

PFAS in Orange County

Jason Dadakis, P.G., C.HG

Executive Director of Water Quality & Technical Resources

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Southern California Water Dialogue



Outline

- OCWD Background
- PFAS Monitoring in Orange County Groundwater
- OCWD Recharge Supply Monitoring
- Pilot Treatment Testing & Planning Studies
- Next Steps



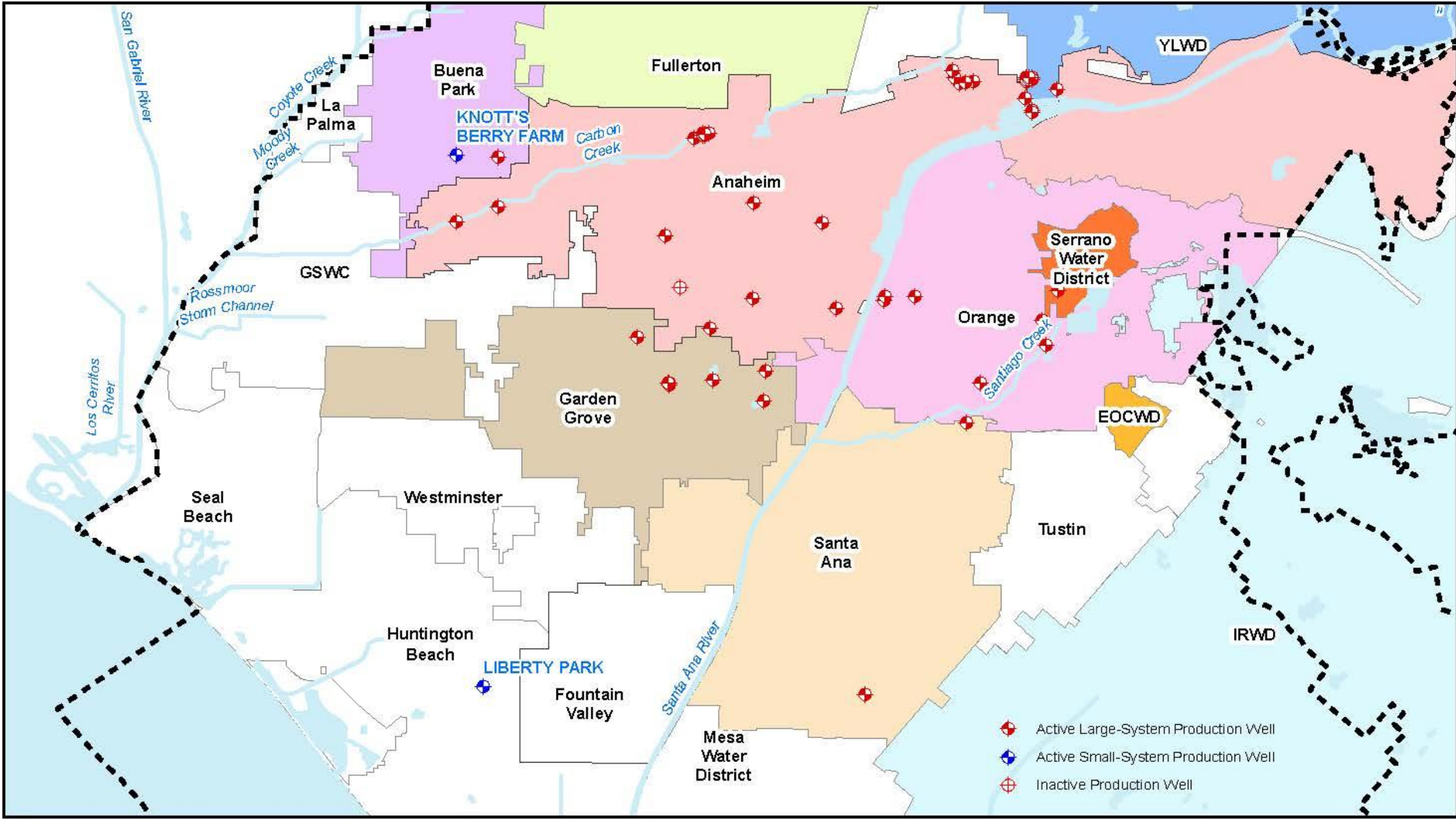
ORANGE COUNTY WATER DISTRICT (OCWD)

- Formed in 1933 by CA Legislature
 - Manage the OC Groundwater Basin
 - Protect rights to Santa Ana River water
- Provide groundwater
 - 19 municipal and special water districts
 - 2.5 million customers
 - 77% of the water supply for North & Central OC



March 2019: Twelve (12) OCWD Area Water Systems Received DDW Monitoring Orders

Producer	# of Wells in Order	Reason(s)
Anaheim	15	Near UCMR3 detection or Landfill
Buena Park	1	Nearby Landfill
East Orange County Water District	2	Nearby UCMR3 detection
City of Fullerton	5	Nearby UCMR3 detection
City of Garden Grove	7	Nearby UCMR3 detection
Irvine Ranch Water District	2	Nearby UCMR3 detection or Airport
Knotts Berry Farm	1	Nearby Landfill
Liberty Park Water Association	1	Nearby Landfill
City of Orange	6	Nearby UCMR3 detection
City of Santa Ana	1	Nearby UCMR3 detection
Serrano Water District	1	Nearby UCMR3 detection
Yorba Linda Water District	11	Nearby UCMR3 detection
Total	53	-



Buena Park

Fullerton

YLWD

KNOTT'S BERRY FARM

Anaheim

Serrano Water District

GSWC

Orange

EOCWD

Garden Grove

Seal Beach

Westminister

Tustin

Huntington Beach

LIBERTY PARK

Santa Ana

IRWD

Fountain Valley

Mesa Water District

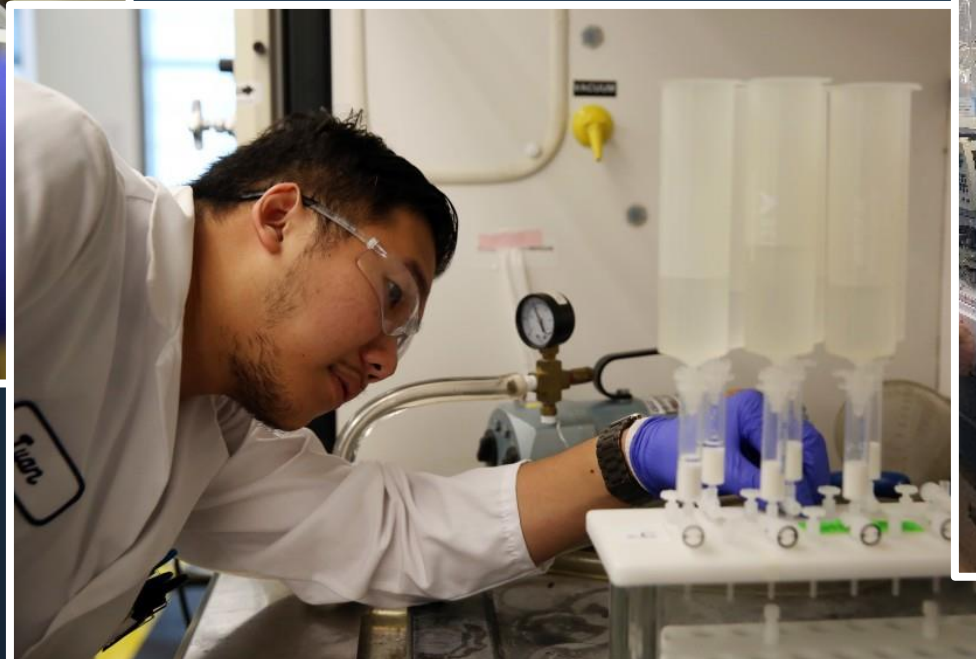
- Active Large-System Production Well
- Active Small-System Production Well
- Inactive Production Well

OCWD Laboratory Performing Analysis

First public agency lab with CA ELAP PFAS certification (EPA 537 Rev 1.1)



(Credit: Dania Maxwell / Los Angeles Times)



(Credit: Dania Maxwell / Los Angeles Times)



(Credit: OCWD)



July 2018: Interim DDW Notification & Response Levels

Advisory Type	PFAS Compound	July 2018
Notification Level	PFOA	14 ng/L
	PFOS	13 ng/L
Response Level	PFOA	70 ng/L combined
	PFOS	

- No USEPA MCL (EPA Lifetime Health Advisory set at 70 ng/L combined)
- No CA MCL
- Other states have different advisory values or MCLs



Monitoring Order Results: First Quarter

- 9 OCWD Producers with one or more results greater than Notification Levels for PFOA or PFOS
- Two wells > 70 ng/L Response Level (shutdown)
- Results consistent with OCWD monitoring well locations downgradient of recharge area

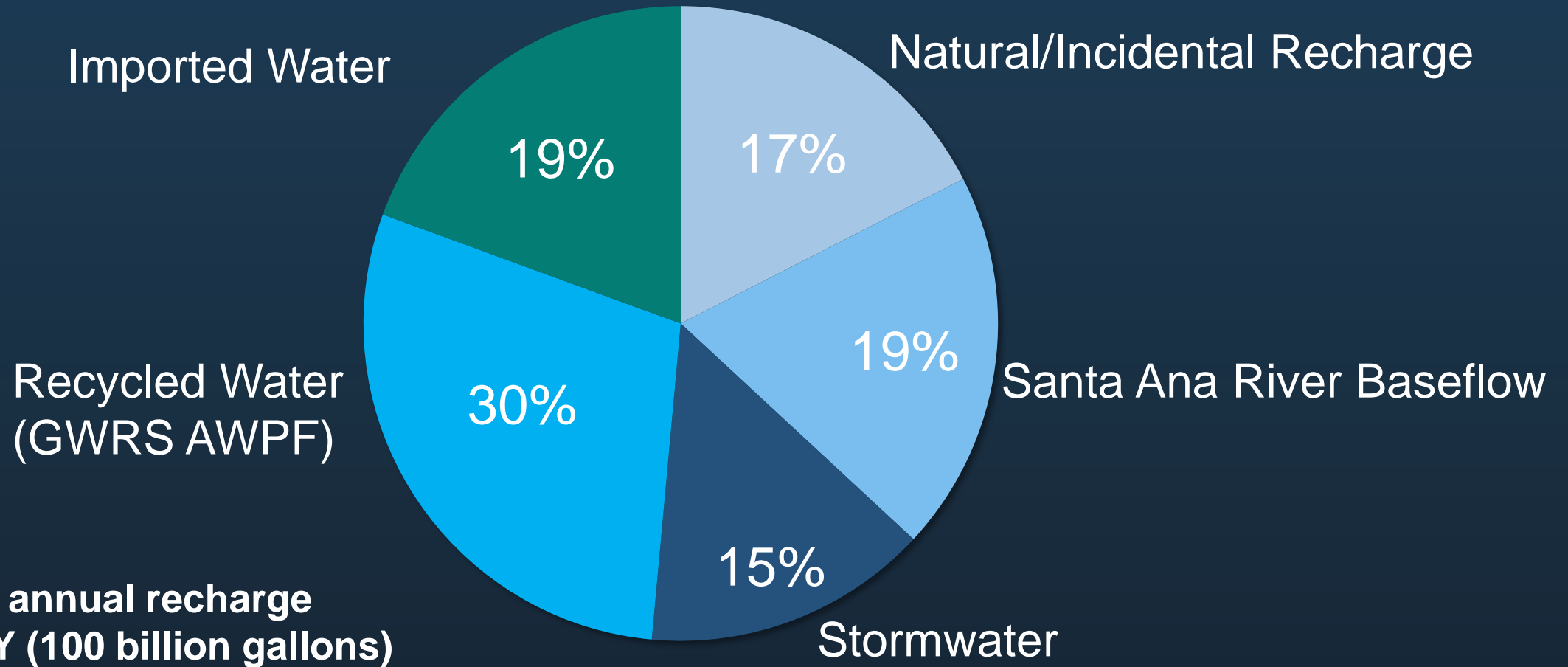


Producer
Anaheim
East Orange County Water District
City of Fullerton
City of Garden Grove
Irvine Ranch Water District
City of Orange
City of Santa Ana
Serrano Water District
Yorba Linda Water District

OCWD Groundwater Recharge Supply Testing



OCWD Groundwater Recharge Supplies



Average annual recharge
~340,000 AFY (100 billion gallons)



GWRS & MWD OC-28 Results

- GWRS

- OCSD Secondary Effluent = 25 – 38 ng/L PFOA + PFOS

- GWRS Final Product = Not detected (ND)

- Reverse Osmosis = Effective PFAS Treatment

- MWD OC-28: ND for PFAS

- MWD reports other data shows ND for PFAS

- Continued regular monitoring at GWRS & OC-28



Imperial Highway Site - Represents “Headworks” of OCWD Santa Ana River (SAR) Recharge System



Santa Ana River at Imperial Hwy

Aug 2016 – Present

Averages (ng/L)

PFOA: 20

PFOS: 18

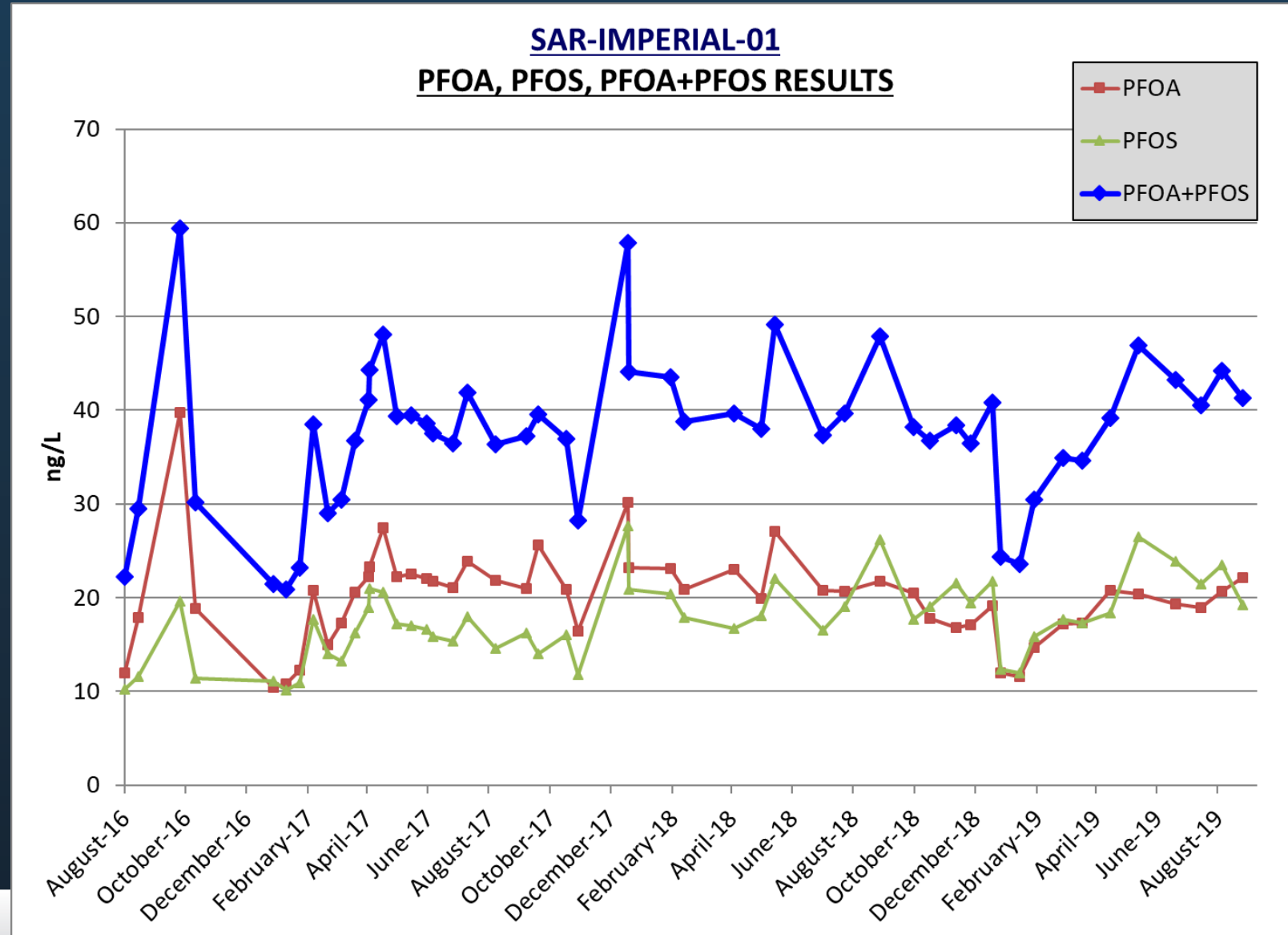
PFOA+PFOS: 38

Min / Max (ng/L)

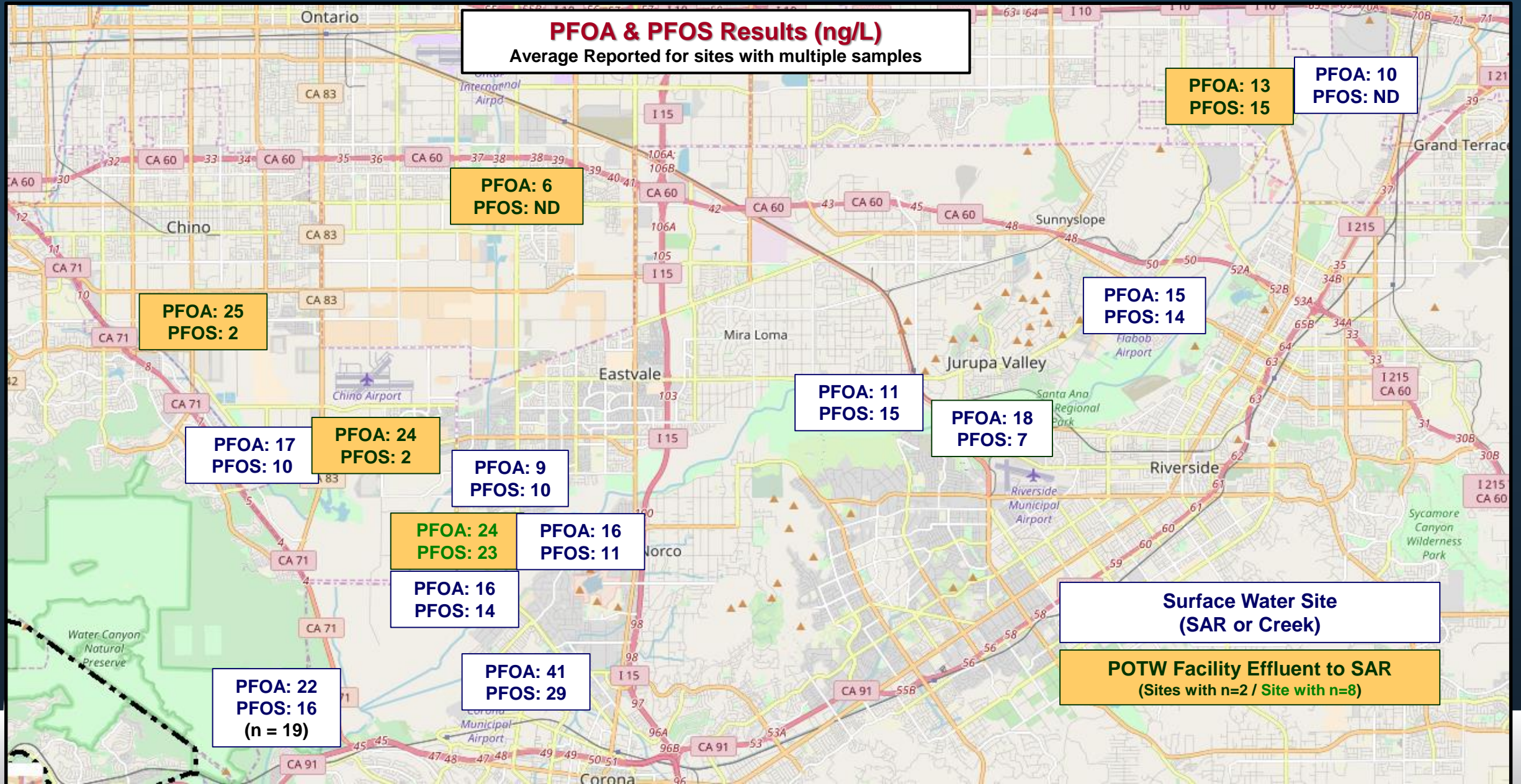
PFOA: 10 / 40

PFOS: 10 / 28

PFOA+PFOS: 21 / 59



Cooperative Upper SAR Watershed Monitoring



August 2019: New DDW Notification Levels

Advisory Type	PFAS Compound	July 2018	August 2019	Potential Fall 2019 Revision
Notification Level	PFOA	14 ng/L →	5.1 ng/L	?
	PFOS	13 ng/L →	6.5 ng/L	?
Response Level	PFOA	70 ng/L combined	70 ng/L →	10 ng/L
	PFOS		combined →	40 ng/L

- OEHAA/NTP Webinar on November 15
- DDW has requested PHG from OEHHA
- OEHHA to request public input at onset of PHG process



OCWD Area Impacts with Lower Response Level

- **At PFOA = 10 ppt and PFOS = 40 ppt**

- 39 of 53 OC wells tested under Monitoring Orders would exceed new RL
- Estimate ~71 of 200 OCWD area wells could exceed (~100,000 acre-ft of annual pumping)

- **Estimated OCWD area financial Impacts (preliminary)**

- 39 wells lost → \$30 million/yr in replacement treated MWD water
- 71 wells lost → \$50 million/yr in replacement treated MWD water



Wellhead treatment for 71 wells = ~\$850 million capital + 30 year O&M (*very preliminary*)

OCWD PILOT TREATMENT & PLANNING STUDIES



PFAS Treatment Technologies



Carbon Adsorption:
Granular Activated
Carbon (GAC)



Ion Exchange
(IX) Resin



Reverse Osmosis or
Nanofiltration
(RO or NF)

OCWD PFAS Pilot Testing to begin in Nov



- GAC + IX + novel sorbents
- Complimentary bench-scale RSSCTs + NF
- **Goal:** Inform & accelerate local retail agencies potential future treatment decisions



Next Steps

- Concurrent treatment planning/implementation study w/ retailers
- Finalize Board Policy for wellhead treatment cost sharing
- ELAP accreditation for EPA Method 537.1 (18 PFAS targets)
- Complete 3rd round of Monitoring Order testing
- Watershed wastewater/surface water/stormwater testing
- Regulatory developments (Response Level, PHG, AB 756,



ers, etc.)