



City of Austin Walnut Creek WWTP Expansion to 100 MGD

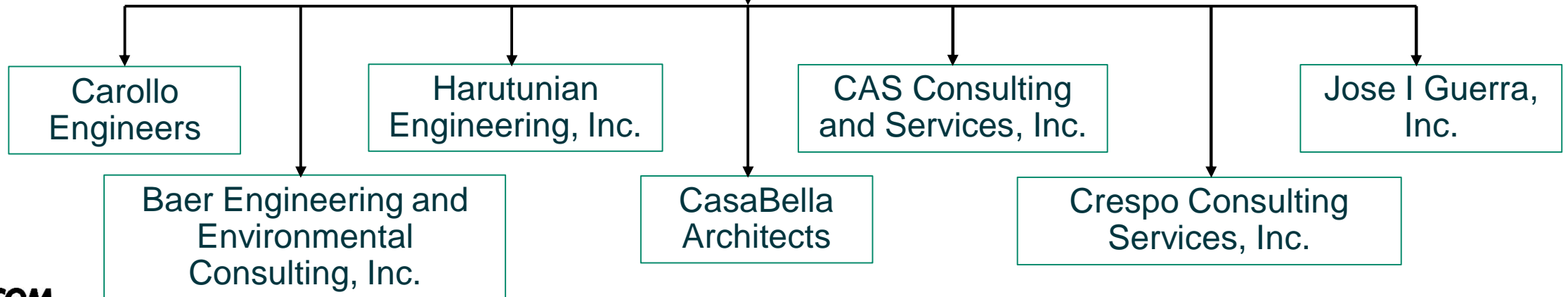
Presented by: Behnoush Yeganeh, PE

Agenda



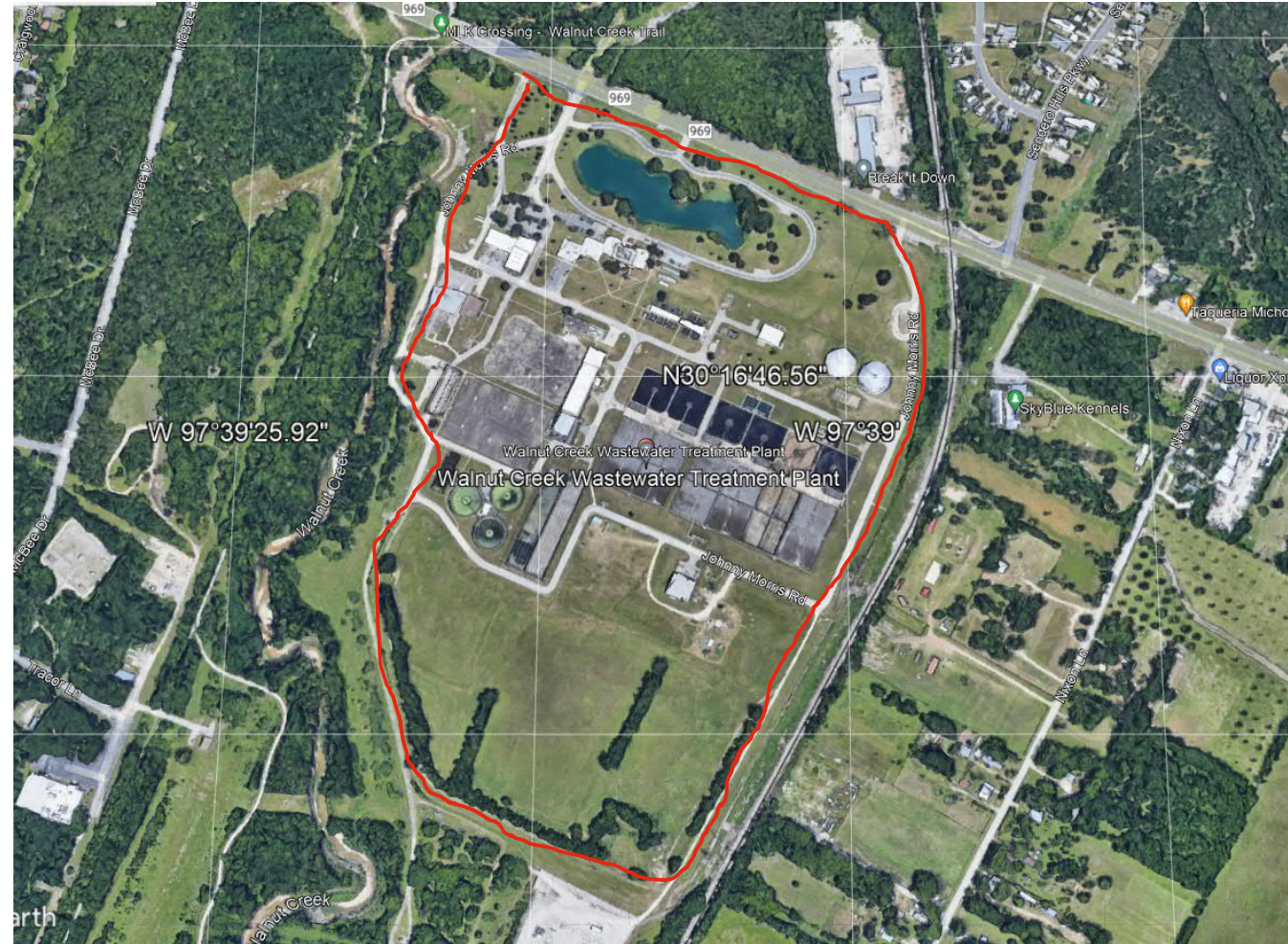
1. Team Introduction
2. Project Overview and History
3. Facility Plan Considerations and Solutions
4. PER and Project Updates
5. Final Layout

Project Team

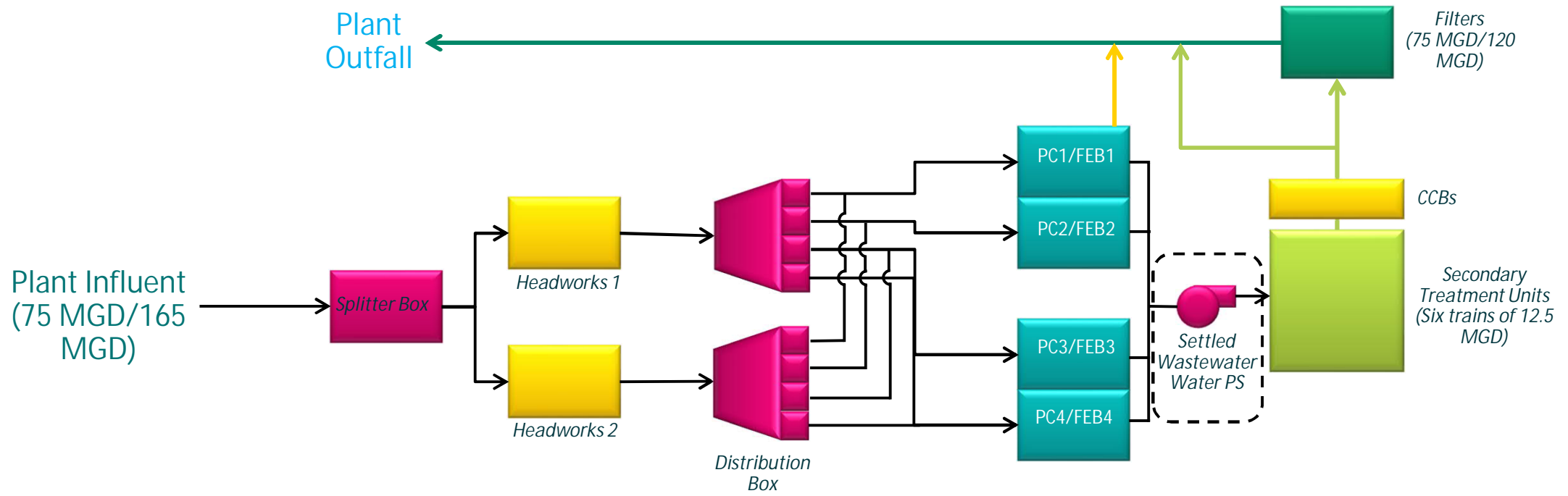


Walnut Creek WWTP Existing Conditions

- One of two municipal WWTPs in Austin
- Conventional activated sludge process
- Permitted for an ADF of 75 MGD and 165 P2HF
- Last expansion to 75 MGD in 2002
- Storm event in excess of 200 MGD
- Average flow exceeded 75% of 75 MGD in recent years due to population growth
- More stringent effluent requirements anticipated
- Significant industrial loads from semiconductor sector
- Miscellaneous limitations in several existing treatment facilities
- Restricted site



Existing Flow Diagram

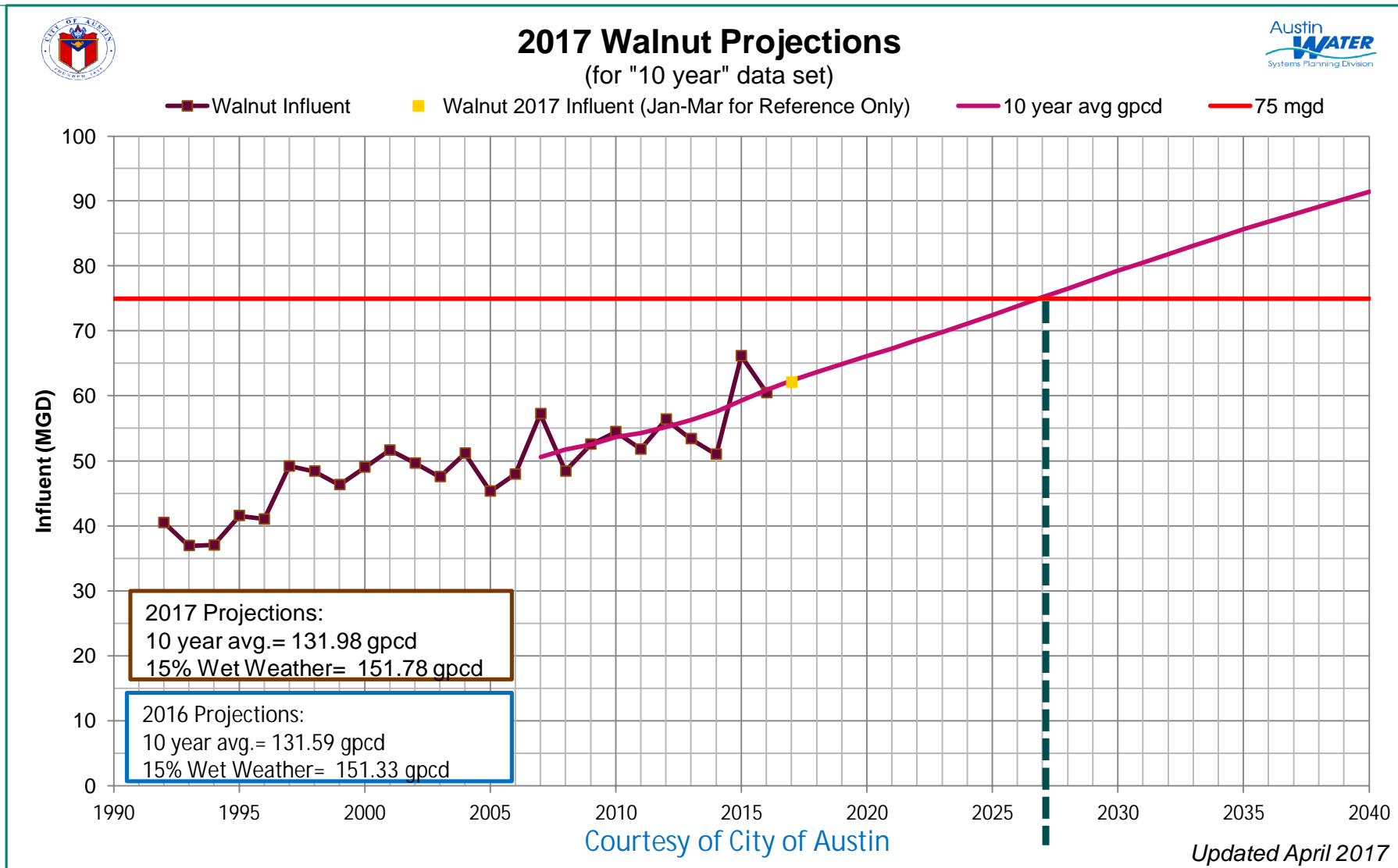


Facility Plan

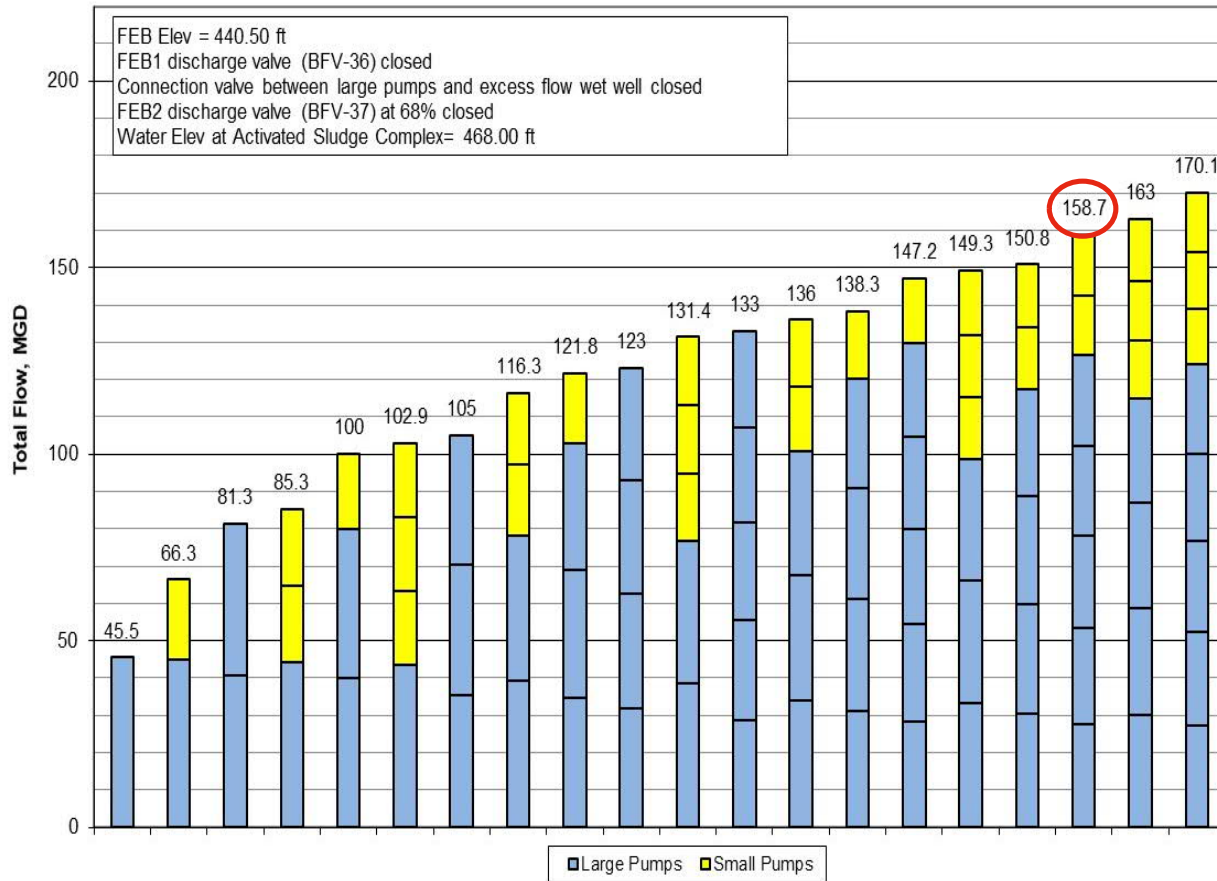
Facility Plan

- 2018 - 2020
- Define Limitations and Solutions
 - Required Flow Capacity
 - Hydraulic Limitations
 - Influent Flow Characteristics
 - Effluent Requirements
 - Process Options
 - Disinfection

Flow Projection



Hydraulic Limitations



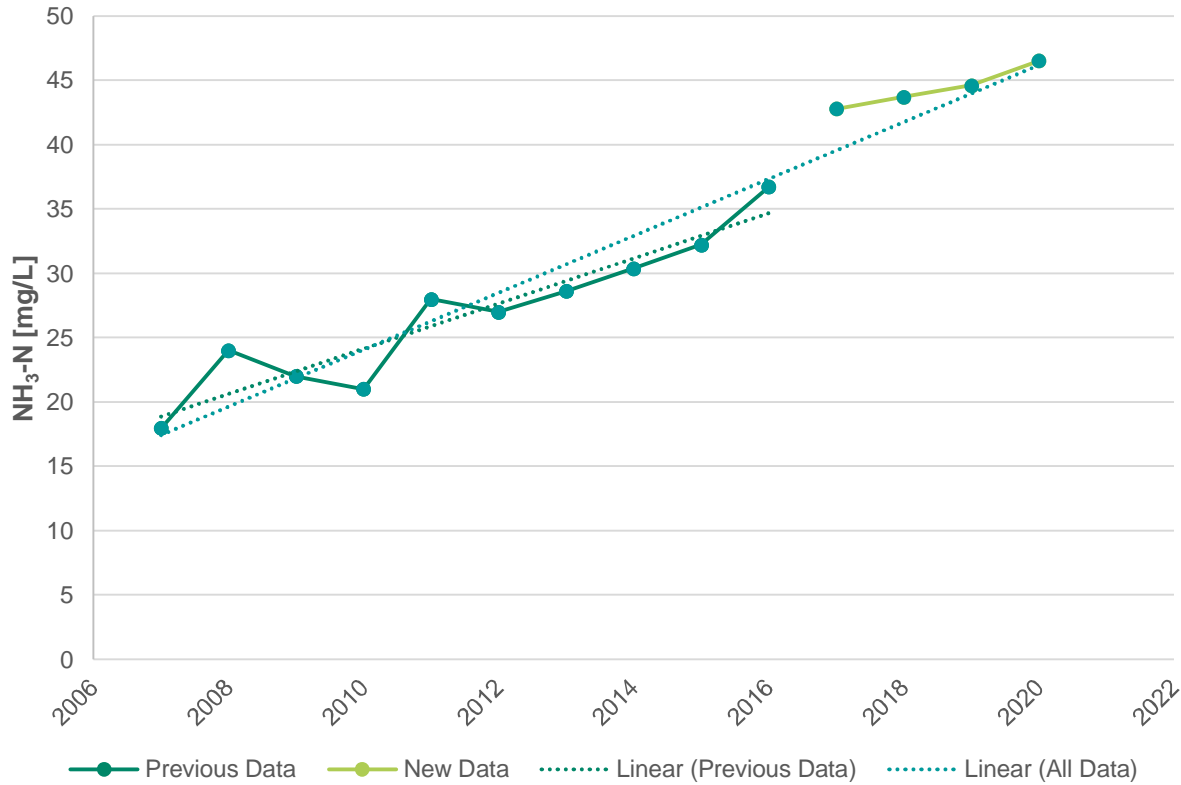
Influent Design Criteria

Parameters	Design Concentration (mg/L)	MMA/AAD*	MDA/AAD*
BOD ₅	225	1.30	2.30
TSS	250	1.30	3.50
VSS	180	1.50	2.75
TKN	55	1.20	1.50
NH ₃ -N	47	1.20	2.00
TP	6.2	1.30	1.80

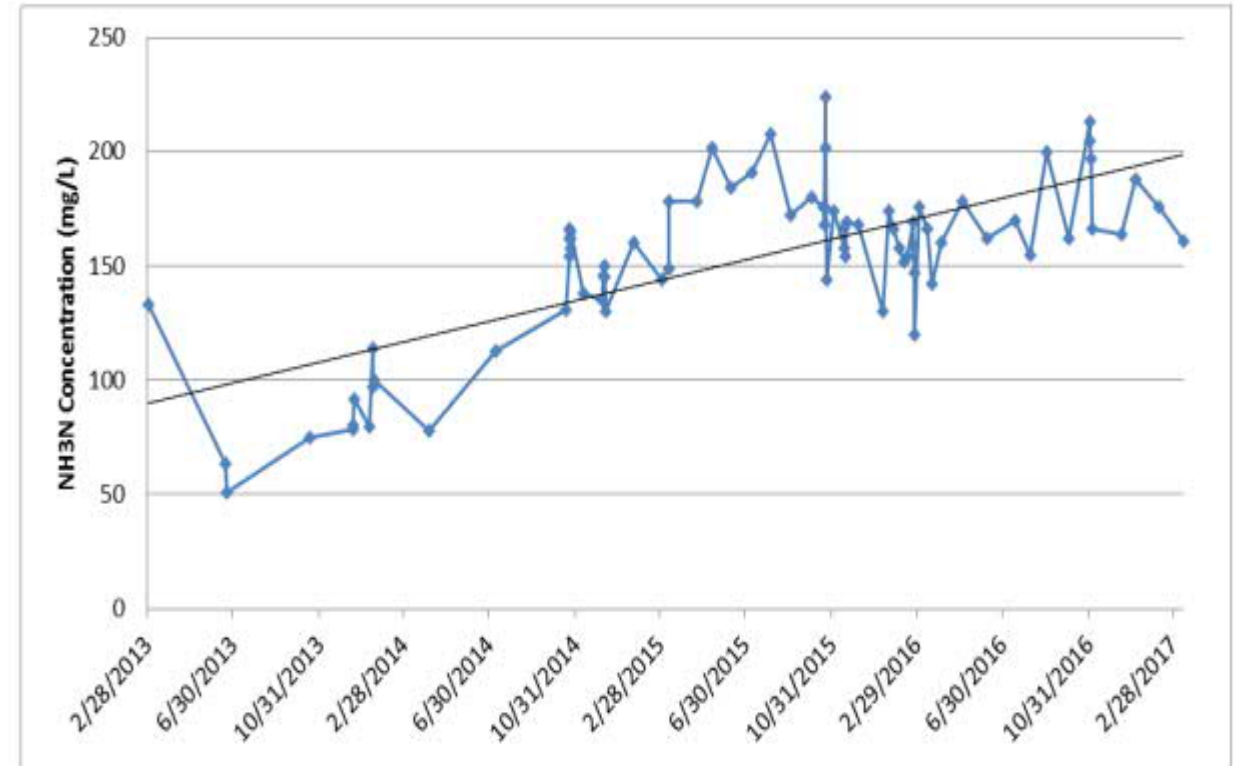
*AAD: Annual average daily loading
MMA: Maximum monthly average daily loading
MDA: Maximum daily loading

Ammonia in Influent

Combined NH₃-N Concentration



NH₃-N Concentration in an Industrial Stream



Future Effluent Limits

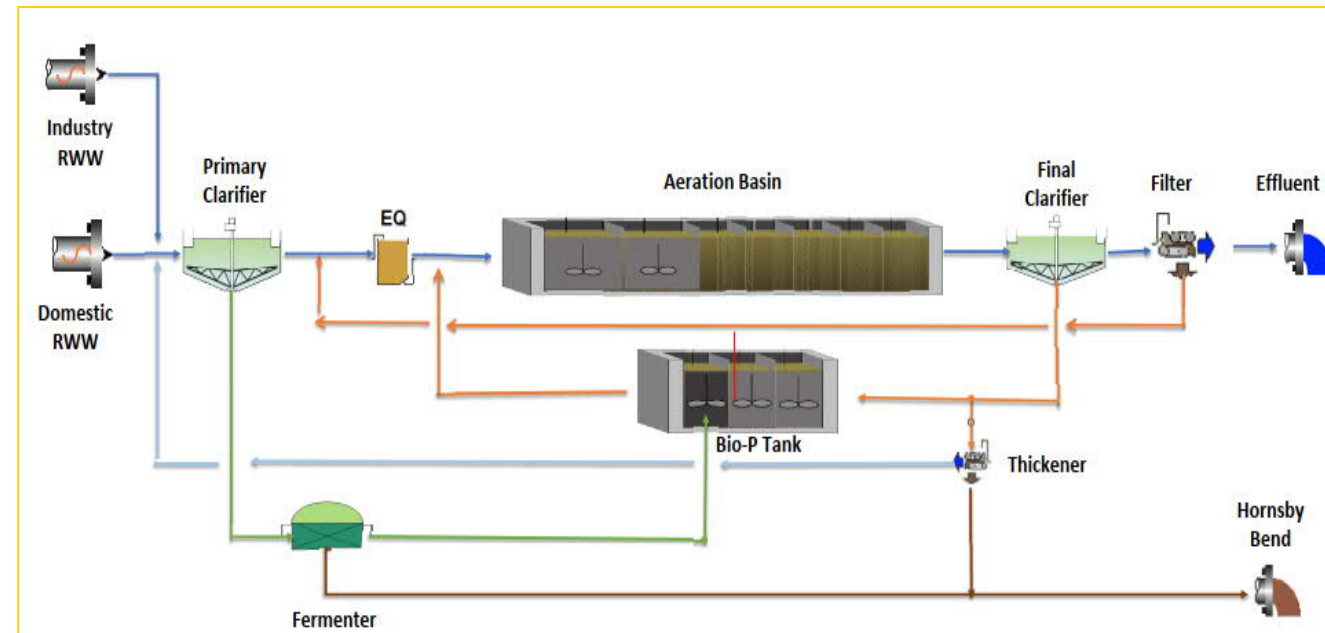
Parameter	Discharge Limitations				
	Daily Avg mg/L (lbs/day)	7-day Avg mg/L	Daily Max mg/L	Single Grab mg/L	Annual Average Mg/L
BOD₅	10 (8,340)	15	25	35	5
TSS	15 (12,510)	25	40	60	5
NH₃-N	2 (1,668)	5	10	15	2
TP	1 (834)	2	4	6	1
TDS	Report	N/A	Report	N/A	Report
NO₃-N	Report	N/A	Report	N/A	Report
E. coli, CFU or MPN/100 ml	126	N/A	399	N/A	
Minimum DO	-	-	-	6.0	

Process Alternative Analysis

1. Integrated Fixed Film Activated Sludge (IFAS)
2. Modified Bardenpho
3. Aerobic Granular Sludge (Nereda®)
4. Ludzack-Ettinger (LE) Process with Chemical Phosphorus Removal (< 0.5 mg/L)
5. Modified LE Process (MLE) with Chemical Phosphorus Removal (< 0.5 mg/L)
6. Westbank Process - LE Process with Biological Phosphorus Removal (< 0.5 mg/L)

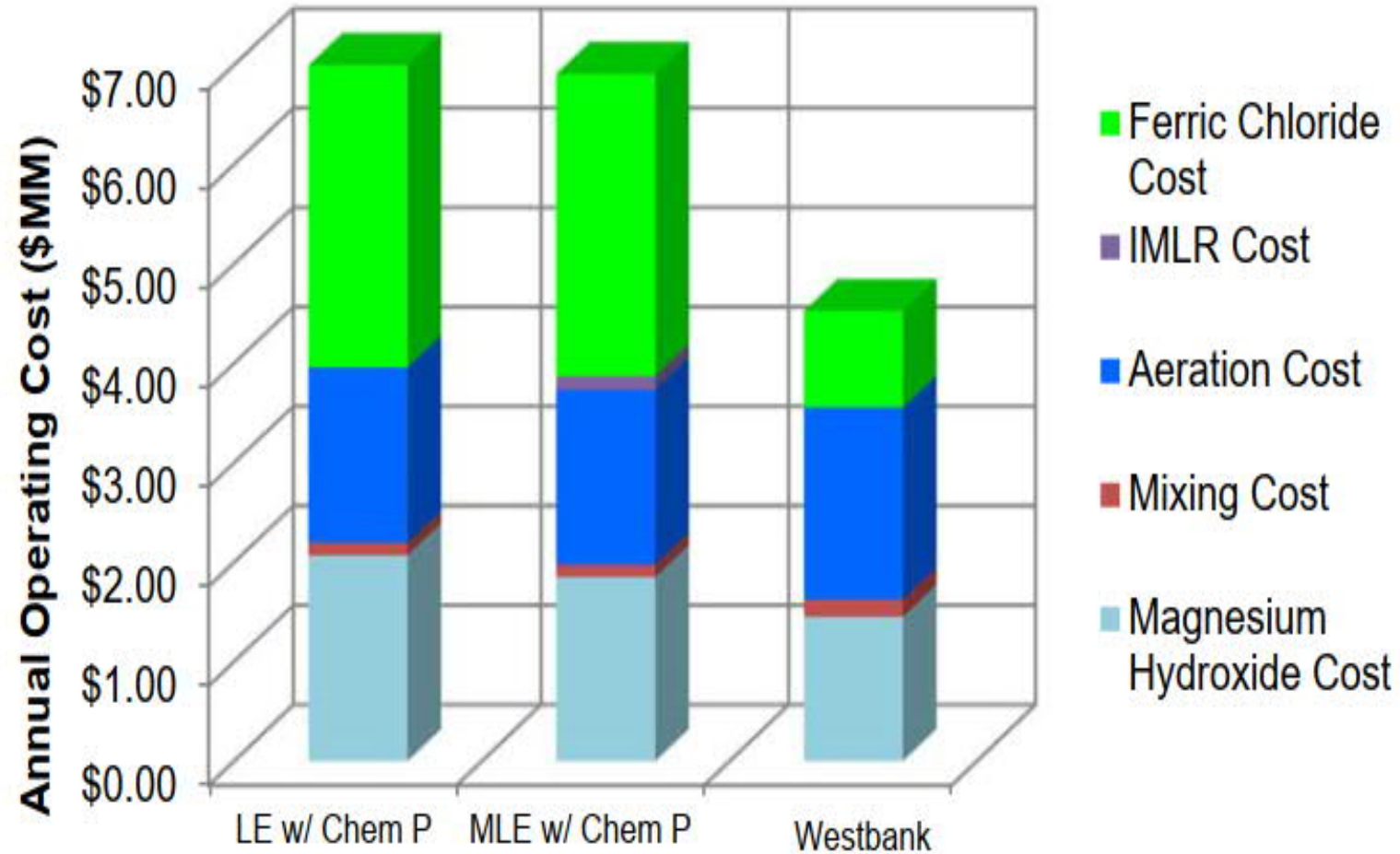


Conventional Activated Sludge vs Granular Sludge (Courtesy of Aqua-Aerobics Systems, Inc.)



Westbank Process

Comparison of Process Alternatives



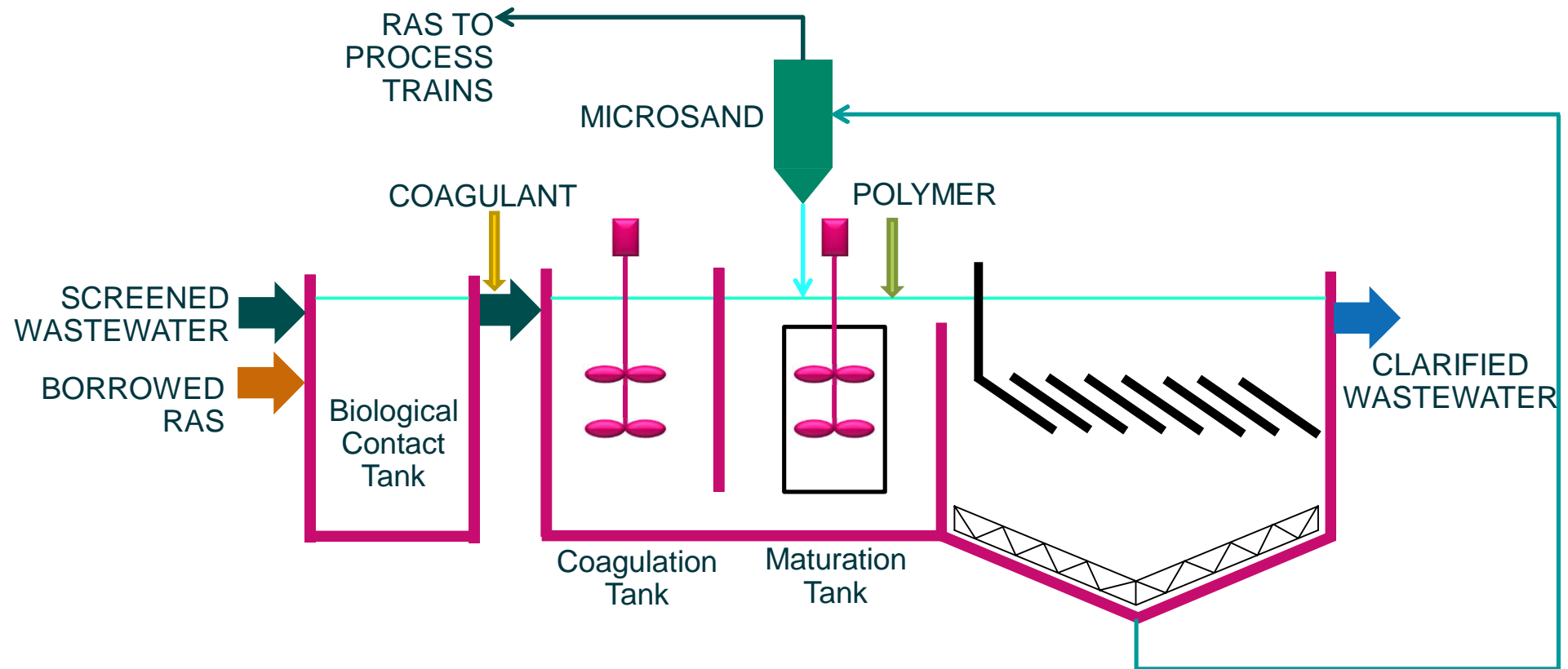
Effluent Disinfection

- Continue to use chlorination for disinfection



Peak Wet Weather Treatment System

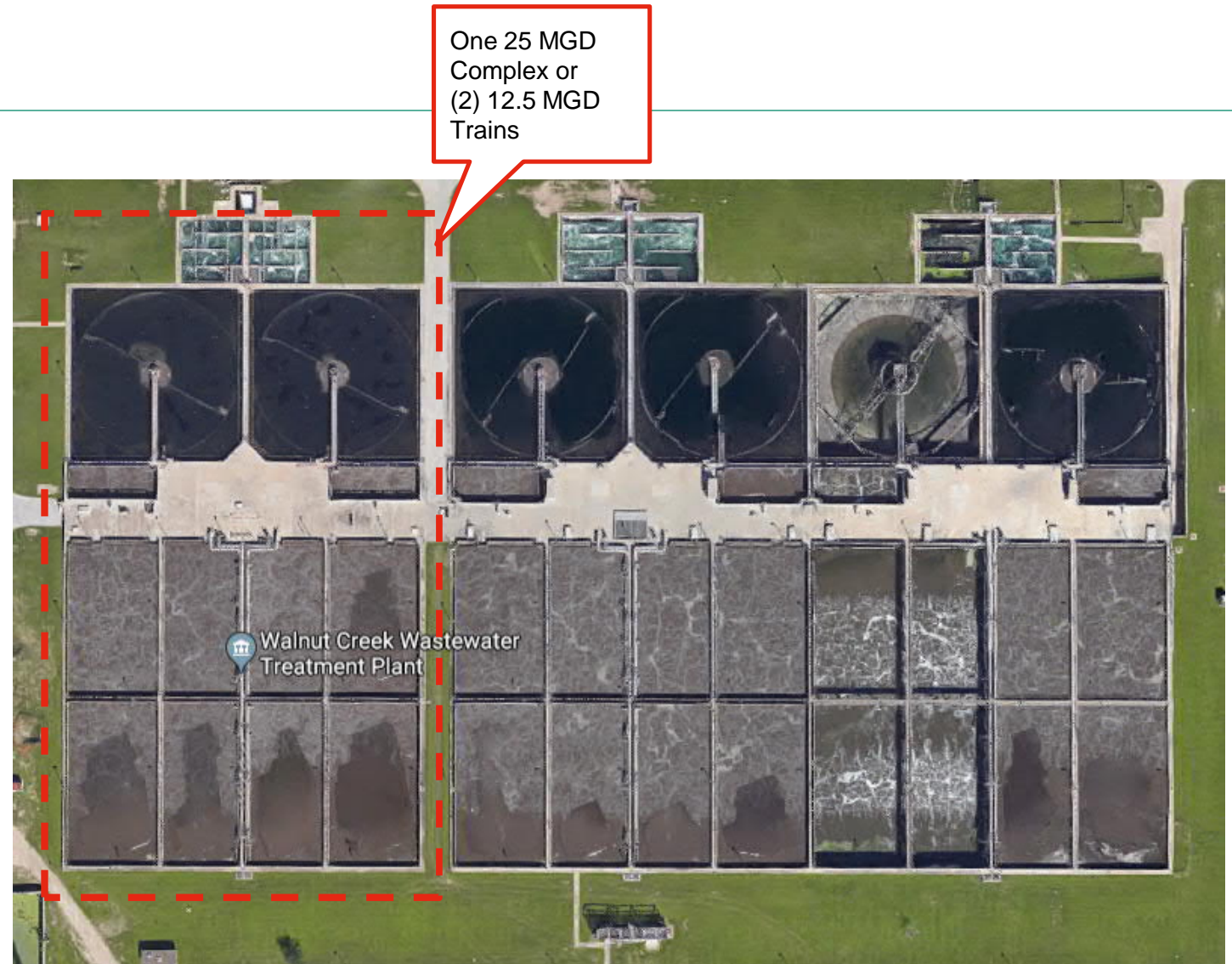
- 100 MGD of Peak Wet Weather Flow
- US EPA Region 6 position on wet weather flow treatment systems



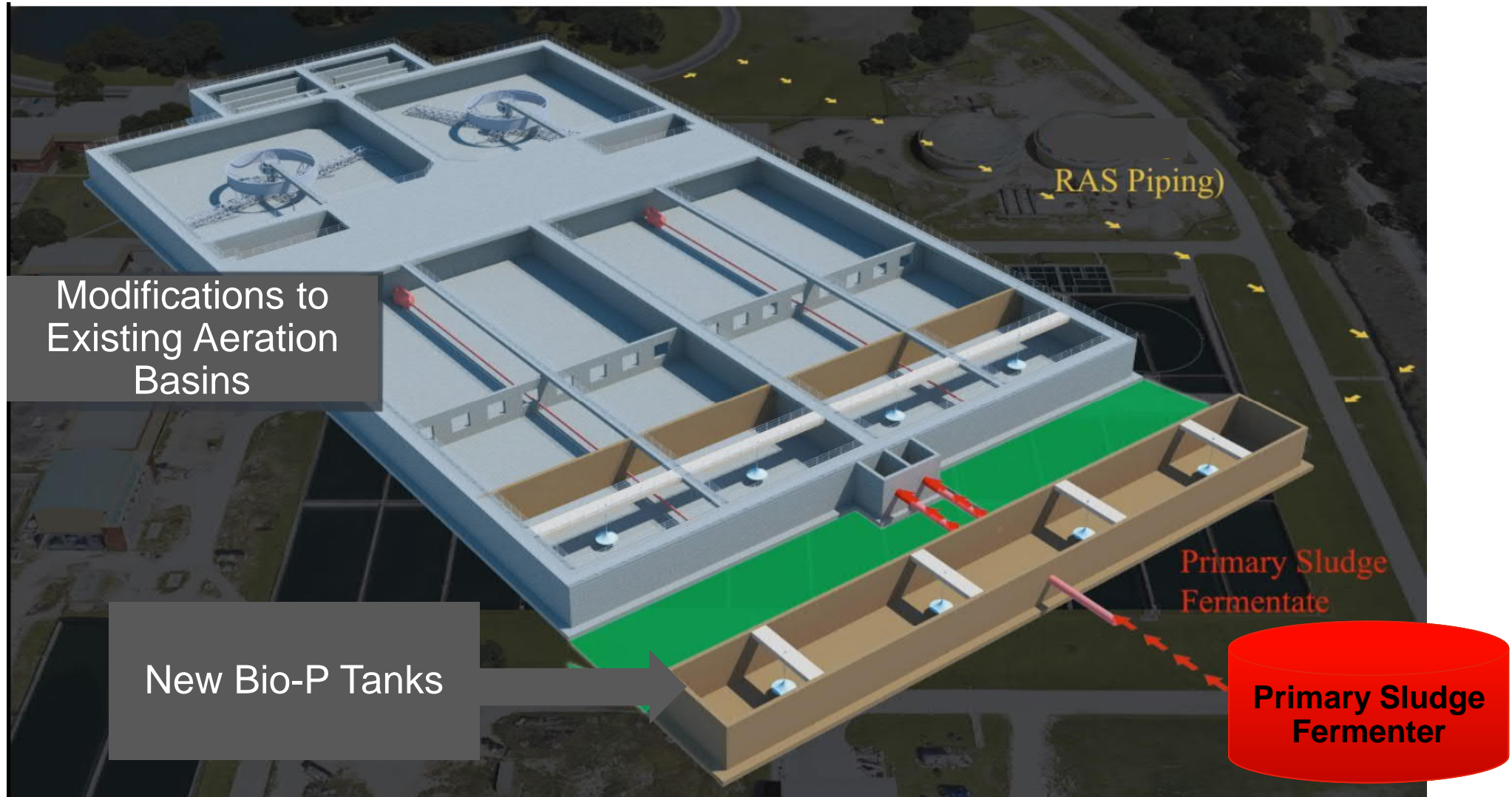
Preliminary Engineering Phase

Updates

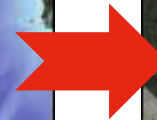
- January 2021 – February 2022
- Touching every area of the plant
- Confirmed hydraulics
- Confirmed process selection and needs to accommodate Westbank process



Conversion to Westbank



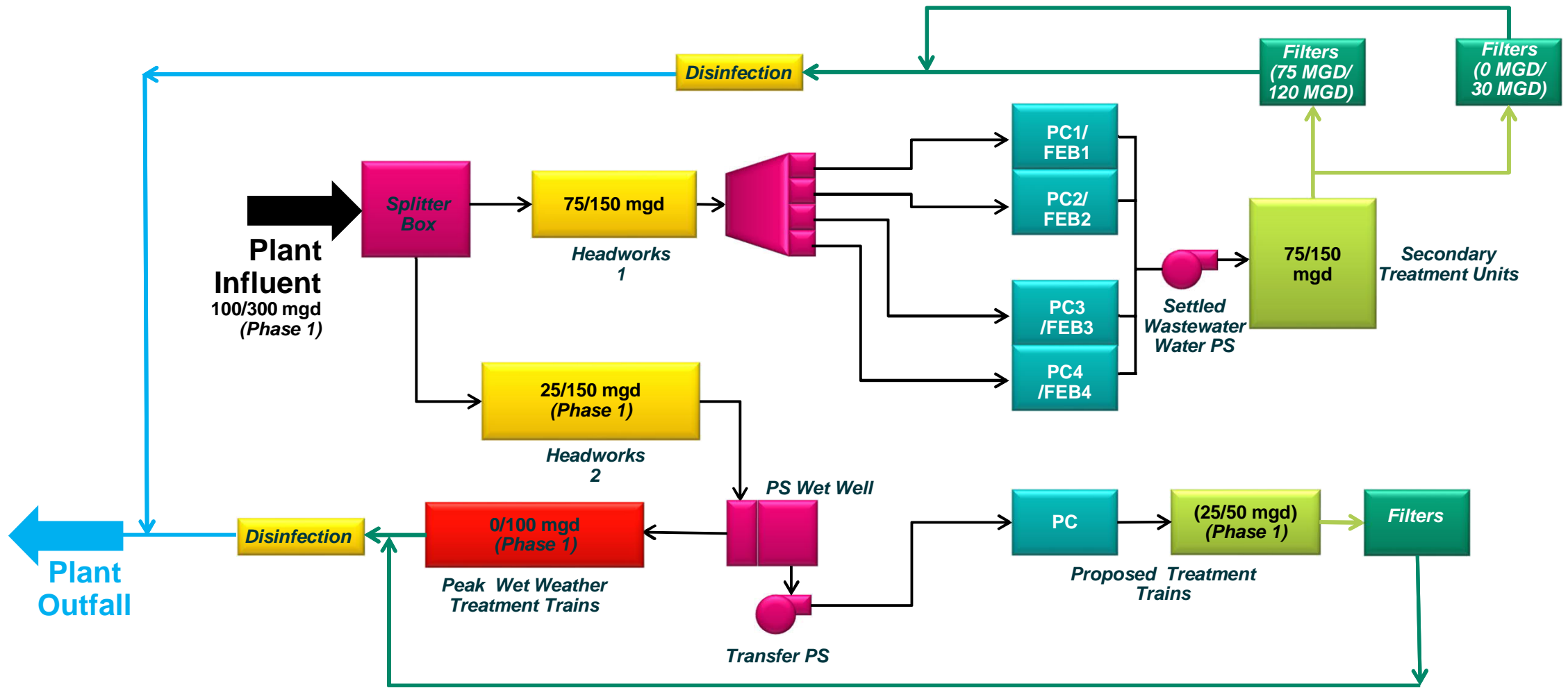
Maximized treatment capacity and use of space



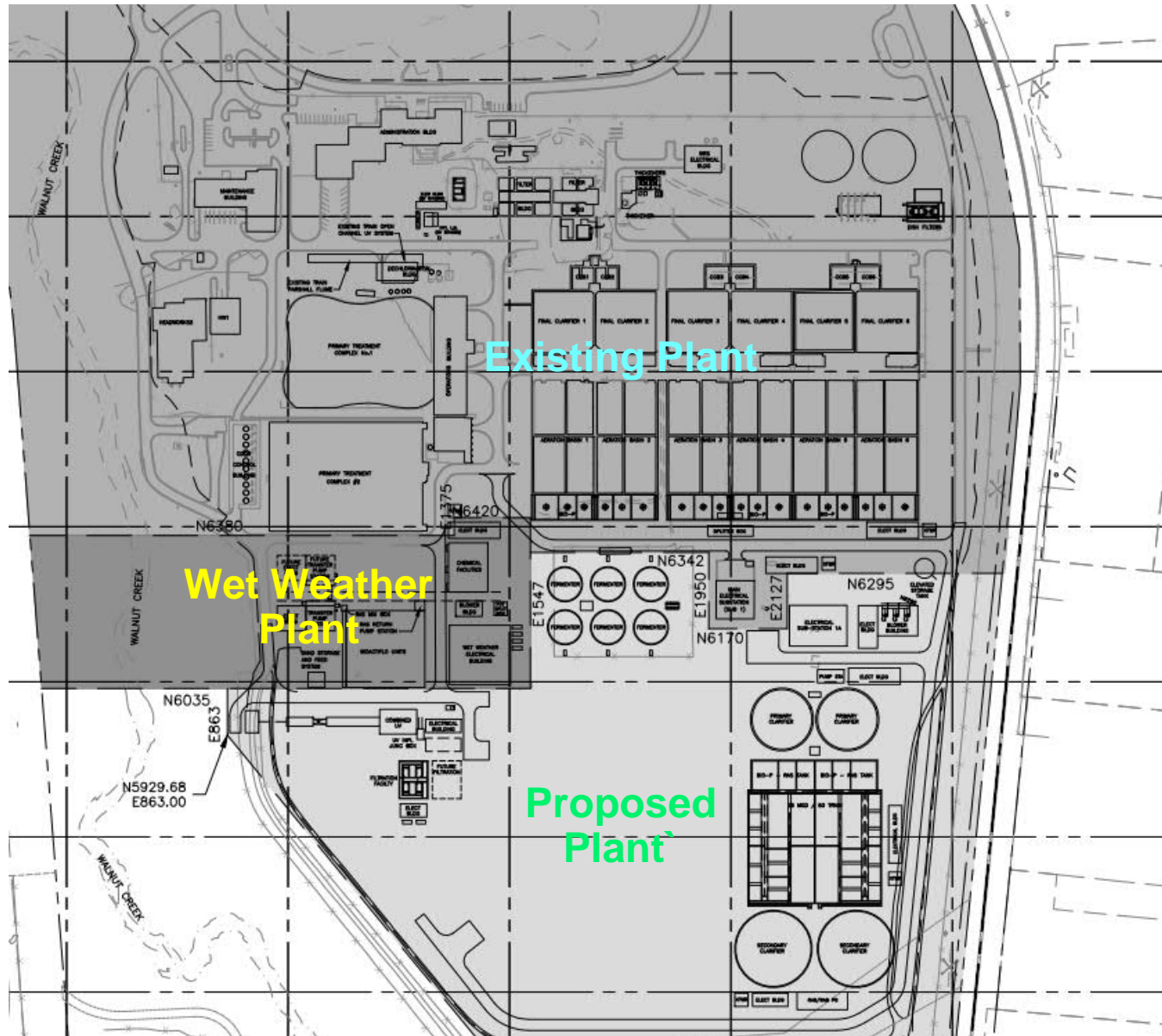
Updates

- Updates on EPA Region 6 position on side-stream treatment
- Changes to effluent disinfection
- Estimated Construction Cost of \$600M - \$700M

Proposed Flow Diagram



Proposed Site Layout





Thank you!