Strategic Plan Development

Tonight's Policy Discussions:

- Constituents of Emerging Concern
- Environmental Water Quality, Stormwater Management and Urban Runoff
- Water Reuse
- Biosolids Management
- Food Waste Treatment

Constituents/ Contaminants of Emerging Concern Policy

Book page: 9

Presented by Roya Sohanaki
Engineering Manager

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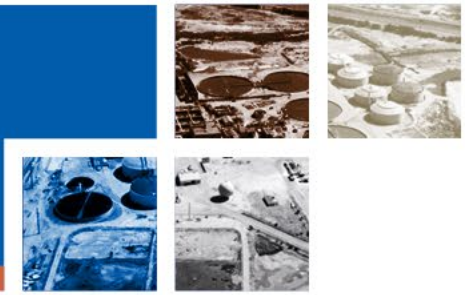
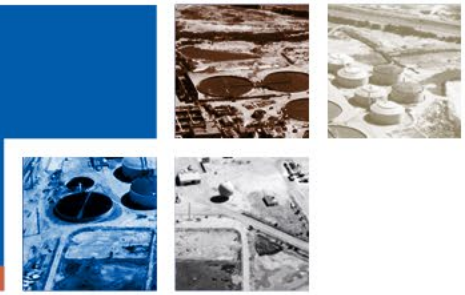
ORANGE COUNTY SANITATION DISTRICT

Policy Question



Should OCSD take a lead role on Constituents of Emerging Concern in wastewater and develop detection and characterization methods in wastewater treatment?

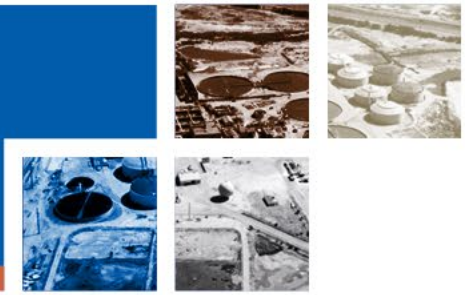
What are CECs?



CECs or **Contaminants of Emerging Concern** (also called **Constituents of Emerging Concern**)

Pollutants that may or may not be subject to regulatory requirements or statues, yet pose a risk to public health and/or the environment

Federal & State Requirements



Federal

- Clean Water and Air Acts
- Federal Pretreatment Regulations
- Federal Biosolids Regulation
- Other Federal Legislation and Regs

State

- State Legislation and Regulations
- NPDES Permit (with USEPA)
- Recycled Water Regulations
- Ocean Plan
- Air Quality Regulations

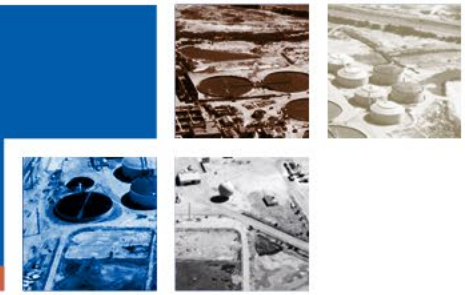
Local

- Approved Pretreatment Program
- Wastewater Discharge Regulations (Pretreatment Ordinance approved by Board)
- Enforcement Response Plan
- Permits & Enforcement Actions

CEC Study Requirements:

Hormones (8)
Industrial Endocrine Disrupting Compounds (7)
Pharmaceuticals and Personal Care Products (13)
Flame Retardants (9)

Partnering with Others



OCSD's Laboratory

SANITATION DISTRICTS OF LOS ANGELES COUNTY

ORANGE COUNTY WATER DISTRICT
SINCE 1933

COUNTY OF ORANGE CALIFORNIA

SOCWA
South Orange County Wastewater Authority

SCAP

Irvine Ranch
WATER DISTRICT

SAWPA

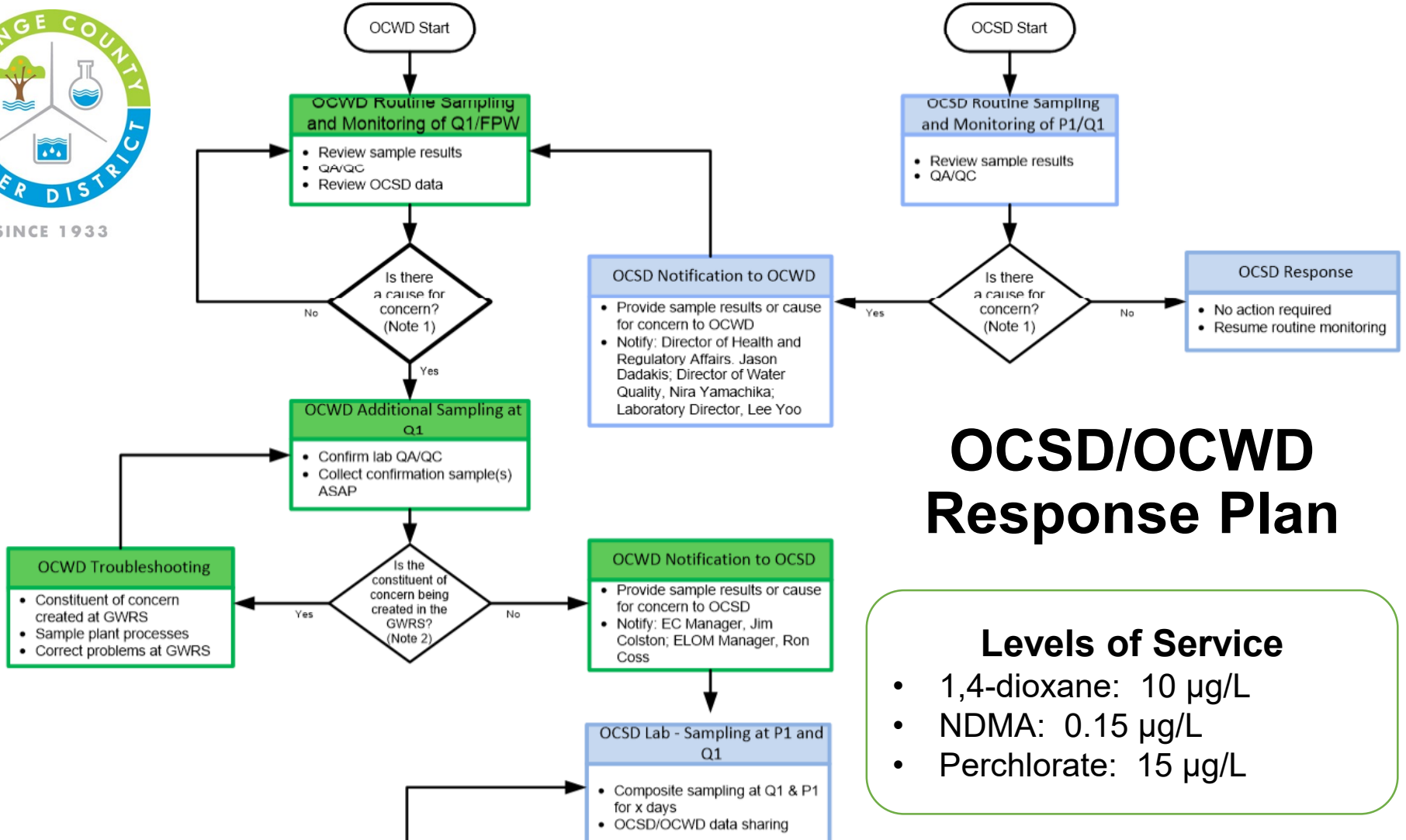
CASA

California Department of
Toxic Substances Control

Partnering with OCWD




ORANGE COUNTY WATER DISTRICT
SINCE 1933

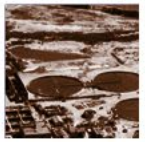


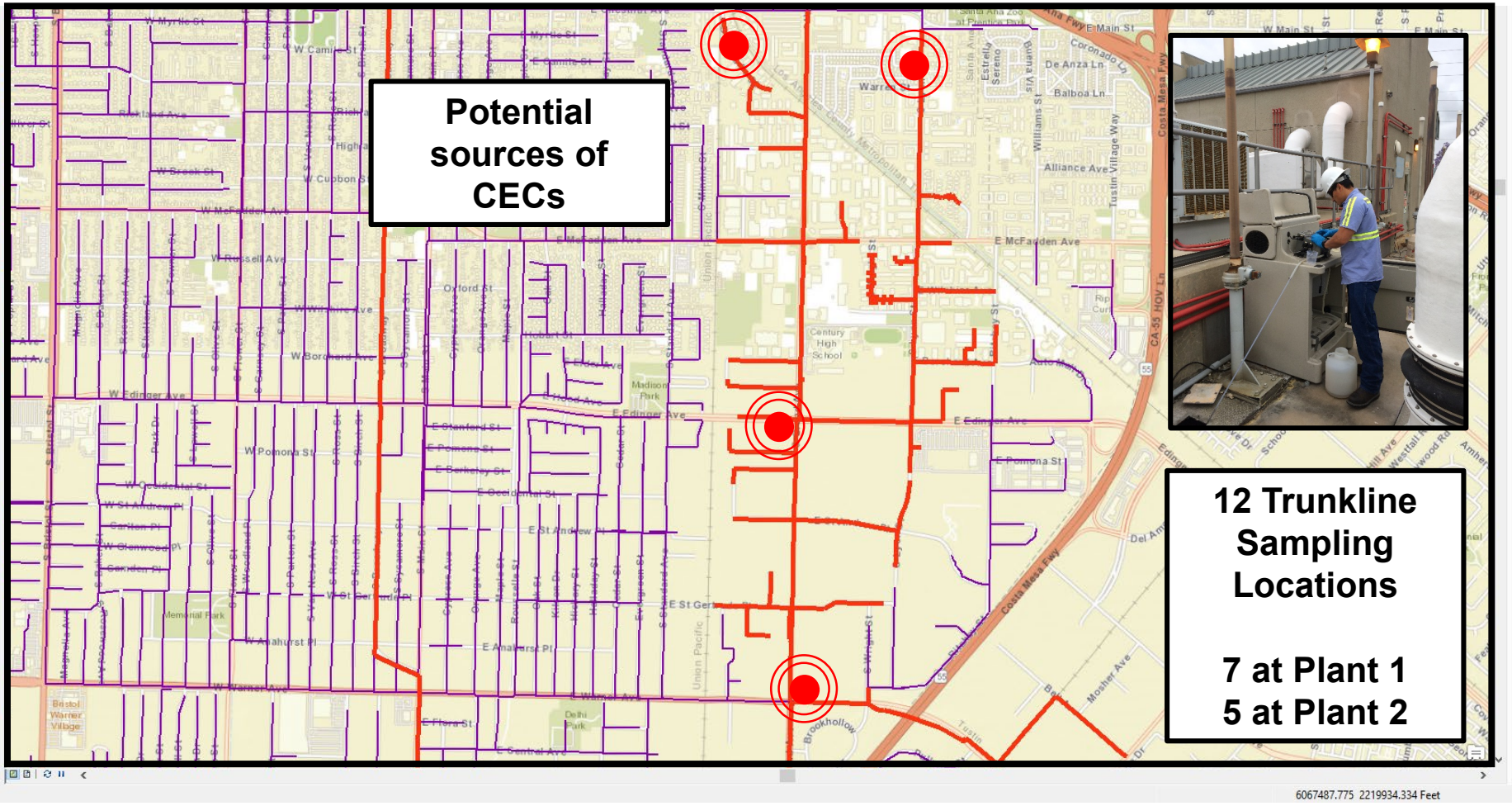
OCSD/OCWD Response Plan

Levels of Service

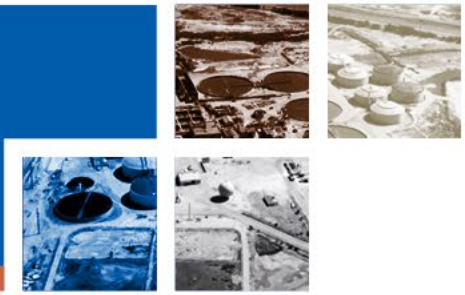
- 1,4-dioxane: 10 µg/L
- NDMA: 0.15 µg/L
- Perchlorate: 15 µg/L

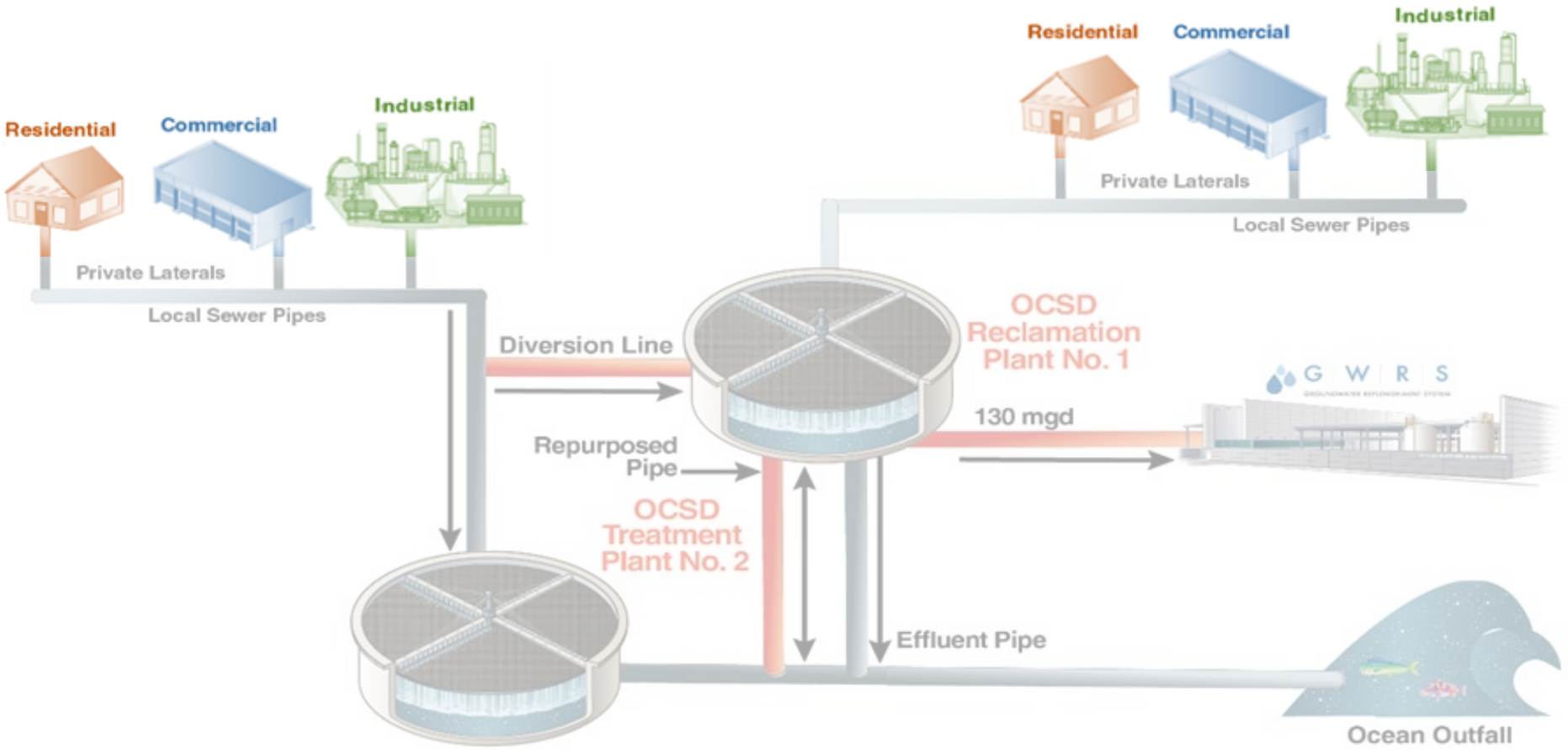
Monitoring CECs



Controlling CECs



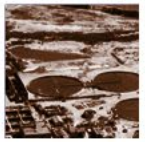


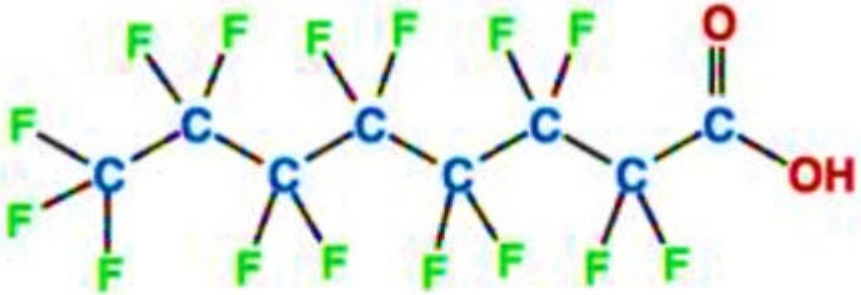
Controlling CECs

- CECs are not new to OCSD
- This framework has been implemented over decades

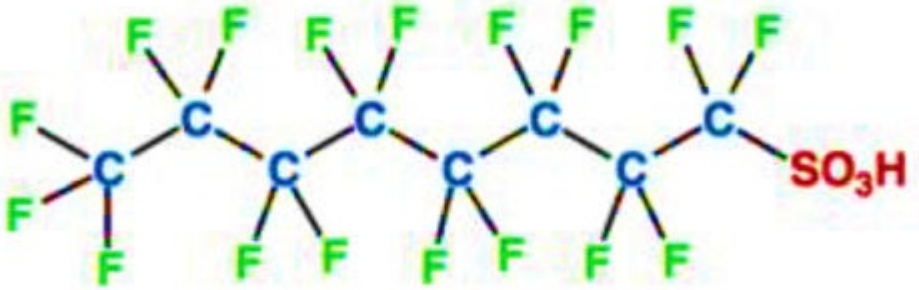
Some Examples CECs	Timeline
Polychlorinated biphenyls (PCBs)	1970s-1980s
Dimethyldithiocarbamate (DTC) & N-Nitrosodimethylamine (NDMA)	1990s-2000s
1,4-dioxane	2000s-2010s
per- and poly-fluoroalkyl substances (PFAS)	2010s-

PFAS (per-and poly-fluoroalkyl substances)



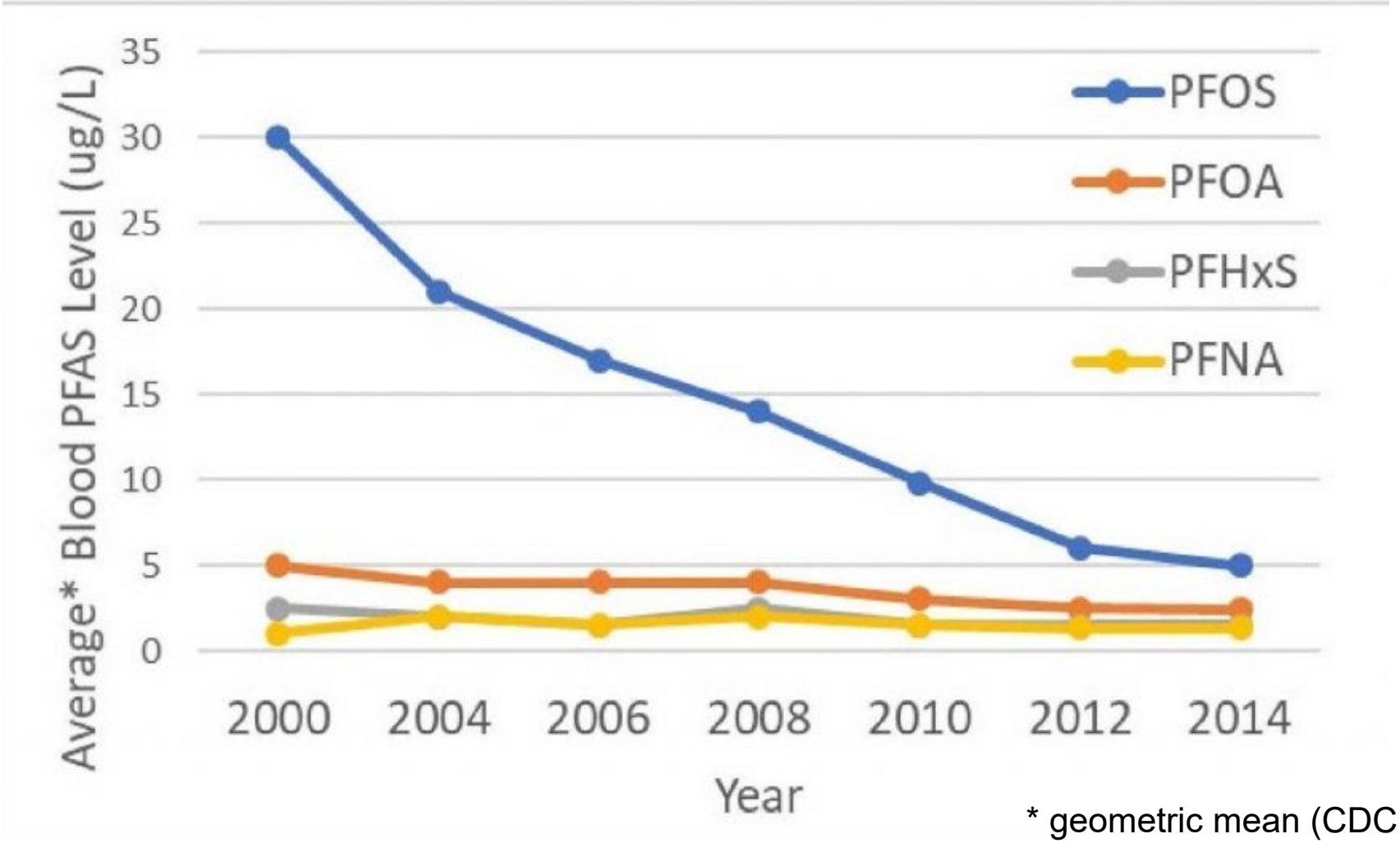
PFOA - perfluorooctanoic acid



PFOS - perfluorooctanesulfonic acid

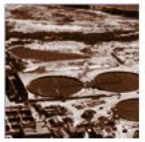
At a molecular level, the strong **carbon (C)** and **fluoride (F)** bonds on PFOA and PFOS substances do not break down easily and can stay in the environment

PFAS Biomonitoring



* geometric mean (CDC 2017)

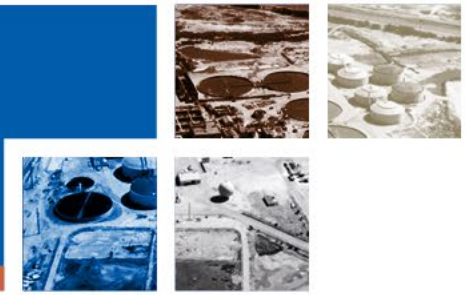
PFAS (per-and poly-fluoroalkyl substances)




PFAS in Aqueous Film Forming Foams (AFFF) has entered watersheds when used at airports and military bases

Source: Australian Department of Defense

Gathering Data

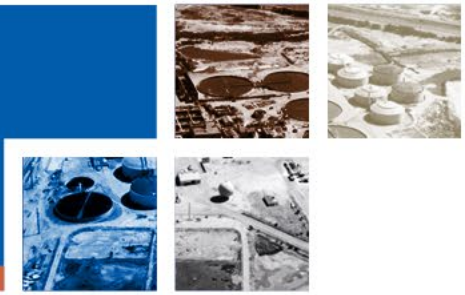


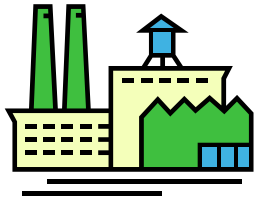
- OCSD expects to acquire data on PFAS concentrations in influent and effluent
- Where do we look and how do we look for it?

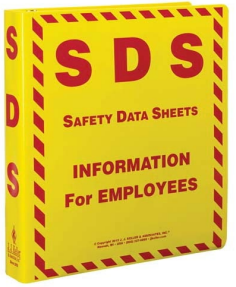
(1) Analysis Method

(2) Originating Sources

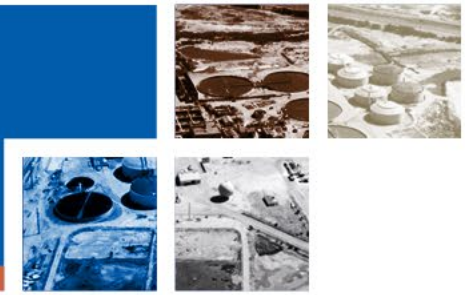
PFAS Industrial Survey



- Canvasing Industries 
- Focus on locations with a higher probability of PFAS presence
- Visit each facility and review processes, chemicals, and Safety Data Sheets (SDS)



OCSD's Plan



Learn and Collaborate

- Monitoring method development & providing input
- Monitor regulations, legislation, and media
- Align resources/coordinate with OCWD & other agencies
- Attending and participating in workshops

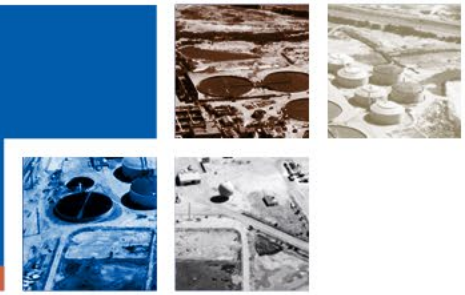
Plan and Prepare

- Educate and engage regulators & legislators
- Inform stakeholders on current requirements & future issues
- Work with Board to establish policies, limits, and standards

Investigate and Act

- Find & inspect potential CEC sources
- Sample and analyze using approved method
- Evaluate & compile data
- Implement Board Policy & federal/state regulations (OCSD Pretreatment Program)

Policy Question

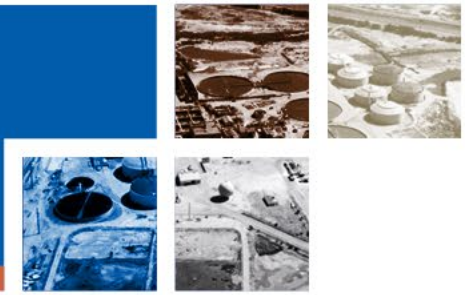


Should OCSD take a lead role on Constituents of Emerging Concern in wastewater and develop detection and characterization methods in wastewater treatment?

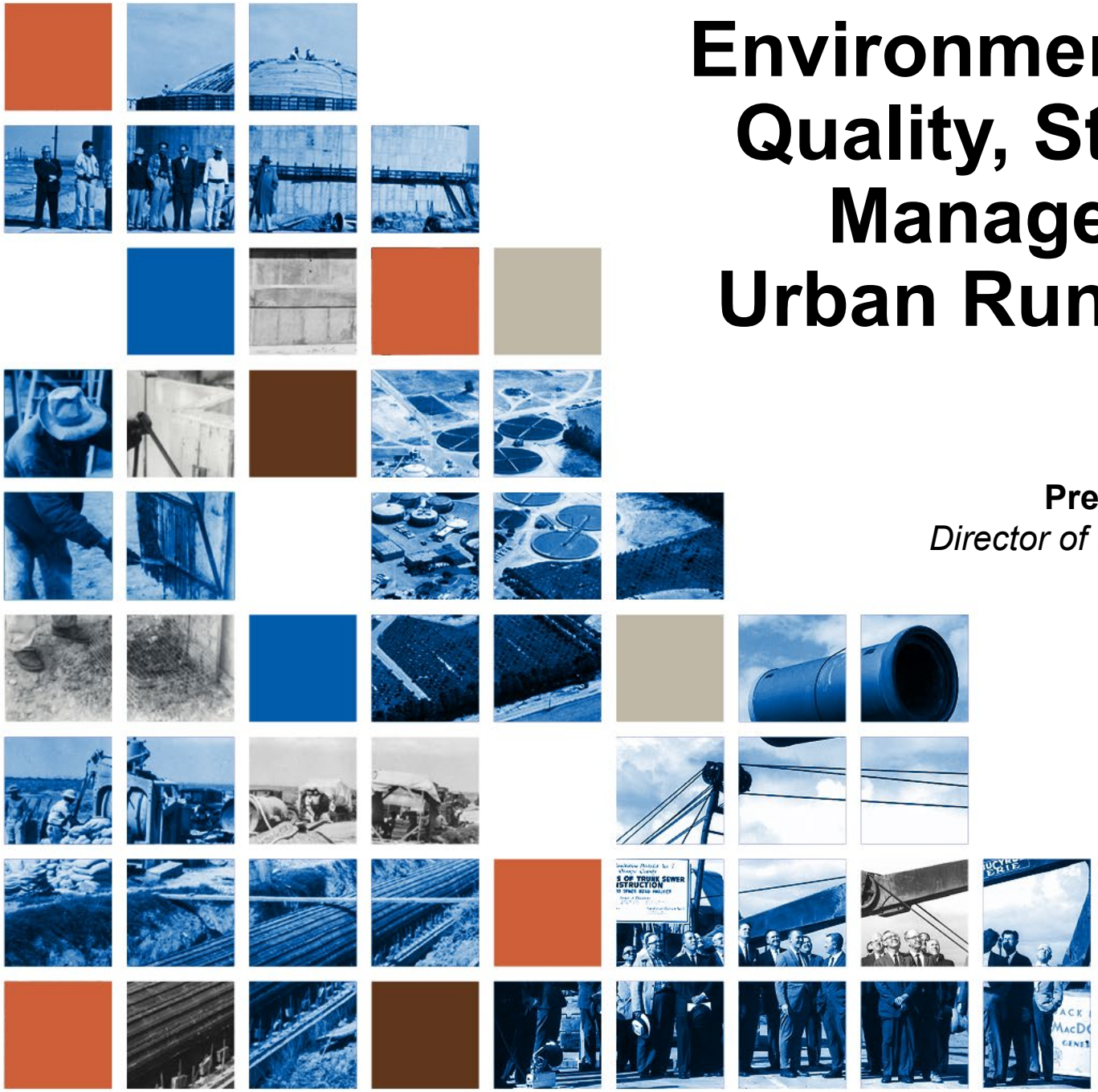
Initiatives to Support Policy

Initiative: OCSD will continue to actively engage water and wastewater stakeholders on CECs to stay abreast of the scientific progress and provide timely briefings to OCSD's management and the Board to facilitate informed decision making.

Initiative: OCSD will continue to develop capacity to detect, quantify, and characterize CECs throughout the service area and treatment process to promote treatment effectiveness and the communication of credible risks.



Questions?



Environmental Water Quality, Stormwater Management and Urban Runoff Policy

Book Page: 17

Presented by Lan Wiborg
Director of Environmental Services

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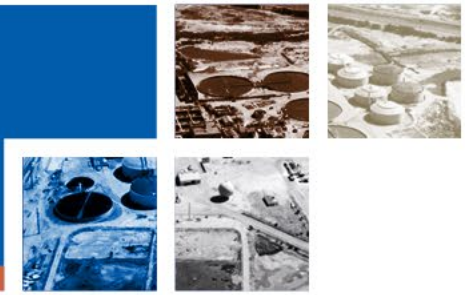
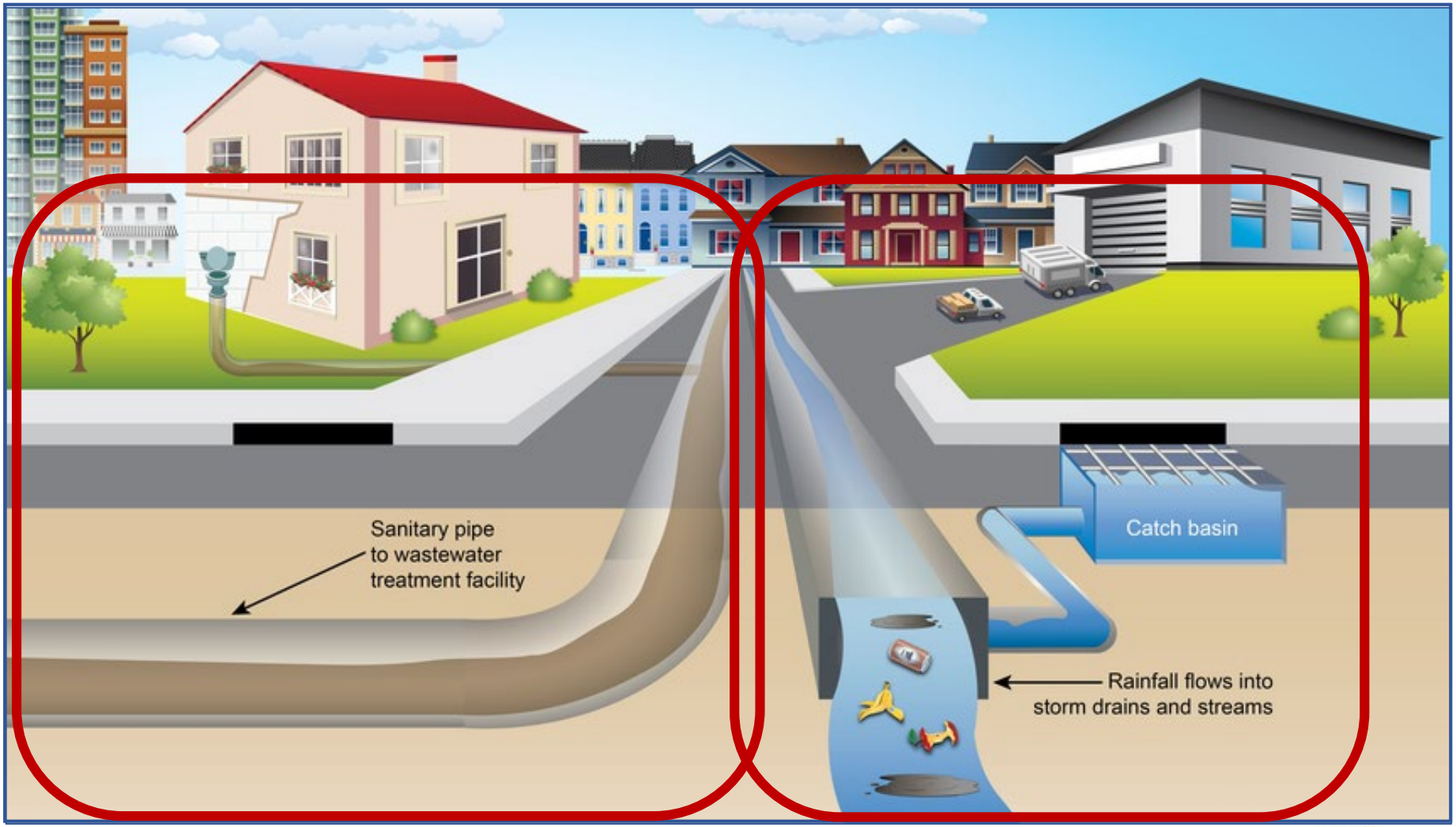
ORANGE COUNTY SANITATION DISTRICT

Policy Question

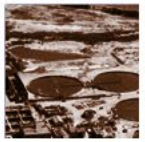


Should OCSD explore accepting controlled discharge of stormwater?

Sanitary Sewer vs. MS4



Dry Weather Diversions to OCSD




Wastewater

- Domestic
- Industrial permittees
- Non-industrial permittees
- Dry weather runoff diversion agreements

Source Control Program

Pollutant / Water quality management

- Support capacity management

OCSD

- Treatment capacity
- Cost containment
- Asset protection
- Regulatory compliance
- Potable reuse/GWRS

OCSD Urban Runoff Resolution

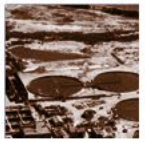
- Address public health and/or environmental problems associated with certain pollutants
- Limited system capacity (10 MGD total)
- Waive fees and charges for authorized discharges
- Prohibit wet weather urban runoff diversion to sewer

OCSD Dry Weather Urban Runoff Diversion Program

- Address beach closure due to bacteria
- Selenium in upper Newport Bay

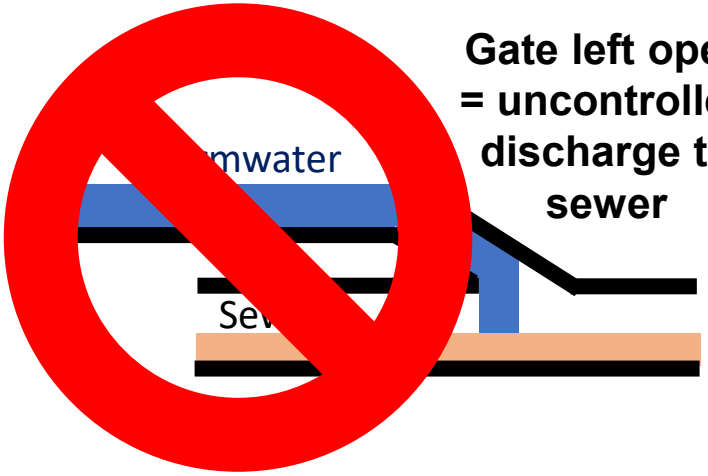
Dry Weather Urban Runoff Diversion

Controlled Discharge to OCSD

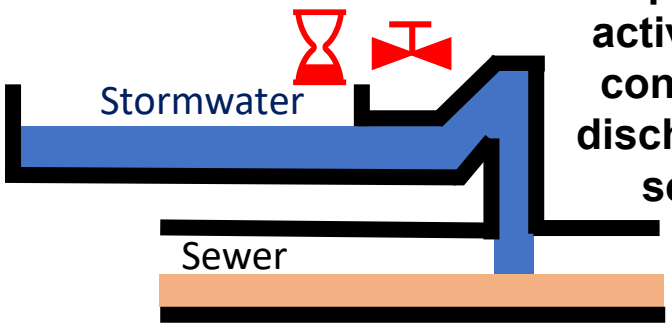



Acceptance Criteria

- Sewer capacity (10 MGD total)
- Must be pumped to prevent uncontrolled release
- OCSD reserves right to reject flow

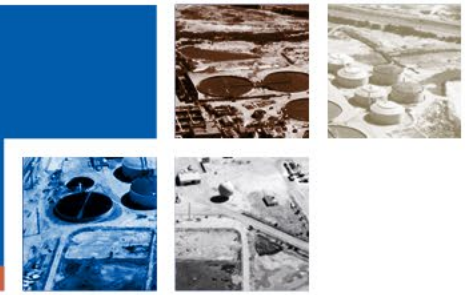


Gate left open = uncontrolled discharge to sewer



Pump must be activated = controlled discharge to sewer

Current Status



OCSD maintains **21 active Dry Weather Urban Runoff Permits** for diversions owned by:

City of Huntington Beach

City of Newport Beach

County of Orange Public Works

Irvine Ranch Water District

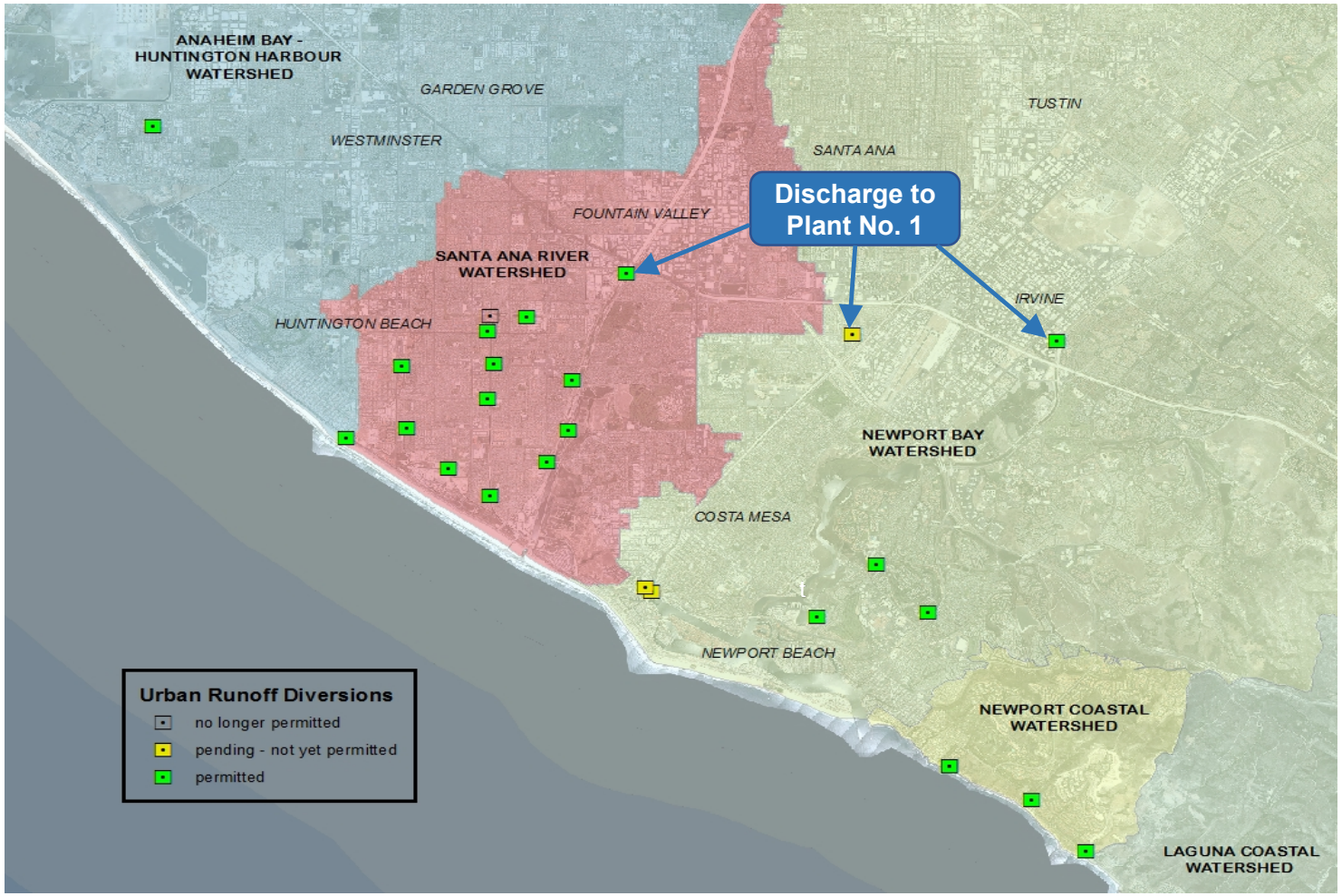
LLC within the Pelican Point community

Last year OCSD received an average of **1.03 MGD** from these facilities

Well below the current **10 MGD** policy cap **and** **9 MGD** action threshold

Since 2000, the program has treated **9.4 billion** gallons of urban runoff

Diversion Locations



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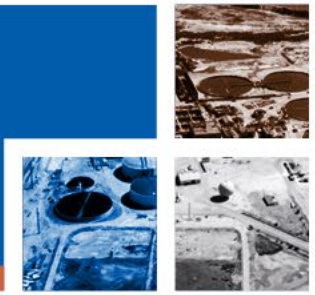
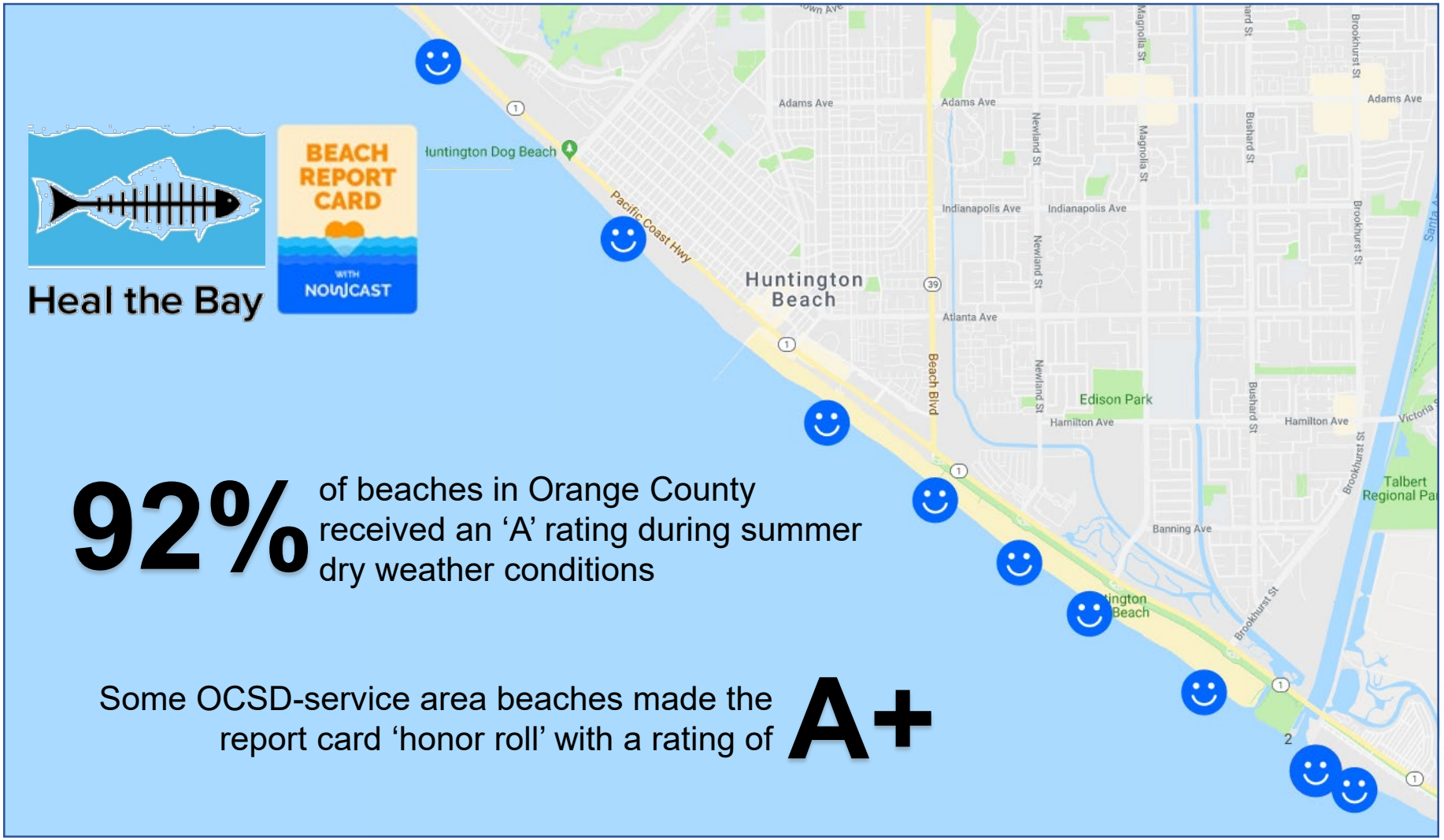
ORANGE COUNTY SANITATION DISTRICT

Achievements



Heal the Bay

BEACH REPORT CARD WITH NOWCAST

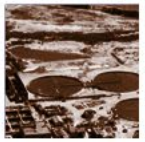


92% of beaches in Orange County received an ‘A’ rating during summer dry weather conditions

Some OCSD-service area beaches made the report card ‘honor roll’ with a rating of **A+**

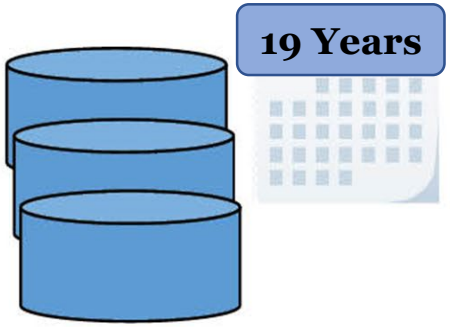
Area of Special Biological Significance

Program at a Glance



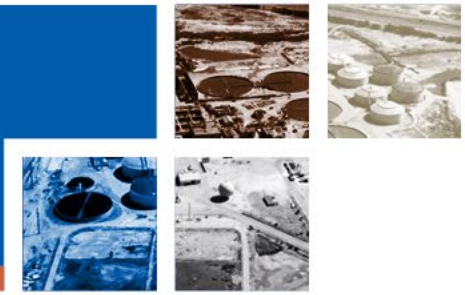

~0.92 Million Gallons Per Day

9.8 Billion Gallons in…



Millions of Happy Beachgoers!

Current Status



Wastewater

- Domestic
- Industrial permittees
- Non-industrial permittees
- Dry weather runoff diversion agreements

Stormwater

Wet Weather Runoff

- Volume
- Pollutants
- Sand/Silt

Source Control Program

- Pollutant / Water quality management
- Capacity management

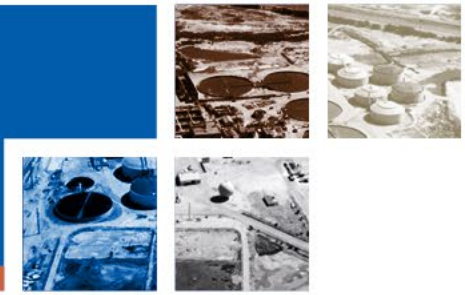
OCSD

- Treatment capacity
- Cost containment
- Asset protection
- Regulatory compliance
- Potable reuse/GWRS

Infiltration/Inflow

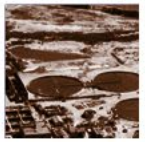
- Volume
- Pollutants
- Sand/Silt

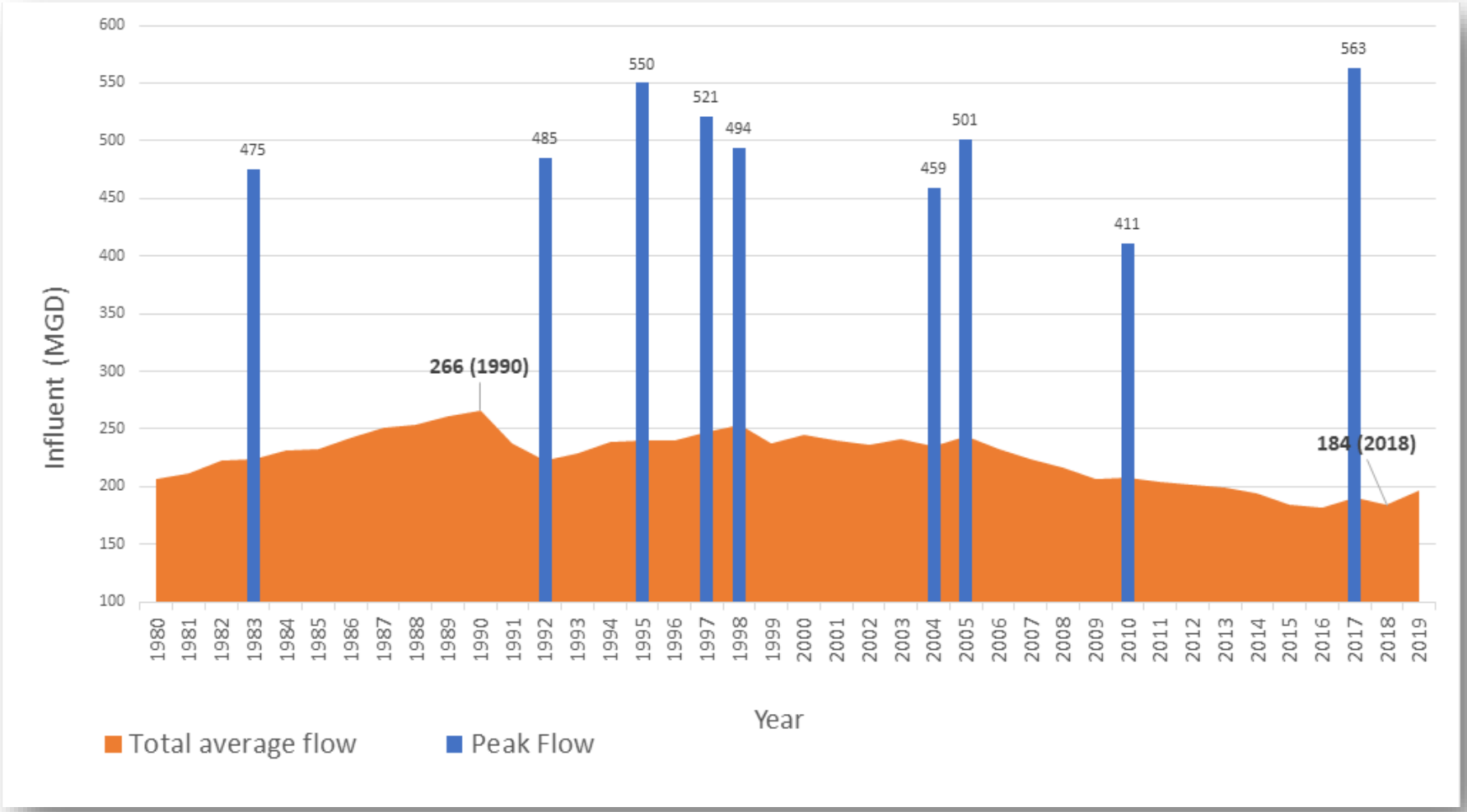
Policy Question



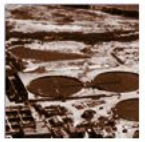
Should OCSD explore accepting controlled discharge of stormwater?

Average Monthly Flow vs. Peak High Flow



Multi-benefit Model

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Stormwater

Wet Weather Runoff
- Volume
- Pollutants
- Sand/silt

Source Control Program
- Pollutant / Water quality management
- Capacity management

Treatment

Storage

Stormwater Reuse
(no discharge to WRRF)
- Site-specific
- Flexible design
- Cost containment
- Community value
- Habitat value

OCSD
- Treatment capacity
- Cost containment
- Asset protection
- Regulatory compliance
- Potable reuse/GWRS

Infiltration/Inflow
- Volume
- Pollutants/sand/silt

Proposed Policy

Partnership with Member Agencies

Accept up to 10 MGD Dry Weather Runoff

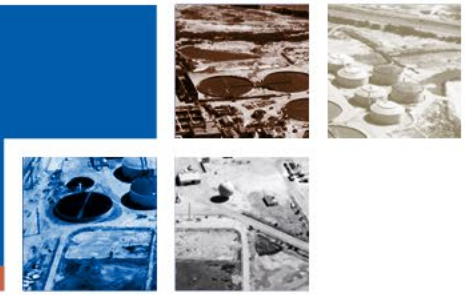
No Charge $ for Member Agencies

Improve Beach and Ocean Water Quality

Prevent Overflows During Storm Events

Protect OCSD Workers, Reuse, Sewers, Plants and Compliance

Initiatives to Support the Policy



Initiative:

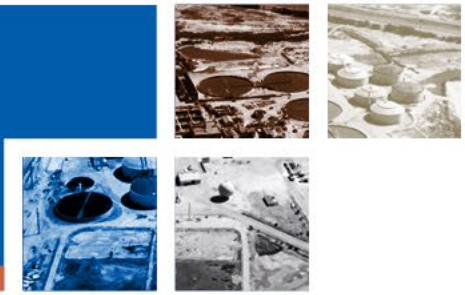
Continue Urban Runoff Program under Resolution 13-09

Accept up to 10 MGD of **pumped dry weather** urban runoff from local agencies

…where there is **existing** capacity and conveyance infrastructure

…and constituents **will not adversely affect** OCSD

Initiatives to Support the Policy



Initiative:

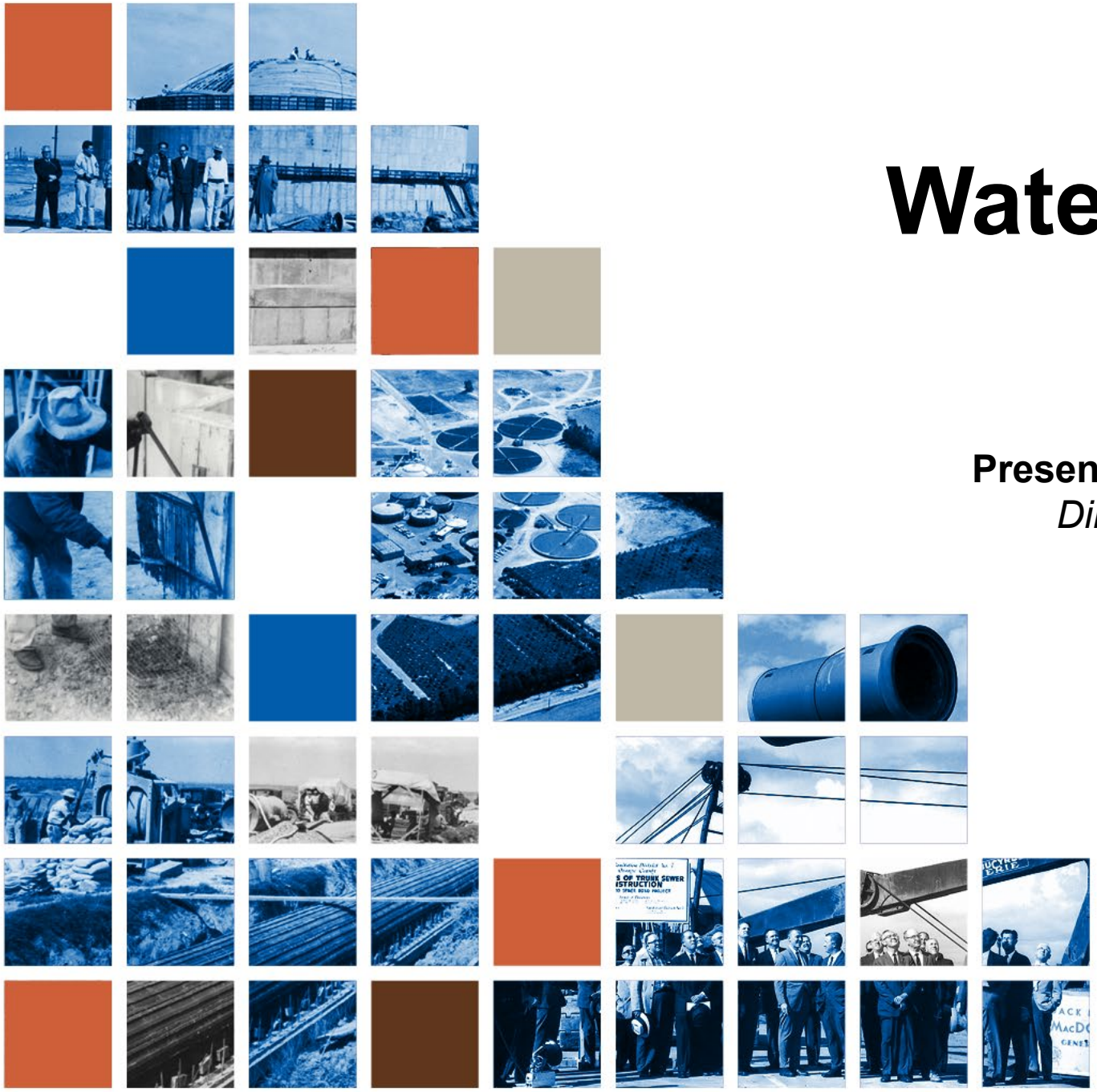
Continue working with local agencies to

…determine feasibility of **regional** wet weather runoff capture, storage, and reuse

…offer alternatives for runoff disposal through **permits** or **written authorization**

…promote responsible stormwater utilization and **sewer protection**

…ensure stormwater is held for evaluation prior to **controlled discharge** to sewer



Water Reuse

Book Page: 23

Presented by Kathy Millea
Director of Engineering

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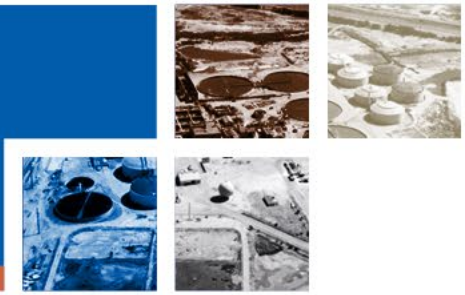
ORANGE COUNTY SANITATION DISTRICT

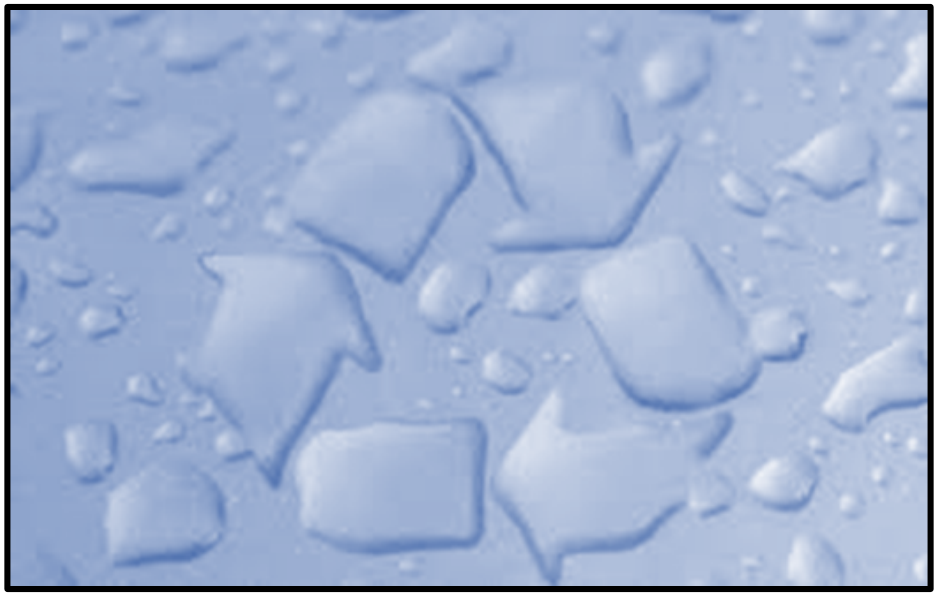
Policy Question



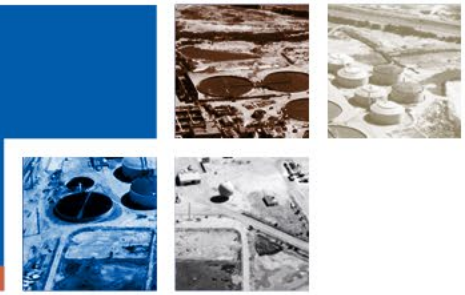
Should OCSD study the feasibility of tapping non-wastewater sources for the purpose of generating more water recycling beyond the final expansion of GWRS?

2013 Strategic Plan

On November 20, 2013, the Board approved the Five-year Strategic Plan which included the strategic goal for “Future Water Recycling”.



OCSD/OCWD 30-Year Partnership



Water Factory 21 Project (1970s)

- Seawater intrusion barrier

Green Acres Project (1991)

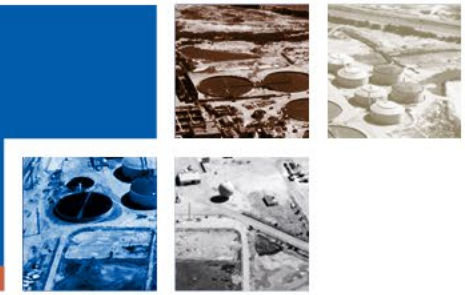
- Non-potable water for landscape irrigation (purple pipe)

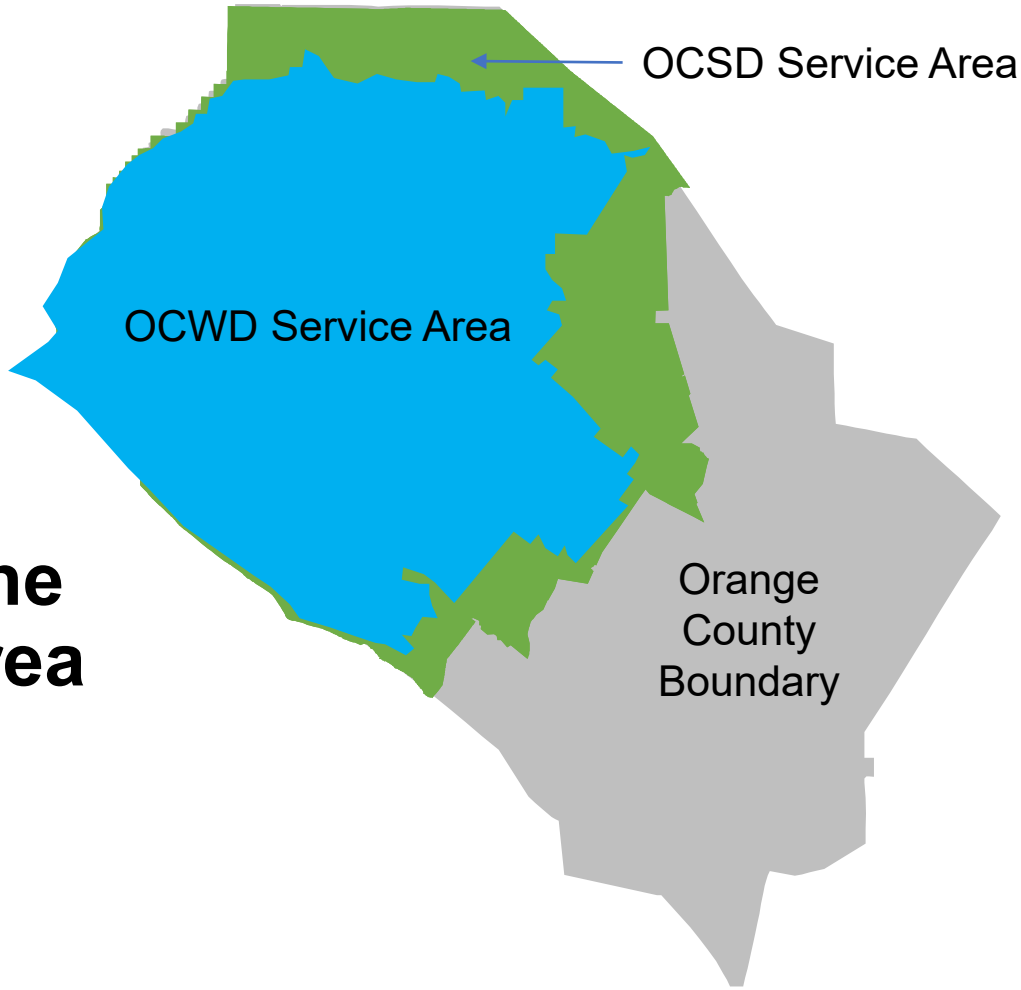
Ground Water Replenishment System (2008/2015/2023)

- 2008 – 70 MGD potable water
- 2015 – 100 MGD potable water
- 2023 – 130 MGD potable water

OCSD and OCWD Joint Campus

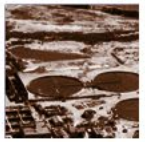
OCSD and OCWD Service Areas





Both agencies serve roughly the same service area (~2.5 million residents)

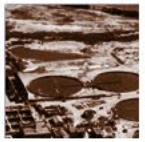
What Is the Groundwater Replenishment System (GWRS)?




- Largest water purification program of its kind in the world – 100 MGD
- Takes treated sewer water that otherwise would be discharged to the ocean and purifies it to near-distilled quality
- Provides a new 100,000 acre-feet per year source of water, which is enough water for 850,000 people
- ½ the energy to pump imported water and 1/3 the energy to desalinate ocean water

GWRS is a joint project with joint governance

GWRS Steering Committee




3 Members


Shawver, Ferryman, Shaw

+

3 Alternates

Silva, Hawkins, Peterson

3 Members

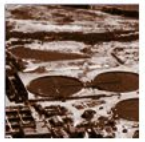

Yoh, Green, Sarmiento

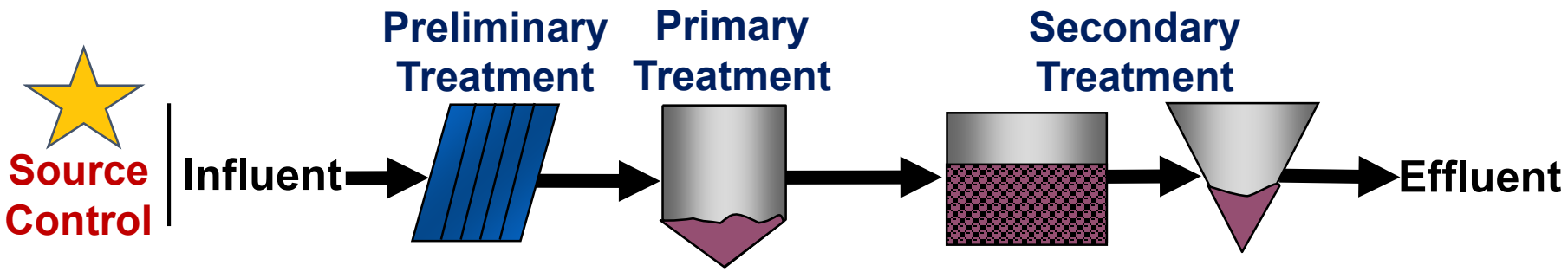
+

3 Alternates

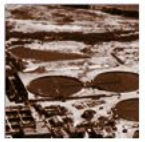
Ta, Nguyen, Sheldon

OCSD Wastewater Treatment





OCWD - Advanced Water Treatment

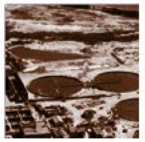


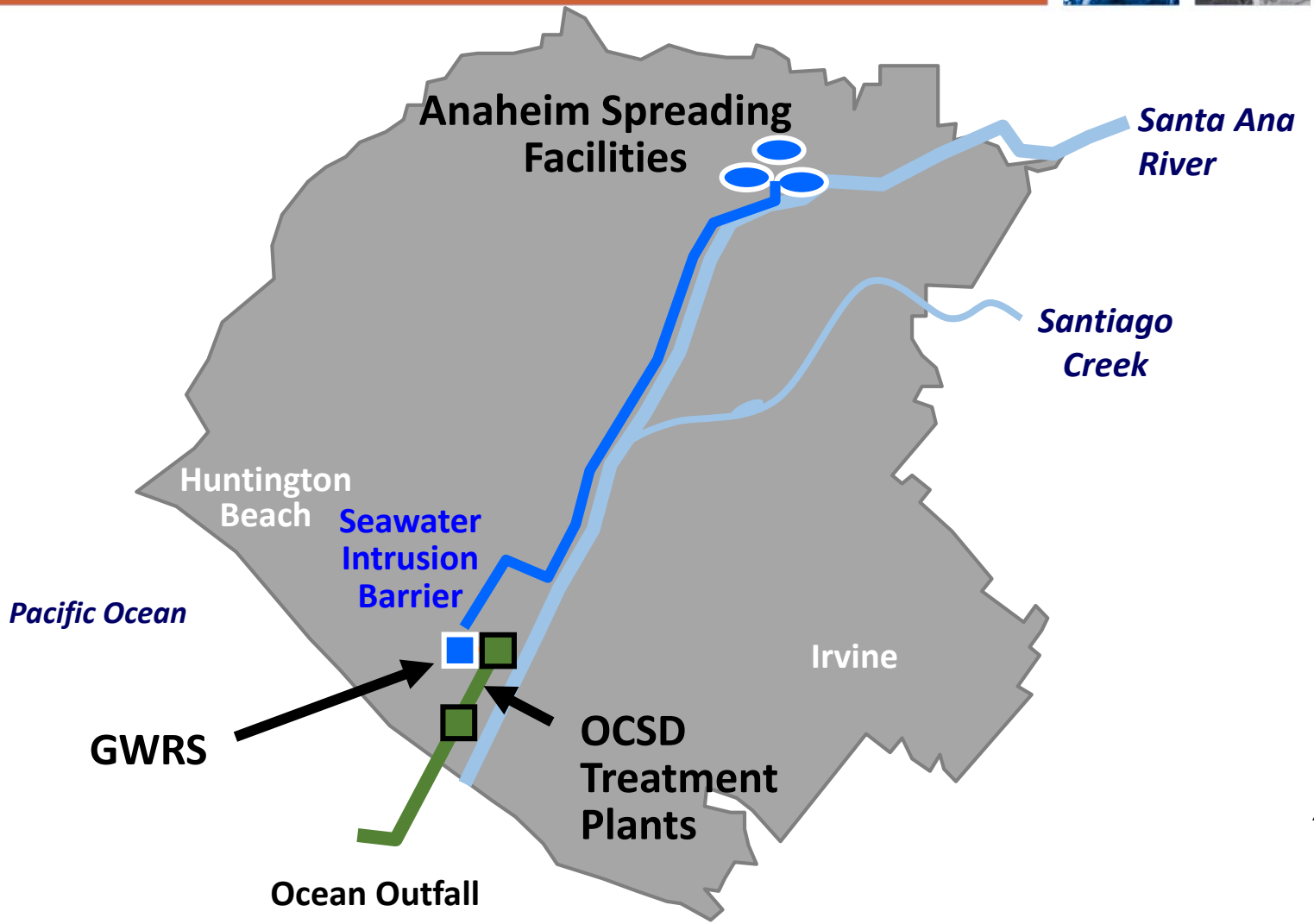

Microfiltration (MF)

Reverse Osmosis (RO)

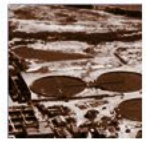
Ultraviolet Light (UV)

OCWD - Distribution System

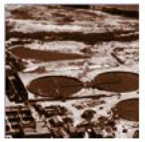


GWRS Groundwater Basin Influent




GWRS Program has many parts

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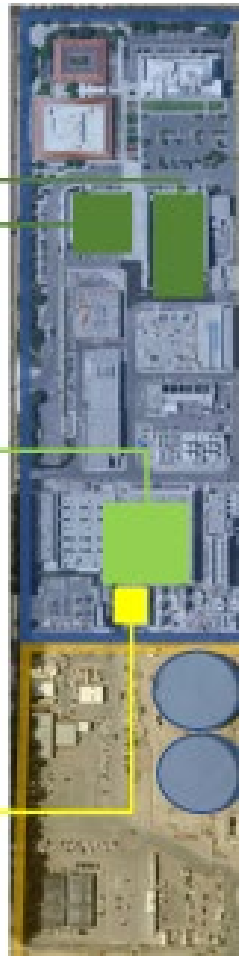
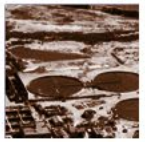
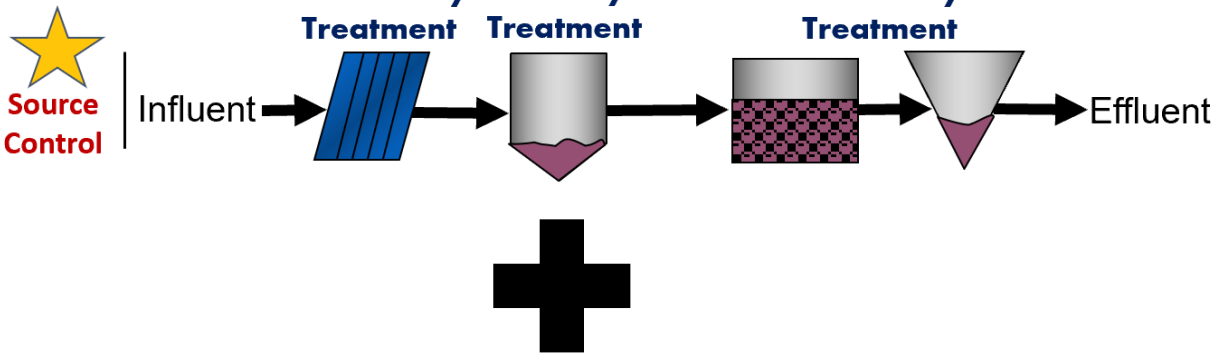


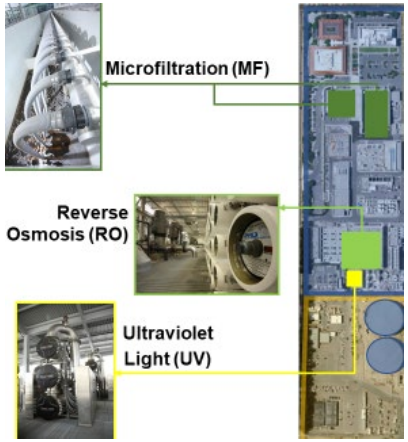
Reverse Osmosis (RO)

Ultraviolet Light (UV)

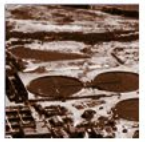
GWRS Program has many parts

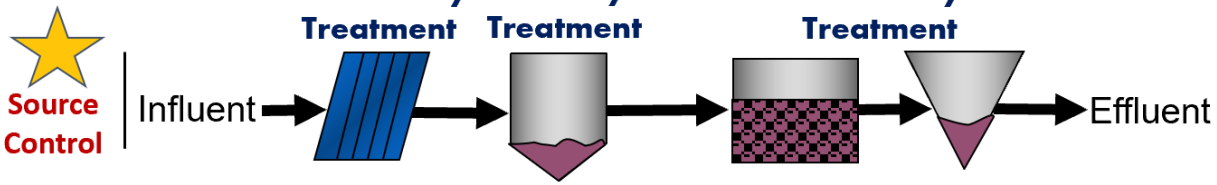


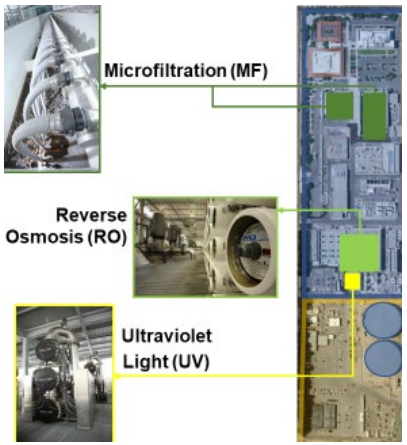



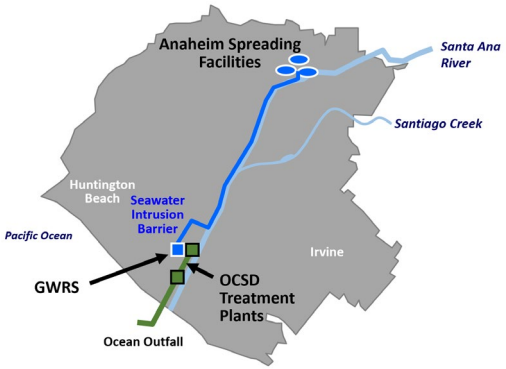


GWRS Program has many parts







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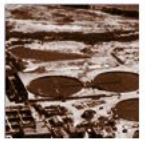
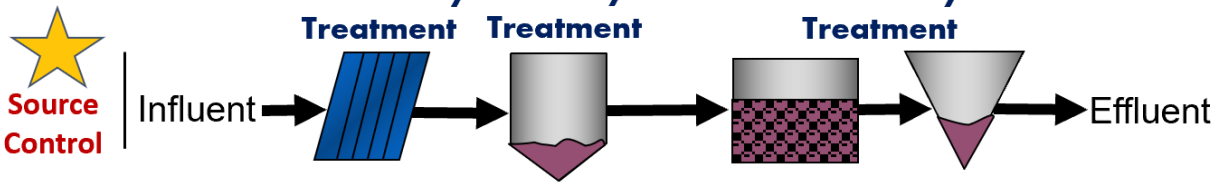
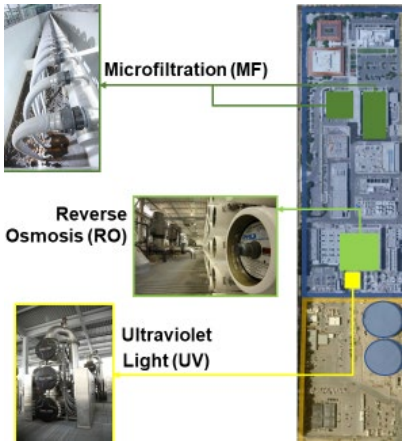
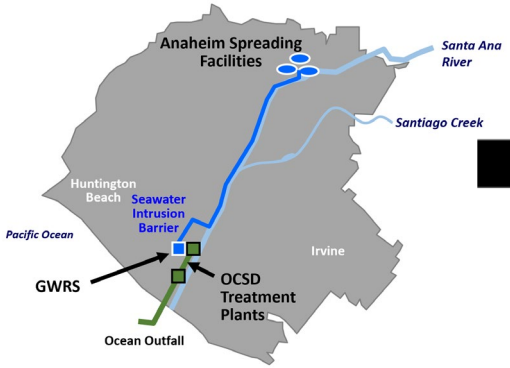
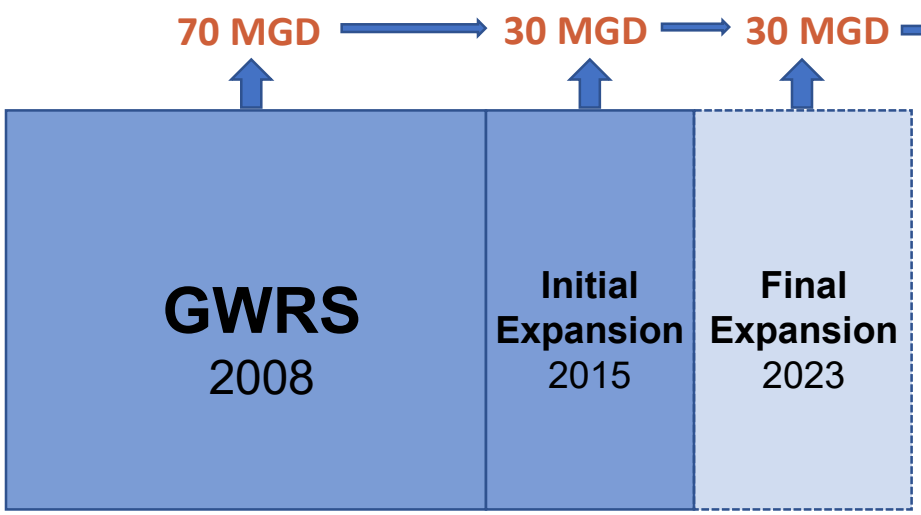






GWRS Production Capacity



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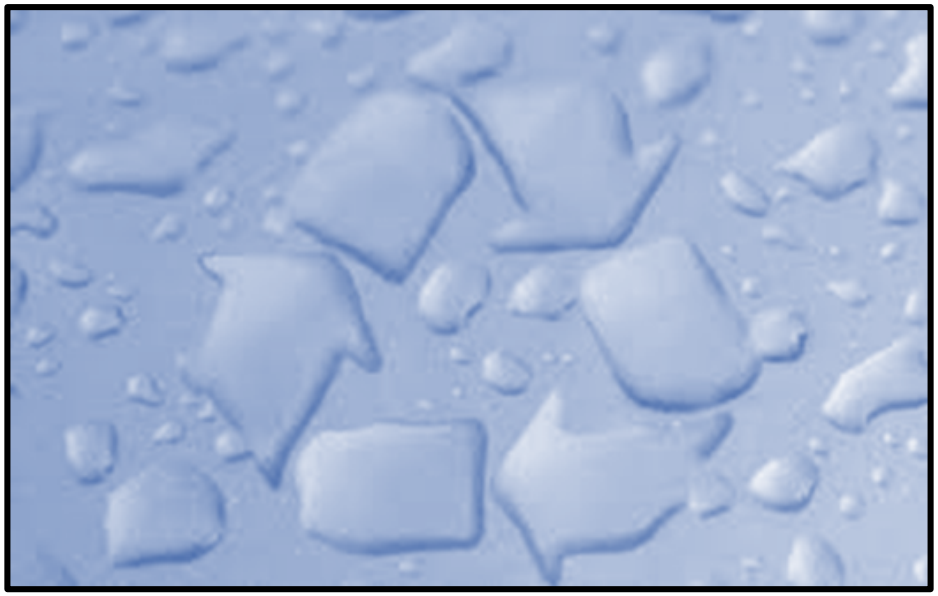
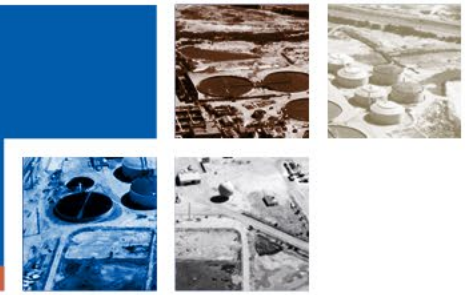


GWRS Final Expansion Projects

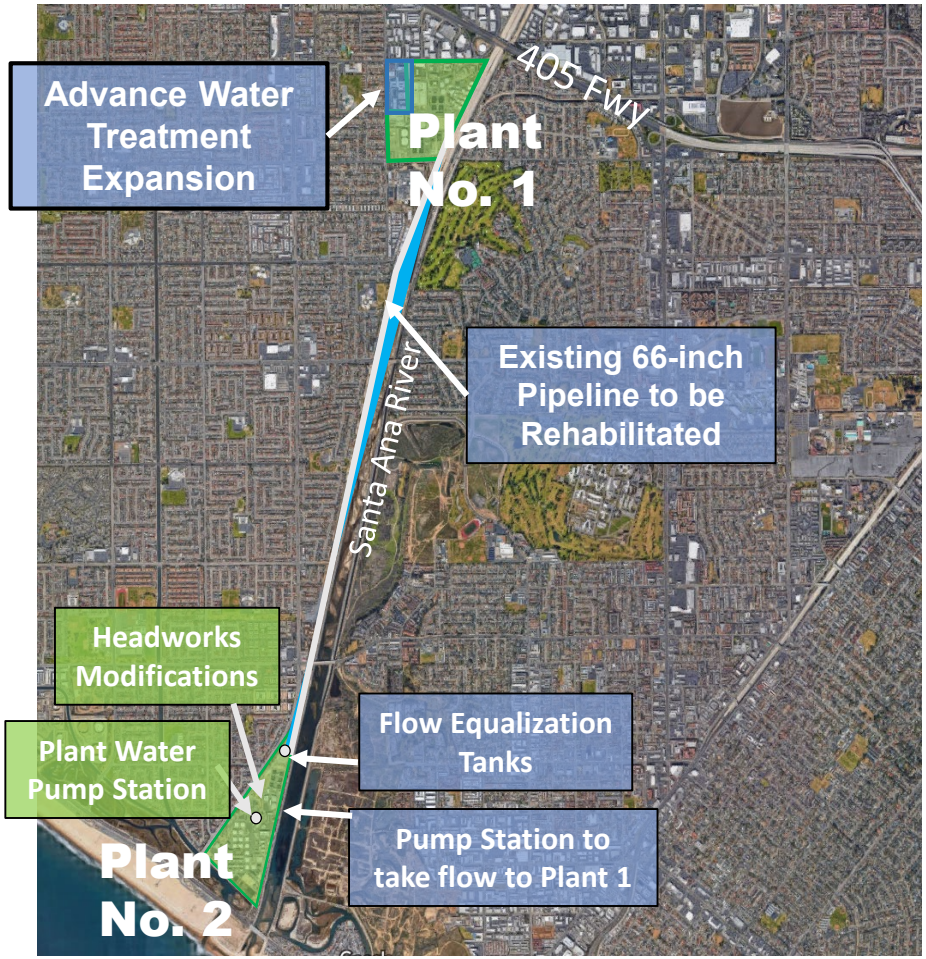


OCSD Design/Construct/Operate (OCWD Fund)

- P2-122 Headworks Modifications at Plant No. 2
- J-117 Plant No. 2 Plant Water Pump Station Relocation

OCWD

- New Flow Equalization Tanks at Plant No. 2
- New Effluent Pump Station at Plant No. 2
- 66-inch Pipeline Rehabilitation
- Advanced Water Treatment Facility Expansion to 130 mgd

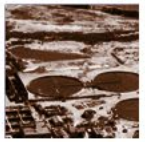


GWRS Final Expansion Schedule

GWRS Final Expansion Construction Completion

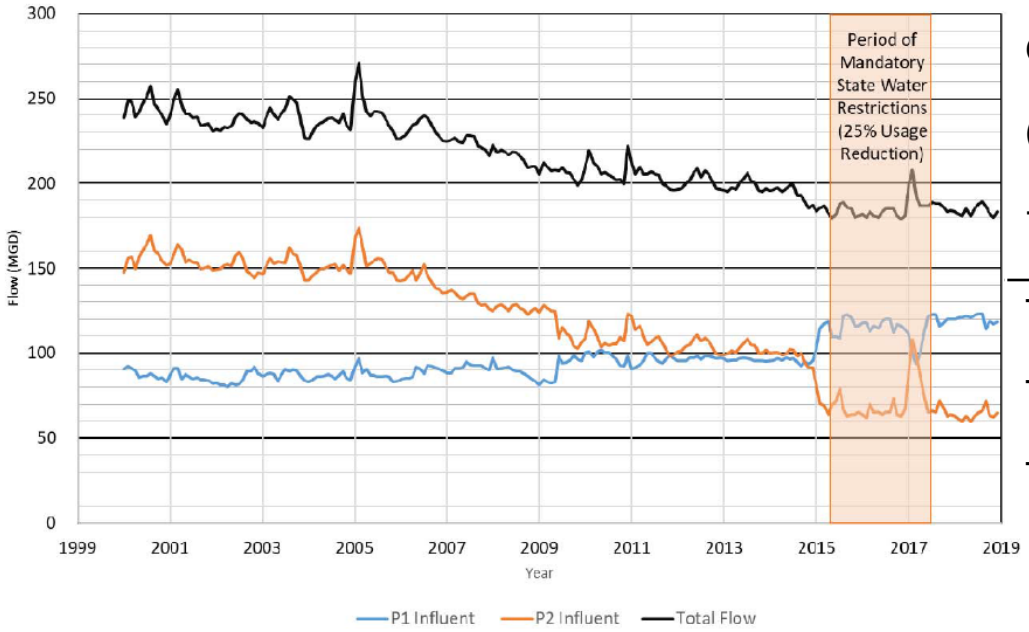
2023

Available Flow for GWRS Final Expansion



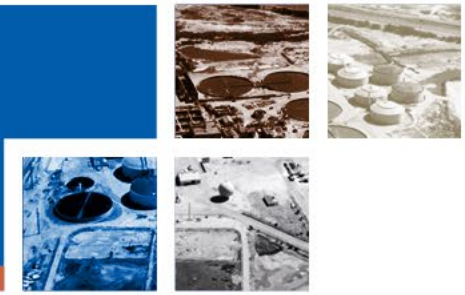

GWRS Final Expansion Production Goal:

134,000 acre-foot/year, or 11,167 acre-foot/month (AF/month)



OCSD Total Influent	185 mgd
(Non-reclaimable flows)	-34 mgd
+ Microfiltration Backwash	+21 mgd
Total influent to GWRS	172 mgd
Total Product water	128 mgd
Total Water Produced in Month	11,855 AF

OCSD Contributions to GWRS



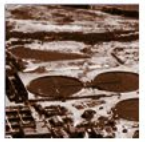
Water

292,000,000,000 Gallons Since 2008 at no charge

Land

≈10 Acres Leased for $10

OCSD Contributions to GWRS



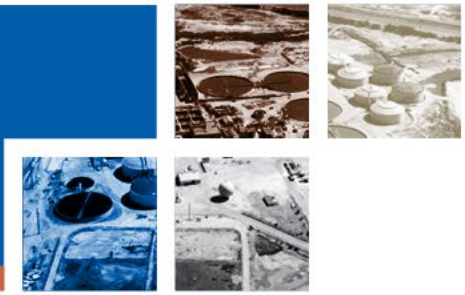

Additional & Improved Treatment

- GWRS Microfiltration Backwash Water Treatment
- GWRS Reject Brine Disposal
- Additional Projects to support High Quality Water = GWRS 97% on-line factor
- Plant No. 2 Low Flow Pump Station

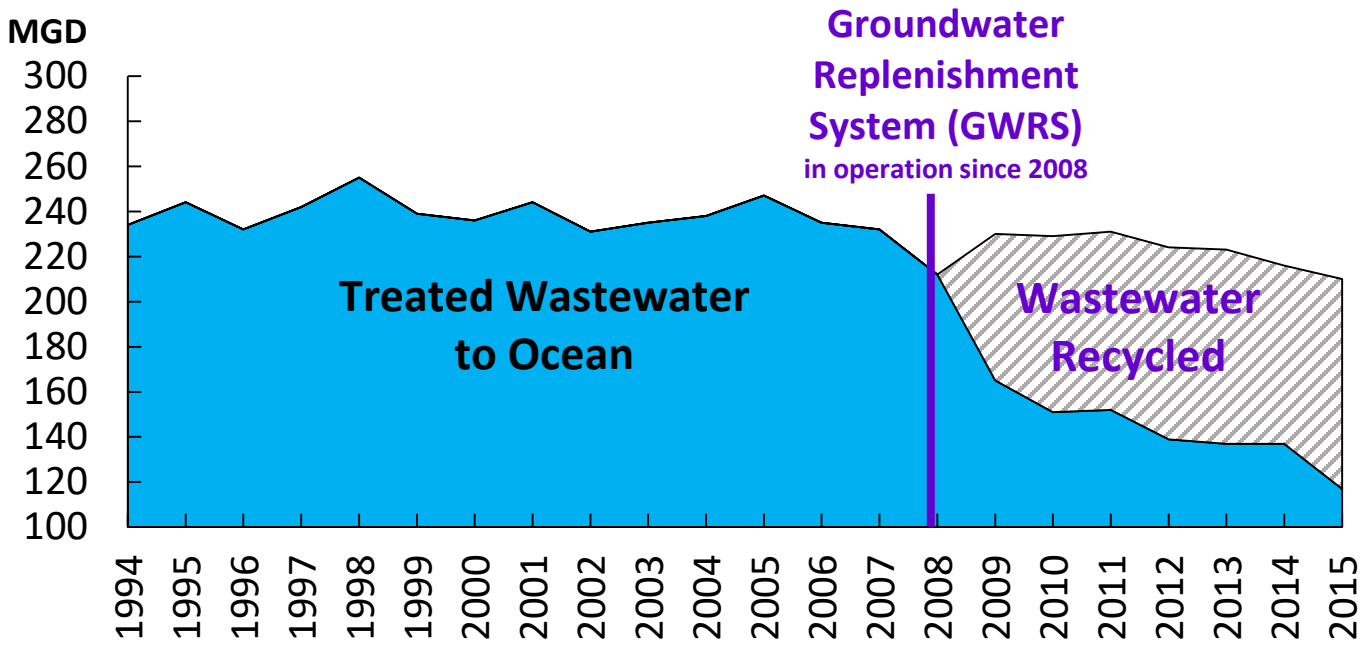
Flow Management

- Diversions in the Collection System
- Plant No. 1 Treats Higher Flows
- Steve Anderson Lift Station
- Continuous Operational Coordination with OCWD

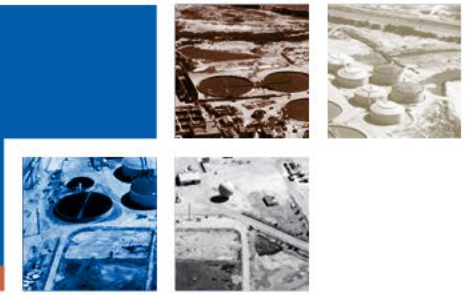
OCSD Direct Benefits



- Reduced outfall flow = less pumping, less disinfection
- No OCWD charge for first 1 MGD of non-potable water ($700k/year prior to 2009)
- 100 MGD emergency outfall flow capacity

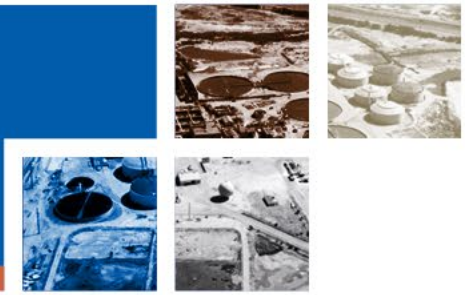


Beyond GWRS



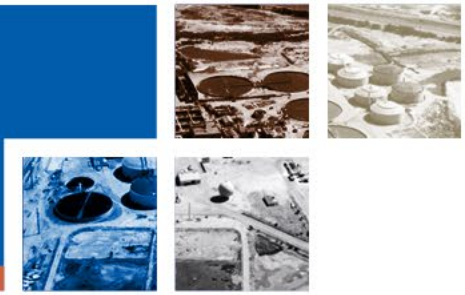
- Potential to create additional water for recycling
- Potential to reduce problematic shallow aquifers for member agencies
- OCSD may lack legal authority
- Understanding County's need and other efforts
- Investment need for infrastructure
- Limited land availability based on 2017 Facility Master Plan

Policy Question



Should OCSD study the feasibility of tapping non-wastewater sources for the purpose of generating more water recycling beyond the final expansion of GWRS?

Current Policy Statement

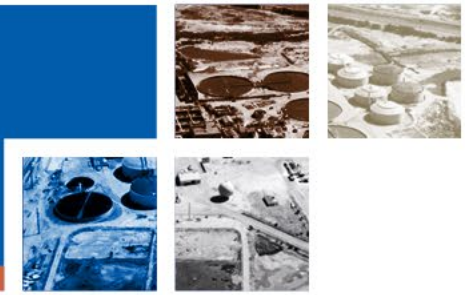


The Sanitation District will seek to recycle 100% of all reclaimable wastewater flows.

Initiatives to Support Policy

Initiative: Support the completion of the final phase of the Groundwater Replenishment System and maximize water availability to the Orange County Water District.

Initiative: Support Green Acres project water production to provide reclaimed water for industrial and irrigation uses.



Questions?

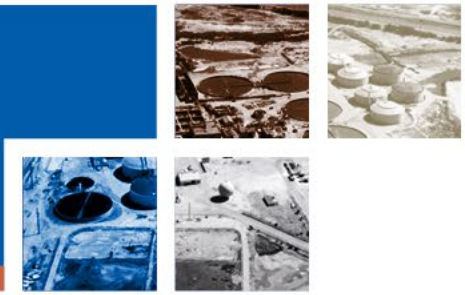
Biosolids Management

Book Page: 5

Presented by Tom Meregillano
Senior Regulatory Specialist

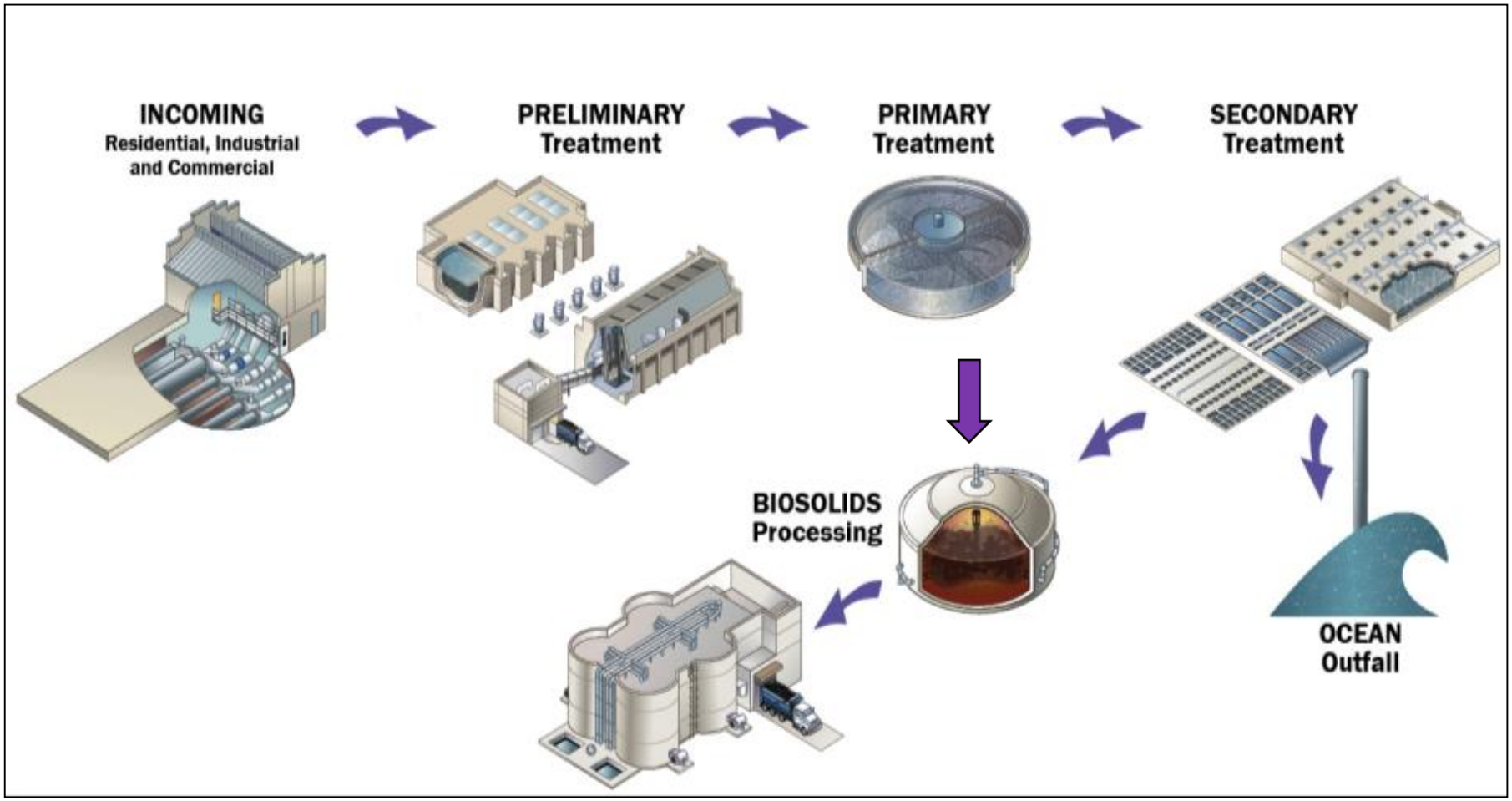
CELEBRATING 65 YEARS
ORANGE COUNTY SANITATION DISTRICT

Policy Question

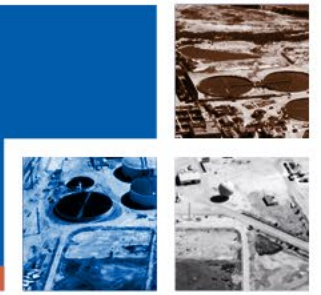


Should OCSD Explore Alternative Uses for Biosolids?

Background


INCOMING
Residential, Industrial and Commercial
PRELIMINARY Treatment
PRIMARY Treatment
SECONDARY Treatment
BIOSOLIDS Processing
OCEAN Outfall

Background



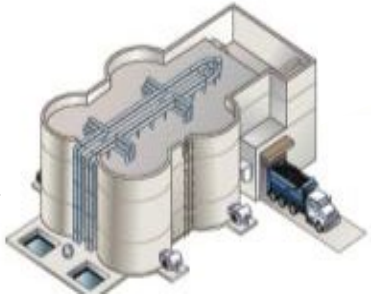
SolidsTreatment

PRIMARY Treatment

SECONDARY Treatment

Dewatering Centrifuge

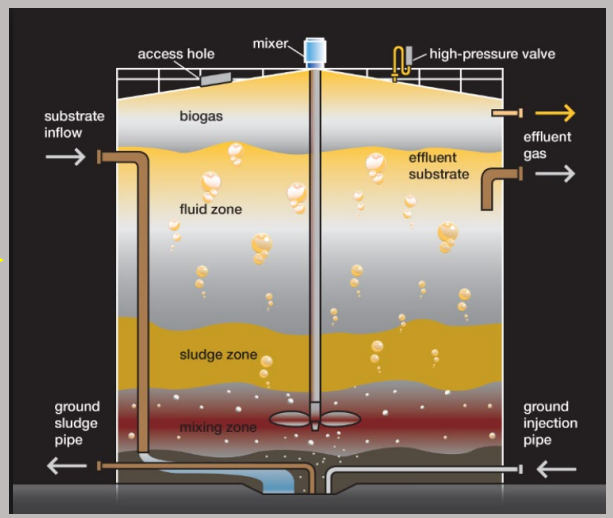
Land Application,& Compost



Biogas to Electricity Generation

Biosolids



Time

Temperature

Pathogens

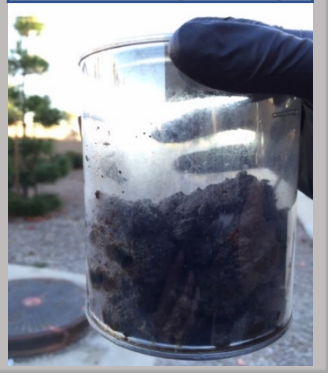
Organic Matter

Metals

(Source Control)

Class B Biosolids OCSD (95F)

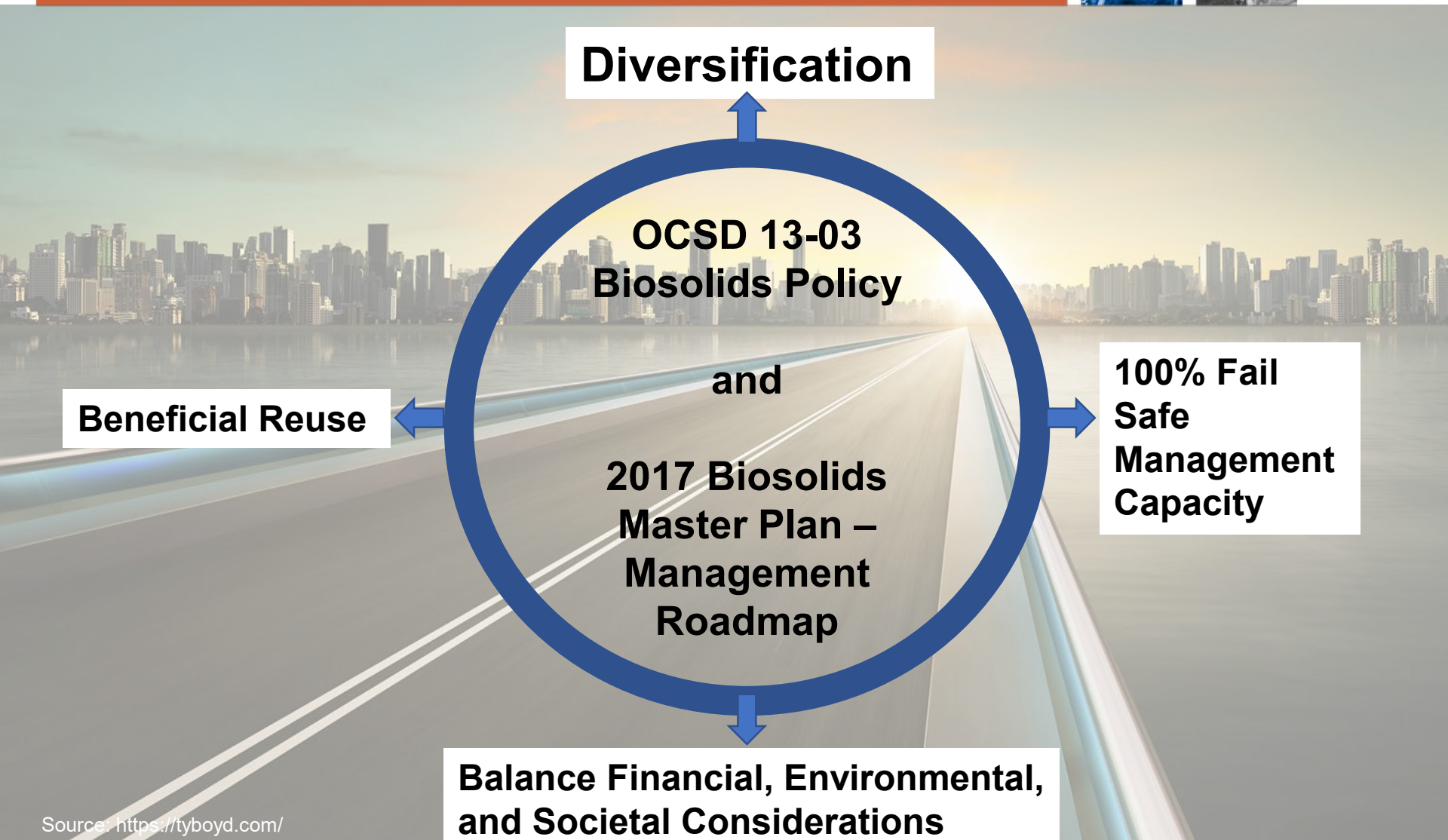
Class A Biosolids Others (131F)



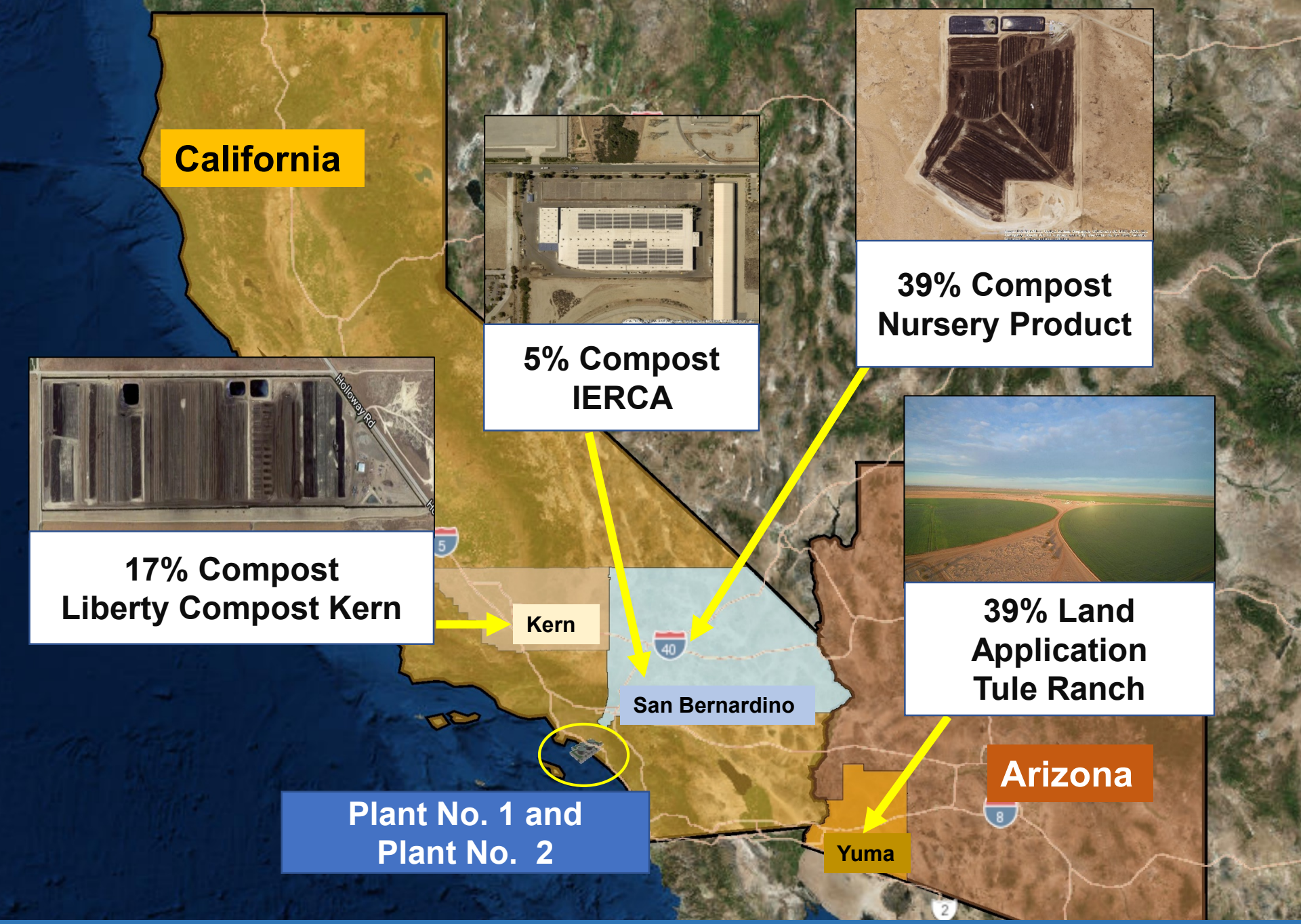
How Much Biosolids?

- 22 Trucks Per Day = 550 Wet tons of Biosolids Per Day
- Biosolids Management Budget 2019-2020: $13.4 Million
- Start-up of Centrifuge Biosolids Management Savings: Approximately $200,000-$400,000/month (Reduction of Volume)

Biosolids Program Framework (Resiliency and Sustainability)

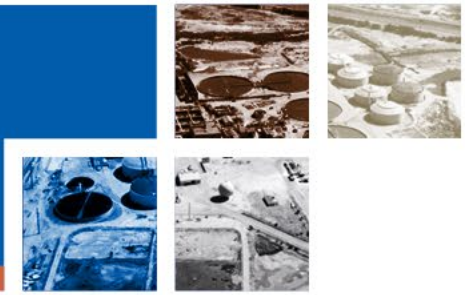


Source: https://tyboyd.com/



Diversification – Biosolids Distribution – 550 Wet Tons/Day

Current Situation – Organic Waste Market Drivers



Renewable Energy

CARB/CEC

SB 100 (2018)

CARB CalRecycle

AB 1826 (2014)

SB 1383 (2016)

SB 32 (2016)

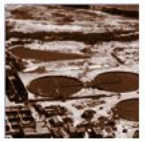
Sept 14

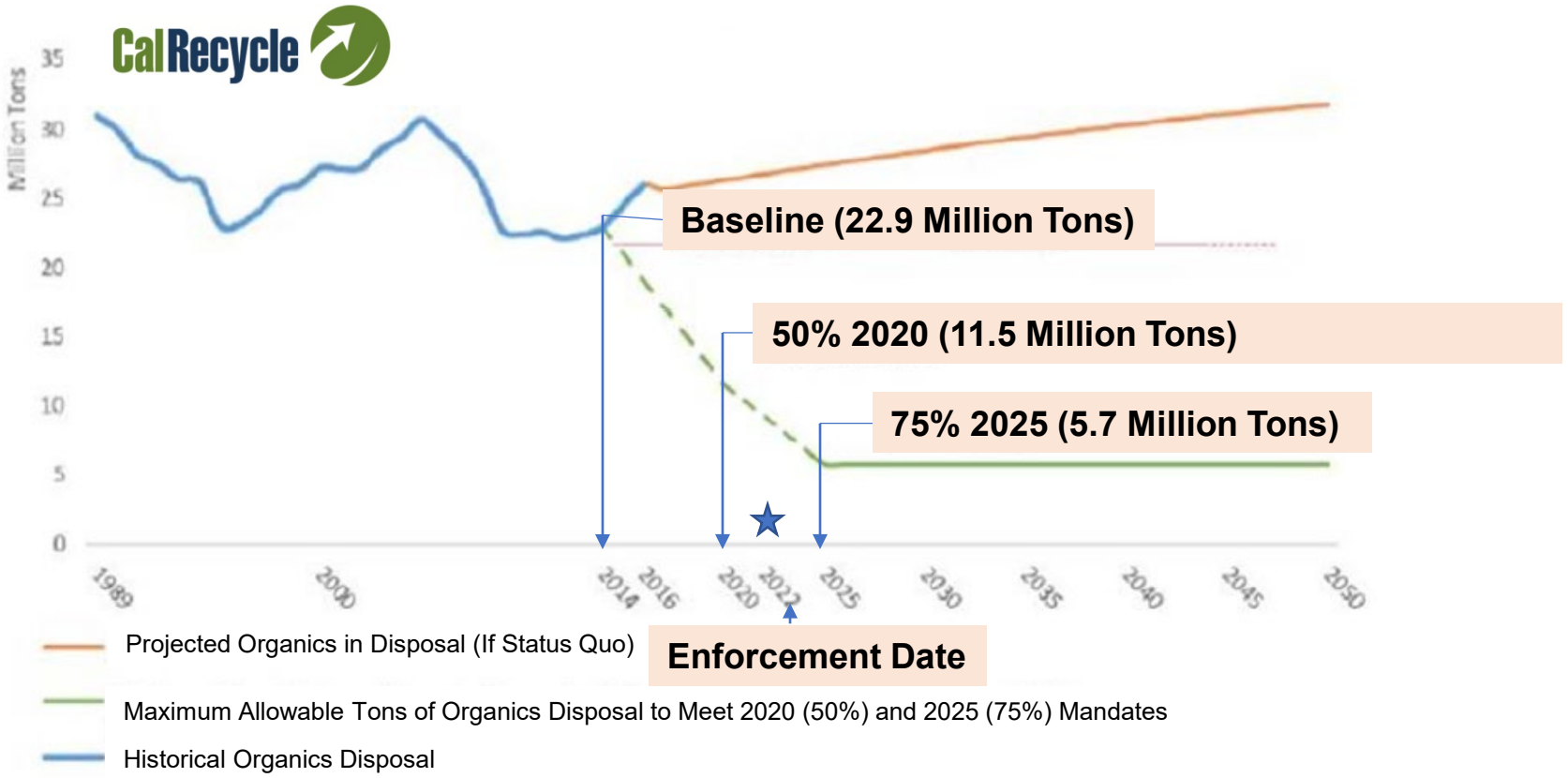
Healthy Soils Initiative

"Organics Market"
Biosolids, Food Waste, Green Waste, etc.

Organics Diversion and GHG Reduction from Landfill

Statewide Organics Diversion (SB 1383)



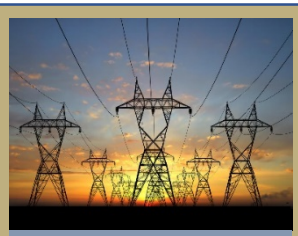
Future Policy – Should OCSD Explore Alternative Uses for Biosolids?




Class B Biosolids (95F)

Emerging Markets (CA)

RFI



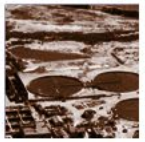
Electricity

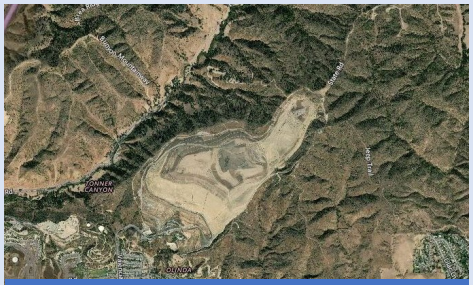
Fuel

Biosolids Land Application (Arizona)

Agriculture

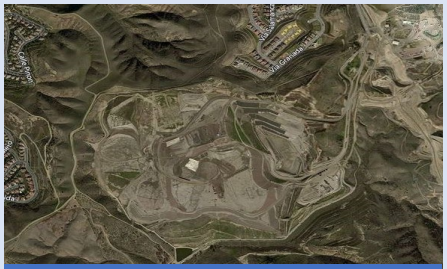
Future Policy - Opportunity to Partner with OC Waste & Recycling





Olinda Landfill (Brea)

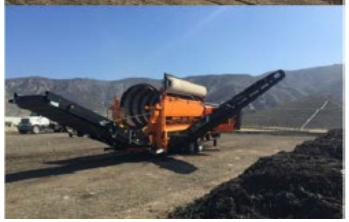
Frank Bowerman (Irvine)



Prima Deshecha (San Juan Capistrano)

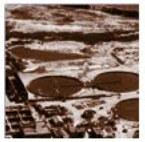
OC Waste&Recycling




Aerial Rendering of New Digesters – Plant No.2 (2030)

Future Policy - Biosolids Management (2030)




Class A Biosolids (131F)

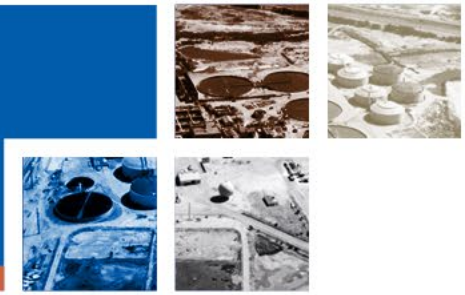
Soil Blending

Horticulture/Gardening

Land Application- California

Agriculture Crops

Summary Policy Statement



OCSD will continue to beneficially reuse biosolids and explore new markets identified in the 2017 Biosolids Master Plan.

Initiatives to Support Policy

Initiative: Educate and advocate for the used of biosolids as a soil amendment and monitor the development of constituents of emerging concerns that may impact biosolids.

Initiative: Stay abreast of new technology options to convert organics to energy and other regional biosolids recycling and renewable energy partnerships.

Initiative: Proceed with mesophilic and thermophilic biosolids facility at Plant No. 2 to enhance biosolids quality and marketability.

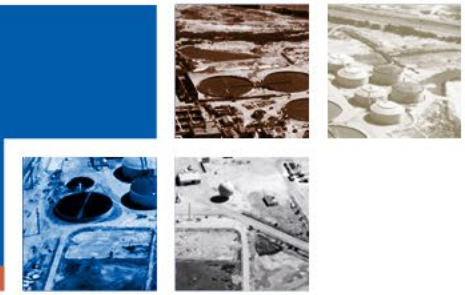
Food Waste Treatment

Book Page: 13

Presented by Rob Thompson
Assistant General Manager and
Director of Operations and Maintenance

CELEBRATING 65 YEARS
ORANGE COUNTY SANITATION DISTRICT

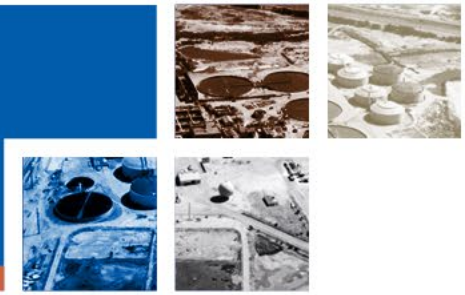
Policy Questions



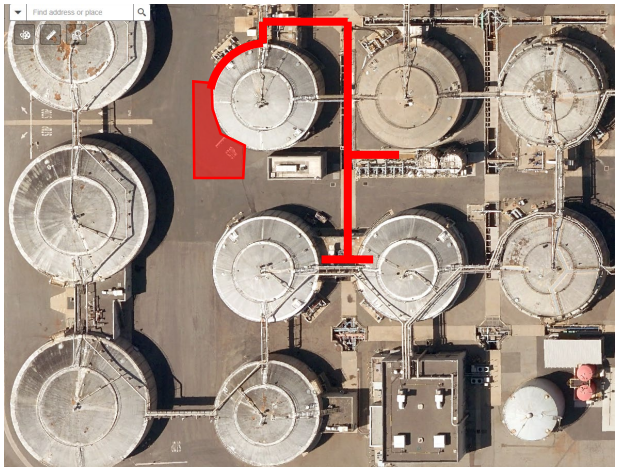
How should OCSD structure the tipping fee for digestion of food waste?

Should OCSD conduct a feasibility study for digestion of green waste?

Why Accept Food Waste

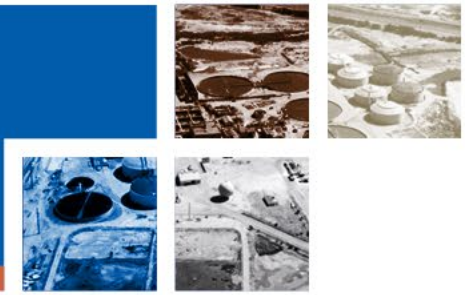


- Regulation diverting organics from landfills
- Food waste slurry is compatible with existing systems
- Existing capacity in digesters, gas treatment, engine-generators, dewatering and truck loading.
- Operating for the benefit of the residents within our mission and legal authority Health and Safety Code 4700.



OCSD Central Generation System

Challenges Ahead



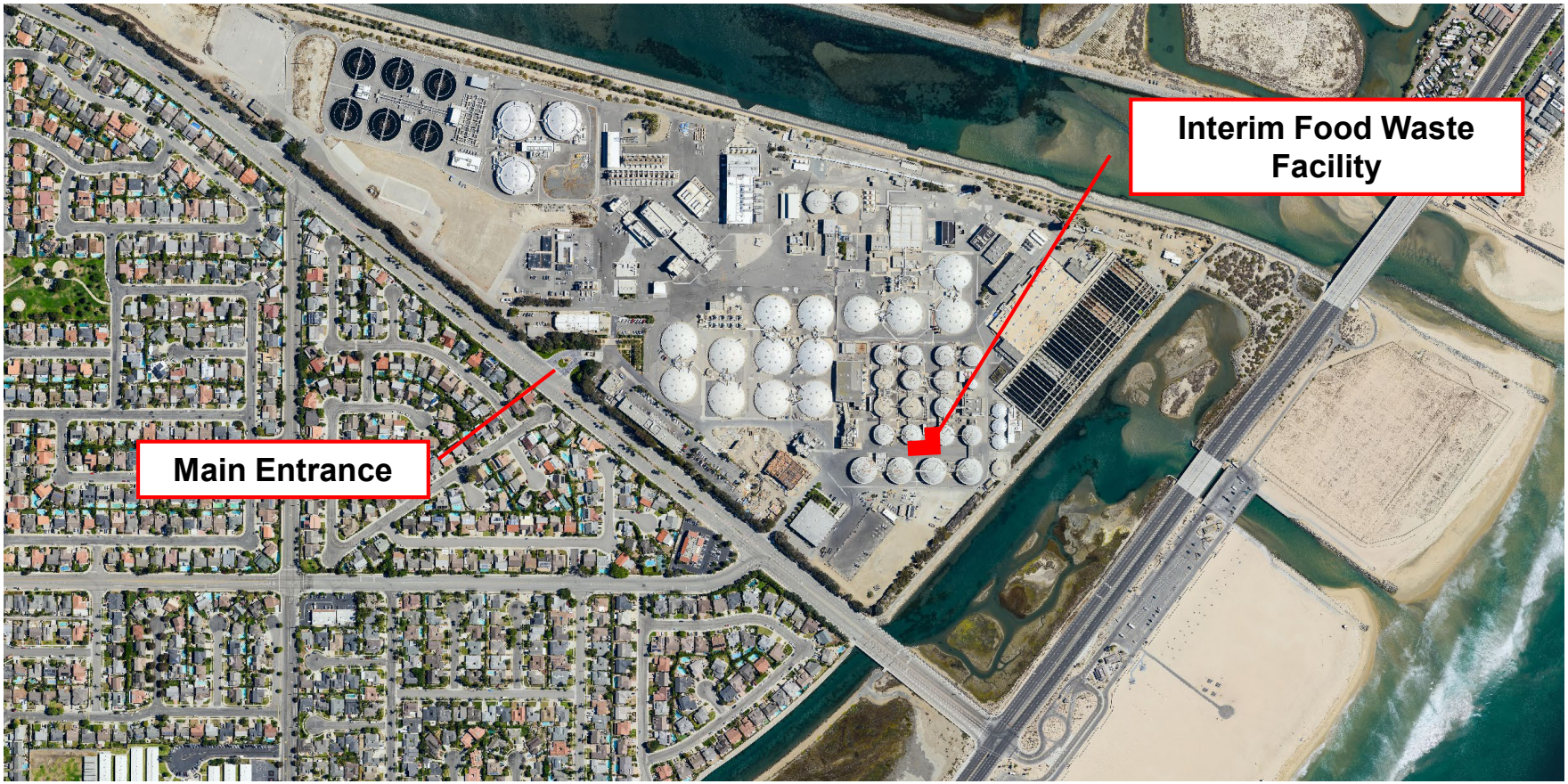
- Steep learning curve to food waste.
  - Lessons learned in Los Angeles County and East Bay MUD.
- Interim Project to learn (10 years)
- Permanent facility with new digesters at Plant No. 2
- Risk to existing 600 tons per day of biosolids (this should not be underestimated).
  - Contamination
  - Process upsets (2 million gallon stomachache)

Interim Food Waste

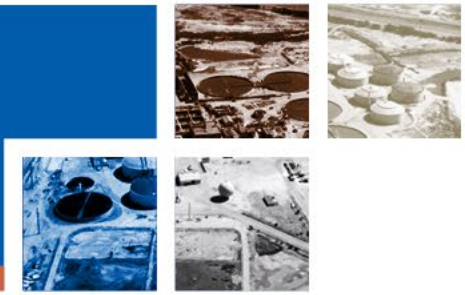
- Biosolids Master Plan Recommendation
- Interim Facility
  - Space & Sequencing Constraints
  - 15-year life specification
- Pre-processed waste only
- 5 to 6 trucks per day
- 15% more digester gas produced (1MW)

OCSD Central Generation System

Located at Plant No. 2



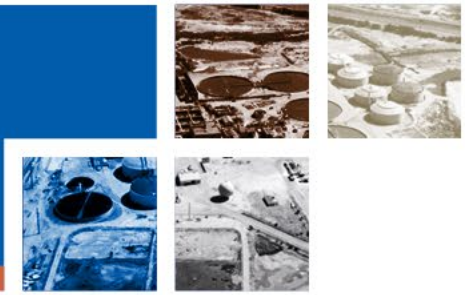
Project Basis



Costs

- $6.2 million project budget
- $2.4 million construction cost
- $1 million/year higher O&M costs

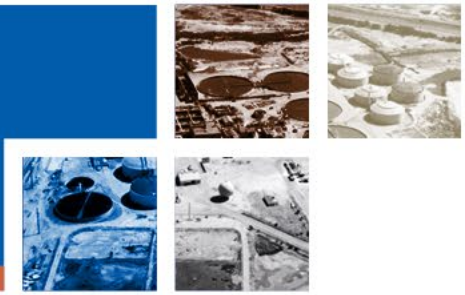
Tipping Fee Basis



- **Tipping fee to recover**
  - All operating cost
  - Capital cost over first five years of operations

- **No credit given for the value of digester gas**
  - No way to accurately separate sludge versus food waste fraction.
  - Gas clean up is costly – offsets value.
- **Savings pass through to residents, not Haulers**
- **Service area preference, premium for outside**

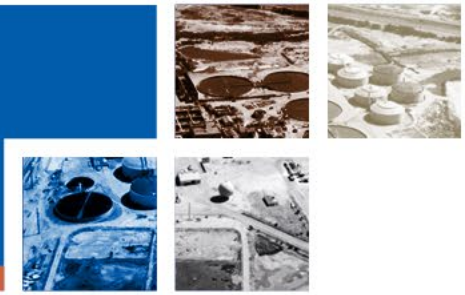
Tipping Fee Comparison



Other Agency Review

- Los Angeles County Sanitation District
  - Temporary Receiving $20/ton
  - Future Permanent Facility $25-40/ton
- East Bay Municipal Utility District $45/ton
- Central Marin Sanitation District $20/ton
- Encina Wastewater Authority $14/ton

Schedule



Project Viability Update to Board	**Jun 2020**
Construction Award	**Oct 2020**
Construction Complete	**Jun 2022**

Exploring Green Waste

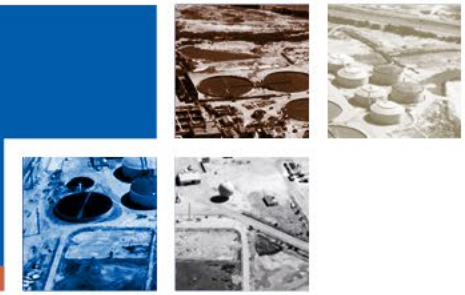
- Potential for additional methane
- Potential municipal organics diversion
- Current solids facilities not capable to handling cellulose based plant materials.
- No room onsite with master planned facilities
- Legal requirements
  - Health and Safety Code
  - Air Regulations (Volatile Organics, Odor and Greenhouse)
  - Gas Pipeline regulation
  - CEQA
- Orange County Waste and Recycling Plans
- Markets for residual materials

Initiatives to Support Policy

Initiative: The Sanitation District will accept a preprocessed food waste slurry from contracted waste haulers that will be fed to existing anaerobic digesters. OCSD will charge a tipping fee to offset its costs for capital construction, operations, handling, maintenance, and biosolids disposal.

Initiative: Design, build, and operate a food waste receiving station. Create a specification for food waste slurry and contract with solid waste haulers to receive and process food waste.

Policy Questions



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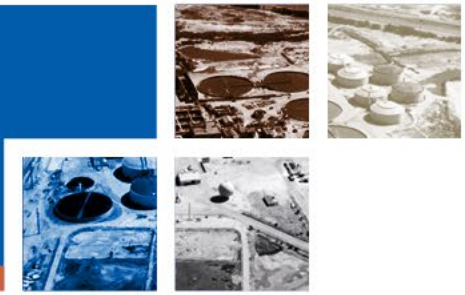

Questions?