



Alamitos Bay Water Quality Enhancement Project

February 23, 2021



Alamitos Bay Water Circulation

- The Bay has had the influence of forced circulation by the powerplants (AES & Haynes) for over 55 years.
- Protected habitats, species, and public use areas have become accustomed to the current condition.
- Once through cooling (OTC) is being phased out due to impacts to fish (impingement and entrainment).
- The cessation of powerplant pumps will have an immediate effect on circulation that is believed to have secondary effects on water quality.
 - New trash management approaches will be required to capture and retrieve trash from environmentally sensitive areas and public access areas.
 - Prolonged periods of elevated bacteria concentrations near source areas, and
 - Increase in temperatures and nutrients in areas that are shallow and stagnant (restricted in flow) within the Bay. These increases are expected result in further water quality impacts in localized areas.

Location of Intakes and Outfalls for Once Through Cooling Pumps



Current Scheduled Dates of Pump Shutdown at AES



Pump locations

Currently planned shut down dates determined by CEC:

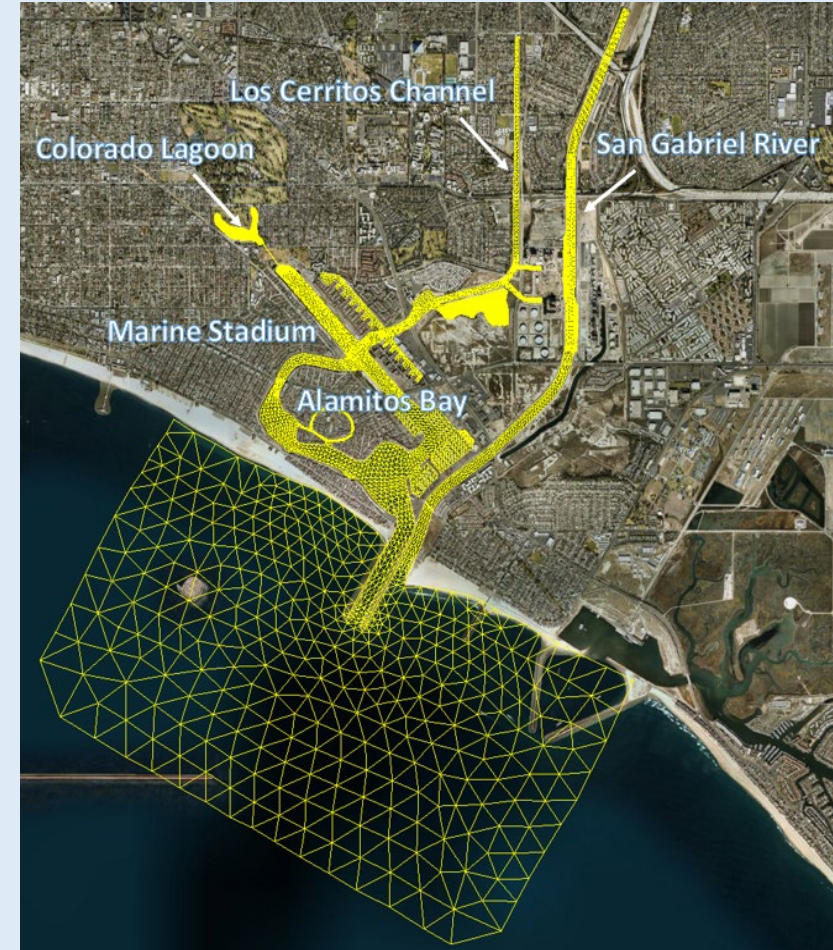
1, 2, 6 = December 2019

3, 4, 5 = December 2023

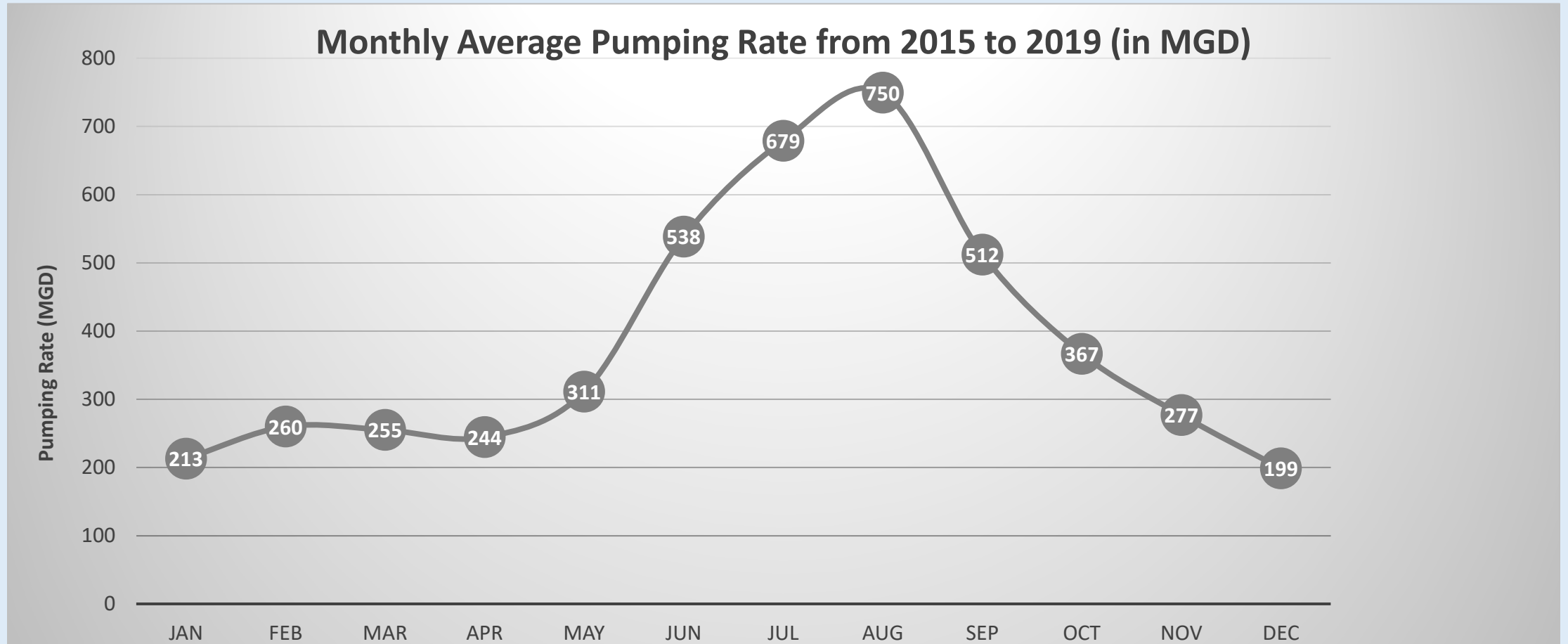
Haynes = December 2029

Future Management Options to Increase Circulation

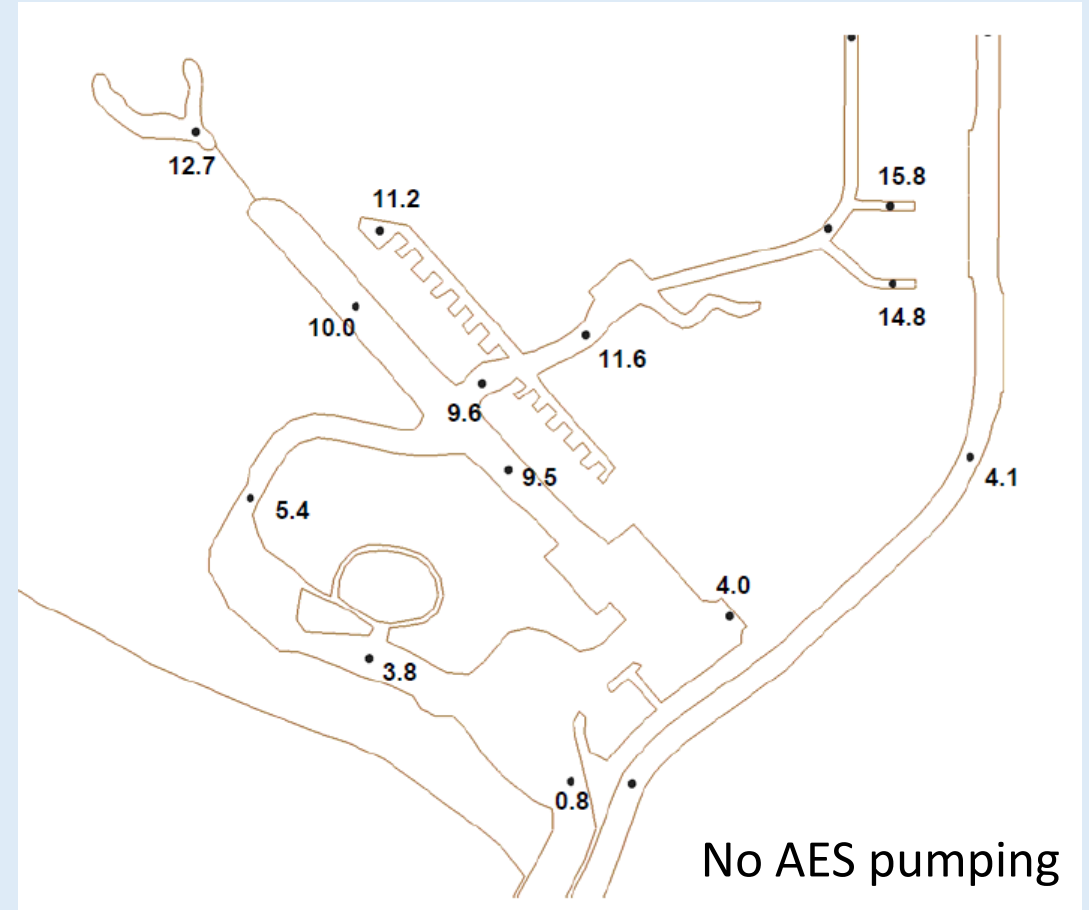
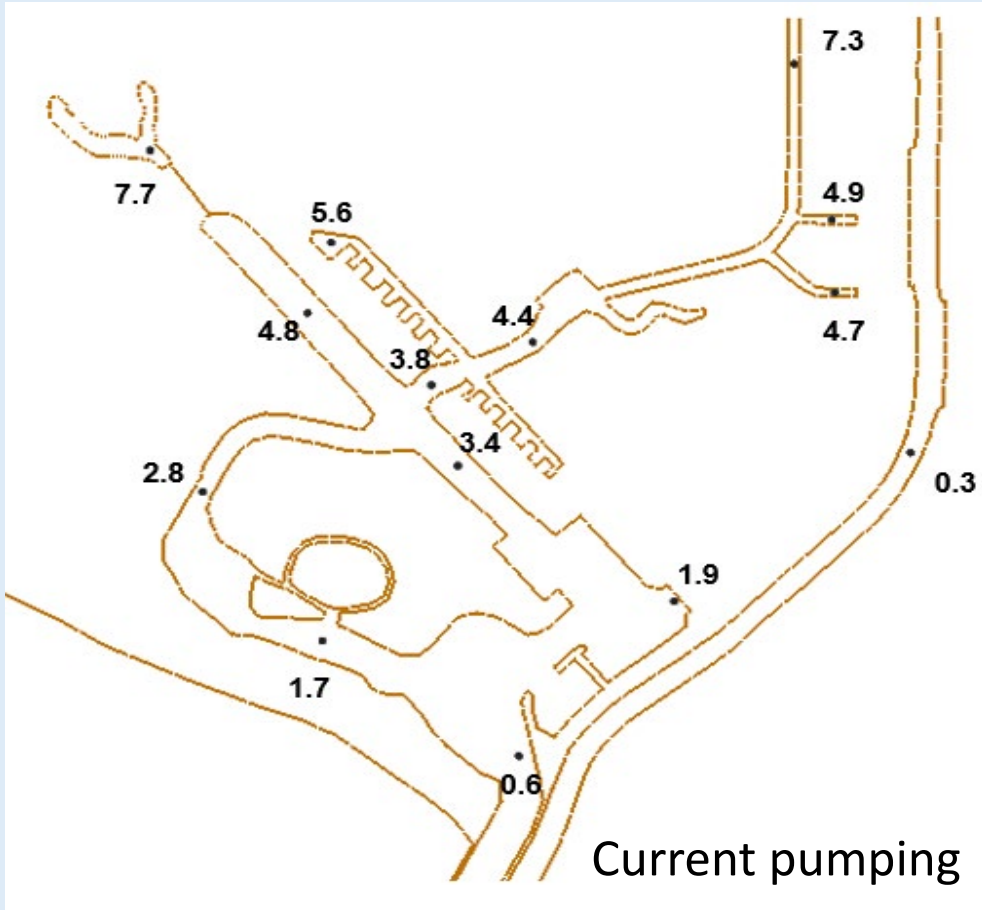
- Hydrodynamic modeling was performed to evaluate potential impacts and effectiveness of management options:
 - Residence times (number of days water is in a given location) were calculated throughout the Bay
 - Comparisons were made between various management options
 - No pumping as a baseline condition – do nothing
 - New pumps' intakes and outfalls at different locations in the Bay
 - Various pump rates and various pump frequencies
 - A new tidal inlet near 54th Street along Belmont Shore
- The most effective and practical method to keep circulation similar to existing conditions was determined to be:
 - Pump at AES facility to San Gabriel River at a constant rate of 258 MGD (400 cfs, protective of fish)



2015 to 2020 – Average Pump Rate through AES

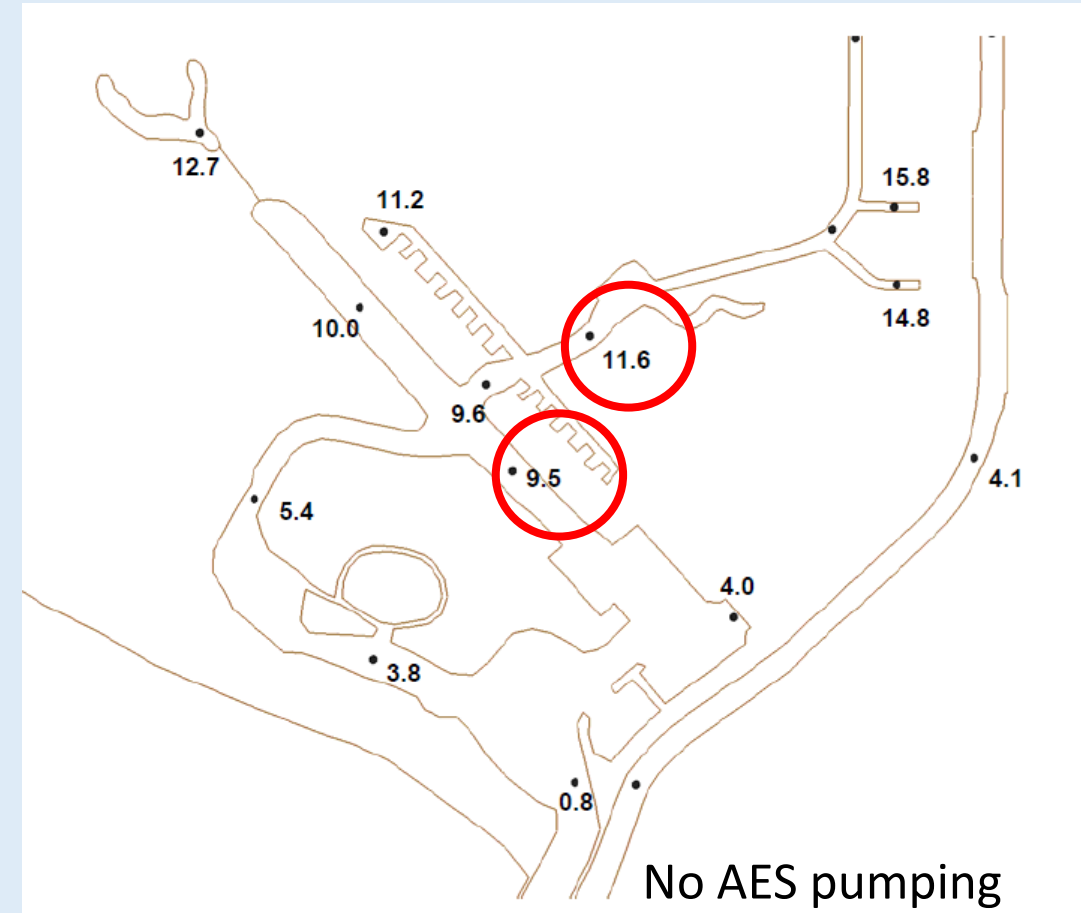
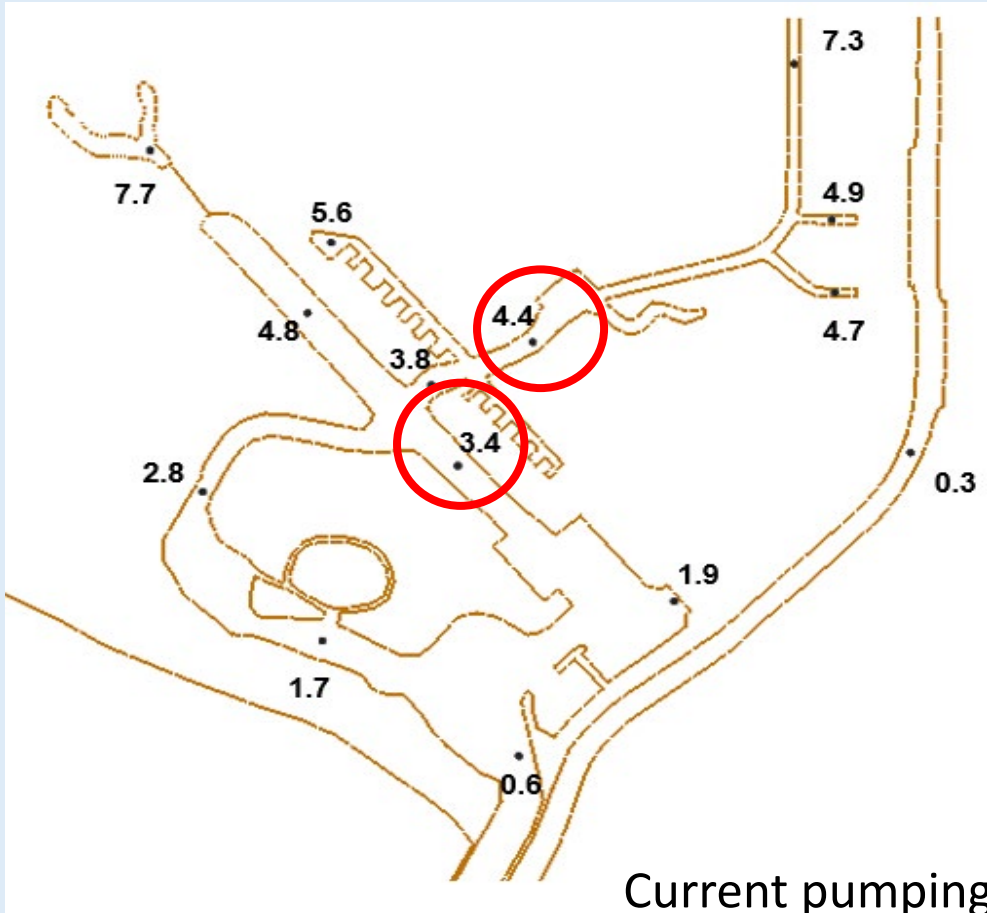


Estimated Dry Weather Residence Time



Residence time = days until water circulates with ocean

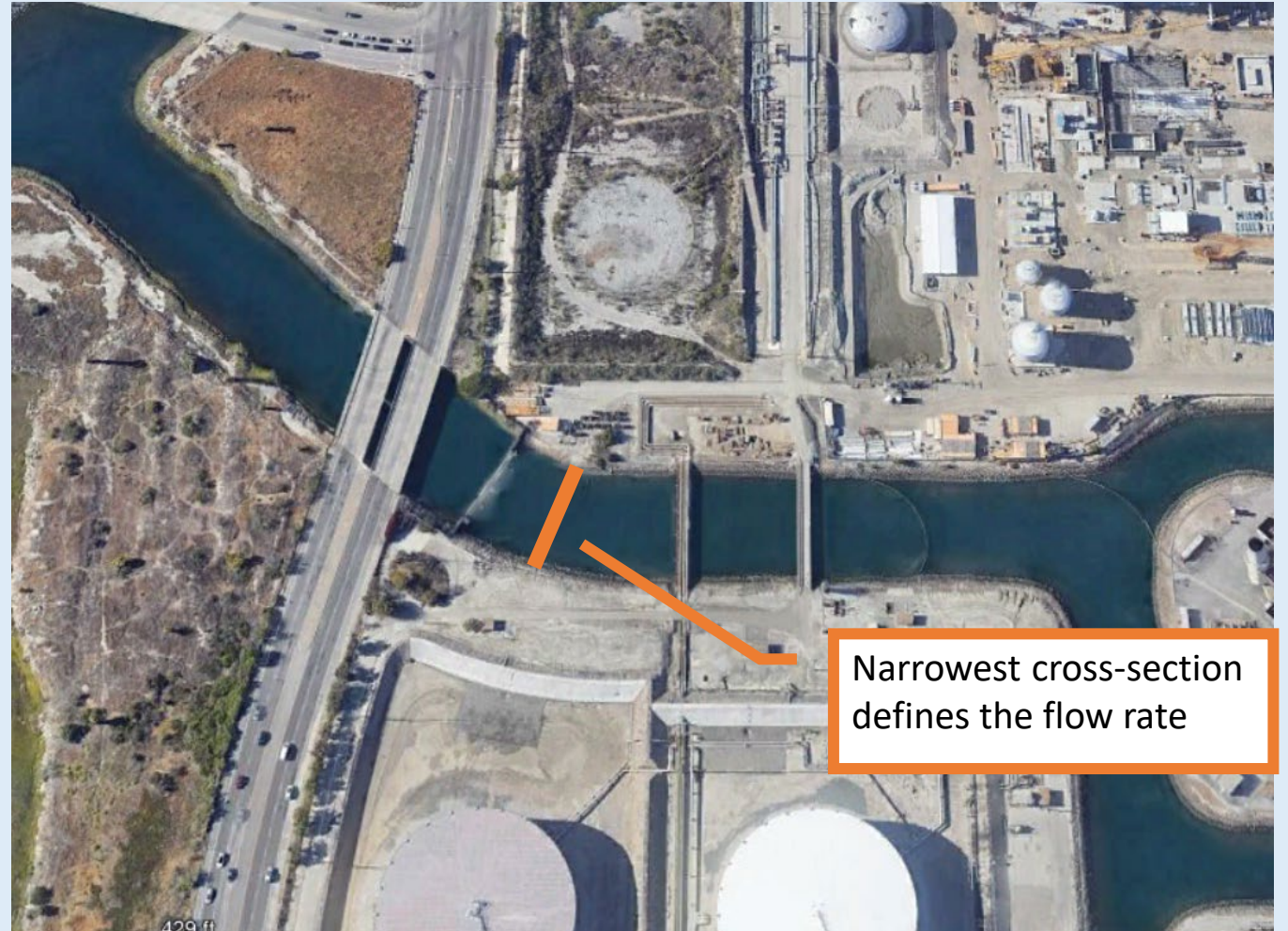
Estimated Dry Weather Residence Time



Residence time = days until water circulates with ocean

What is the “Right” amount of pumping?

- Size of channel into AES pump station defines the maximum pump rate to meet fish impingement requirements
- Fish impingement regulations limits forces to 0.5 ft/second
 - = 380 cubic feet per second (cfs) in the smallest AES entrance channel cross-section
 - = 246 MGD

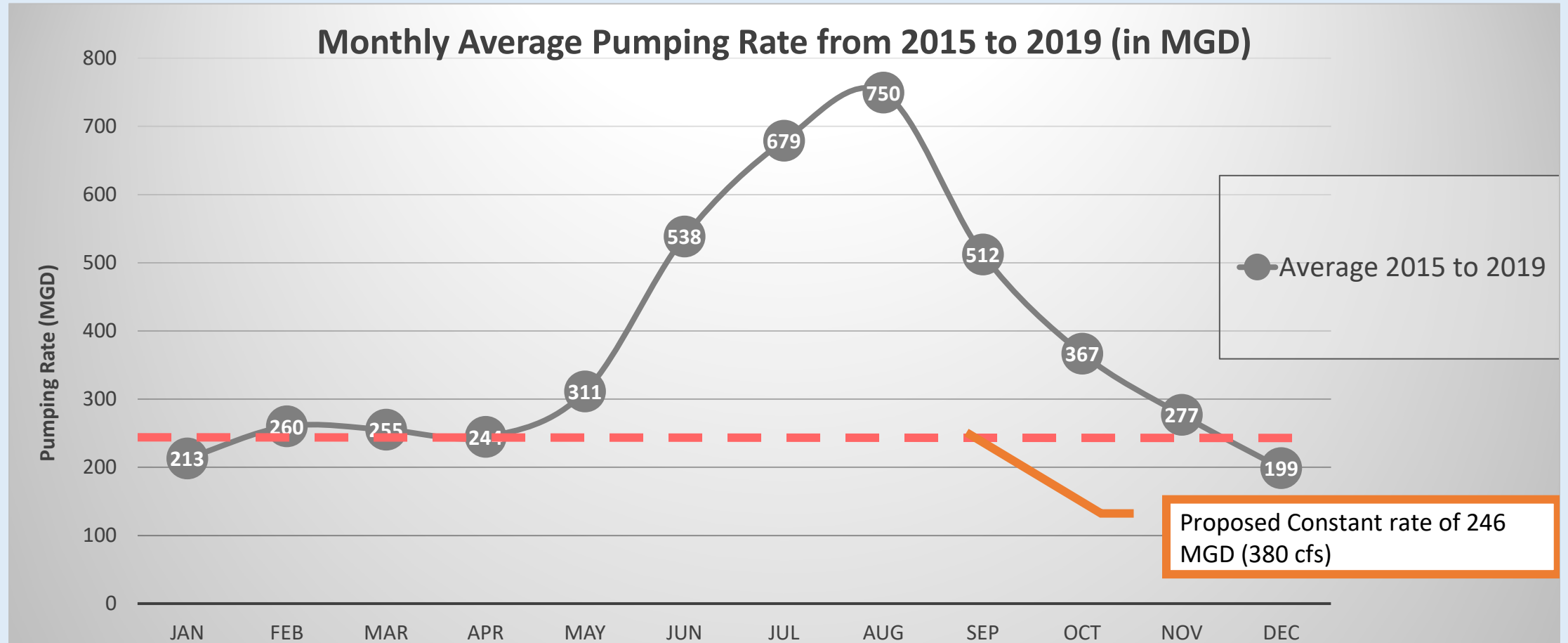


Fish Impingement

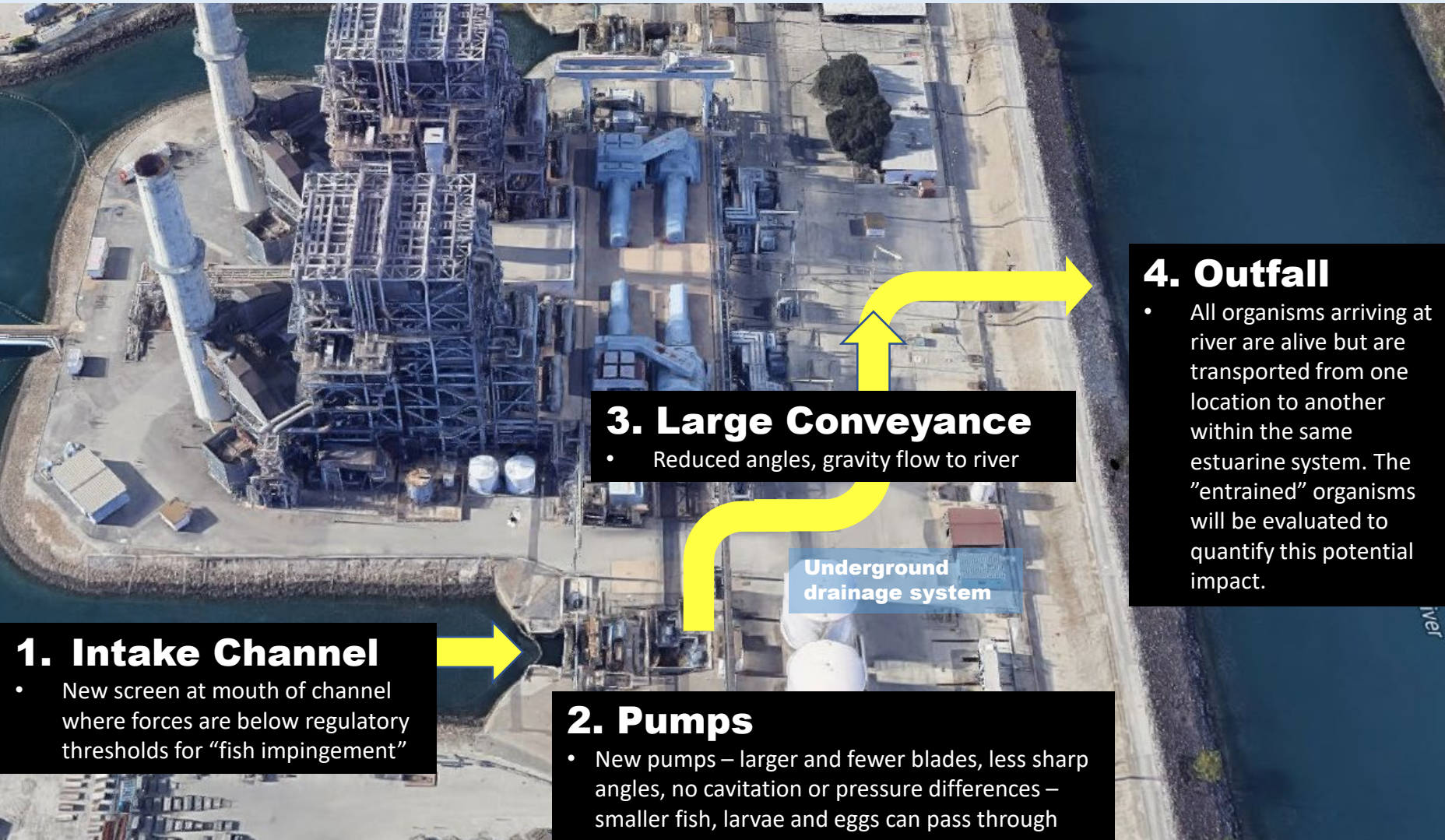
- Current so strong that the fish cannot swim away from the force and are killed.
- Reduce mortality by :
 - Reduce current (< 0.5 cfs)
 - Increase grate size
 - Increase pump size
 - Increase conveyance



New Pump Rate



New Water Circulation at AES Facility

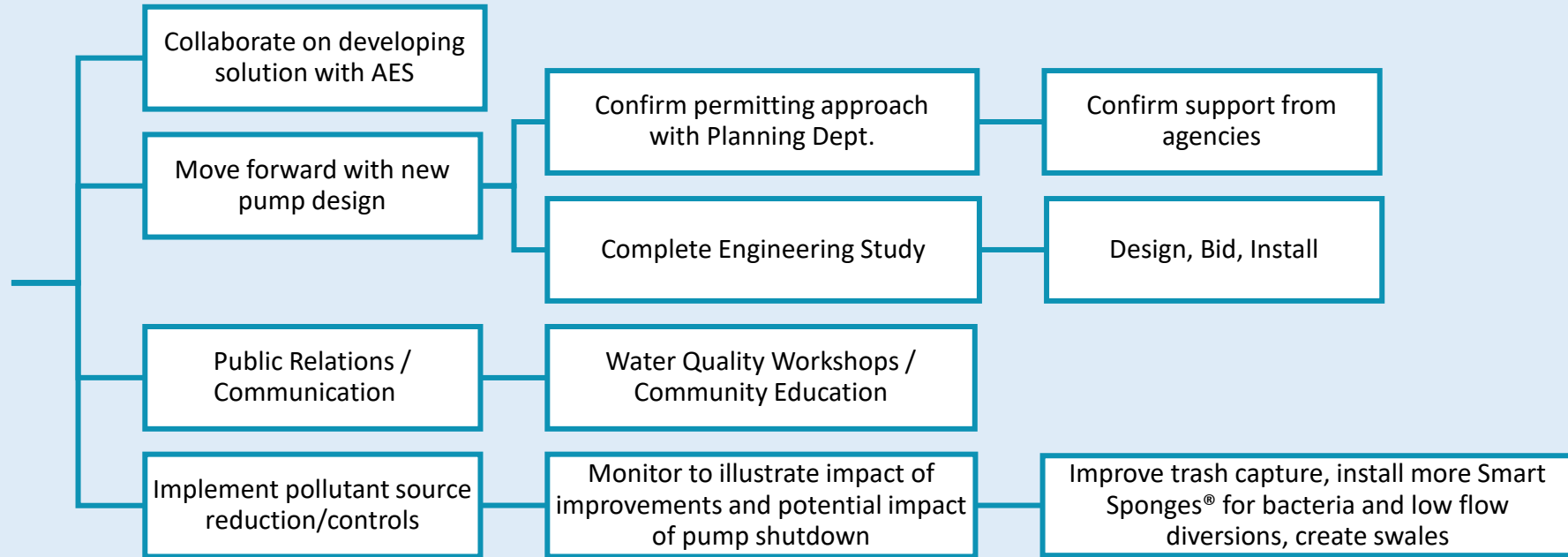


Reduced Fish Impact Pumps



Alamitos Bay Water Quality Enhancement Project

Multi-Pronged Project Approach



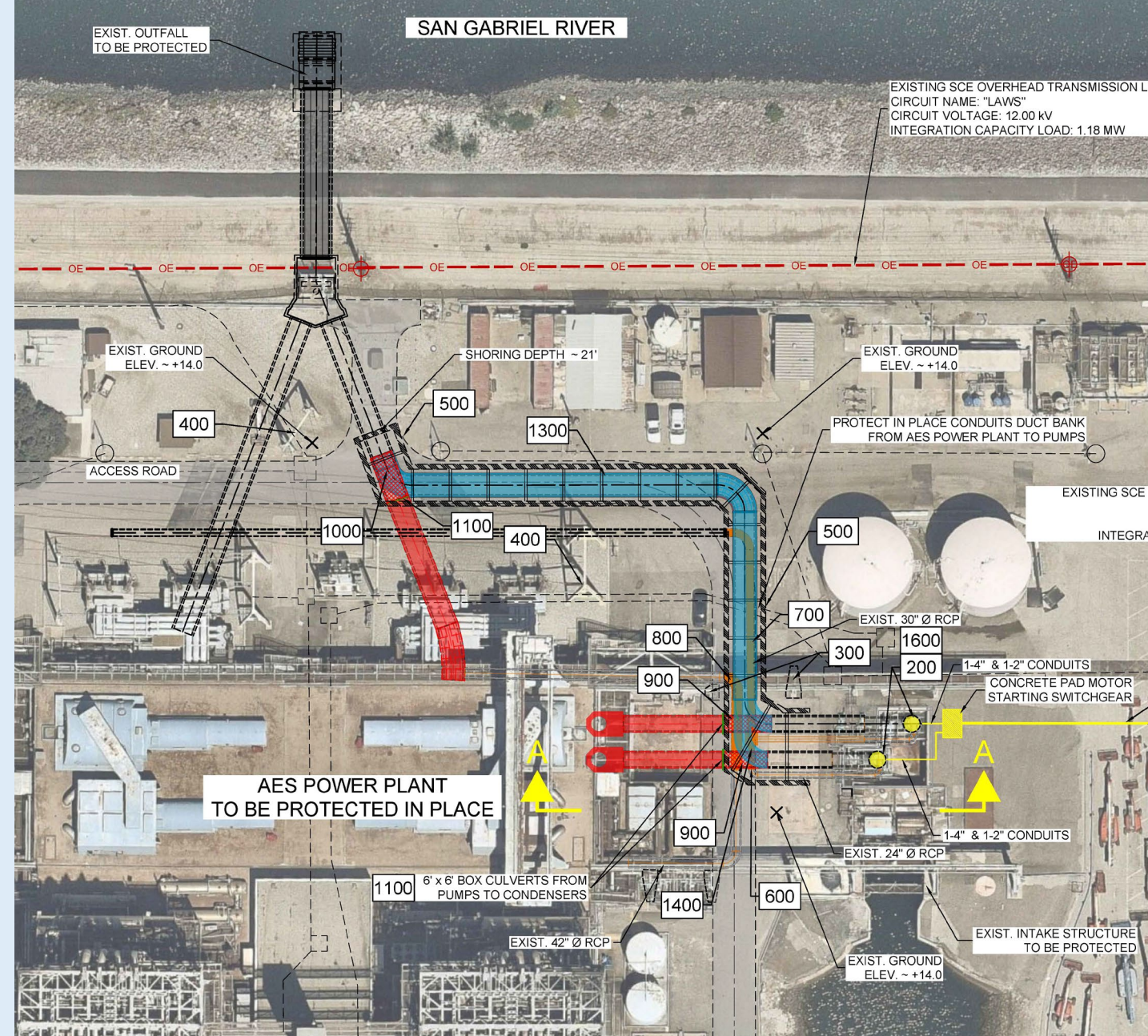
Collaborate with AES

- Collaborative relationship to be defined in a MOU
- Installation will require
 - Acquire/access to land to house the equipment
 - Pump station detailed design development
 - Modifications to the existing intake structure, piping, and outfall structure
 - Electrical infrastructure improvements
 - Trash collection system



Designing New Pump System

- Engineering feasibility study is nearly complete
- Currently confirming approach with AES, City department leads, and regulators
- Plan to complete 30% design this year





Public Engagement

- City is developing a Public Engagement and Communication Plan
- Share with public current water quality condition and the concerns regarding potential impacts related to lower circulation
- Engage early discussions with the community to obtain project input

Pollutant Source Control

- Increase trash capture, install more smart sponges for bacteria, build 2 low flow diversions and a swale
- Seek grant funding support
- Studies have identified targeted areas for trash capture, Smart Sponges® for bacteria, low flow diversions, bioswale

Potential Areas to Install Water Quality Improvement Devices



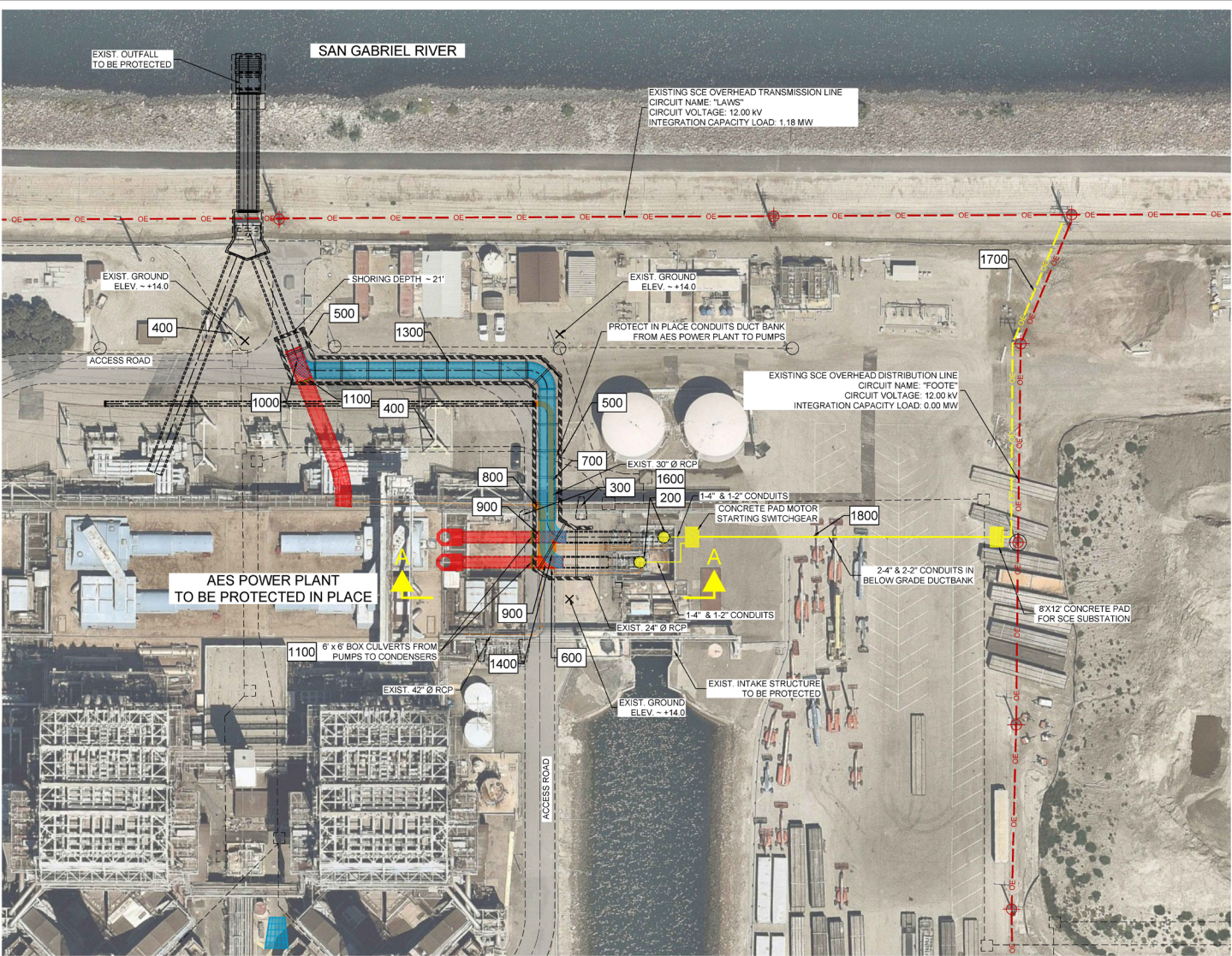
Schedule and Budget

- Need to have new pumps installed before old pumps are retired – Dec. 2023
 - 2021 – complete 30% design
 - 2022 – complete 100% design and go to bid
 - 2023 – complete construction
- Water Circulation System with Fish Friendly Pumps at AES Facility - \$30M
 - Only element currently funded: 30% engineering studies and permitting - \$500,000
- Operations and Maintenance (including monitoring) – Up to \$2M per year



Thank you

Extra slides



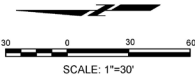
CONSTRUCTION COST ESTIMATE SUMMARY				
BID ITEM	LEGEND	DESCRIPTION	UNIT	QTY
100		MOBILIZATION/DEMOBILIZATION	LS	1.000
200		REMOVAL OF EXISTING PUMPS	EA	2.000
300		PROTECT OVERHEAD GANTRY CRANE STRUCTURE	LS	1.000
400		PROTECT EXISTING POWER TOWERS	EA	2.000
500		TEMPORARY SHORING	LF	640.000
600		REMOVAL OF EXISTING 24" RCP	LF	96.000
700		REMOVAL OF EXISTING 30" RCP	LF	45.000
800		REMOVAL OF EXISTING 42" RCP	LF	77.000
900		PARTIAL REMOVAL OF 6X8 RCB	LF	66.000
1000		PARTIAL REMOVAL OF 8X8 RCB	LF	38.000
1100		PLUG AND ABANDON EXISTING RCB AND RCP	EA	6.000
1300		INSTALL 6X8 RCB	LF	247.000
1400		INSTALL TRANSITION STRUCTURE 6X6 RCB TO 8X8	LF	48.000
1600		INSTALL NEW PUMPS	EA	2.000
1700		SCE SERVICE LINE	LS	1.000
1800		POWER DISTRIBUTION	LS	1.000
CONSTRUCTION SUB TOTAL				27,094,000
CONTINGENCY @ 30%				8,128,000
CONSTRUCTION TOTAL COST				35,222,000

CONSTRUCTION SCHEDULE
FROM MID 2021 TO MID 2022

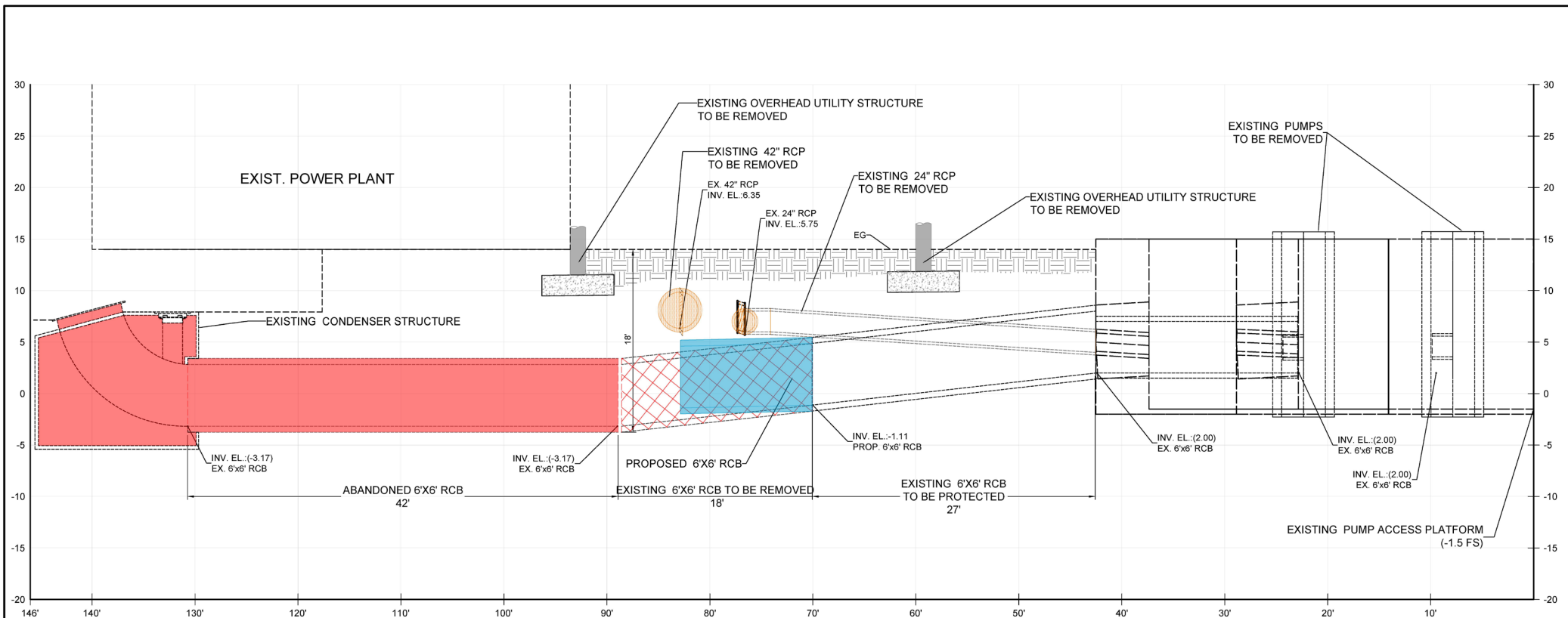
ASSUMPTIONS	
1	EXISTING 24", 30" AND 42" RCP CAN BE PARTIALLY REMOVED
2	EXISTING 6' X 6' AND 8' X 8' RCB CAN BE PARTIALLY REMOVED
3	EXISTING ROAD FROM INTAKE STRUCTURE TO OUTFALL CAN BE TEMPORARY CLOSED
4	PROPOSED PUMPS CAN BE POWERED FROM ADJACENT SCE CIRCUITS
5	SHORING AND INSTALLING 8' X 8' RCB WILL NOT CONFLICT WITH UNKNOWN UNDERGROUND STRUCTURES OR UTILITIES OTHER THAN THE CONDUITS DUCT BANK CROSSING FROM THE AES POWER PLANT TO THE PUMPS
6	NO CONSTRAINTS FOR ACCESSING THE SITE AND AVAILABILITY OF LAYDOWN AREAS FOR CONSTRUCTION

ADVANTAGES AND DISADVANTAGES	
BENEFITS	CONS
REDUCED COST BY USING EXISTING "WELL" INTAKE STRUCTURE	EXISTING STRUCTURE MAY LIMIT THE SIZE OF PUMPS
REDUCED COST BY USING EXISTING OUTFALL STRUCTURE	CONSTRUCTION ACTIVITIES HAVE THE MOST INTERACTION WITH AES OPERATIONS
REDUCED PERMITTING CONSTRAINTS BY USING EXISTING INTAKE AND OUTFALL STRUCTURES	

ALTERNATIVE No. 1-A "PRIOR DEMO - SHORT" - LAYOUT
SCALE: 1" = 30'



PLAN PREPARED FOR: CITY OF LONGBEACH	PLAN PREPARED BY: 555 Anton Blvd., Suite 400 Costa Mesa, CA 92626 657-261-2699	ALAMITOS BAY PUMPING SYSTEM AT AES PLANT Conceptual Engineering Design Preferred Alternative
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PLAN PREPARED FOR:

CITY OF
LONG BEACH

PLAN PREPARED BY:

moffatt & nichol

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657-261-2666

ALAMITOS BAY PUMPING SYSTEM
AT AES PLANT

Conceptual Engineering Design
Preferred Alternative
SECTION A-A
(2020-03-17)

Starting to see lower than normal flow rates

