

# Wastewater Treatment Plant (WWTP) Consolidation



Council Update  
May 19, 2015



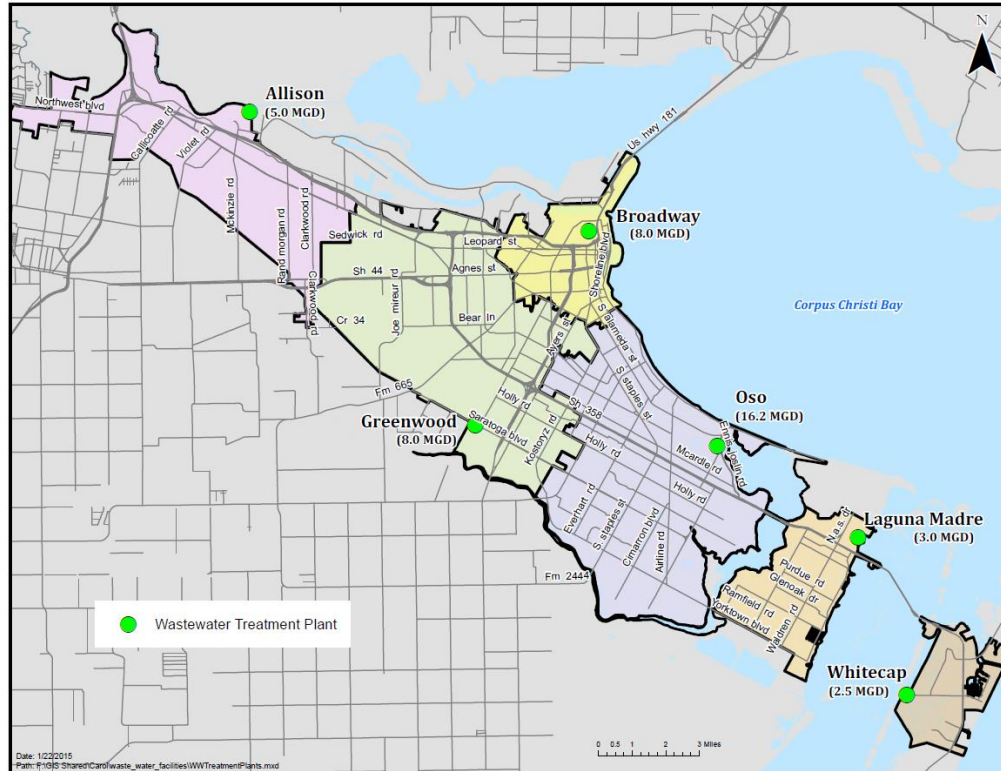
# Outline

---

- Existing Wastewater Treatment Plant (WWTP) Condition
- Analysis to Date
- Path Forward

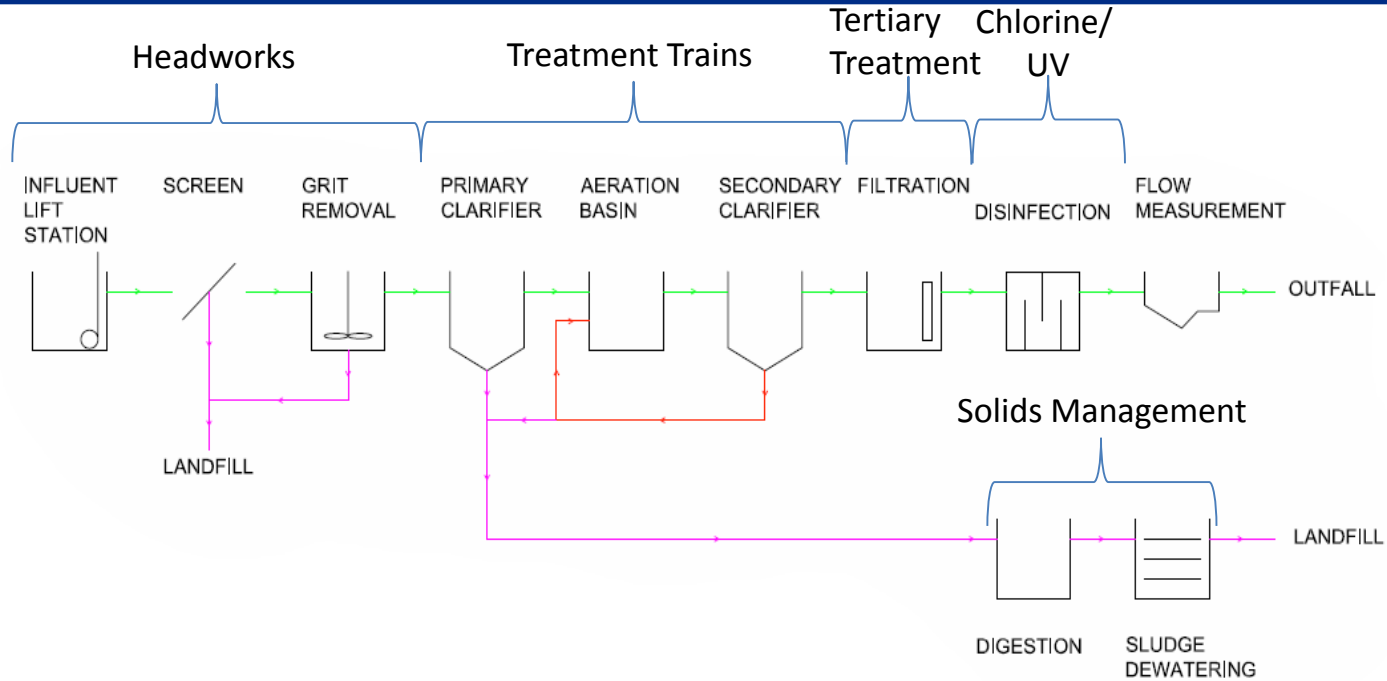


# Existing WWTP Condition



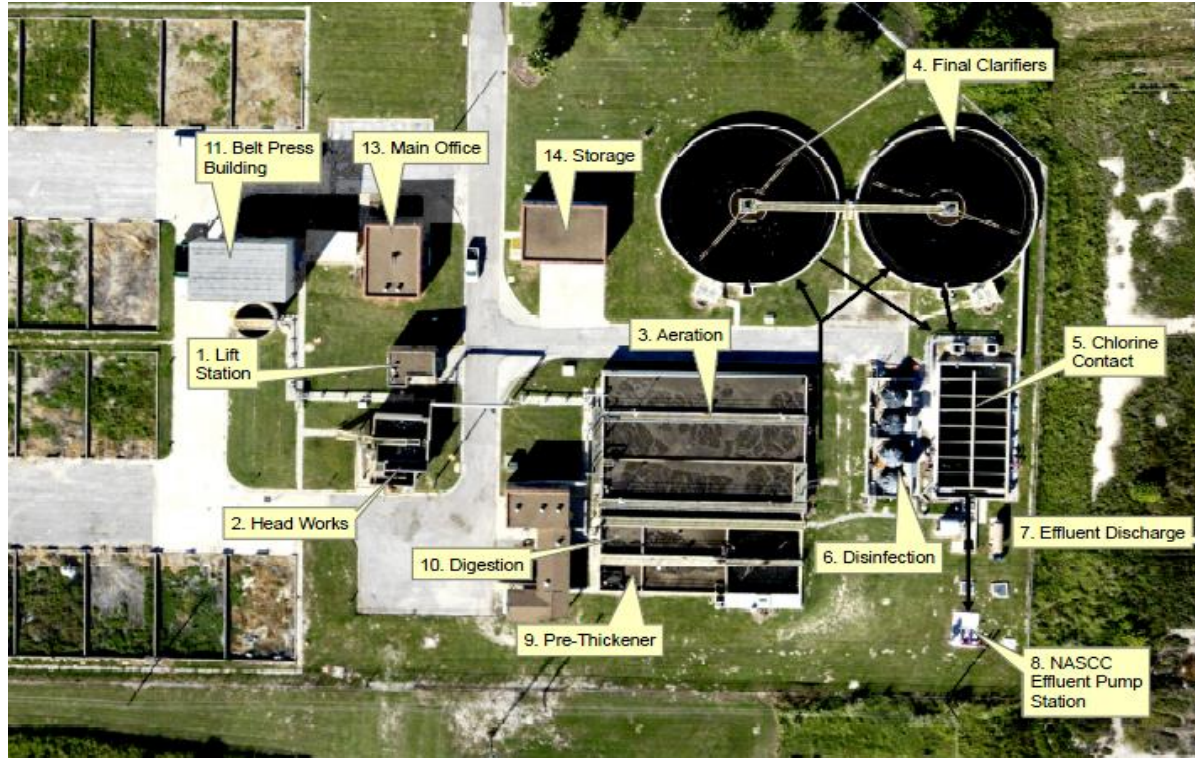


# Existing WWTP Conditions





# Existing WWTP Conditions



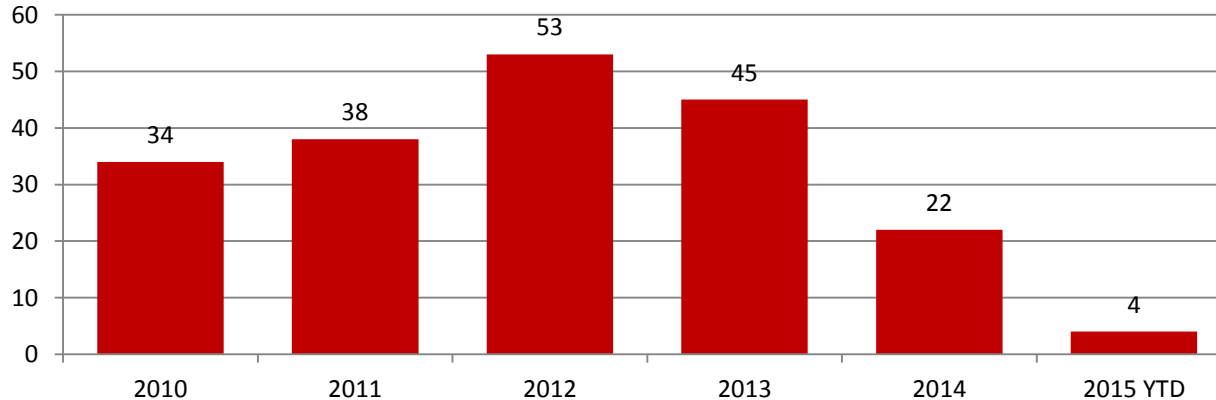


# Existing WWTP Condition

## Violations - Total by Year and Plant

2010 through April 23, 2015

	Allison	Broadway	Greenwood	Laguna Madre	Oso	Whitecap	Total
2010	4	0	7	0	7	16	34
2011	18	2	1	1	6	10	38
2012	3	6	1	6	22	15	53
2013	8	7	1	6	21	2	45
2014	9	4	6	1	1	1	22
2015 YTD	1	1	1	0	0	1	4
Total	42	19	16	14	57	44	192





# Existing WWTP Condition

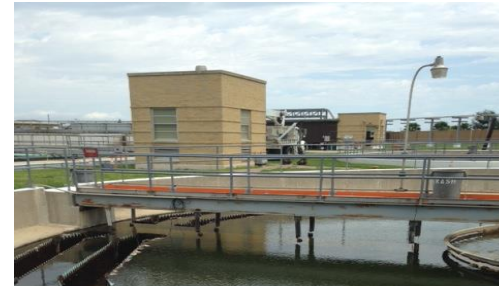
- Allison
  - Internal improvements made to meet Ammonia Limit
  - Lift Station and Disinfection Improvements Needed
- Laguna Madre
  - Construction Under Way for New Chlorine Disinfection Equipment
- Greenwood
  - UV System not designed to treat for Enterococci
  - Consultant Selected during last RFQ





# Existing WWTP Condition

- Oso
  - Phase 1 was intended to be short term and utilizes elevated Chlorine levels
  - Lift Station and Headworks could fail at any time
  - Unknown condition of the Aeration Equipment
- Whitecap
  - UV System not designed to treat for Enterococci







# Analysis to Date

---

- Continue to Operate 6 WWTP
  - Major Capital Investment at 6 Locations
  - Rising Operating Costs
  - Future Plant Expansion
  - Development of Equipment Asset Management Program
  - Changing Water Quality Standards
- Phased Consolidation Plan Aimed at 1 WWTP
  - Large Capital Investment
  - Rerouting of Wastewater Collection System





# Analysis to Date

- O&M Needs include
  - Asset Management
  - Labor
  - Electricity
  - Purification Chemicals
  - Solids Handling
  - Collection System Cleaning and Televising
- Capital Needs Include:
  - Plant Expansions
  - Recapitalization
  - Changing Permit Requirements
  - Rehabilitation and Replacement of Collection Lines

30 Year O&M Breakdown		
Plant	Total O&M	Average \$/1000 gallons
Greenwood	\$211,000,000	\$2.30
Oso	\$403,000,000	\$2.35
Broadway	\$174,000,000	\$2.49
Laguna Madre	\$94,500,000	\$3.41
Whitecap	\$70,200,000	\$3.78
Allison	\$155,000,000	\$3.93
<b>Total</b>	<b>\$1,110,000,000</b>	<b>\$2.65 (avg)</b>

❖ National Average for small plants \$1.23 - \$3.42 per 1000 gallons



# Analysis to Date

---

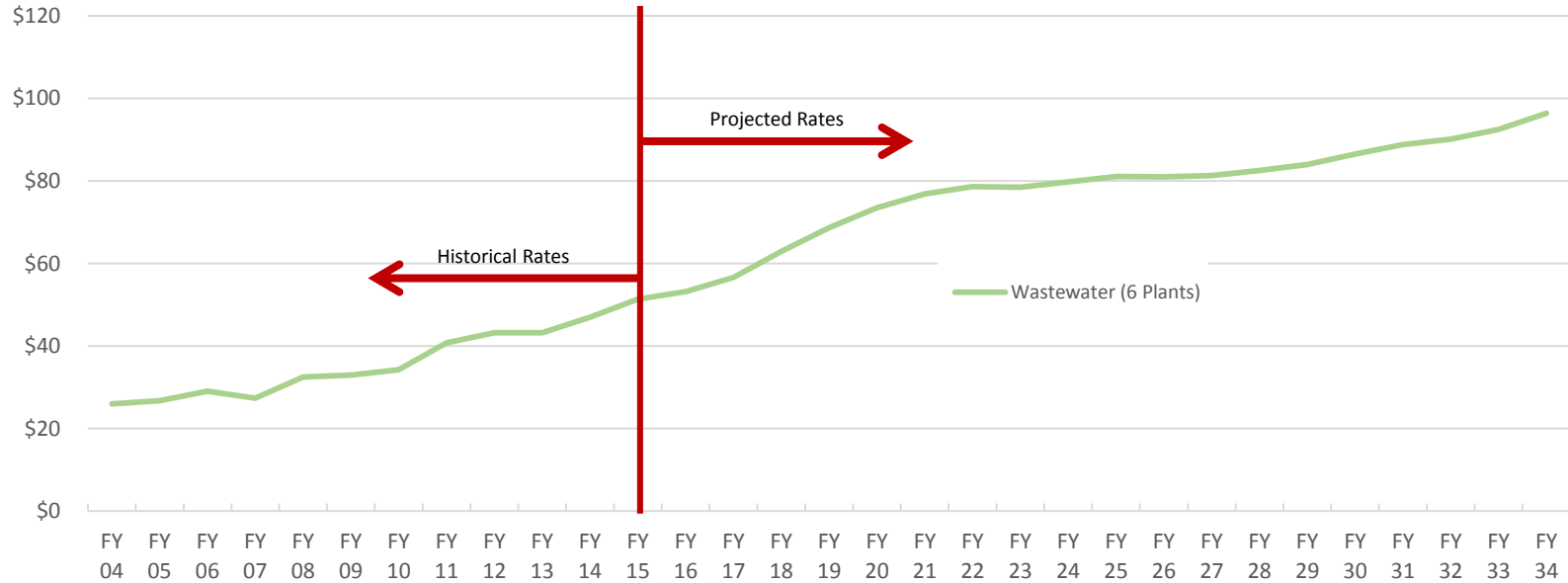
## **Analysis does Not Include**

- Quality of effluent is improved
- Effluent truly becomes a Water Supply
- Consolidated sludge handling – could become a commodity
- The plants are beyond their economic life
  - Additional repairs may be necessary at existing plants
- Co-Generation may become feasible
- Lower total cost to include redundancy needed for maintenance
- Construct above the flood plain
- Does not move any costs to raw water



# 6 Plants

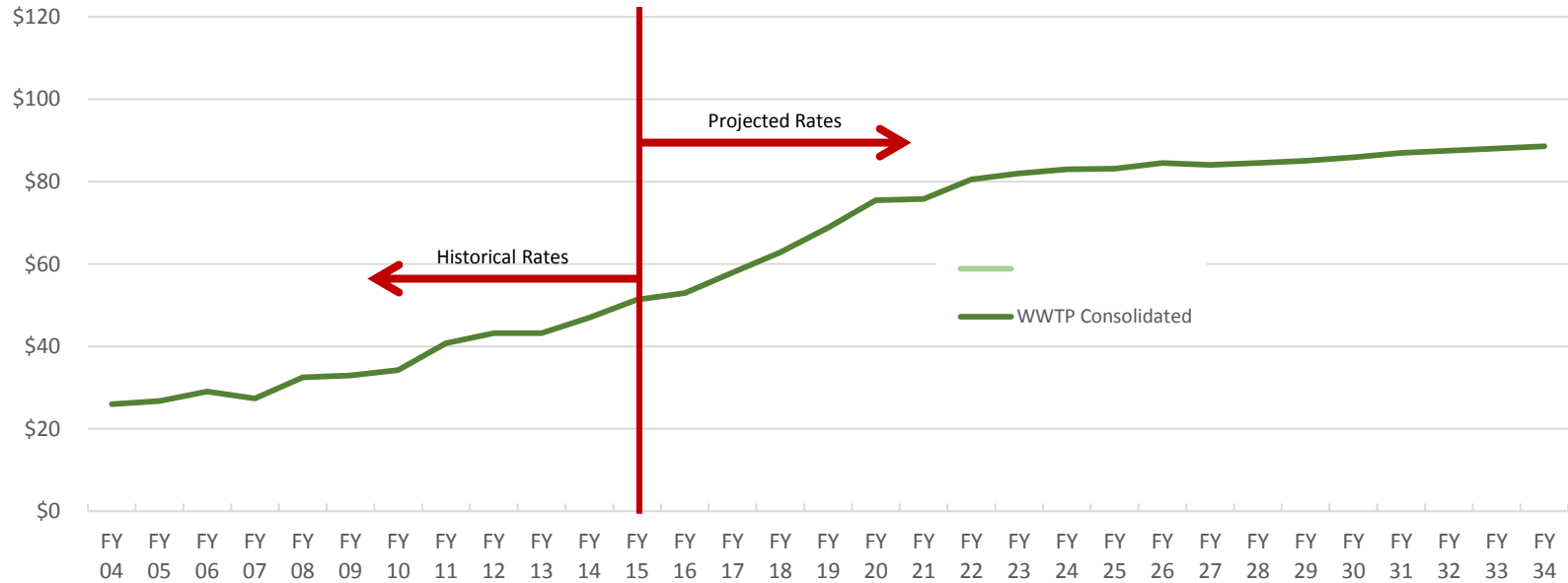
Average Monthly Bill





# Regional Plant

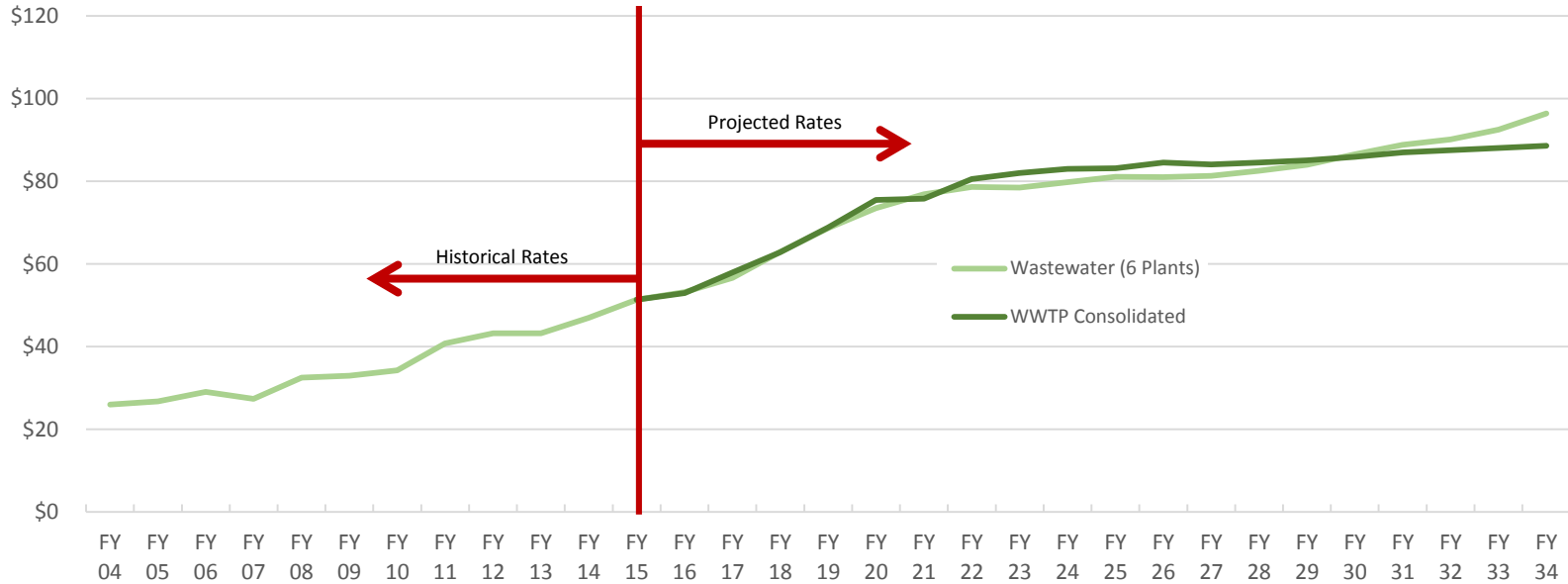
Average Monthly Bill





# Combined

## Average Monthly Bill





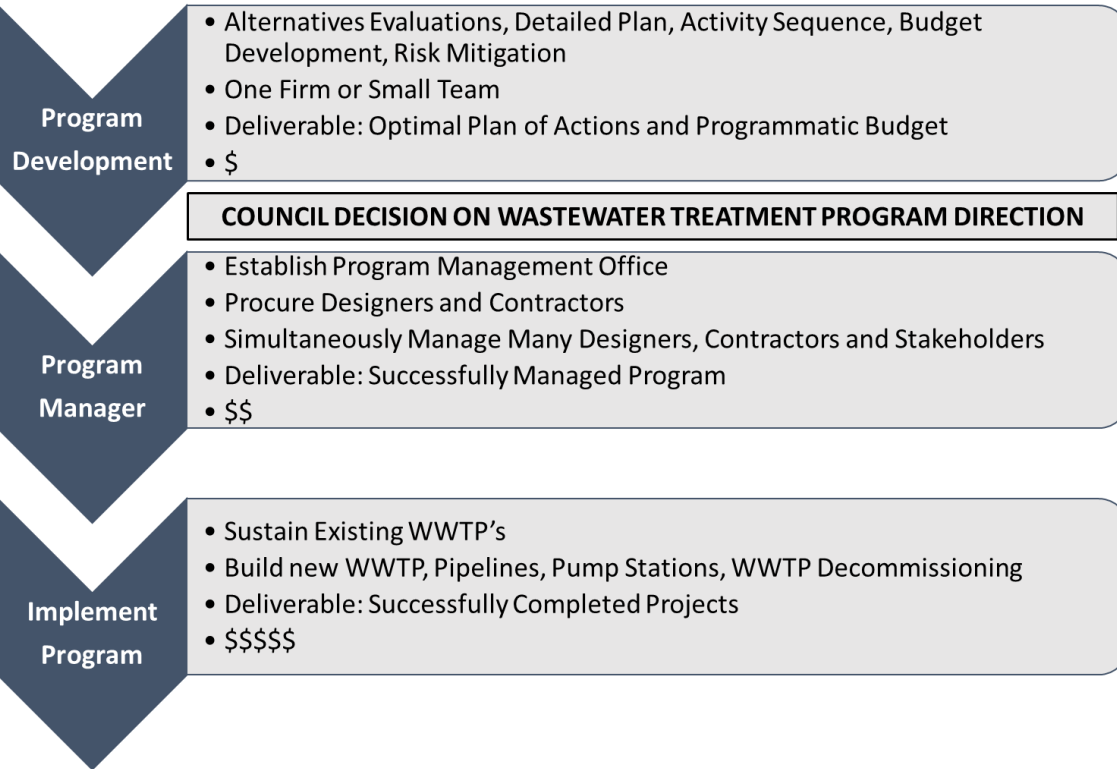
# Path Forward

---

- Continue Investment in Existing Wastewater Treatment Plants
- Prepare RFQ for the following services:
  - Evaluate WWTP site locations, size, outfall locations and/or other needs
  - Evaluate plant process alternatives and phasing
  - Develop final collection system reroute plan
  - Develop an Existing WWTPs Sustainment Plan
  - Develop Project Schedule
  - Develop Project Budget
  - Verify Rate Model
  - Identify Project Delivery Method
  - Plant Decommissioning Schedule & Land use alternatives
  - Develop permitting Strategy
  - Public involvement



# Path Forward







# Backup



# Permit Standards

WWTP	Allison	Broadway	Greenwood	Laguna Madre	Oso	Whitecap
Permitted Annual Average Flow	5 MGD	10 MGD	8 MGD	3 MGD	16.2 MGD	2.5 MGD
2-Hour Peak Flow	15 MGD	20 MGD	24 MGD	9 MGD	97.2 MGD	7.5 MGD
2013 Treated Effluent	2.7 MGD	4.0 MGD	5.4 MGD	1.5 MGD	11.4 MGD	1.2 MGD
% of Permitter Flow*	54%	40%	68%	50%	70%	48%
2013 Reuse	0.04 MGD		0.31 MGD	0.26 MGD	0.20 MGD	0.47 MGD
BOD	20 mg/l	20 mg/l	10 mg/l	20 mg/l	20 mg/l	20 mg/l
TSS	20 mg/l	20 mg/l	15 mg/l	20 mg/l	20 mg/l	20 mg/l
Ammonia	12 - 4mg/l		3 mg/l		4 mg/l	
Enterococci	35	35	35	35	35	35
Copper		.0241 mg/l	.013 mg/l			

\* TCEQ requires expansion design when a plant is treating 75% of permitted annual average flow and construction to begin when a plant is treating 90% of permitted annual average flow

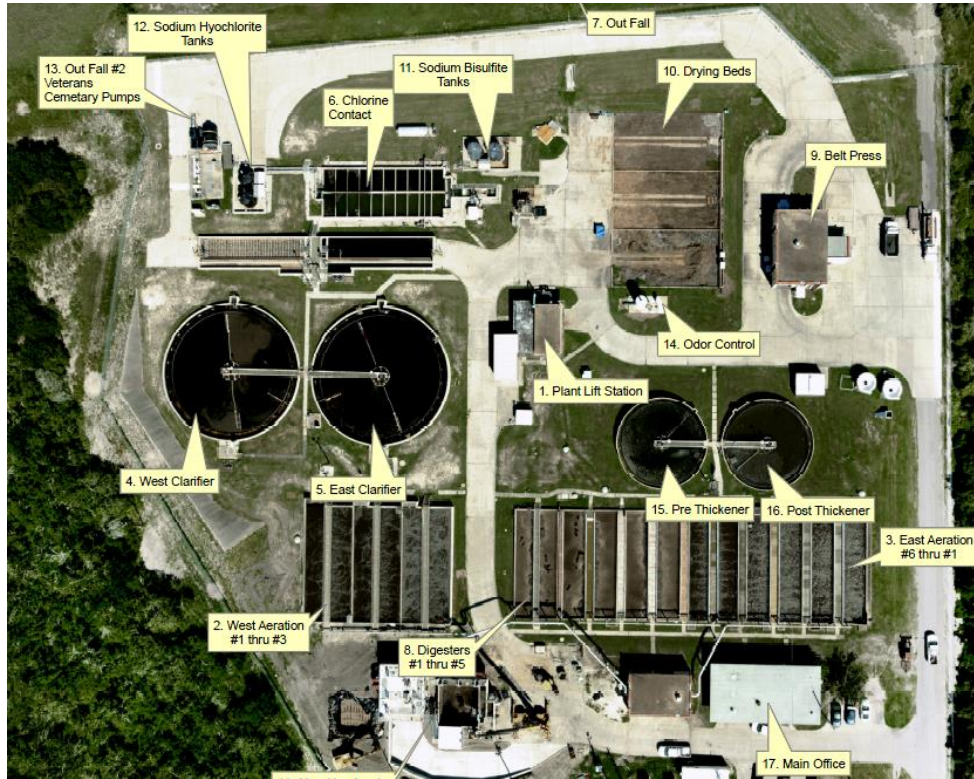


# Processes

WWTP	Allison	Broadway	Greenwood	Laguna Madre	Oso	Whitecap
Influent Lift Station	*	*	*	*	*	*
Screens	*	*	*		*	*
Grit Removal	*	*				
Primary Clarification			*			
Aeration	*	*	*	*	*	*
Secondary Clarification	*	*	*	*	*	*
Filtration	*					
Disinfection	Chlorine	UV	UV	Chlorine	Chlorine	UV
Digestion	*	*	*	*	*	*
Sludge Dewatering	*	*	*	*	*	*



# Allison WWTP



Year Constructed:	1965
Major Expansion:	1985
Capacity (MGD):	5
Peak (MGD):	15
Permitted:	2015

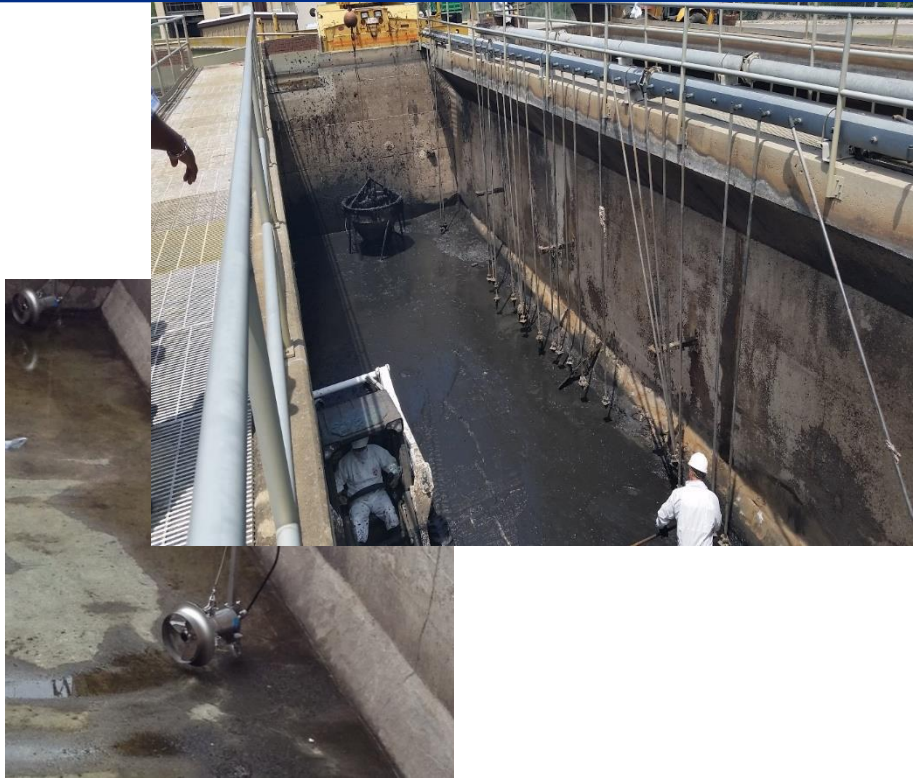


# Allison WWTP



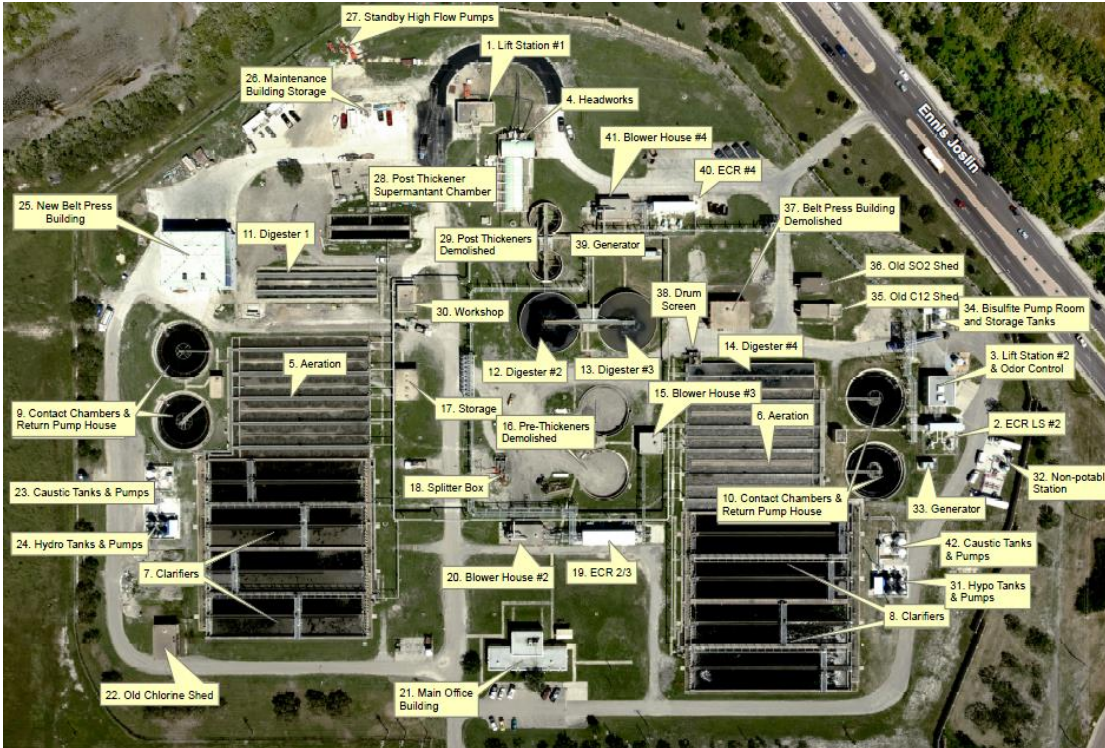


# Allison WWTP





# Oso WWTP



Year Constructed:	1941
Major Expansion:	1985
Capacity (MGD):	16.2
Peak (MGD):	98.3
Permitted:	2011



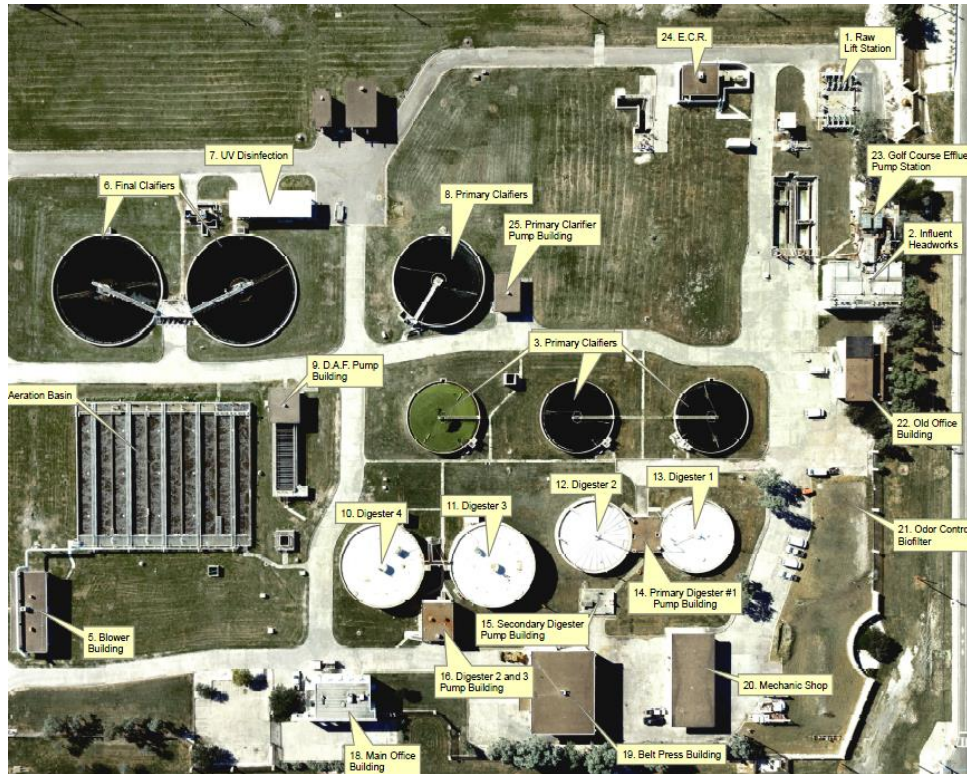
# Oso WWTP







# Greenwood WWTP



Year Constructed:	1959
Major Expansion:	1995
Capacity (MGD):	8
Peak (MGD):	24
Permitted:	2014



# Greenwood WWTP





# Laguna Madre WWTP



Year Constructed:	1971
Major Expansion:	1982
Capacity (MGD):	3
Peak (MGD):	9
Permitted:	2012



# Laguna Madre WWTP





# Whitecap WWTP



Year Constructed:	1974
Major Expansion:	1992
Capacity (MGD):	2.5
Peak (MGD):	7.5
Permitted:	2014



# Whitecap WWTP





# Broadway WWTP



Year Constructed:	2013
Major Expansion:	
Capacity (MGD):	8
Peak (MGD):	20 (40)
Permitted:	2013