

State Water Board's General Order Regulating the Land Application of Biosolids

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Biosolids Committee Meeting
Clean Water So Cal
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I will discuss:

- Biosolids Land Application Regulations
- California Statewide PFAS Investigation Orders
- How Other States Are Addressing PFAS in Biosolids
- USEPA Draft Risk Assessment of PFAS in Biosolids
- Water Board Approach to Address PFAS in Biosolids



There are Federal and State Requirements for Biosolids.



Federal
40 CFR Part 503, 1994



State Water Board
Biosolids General Order, 2004

There are Federal and State Requirements for Biosolids.



Federal
40 CFR Part 503, 1994

- Pollutant limitations for 7 heavy metals
- Pathogens and vector attraction reduction requirements
- Best practices and sets of monitoring, record keeping, and reporting.
- Biosolids are classified to A, B, and EQ

There are Federal and State Requirements for Biosolids.

Biosolids General Order requirements exceed federal standards

- Longer grazing holding time
- Specific setbacks, slope limitations, and weather conditions
- Additional prohibitions and monitoring

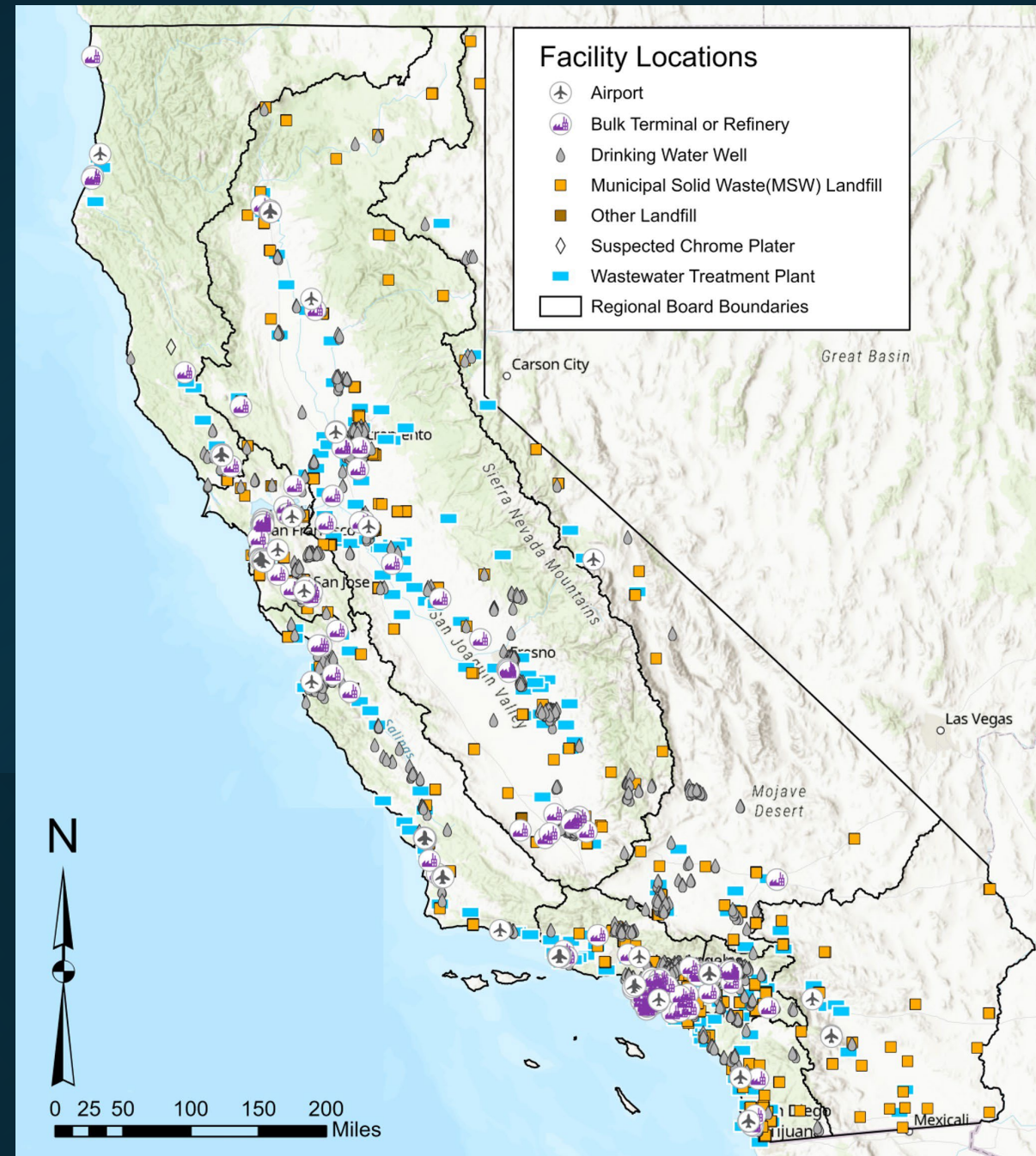


State Water Board
Biosolids General Order, 2004

Locations of Highest Risk from PFAS are Understood

About 3,000 General Investigative Orders issued since 2019 within Division of Water Quality (DWQ) and Division of Drinking Water (DDW)

- DWQ - Point Sources: Airports, Bulk Fuel Terminals, Refineries, Chrome Platers, DoD
- DWQ - Secondary Sources: Landfills and Wastewater Treatment Plants
- DDW - Public Water System wells in the vicinity of these point sources and at the disadvantaged communities



POTWs sampled influent, effluent, biosolids, and groundwater for PFAS

	# of POTWs	TREATMENT SYSTEM SAMPLING		REVERSE OSMOSIS CONCENTRATE	BIOSOLIDS	GROUNDWATER MONITORING (POTWS with GW MRP)	
Ave. Dry Weather Design Flow Rate		Locations	Frequency	Frequency	Frequency	Criteria	Frequency
1 to 5 MGD	122	Influent, Effluent	Quarterly for 1 year	Quarterly for 1 year	Once	Min. of 3 well locations (existing)	Once
> 5 MGD	119				Quarterly for 1 year		

Median PFOA and PFOS concentrations in effluent is slightly higher than EPA proposed MCL

	Median (ng/L)		Range (ng/L)		EPA MCL (ng/L)
	Influent*	Effluent*	Influent*	Effluent*	
PFOA	8	11	0.4-590	0.32-152	4
PFOS	5.1	5	0.3-672	0.25-2,420	4

*215 POTWs (as of 2/9/2022)

Median Biosolids results are less than EPA screening Level for PFOA and PFOS

	Soil	California	
	EPA Screening Levels for Residential Soil (mg/kg)*	POTW Biosolids Maximum (mg/kg)**	POTW Biosolids Median (mg/kg)*
PFOA	0.19	0.06	0.0033
PFOS	0.13	1.3	0.0116
PFHxS	1.3	0.05	2.3E-09
PFNA	0.19	0.27	2.0E-09
HFPO-DA (GenX)	0.23	0.14	7.8E-09

* <https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables>

**147 POTWs (as of 2/9/2022)

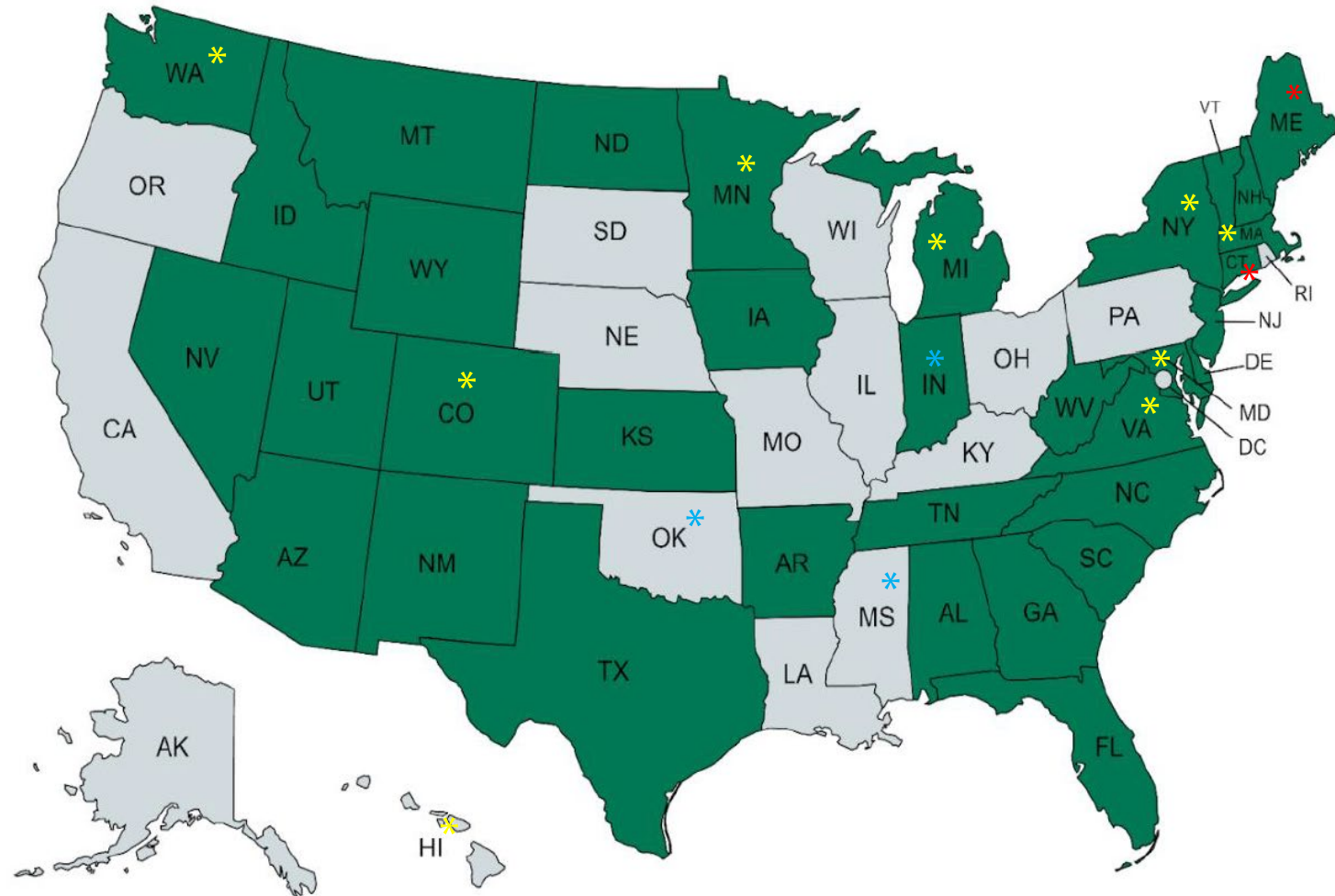
More States are taking actions to address PFAS in biosolids

* (Maine and Connecticut) Banning land application of sludge or sludge-derived products

* (New Hampshire, Massachusetts, Virginia, Michigan, Vermont, Minnesota, Colorado, Maryland, New York, Hawaii, Washington) Monitoring or sampling for PFAS before land application

* (Oklahoma, Mississippi, Indiana) Introduced legislations to ban or partially ban biosolids land application

(Texas) Review banning of Biosolids labeled as for Farmers in Johnson County sued Synagro, alleging contamination of their land and water with PFAS biosolids



Michigan Interim Strategy for Biosolids Containing PFOS and/or PFOA is to Identify and Reduce Industrial Source

Biosolids Type	Sampling Frequency	Analytical Results/Source Investigation and Control
Class A and Class B	Annually Prior to land application per permit cycle	<ul style="list-style-type: none"> ○ PFOS or PFOA > 0.10 mg/kg <ul style="list-style-type: none"> • Biosolids are deemed Industrially Impacted and cannot be land applied • Sample effluent and investigate potential sources to develop a source reduction program • Arrange alternative treatment or disposal of solids. ○ 0.02 mg/kg < PFOS or PFOA < 0.10 mg/kg <ul style="list-style-type: none"> • Sample effluent and investigate potential sources to develop a source reduction program • Reduce land application rates to no more than 1.5 dry tons per acre (or submit an alternative risk mitigation strategy). ○ PFOS or PFOA < 0.02 mg/kg <ul style="list-style-type: none"> • If PFOS > 0.02 mg/kg, investigate sources and sampling the WWTP effluent for PFAS
Exceptional Quality (EQ)	Quarterly	<ul style="list-style-type: none"> ○ PFOS + PFOA < 0.02 mg/kg

USEPA Draft Biosolids Risk Assessment for PFOA and PFOS does not provide a clear guidance

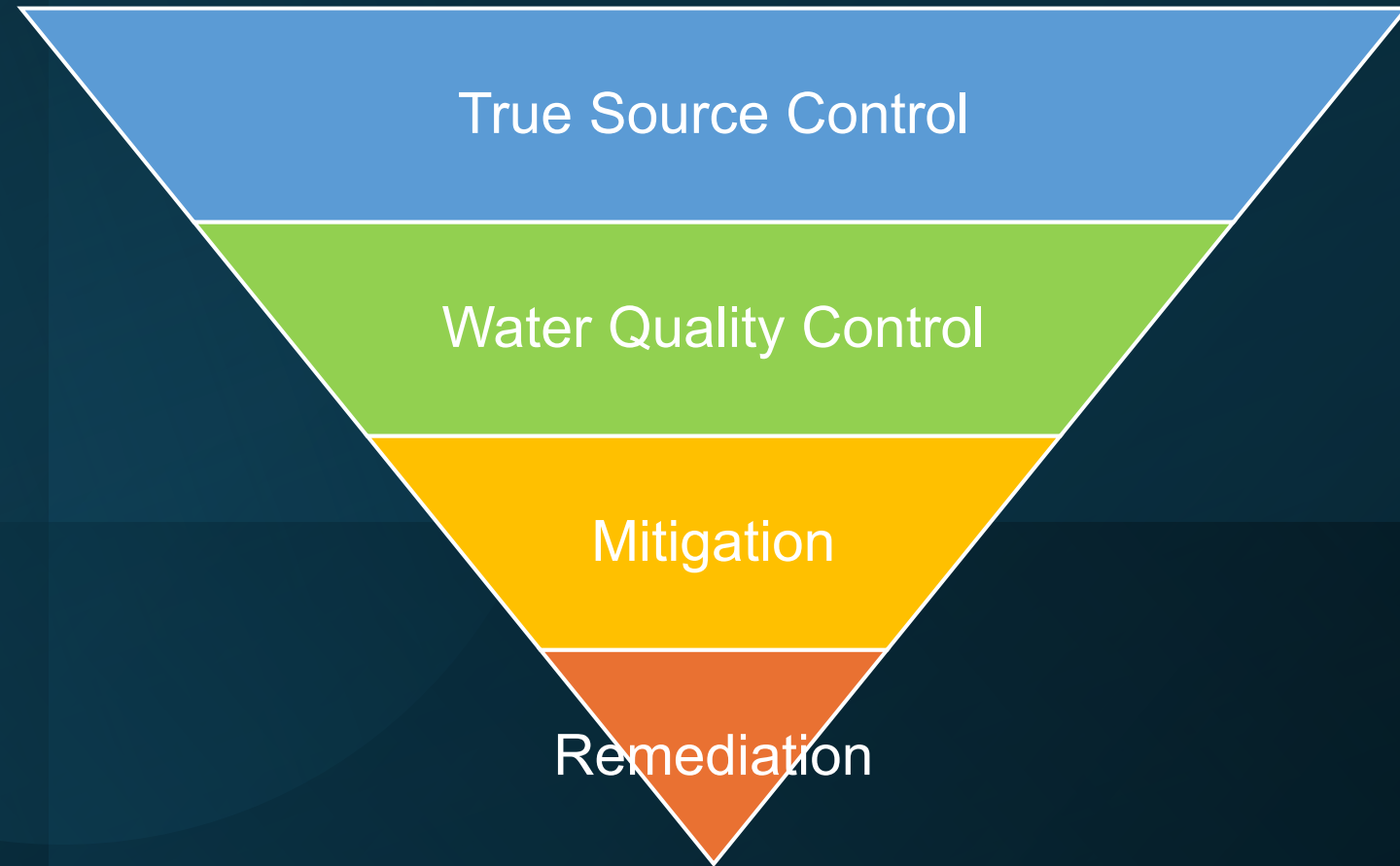
- Preliminary evaluation of human and environmental risks from PFOA/PFOS in biosolids for land application and monofill disposal.
- The model is based on people living in the impacted sites and primarily relying on products like food, animal products, and drinking water.
- The model concluded that 1 ppb of PFOA and PFOS in biosolids used in land application pose a risk above the EPA's acceptable threshold.
- EPA will use the results of the risk assessment in addition to consideration of other factors including economics and technological feasibility in the risk management process.

California is developing a strategic approach to address PFAS and other contaminants of concerns

Most Preferred



Least Preferred





GeoTracker PFAS Map

https://geotracker.waterboards.ca.gov/map/pfas_map

PFAS SAMPLING LOCATIONS

☒ Locations with PFAS Investigative Orders

- ☒ Airport
- ☒ Bulk Fuel Terminal/Refinery
- ☒ Chrome Plating
- ☒ Landfill
- ☒ Wastewater Facilities

☒ Other Locations with PFAS Data

- ☒ Cleanup Program Site
- ☒ Land Disposal Site
- ☒ Military Cleanup Site
- ☒ Military Privatized Site
- ☒ Military UST Site
- ☒ Non-Case Information
- ☒ Project
- ☒ Sampling Point - Private
- ☒ WDR Site
- ☒ NPDES
- ☒ GAMA - Priority Basin Project (USGS)
- ☒ GAMA - Water Replenishment District

☒ Water System Wells - GAMA DATA

- ☒ Drinking Water Wells
- ☒ Surface Water Intakes

☒ Source Water
 ☒ Treated Water

PFAS Chemical Filter

Chemical:

Any PFAS Chemical

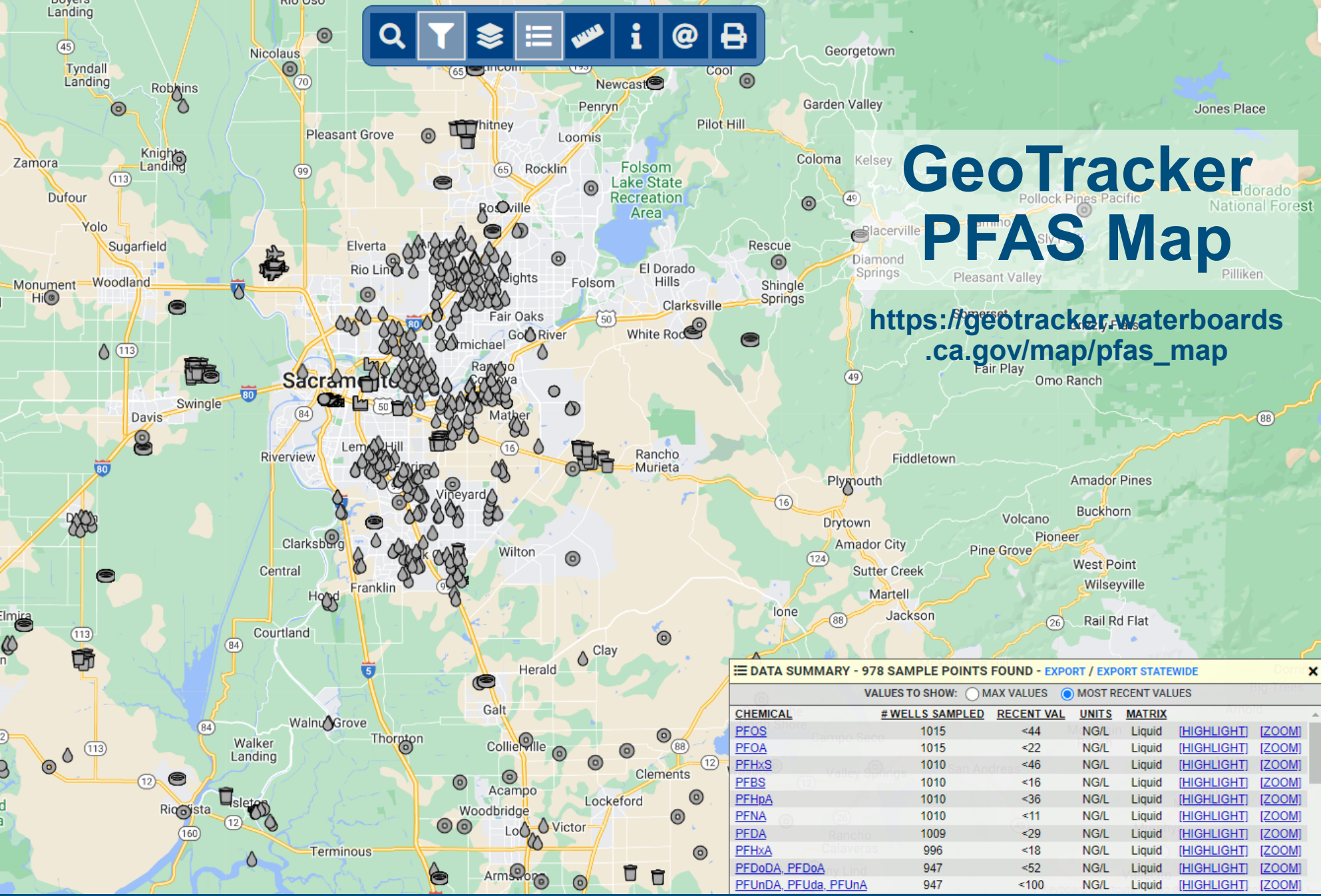
Wells to Show:

Any Result

Matrix

☒ Gas
 ☒ Liquid
 ☒ Solid

Field Point Class



DATA SUMMARY - 978 SAMPLE POINTS FOUND - EXPORT / EXPORT STATEWIDE

VALUES TO SHOW:

☐ MAX VALUES
 ☒ MOST RECENT VALUES

CHEMICAL	# WELLS SAMPLED	RECENT VAL	UNITS	MATRIX		
PFOS	1015	<44	NG/L	Liquid	[HIGHLIGHT]	[ZOOM]
PFOA	1015	<22	NG/L	Liquid	[HIGHLIGHT]	[ZOOM]
PFHxS	1010	<46	NG/L	Liquid	[HIGHLIGHT]	[ZOOM]
PFBS	1010	<16	NG/L	Liquid	[HIGHLIGHT]	[ZOOM]
PFHpA	1010	<36	NG/L	Liquid	[HIGHLIGHT]	[ZOOM]
PFNA	1010	<11	NG/L	Liquid	[HIGHLIGHT]	[ZOOM]
PFDA	1009	<29	NG/L	Liquid	[HIGHLIGHT]	[ZOOM]
PFHxA	996	<18	NG/L	Liquid	[HIGHLIGHT]	[ZOOM]
PFDoDA, PFDoA	947	<52	NG/L	Liquid	[HIGHLIGHT]	[ZOOM]
PFUnDA, PFUda, PFUnA	947	<100	NG/L	Liquid	[HIGHLIGHT]	[ZOOM]

Thank you!

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