# Session 2

***Pathway to a MCL; monitoring, lab methods, scientific studies, and regulatory process***

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***Contaminants of emerging concern in Chino Basin: What's been dealt with previously (perchlorate, Cr6, and 1,2,3-TCP).***

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***Contaminants of emerging concern in the Central Basin and West Coast Basin***

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**Chino Basin Water Quality Colloquium**

**May 2, 2019**

# *Contaminants of emerging concern in Chino Basin: What's been dealt with previously (perchlorate, Cr6, and 1,2,3-TCP)*

**Chino Basin Water Quality Colloquium**

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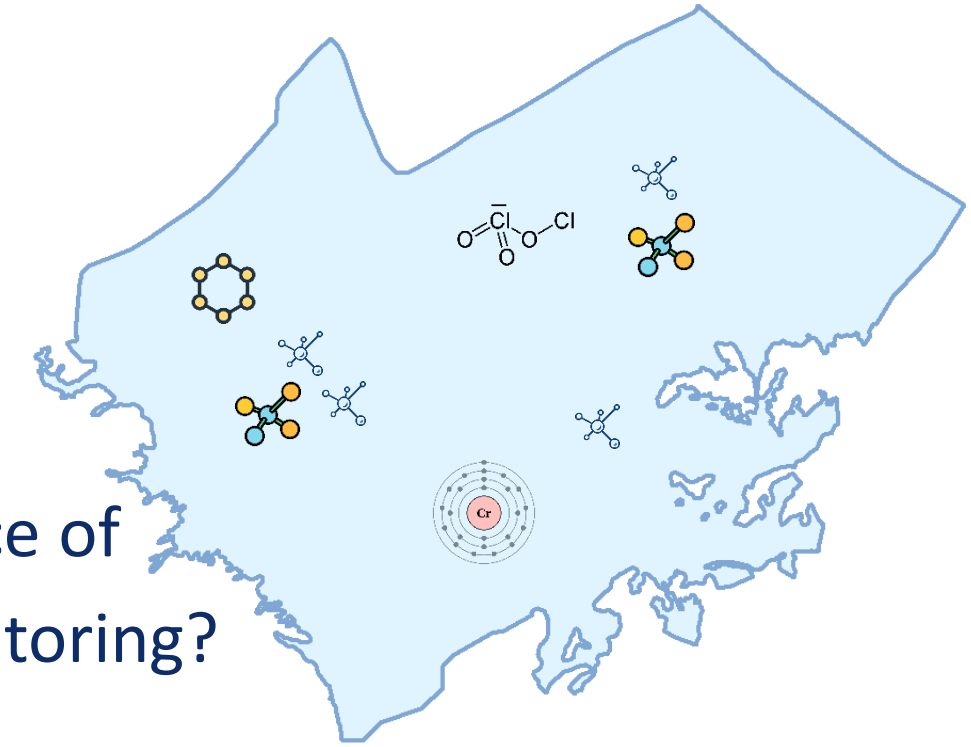
# Historical Contaminants of Emerging Concern

- In the last ten years, drinking water MCLs have been established by the State of CA for:
  - Perchlorate
  - Hexavalent chromium (Cr6)
  - 1,2,3-trichloropropane (1,2,3-TCP)




- How did our understanding of the occurrence of these constituents evolve as a result of monitoring?

# Common History on the Path to MCLs

1. Emergence of contaminant as a CEC
2. Evaluation under Federal and CA Unregulated Contaminants Monitoring Rule (UCMR)
3. Resulting interim regulatory and monitoring actions
4. Establishment of an MCL
5. Post MCL developments
6. Future considerations

# 1. Emergence of contaminant as a CEC

- Point source discharges into the environment
- Identification as risk to human health (natural and man-made contaminants)
- Safe Drinking Water Act activities to identify Contaminant Candidate Lists
- Advancements in analytical methods to reduce Method Detection Limits (MDL)

# 2. Evaluation under Federal and CA UCMR

The EPA Unregulated Contaminant Monitoring Rule (UCMR) program was developed to collect data for contaminants that are suspected to be present in drinking water and do not have health-based standards set under the Safe Drinking Water Act.

- Perform monitoring and testing every five years
- Test up to 30 contaminants (2-3 year period)
- 3 UCMRs completed to date (2001-03; 2008-2010; and 2013-2015)
- All 3 CECs were included in UCMR 1

# 3. Resulting interim regulatory and monitoring actions

Following UCMR1, various actions were taken to better monitor and/or understand each CEC

- Establishment of Public Health Goals (PHG)
- Establishment of Notification Levels (NL)
- Lowering of Detection Limits for Purposes of Reporting (DLR)

# 4. Establishment of an MCL

Each of the three CECs had Maximum Contaminant Levels (MCLs) established to regulate allowable concentrations in drinking water following the interim regulatory activities

# 5. Post MCL developments

Following the establishment of MCLs for each CEC, there have been various additional developments that have impacted regulations or monitoring:

- Updated Public Health Goals (PHG)
- Revised Detection Limits for Purposes of Reporting (DLR)
- Contested MCL requirements

# 6. Future considerations

For each CEC, there remain lingering issues that could result in future changes in drinking water standards and regulation of the contaminants

# Perchlorate

# 1. Emergence as CEC and initial monitoring: perchlorate

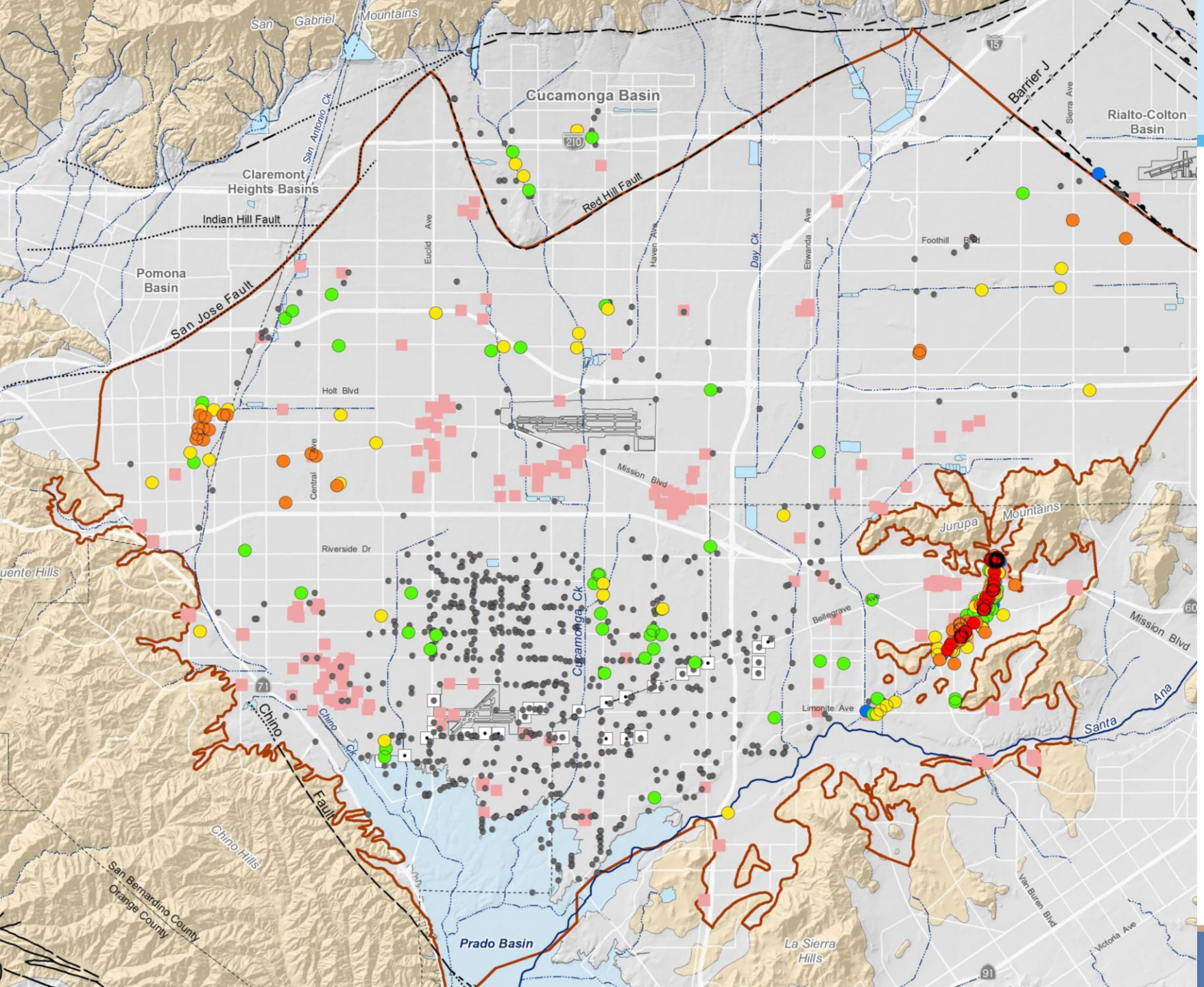
- **1990s:** Monitoring began for perchlorate in groundwater
  - Standard MDL/RDL of 400 µgl (parts per billion)

- **1997:** New analytical methods developed – Ion Chromatography
  - Enabled a MDL as low as 1 µgl
  - DLR lowered to 4 µgl

- Testing at this lower DLR revealed widespread occurrence of perchlorate in groundwater, predominately in CA

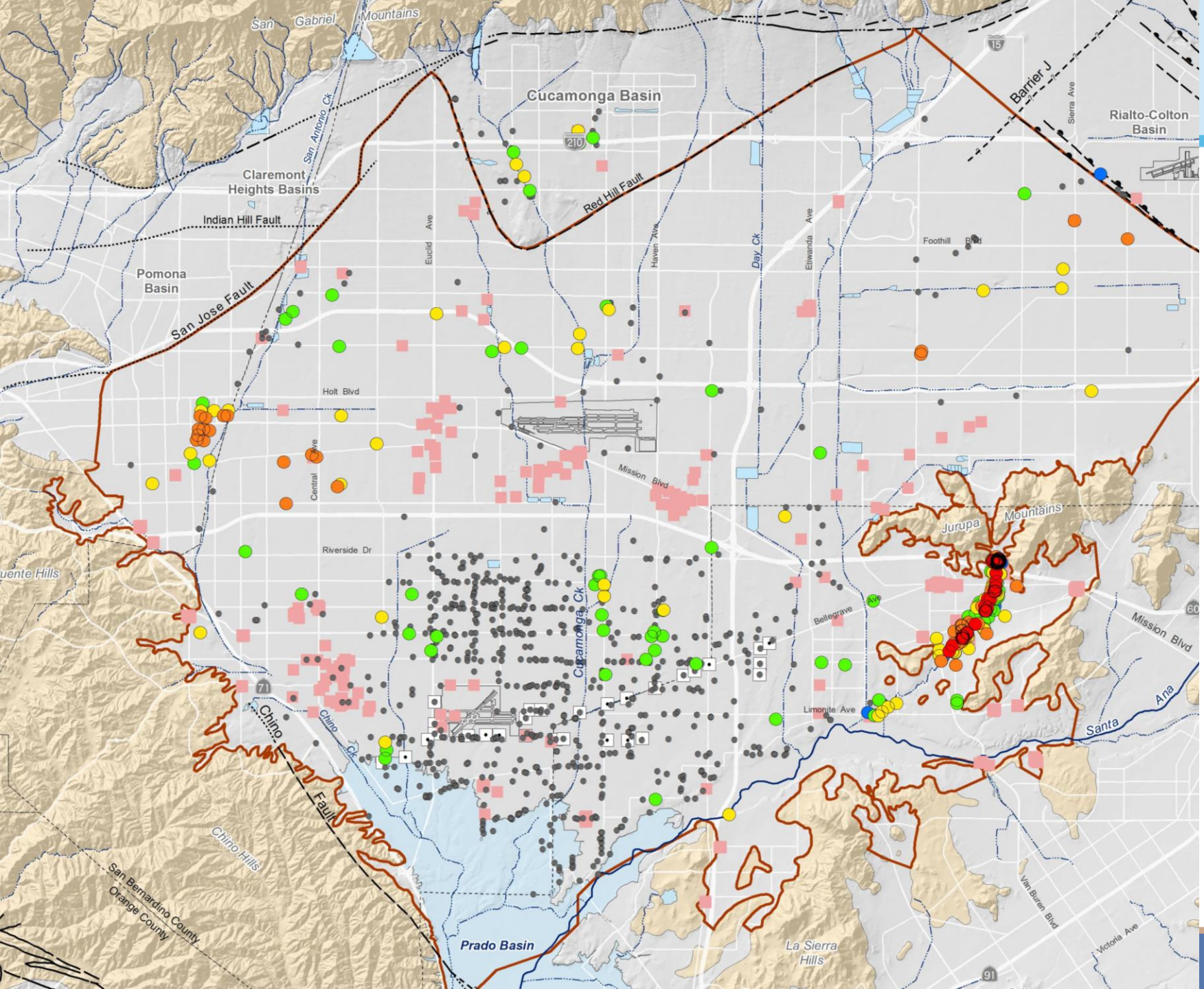
# 2. UCMR: Perchlorate

- EPA/CA UCMR monitoring occurred from 2001-2003
- DLR = 4 µgl
- Detected: 2-20 µgl
- Plume at Stringfellow



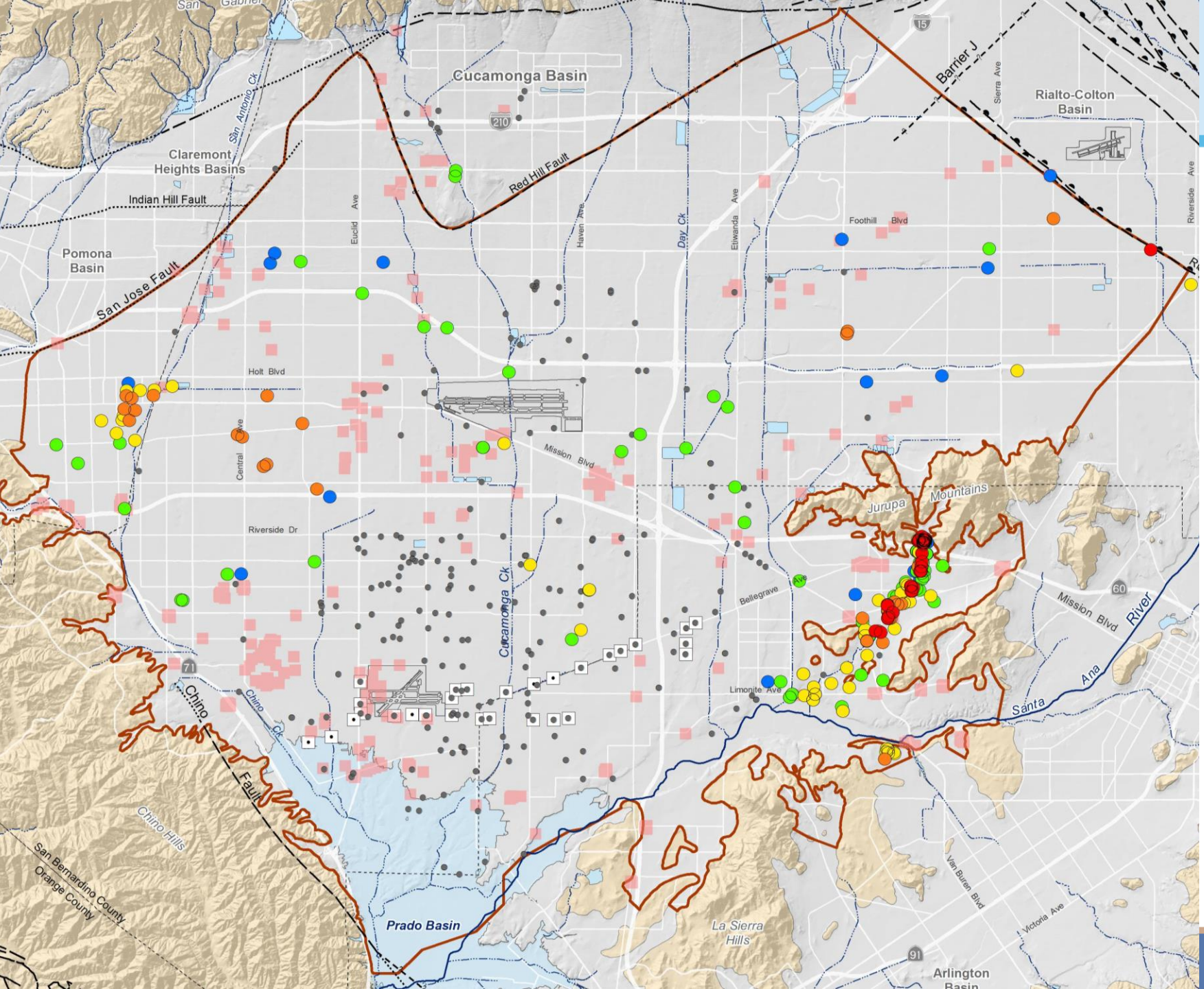
# 3. Resulting Actions: Perchlorate

- In 2004:
  - OEHHA established a PHG of **6 µgl**
  - DDW adopted NL of **6 µgl**
- Watermaster sampling 2006



# 4. Establishment of an MCL: Perchlorate

- 2007: MCL of **6 µgl**
- DLR remained **4 µgl**
- New detection methods allowed analysis below 4 µgl (0.5 to 2 µgl)




**(2005-2007)**
**Perchlorate (µgl)**

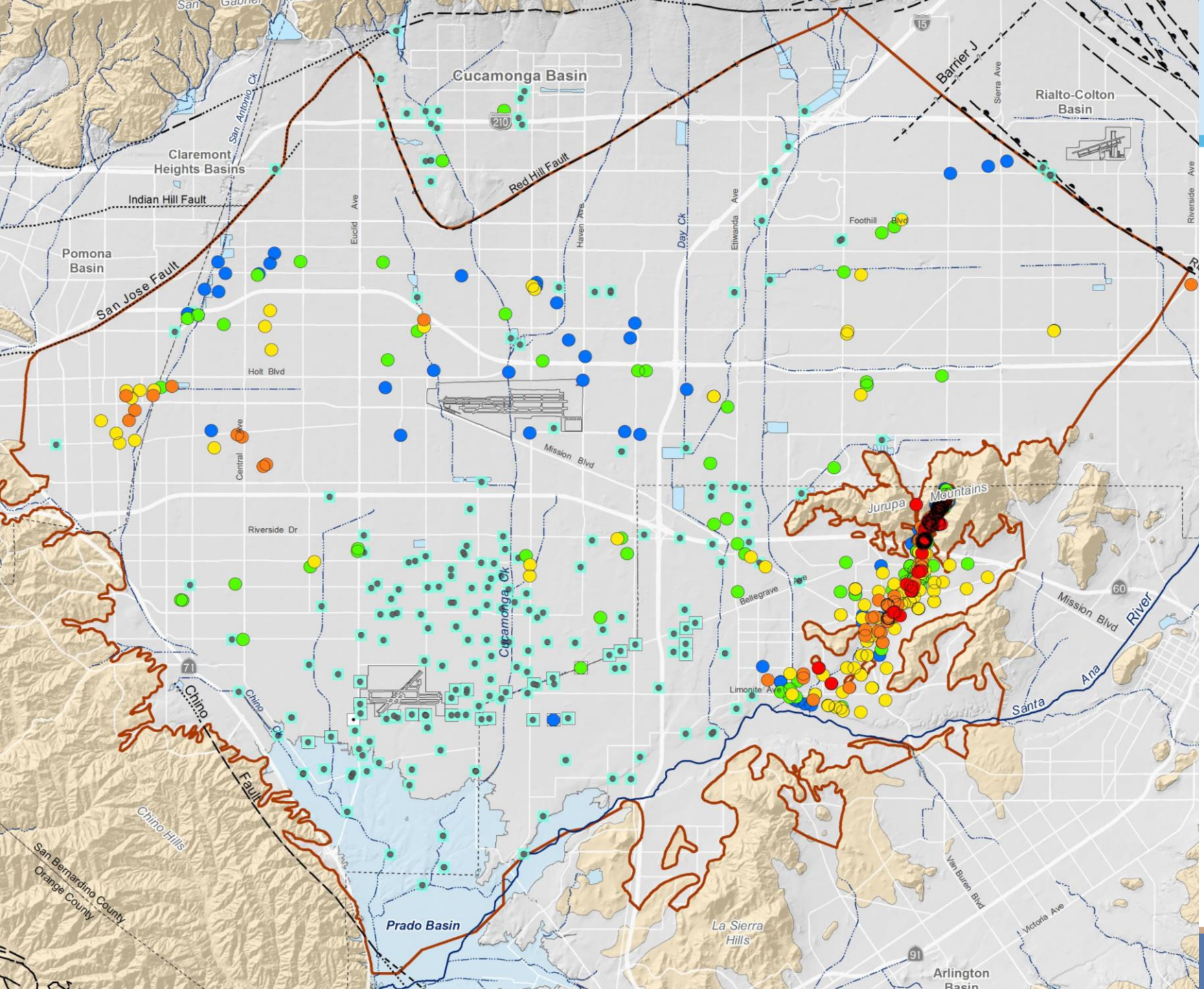
- ND
- < 3
- 3 - 6
- 6 - 12
- 12 - 24
- > 24

Based on CA Primary MCL of 6 µgl established in 2007

Well Not Sampled for Perchlorate

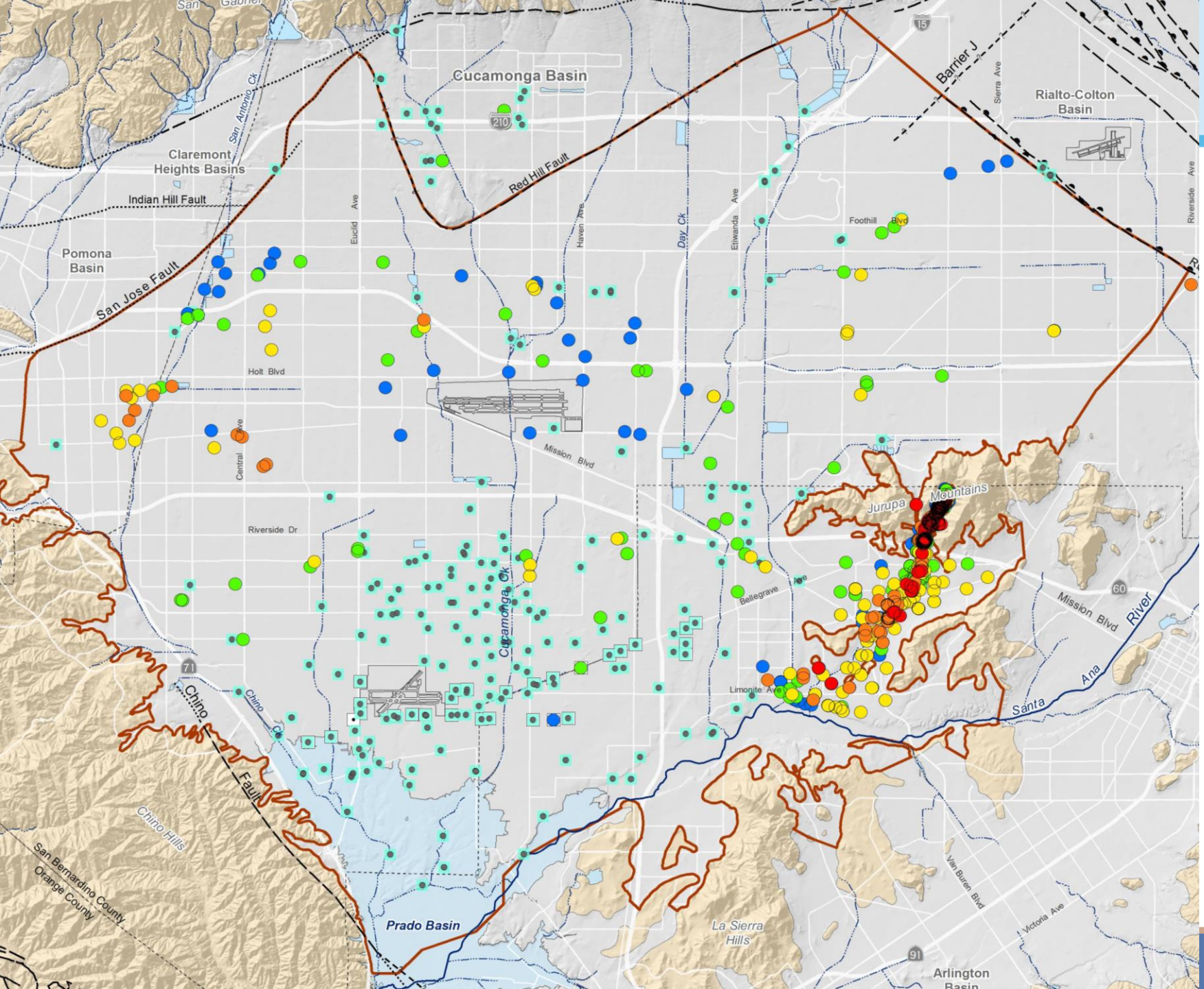
# 5. Post MCL Developments: Perchlorate

- 2015: PHG lowered to **1 µgl**
- 2017: DLR lowered to **1 µgl** to evaluate occurrence



# 6. Future Considerations: Perchlorate

- There is the potential for lowering the MCL based on these new levels
- *Many wells sampled over this period still used DLR of 6 µgl*



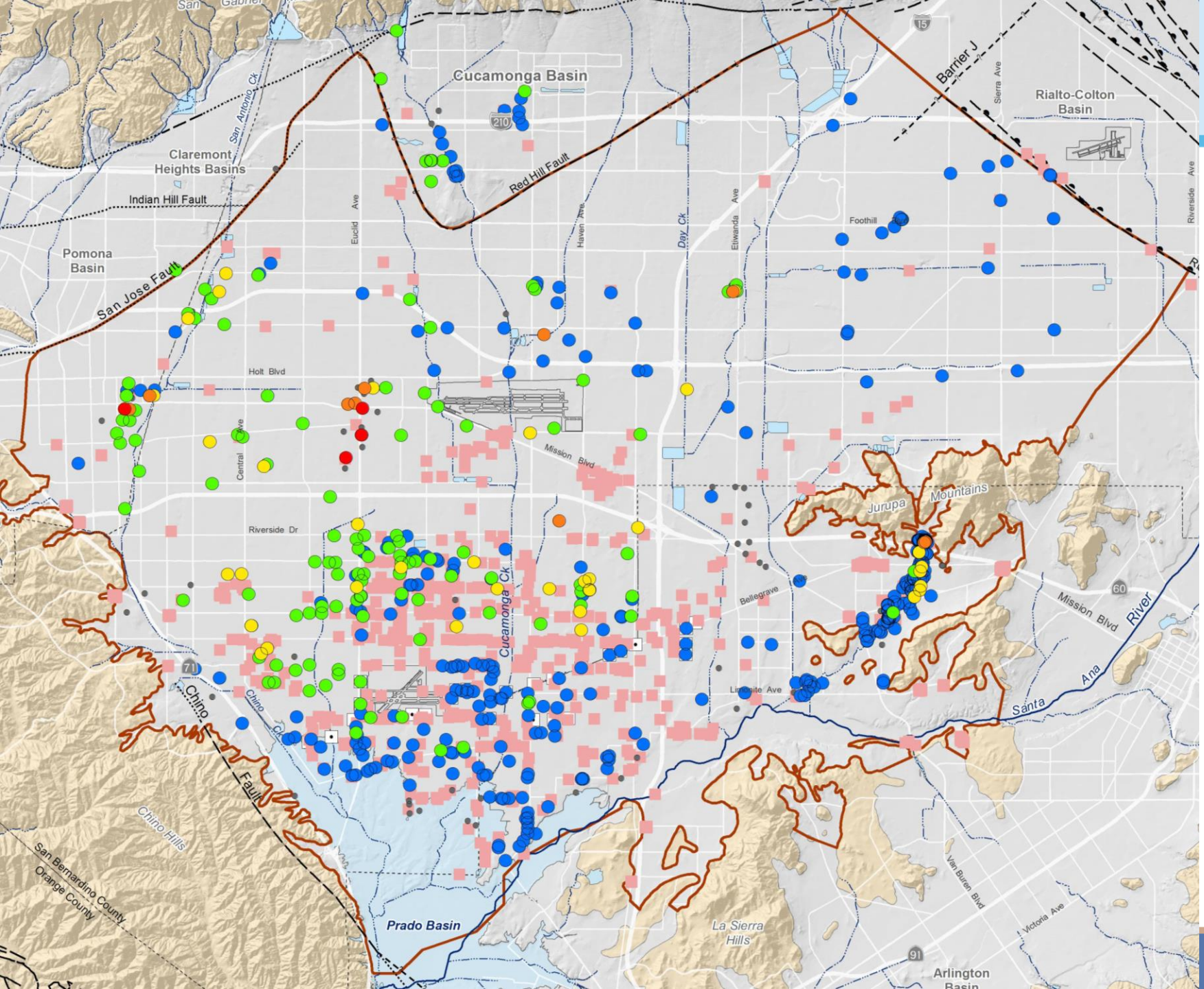
# Hexavalent Chromium

# 1. EMERGENCE AS CEC AND INITIAL MONITORING: HEXAVALENT CHROMIUM

- Historically regulated under the MCL for total chromium (50 µgl)
- **1999:** DDW identified need for separate MCL for hexavalent chromium due to growing concerns over its potential to cause cancer

# 2. UCMR: Hexavalent Chromium

- State CA UCMR 2001-2003
- DLR = **1 µgl**




**(1998-2004)**

**Hexavalent Chromium (µgl)**

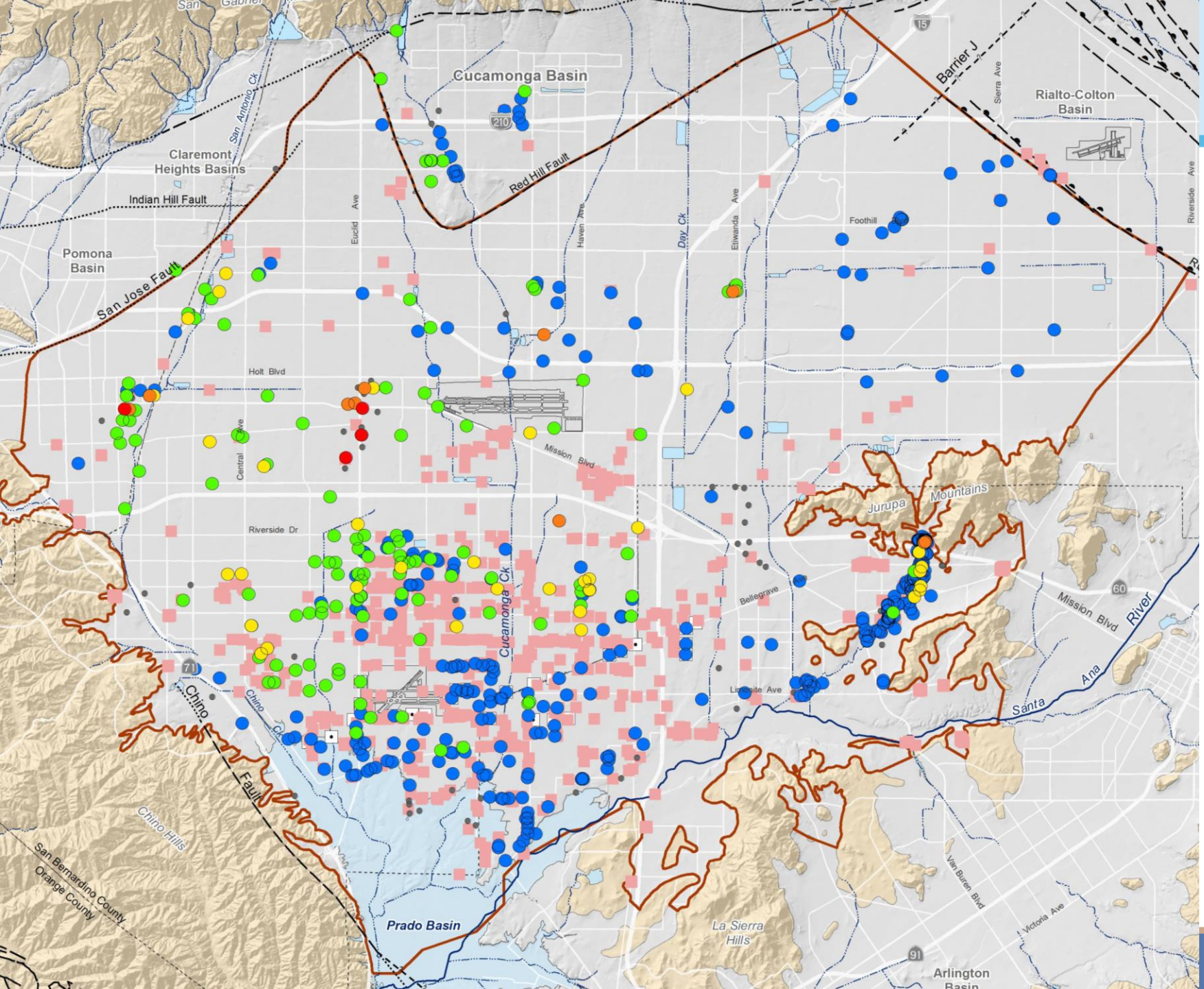
- ND
- < 5
- 5 - 10
- 10 - 20
- 20 - 40
- > 40

Based on CA Primary MCL of 10 µgl established in 2014

Well Not Sampled for Hexavalent Chromium

# 3. Resulting Actions: Hexavalent Chromium

- 2001: State law required DDW to adopt an MCL by 2004, close to yet-to-be-determined PHG
- No PHG established by 2004
- Heavy Sampling through 2004 with prospect of MCL; reduced thereafter




**(1998-2004)**

**Hexavalent Chromium (µgl)**

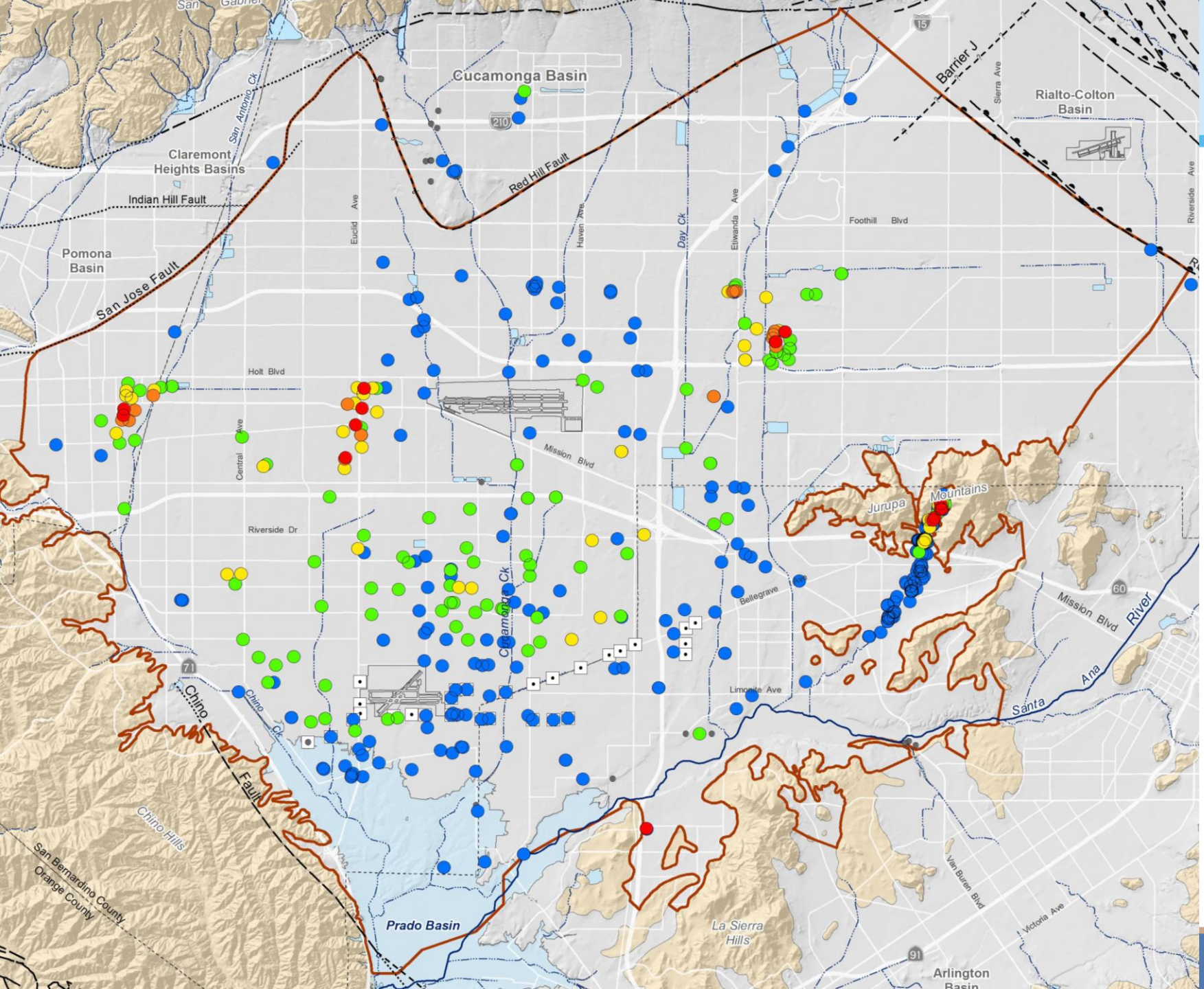
- ND
- < 5
- 5 - 10
- 10 - 20
- 20 - 40
- > 40

Based on CA Primary MCL of 10 µgl established in 2014

Well Not Sampled for Hexavalent Chromium

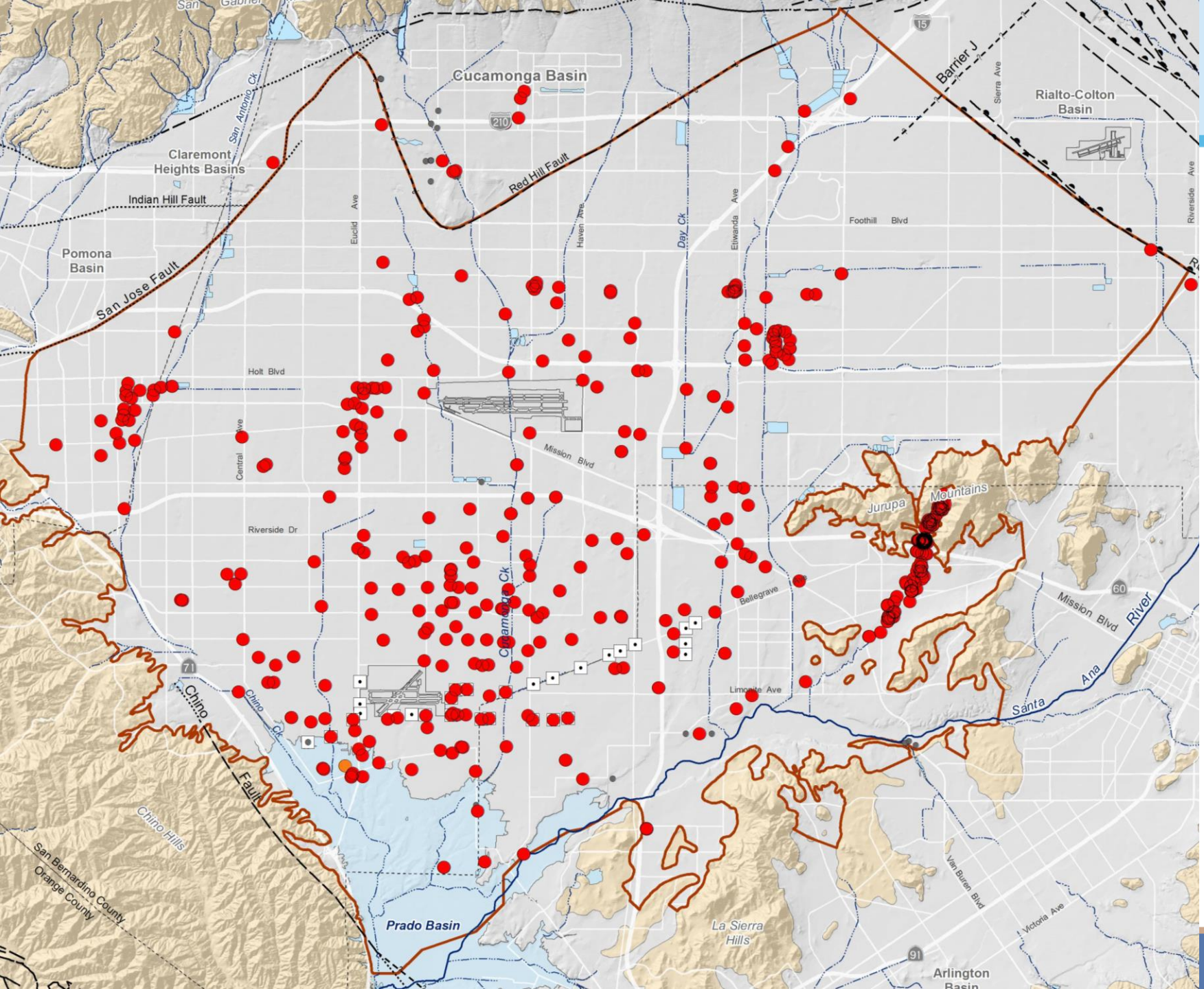
# 3. Resulting Actions: Hexavalent Chromium Cont'd

- New analytical methods developed with MDL = **0.02 µgl**
- 2009: Watermaster sampling at new, lower MDL
- 2011: PHG = **0.02 µgl**
- DLR remained at **1 µgl** despite lower method detection limits



# 3. Resulting Actions: Hexavalent Chromium Cont'd

- Majority of prior sampling results exceeded new PHG




**(2007-2011)**

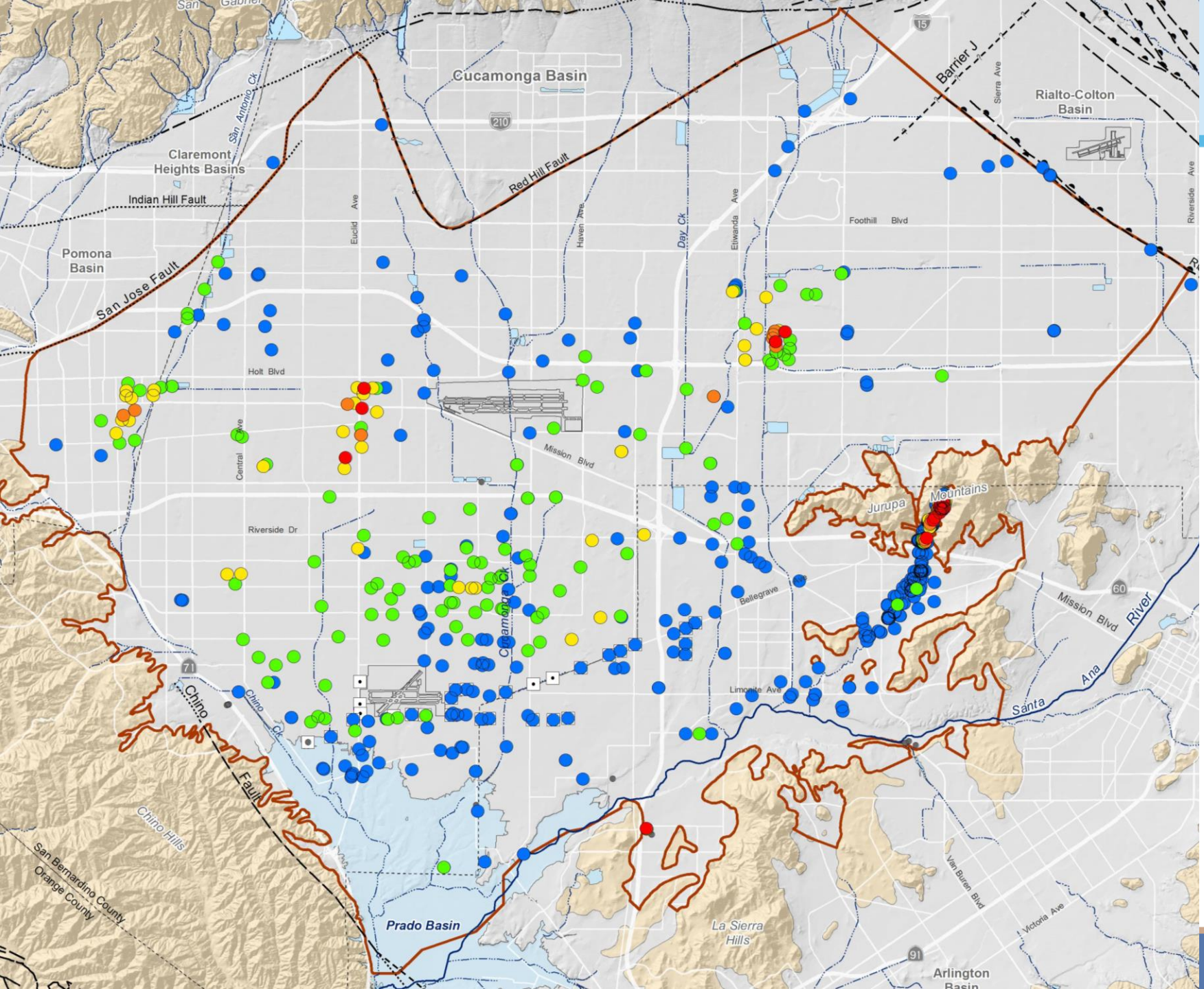
**Hexavalent Chromium (µgl)**

- ND
- < .01
- .01 - .02
- .02 - .04
- .04 - .08
- > .08

Based on the PHG of .02 µgl established by OEHH in 2011

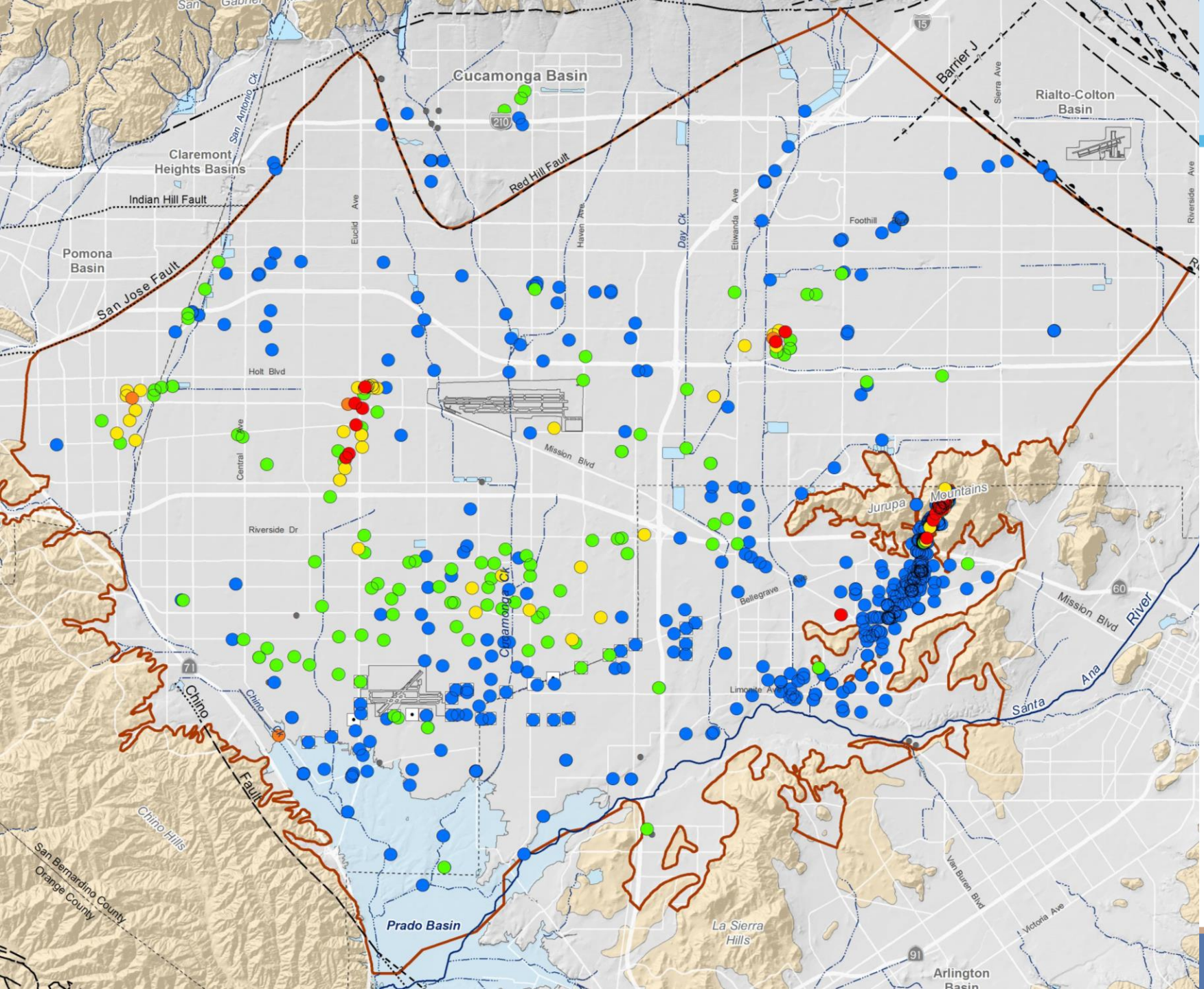
# 4. Establishment of an MCL: Hexavalent Chromium

- July 2014: MCL of **10 µgl**
- Required all water supply wells be sampled within 6 months
- 2015: Senate Bill 385 (SB385) providing public water systems ability to defer compliance until 2020, with approved compliance plan in place



# 5. Post MCL Developments: Hexavalent Chromium

- 2016: MCL challenged in court for being too low to allow economically feasible compliance
- 2017: Court invalidated Hexavalent Chromium MCL for drinking water




**(2014-2018)**

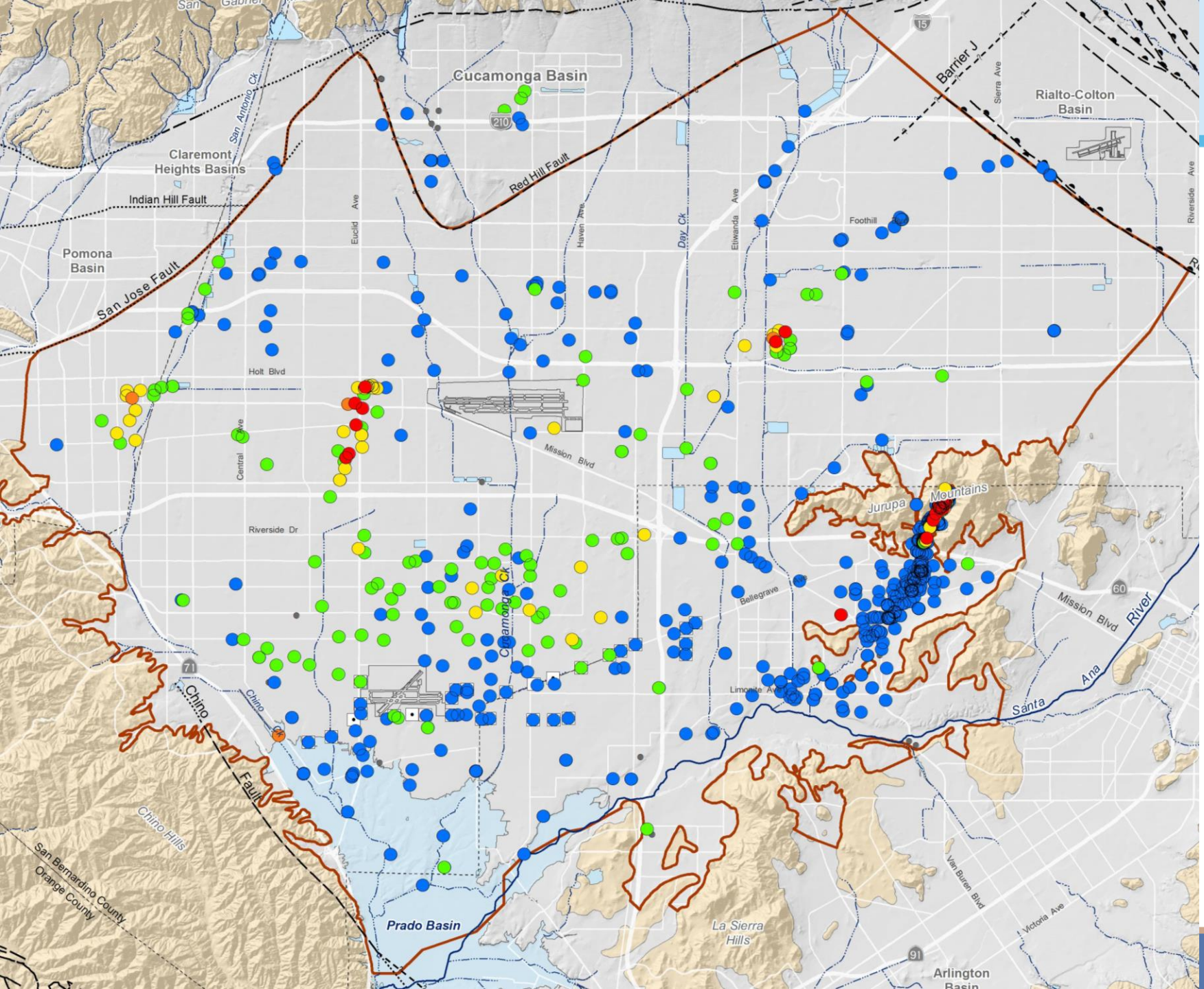
**Hexavalent Chromium (µgl)**

- ND
- < 5
- 5 - 10
- 10 - 20
- 20 - 40
- > 40

Based on CA Primary MCL of 10 µgl established in 2014

# 6. Future Considerations: Hexavalent Chromium

- New MCL still under development
- Hexavalent chromium may be problematic, depending on the promulgation of future standards based on the PHG of .02 µg/L
- Economic feasibility is key



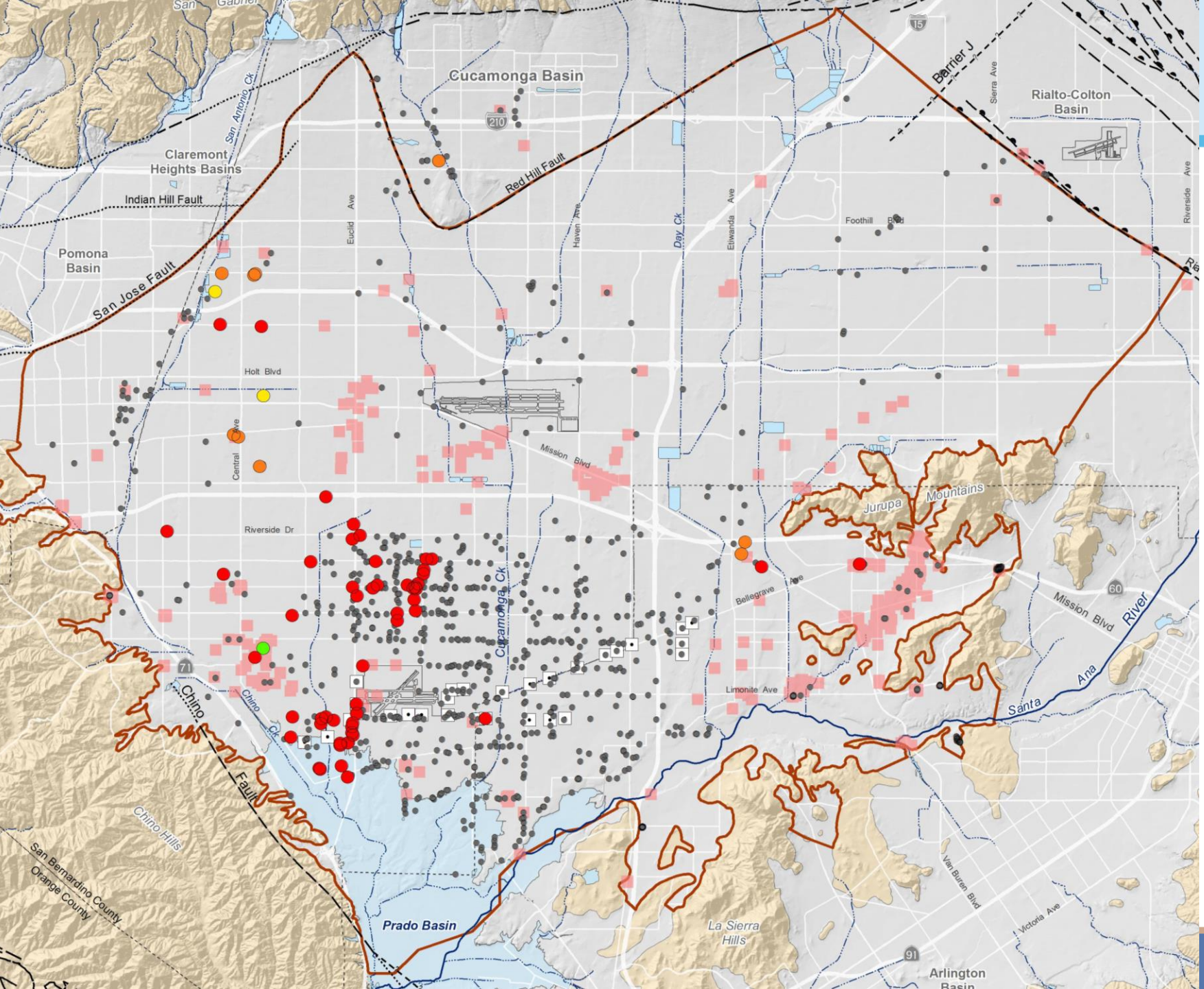
# 1,2,3-TCP

# 1. Emergence as CEC and initial monitoring: 1,2,3-TCP

- 1999: Notification Limit of **0.005 µgl** established
  - Equivalent to 5 *parts per trillion*

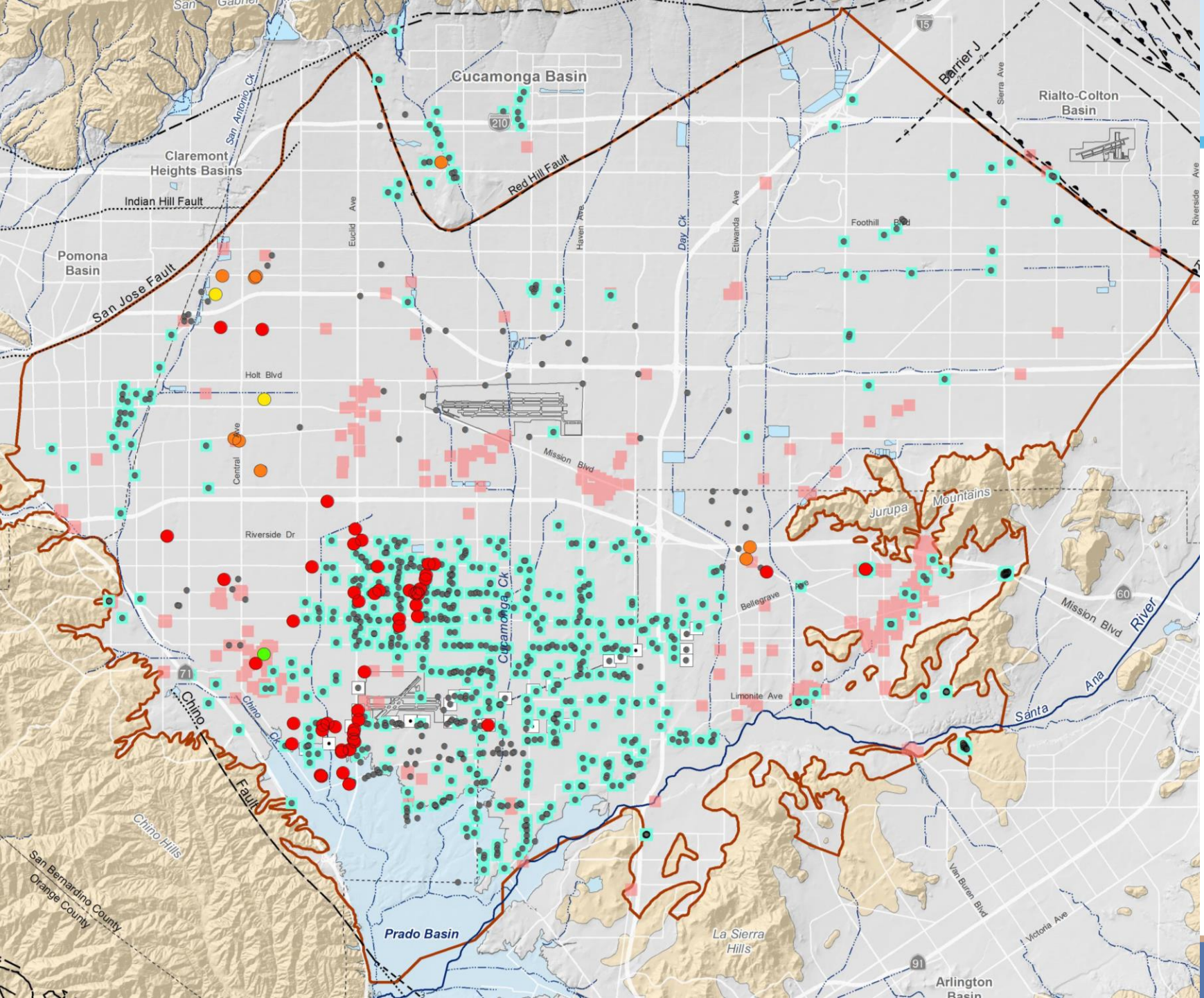
# 2. UCMR: 1,2,3-TCP

- CA UCMR 2001
- Monitoring occurred from 2001-2003
- No MDLs near the NL level, used DLR of **0.5 µgl**



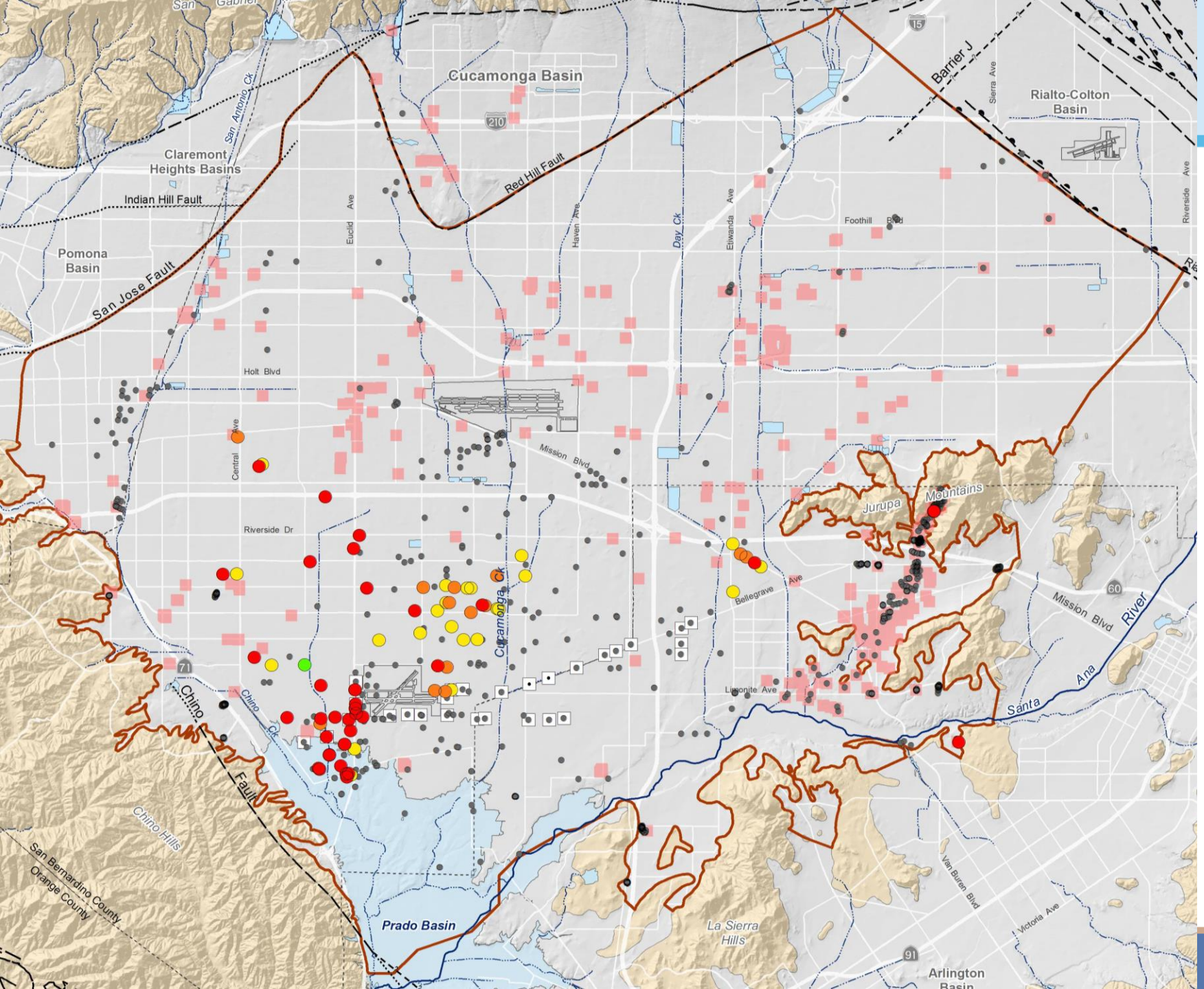
# 2. UCMR: 1,2,3-TCP Cont'd

- Some agencies did follow up using MDL of 0.005 when it became available shortly after UCMR



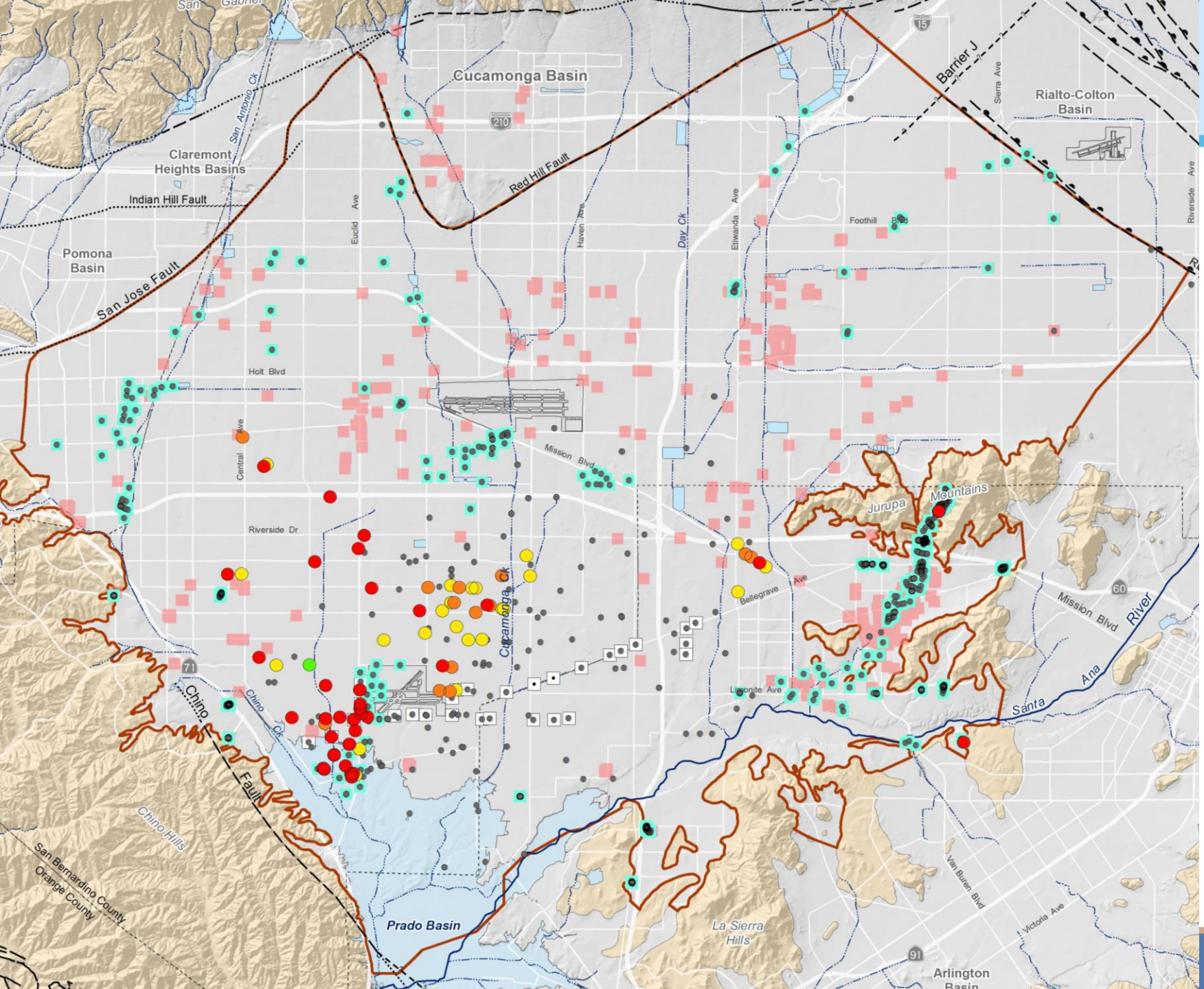
# 3. Resulting Actions: 1,2,3-TCP

- 2008: Watermaster sampling at new, lower MDL
- 2009: PHG of **0.0007 µgl** established
  - 0.7 parts per trillion!



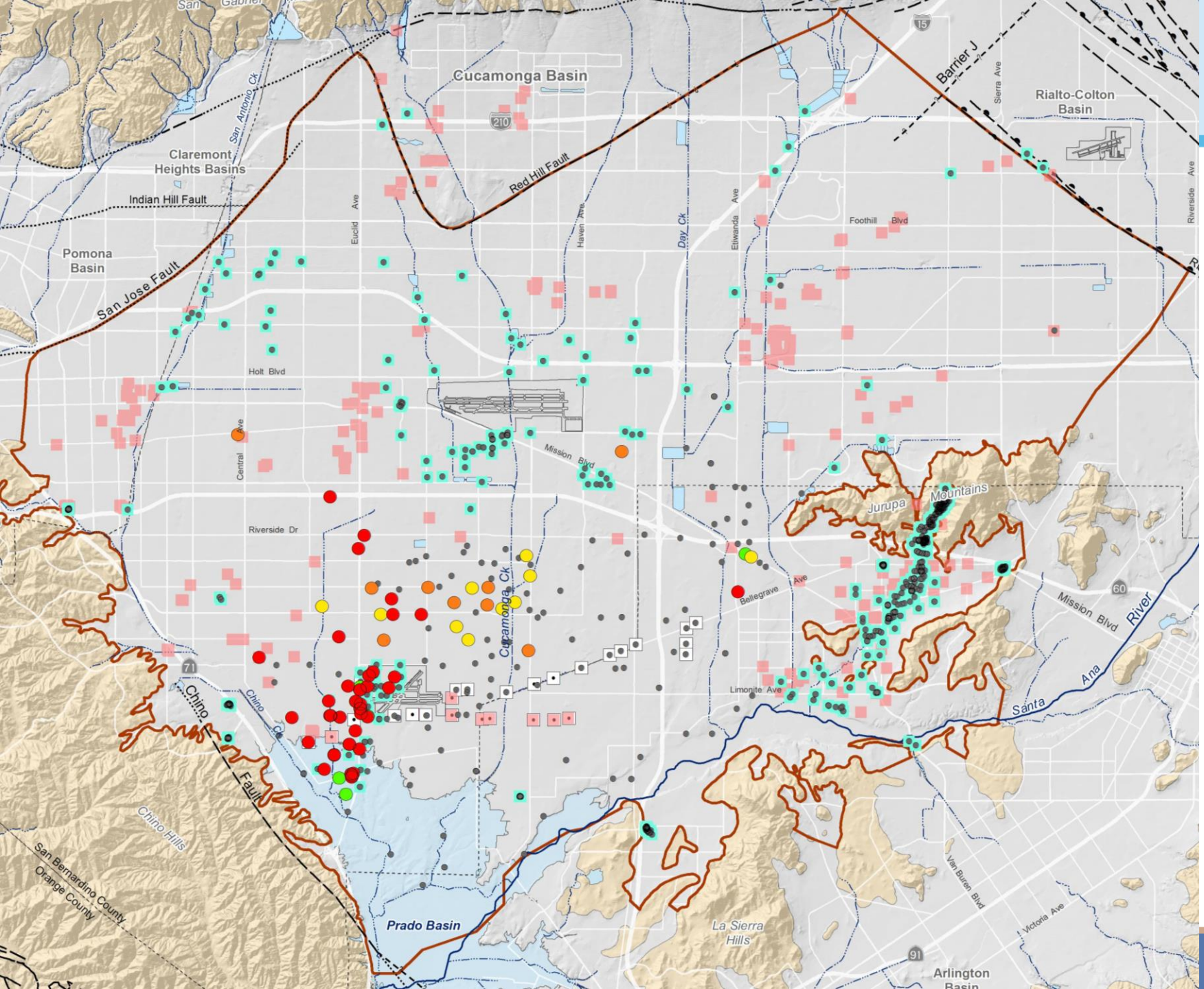
# 3. Resulting Actions: 1,2,3-TCP Cont'd

- PHG of .0007 µgl significantly lower than .005 µgl detection limit used by Watermaster in 2008
- Many non-detect values may be greater than the PHG (turquoise squares)



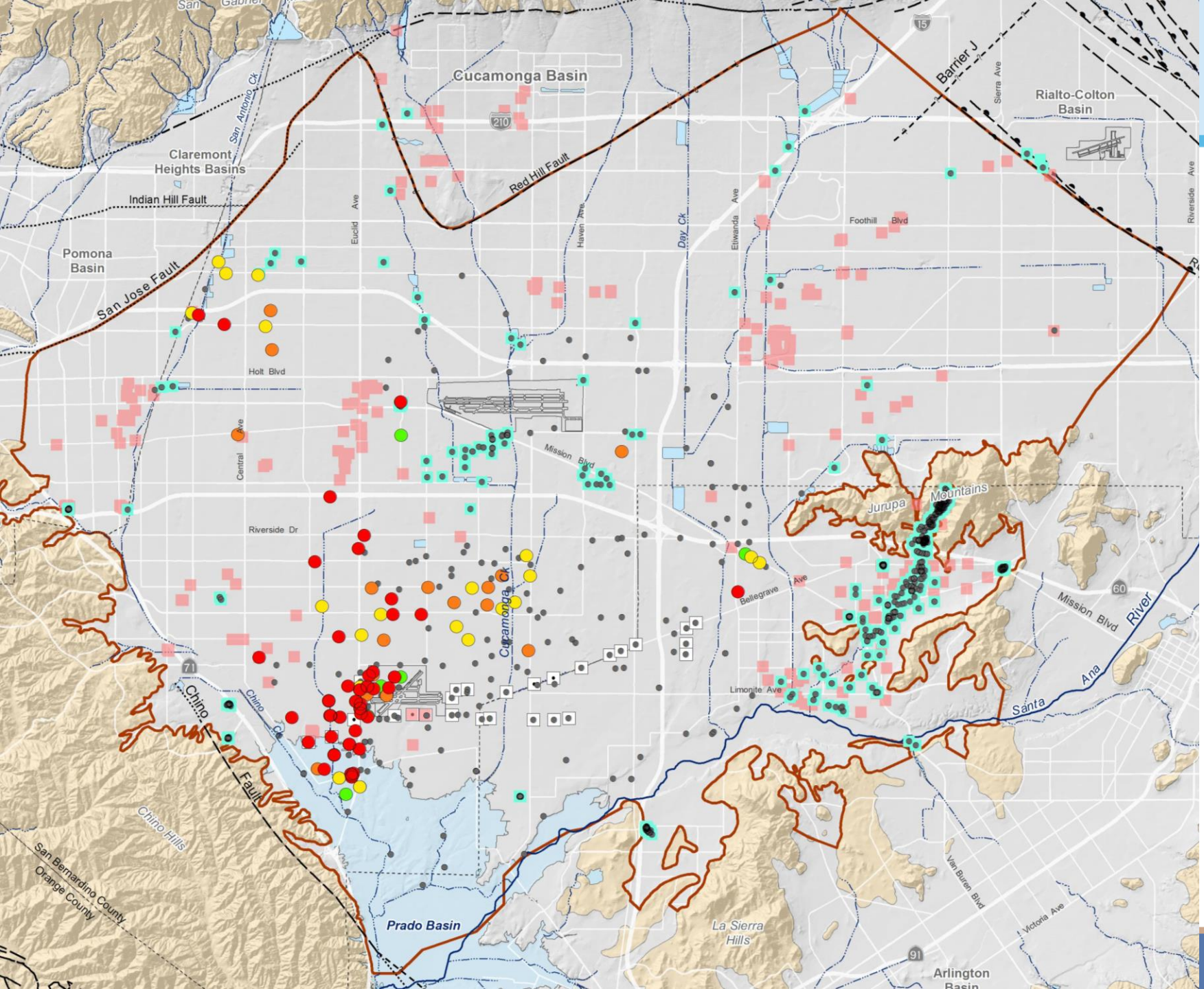
# 3. Resulting Actions: 1,2,3-TCP Cont'd

- 2013-2015: Federal **UCMR 3**
- DLR of 0.**03 µgl** despite MDL of 0.005 µgl possible;
- No detects north Chino Basin, but **most used DLR of 0.03**



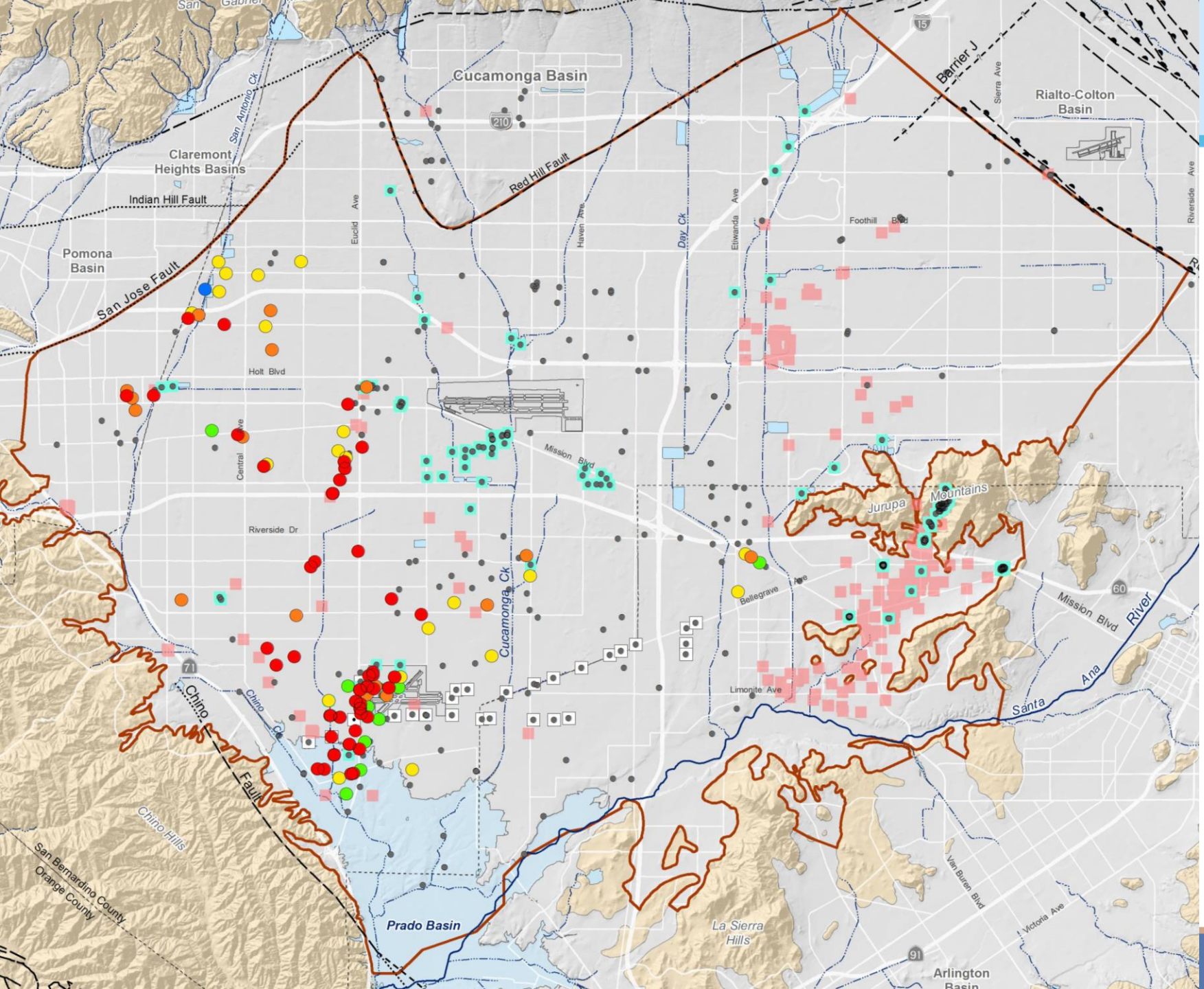
# 4. Establishment of MCL: 1,2,3-TCP

- July 2017: MCL of **0.005 µgl** established (same as NL)
- OAL approved an early effective date of **December 2017**
- Quarterly monitoring required starting January 2018



# 5. Post MCL Developments:
# 6. Future Considerations
# 1,2,3-TCP

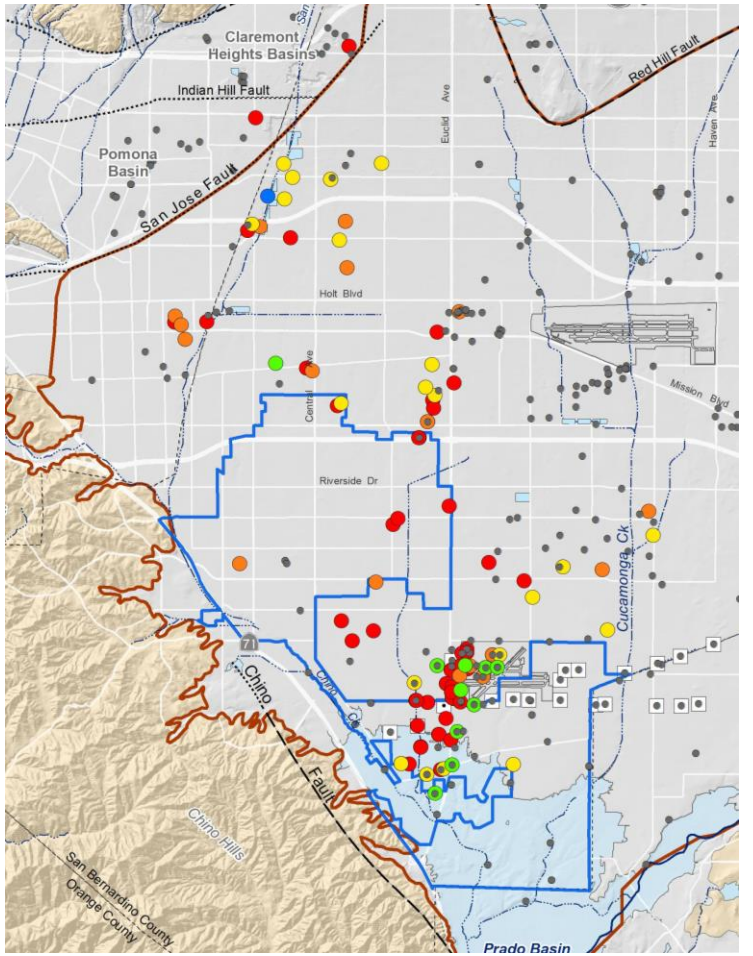
- Early effective date triggered immediate shutdown of sources exceeding the MCL
- No accommodations afforded similar to SB 385 for Cr6



# City of Chino Response to 1,2,3-TCP

- In **2017**, recognized that 1,2,3-TCP concentrations were going to be out of compliance for almost **every** City well; concentrations ranging from **13 – 100 µgl**.
- **June 1, 2017** released a RFP to lease and install LGAC vessels at two centralized ion exchange treatment plants.
  - Became evident that purchase was more economic
  - City Council declared a **need for emergency action**, allowing City Council to forego bidding procedures due to urgent need to protect public health and welfare.
- **August 15, 2017** contract awarded ($5 Million)

**Groundwater represents 50 percent Of the City of Chino's Water Supply**



# 1,2,3-TCP - City of Chino Response

- **November 15, 2017** small wellhead treatment – one of the first permits to treat for 1,2,3-TCP in accordance with the new MCL

**Two Centralized Plants**
**Liquid Granular Activated Carbon (LGAC) Treatment**

## Permitted December 21, 2017


## Permitted January 30, 2018

# Thank you

***Contaminants of emerging concern in Chino Basin: What's been dealt with previously (perchlorate, Cr6, and 1,2,3-TCP)***

**Samantha Adams**
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