Materials Engineering Section

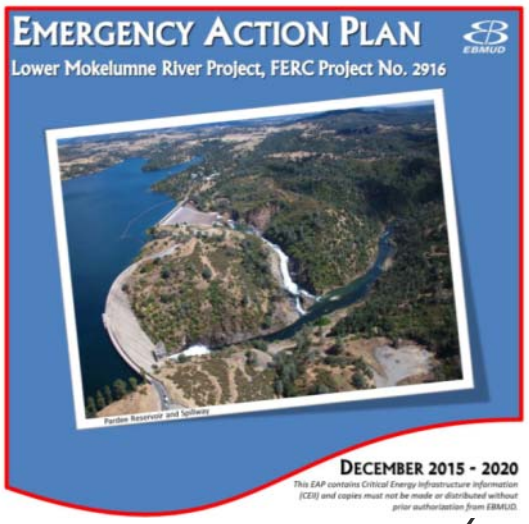
STRUCTURE NAME _____ DATE & TIME _____
INSPECTED BY _____ WEATHER _____
W.S. ELEV _____

	FEATURE		CONDITIONS OBSERVED	ACTION TAKEN	NOTED
1	CREST	Drainage, structures, cracks, settlement, etc.			
2	UPSTREAM SLOPE	Riprap, facing, erosion, weeds, settlement, cracks, etc.			
3	DOWNSTREAM SLOPE	Drainage, berms clear, seepage, brush, cracks, etc.			
4	DOWNSTREAM TOE	Seepage, drainage, brush, cracks, etc.			
5	SPILLWAY	Cracks, debris, drainage slots, weeds, etc.			
6	RIGHT ABUTMENT (Looking Downstream)	Cracks, seepage, brush, etc.			
7	LEFT ABUTMENT (Looking Downstream)	Cracks, seepage, brush, etc.			
8	OUTLET WORKS	Cracks, seepage, maintenance, etc.			
9	STREAM BED DOWNSTREAM	Obstructions, erosion, unusual flow, etc.			
10	INSTRUMENTATION	Accessibility, repair needs, etc.			
11	ACCESS ROADS	Drainage, repair needs, etc.			
12	TUNNELS	Seepage, repair needs, etc.			
13	VALVE PITS	Repair needs, etc.			
14	LEAKAGE				

6-147 2/04 Note: Use reverse side for other features, sketches, remarks, recommendations, etc.

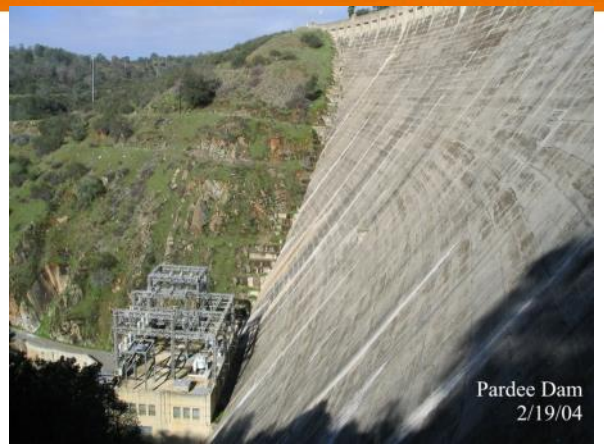
Emergency Plans, Drills and Exercises

- Substantial Emergency Action Plan (EAP) for federal dams; other dams covered by Dam Annex to general District Emergency Operations Plan
- Annual multi-agency drill held upcountry on September 27, 2016
- DSOD on July 14 directed dam owners to provide updated emergency plans by Jan 2018



Dam Inspection and Surveillance

- Monthly inspections by staff
- Annual inspections with regulators
- 2017 inspections all on track, final ones will be done in the fall
- Based on the results of the inspections and with concurrence of the regulatory agencies, all District dams are deemed safe for continued operations.

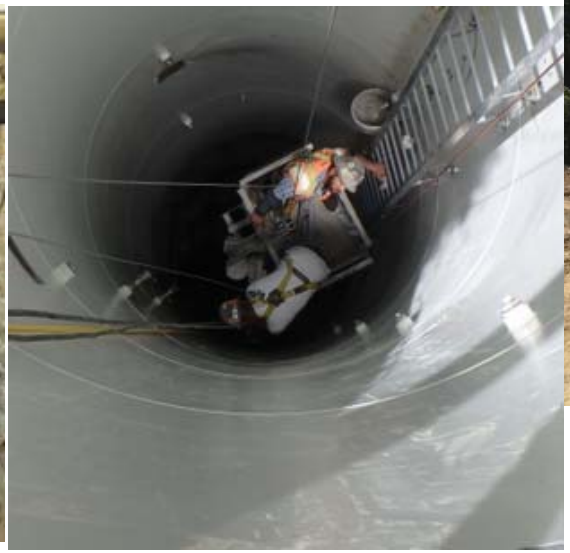


Pardee Dam face inspection

Pardee gallery stairs

Dam Safety Studies and Improvements

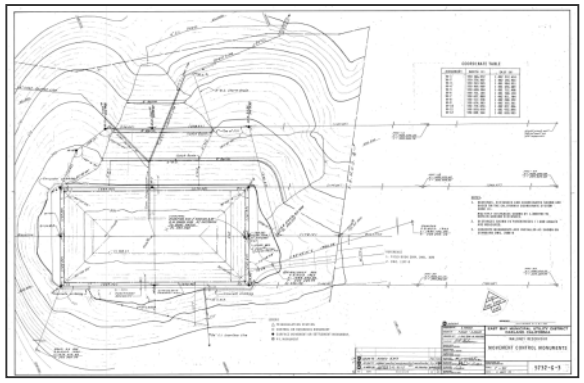
- Chabot Dam Seismic Upgrade:
  - *Cement Deep Soil Mixing, buttress, drainage trench, tower upgrades.*
  - *Construction scheduled to be completed September 2017*



Dam Safety Studies and Improvements

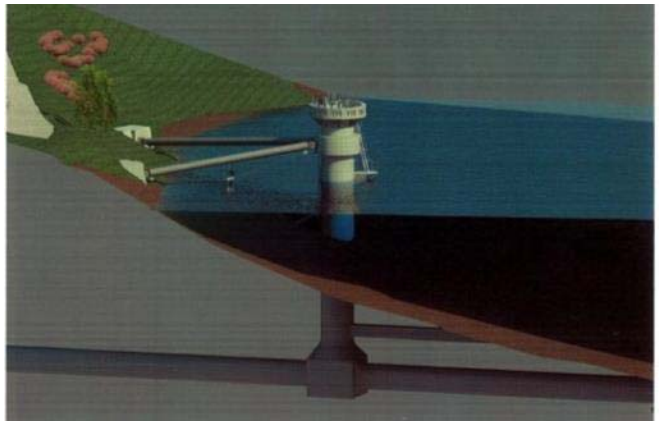
- Camanche and Pardee Survey Improvements – *survey-grade GPS system installed at Pardee and Camanche. Completed in 2016*

- Dam Seismic Stability Studies– *Maloney Reservoir*



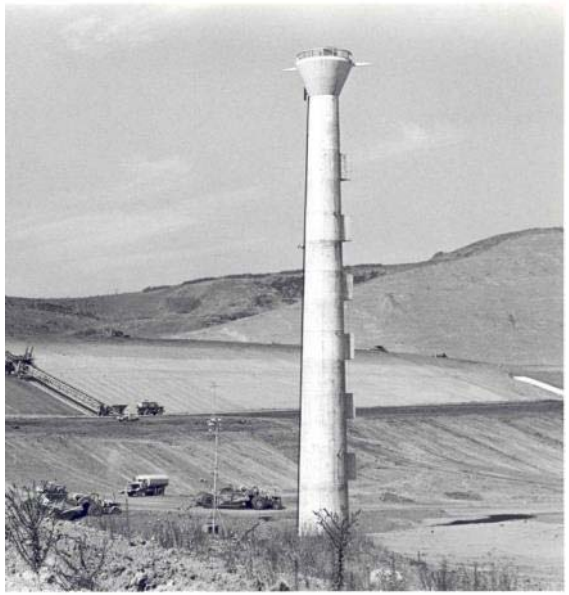
Dam Safety Studies and Improvements –Cont'd

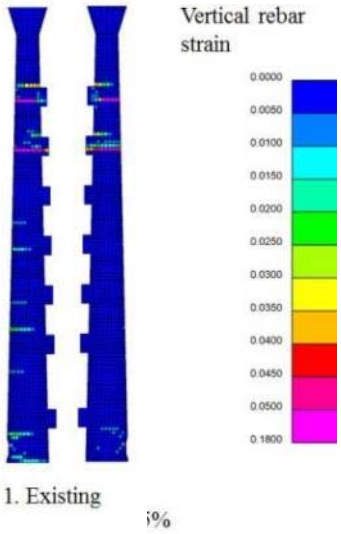
- Upper San Leandro Reservoir Tower Retrofit – *Tower braces to provide seismic stability, mechanical, electrical and controls improvements. Construction to be completed by March 2018*

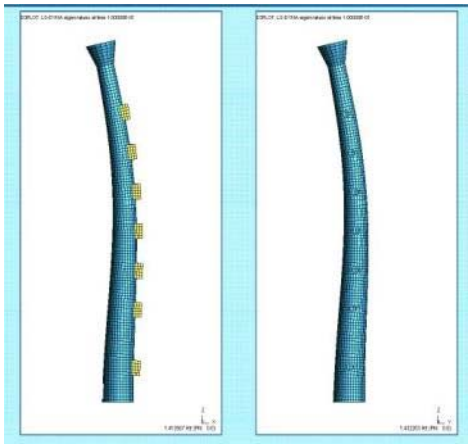


Dam Safety Studies and Improvements –Cont'd

- Briones Tower Modifications– *Seismic evaluation and design upgrades. Currently at 50% design. Construction scheduled for FY 18/19.*







Dam Safety Studies and Improvements –Cont'd

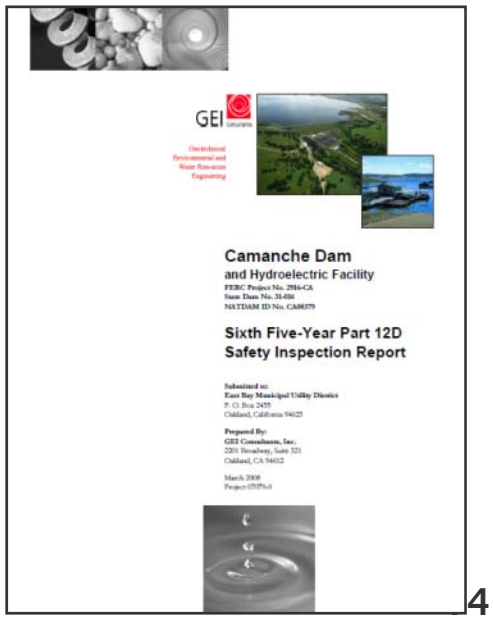
- Dam Spillway Assessments – *Comprehensive evaluation of Briones, Chabot, San Pablo and USL spillways, including review of design documents, field testing, analyses and report of findings and recommendations for any repairs and retrofit alternatives.*

- Lafayette Tower Modifications – *Tower performs spillway function and requires seismic upgrades. Staff is incorporating DSOD and City of Lafayette concerns and developing scope and schedule for the project*

Dam Safety Studies and Improvements –Cont'd

- Open Cut Reservoir Underdrain Instrumentation– *Automated underdrain flow monitoring has been installed at open cut reservoirs. Completing final sites - Maloney and Dunsmuir*

- FERC Part 12 D Safety Inspections and Evaluation– *Required every 5 years. Includes review of structural and operational conditions of dams. A Focus area will be spillway safety. Reports due to FERC by March 2018. Work to begin August 2017.*



Summary and Next Steps

- Dams safe for continued operations
- Various new regulatory mandates will be incorporated into the program, funds reallocated if needed:
  - Spillway studies
  - Acceleration of Lafayette Tower work
  - Updated plans and inundation maps
- Next report to the Board – January 2018
- Audit of program due March 2021

EAST BAY MUNICIPAL UTILITY DISTRICT

Reestablishing Native Landscape at Estates Reservoir

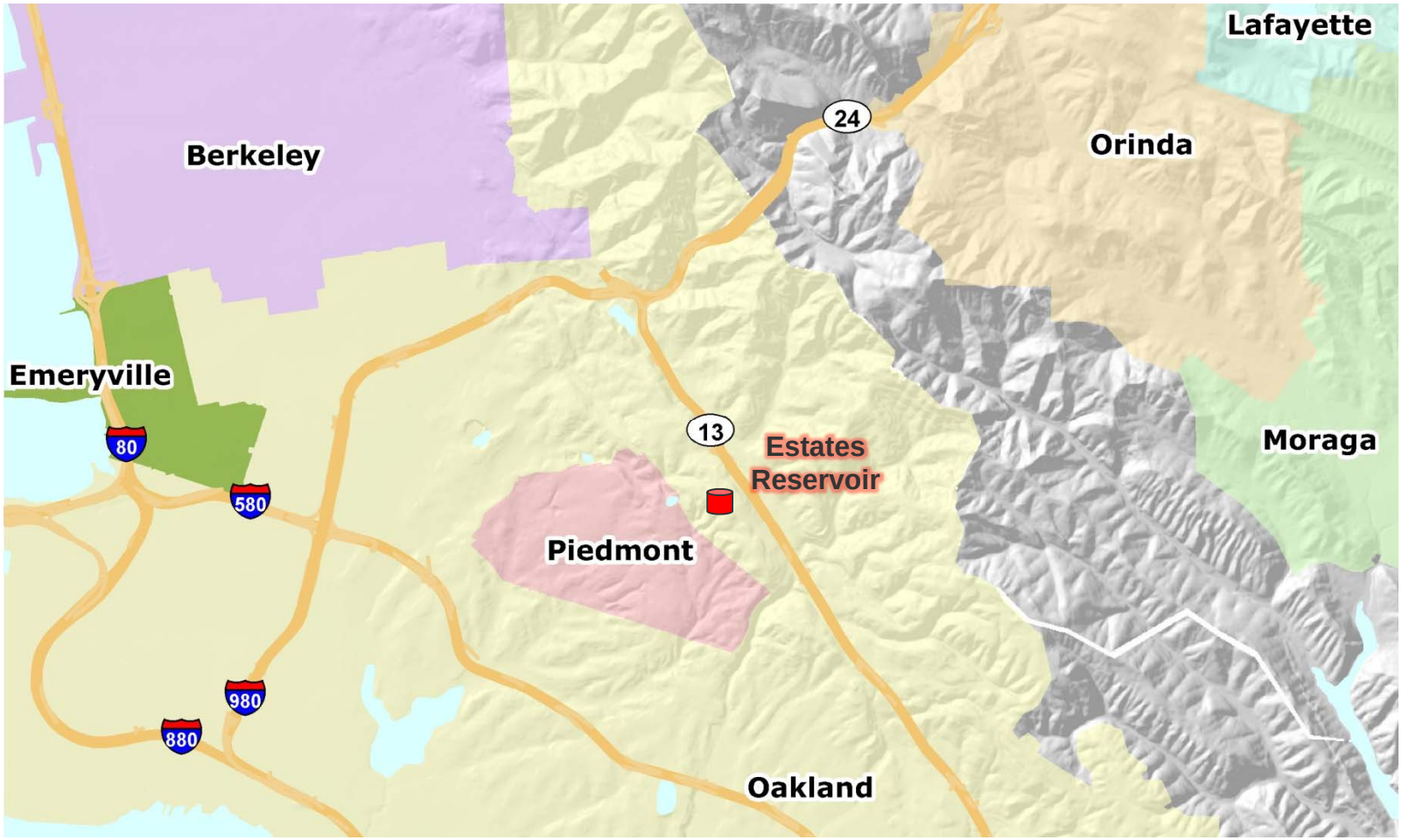
Planning Committee

August 8, 2017

Agenda

- Project Background
- Current Challenge
- Purpose for Project
- Scope, Schedule, & Costs

Project Background



Location: Ward 3, Oakland, CA

Project Background

Estates before Replacement

EIR in 2009

Estates During Construction

Estates Post Construction

Open Cut:

- Built in 1903
- Roof in 1968
- 17.6 MG

Reconstructed:

- 2012 to 2014
- Partially Buried
- Concrete
- 2 - 3.5 MG

Completed:

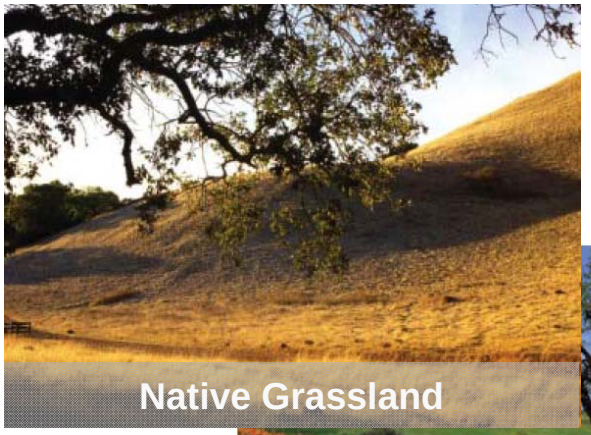
- June 2014
- 3 Acres of Landscaping

Project Background

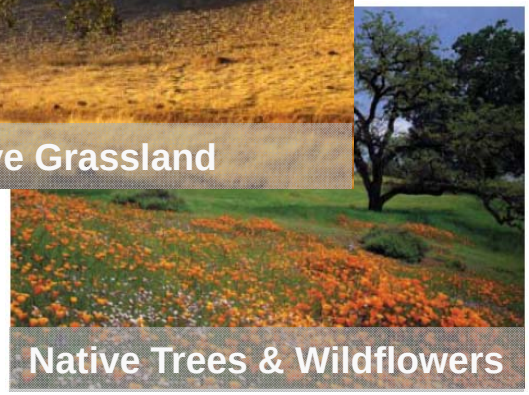
- California Environmental Quality Act – Key Driver – Visual Impacts

Vocal Community loved fountains

Five Public Meetings



Native Grassland



Native Trees & Wildflowers

RESOLUTION NO. 33753-10

CERTIFYING THE FINAL ENVIRONMENTAL IMPACT REPORT FOR THE ESTATES RESERVOIR REPLACEMENT PROJECT, MAKING FINDINGS, APPROVING THE MITIGATION MONITORING AND REPORTING PROGRAM, AND APPROVING AND AUTHORIZING THE PROJECT.

RESOLUTION NO. 33960-13

CERTIFYING THE FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT FOR THE ESTATES RESERVOIR REPLACEMENT PROJECT, MAKING FINDINGS, APPROVING MODIFICATIONS TO THE MITIGATION MONITORING AND REPORTING PROGRAM, AND APPROVING MODIFICATIONS TO THE PROJECT

Current Challenge

Record Drought: 2014 to 2016

No supplemental irrigation available

Native grasses outcompeted by WEEDS

Some Native trees struggled

Current Challenge

Non-Native Crab Grass

Mulch & Weeds

Exposed Soil & Weeds

Some Damaged Trees

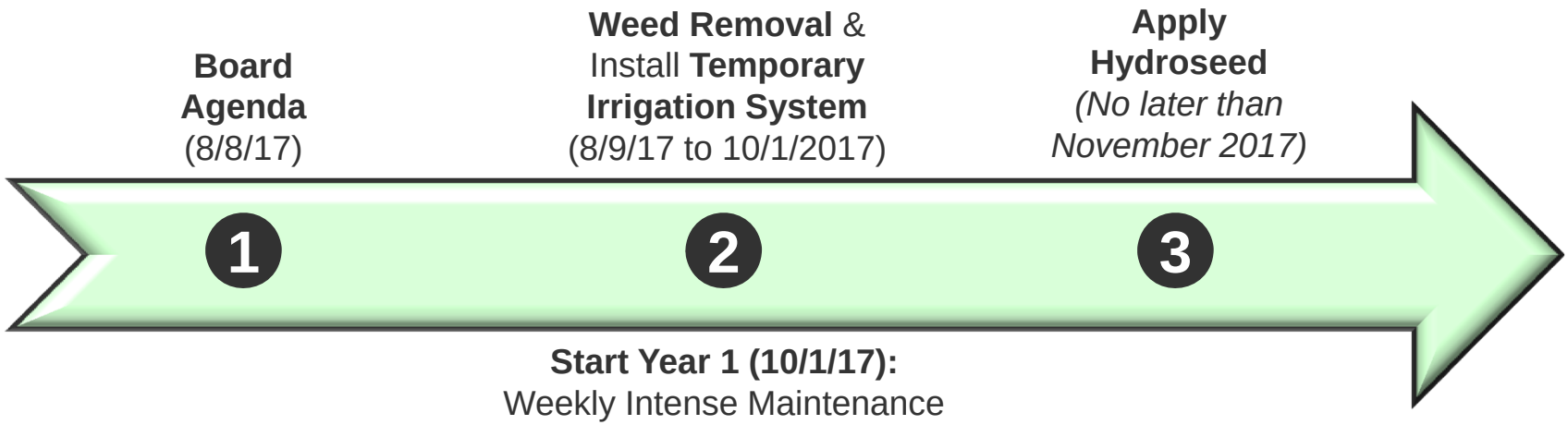
Purpose of the Project

Montclair Pumping Plant located onsite

Highest Priority Pumping Plant Replacement
(supports over 6,700 customers)

- Many mechanical & electrical failures
- Electrical system is 40 years old
  (no replacement parts available)

Scope, Schedule, Costs



Cost Range: $410,206 to $455,406

Optional Year 2: Monthly Maintenance
Optional Year 3: Quarterly Maintenance

Contract Management: District Forces

EAST BAY MUNICIPAL UTILITY DISTRICT

Reestablishing Native Landscape at Estates Reservoir

Questions?

EAST BAY MUNICIPAL UTILITY DISTRICT

Main Wastewater Treatment Plant Odor Control Program Update

Planning Committee

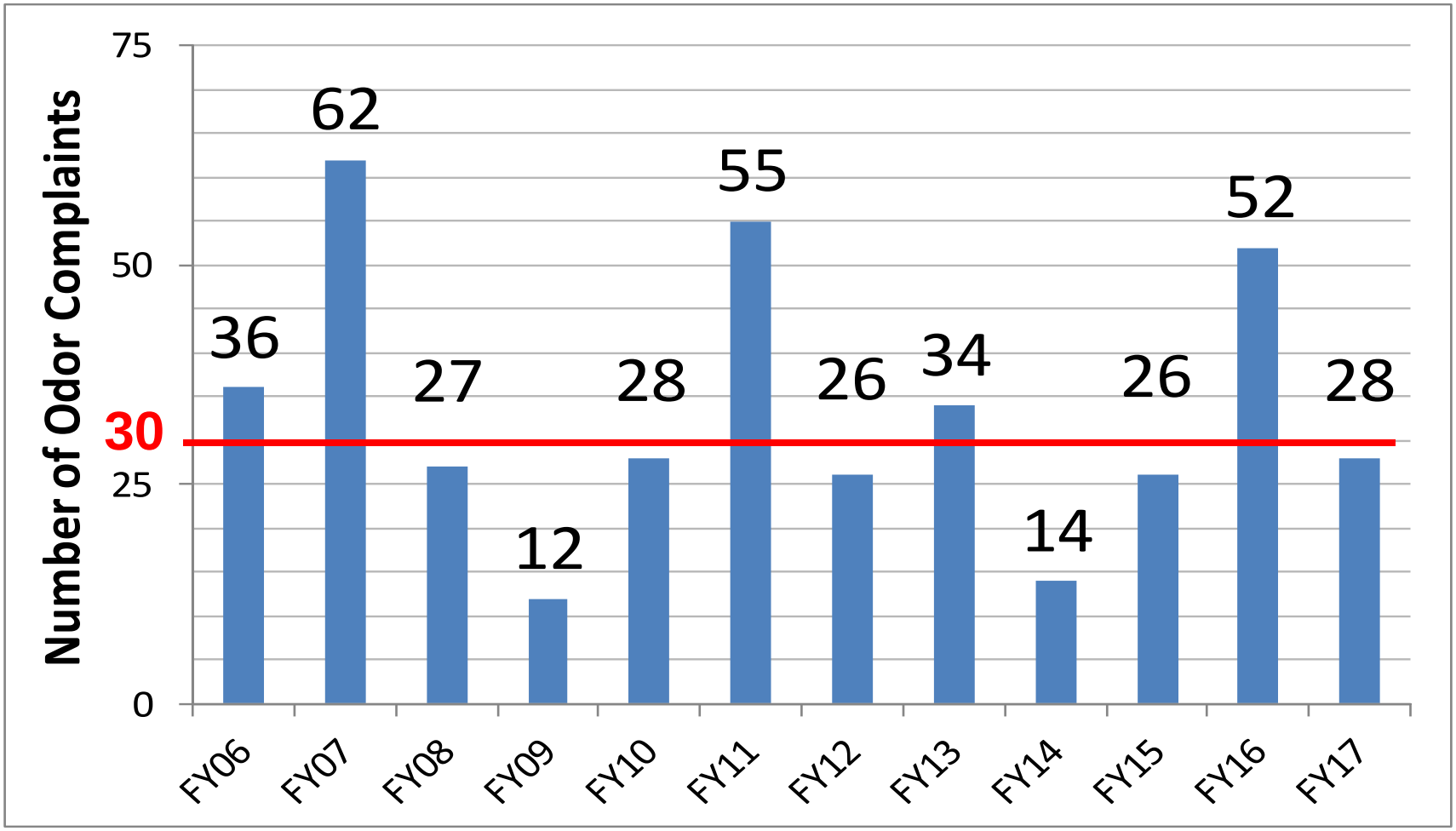
August 8, 2017

Agenda

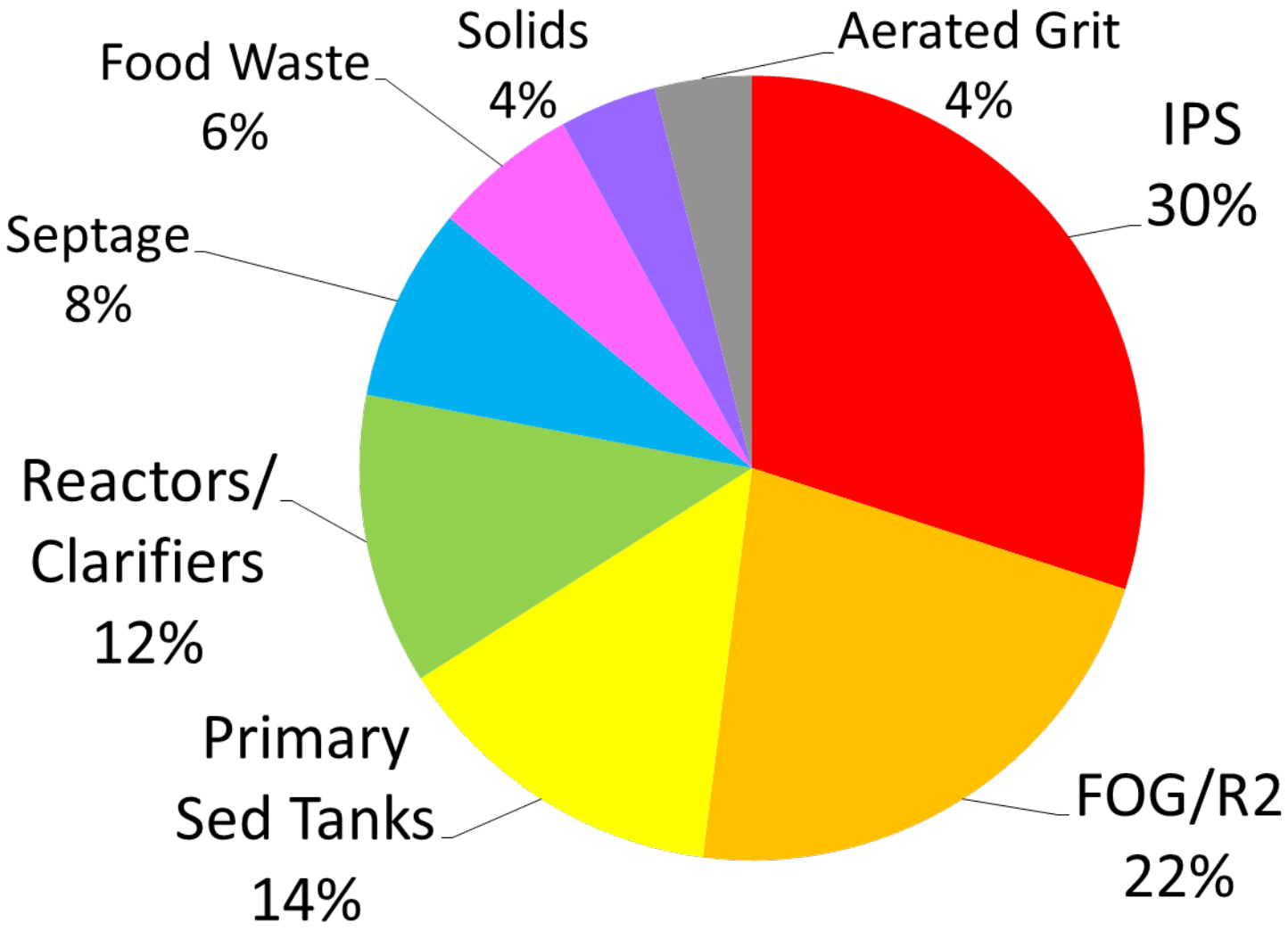
- Key Performance Indicator (KPI)
- Capital Investments
- Improvements to Operational Practices
- Odor Management Team Accomplishments
- Next Steps

Achieved KPI in FY17

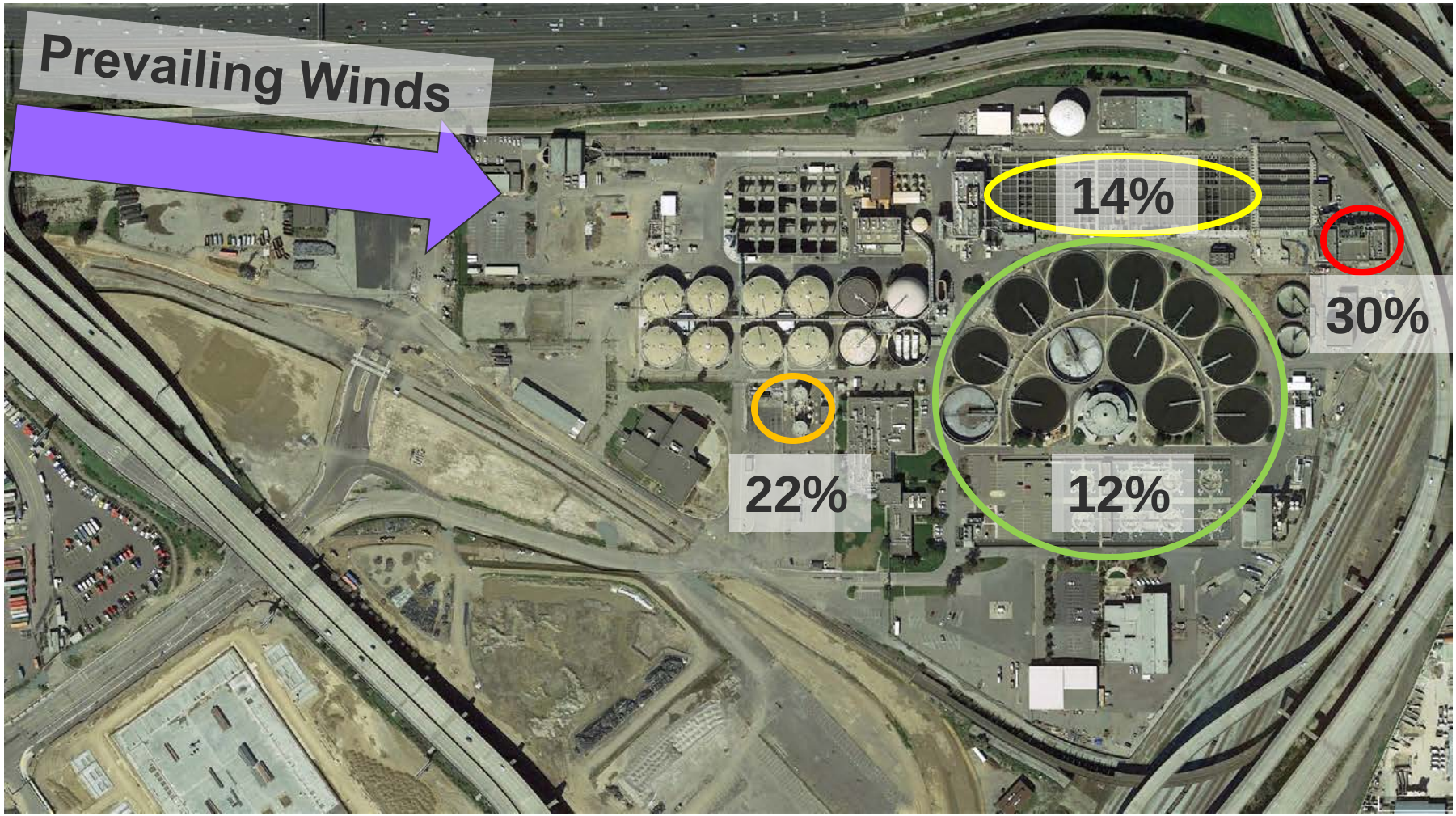
- ≤ 30 odor complaints near the MWWTP



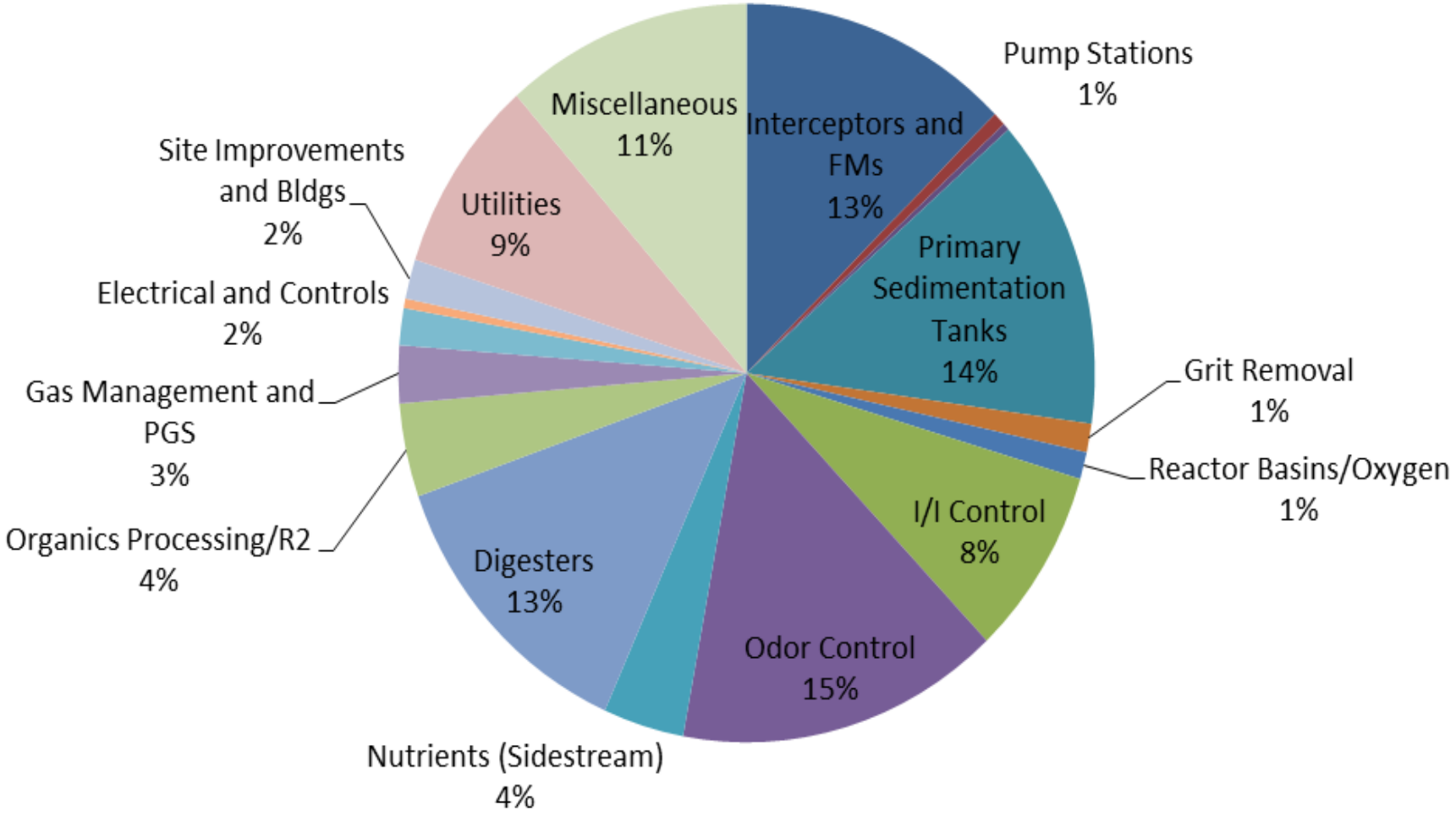
FY17 Odor Sources



FY17 Odor Sources



FY18 – FY 22 Wastewater CIP



$23 million budgeted for Odor Control

Influent Pump Station (IPS) Odor Control Improvement Project

- Replaces 15-year-old single stage carbon scrubbers

- $9.7 M project
- New two-stage system
  - Biotrickling filters followed by carbon polishing

R2 Facility Odor Control Upgrade

- $2.8 M project
- Upgrades existing dual-stage biofilter/carbon system with larger biofilter

Primary Sedimentation Tank Odor Control Phase 1

- $9.0 M project
- Includes covering the effluent weirs with low profile, flat covers and providing collection and treatment of the foul air

Operational Enhancement
Oxygen Reactor Deck

- Modified method for reducing odors from out of service reactors
- Continually flush high volume of plant water through basins
- Moved location of exhaust fan

Operational Enhancement
Secondary Clarifiers

- Continuing to assess opportunities to reduce odor generation while removing a secondary clarifier from service

In-Service Clarifier

Flushing Solids from a Clarifier Being Taken Out of Service

Odor Management Program Team

- One of three District-wide Values Teams
  - Meets regularly with focus on public outreach, Department culture change, O&M Practices, and capital upgrades
- Improved process in FY17 for investigating odor reports
- Participated in April 19, 2017 West Oakland Liaison Group Meeting
  - Provided refrigerator magnets with odor hotline

Next Steps

- Continue vigilance to minimize odor generation in all activities (O&M, Construction, etc.)
- Continue open dialogue with our neighbors in West Oakland
- Implement Capital Improvement Program
- Identify opportunities to optimize current practices to reduce odor potential

EAST BAY MUNICIPAL UTILITY DISTRICT

Pollution Prevention Program Update

Planning Committee

August 8, 2017

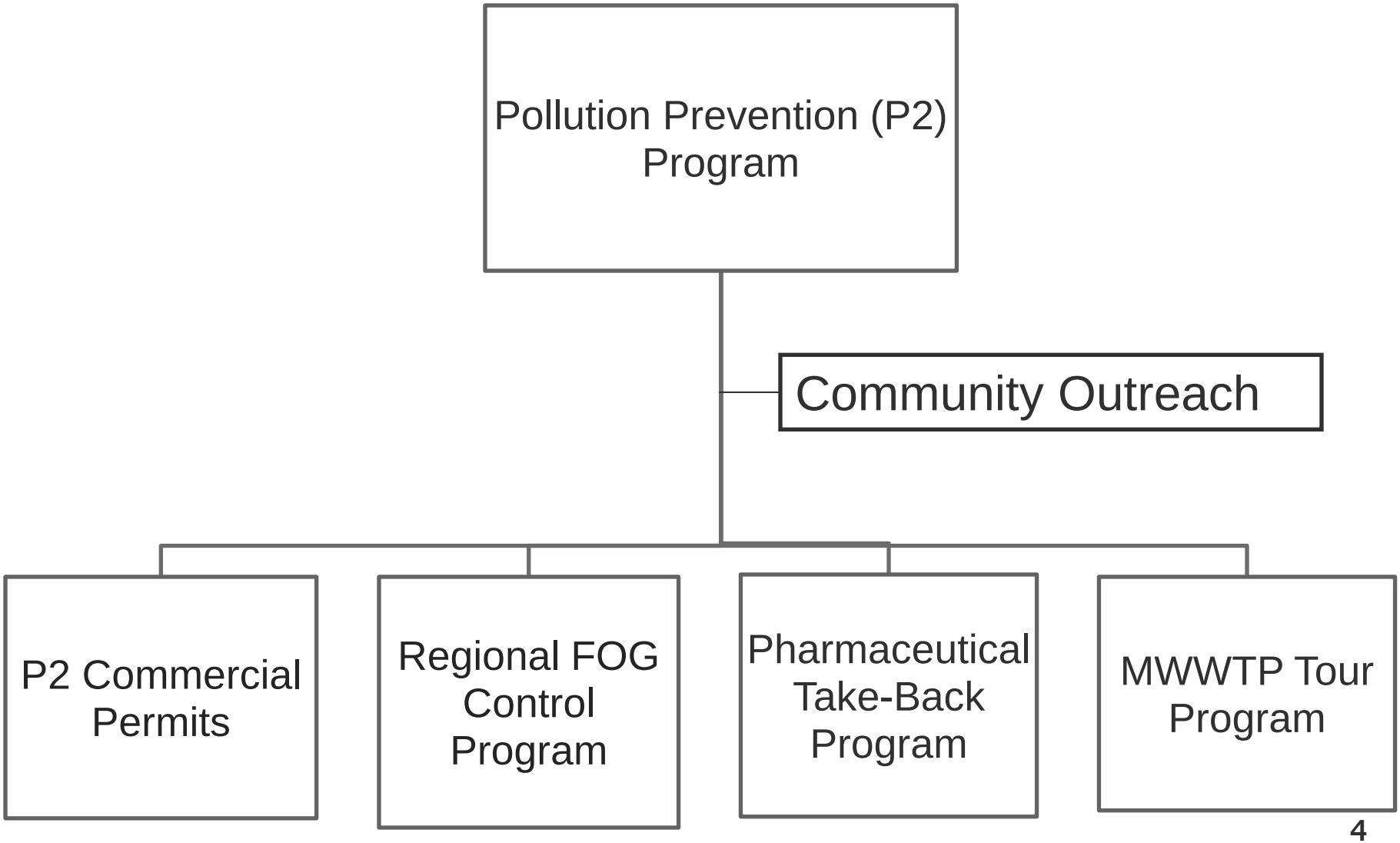
Pollution Prevention (P2) Program Overview

- Program Goals
- Program Components
- FY18 Initiatives

Program Goals

- Protection of WWTP staff and infrastructure
- Stewardship of San Francisco Bay
- Public education and awareness
- Meeting and exceeding regulatory requirements
- Opportunity for partnerships

Program Components



Program Components
Commercial Permits

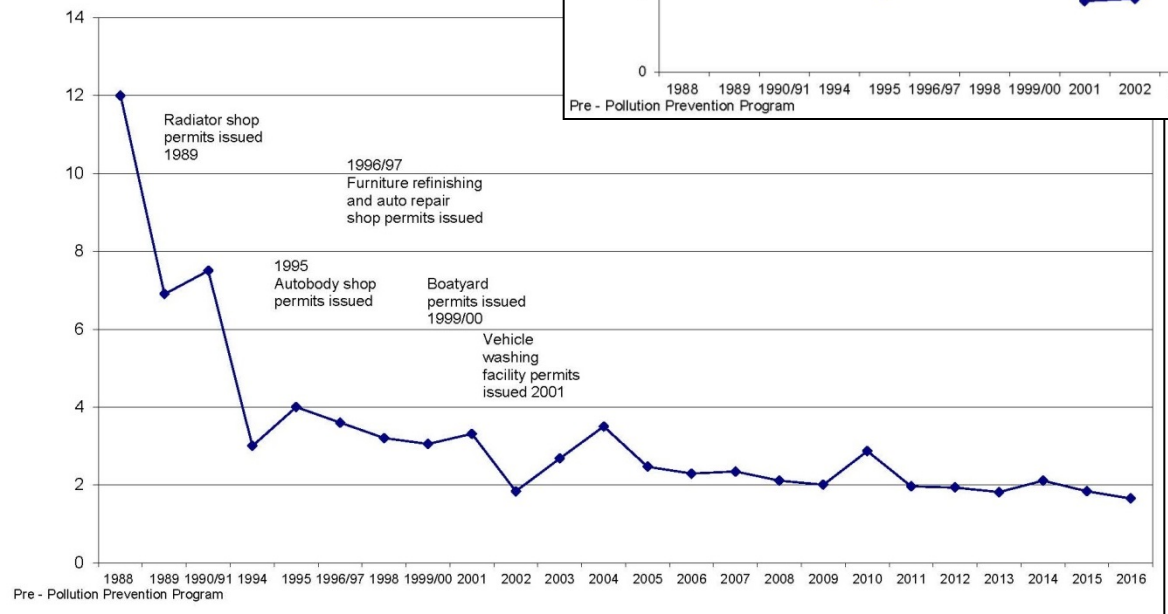
- Categories of P2 Permits (1,156 total)
  - Dry cleaning (56)
  - Dental offices (288)
  - Hospitals (7)
  - Auto repair (592)
  - Boatyards (5)
  - Printing services (74)
  - Photo processors (42)
  - Vehicle wash (76)
  - Furniture stripping (11)
  - Radiator repair (5)

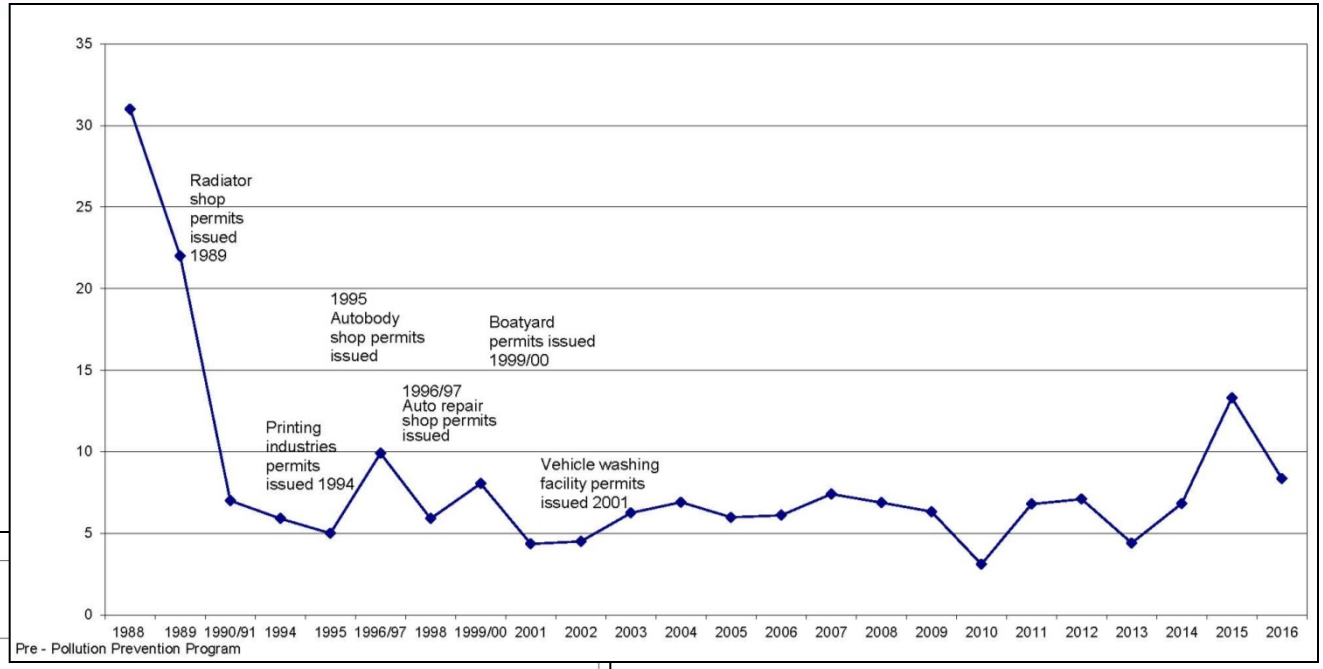
Program Components
Commercial Permits (cont.)

- Permits focus on Best Management Practices, which are periodically reviewed
- New categories under consideration:
  - Microbreweries
  - Long-term Care Facilities
  - Cannabis growing and processing

Program Components
Commercial Permit Effectiveness

Influent Metals
(Lead in kg/day)





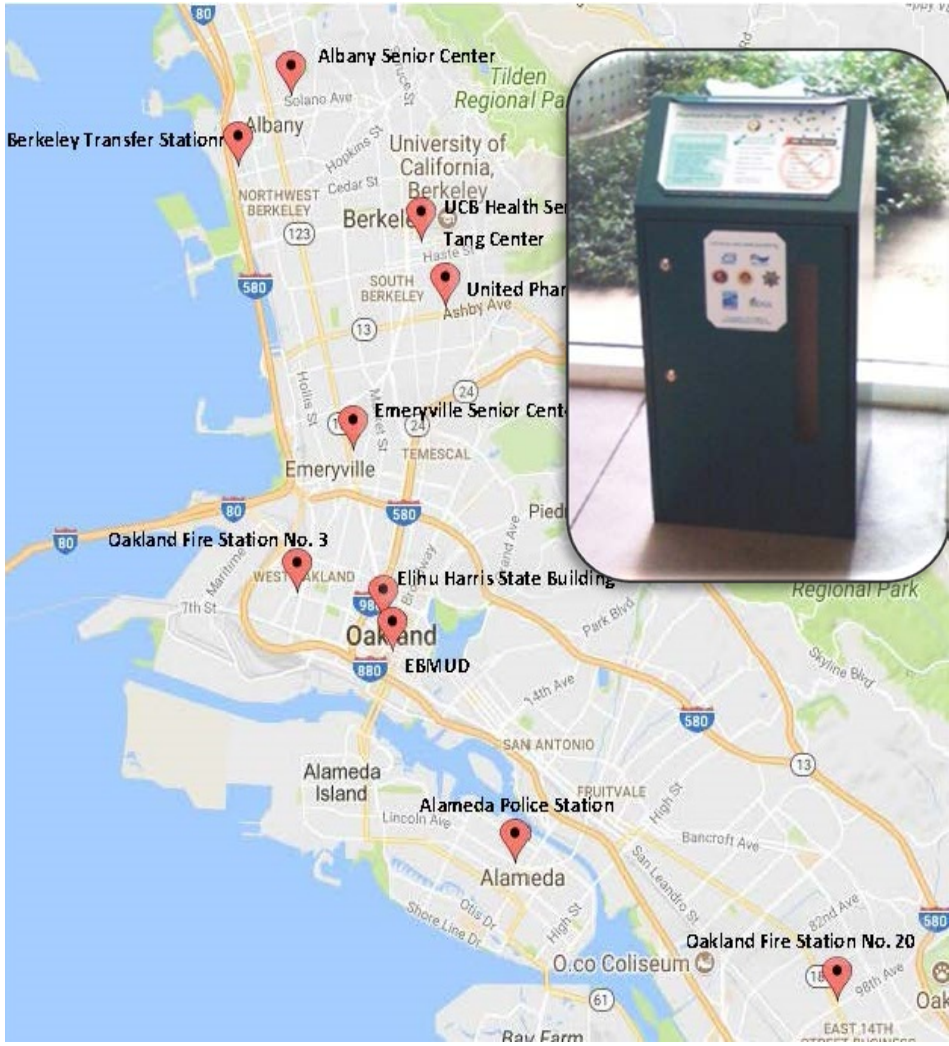
Influent Organics
(Toluene in kg/day)

Program Components
Regional FOG Control Program

- Work collaboratively with satellite agencies to reduce blockages & sanitary sewer overflows (SSOs)
  - Includes inspection of grease control devices at restaurants in hot spot areas
- Cooking oil drop-off sites (MWWTP, Stege, Whole Foods)
- Residential FOG Holiday Campaign (in Partnership with Baykeeper)

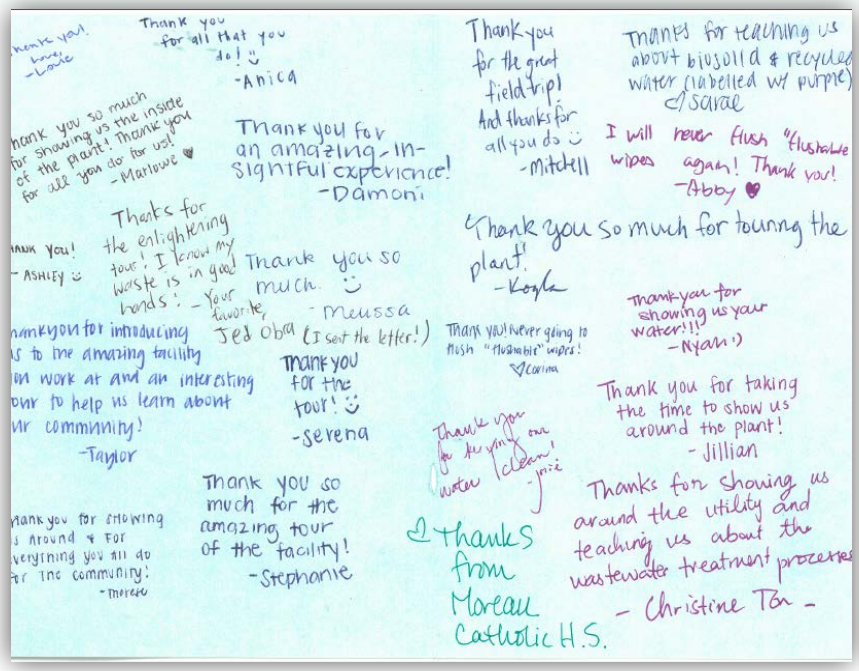
Program Components
Pharmaceutical Take-Back

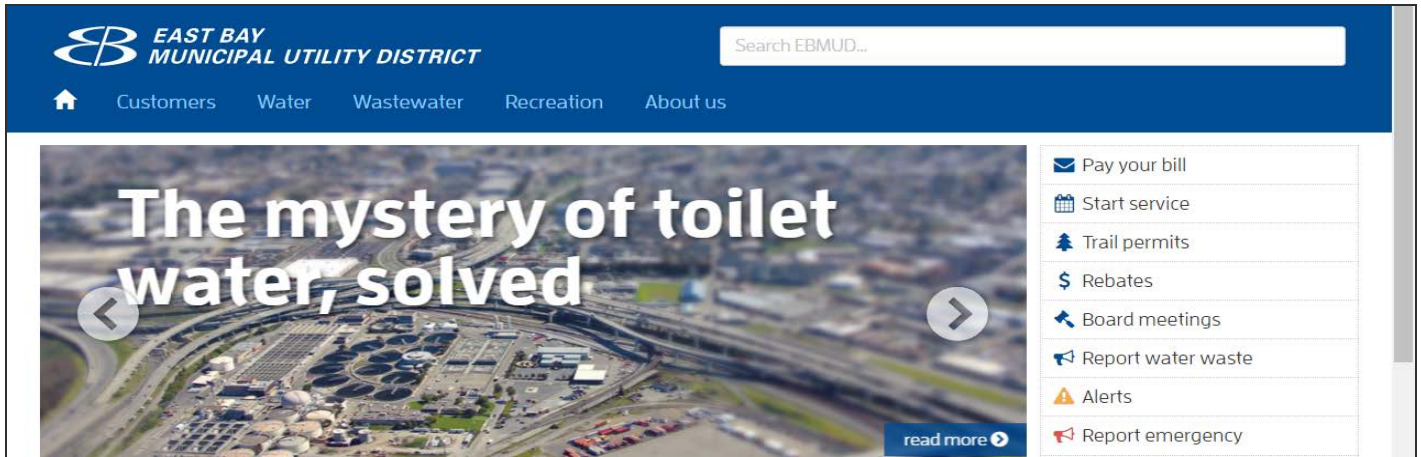
- Ten District collection sites
  - Newest at UC Berkeley
- Over 12 tons collected
  - 2016 total = 3,965 lbs
- Supported precedent-setting Alameda County Ordinance- July 24, 2012
  - County now has 44 sites including the District's



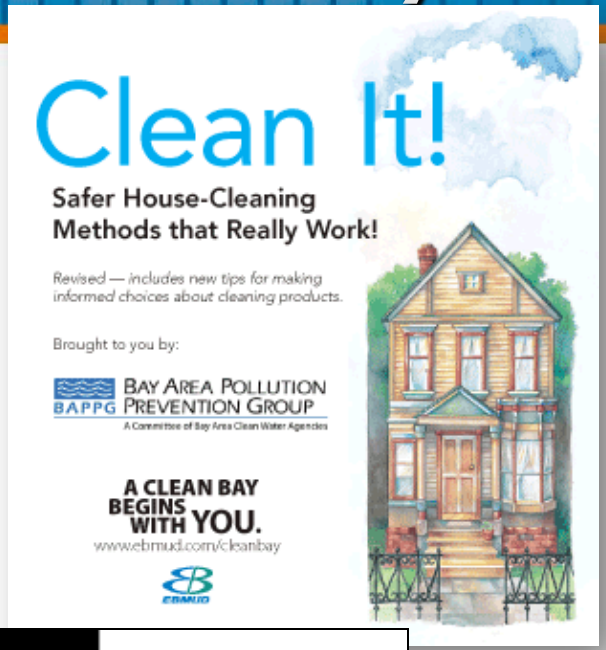
Program Components
Main WWTP Tour Program

- Launched in 2016
- Monthly tours for schools and members of the public
- Includes pollution prevention education
- About 1,000 participants and 52 tours to date



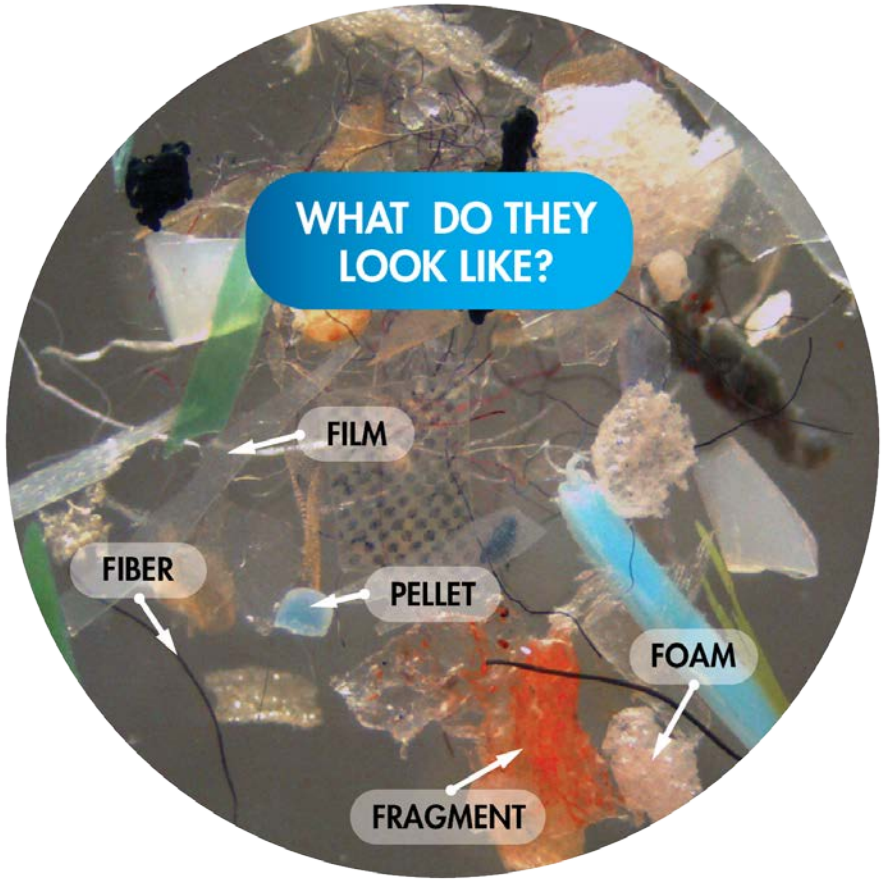


Program Components
Community Outreach



FY18 Initiatives
Microplastics Partnership

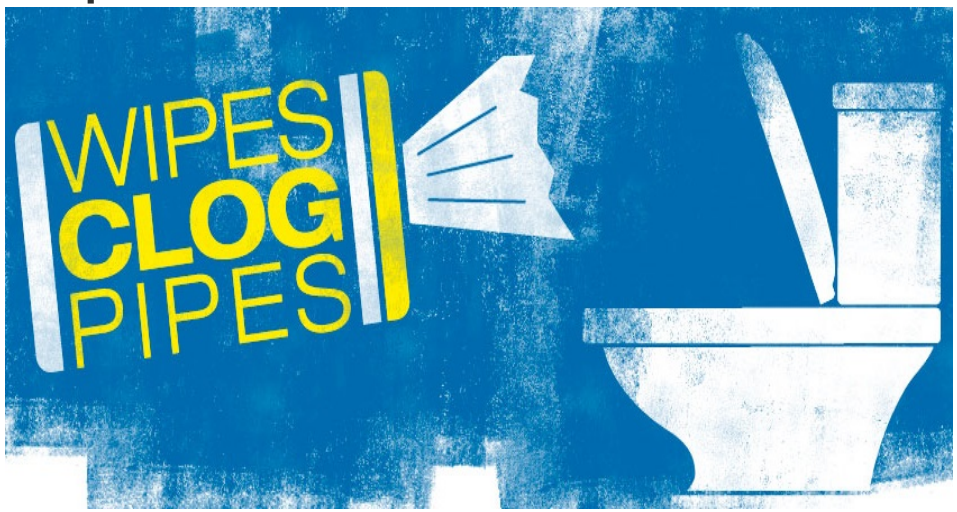
- Partnering with San Francisco Estuary Institute and 5 Gyres on research to characterize microplastics in SF Bay and develop policy recommendations



FY18 Initiatives
Fall Outreach Campaign

- East Bay Express Insert:
  Watersheds to the Bay
  - Highlighting District stewardship and opportunities for the public to get involved
  - Partnership with NGOs and public agencies
  - Aligned with California Coastal Cleanup Day and Creek to Bay Day – September 16

- AC Transit bus shelters and inserts
- Clear Channel billboards



EAST BAY MUNICIPAL UTILITY DISTRICT

Trihalomethane Update

Planning Committee

August 8, 2017

Overview

- Regulations
- Background
- THM control actions
- Long-term plans

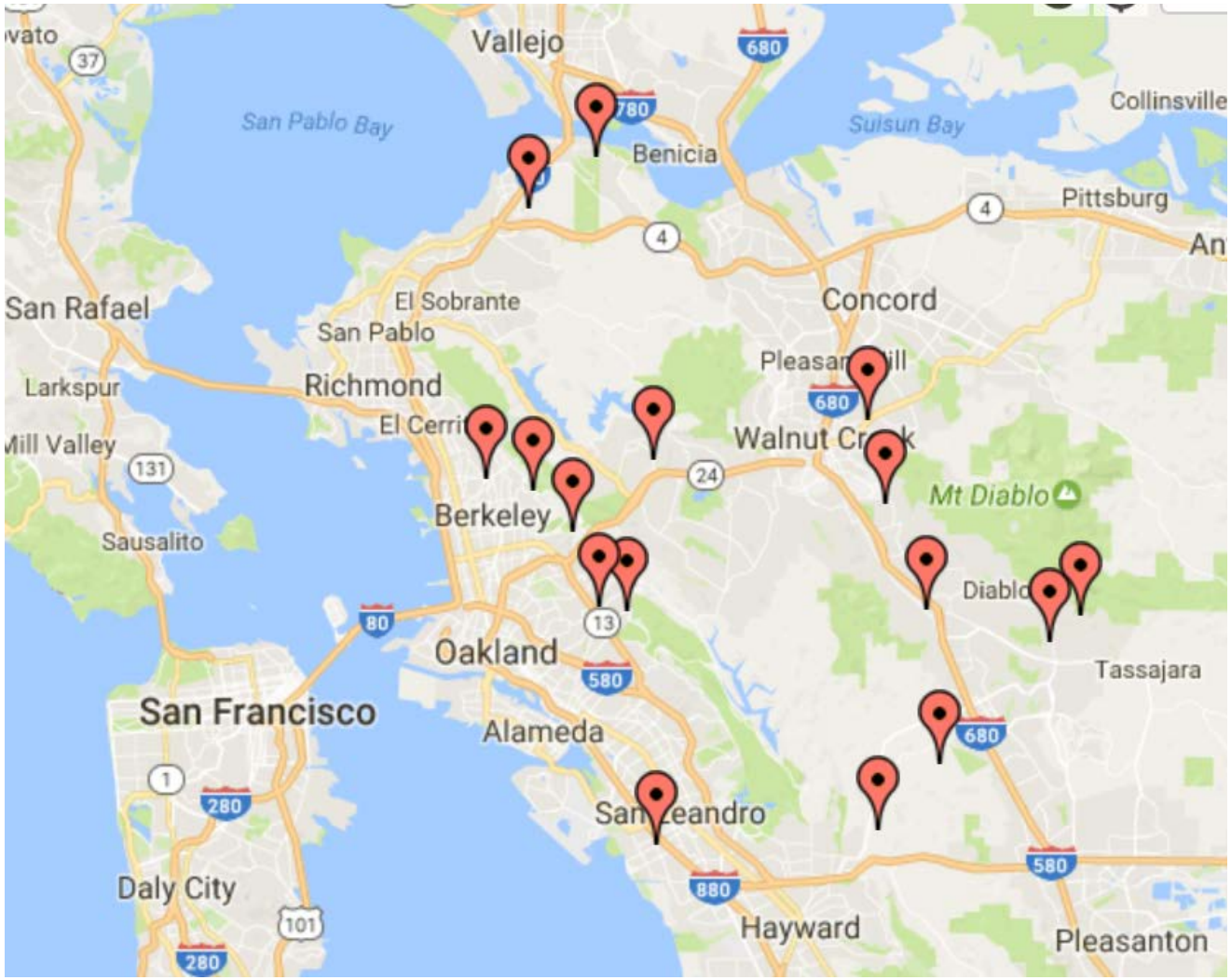
THM Regulations

- Form when free chlorine is in contact with natural organic matter
- All chlorinated water contains THMs
- Levels are regulated by EPA and CA Division of Drinking Water
- MCL = 80 ppb
- Regulatory standard applies to **each** of 16 specific sites in the distribution system
- MCL developed to limit long-term exposure to THMs while balancing the need to disinfect water to protect the public from disease-causing pathogens

Background

- At all times, water meets all state and federal requirements
- THMs concentrations are lower than MCL but are higher than typical for the past few years
- Primary cause is prolonged drought followed by significant rain/runoff and high temperature
- In April 2017, two of the 16 sites had individual values above 80 ppb

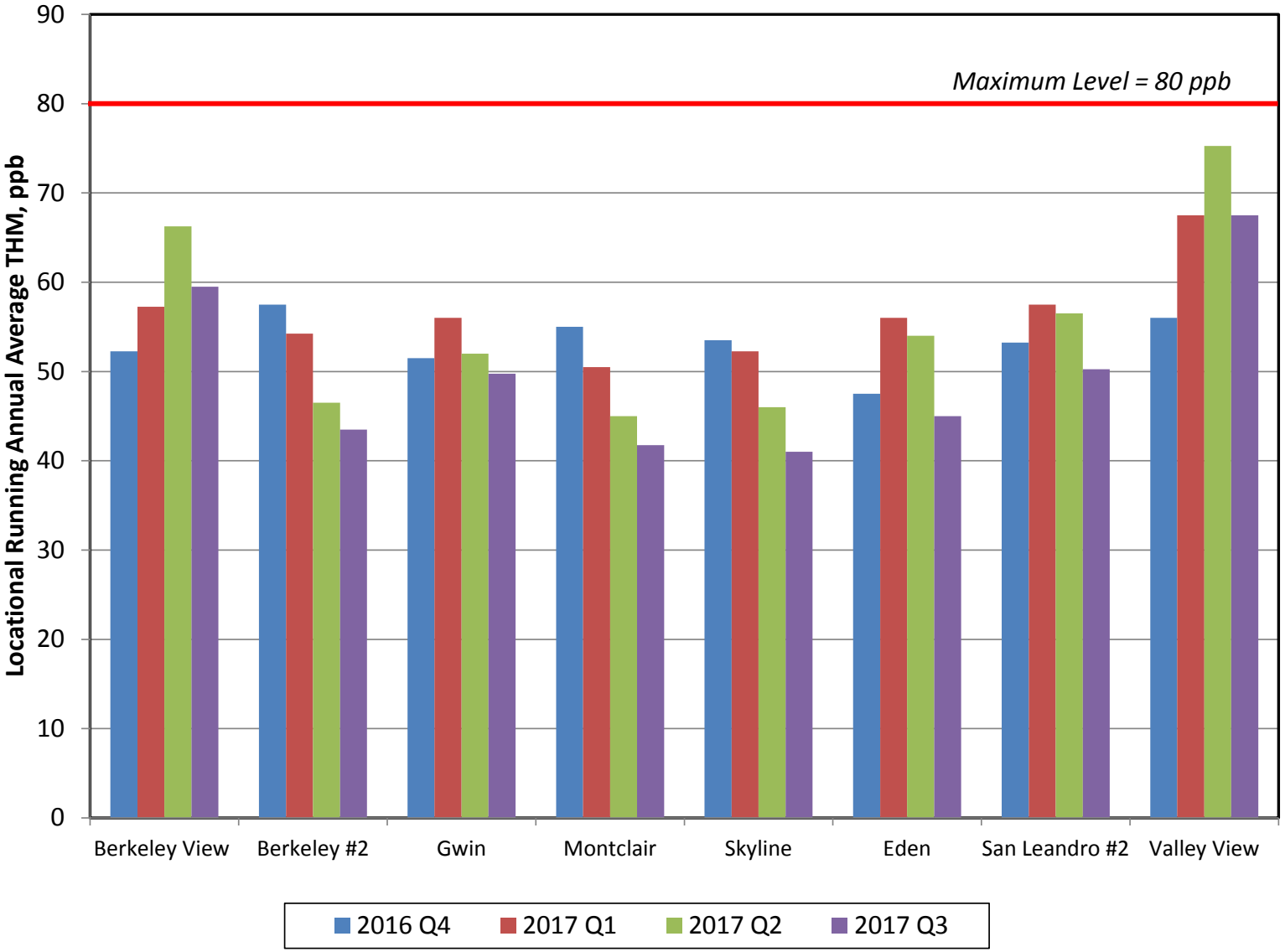
Quarterly Samples from 16 Sites



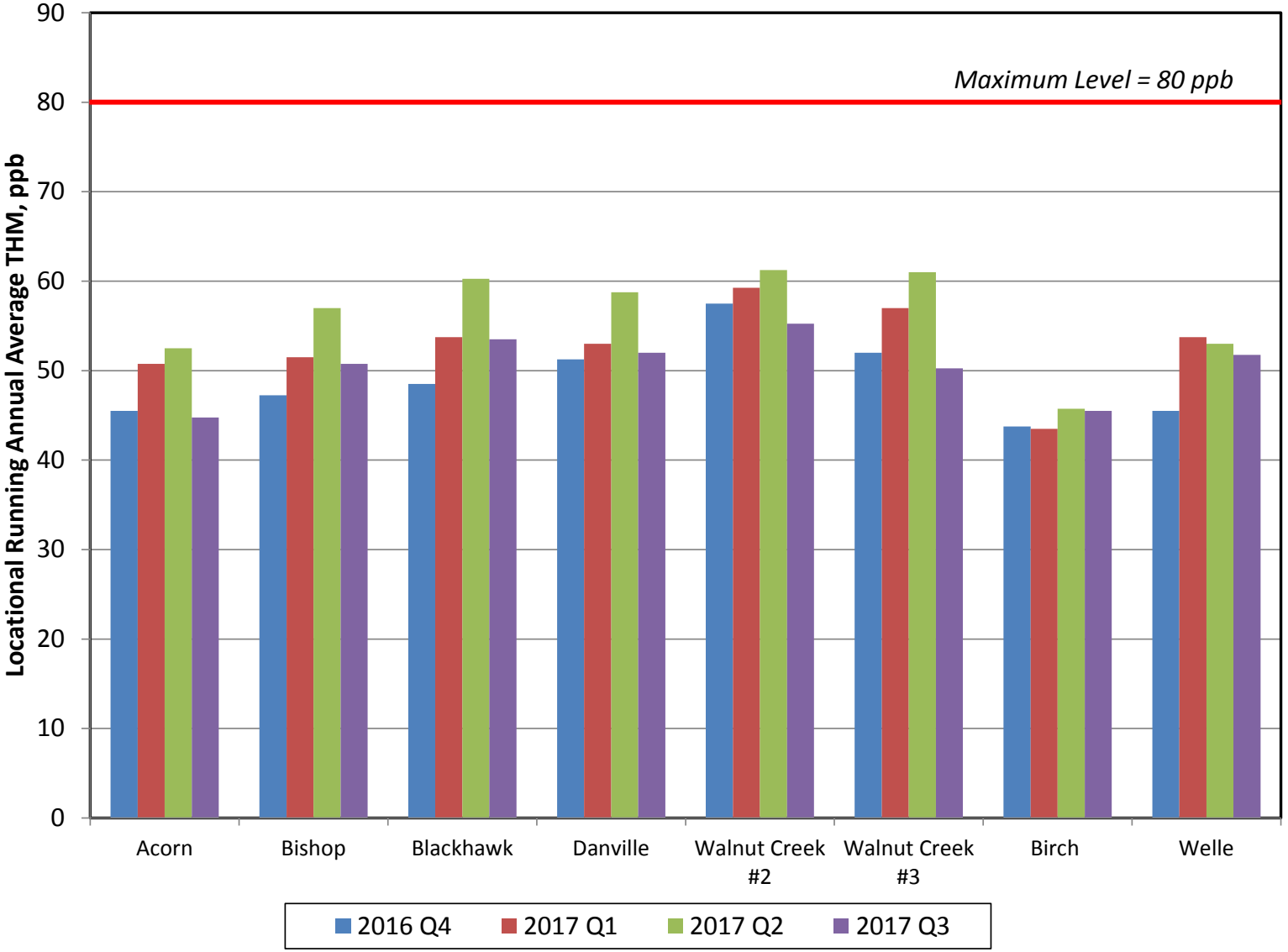
Recent THM Results

- In July 2017
  - All 16 sites less than 80 ppb, ranging from 30 ppb to 57 ppb
  - Maximum LRAA reduced from 75 ppb to 68 ppb
- Significant efforts have been undertaken to reduce THM levels
- Reduction due to
  - Short-term operational changes
  - Lafayette clearwell THM pilot reduction system
  - Reduced raw water organic carbon

THM Results


Maximum Level = 80 ppb
Locational Running Annual Average THM, ppb
90
80
70
60
50
40
30
20
10
0
Berkeley View
Berkeley #2
Gwin
Montclair
Skyline
Eden
San Leandro #2
Valley View
2016 Q4
2017 Q1
2017 Q2
2017 Q3

THM Results


Locational Running Annual Average THM, ppb
90
80
70
60
50
40
30
20
10
0
Maximum Level = 80 ppb
Acorn
Bishop
Blackhawk
Danville
Walnut Creek #2
Walnut Creek #3
Birch
Welle
2016 Q4
2017 Q1
2017 Q2
2017 Q3

THM Control Actions

- Short-term actions
  - Formed in-house THM response team
  - Implemented additional monitoring
  - Lowered pH in Mokelumne Aqueducts
  - Reduced chlorine doses at plants
  - Installed THM removal pilot system in Lafayette clearwell
  - Removed one Lafayette aqueduct from service to reduce travel time
  - Evaluated and adjusted chemical addition and mixing

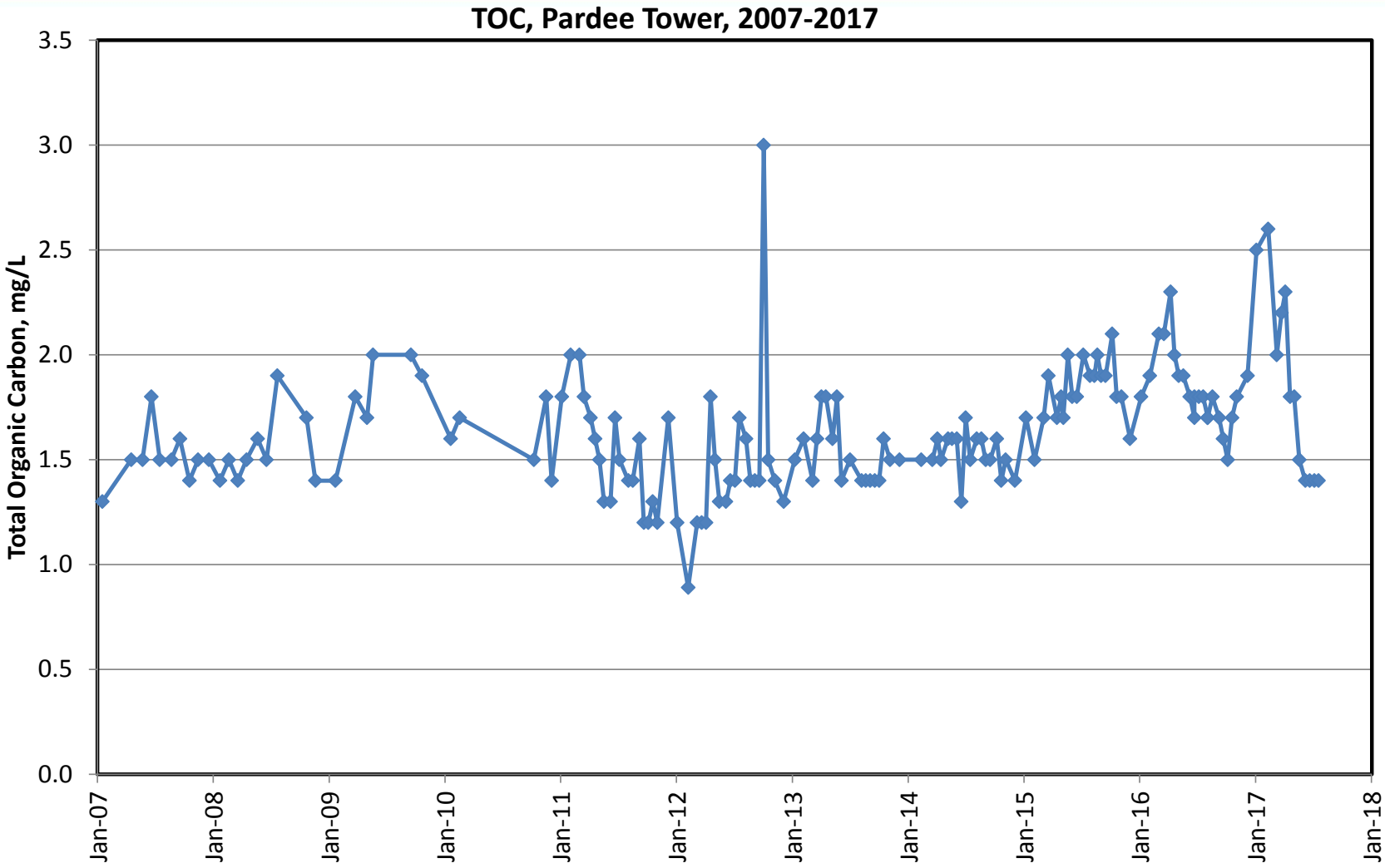
THM Control Actions

- Short-term actions
  - Investigating increases in distribution system
    - Bench-scale studies to better understand chemistry and kinetics
    - Outside panel of experts to assist in review
    - Mixing in key reservoirs
    - Localized flushing in distribution system

THM Pilot Removal System in Lafayette Clearwell

- Take water out of clearwell
- Pump back through 12 diffusers on roof
- Effective but energy intensive

Pardee Reservoir Total Organic Carbon



Samples through 7/18/2017

Long-Term Plans

- Capital projects
  - pH adjustment at inline plants
  - UV disinfection at Orinda WTP
  - Alternative coagulants to remove precursor material
    - Pilot test first to determine impacts
    - May affect solids production
  - Improvements to chemical injection/mixing
  - Improvements to San Pablo Reservoir
  - Pre-treatment (clarification) for organic carbon removal at inline plants

Questions