



**Raw Wastewater Filtration to
Increase Organic Removal
Efficiency and Achieve Significant
Electrical Energy Savings**

EPC-14-076

**Presented at
California Energy Commission
2015 EPIC Innovation Symposium**

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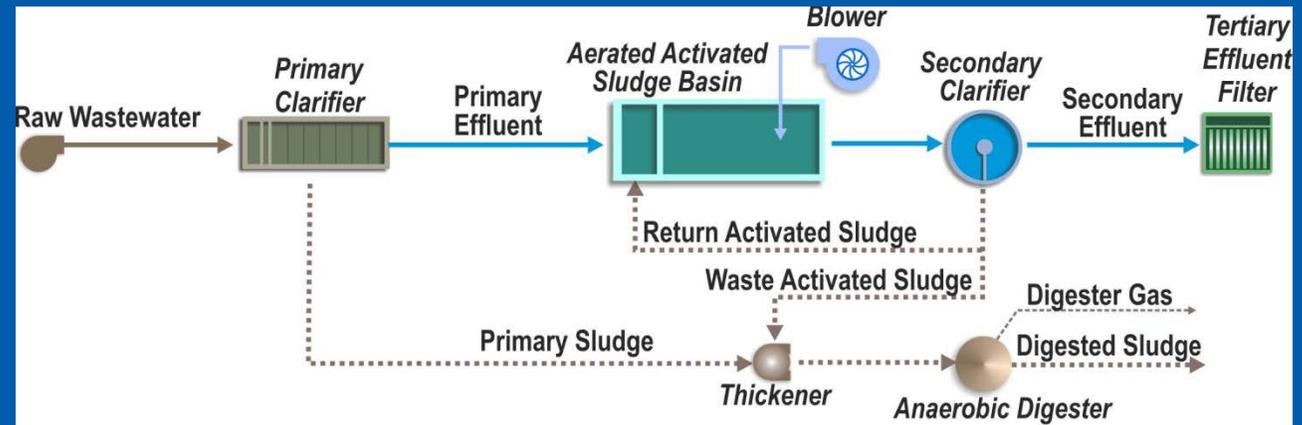
December 3, 2015

- Funded by California Energy Commission (EPC-14-076)
- Demonstration Sites
 - Linda County Water District
 - City of Manteca
 - Los Angeles County Sanitation District
- Pilot Testing – Rock River Water Reclamation District, Rockford, IL
- Advisor - Prof. Emeritus George Tchobanoglous / UC Davis
- Major Equipment Suppliers
 - Aqua Aerobics Systems, Inc.
 - Process Water Technologies, LLC

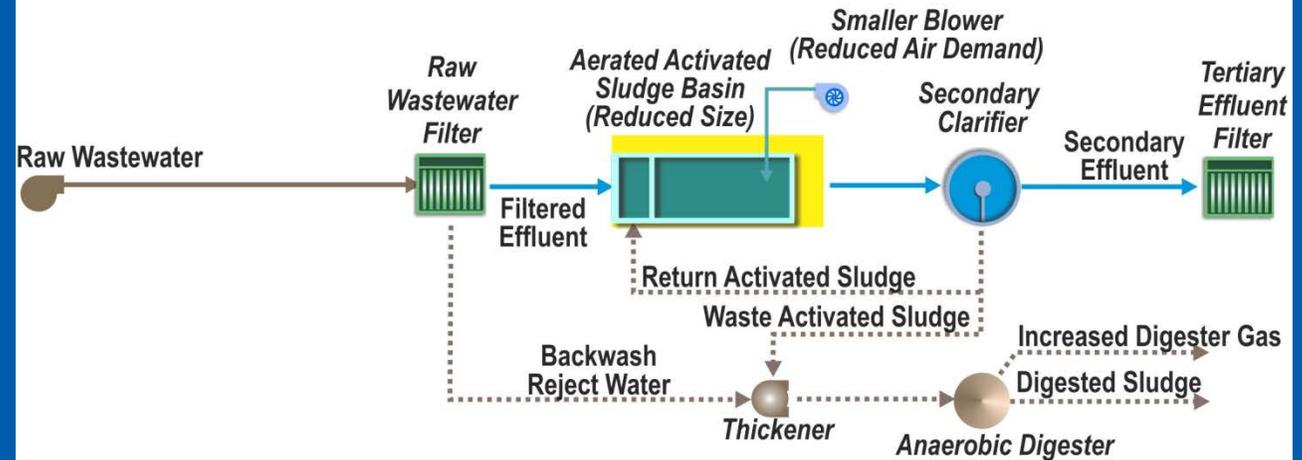
- Issue
 - High Biological Treatment Aeration Energy Requirements
- Raw Wastewater Filtration *as an Advanced Primary Treatment Step*
 - Innovations
 - Objectives and Advantages
 - Pilot Program at Rock River Water Reclamation District (Rockford, IL)
- Project Plans
- Expected Benefits and Recommendations

Innovations with the Modified Wastewater Treatment Flow Diagram

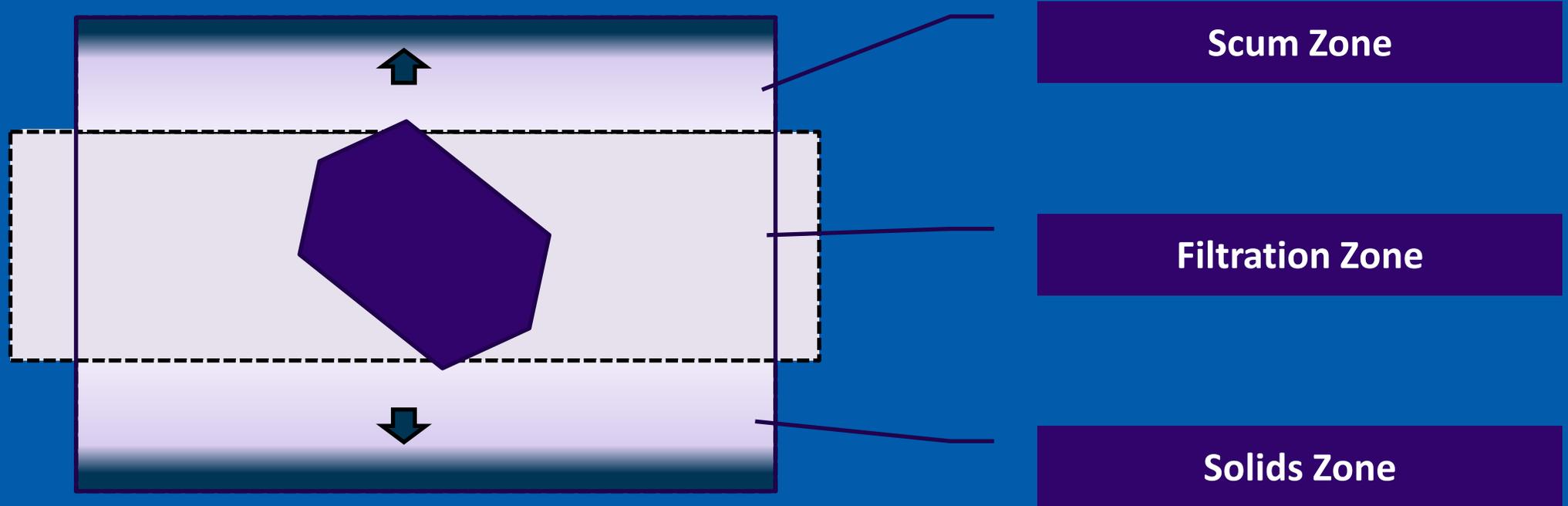
Conventional Wastewater Treatment Flow Diagram



Modified Wastewater Treatment Flow Diagram



Filtration System - Zone Managed Solids Control

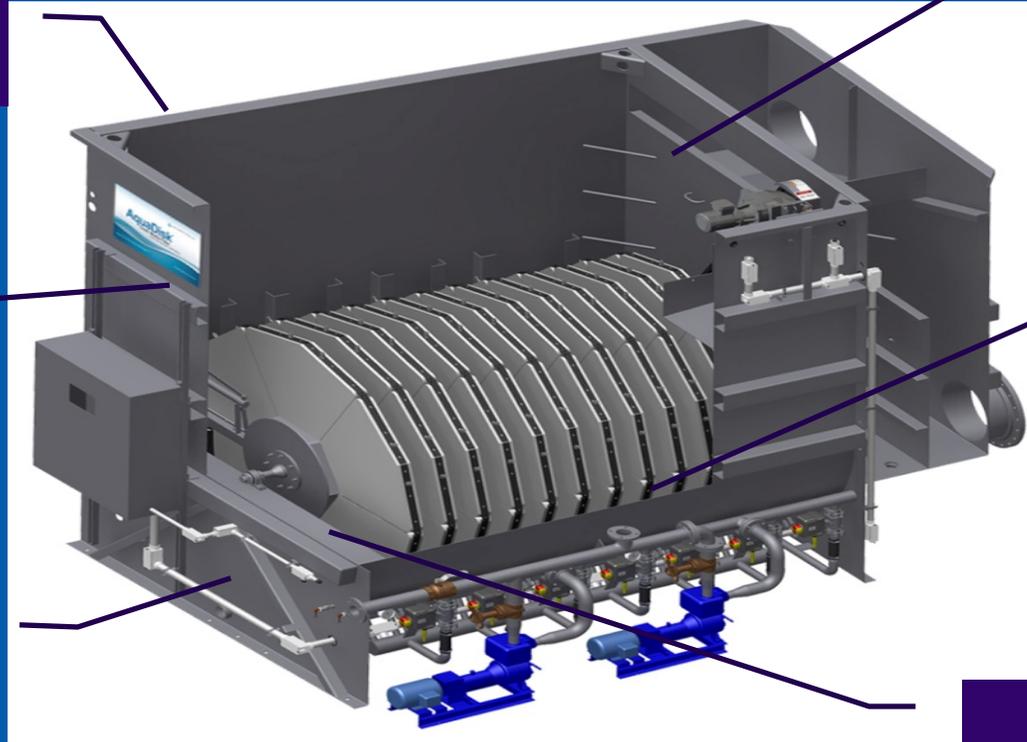


Design Implications

Elevated Tank Height

Influent Baffle
Relocated

Redesigned Hopper
Bottom



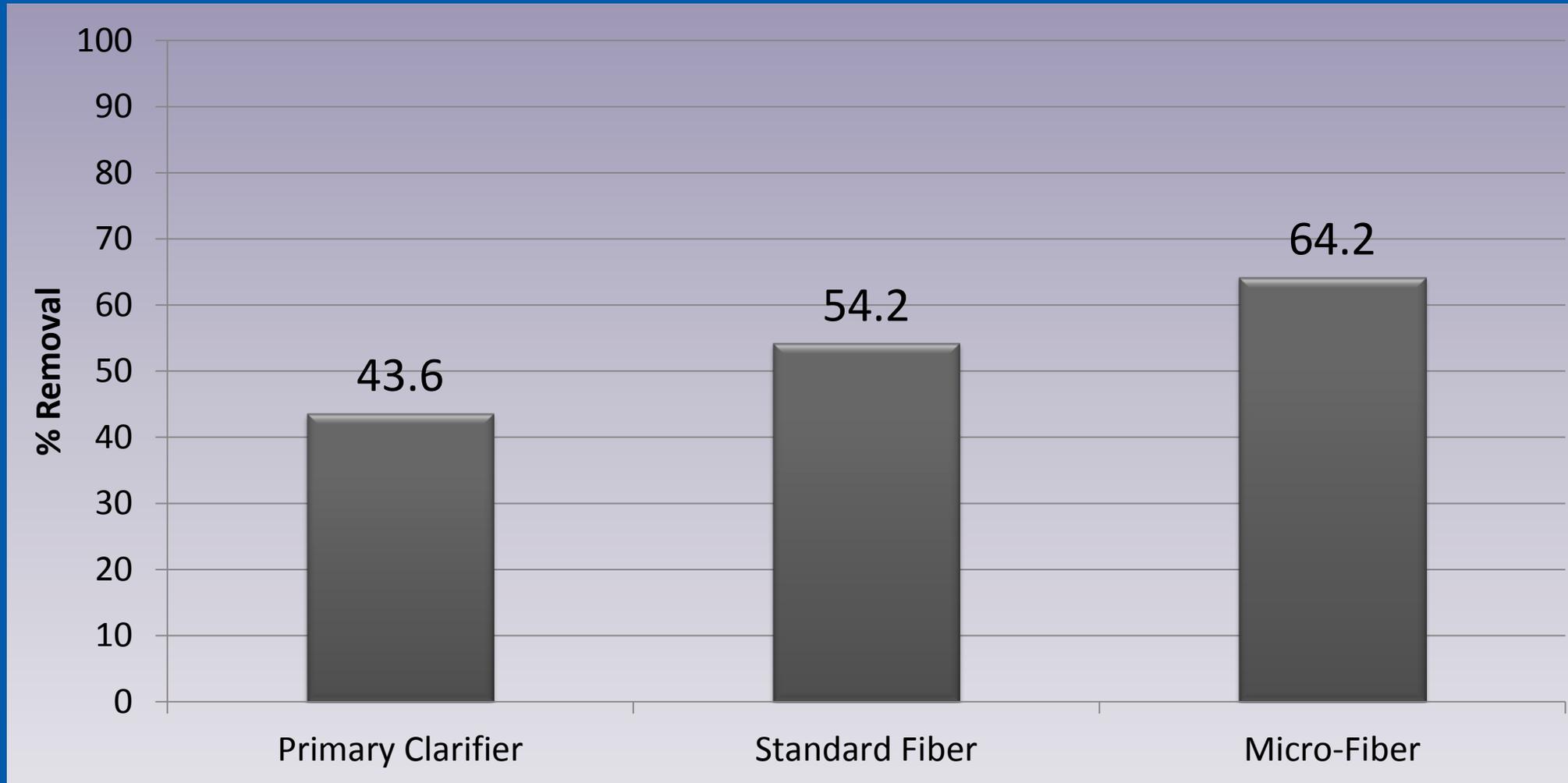
Scum Control

Redesigned Solids Collection
Manifold

Raised Centertube

- Higher removal of organic load (BOD):
 - Reduction in aeration power consumption
 - Increase in secondary treatment capacity
 - Decrease in aeration treatment basin volume requirement
 - Reduction in aeration basin mixing power requirements
- Increase in digester biogas energy production
- Particle size modification: Increase in biological treatment efficiency

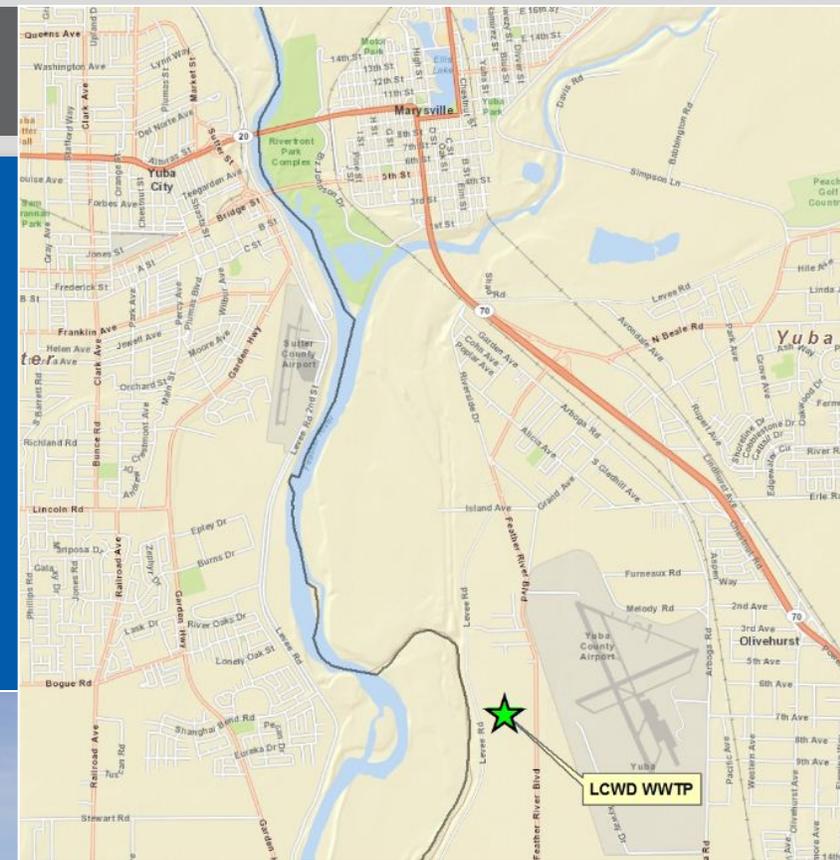
BOD₅ Removal Efficiencies



- Demonstrate continuous operation of the system for 3 years at Linda WWTP
- Demonstrate continuous operation of the system at City of Manteca and Los Angeles for 1 year
- Determine and resolve any operational and/or maintenance issues
- Develop operational and design criteria for full-scale installations
- Determine the energy and capital savings

First Deployment Site – Linda County Water District WWTP

- 40 miles north of Sacramento, CA
- Serves primarily residential and light commercial
- Average Expected Total Plant Flow : 2.5 Million Gallons per Day



Estimated Benefits in California

| Savings | Unit | Percent Implementation of the Proposed Technology in California | |
|--|-------------------------------|---|-------------|
| | | 10% | 25% |
| Annual electricity savings | kW-h | 34,000,000 | 85,000,000 |
| | \$ | \$3,600,000 | \$9,000,000 |
| Annual greenhouse gas emissions reductions | metric tons CO ₂ e | 9,000 | 24,000 |

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