

Optimizing Odor Control and Cleaning in the Sewer: OC San Reduces the Carbon Footprint



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Orange County Sanitation District, CA

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SmartCover Systems

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Introductions



Don Stokes

- Maintenance Manager at OC San
- 15+ Years with OC San; 4 Years in Current Position

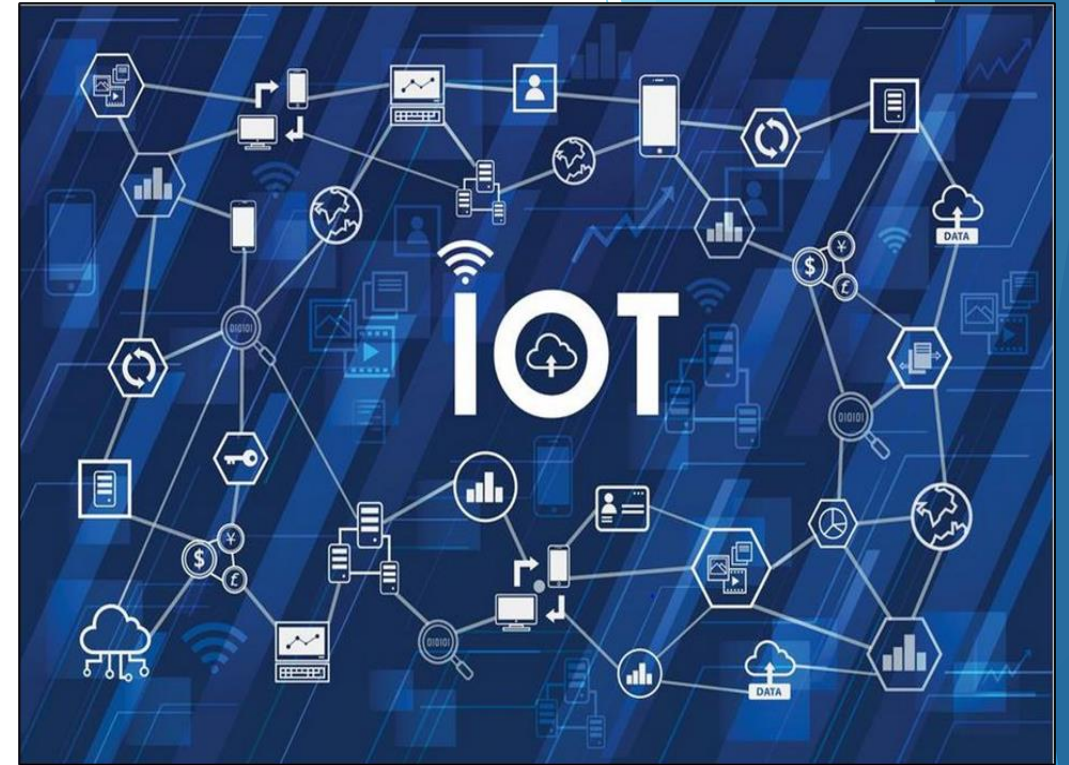


Eric Van Cleave

- Southern California Regional Sales Manager, SmartCover Systems
- 6+ Years with SmartCover / Industry
- Treasurer CWEA San Diego (President Next Year)

Smart Technology

- Ultrasonic & pressure combo
- Battery powered
- **Satellite communications**
- Cloud based
- “Real Time” data
- **Automatic trending analysis**
- No confined space installation
- Data overlay tools (rain)

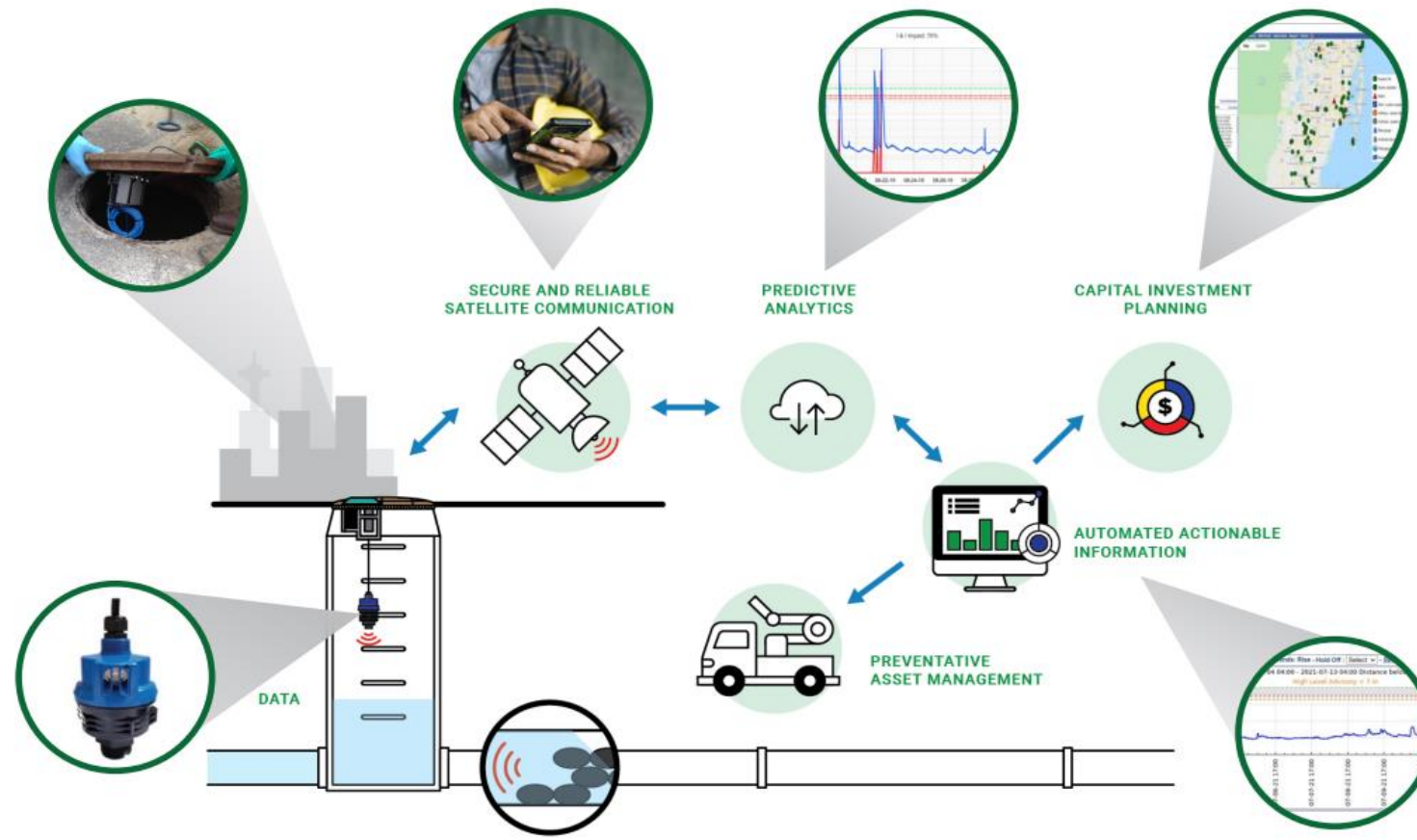


Satellite Communications

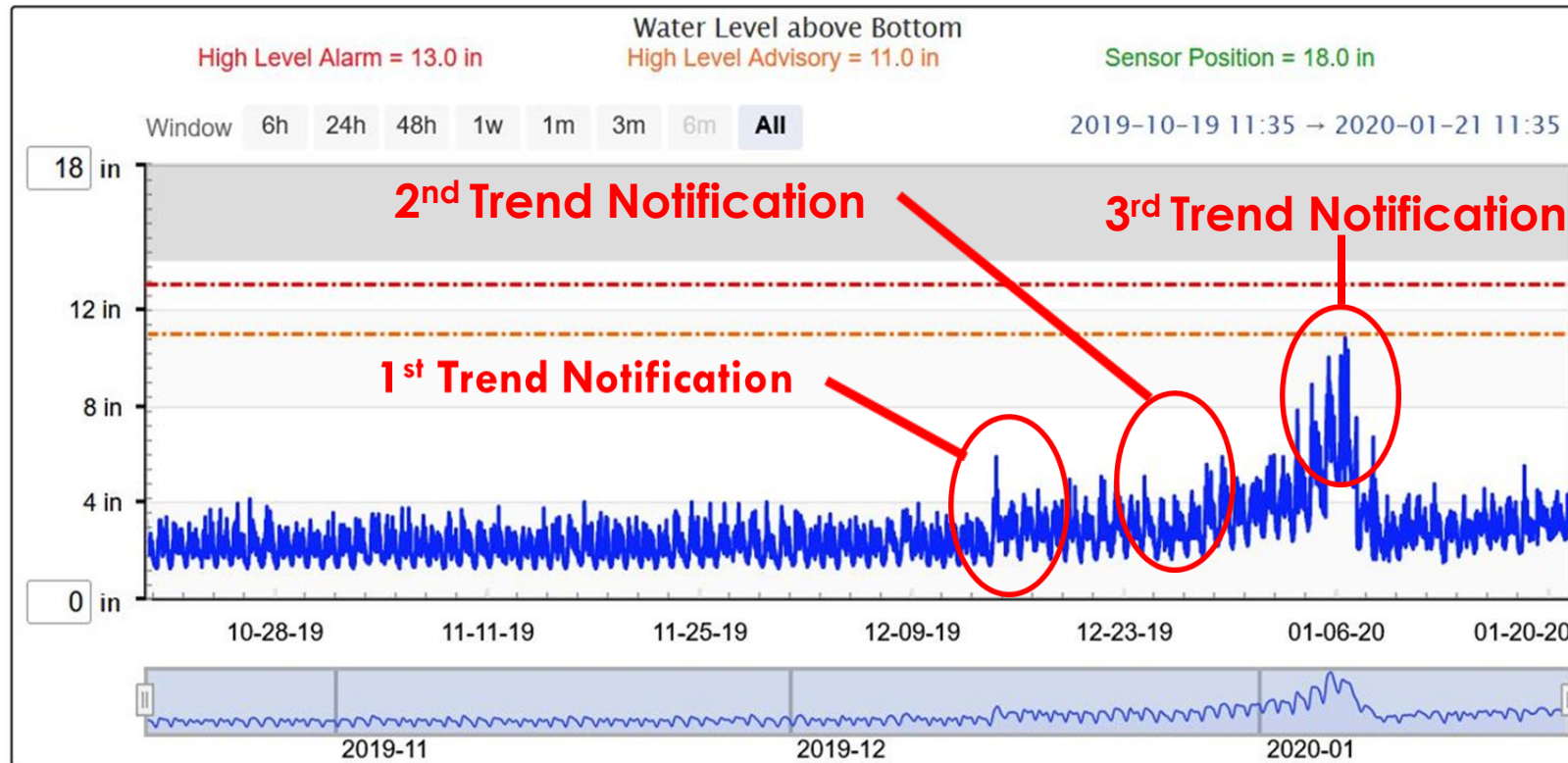


- Low earth orbiting
- Global coverage
- Extreme reliability
- Severe weather
- Power outages
- Ground interference
- No upgrades required

Communications Architecture



Trending Analysis



Benefits of Smart Sewers

- **SSO Prevention**
- Flow estimation
- **Cleaning optimization**
- Lift station back up
- Easement monitoring
- I&I detection
- **H2S Monitoring**
- Storm & surface water monitoring
- CSO prevention



OC San System Overview



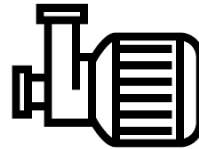
2.6 Million Customers



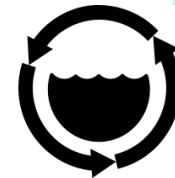
388 Miles of Sanitary Sewer



480 Square Miles

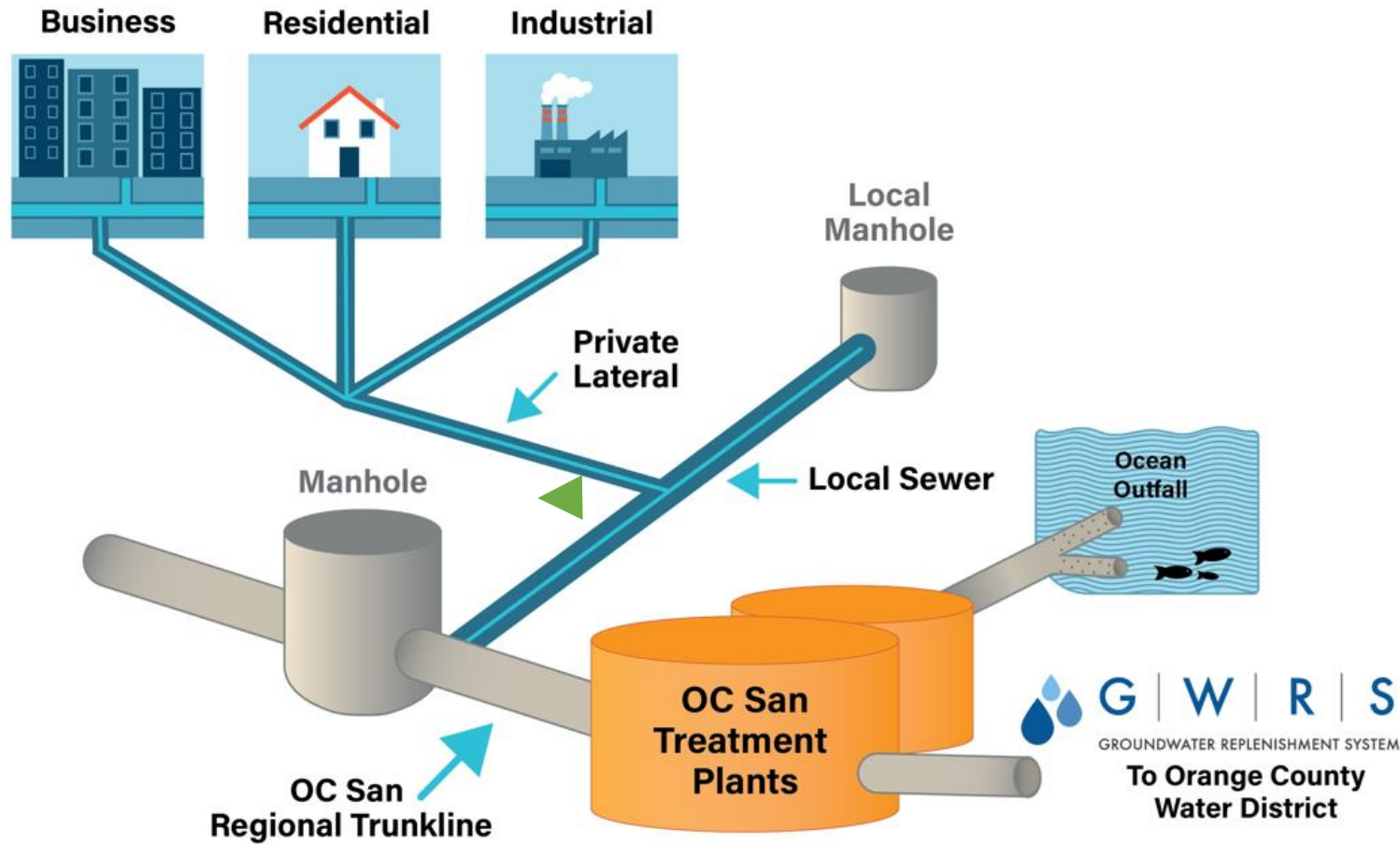


15 Offsite Pump Stations



2 Treatment Plants

Wastewater Collection System



OC San System Overview

- Wastewater characteristics and flow profiles impacted by
 - Water conservation measures
 - Periodic drought conditions
 - Changes in industrial dischargers
 - Flow diversions for the Groundwater Replenishment Systems indirect potable reuse
- Leads to major odor issues in the most densely populated areas

Collections O&M Philosophy

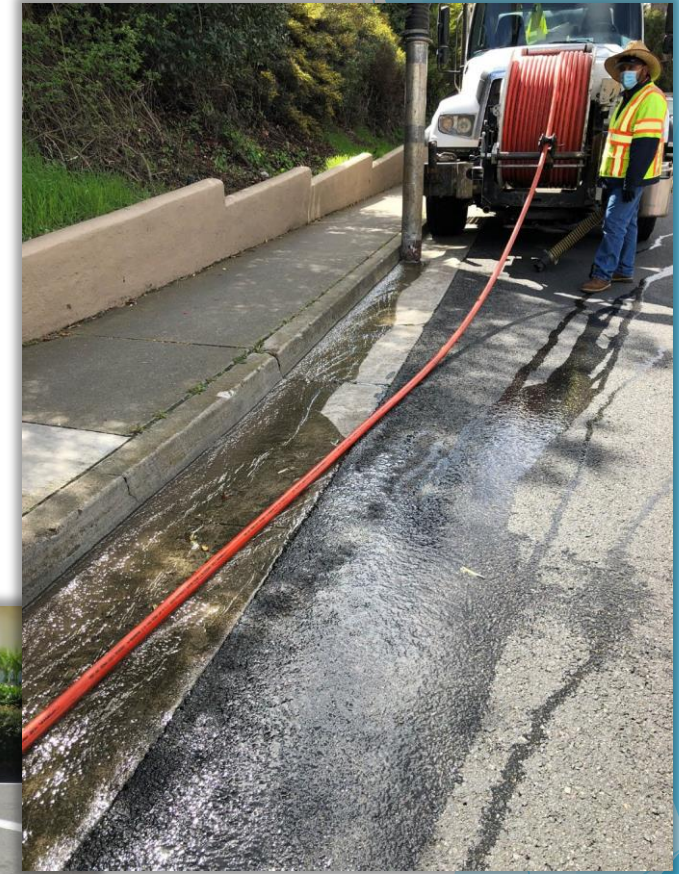
- Keep it in the pipe
- Don't let the stink out
- Keep pump stations operating reliably
- Train and build skills
- Coach and mentor the up and coming
- Improve and optimize

Are We:

- At risk of a spill?
- Focusing on the areas that need attention?
- Ignoring dirty pipes?
- Cleaning clean pipes?
- Determining cleaning methods and intervals?
- Over/under dosing chemicals?
- Meeting our levels of service?

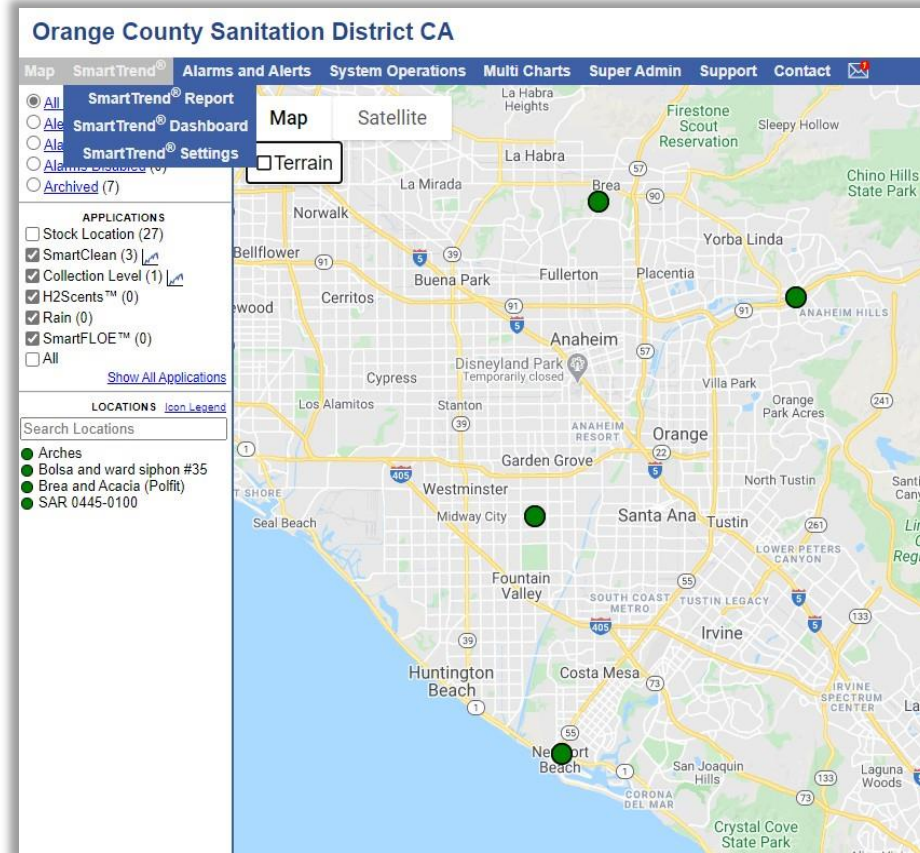
Prevent Sewer Spills

- OC San Relevant Standard
 - 2.1 Sewer Spills per 100 Miles
- Collection's Goal
 - 0 Spills



Deploying Technology

- Early SSO warning
- Condition based cleaning
- H2S monitoring

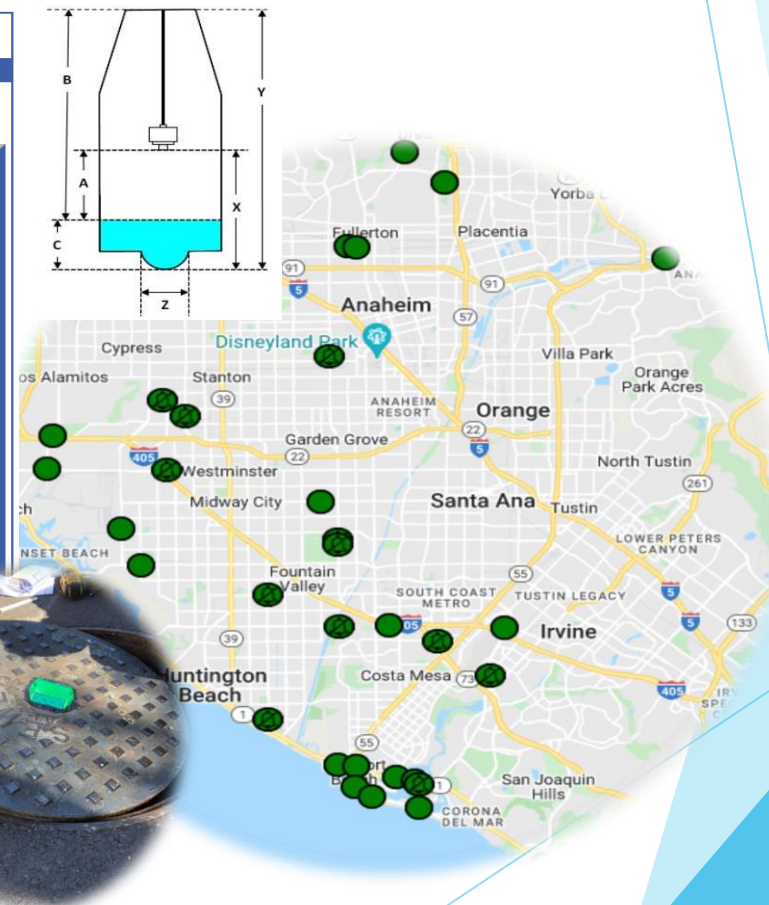
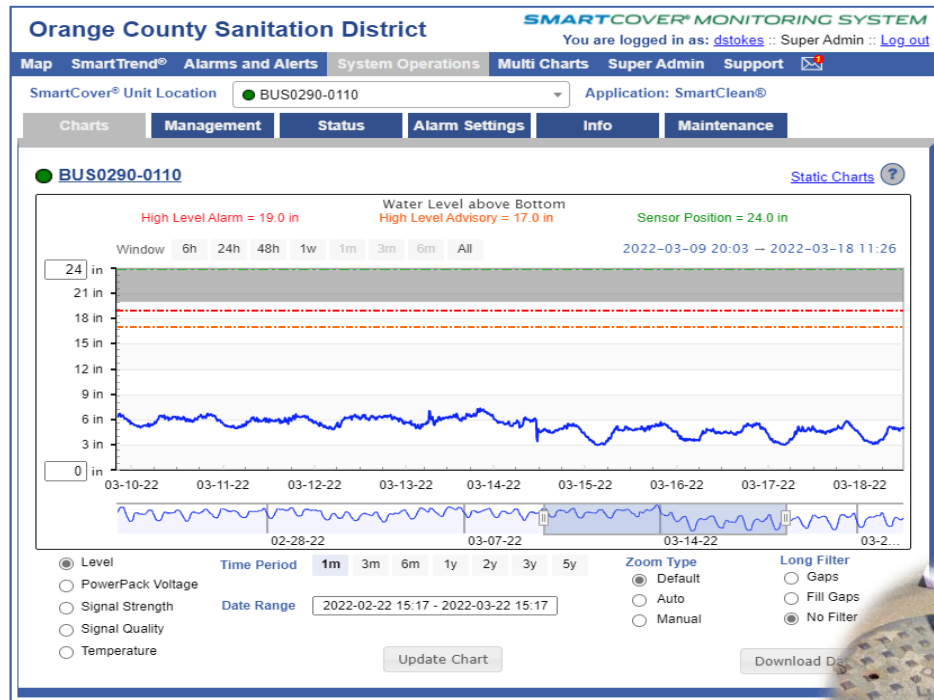


Early SSO Warning

- Prevent versus react
- Low elevation manhole structure
 - Collections capacity study results
 - Asset Engineer support
- Protect local system
- Technology based alert system

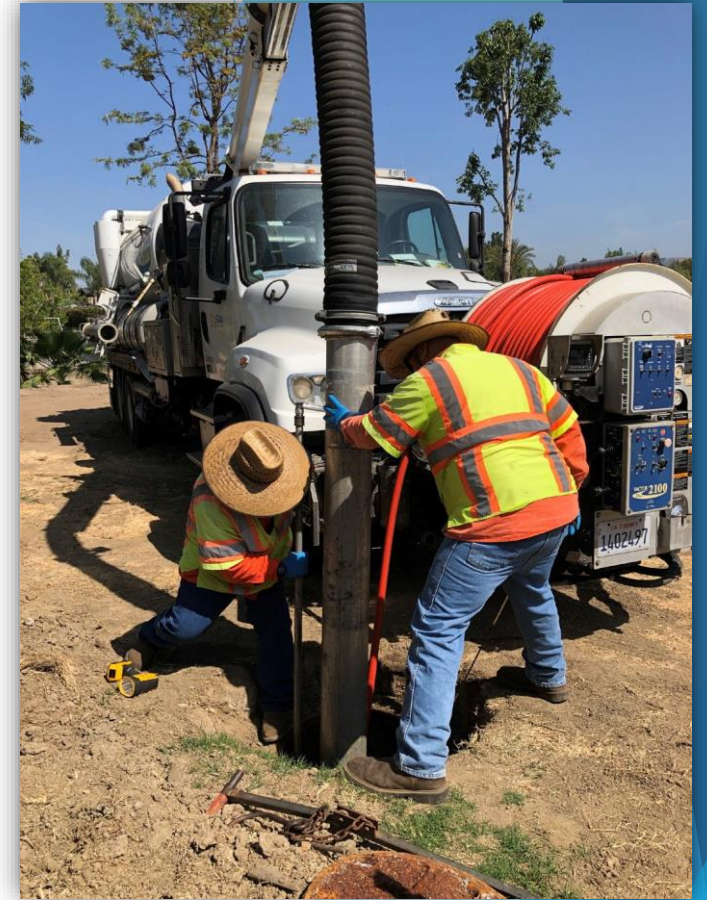


Using the Technology



Current Approach

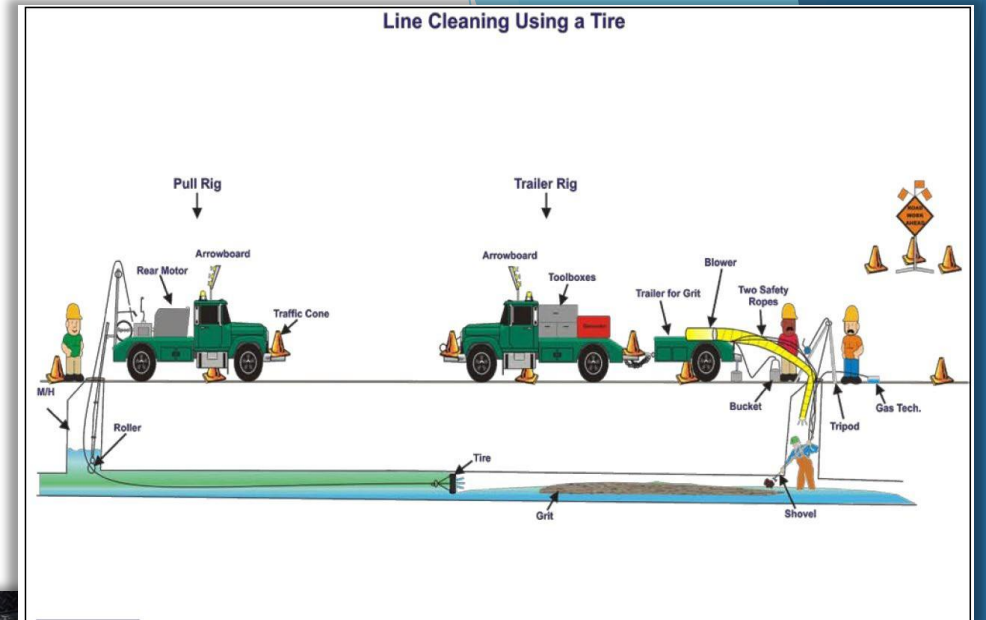
- High frequency cleaning >100 locations
- Three crews
 - Small Diameter Flushing
 - Large Diameter Tire
 - Siphons and Hot Spots
- Calendar-based
- Resource heavy



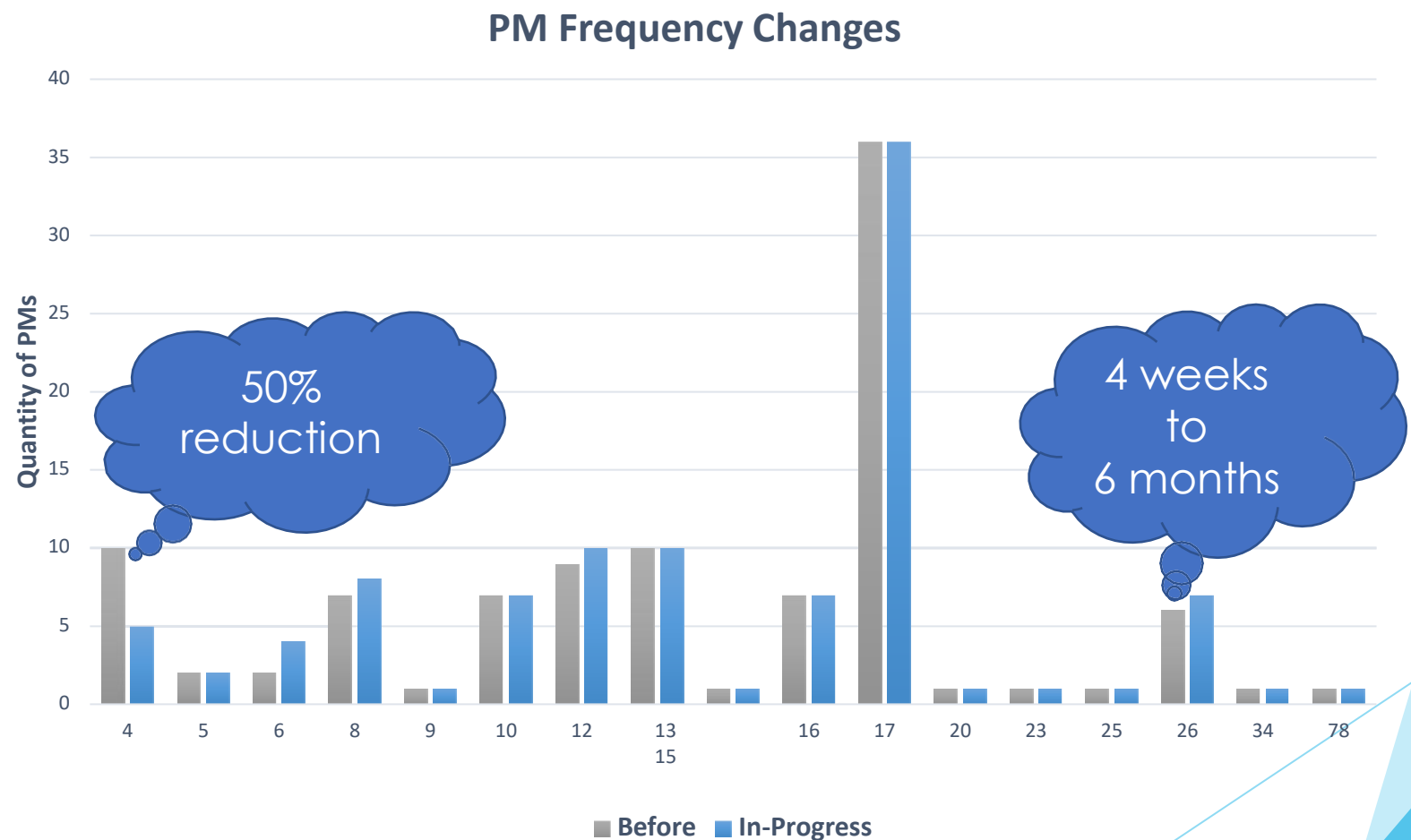
Line Flushing



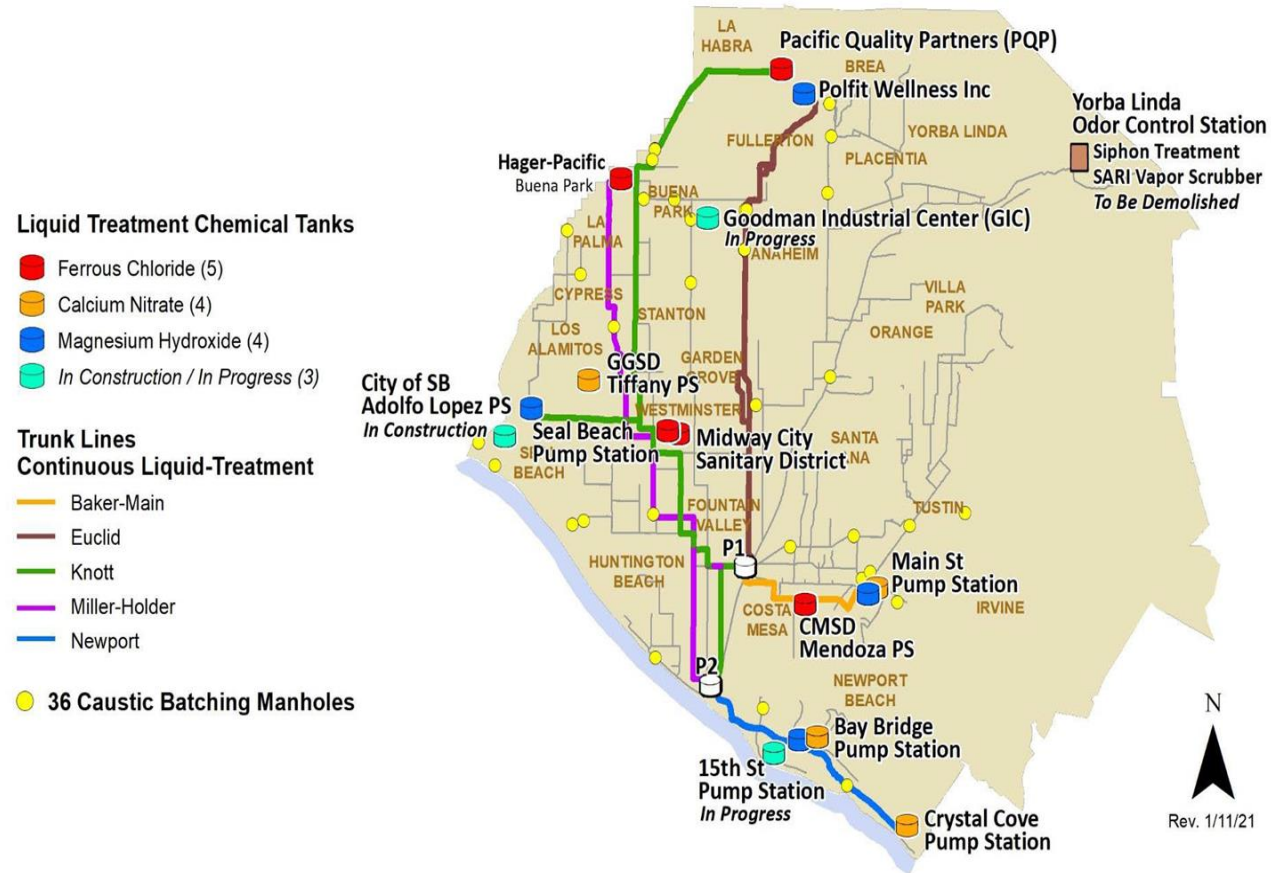
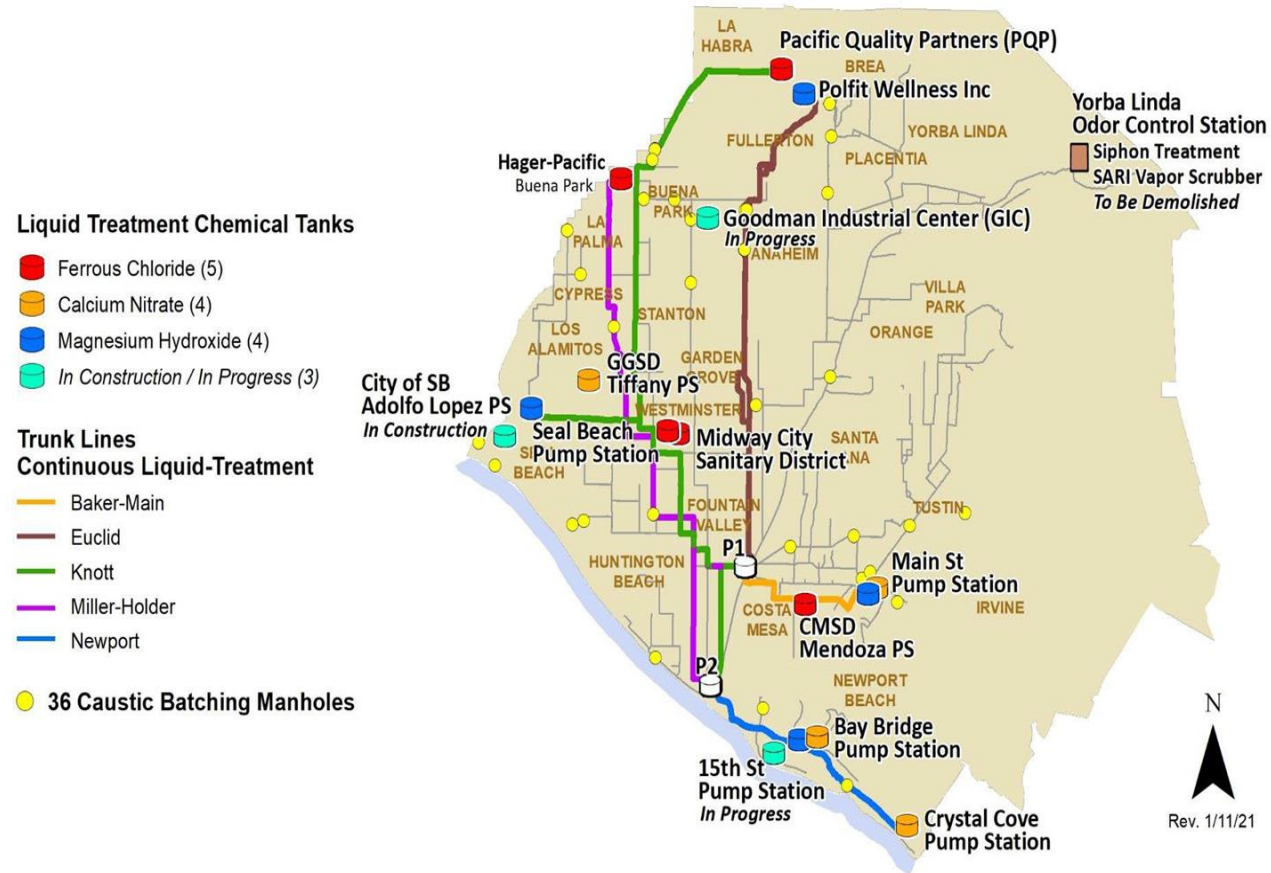
Mechanical Cleaning



Data Usage

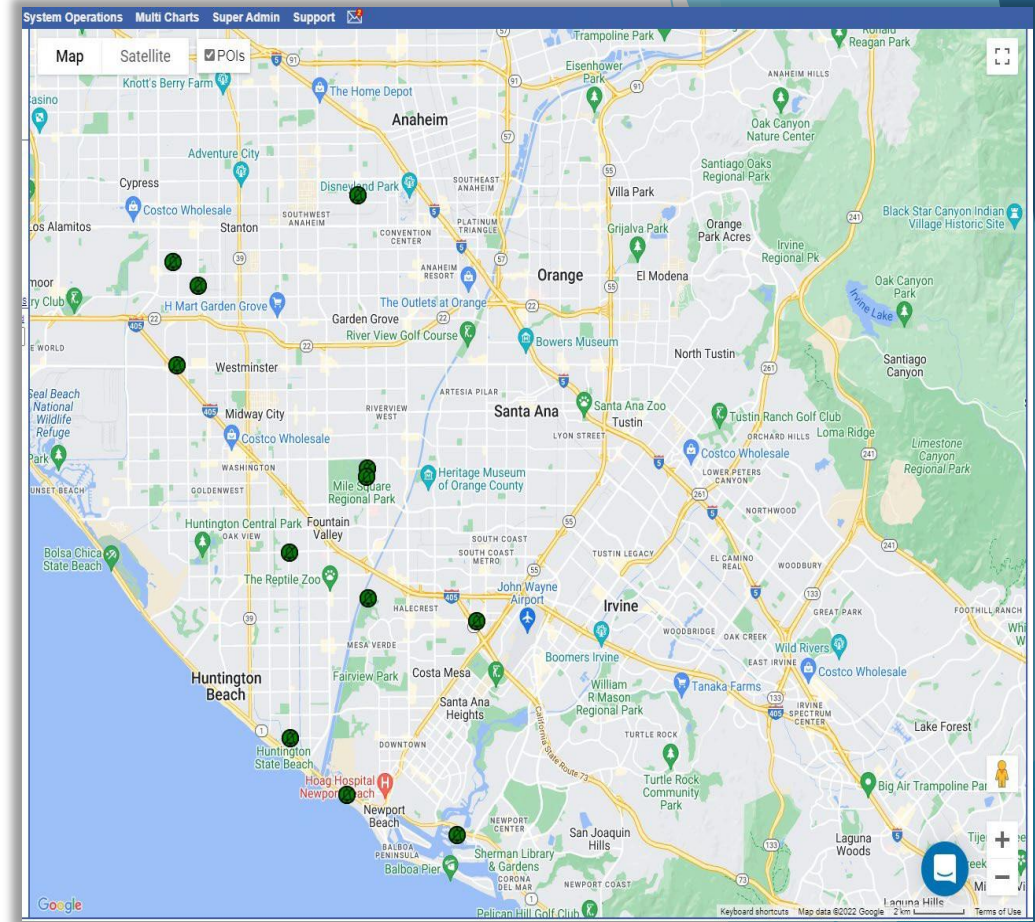


Chemical Dosing System



H2S Monitoring

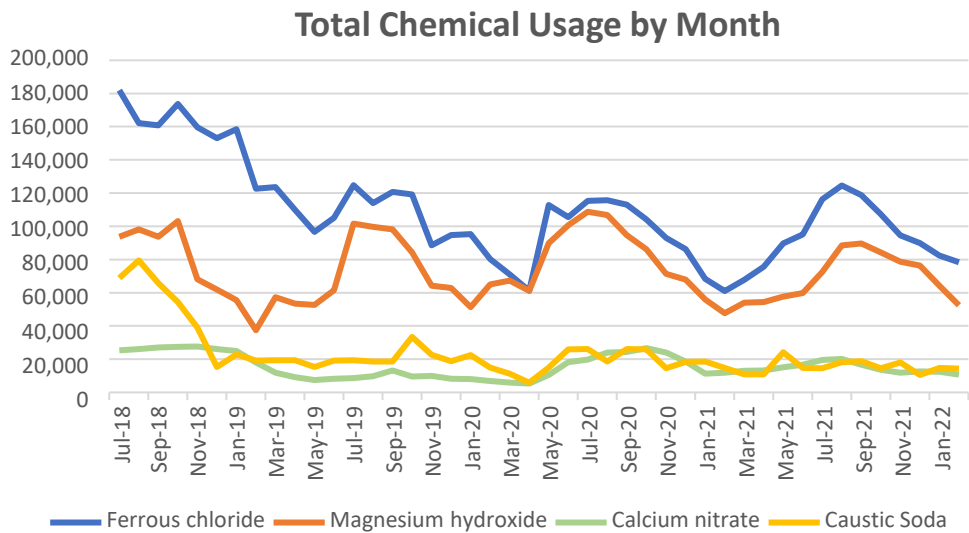
- ROCCS program approach
- Continuous chemical dosing sites
- Provides feedback mechanism
- Eliminates safety concerns and manual attention



Optimization Consideration

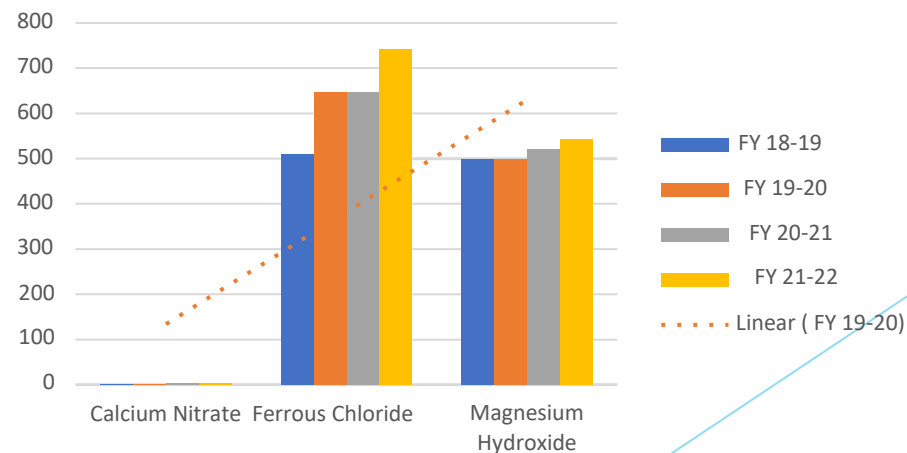
- Cost of monitoring system \$215k initial, \$38k annually for monitoring
- Chemical costs
- Reduction of manhours deploying portable units
 - Traffic control risks
- Data refreshed multiple times an hour vs. monthly

Return on Investment



=

\$607,458
Chemical
Cost Savings



Return on Investment

- Transitioned from calendar-based approach to a condition-based approach
 - Lowered chemical dosing by 21.3%
 - Controlled system cleaning frequency
- Decreased operational costs
- Reduced carbon footprint
- Lessened odor complaints

Next Steps

- Deploy additional units for condition- based cleaning (over 100 locations)
 - Target vs. blanket approach
- Optimize chemical dosing
 - Chemical piloting
- Amass data and field verify, revise approach
- IT effort to provide visibility in conjunction with others - PowerBI

Lift Station Monitoring

Provides Off-the-Grid Backup

When gravity flow isn't possible, utilities rely on lift stations to pump wastewater or sewage material from a lower elevation to a higher elevation. Because lift stations are powered by electricity, sewer spills happen if they go down.

Benefits:

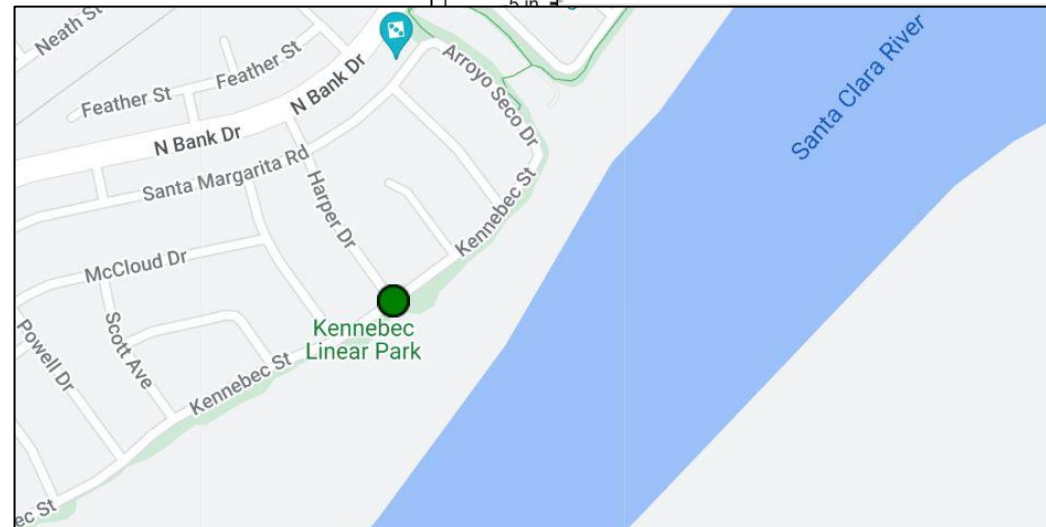
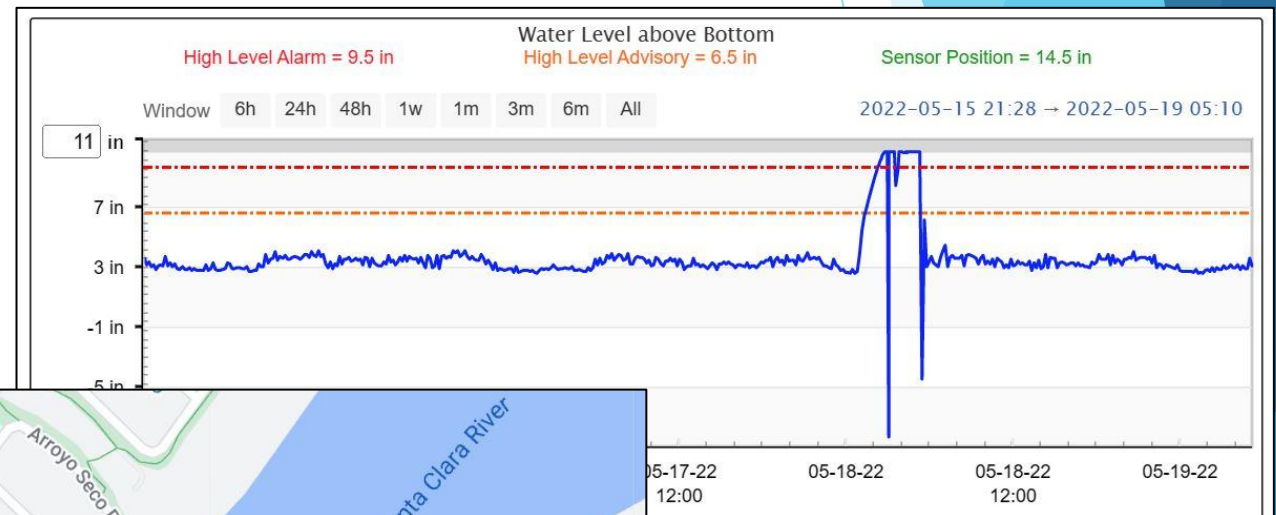
- Allows a truly off-the-grid means to monitor lift station levels, regardless of a power outage
- Delivers continued visibility through satellite communications even when there is no power or cell service
- Provides resiliency and redundancy to better manage and respond to unexpected events
- Complements SCADA



Example: Ventura Water, CA

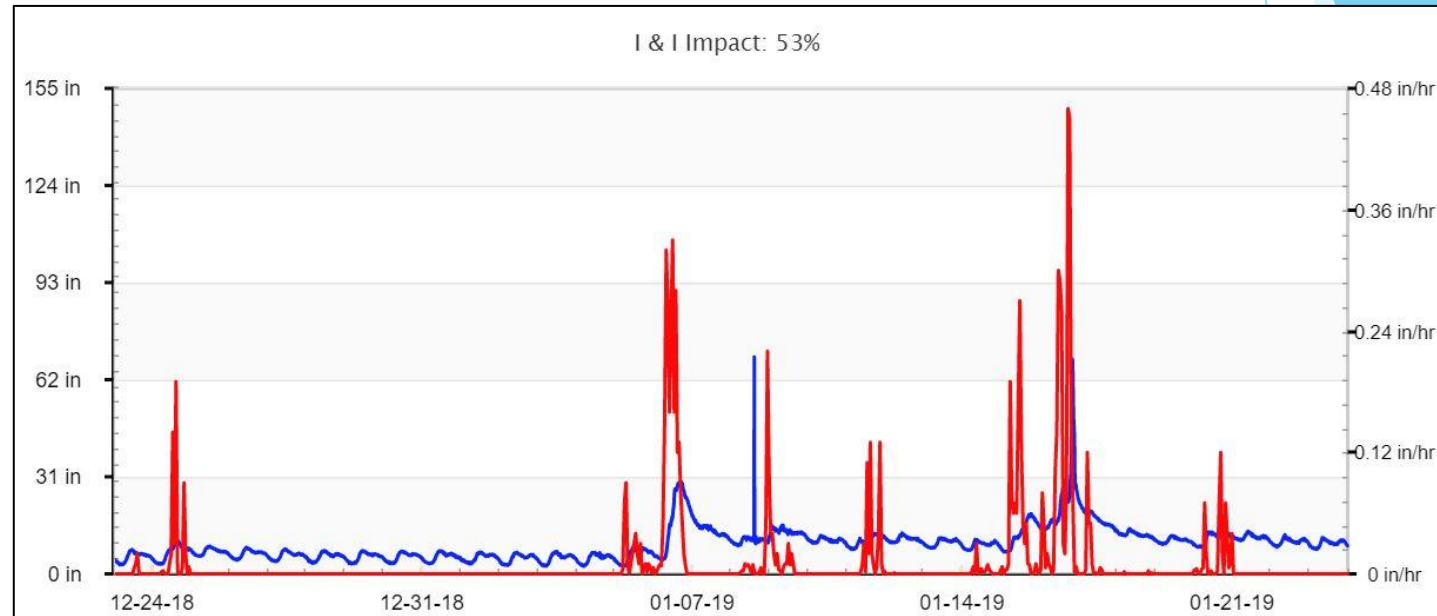
Saved Spills during Lift Station Power Outage

- Unknown Power Outage @ 1:00am
- High Level Alarm – Remote Monitor
- Did Not Receive Other Alarms (SCADA)
- Battery Powered & Satellite Communications
- Spill Into Santa Clara River
- **SPILL SAVED!**



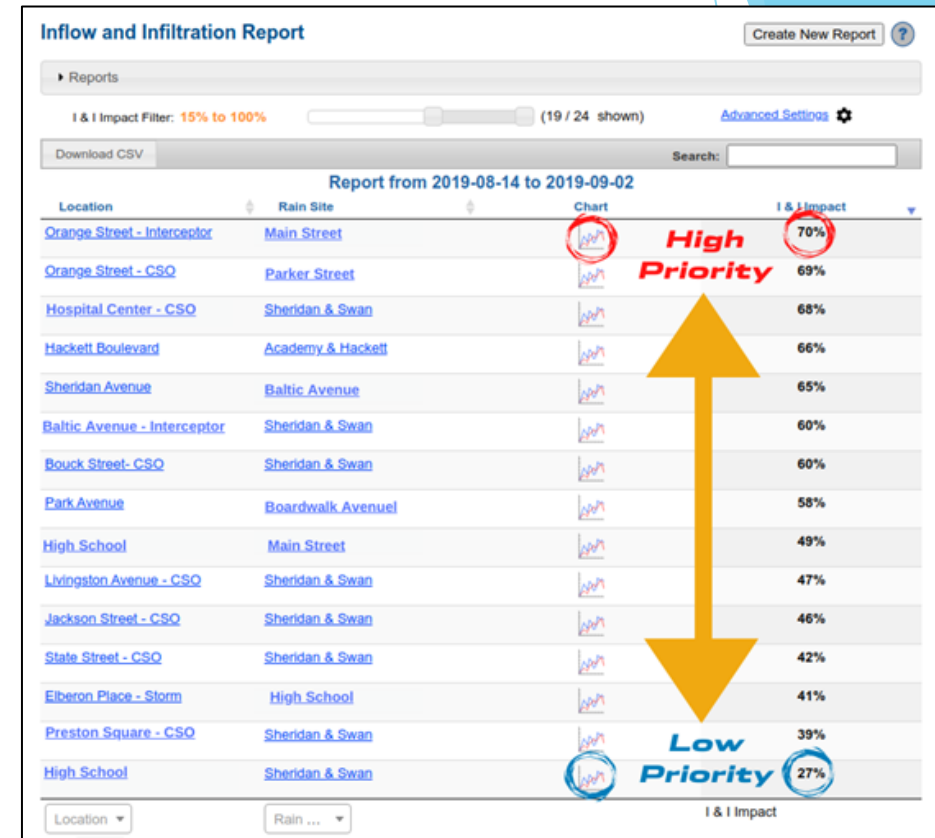
Inflow & Infiltration Detection

- 0.62 Mile Radius
- Multiple Sources (NOAA)
- Hourly Updates
- Download Data
- No Maintenance
- Non-Hardware

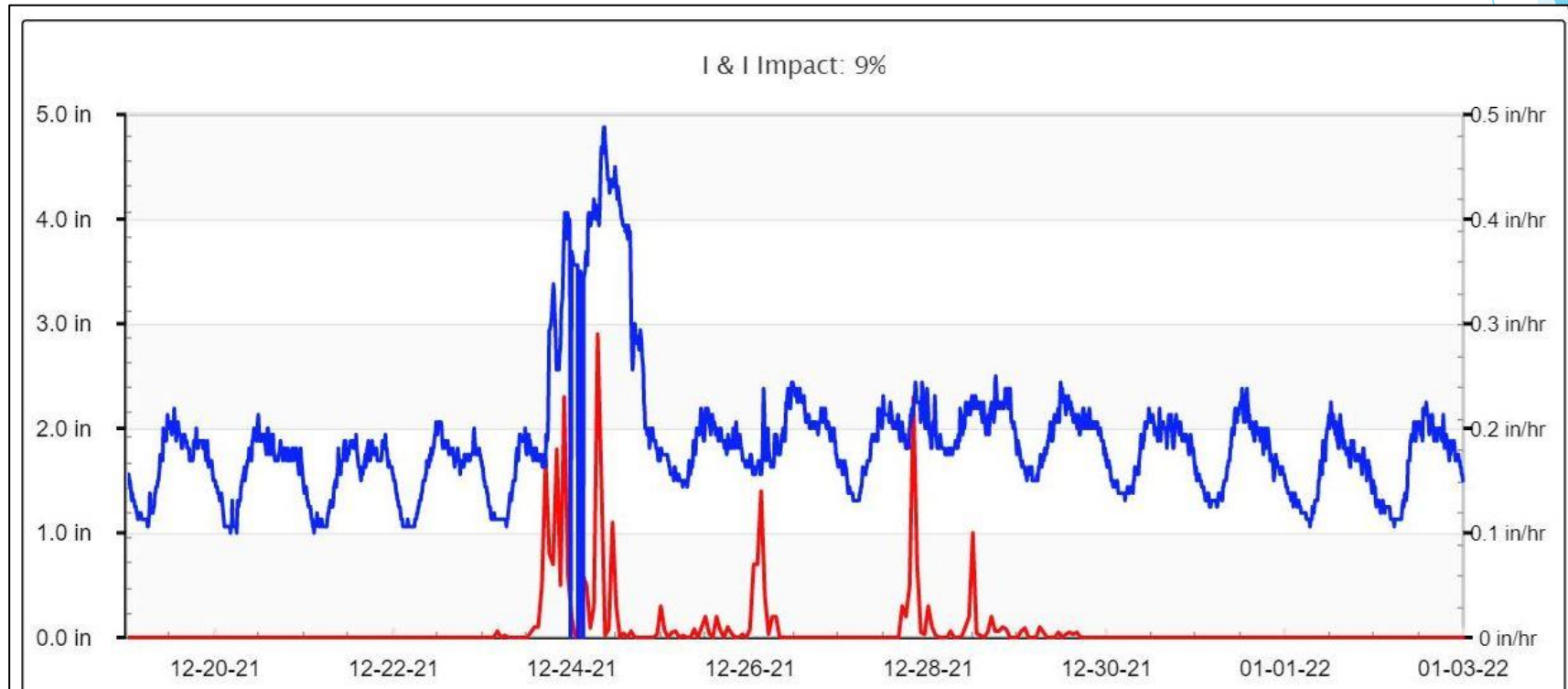


I&I Reporting Tool

- Automatic Reporting Tool
- Location Ranking Based On Impact



Agency In San Diego County



San Diego County



Thank You

Q&A

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