

City of Santa Barbara Reclaimed Water System Overview

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Presentation Outline

- Reclaimed Water (RW)
Distribution System
- Wastewater Treatment Process
- RW Quality Improvement
Projects

RW System Development

- In late 1970's City Identified Need To Increase Water Supply Availability
- RW Unit Processes Constructed And Operational By 1990 At El Estero Wastewater Treatment Plant
- RW Distribution System Constructed In Two Phases (costly to construct and maintain a water distribution system)

RW Distribution System:

- RW Pipeline Network
 - 13.4 Miles (4" To 18" Diameter Pipe)
 - 72 RW Sites
 - 79 RW User Meters
- Two RW Reservoirs
 - El Estero: 0.67 MG
 - Golf Course: 1.5 MG

RW Distribution System:

- Total Design RW Usage: 424 MG Per Year On 520 Acres Of Landscaping
- Use Categories:
 - Golf Courses: 39%
 - Parks: 34% (including Park Restrooms)
 - Schools: 15%
 - Residential/Commercial: 12%

Barriers To RW Expansion

- Distribution System Is Costly
 - Market Targets Large Users, Most Are Already Served
 - Difficult to Justify Costs For Residential Use
- RW Water Quality Not As Good As Potable Water
 - Total Dissolved Solids Content Can Limit Use
 - Nitrogen Content Can Limit Use
- Potable Water Is Less Expensive
 - RW Averages \$750/Acre-Foot
 - PW Averages \$100/Acre-Foot

RW Quality Requirements

The recycled water that is produced at the EEWTP is regulated by the California Department of Public Health (CDPH). The EEWTP recycled water is considered disinfected tertiary recycled water as defined by Title 22 of the California Code of Regulations. Table 2-3 summarizes the Title 22 requirements for EEWTP recycled water.

Table 2-3. Summary Title 22 Requirements for the EEWTP

Parameter	Quality Criteria ^{1,2}
Total Coliform	<ul style="list-style-type: none">• Median concentration must not exceed 2.2 MPN/ 100 mL using the last 7 days analyses were completed• Must not exceed 23 MPN/ 100 mL in more than one sample in any 30 day period• Must not exceed 240 MPN/ 100 mL at any time
Turbidity	<ul style="list-style-type: none">• Must not exceed average turbidity of 2 NTU within a 24-hour period• Must not exceed 5 NTU more than 5 percent of the time within a 24-hour period• Must not exceed 10 NTU at any time

Notes:

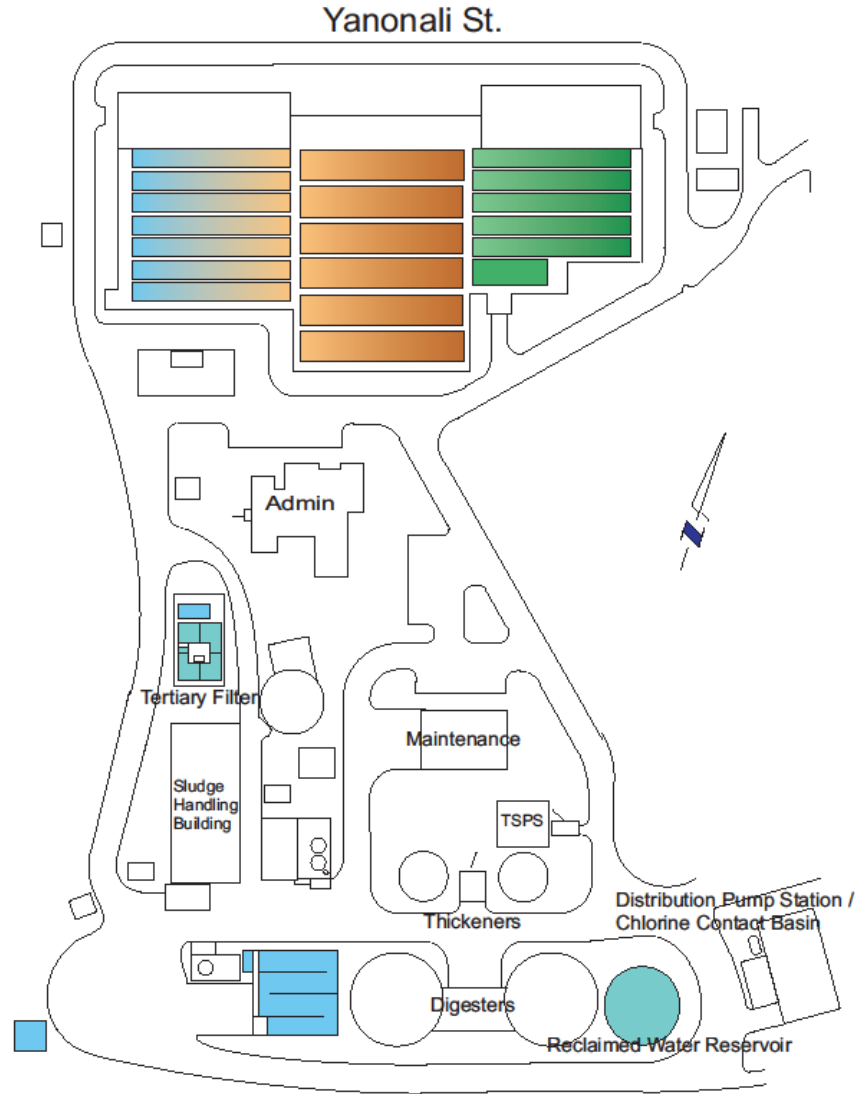
¹MPN/100 mL is a bacterial count in most probable number per 100 milliliters.

²NTU is Nephelometric turbidity units.

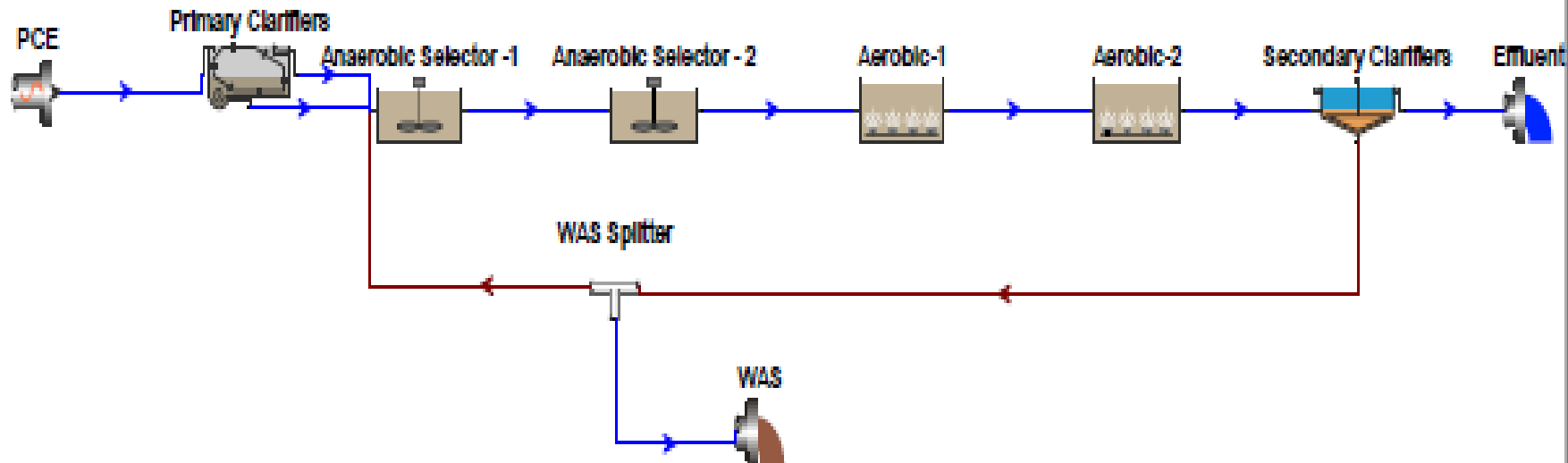
RW Quality Issue

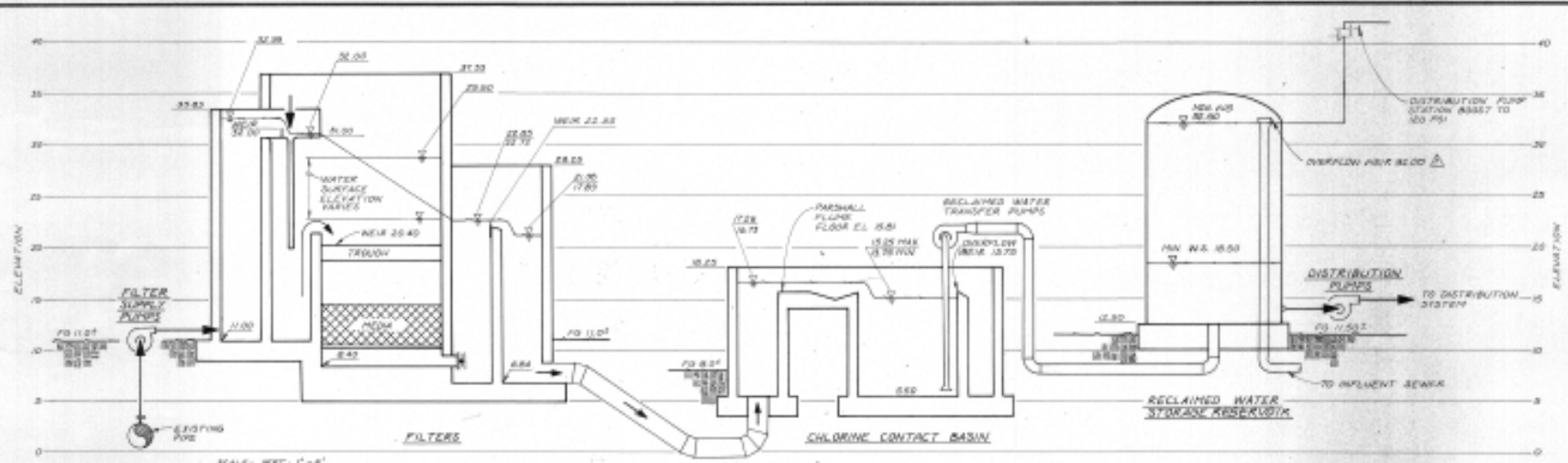
- Difficult To Successfully Filter Out Small Diameter Particles
 - Turbidity Higher Than Desired Levels
 - Tertiary Filter Process Design And Age
 - Result: Blend RW With Potable Water
- Technical Studies Provide Two Paths To Improve RW Turbidity
 - Chemical Conditioning
 - Biological Conditioning

El Estero WWTP Layout

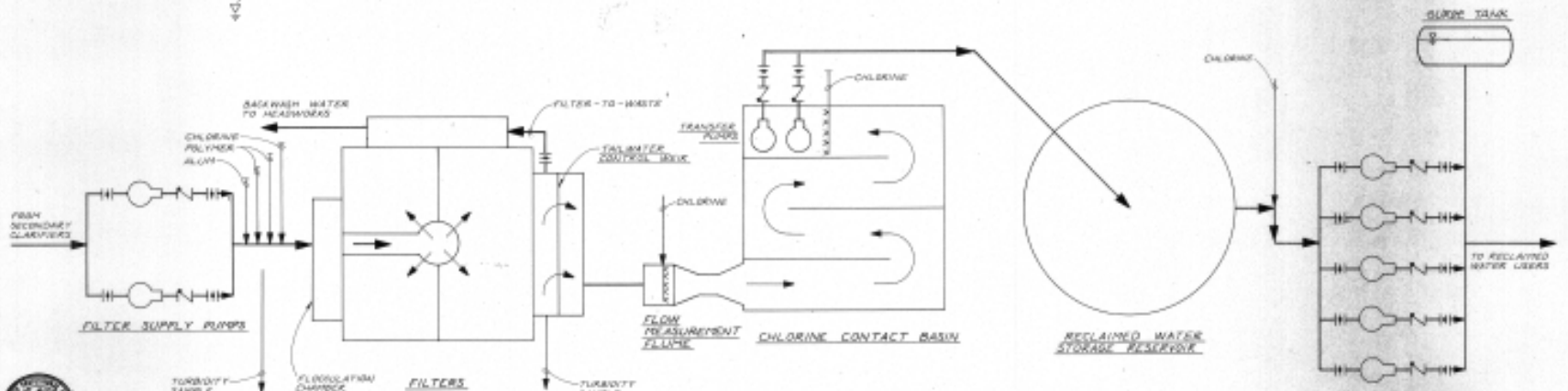


Treatment Process Overview





HYDRAULIC PROFILE



FLOW DIAGRAM



DESIGNED BY A. P. BALDWIN CHECKED BY DATE APR 1970 REVISIONS		PREPARED BY Engineer Ronald Economis Scientist		SANTA BARBARA WATER RECLAMATION PROJECT HYDRAULIC PROFILE AND GENERAL FLOW DIAGRAM		CITY OF SANTA BARBARA PUBLIC WORKS DEPARTMENT - ENGINEERING DIVISION REVIEWED BY DATE 12-18-78 CITY ENGINEER		PERMIT NO. 102185A1 SHEET 4 OF 22 SHEETS DATE 12-18-78	
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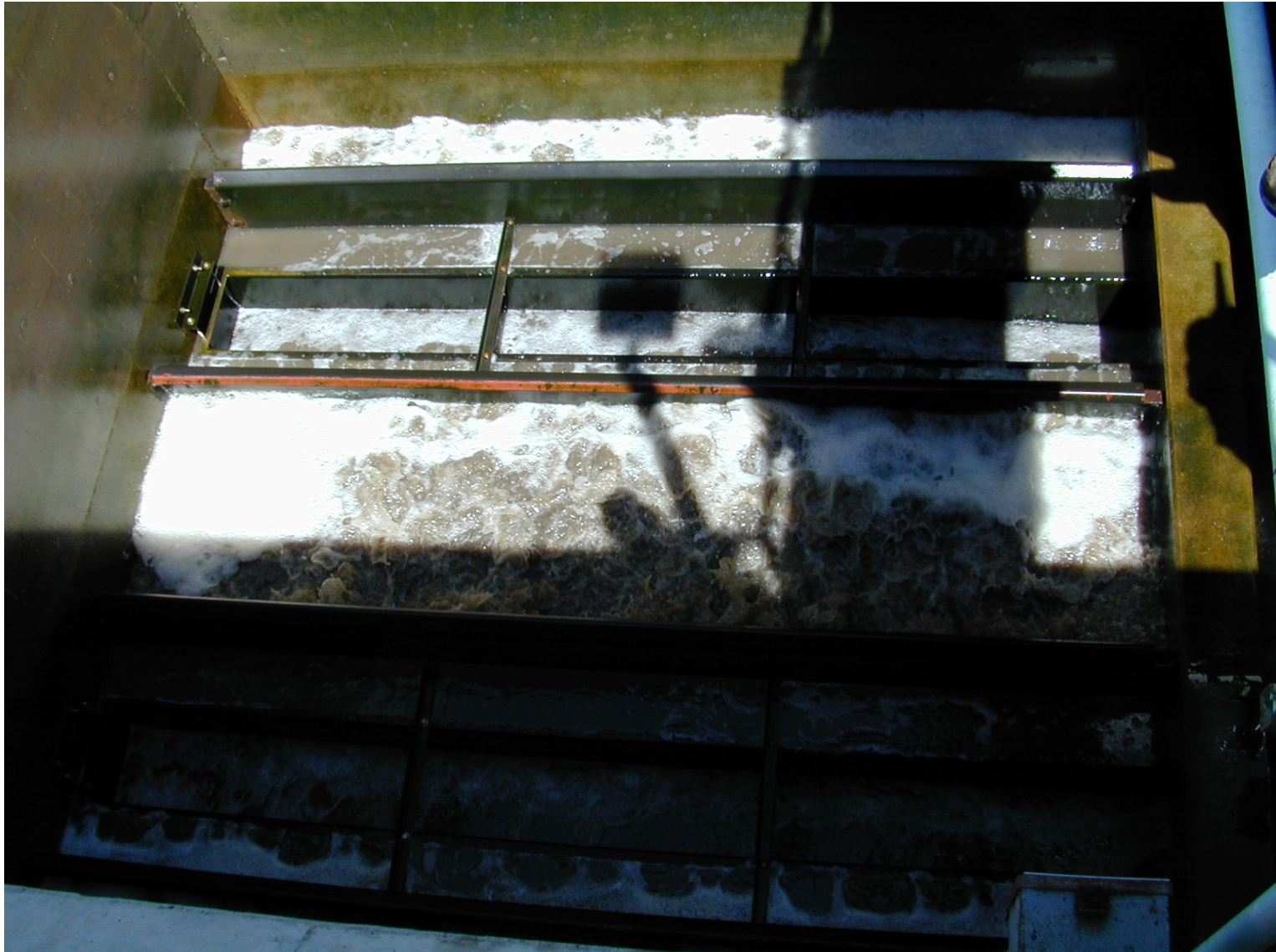
Tertiary Filtration

- Portion Of Secondary Effluent (Approximately 0.76 MGD) Is Diverted From Outfall Disposal
- This Portion Is Treated With Chemicals To Create Flocculated Material In the Secondary Effluent (Chemical Treatment)
- Effluent Is Then Filtered Through Gravity Filters (4 Foot Depth Of Anthracite Coal)

Filter Cell In Service



Filter Cell In Backwash Mode



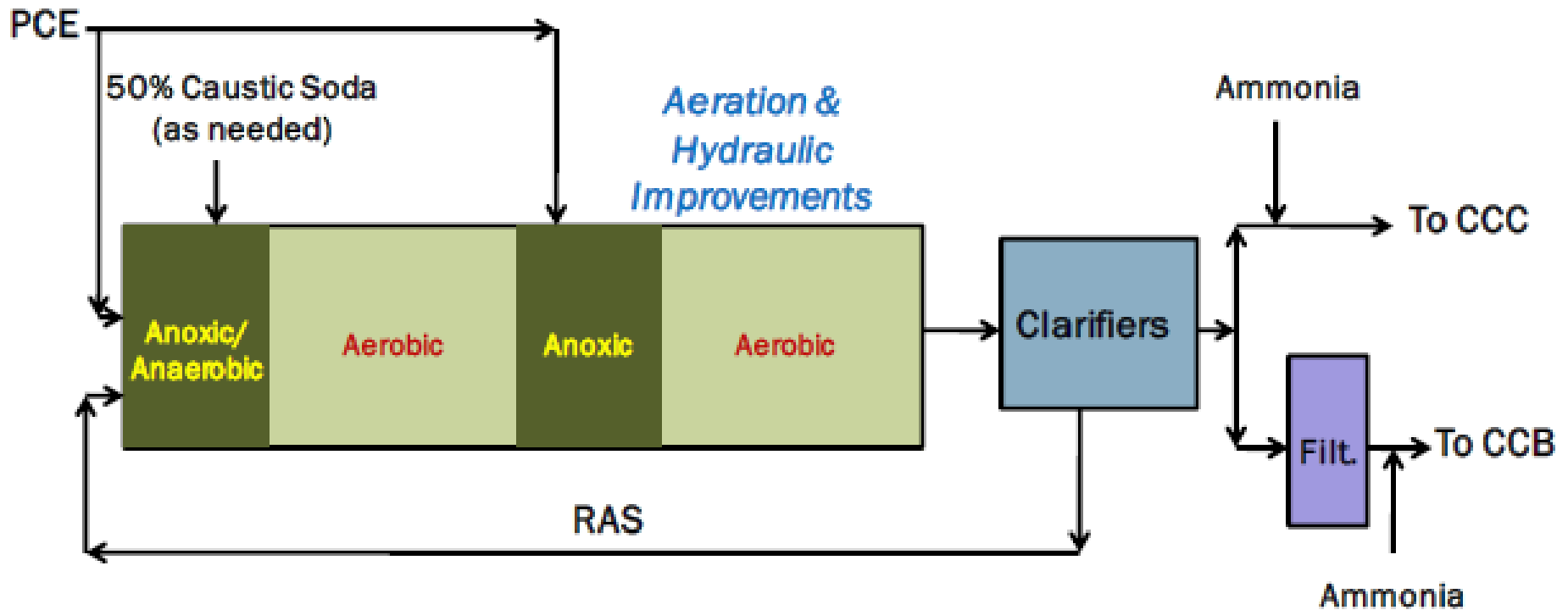
Tertiary Disinfection

- Following Filtration, Tertiary Effluent Is Disinfected Using Sodium Hypochlorite Applied Through A Chlorine Contact Chamber
- RW Is Pumped Into A 0.6 MG Storage Tank And Then Pumped Into the RW Distribution System

Biological Process Improvements

- Activated Sludge Process Improvement
Recommendation:
 - Convert Current Process To A Step-Feed Biological Nitrogen Removal Process
 - Increases Solids Retention Time in Reactors from 1-Day to 7-Day time period
 - Upgrade Aeration System
 - First Selector Zone Anaerobic; Second Reactor Zone Anoxic

Proposed Activated Sludge Process



Process Improvement Projects

- Aeration Basin Improvement Project
 - Planning Report Completed
 - Preliminary Design Begins November, 2011
 - Construction Complete End Of CY 2013
- Tertiary Filter Improvement Project
 - Planning Contract Begins December, 2011
 - Design In CY 2012
 - Construction Complete End Of CY 2014

Questions?