

CHINO BASIN WATER CONSERVATION DISTRICT

The Confluence Regional Water Resource Project

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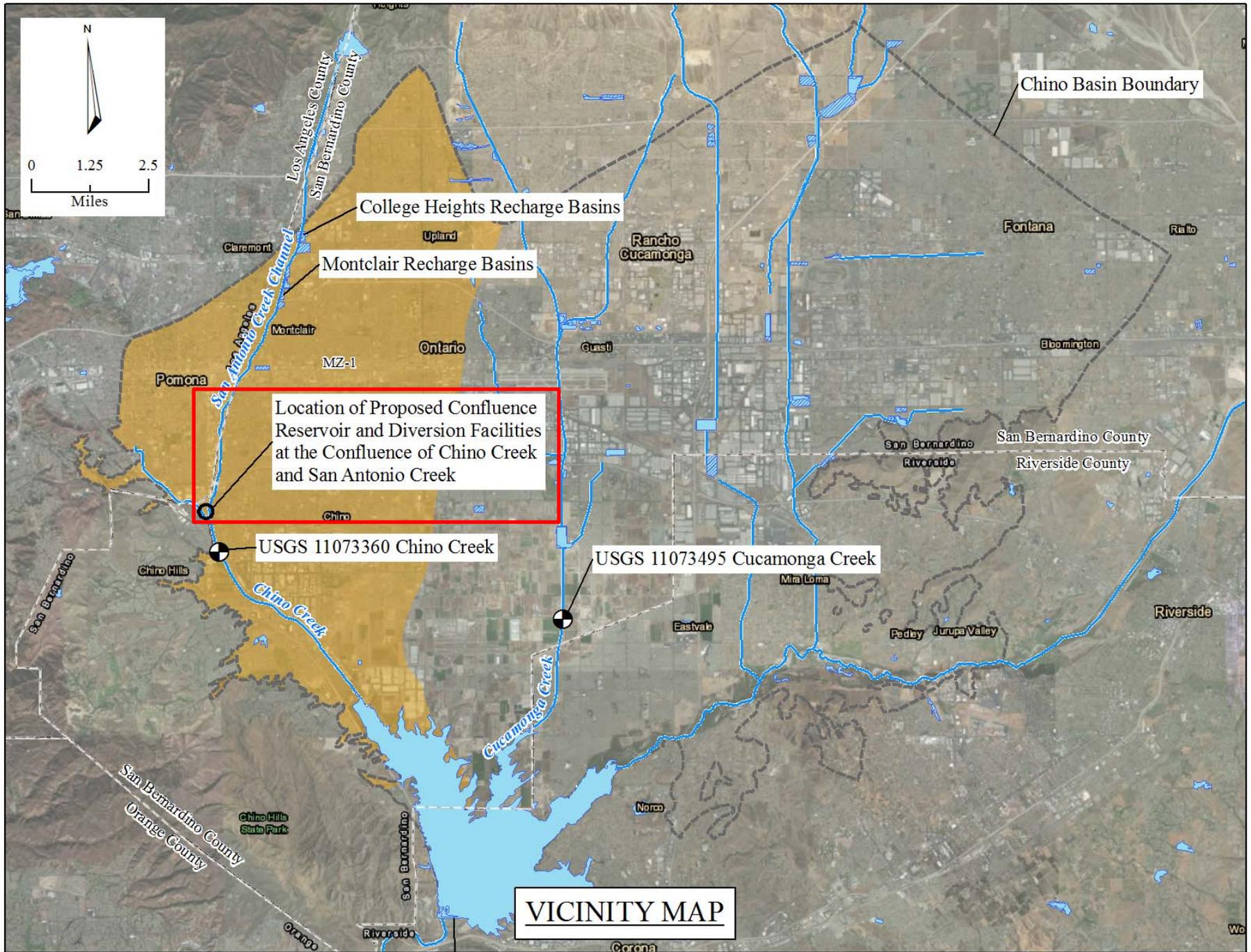
Confluence Regional Water Resource Project

- Current state of diversions within Chino Basin
 - Average Recharge 11,000 af/yr
 - Watermaster Water Right Permit allows 68,500 af
- MZ-1 recharge operations & subsidence
- Water quality issues
- Maximize use of existing recharge facilities
- Recycled water supply vs. increased stormwater capture

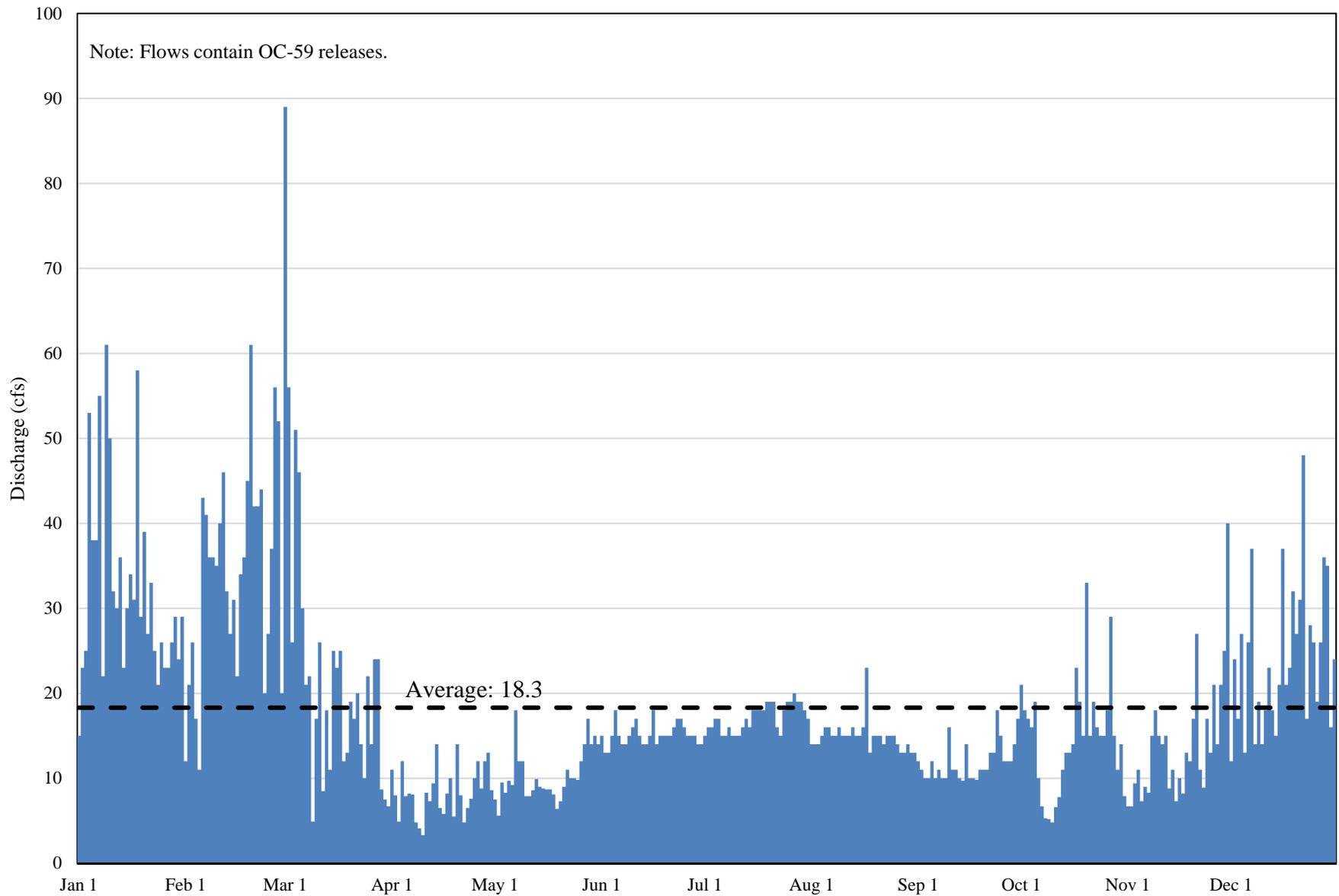
Confluence Regional Water Resource Project

Project Benefits

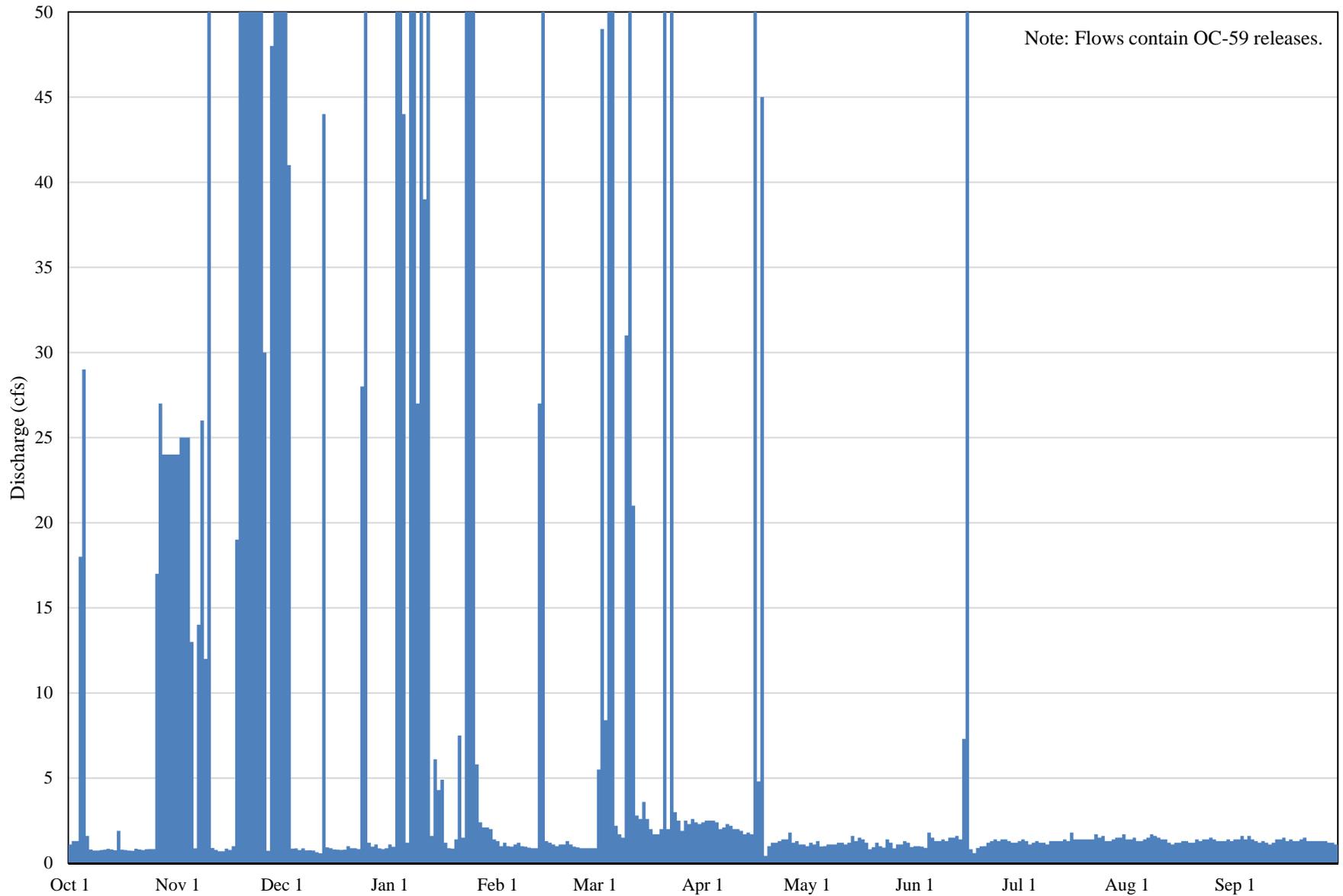
- Capture water that would otherwise leave the basin
- Improve water quality
- Reduce subsidence in MZ-1
- Scientific research and development
 - Develop academic learning center
- Public education and recreation



USGS 11073360 Chino Creek at Schaefer Ave near Chino, Ca
Daily Mean Discharge for Period of Record, 1970-2017



USGS 11073360 Chino Creek at Schaefer Ave near Chino, Ca
Discharge for Near-Average Water Year (1995)



Project Description

1. Construct Groundwater Recharge and Regulatory Storage Reservoir
2. Construct Diversion Facilities
3. Construct Regional Water Conveyance
4. Construct and Develop Water Quality Improvement Facilities and Features
5. Create Environmental Enhancement

Project Location



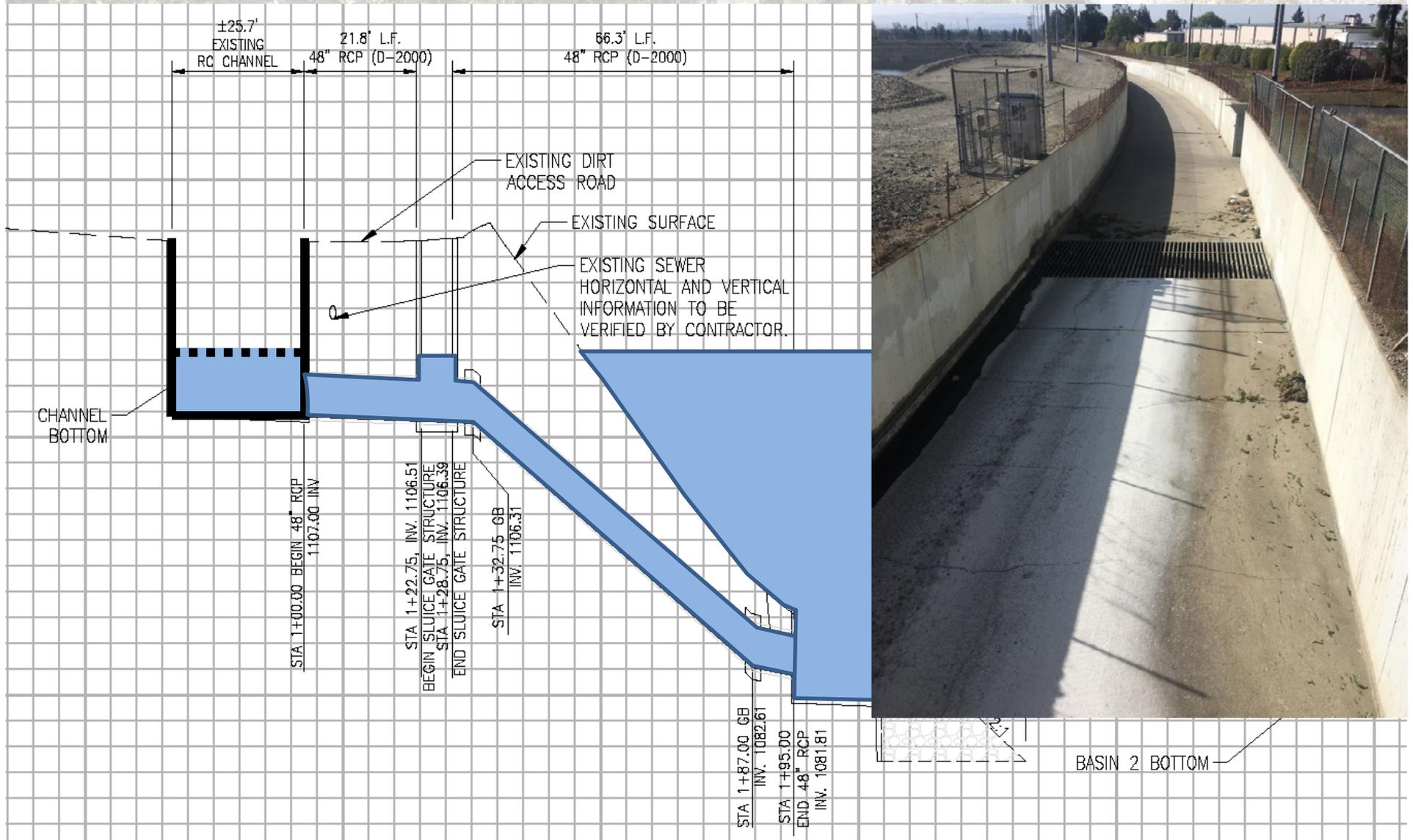
Confluence Reservoir



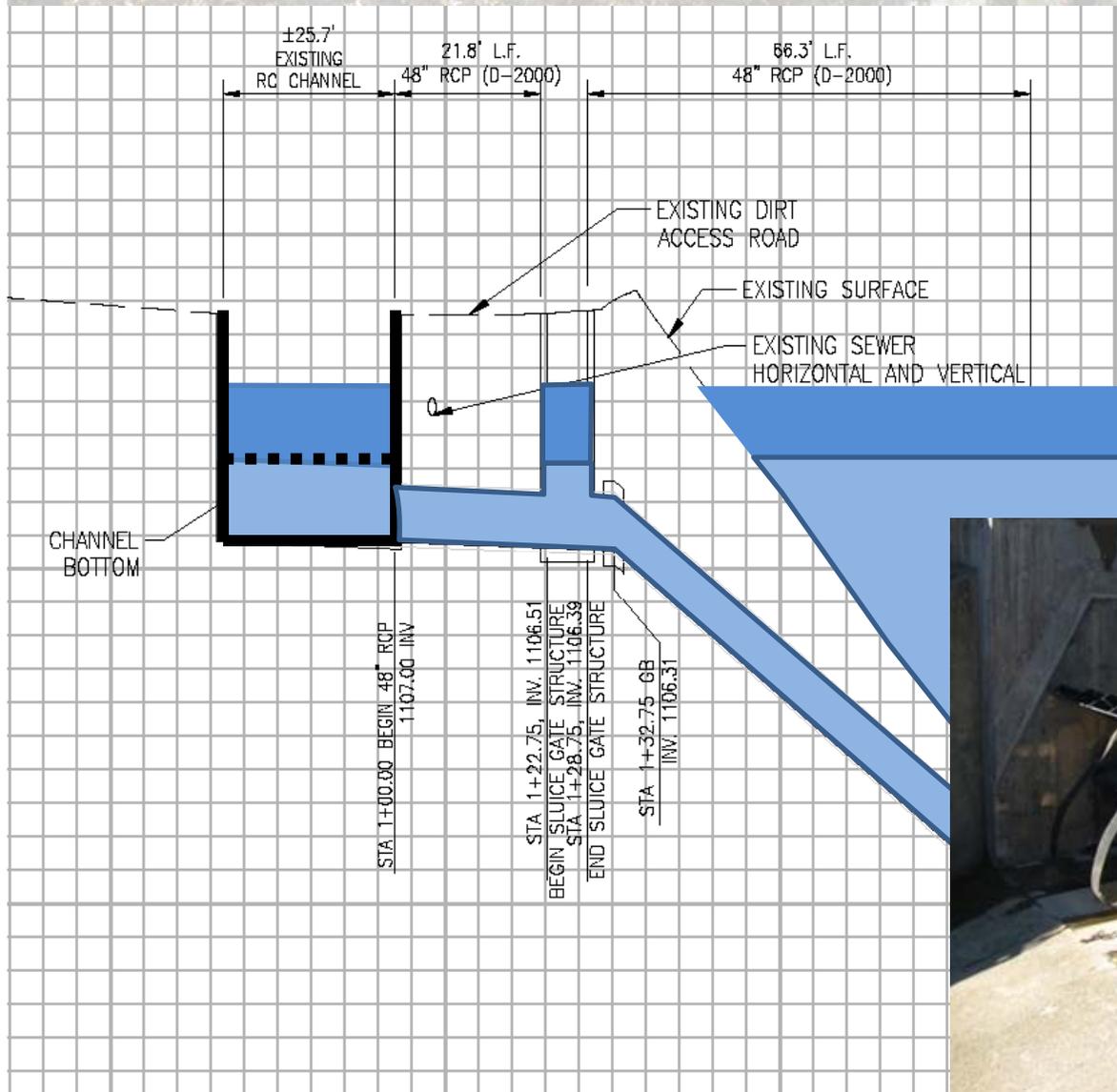
Diversion Facilities



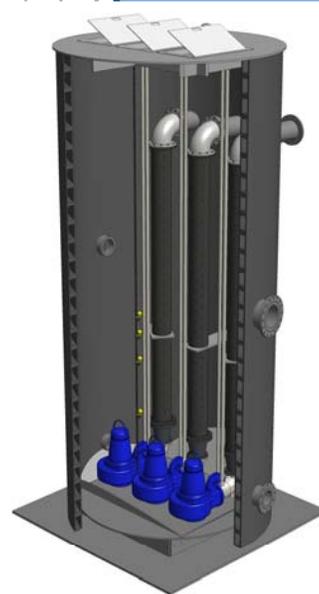
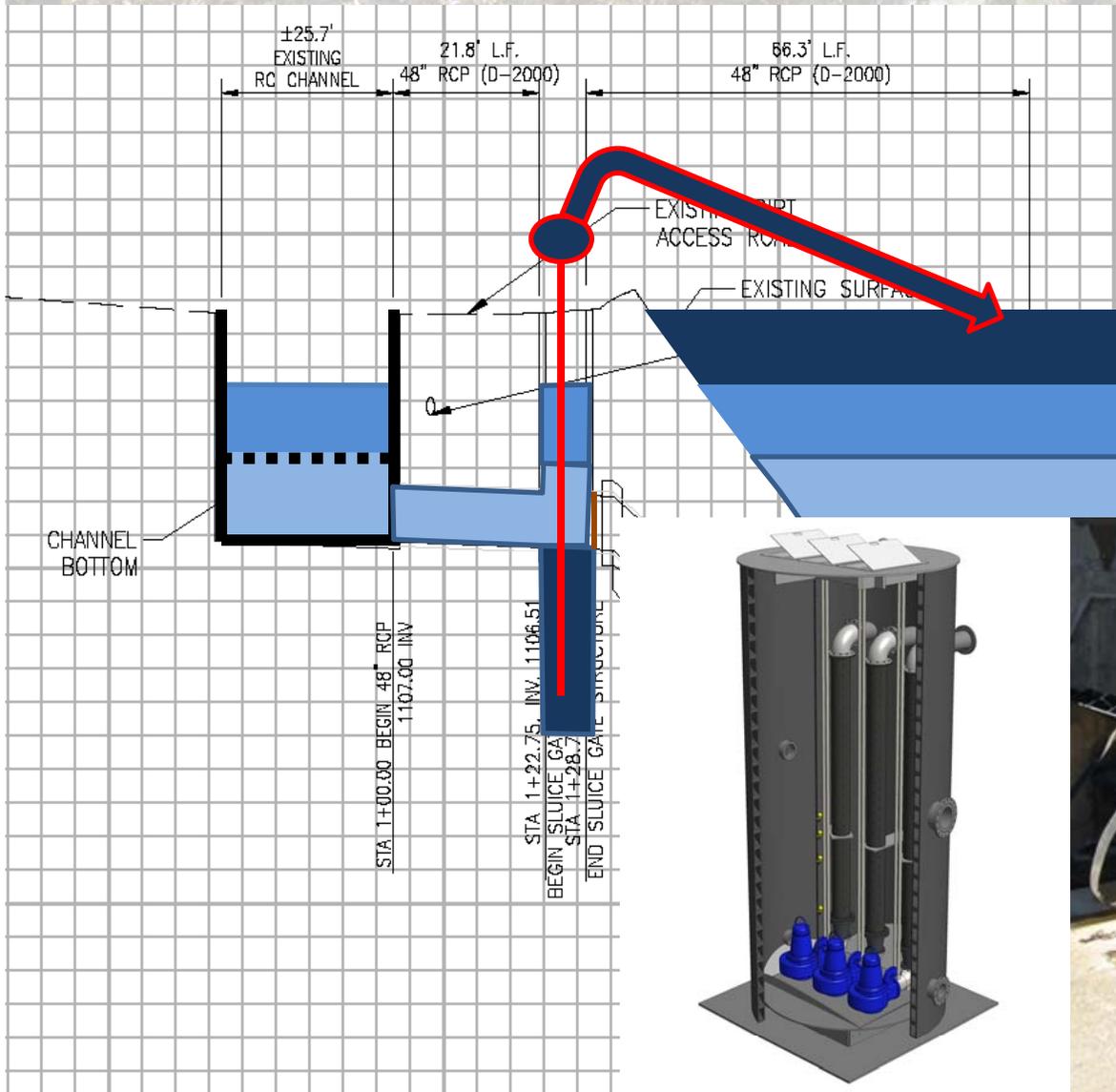
Gravity Diversion Facility



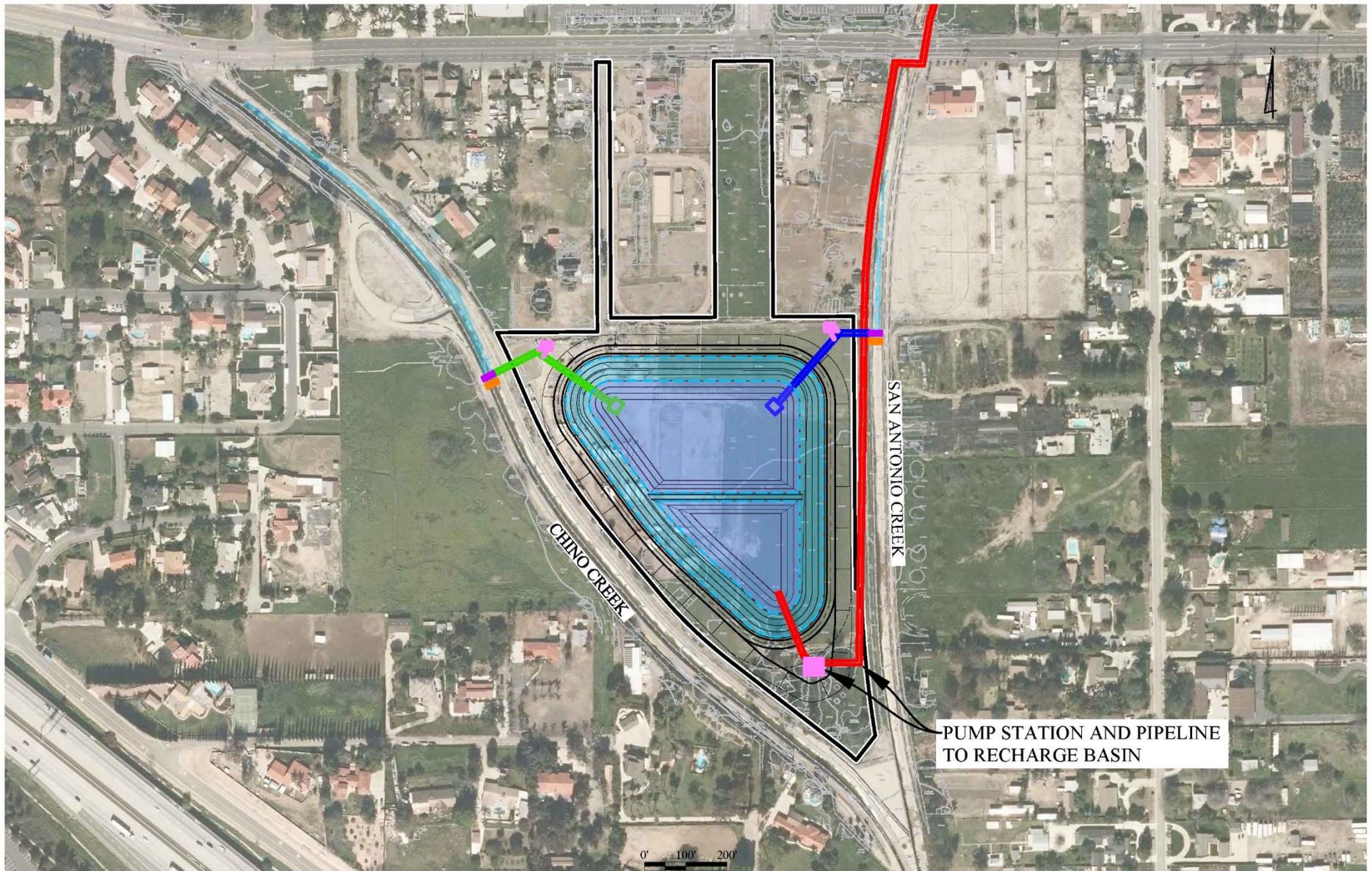
Gravity Diversion Facility – Pneumatically Actuated Bladder Gate



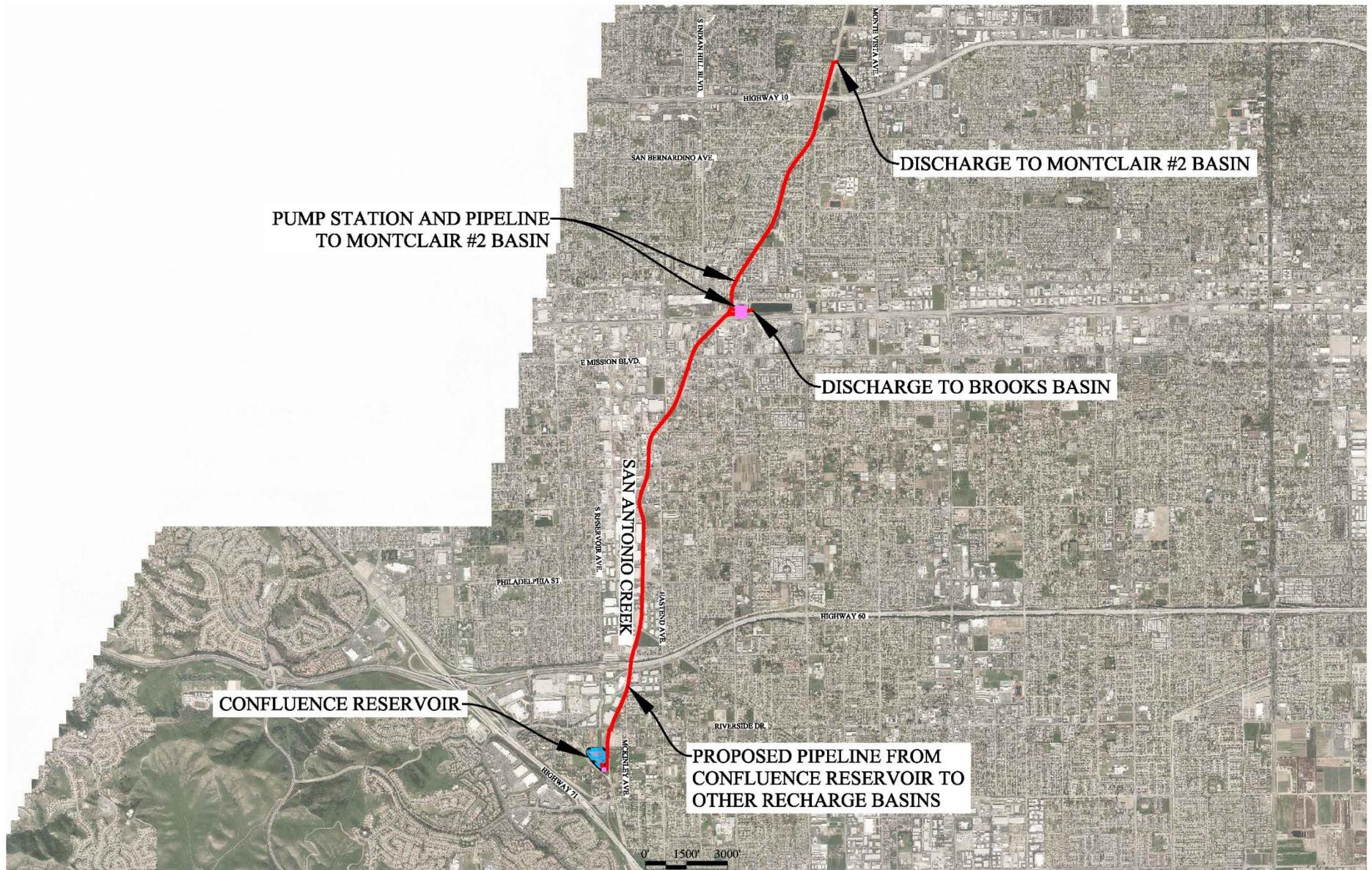
Pumped Diversion Facility



Pumping Facility and Conveyance System



Pipeline to Recharge Basins



Estimated Annual Recharge

- Conservation storage at the Confluence Reservoir
 - Average annual recharge of about 60 to 80 af/yr
- Conservation storage developed from pumping to other recharge facilities
 - Estimated to develop between about 1,770 to 2,430 af/yr
- Total conservation storage developed by the project
 - Estimated to be about 1,830 to 2,490 af/yr

Water Quality Benefits

The Confluence Project will capture approximately 37% of the annual flow that passes the Project site

- Captured Nitrate-N load will be in the range of 17 tons/yr.
- Captured TSS load will be in the range of 32 tons/yr.
- E. coli bacteria loads from Chino Creek will be reduced by 1 billion CFU/day, a 3% reduction of the TMDL

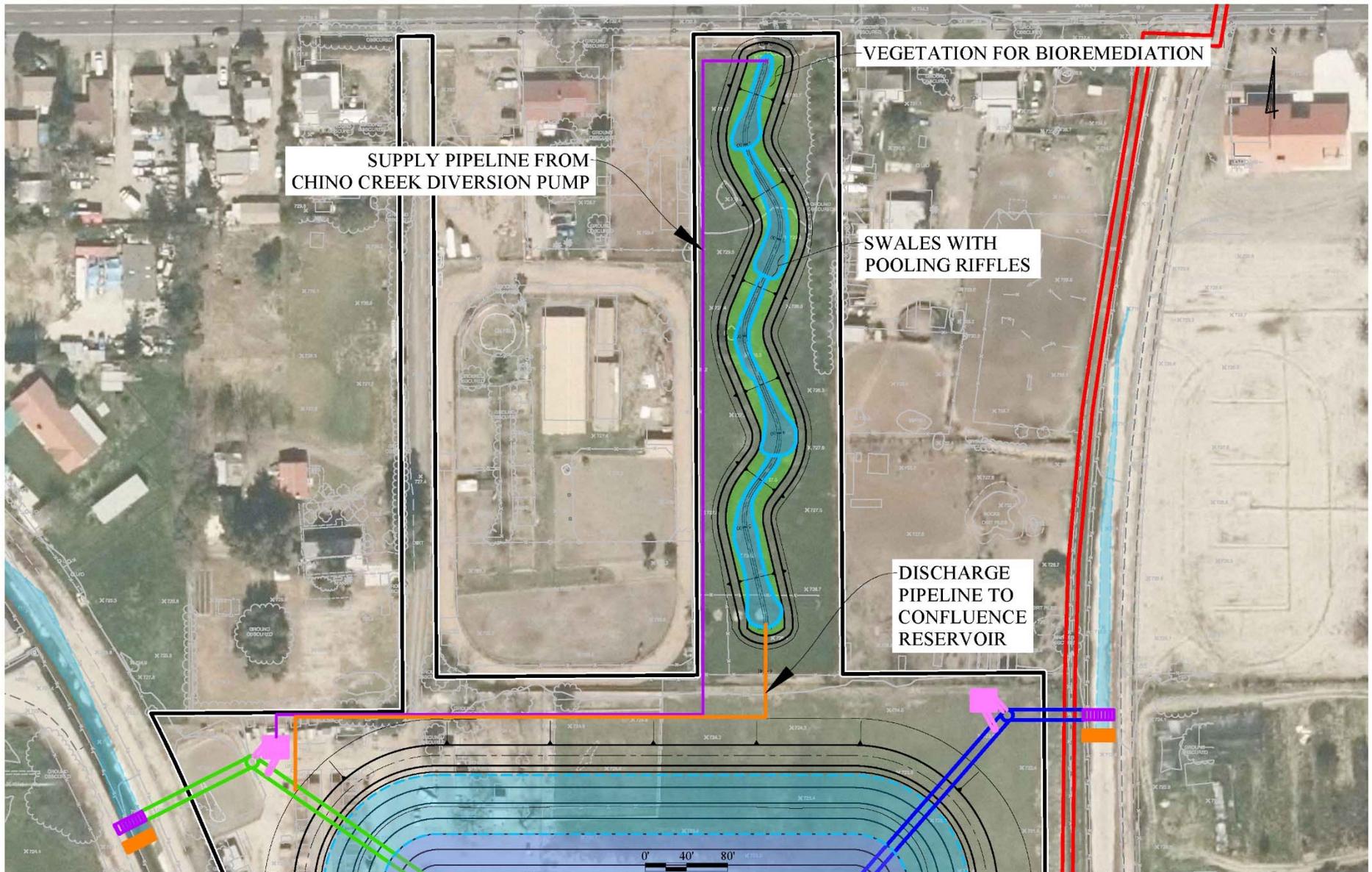
Water Quality Cost Benefit

- Equivalent Annual Cost over 20 years for Nitrate treatment cost is \$55/lb N
- Cost for TSS treatment cost is \$29/lb
 - Virginia & Maryland studies indicate removal cost ranges from \$500 to \$4,600/lb N
 - Virginia TSS cost is \$44/lb
- Treatment costs are significantly less than published costs from Virginia and Maryland

Educational and Public Benefits

- Project can support scientific research and testing of various means and methods of improving water quality.
- Education outreach opportunities for various public and scientific communities.
- Habitat enhancement and bioremediation treatments consistent with recreational opportunities for the public.

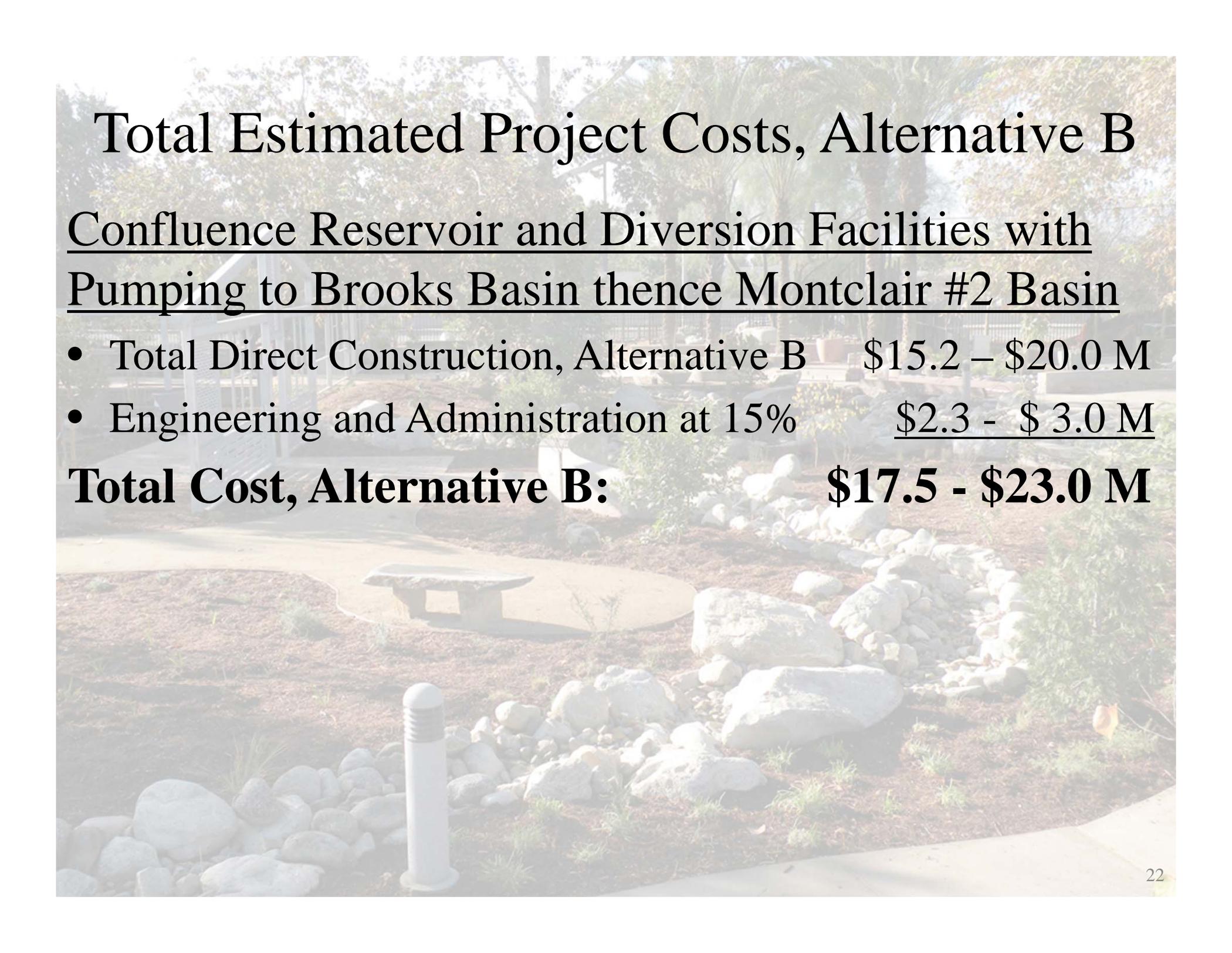
Habitat and Bioremediation Channel



Total Estimated Project Costs, Alternative A

Confluence Reservoir and Diversion Facilities with Pumping Directly to Montclair #2 Basin from Confluence Reservoir

- Total Direct Construction, Alternative A \$14.7 - \$18.5 M
 - Engineering and Administration at 15% \$2.2 - \$2.8 M
- Total Cost, Alternative A: \$16.9 - \$21.3 M**



Total Estimated Project Costs, Alternative B
Confluence Reservoir and Diversion Facilities with
Pumping to Brooks Basin thence Montclair #2 Basin

- Total Direct Construction, Alternative B **\$15.2 – \$20.0 M**
- Engineering and Administration at 15% **\$2.3 - \$ 3.0 M**

Total Cost, Alternative B: **\$17.5 - \$23.0 M**

Estimated O&M and Energy Costs

Unit Costs for O&M, per af of Total Conservation Storage is:

- Alternative A (Direct to Montclair #2): \$55 - \$58
- Alternative B (BB thence to Montclair #2): \$62 - \$65

Unit Costs for Energy, per af of water pumped to Conservation Storage is:

- Alternative A (Direct to Montclair #2): \$105 - \$140
- Alternative B (BB thence to Montclair #2): \$130 - \$160

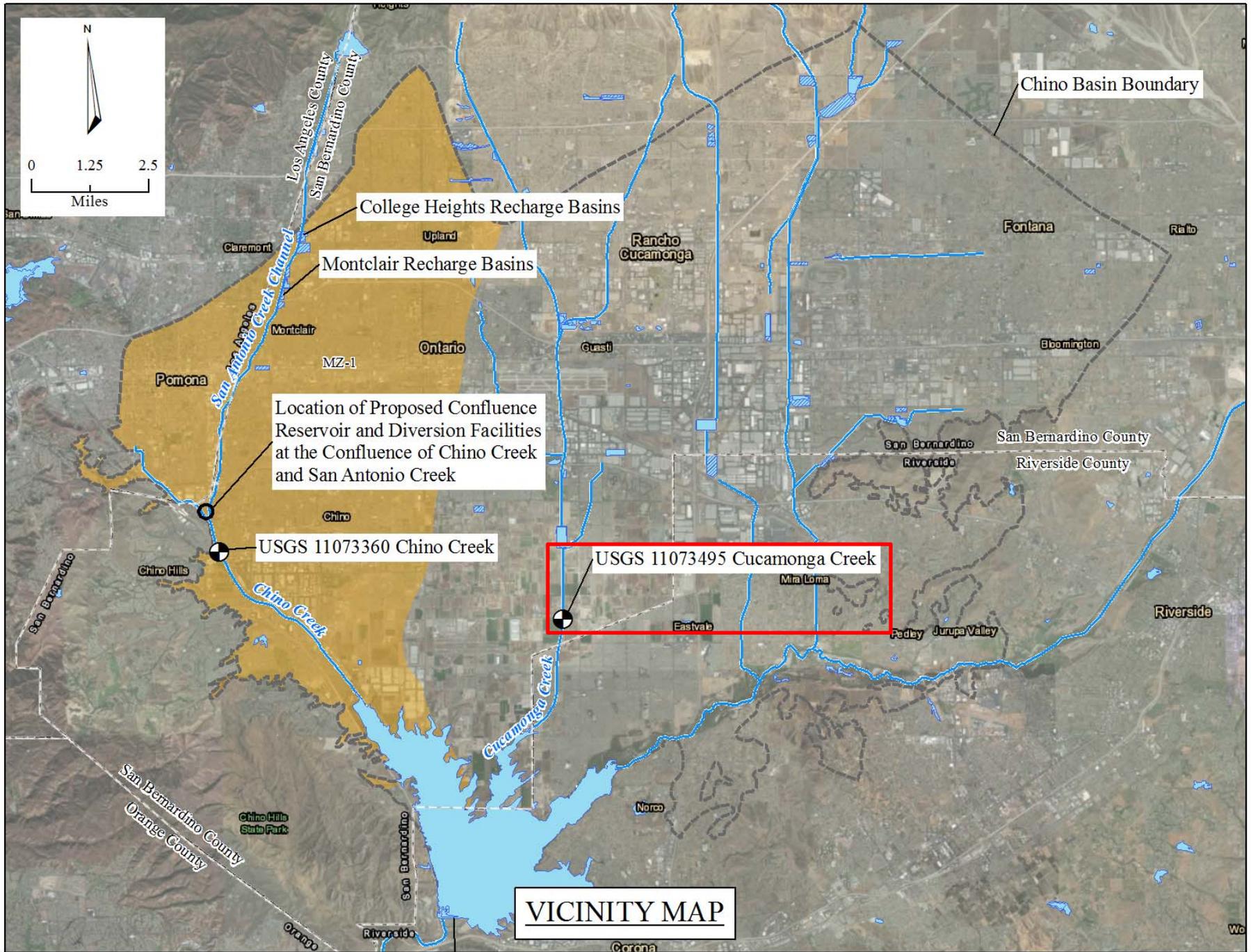
Unit Costs

Including estimates for O&M and Energy, the cost per af of Total Conservation Storage is:

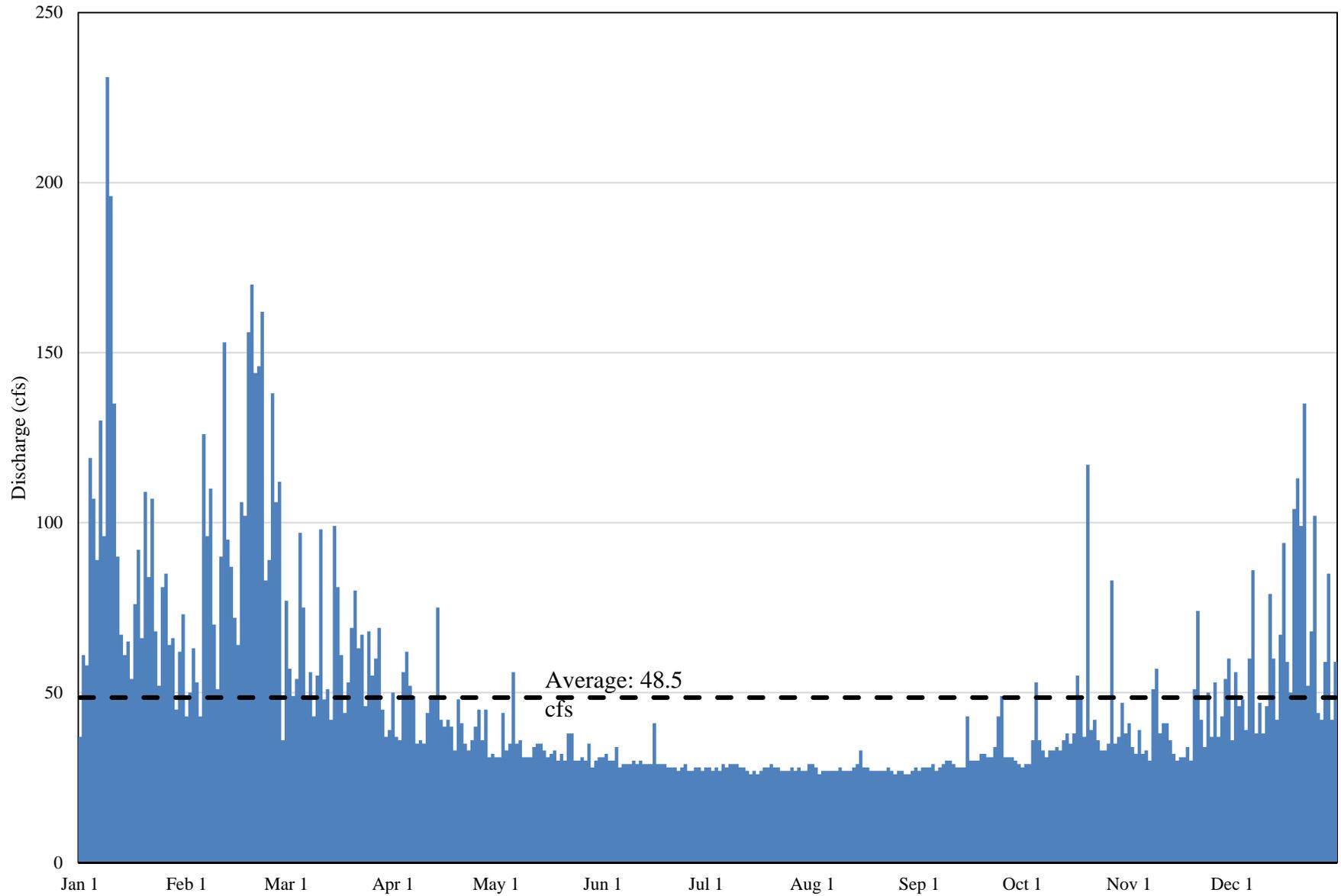
- Alternative A (Direct to Montclair #2): \$650 - \$670
- Alternative B (BB thence to Montclair #2): \$670 - \$685

Summary

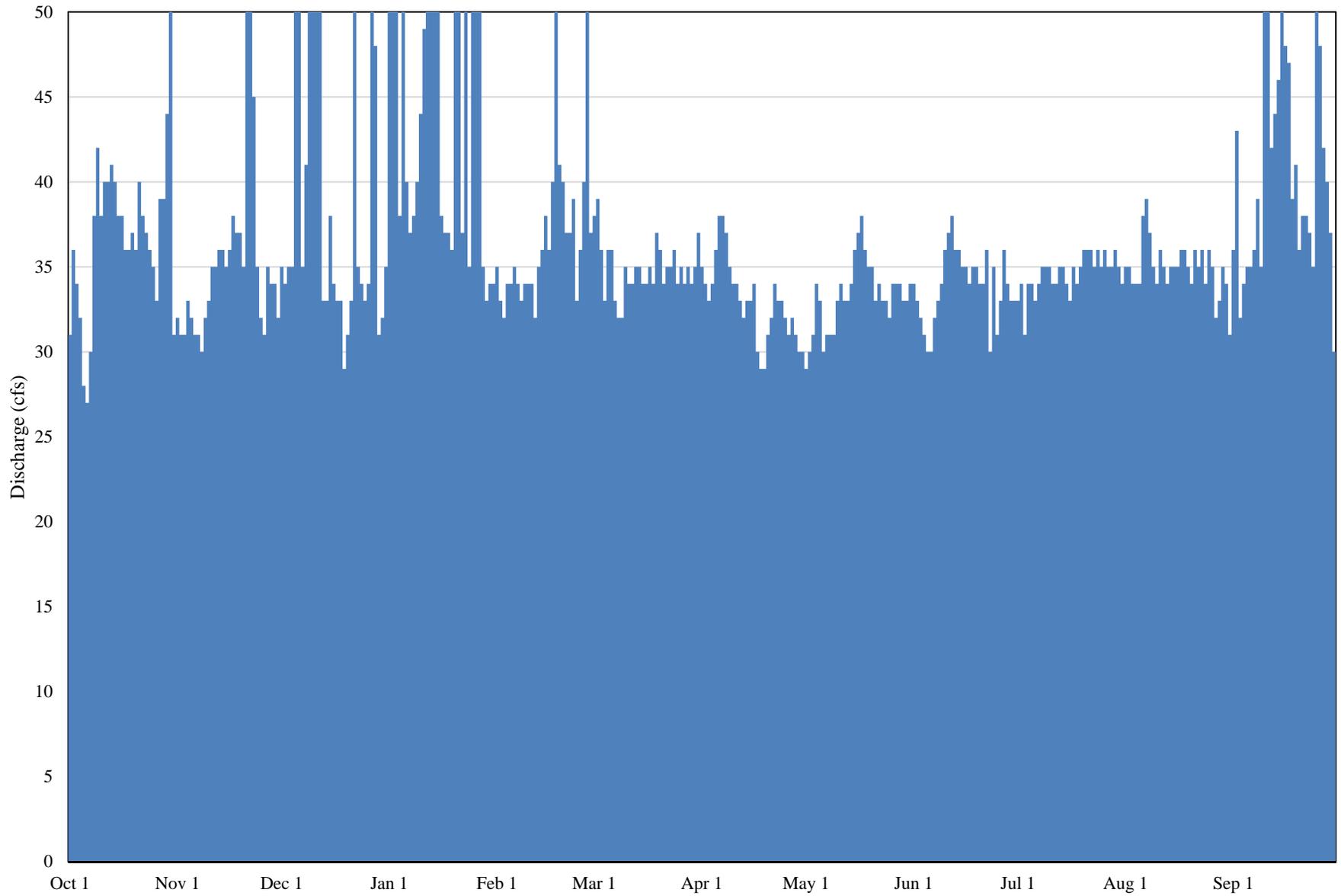
- Stormwater and low-flow recharge is obtainable at \$650 - \$685 per af.
- Water quality improvements are obtainable at a rate as little as one-tenth the cost of comparable systems.
- Educational, Scientific and Recreational opportunities can be developed.
- Concept is “portable”.
- Chino Basin does not have a water supply problem as much as a water distribution problem.



USGS 11073495 Cucamonga Creek near Mira Loma, Ca
Daily Mean Discharge for Period of Record, 1986-2017



USGS 11073495 Cucamonga Creek near Mira Loma, Ca
Discharge for Near-Average Water Year (1997)



Confluence Regional Water Resource Project

QUESTIONS