PFAS, PFOA, and PFOS in Orange County

July 2, 2019

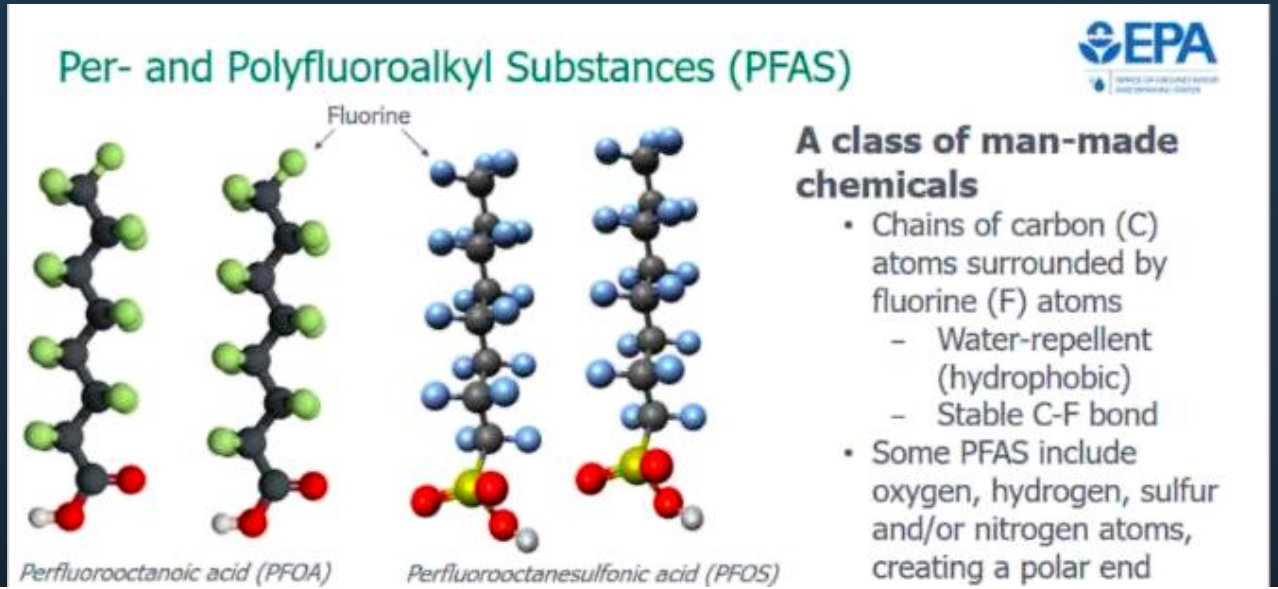
SAWPA Commission

Outline

- Background on PFAS
- OCWD Groundwater Results
- Pilot Treatment Testing
- OCWD SAR and Discharger Testing
- Managing PFAS in SAR Watershed

WHAT ARE PFAS, PFOA & PFOS?

- PFAS = Per- and Polyfluoroalkyl Substances (family of 1000s of chemicals)
- PFOA = Perfluorooctanoic Acid ($C_8HF_{15}O_2$)
- PFOS = Perfluorooctane Sulfonate ($C_8HF_{17}O_3S$)



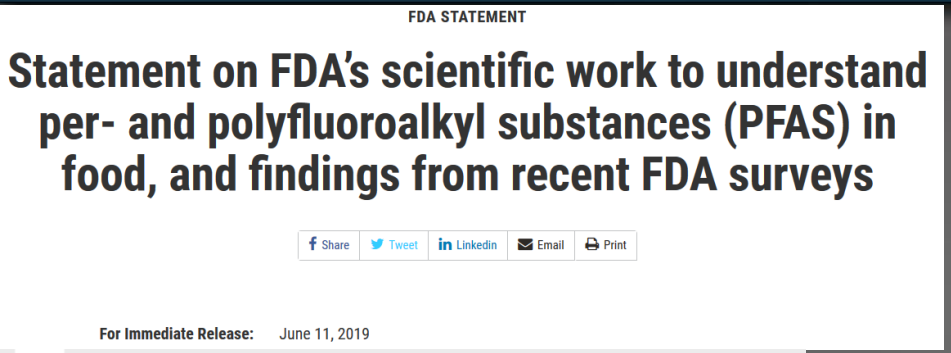
PFAS Use Across A Wide Range of Industries and Consumer Products

STAINMASTER carpet

GUARANTEED TO KEEP YOU DRY
GORE-TEX PRODUCTS
GORE

ORANGE COUNTY WATER DISTRICT

FDA: PFAS Occurrence in Food



FDA STATEMENT

Statement on FDA's scientific work to understand per- and polyfluoroalkyl substances (PFAS) in food, and findings from recent FDA surveys

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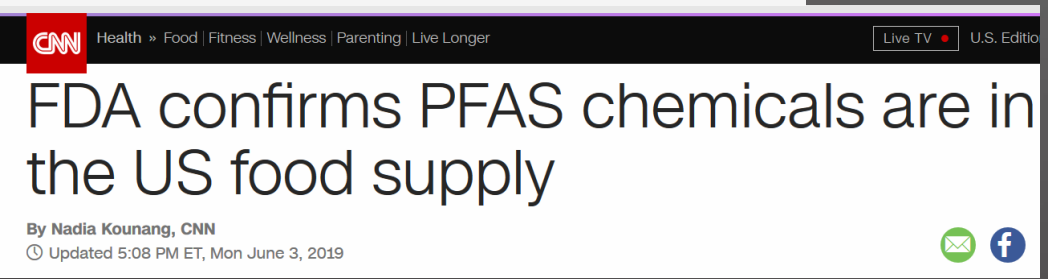
For Immediate Release: June 11, 2019

AP

FDA: Sampling finds toxic nonstick compounds in some food

By ELLEN KNICKMEYER, JOHN FLESHER and MICHAEL CASEY June 3, 2019



CNN Health » Food | Fitness | Wellness | Parenting | Live Longer Live TV U.S. Editio

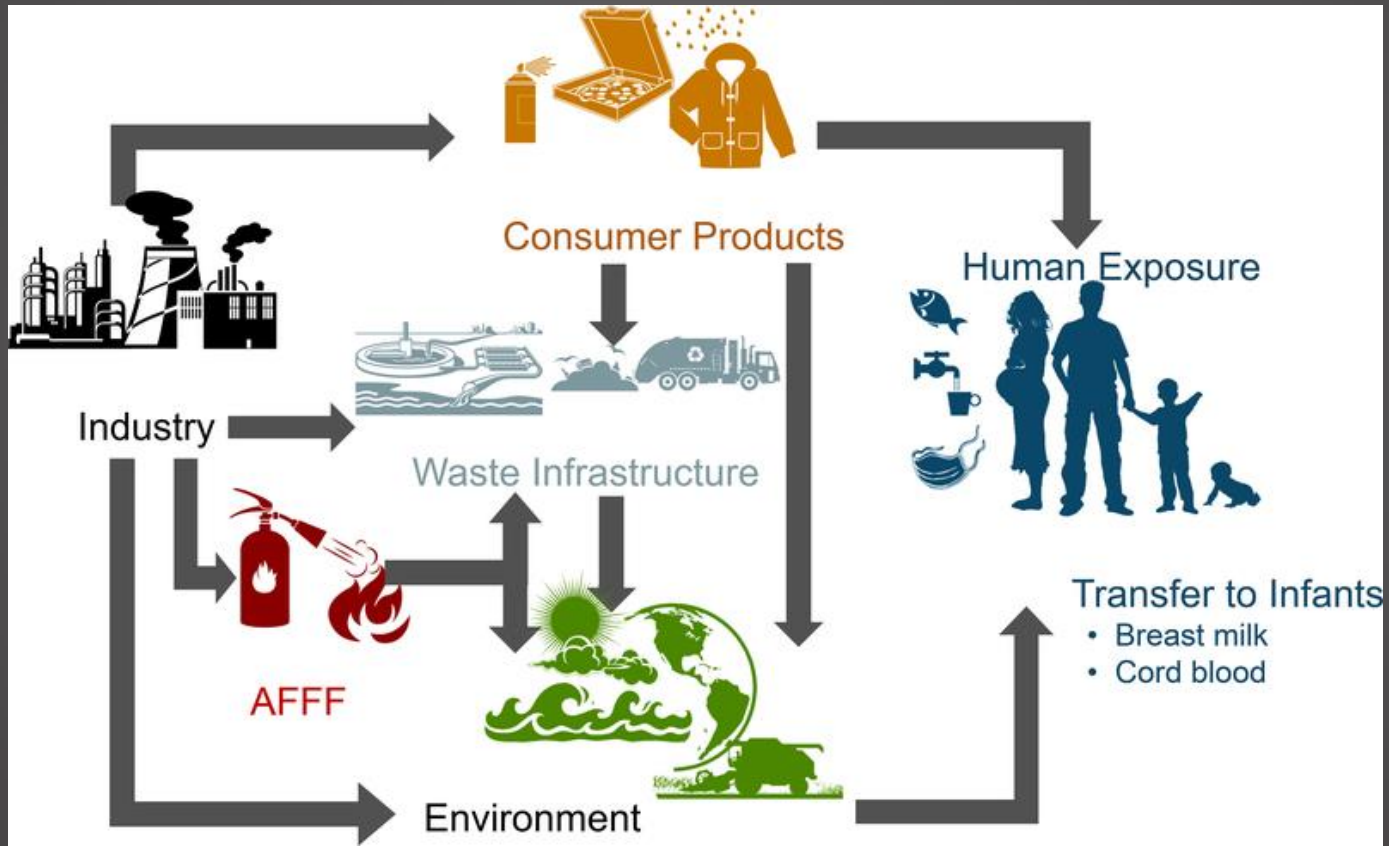
FDA confirms PFAS chemicals are in the US food supply

By Nadia Kounang, CNN

Updated 5:08 PM ET, Mon June 3, 2019

- Meats & seafood
- Produce irrigated with PFAS-impacted water
- Milk from dairy using feed grown with PFAS-impacted water

PFAS Exposure Pathways



Summary of Current EPA & CA Drinking Water Guidance

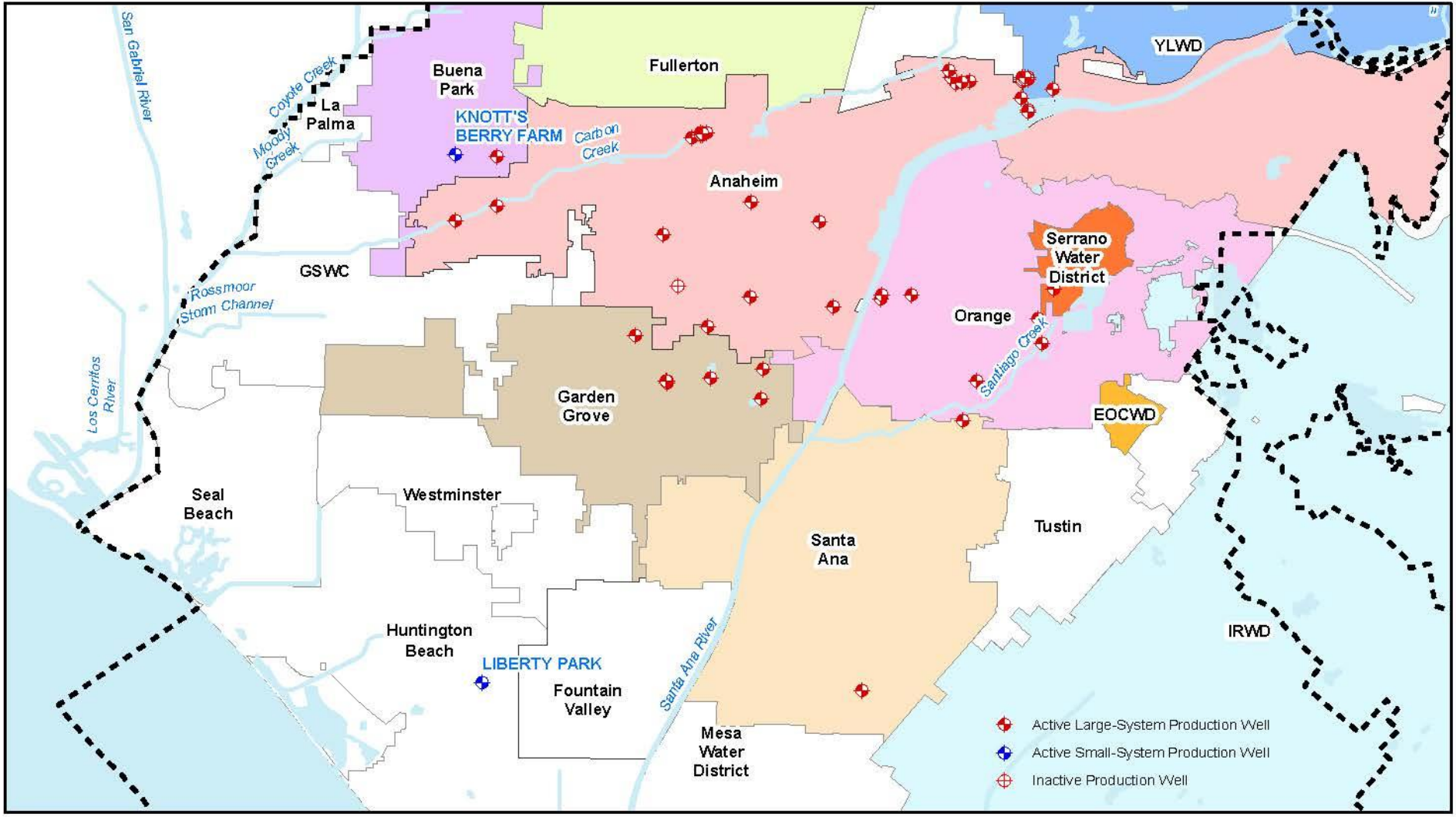
Agency	Type	Value	Description
USEPA	Lifetime Health Advisory (2016)	70 ng/L PFOA + PFOS	Non-enforceable. Recommends notifying local regulators and consumers, removing source, blending, or treatment
CA DDW	Interim Response Level (2018)	70 ng/L PFOA + PFOS	Non-enforceable. Recommends taking source out of service.
CA DDW	Interim Notification Level (2018)	PFOA = 14 ng/L PFOS = 13 ng/L	Non-enforceable. **Can serve, but must notify governing body** (city, county, board); recommends notifying consumers

- Maximum Contaminant Level (MCL) is enforceable standard
  - No federal MCL (bills in Congress to put EPA on 2-year timetable)
  - No CA MCL (must first establish Public Health Goal [PHG]); multiple PFAS grouping?
- Some states have advisory values and proposed MCLs

Orange County
Recent Groundwater Testing

12 OCWD Producers (retailers) Received Testing Orders in March 2019

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**	**-**


San Gabriel River
Coyote Creek
Moody Creek
La Palma
Buena Park
KNOTT'S BERRY FARM
Carbon Creek
Fullerton
YLWD
Anaheim
GSWC
Rossmoor Storm Channel
Los Cerritos River
Serrano Water District
Orange
Santiago Creek
Garden Grove
EOCWD
Seal Beach
Westminster
Santa Ana
Tustin
Huntington Beach
LIBERTY PARK
Fountain Valley
Santa Ana River
IRWD
Mesa Water District
Active Large-System Production Well
Active Small-System Production Well
Inactive Production Well

OCWD Laboratory performing testing

- Only public agency lab in CA with PFAS certification (EPA 537 Rev 1.1)
- Analysis and data reporting takes 2-3 weeks
- Strict sample collection & handling guidelines
  - No new or unwashed clothing
  - No pre-packaged food, fast food wrappers, or foil
  - No water proof paper or markers

9 OCWD Producers with one or more initial results greater than DDW Notification Levels for PFOA or PFOS

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

Results consistent with OCWD monitoring well results downgradient of recharge area

Orange County Governing Body Notifications

- 30 days to notify “Governing Body” after receiving result >NL
- Notifications status
  - **Sent out:** Yorba Linda Water District, City of Fullerton, City of Anaheim
  - **Pending:** Orange, EOCWD, Serrano, IRWD, Santa Ana, Garden Grove
- If well/source > **Response Level**
  - DDW recommends to stop serving
  - If continue to serve, DDW recommends extensive monitoring + public notification

PFAS Treatment Technologies

Carbon Adsorption: granular activated carbon (GAC)

Ion Exchange (IX) resin

Reverse Osmosis or Nanofiltration (RO or NF)

- More conventional treatment, site specific, WQ factors in, footprint area also
- Higher capital cost, concentrate disposal

OCWD Field Pilot Testing

- Pilot test skid delivery in July
- Pilot will assess GAC + IX
- Complimentary lab bench-scale testing of GAC and NF
- Will assess multiple technologies and local impacted groundwaters
- Goal: inform & accelerate local retail agencies potential future treatment decisions

OCWD Groundwater Recharge Supply Testing

GWRS & MWD OC-28 results

- GWRS
  - **OCSD Secondary Effluent** = 25 – 38 ng/L PFOA + PFOS
  - **GWRS Final Product =** Not detected (ND)
  - Reverse Osmosis = effective treatment

GWRS
GROUNDWATER REPLENISHMENT SYSTEM

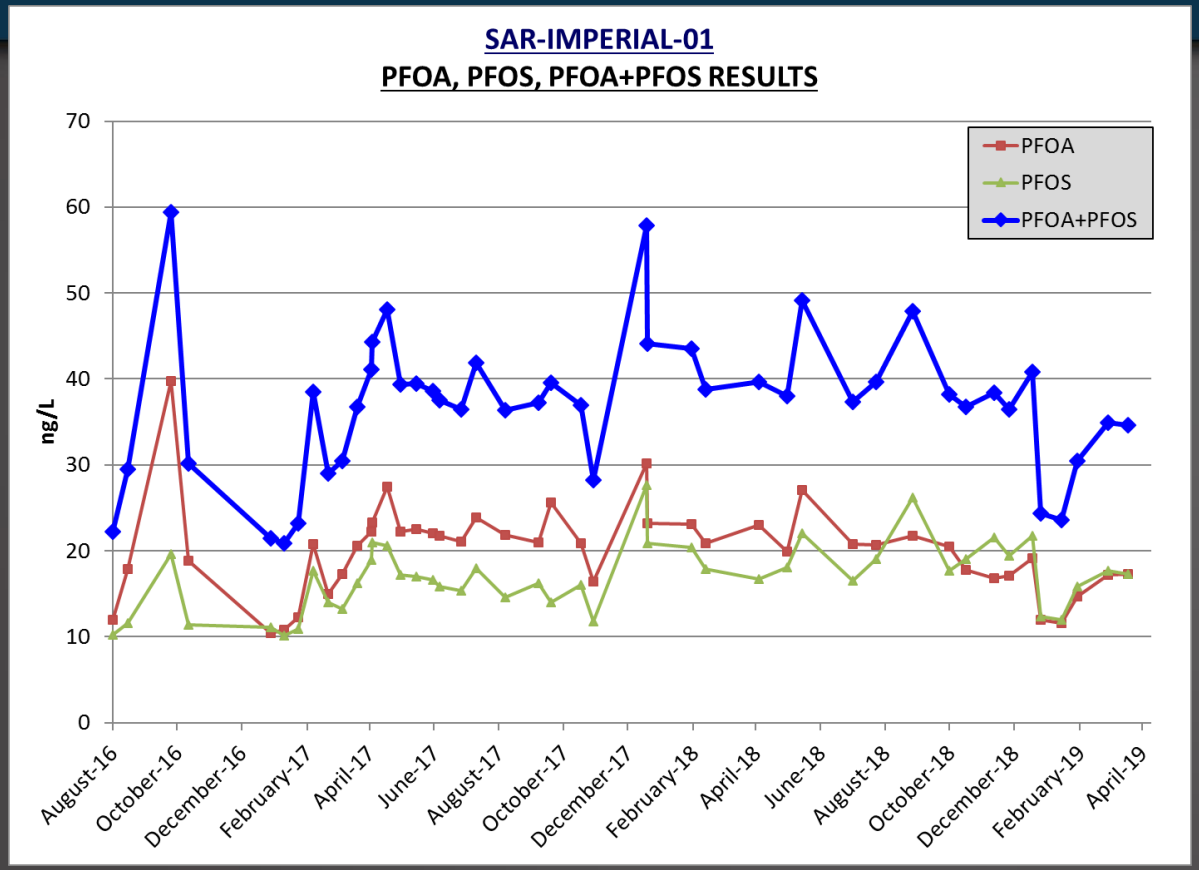
- MWD OC-28: Not detected for PFOA & PFOS
- Other MWD data shows non detect for PFOA & PFOS

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

- Continued regular monitoring

SAR Imperial Highway is key sample location, represents “headworks” of OCWD SAR recharge system

Santa Ana River at Imperial Hwy



Aug 2016 – Present

Averages (ng/L)

PFOA: 20

PFOS: 17

PFOA+PFOS: 37

Min / Max (ng/L)

PFOA: 10 / 40

PFOS: 10 / 28

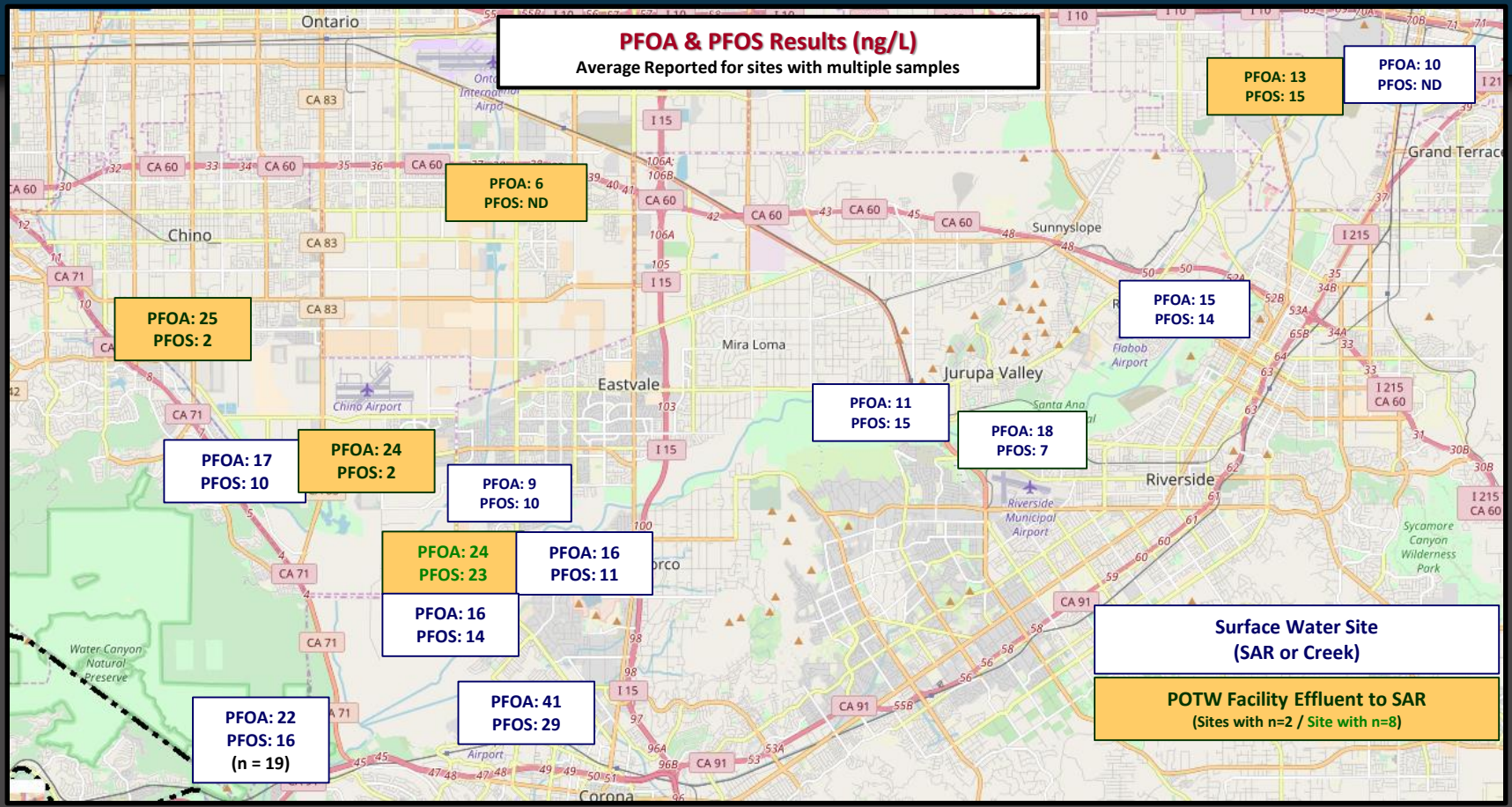
PFOA+PFOS: 21 / 59

Cooperative SAR Upstream Discharger Testing

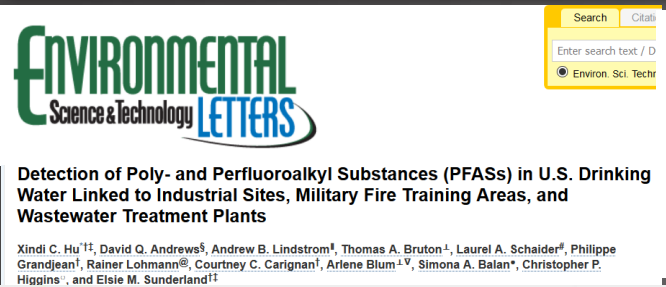
- Reached out to 5 different SAR wastewater discharger sites in 2017
  - **Inland Empire Utilities Agency (IEUA):** CCWRF, RP1/RP4, RP5 Plants
  - **Western Municipal Water District (WMWD):** WRCRWA Plant
  - **San Bernardino Municipal Water Dept (SBMWD):** RIX Plant

- 2 coordinated monitoring events at all 5 sites in 2017 & 2018
- Provided data back to each cooperating agency
- Shared results with Regional Board regulators and SARDA in Fall 2018

Upper SAR Watershed Monitoring



Occurrence of PFAS compounds in conventionally treated wastewater is well-established in literature



July 8: Possible reduction to DDW Notification & Response Levels

- Based OEHHA review of recent NTP rodent study
- "Lowest observed effect"/One-in-One-million cancer risk estimate
  - PFOA = 0.1 ng/L (pancreatic cancer)
  - POFS = 0.4 ng/L

Standard	PFAS Compound	Current	Proposed	Basis
Notification Level	PFOA	14 ng/L	**5.1 ng/L**	Analytical Detection Limit
Notification Level	PFOS	13 ng/L	**6.5 ng/L**	Analytical Detection Limit
Response Level	PFOA	70 ppt combined	**10 ng/L**	100x 1-in-1-million cancer risk
Response Level	PFOS		**40 ng/L**	100x 1-in-1-million cancer risk

Effects of lowering DDW Response Level

- Two wells in OCWD service above current 70 ng/L PFOA + PFOS Response Level
- Reducing Response Level to PFOA = 10 ppt and PFOS = 40 ppt
  - 39 of 51 wells tested under Monitoring Orders will exceed RL in OCWD area
  - Project ~71 out of ~200 OCWD area wells would exceed (~100,000 acre-ft of annual pumping)
- **Statewide**
  - ~300 of 600 wells with Monitoring orders have reported to state database
  - 65 results > 10 ppt PFOA
  - All first round results due July 10th
- **Agencies/areas likely affected:** Corona, Riverside, Elsinore Valley, Santa Clarita, Glendale, Desert Water Agency, Lathrop, Atascadero, Central Basin?

Meeting in Sacramento on July 3

- Parties involved
  - OCWD
  - Intertox
  - Santa Clarita Valley Water Agency
  - Cabinet Secretary: Jared Blumenfeld
  - State Board Chairman: Joaquin Esquivel
  - Deputy Director (DDW): Darrin Polhemus
  - OEHHA Director: Lauren Zeise, Ph.D
- Request
  - 90 day delay in establishing a new Response Level
  - Share OEHHA's review of NTP study + basis for recommendation
  - Prioritize setting PHG + MCL

Managing PFOA & PFOS in SAR

- Groundwater Recharge **(GWR)** is a designated beneficial use for SAR
- No current CA limits for PFOA & PFOS in SAR wastewater discharges
- Meetings with Regional Board & SARDA in Fall 2018
- Reestablished SAWPA EC Task Force in Jan-Feb 2019 to implement voluntary watershed CEC + PFAS testing in Aug
- Wastewater Dischargers (POTWs) statewide expected to receive PFAS testing orders in Fall 2019

California Water Boards
Santa Ana Regional Water Quality Control Board

SAWPA