CALIFORNIA WATER EFFICIENCY PARTNERSHIP

Alliance for Water Efficiency

Advancing Water Resource Management Through Team Collaboration

Zoom Webinar

August 23, 2022

Special thanks to . . .

CALIFORNIA
ENERGY
COMMISSION

UCDAVIS
Center for Water-Energy Efficiency

Special thanks to . . .

CalWEP's Mission

Maximize urban water efficiency and conservation by:

- *Advancing research, training, and public education*
- *Building collaborative approaches and partnerships*
- *Supporting and integrating innovative technologies and practices*
- *Encouraging effective public policies*

Contact us: hello@calwep.org

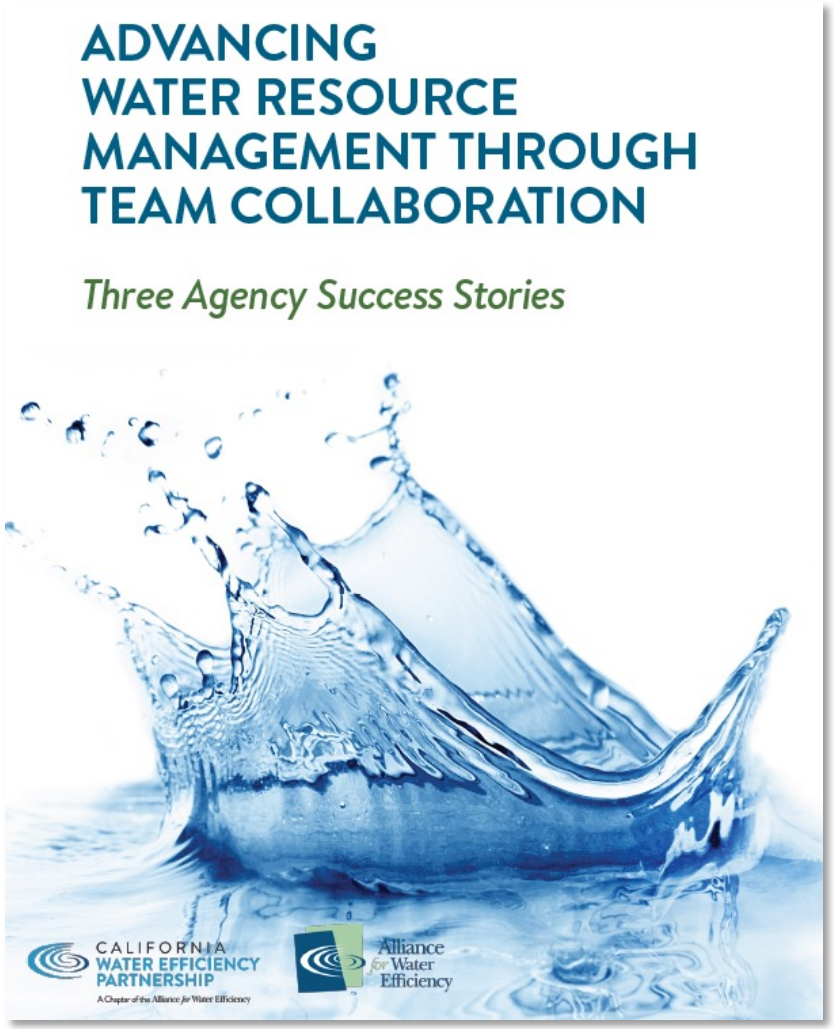
AWE: A Voice for Water Efficiency

- Our mission is to promote an efficient and sustainable water future
- 530+ member organizations in 200 watersheds delivering water to over 50 million water users
- A unique network of water efficiency experts and practitioners
- A forum for collaboration around policy, information sharing, education, and stakeholder engagement
- AWE provides training, research, and other resources for water efficiency professionals
- Visit allianceforwaterefficiency.org/membership to learn more

Alliance for Water Efficiency

Advancing Water Resource Management Through Team Collaboration – Report Summary

- A strong, positive, collaborative work culture can lead to conservation and operations developing an effective relationship
- Making sure that the priorities, agendas, and performance indicators of both departments are as aligned as possible can potentially help eliminate competing goals
- Need to build trust and relationships to overcome the barriers
- Working together on water loss is not only beneficial for the whole utility, but strengthens interdepartmental teamwork



EAST BAY MUNICIPAL UTILITY DISTRICT

Water Conservation and Operations Collaboration "Pushing the Envelope"

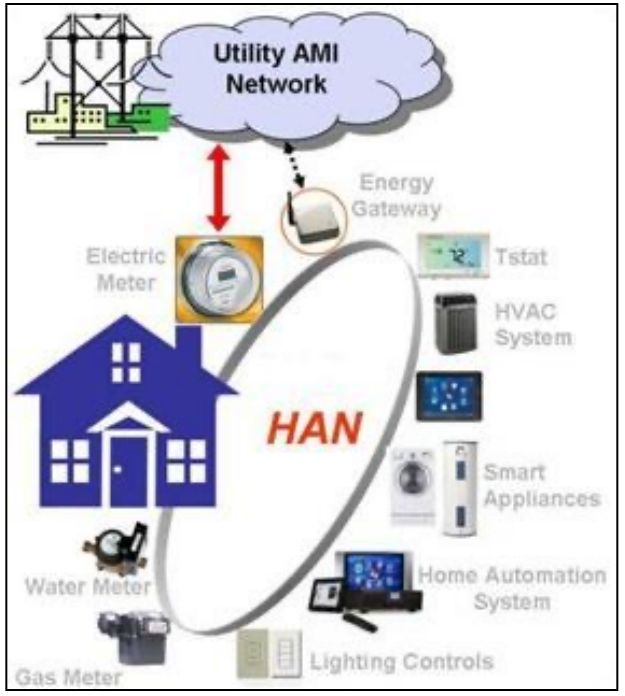
Charles Bohlig, Water Conservation Supervisor

David Wallenstein, P.E., Associate Engineer

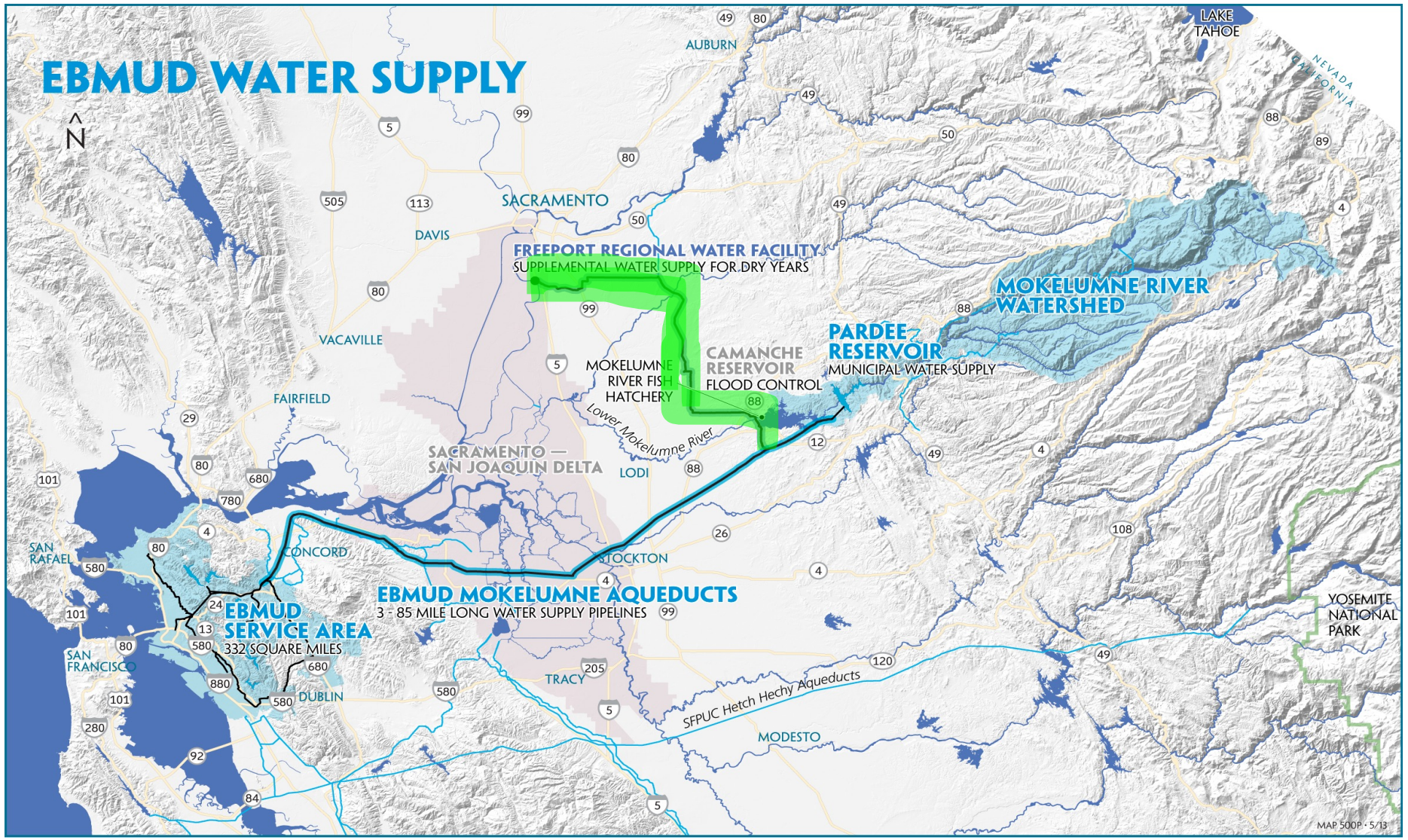
EBMUD Water Conservation

What are we going to talk about?

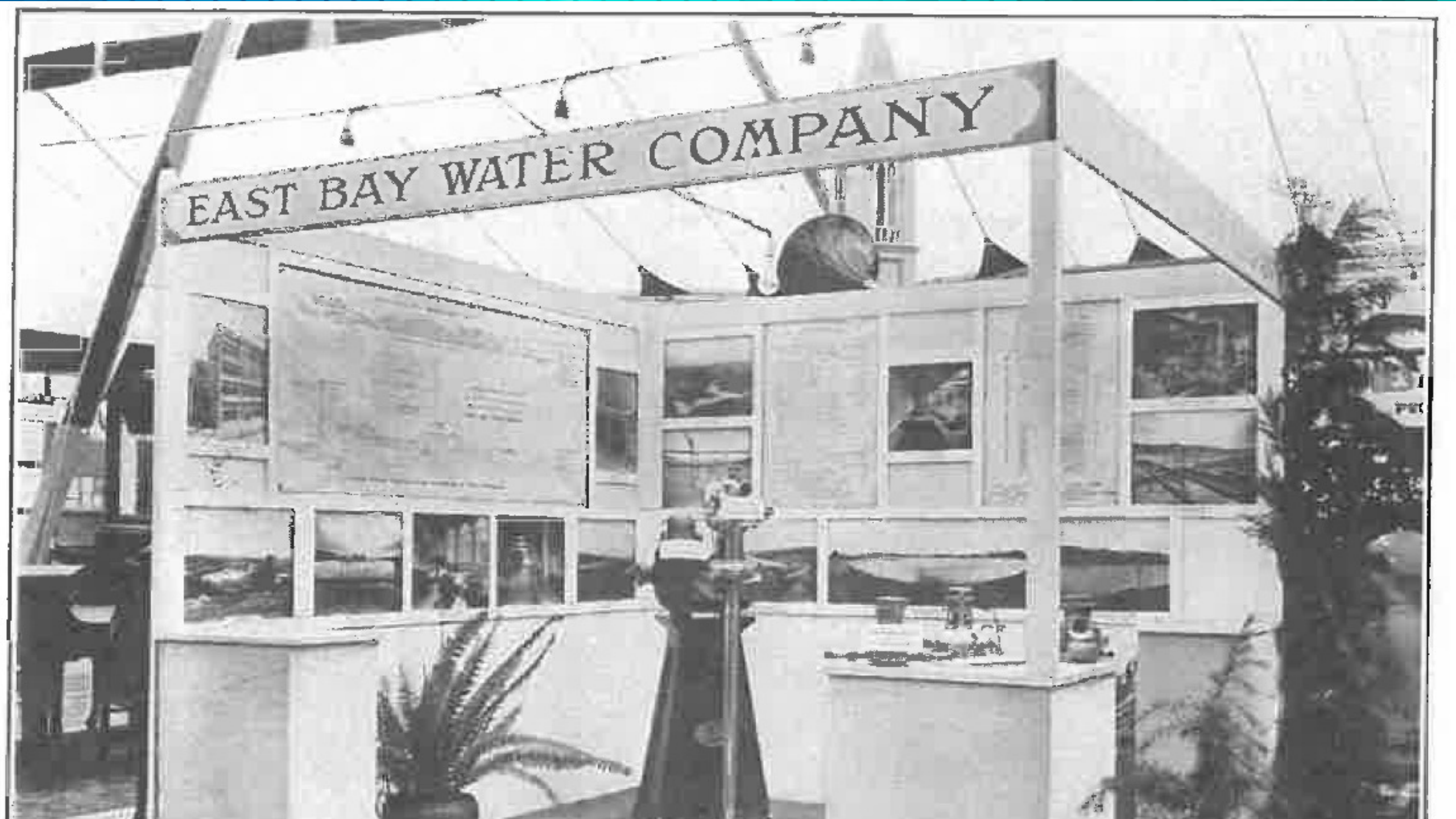
- Overview of EBMUD
- Water Conservation Strategic Plan
- Collaboration with other departments
- Berkeley Leak Detection Project
- AMI Business Case



From the Snowflake to the Bay

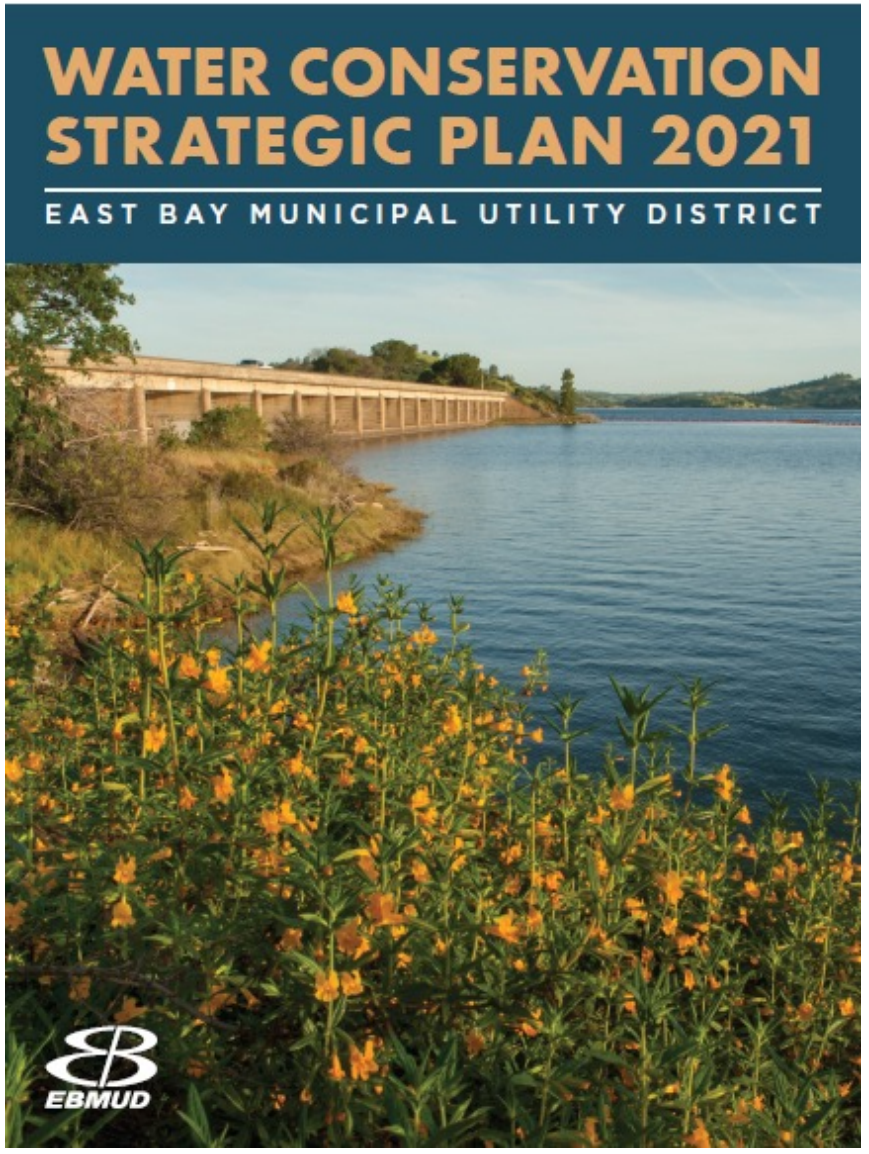



Sobrante WTP
Richmond
San Pablo Reservoir
Briones Reservoir
San Pablo WTP
Orinda WTP
Lafayette WTP
Walnut Creek WTP
Berkeley
Lafayette Reservoir
Oakland
Upper San Leandro Reservoir
Upper San Leandro WTP
Chabot Reservoir
BAYSIDE 1MGD GROUNDWATER FACILITY
MOKELUMNE AQUEDUCTS
Contra Costa Canal
Martinez
Concord
Antioch
Pittsburg
San Joaquin River
Bixler
Holt
Los Vaqueros Pipeline
Old River Pipeline
Transfer Pipeline
Clifton
Contra Costa County
San Rafael
San Francisco
Hayward
Alameda County
Pleasanton
Tracy
South Bay Aqueduct
San Antonio Res.
Hetch Hetchy Aqueduct
Mokelumne Watershed
Water Service Area
Sacramento San Joaquin Delta
EBMUD Reservoir
Watershed Reservoir Operated by Others
RA Recreation Area
PH Power House
6 Treatment plants
129 Reservoirs
136 Pumping plants
4,200 mi. pipelines
400,000 Meters


EAST BAY WATER COMPANY

Forward Planning

- These are 10-year plans
- Transitioning to *Informational Services*
- Long term goal of 70 MGD of savings by 2050



Approach

Water Management

- Web services
- Calculators
- How to videos
- Water surveys
- Water budgets
- Leak notification

Education & Outreach

- Public education
- Marketing
- Community events
- Conservation workshops
- Training & certifications

Conservation Incentives

- Plumbing Fixtures
- Appliances
- Landscaping
- Irrigation Systems
- Process Equipment
- Customized

Regulation & Legislation

- Water-Efficiency Requirements
- Individual & Landscape Metering
- CalGreen
- Model Landscape Ordinance

Supply Side Conservation

- Leak Detection
- Pipeline Replacement
- Water Facility Audits
- Pressure anagement
- Distribution Monitoring

Research & Development

- Water-Use Information
- Meter Technology
- Product testing and labeling (i.e. WaterSense, Energy Star)
- Plan check review

Challenges when launching co-organizational projects

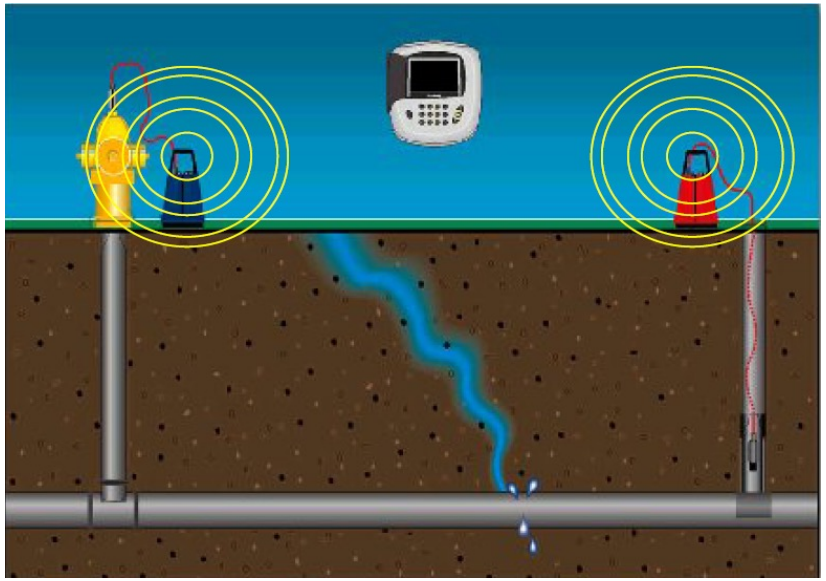
- We don't have the staff?
- We don't have the budget?
- We don't know how to do this?
- We are already too busy
- We don't have people that can manage a project like this.
- We don't see the point in doing this?
- How are we going to get rid of this at the end of the project?

Converts…

- We get a grant. Nothing like free money.
- We beg, borrow, and bargain more money from other departments, usually Operations
- We manage the project planning, reporting and data collection. The not so fun parts.
- We start the project as a pilot and show early benefits
- In the end: Operations likes the technology so much; they take it over for themselves and Conservation no longer needs to be involved.

EAST BAY MUNICIPAL UTILITY DISTRICT

Berkeley Pipeline Leak Detection Final Report

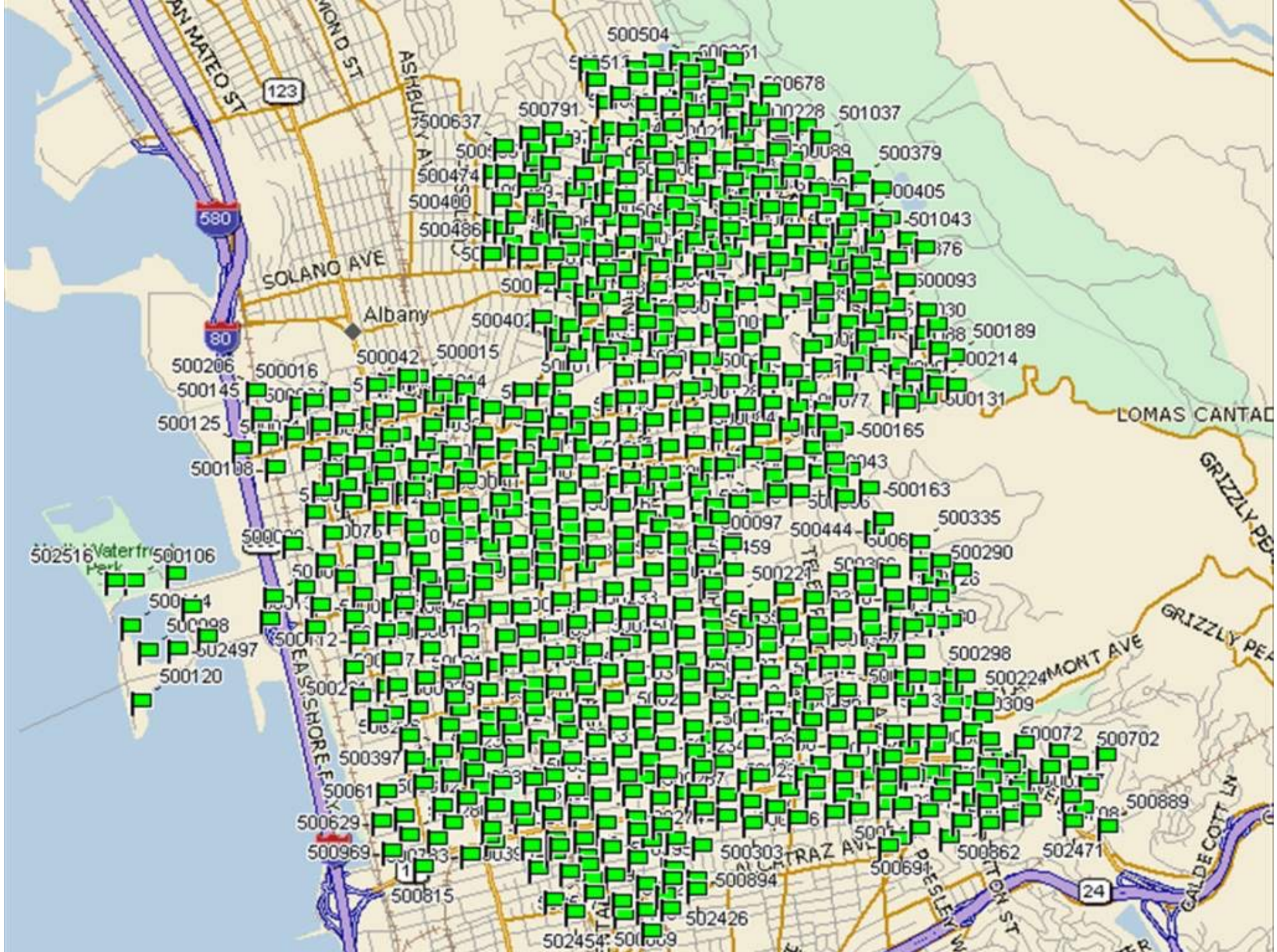


June 21, 2011


EBMUD

What is the Berkeley Project?

- Joint effort between EBMUD's Maintenance and Water Conservation departments.
- Partially funded by a $300k grant and Operations budget.
- Semi-permanent deployment of leak detection loggers as opposed to lift and shift methods of the past.
- 850 loggers on 250 miles of pipe in Berkeley.
- Water Conservation flagged potential leaks
- Operations verified the leaks and repaired them.
- Conservation managed the project and documented results


SAN MATEO ST
123
ASHBURY AV
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SOLANO AVE
Albany
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LOMAS CANTAD
GRIZZLY PEA
GRIZZLY PEA
MONT AVE
EASTSHORE FWY
TRAZ AVE
PRESLEY WAY
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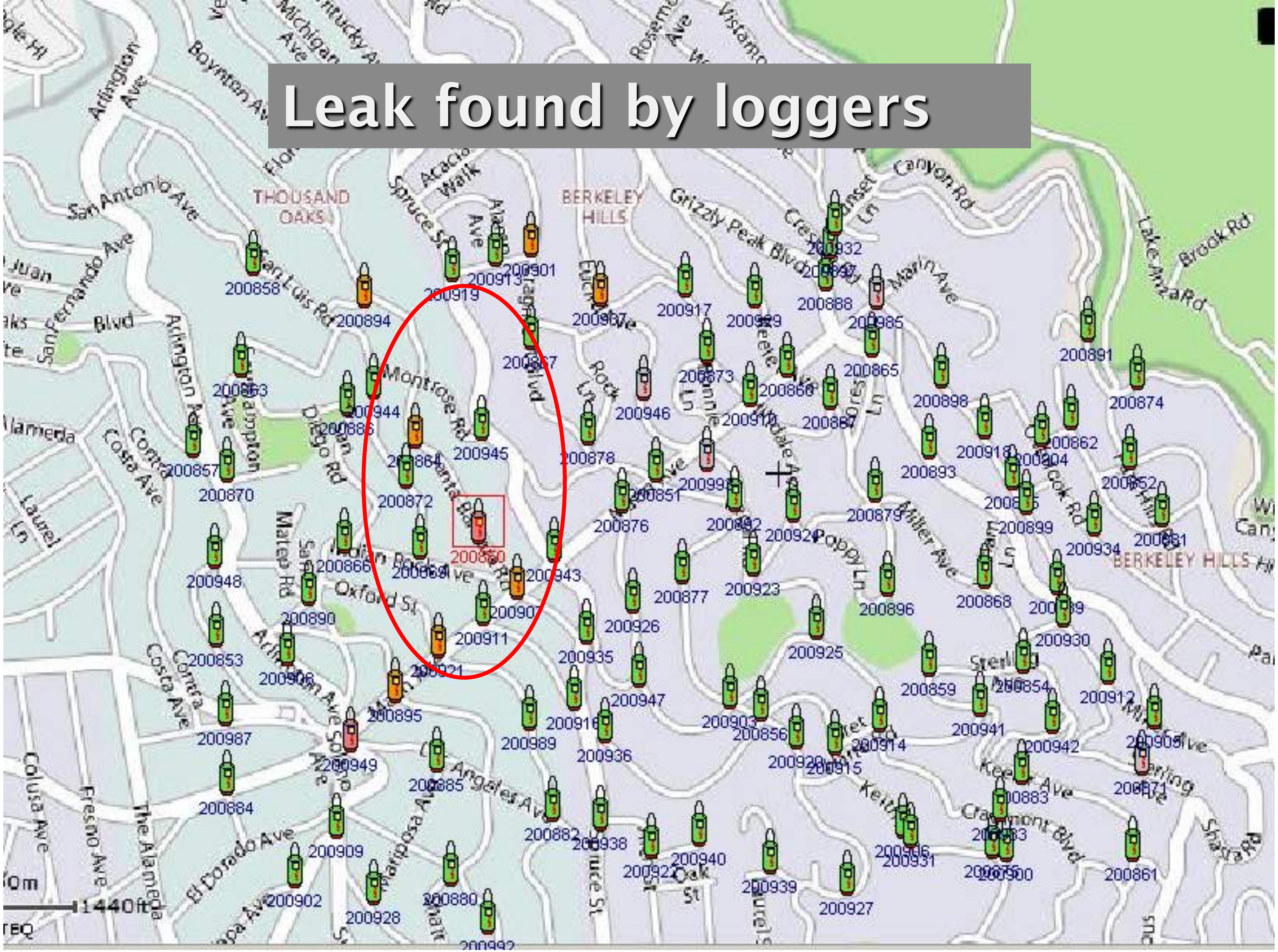
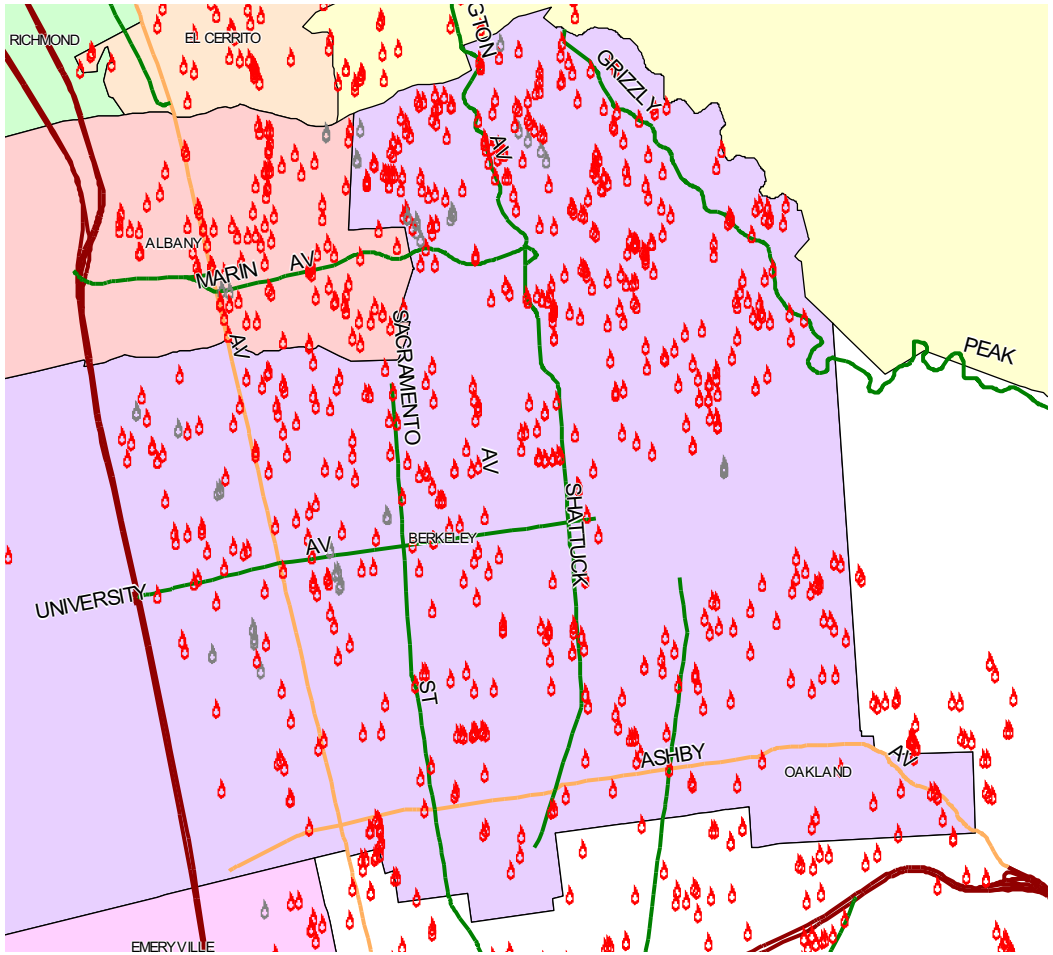
Leak found by loggers



What we found



- Representative mix of pipe types, age, etc.
- Sizable area with numerous creeks
- Usual leaks on slide areas
- Found leaks where never found before
- 4 Major leaks were the big win

Results

- 233 Leaks (documented in GWO)
  - 136 mains 2-20-inch diameter
  - 92 service laterals
  - 1 hydrant lateral
  - 2 valves

- Leaks heard (% of leaks, # of leaks, % of pipe type)
  - 44% (102) of leaks were heard by loggers
  - 71% (165) of leaks were on cast iron (64% of 250 miles of pipe was cast)
  - 17% (39) of leaks on steel (21% of pipe was steel)
  - 9% (22) of leaks on AC (13% of pipe was AC)
  - 2% (5) of leaks on PVC (2% of pipe was PVC) only 1/5 was heard
  - Best-to-worst detection: Steel, Cast, AC, PVC
  - Average distance from logger to leak heard was 240 feet

AMI Business Case Includes Many Departments in a Utility

- Metering and Billing
- Water Conservation
- Customer Services
- Engineering
- Operations
- Regulatory
- Planning
- Finance

Questions & Comments

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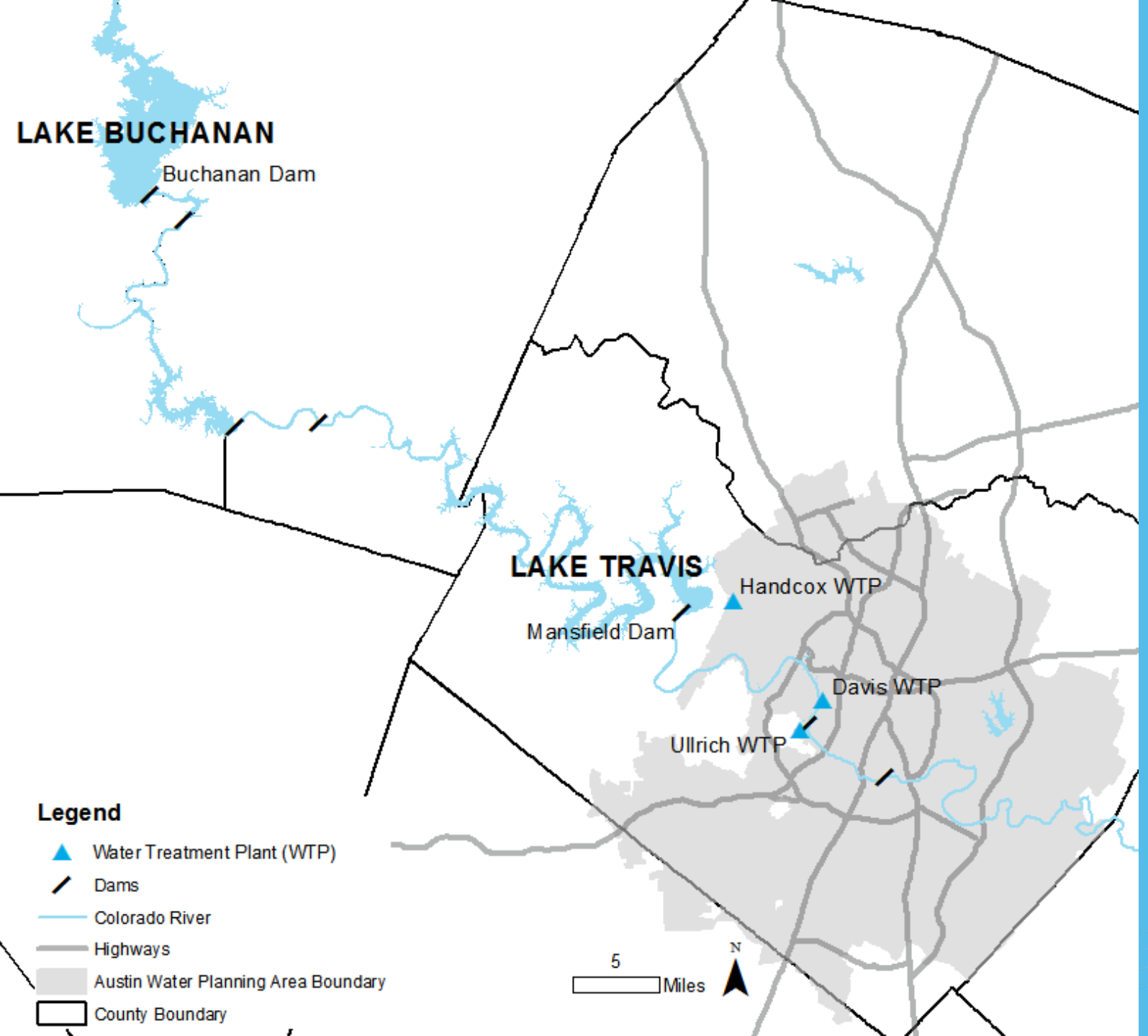
david.wallenstein@ebmud.com

Team Collaboration in Austin, TX

Kevin Kluge | August 24, 2022

About Austin Water

- Drinking water, wastewater, & reclaimed water
- 548 sq. mi. service area
- Over 1 million customers
- Approx. 1,200 employees
- Conservation division (20)
  - Incentives
  - Enforcement
  - Not reuse or water loss

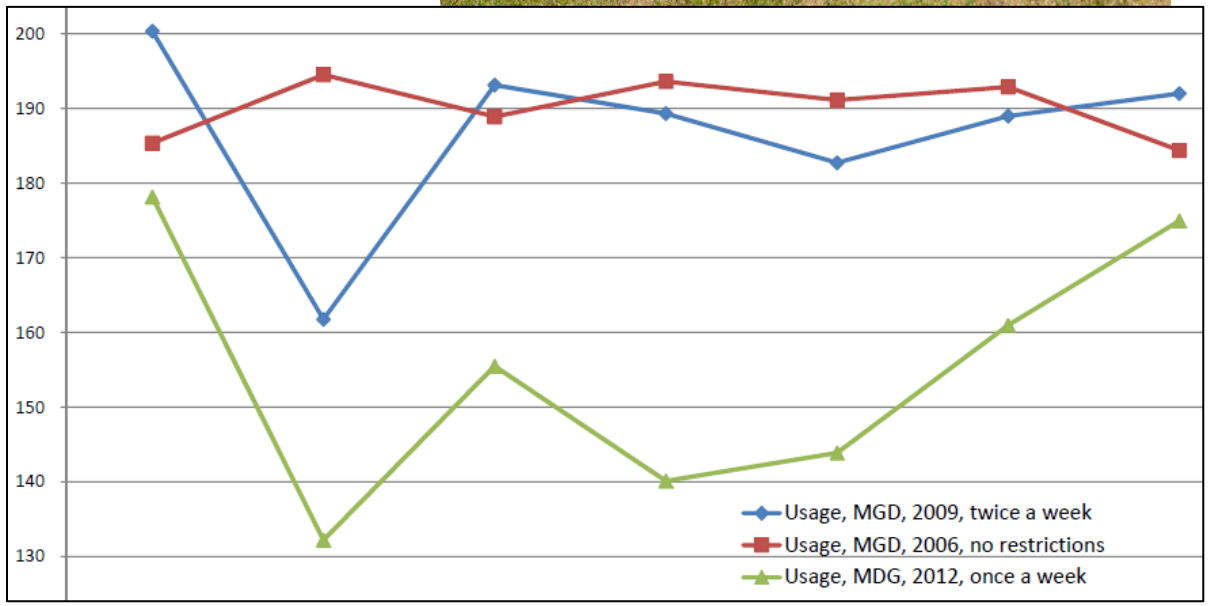


Water Supplies

- Surface water supplies of up to 325,000 acre-feet/yr
  - 157,000 acre-feet in 2021
- Centralized reclaimed - 4,900 acre-feet/yr
- Currently Drought Stage 1 (53% of reservoir storage)
- Future supply activities:
  - Onsite water reuse
  - Aquifer storage & recovery

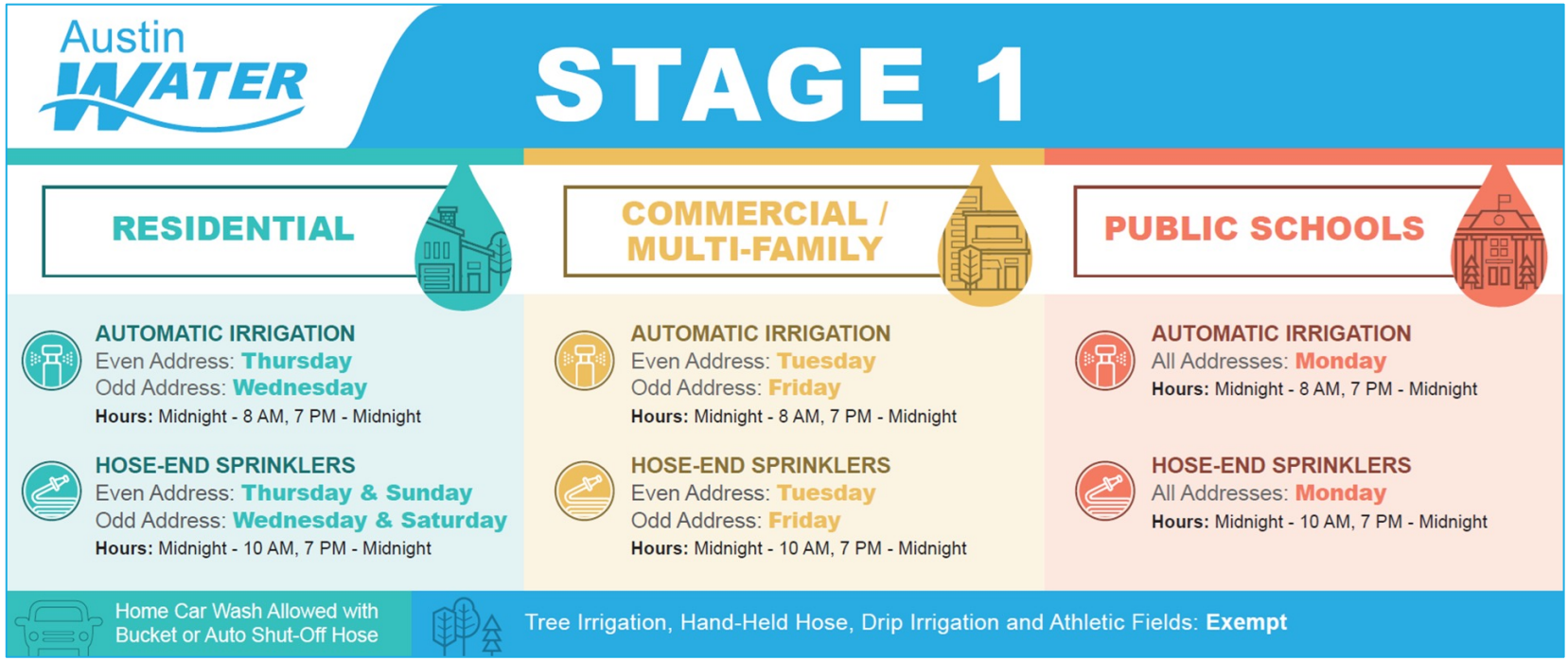
Large-scale collaboration: Designing a water schedule

- 2x per week watering - worked well for all
- **Drought 2011 – 2015**
- Stage 2 (2011) - required 1x per week watering
- Saved water, but
  - High peaks hindered repair efforts
  - Low weekday use
  - Did not reduce peak use goal



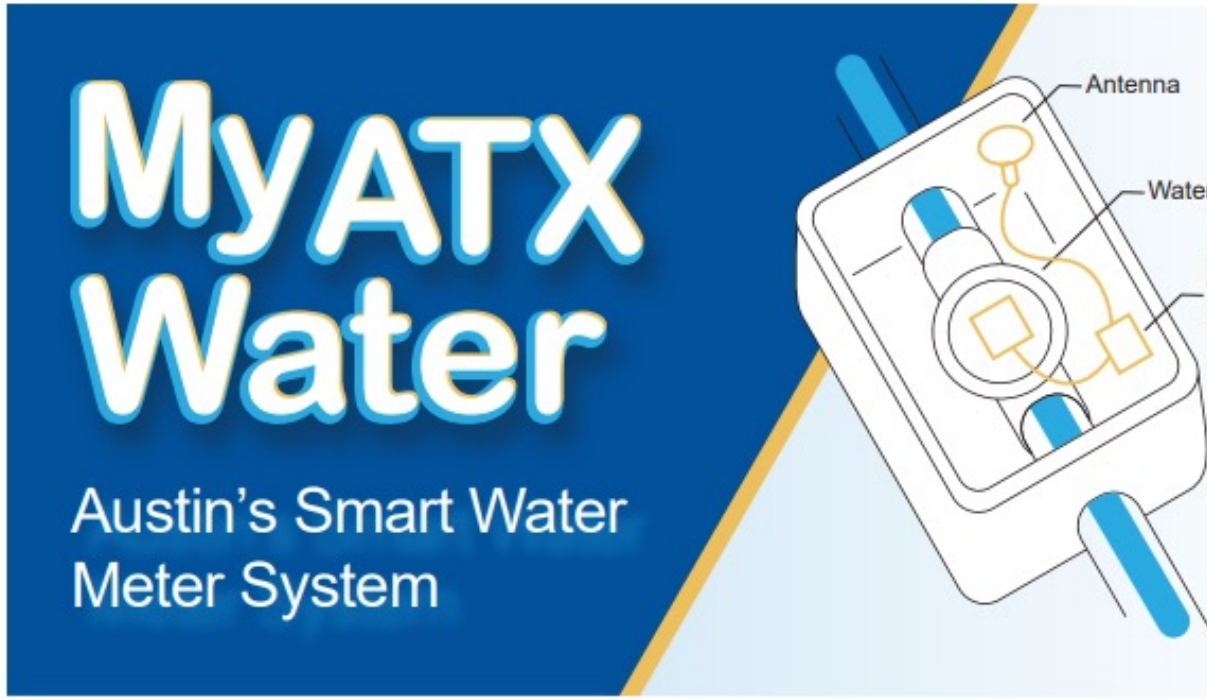
Large-scale collaboration: Designing a water schedule

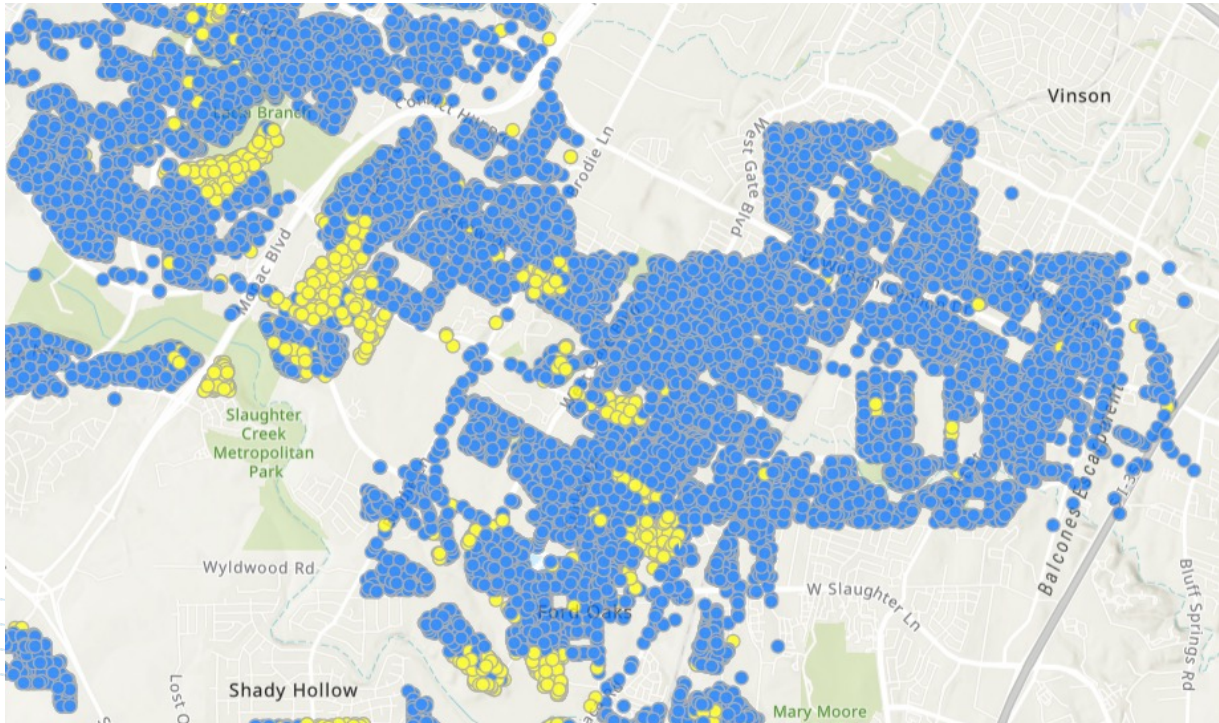
- Collaboration:
  - Largely at manager level then down
  - Multiple scenarios
- Saved water and evened out usage
- 1x per week made permanent and year-round in 2016



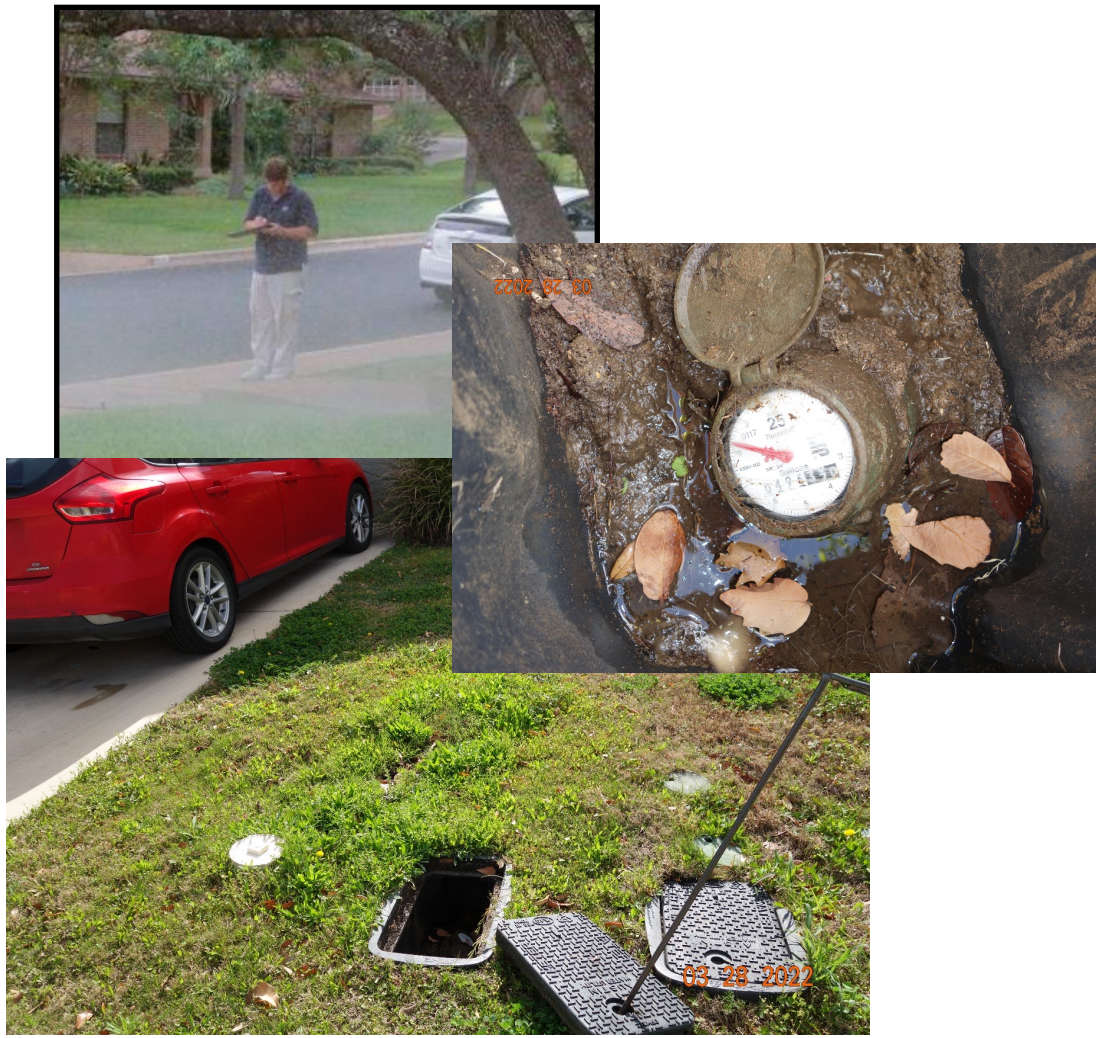
Small-scale collaboration: AMI deployment

- Full deployment in summer 2021
- Contracted installers
- >1,000 installations per week
- Challenge: leaks on the customer side, how to get it fixed?





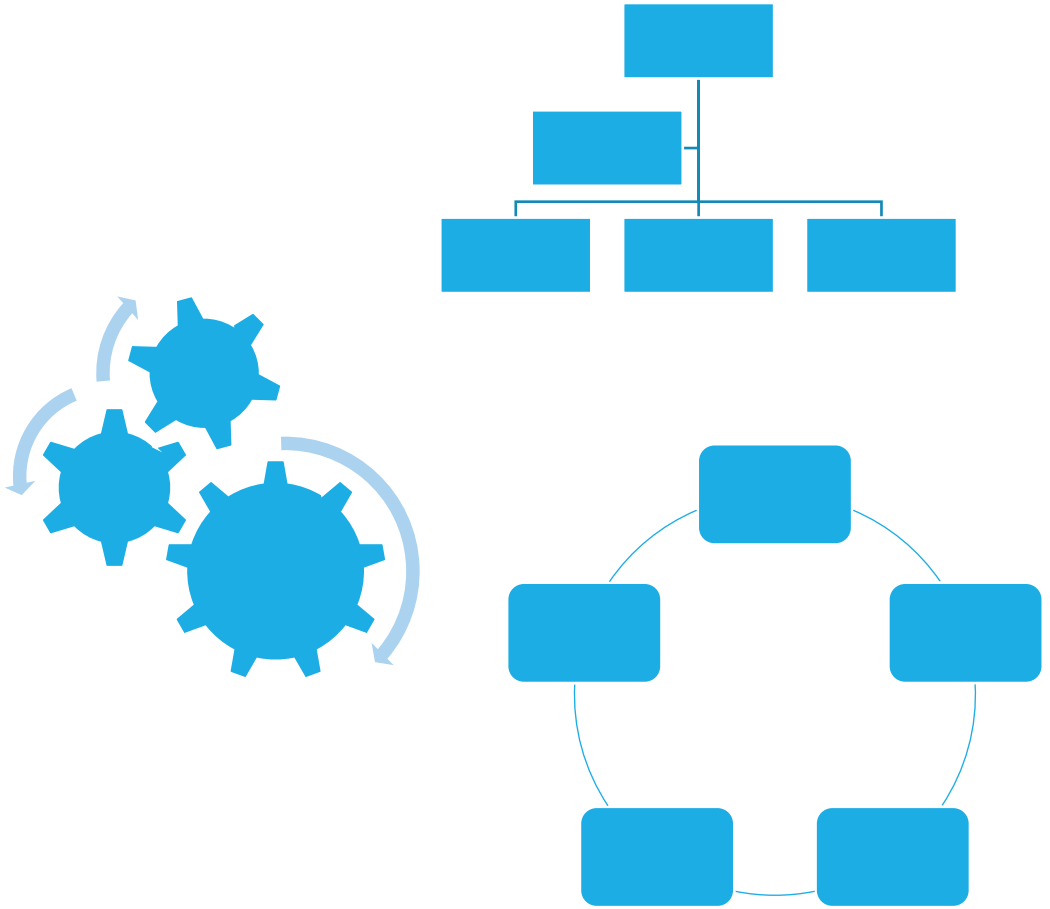
Conservation in the installation



- Conservation can investigate and encourage leak repair under ‘water waste’ ordinance
  - Field investigation to verify and document, if not..
    - Letter requesting repair w/in 30 days
  - 2nd investigation, if not repaired…
    - Letter requesting repair w/in 15 days
  - 3rd investigation, if not repaired…
    - Notice of violation warning, then enforcement

Thoughts regarding collaboration:

- Task collaboration or system collaboration?
- Size has pros and cons
- “Operations” is not a monolith
- Embed your people, but stay connected
- Pushing collaboration down
- One Water [utility]?



QUESTIONS

Kevin.kluge@austintexas.gov

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An Operators Journey to Collaboration

Dan West, Superintendent of Operations
Lindsey Stuvick, Water Efficiency Manager
August 23, 2022

MOULTON NIGUEL WATER DISTRICT

- 7-Member Board of Directors
- 170,000 residents
- Serve 6 cities (Laguna Niguel, Aliso Viejo, Laguna Hills, Mission Viejo, Dana Point, San Juan Capistrano)
- AAA credit rating from Fitch and S&P
- Top workplace in Orange County and USA
- Recognized in California and nationally for innovation, environmental stewardship and customer service
- Lowest average bill in south Orange County

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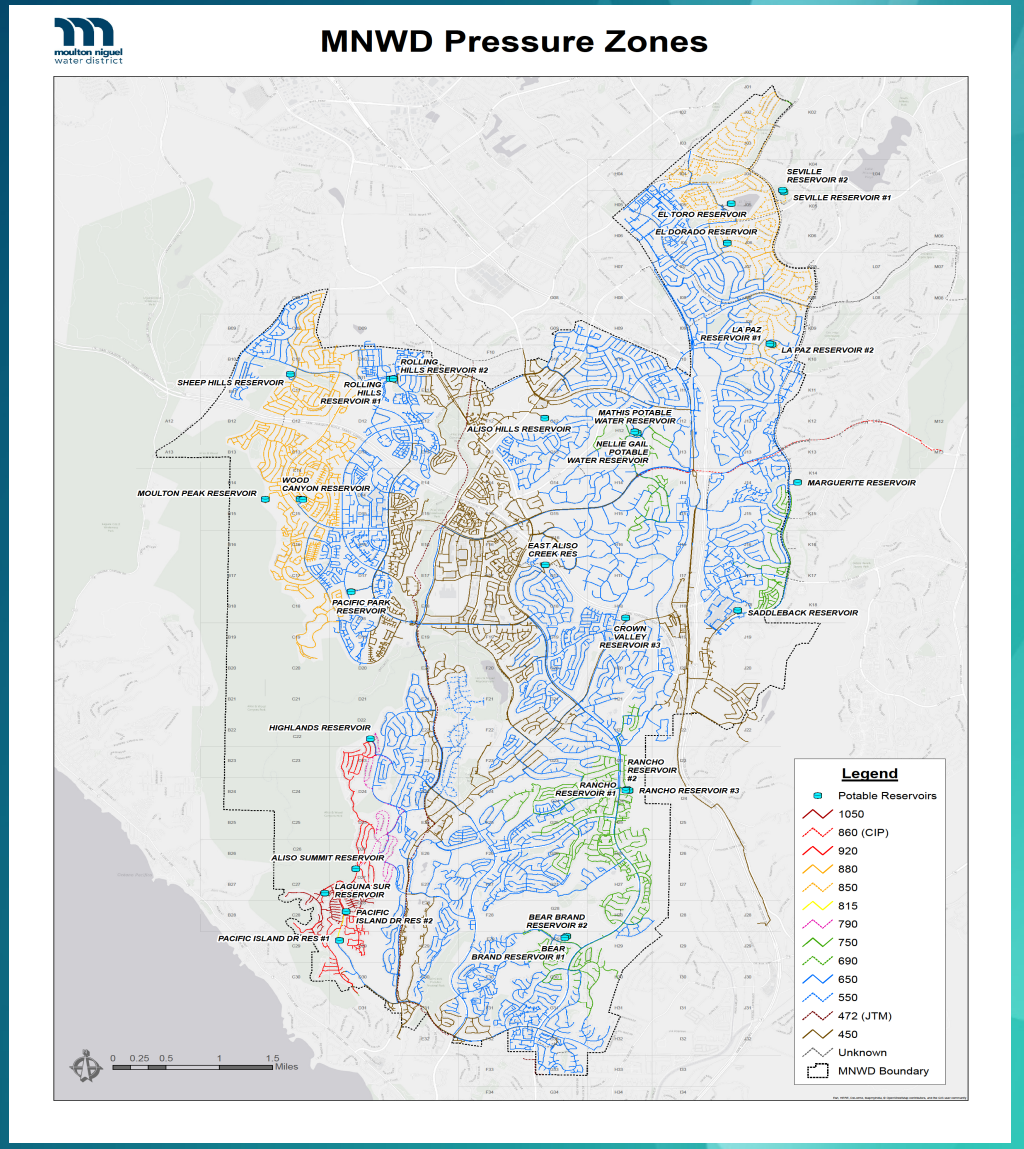
MNWD DISTRIBUTION SYSTEM OVERVIEW

- Potable and Reclaimed Systems Combined Stats
- 37 Sq Mile Service Area
- 39 Reservoirs
- 816 Miles of Pipeline 4”-54”
- 47% AC / 37% PVC / 8% Steel / 8% D.I.
- 56,300 Metered Service Connections
- 20 Pressure Zones Across the 2 systems
- 34 Pump Stations



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COL-LAB-O-RA-TION

1. The action of working with someone to produce or create something. (cooperation)(alliance)(partnership)

2. Traitorous cooperation with an enemy. (conspiring)(collusion)

- What definition are you choosing?
- Perception is reality…

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MNWD LIFE BEFORE COLLABORATION

- Silos, walls, dividers, split locations
- No understanding of each others' roles
- Unhealthy competition
- Trust issues between departments
- Disproportionate workloads
- No empathy

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TEAR DOWN THAT WALL!!

- The walls literally came down
- Change is good, embrace it
- Director of Operations and Engineering
- Seeds of collaboration starts at recruitment and hiring
- Be a Moulton H.E.R.O. and live by it
- Score points by excelling in interactions

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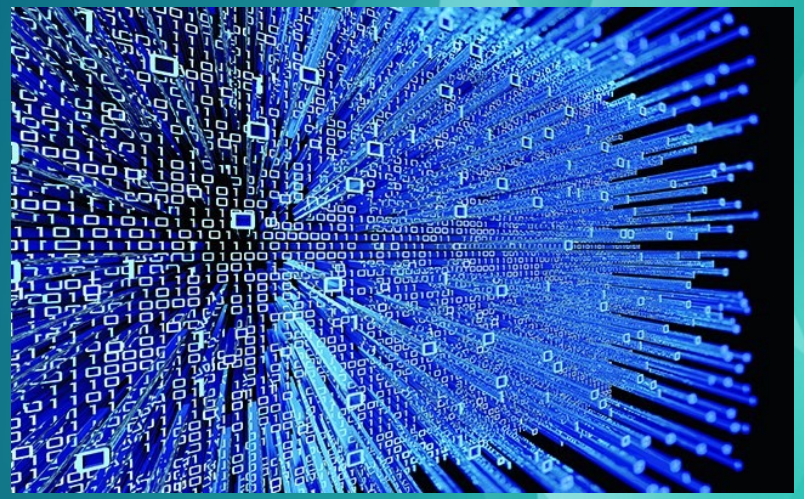
ANOTHER DATA SCIENTIST?

- MNWD team of data scientists
- Integrate data from AMI, GIS, billing, and rebate program
- Create reports and dashboards
- You dream it, they create it
- Part of our daily operations now



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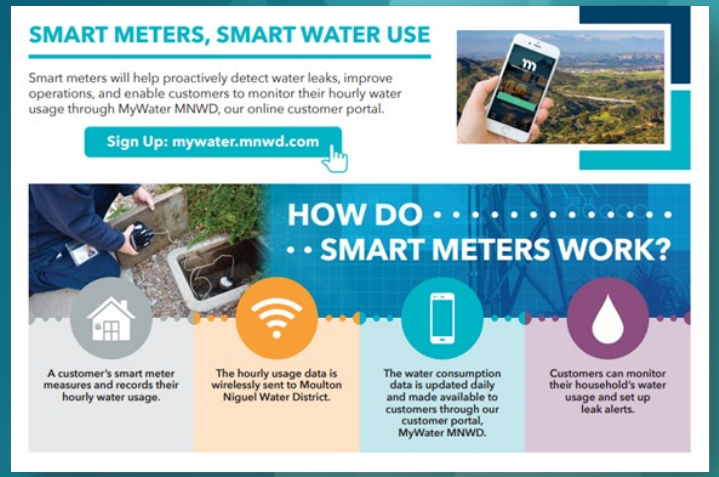
PROJECTS BORN THROUGH COLLABORATION

- **Advanced Metering Infrastructure**
- Three phase project
- Collaboration, collaboration, and more collaboration
- Numerous departments leveraging data from system
- Win-win for everyone: customers, CSF, WUE, PALD, etc.



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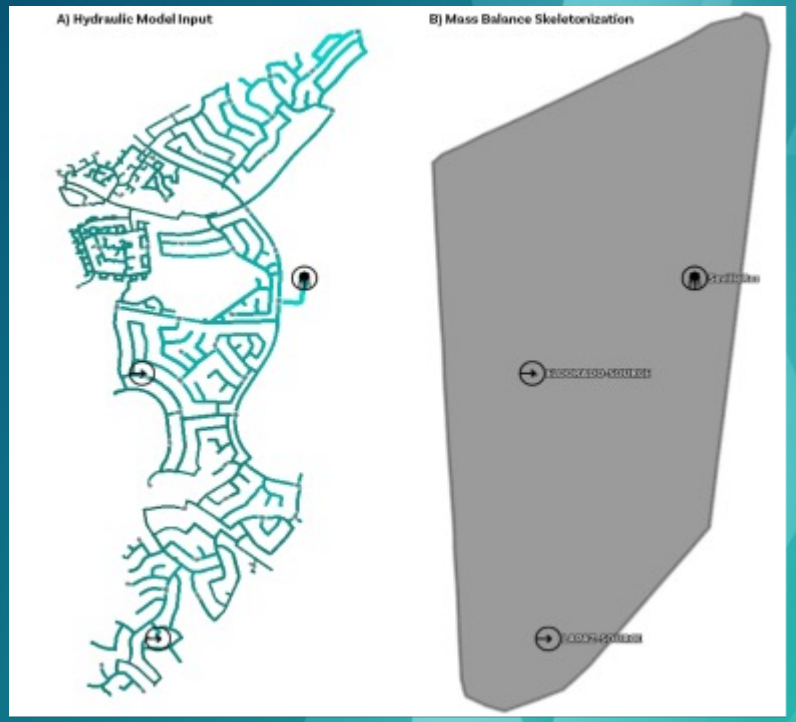
PROJECTS BORN THROUGH COLLABORATION

- **Water and Energy-Efficiency Dashboard**
- Collaborative project with WUE, Ops, UC Davis
- Real-time data analytics to populate a dashboard
- Dashboard will use mass balance calculations to show non-revenue water loss
- Will also evaluate energy intensity within the system zone by zone.



$$\left|_{zone=0}^{n} TotalInflow_{zone} = \sum_{link=0}^{L_{zone}} Inflow_{link,zone}\right. \quad \text{Eq. 4}$$

$$\left|_{zone=0}^{n} TotalEnergyInput_{zone} = \sum_{link=0}^{L_{zone}} EnergyDemand_{link,zone} + \sum_{link=0}^{L_{zone}} Inflow_{link,zone} * EnergyIntensity(link)\right. \quad \text{Eq. 5}$$

$$\left|_{zone=0}^{n} EnergyIntensity_{zone} = \frac{TotalEnergyInput_{zone}}{TotalInflow_{zone}}\right. \quad \text{Eq. 6}$$

$$TotalWaterUse = \left(\sum_{Interconnection} (Inflow - Outflow)\right) - \left(\left(\sum_{Reservoir} (Fill - Drain)\right)\right)$$

$$NonRevenueWater = \left(TotalWaterUse - \sum_{Customer} WaterSales\right)$$

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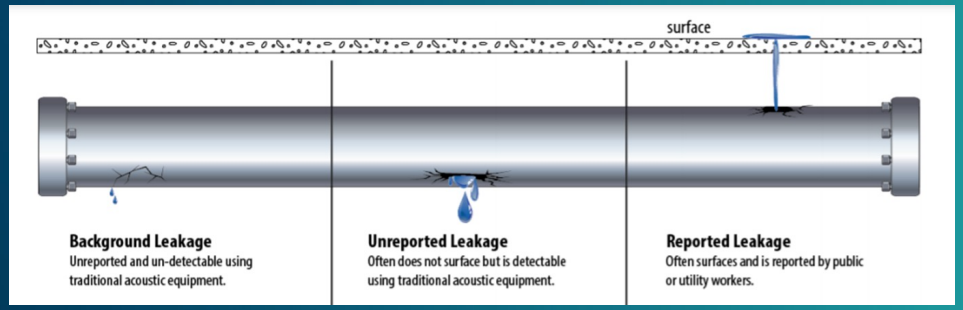
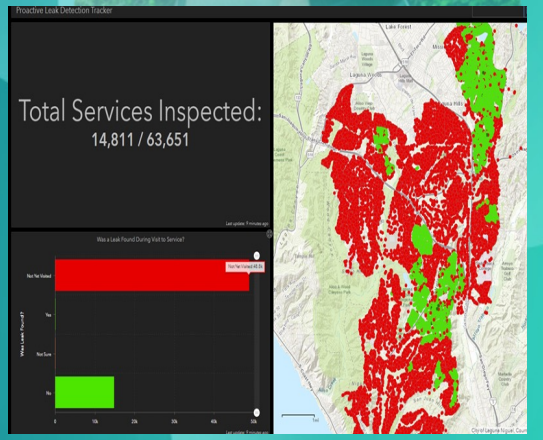
PROJECTS BORN THROUGH COLLABORATION

- **<u>Proactive Leak Detection Team</u>**
- Team created in 2020 to survey entire service area
- Lobbied for by WUE and Operations
- GIS collaboration – ArcGIS collector to track progress
- Data gathered will inform future leak detection efforts





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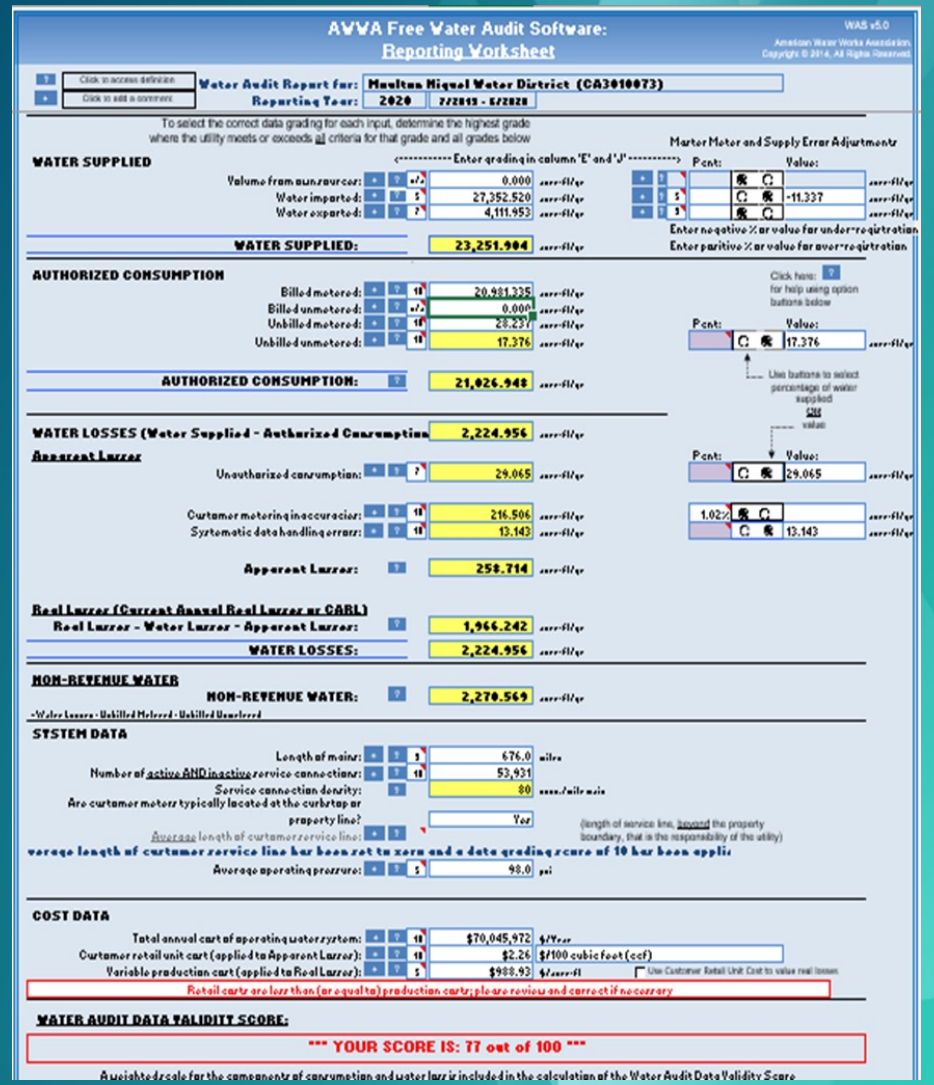
PROJECTS BORN THROUGH COLLABORATION

- **Water Loss Audit & Validation**
- Collaborative effort from first audit
- Great opportunity to recognize strengths and weaknesses, room for improvement
- Feedback from other departments



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TAKEAWAYS FOR COLLABORATION

- Continued support throughout the project
- Clear communication is essential
- Know departments limitations
- Ensure common goals and expectations

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THANK YOU!

Lindsey Stuvick, Water Efficiency Manager
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Questions?

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Thank you!