

# C/CAG STORMWATER COMMITTEE

## FEBRUARY 19, 2026



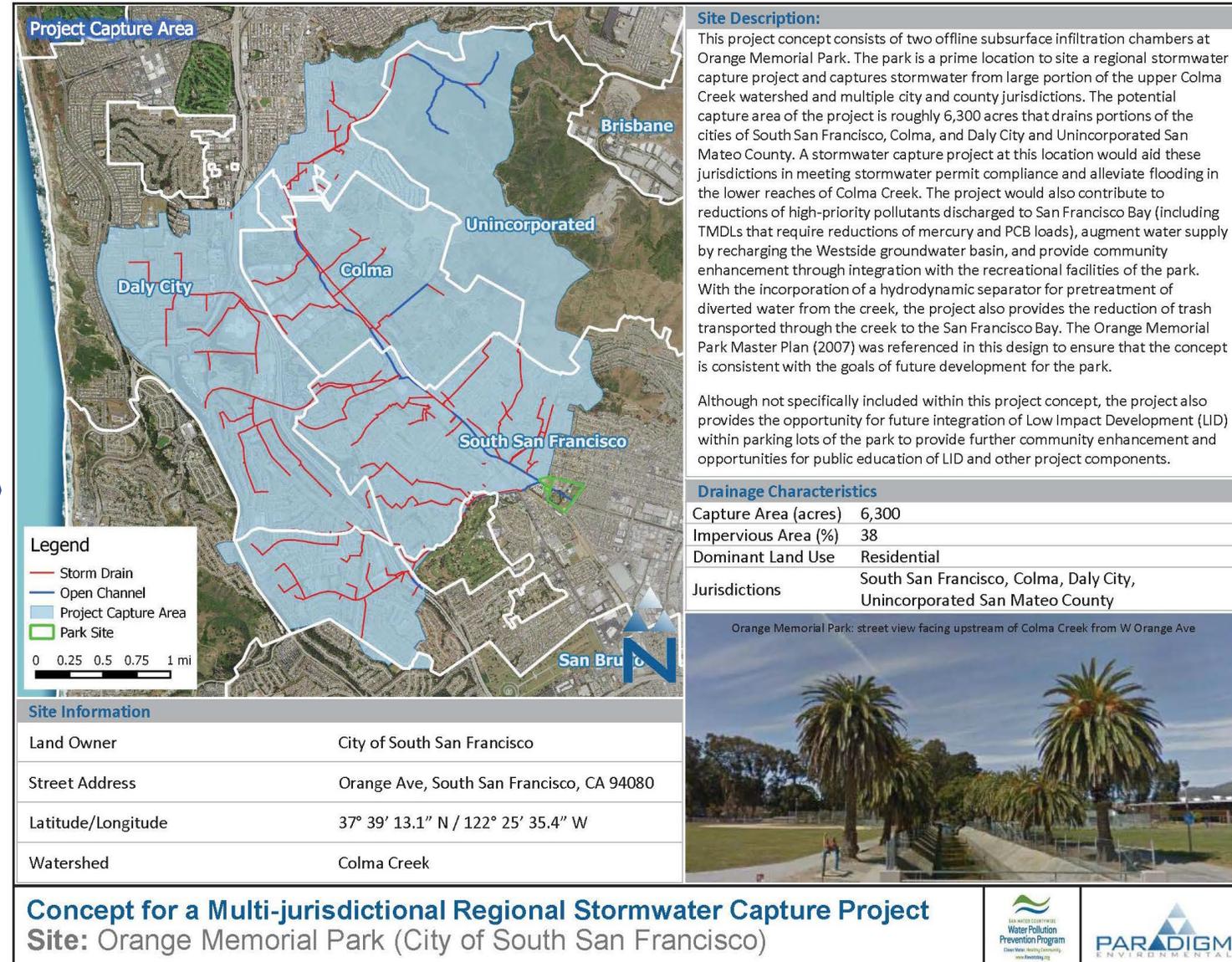
### Orange Memorial Park Regional Stormwater Capture Project

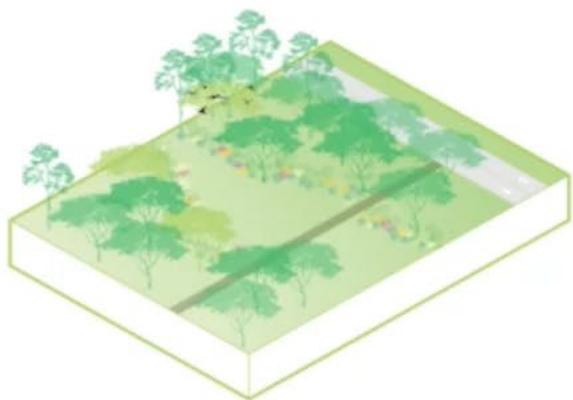
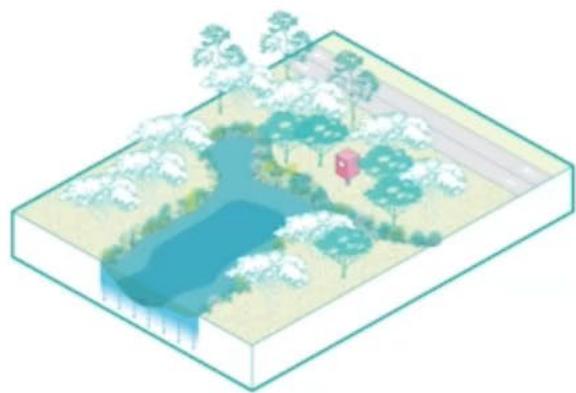
Rob Dusenbury, PE - Lotus Water



# PROJECT CONCEPT

- Original project concept by Paradigm is from the San Mateo County Stormwater Resource Plan (SWRP)
- Water quality project to remove PCB's, mercury & trash
- The SWRP concept attracted \$9.5M in funding from Caltrans
- At 60% design, Caltrans funded an additional \$6M to double project capacity

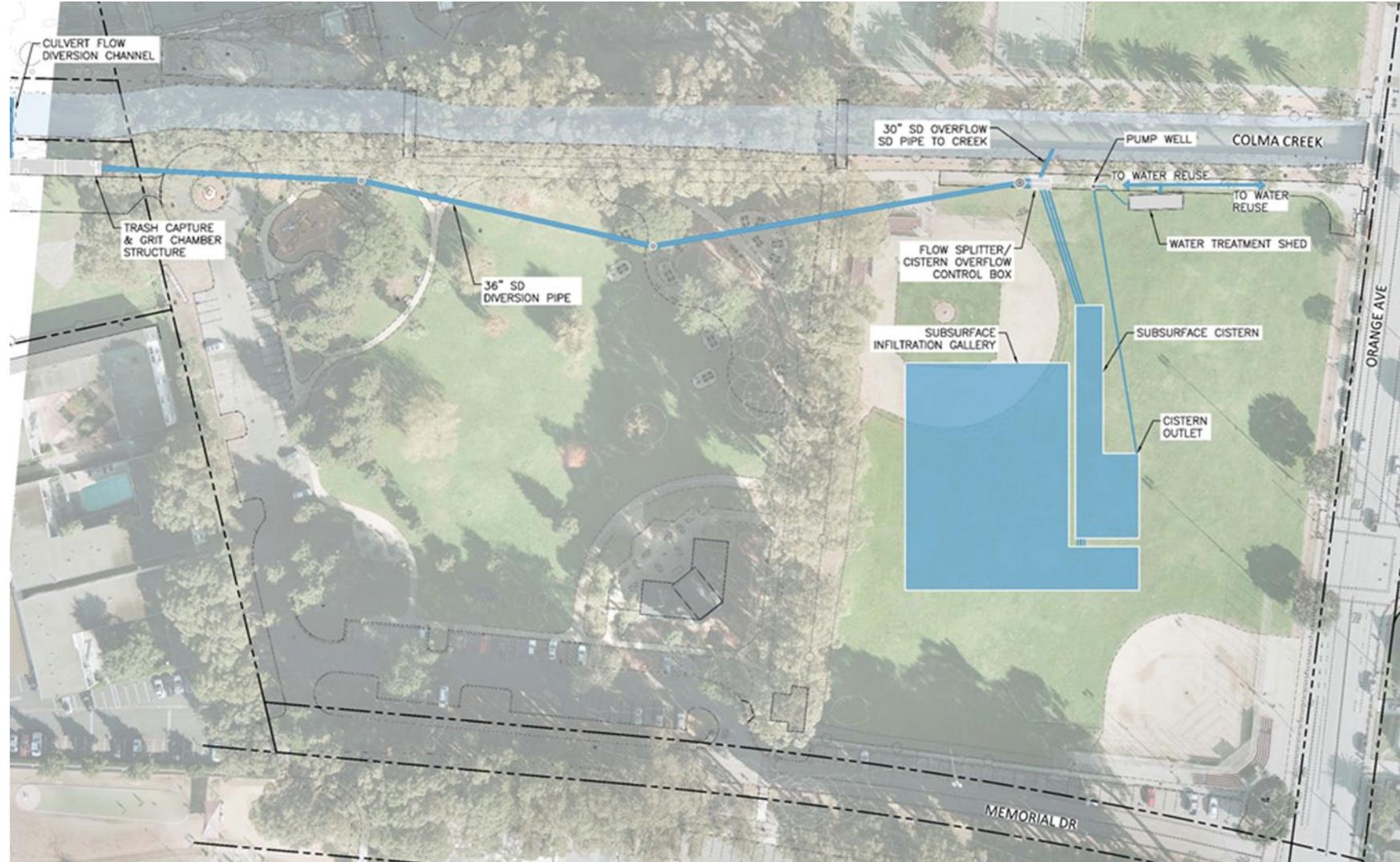




# Operations & Maintenance

## Project Elements

- Instream Diversion
- Trash/Grit Chamber
- Flow Splitter
- Cistern & Infiltration Gallery
- Water Quality Treatment Shed



# Operations & Maintenance

## Project Elements

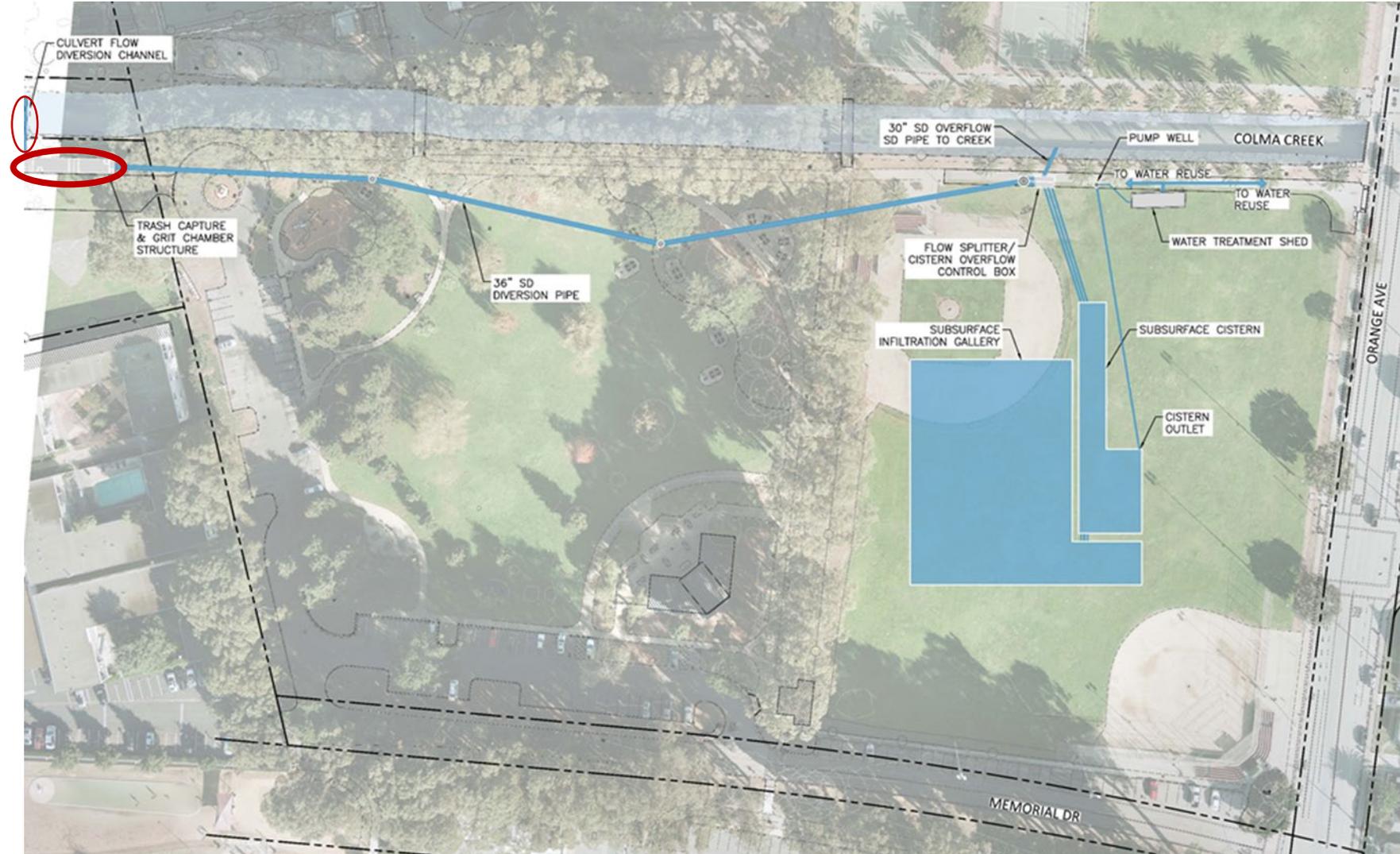
- **Instream Diversion**
- Trash/Grit Chamber
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# Operations & Maintenance

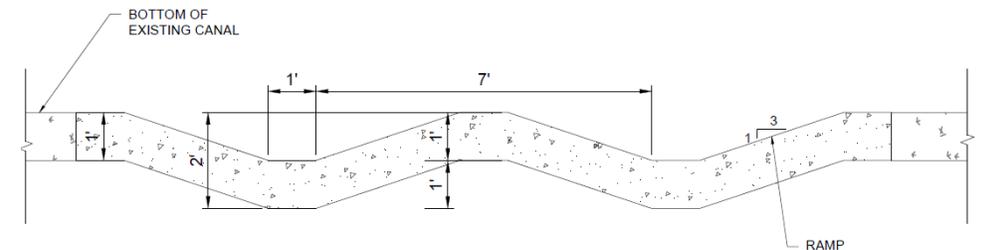
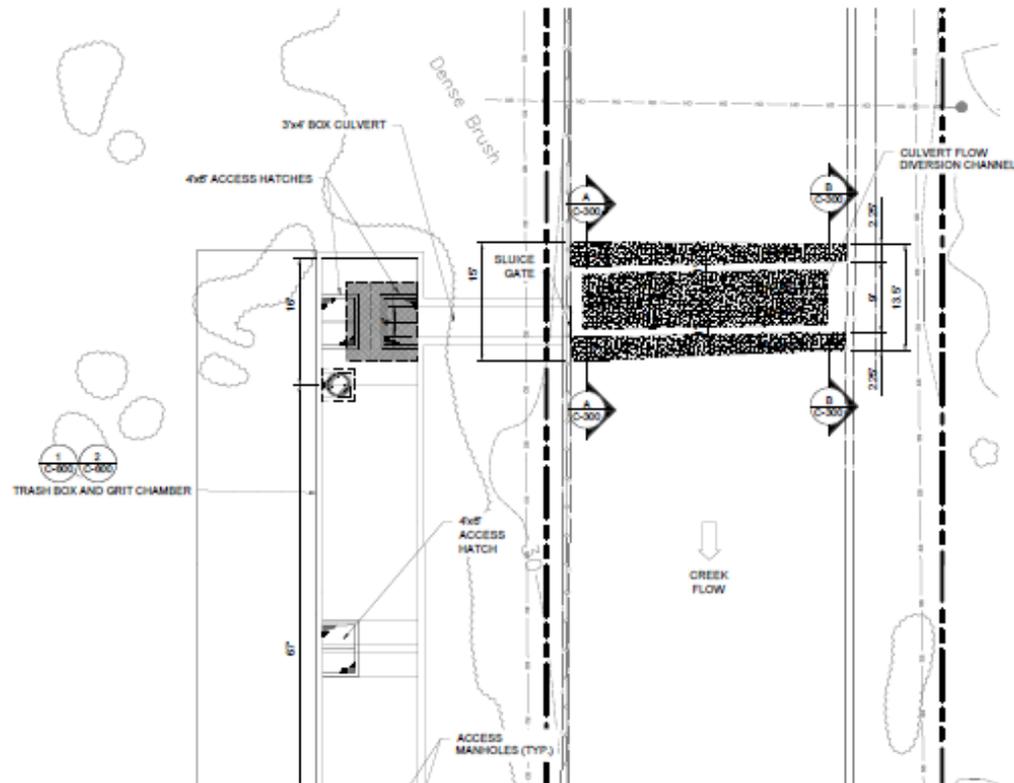
## Project Elements

- Instream Diversion
- **Trash/Grit Chamber**
- Diversion Pipe
- Cistern & Infiltration Gallery
- Water Quality Treatment Shed



# Lessons Learned: Heavy Bedload

- Expected low maintenance needs based on designing mainly for *suspended sediment* load



# Lessons Learned: Heavy Bedload

## More bed load than expected

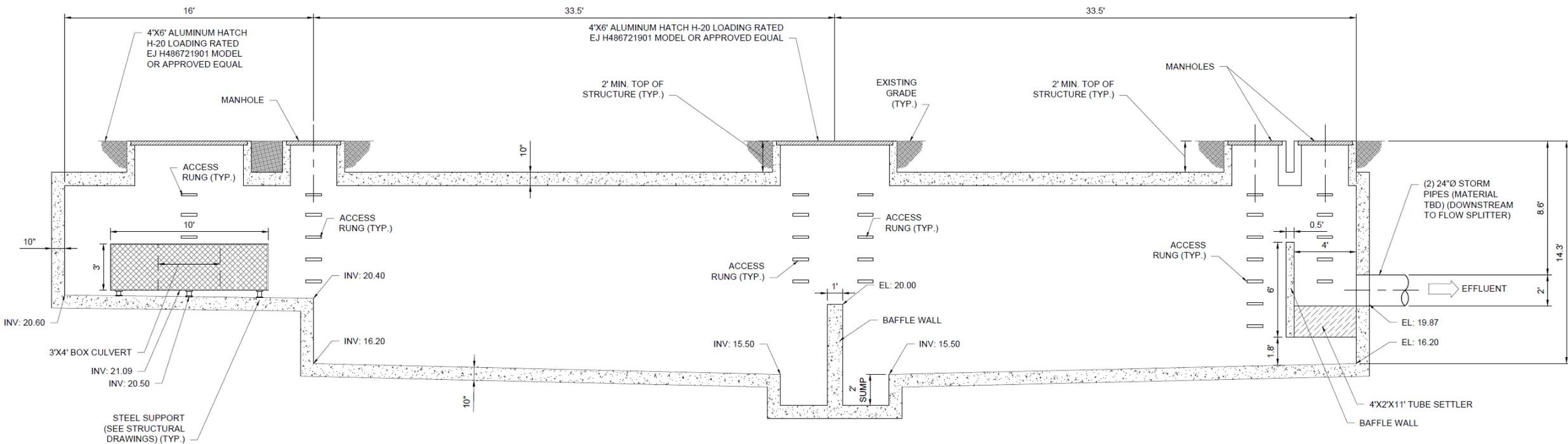
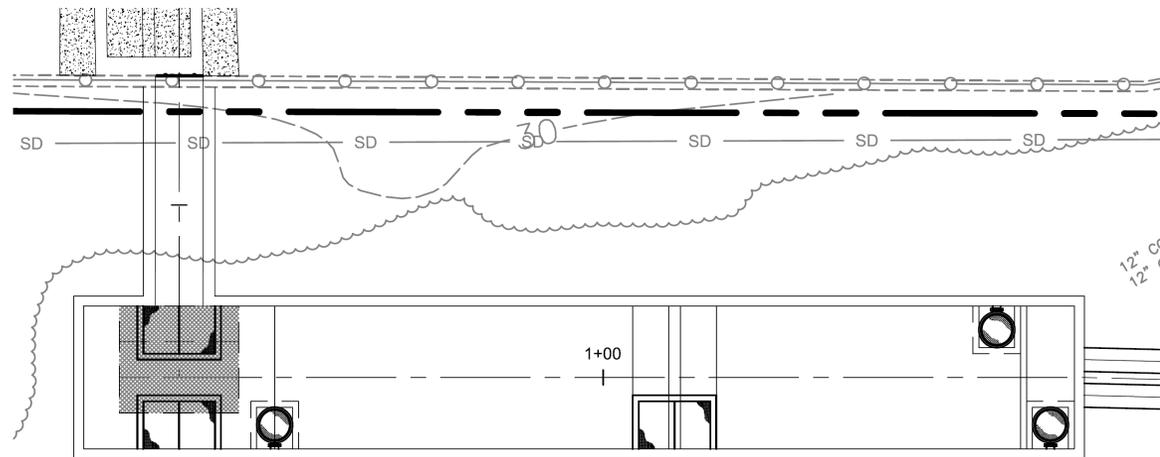
- In reality, a lot of *bed load* washes into and can eventually clog the instream diversion.
- During the rainy season, monthly cleaning of the diversion has become part of the Maintenance Plan, which is more than expected but allows for less cleaning of the main grit chamber.



# Grit/Trash Chamber

## Maintenance Requirements

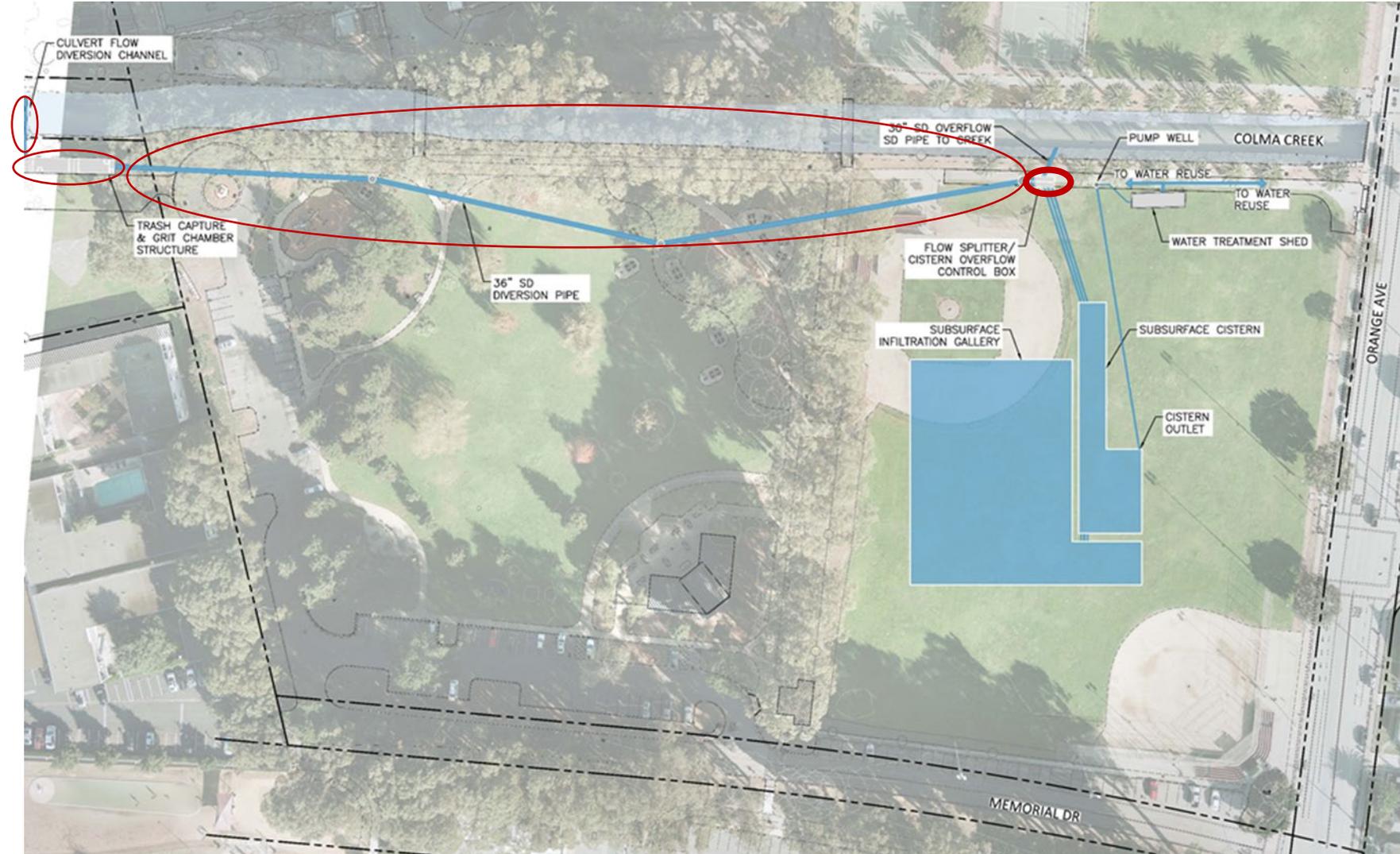
- Expected to clean out the whole thing 2X/yr
- Wound up cleaning trash rack ~monthly (along with the instream diversion) but the grit chamber only 1X/yr



# Operations & Maintenance

## Project Elements

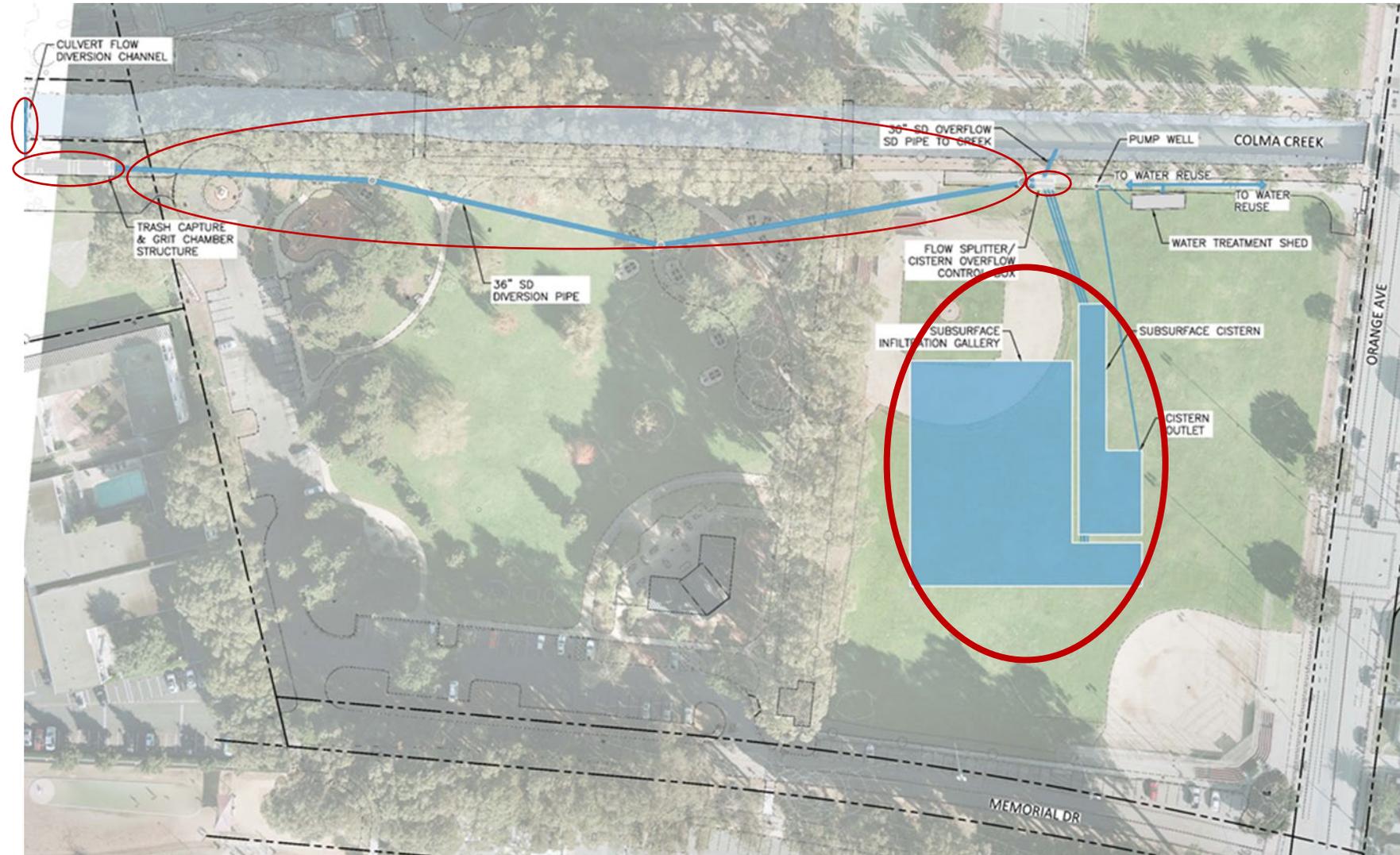
- Instream Diversion
- Trash/Grit Chamber
- **Flow Splitter**
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- Water Quality Treatment Shed



# Operations & Maintenance

## Project Elements

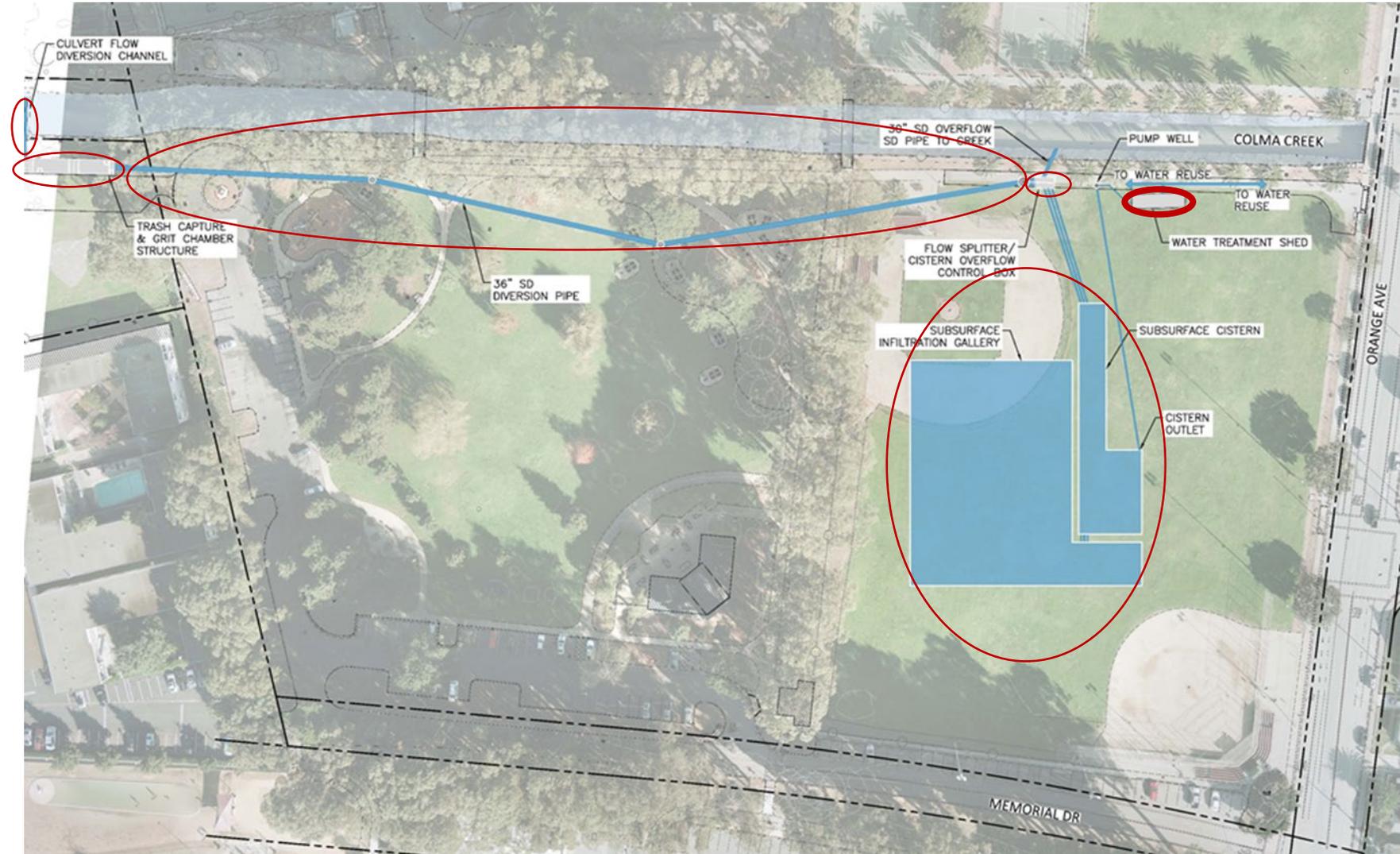
- Instream Diversion
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# Operations & Maintenance

## Project Elements

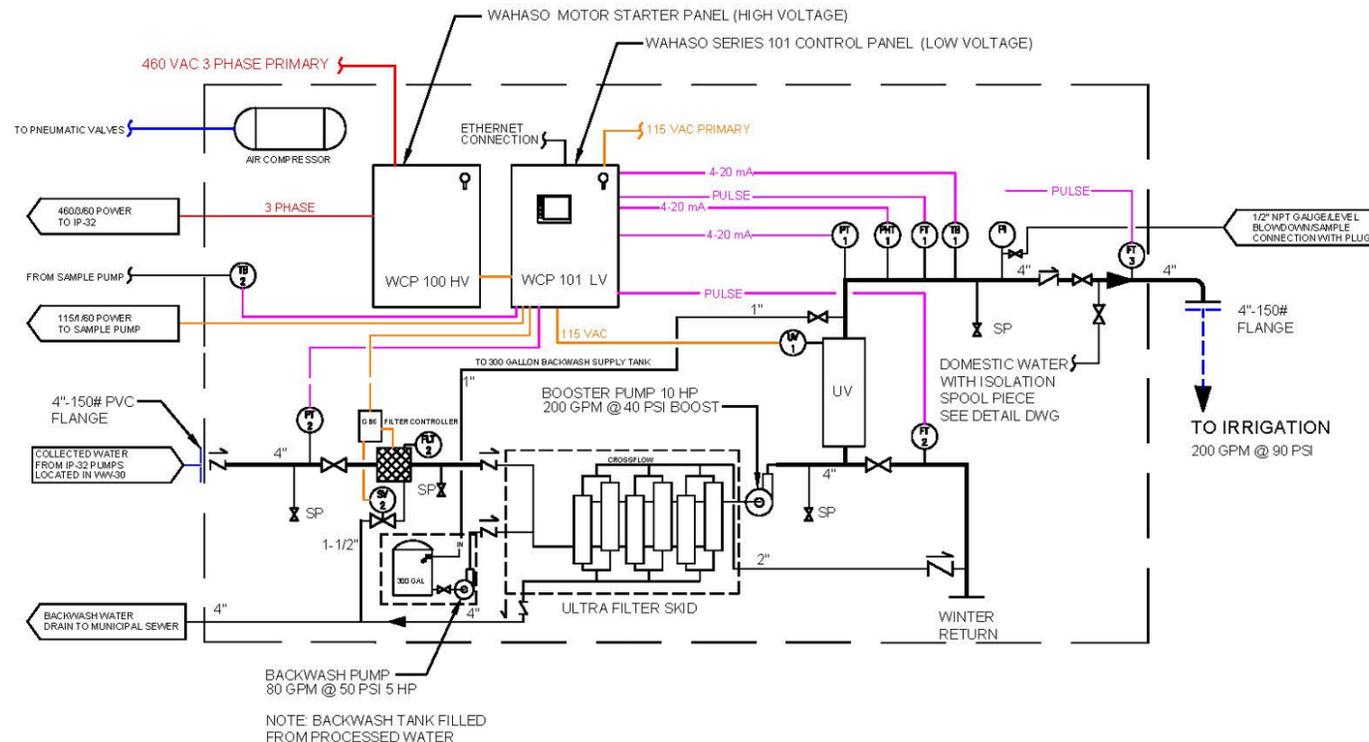
- Instream Diversion
- Trash/Grit Chamber
- Flow Splitter
- Cistern & Infiltration Gallery
- **Water Quality Treatment Building**



# Lessons Learned: Water Reuse Treatment System

## Original System

- Fully commissioned system brought online Jan 2024
- Filter membranes ruptured over and over
- Programming shutdowns, no remote monitoring



# Lessons Learned: Water Reuse Treatment System

- New skid installed October 2025
- Brought online for testing/commissioning in November 2025
- Treatment Train

## Pretreatment

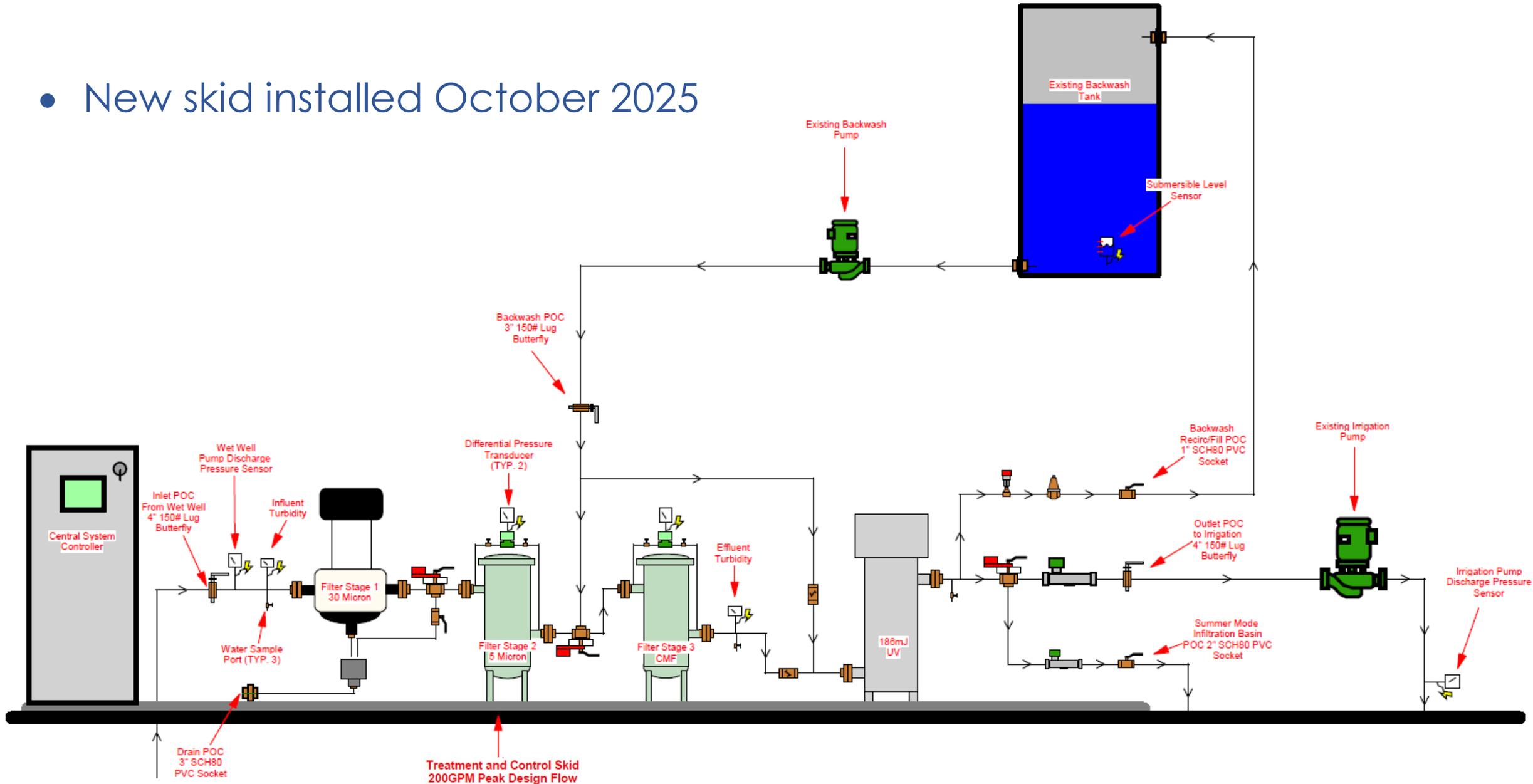
- Trash rack → grit chamber → cistern

## In-building

- 30-micron sediment filter with automatic, non-interruptive backwash
- 5-micron cartridge filter array, 99% retention efficiency
- Charged membrane filter array, 0.002-micron net retention pore size (NSF P231 certified)
- High dosage UV; certified dose of 186mJ/cm<sup>2</sup> at 240gpm

# Lessons Learned: Water Reuse Treatment System

- New skid installed October 2025



# Operations & Maintenance Level of Effort

Element	Frequency	Intensity
Instream Diversion	Monthly	Medium
Grit/Trash Chamber	2 per year	High
Flow Splitter	After large storms	Low
Cistern	1 per 3-5 years	High
Infiltration Gallery	1 per 10+ years	High
Water Reuse System	Daily	Low

Total cost for first three years ~\$300K/yr

# Monitoring Requirements

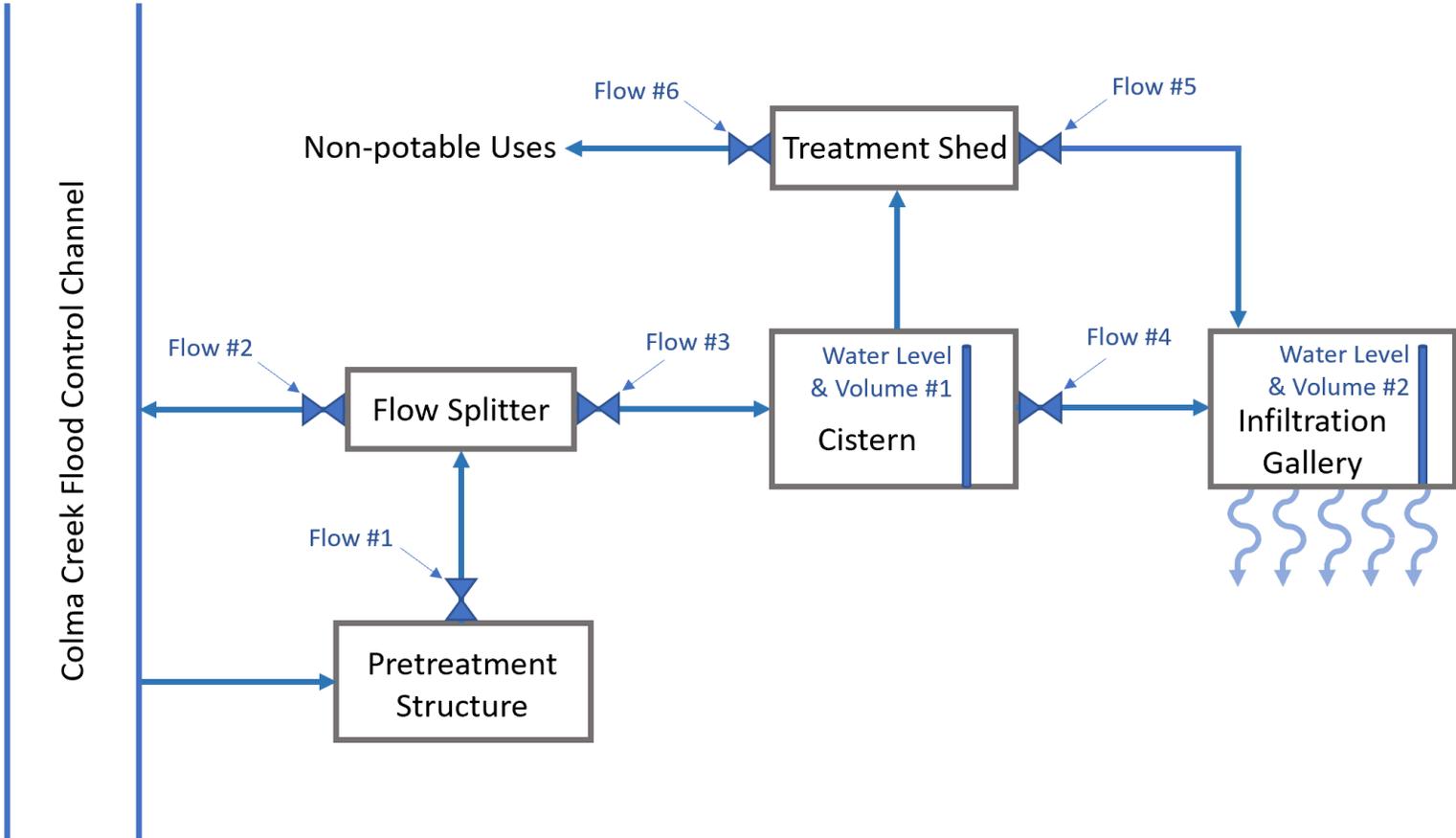
- Established primarily by the 401 Permit and Waste Discharge Requirements administered by the Bay Area Regional Water Board
  - Environmental Water Quality Monitoring (many constituents)
  - Performance Monitoring (PCB and Hg removal)
  - Flow Monitoring (water balance with fate of treated waters)
- The water reuse system is regulated by the City itself
  - SB 966 looms large for potential CT requirement



# Monitoring Requirements

## 1. Flow Monitoring

- Diverted
- Infiltrated
- Reused
- Returned to Stream



# Monitoring Requirements

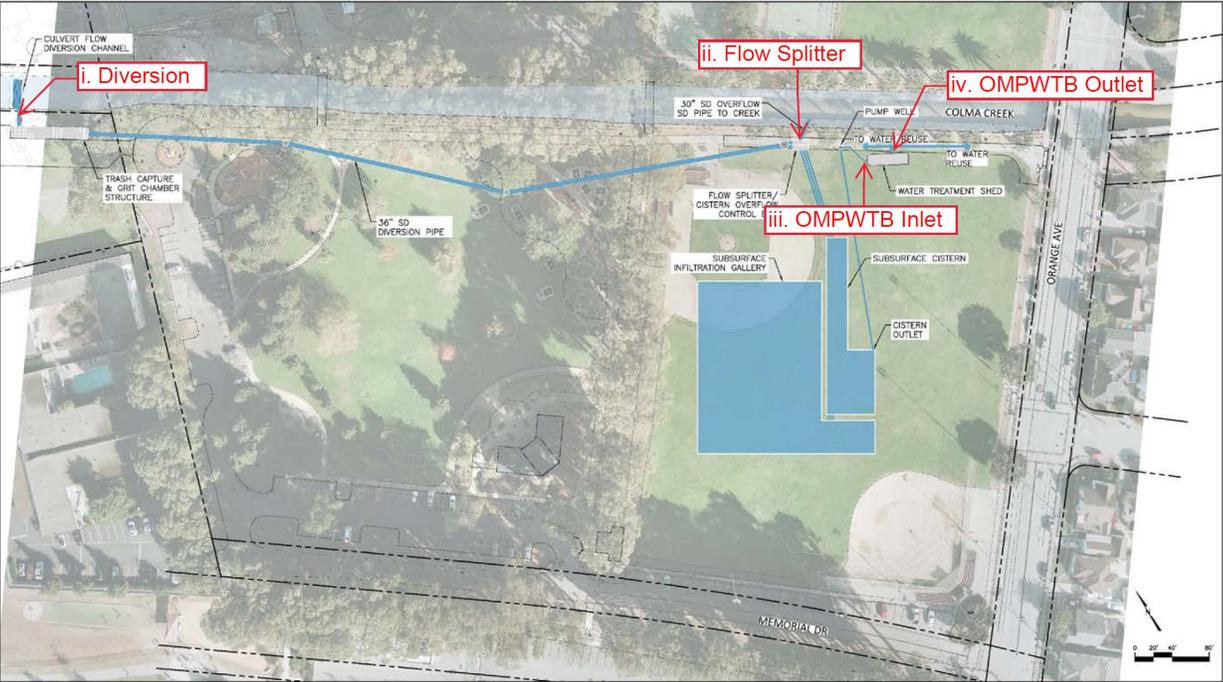
- 2. Performance Monitoring for PCBs, Hg, and Trash removal
  - Trash placed in 50-gal bags
  - Soil dried then offhauled to Ox Mountain Landfill (Class III)

<i>Contaminant</i>	<i>Sample Type</i>	<i>Frequency</i>	<i>Testing Method</i>
PCBs	Sediment	Biannual (2/year)	EPA 1668C
Mercury	Sediment		EPA 7471A
Total Organic Carbon (TOC)	Sediment		EPA 9060A
Moisture	Sediment		ASTM D-2216 (M)



# Monitoring Requirements

## 3. Environmental Water Quality Monitoring



Analyte	Frequency	Testing Method
Temperature	Monthly first 3 months Biannual next 2 years	EPA 170.1
pH		SM 4500-H+B
Turbidity		SM 2130B
Chemical Oxygen Demand (COD5)		SM 5220D
Total Coliform		SM 9223
Total Suspended Sediment (TSS)		SM 2450D
Volatile Organic Compounds (VOC's)		EPA 8260B
TPH's (Gas, Diesel and Motor Oil)		EPA 8015
Total Oil & Grease (TOG)		EPA 1664B
Polycyclic Aromatic Hydrocarbons (PAH's)		EPA 8270
Polybrominated Diphenyl Ethers (PBDE's)		GC-MS SIM
Dissolved Copper		EPA 6010B
Pyrethroid Pesticides Full List		EPA 8270 SIM
Per- and Polyfluoroalkyl Substances (PFAS)		EPA 537
UV Transmittance	Continuous	in situ sensor
Flow	Continuous	in situ sensor



# Monitoring Requirements

## 4. Non-potable Reuse Monitoring

<i>Parameter</i>	<i>Water Quality Limit</i>	<i>Monitoring Frequency</i>
Virus	Treatment must achieve at least 3.0-log reduction in enteric virus for outdoor reuse.	Continuously <sup>2</sup>
Protozoa	Treatment must achieve at least 2.5-log reduction in parasitic protozoa for outdoor reuse.	Continuously <sup>2</sup>
Bacteria <sup>1</sup>	Treatment must <u>achieve</u> at least: <ul style="list-style-type: none"> <li>• 2.0-log reduction in enteric bacteria for outdoor reuse</li> <li>AND</li> <li>• Concentrations shall not exceed: 2.2 MPN/100 mL as a seven-sample median; 23 MPN/100 mL as the 30-day maximum; or 240 total coliform bacteria per 100 mL at any time</li> </ul>	Continuously <sup>2</sup>  Biweekly for first 3 months then biannually
Turbidity	<ul style="list-style-type: none"> <li>• The median inflow concentration shall not exceed 5 NTU within a 24-hour period; and</li> <li>• The maximum inflow concentration shall not exceed 5 NTU at any time.</li> </ul>	Continuously
VOCs	See Table 5	Monthly for first 3 months then biannually <sup>3</sup>
Odor	The system <u>shall</u> not emit offensive odors.	n/a
Flow	At least one flow meter must be installed to measure the volume of water passing through the water treatment system.	Continuously

Notes:

1. Pathogenic microorganism control for bacteria is achieved by complying with water quality limits for total coliform. Total coliform sampling shall be conducted biweekly during the commissioning period.
2. Log reduction in microorganisms is monitored via continuous measurement of Ultraviolet Transmittance (UVT). If measured UVT drops below the prescribed thresholds of either 75% of the UV irradiator's maximum UVT or 45 mJ/cm<sup>2</sup>, flow through the treatment system is automatically stopped.
3. The Regional Board may reduce the frequency of VOC monitoring if the first two years of stormwater system monitoring results demonstrate consistent evidence of minimal risk of contamination by VOCs.



# Thank you!

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