



Critical Analysis of AWQ Methods – Pt 3

The Case for Prioritization

April 11, 2022

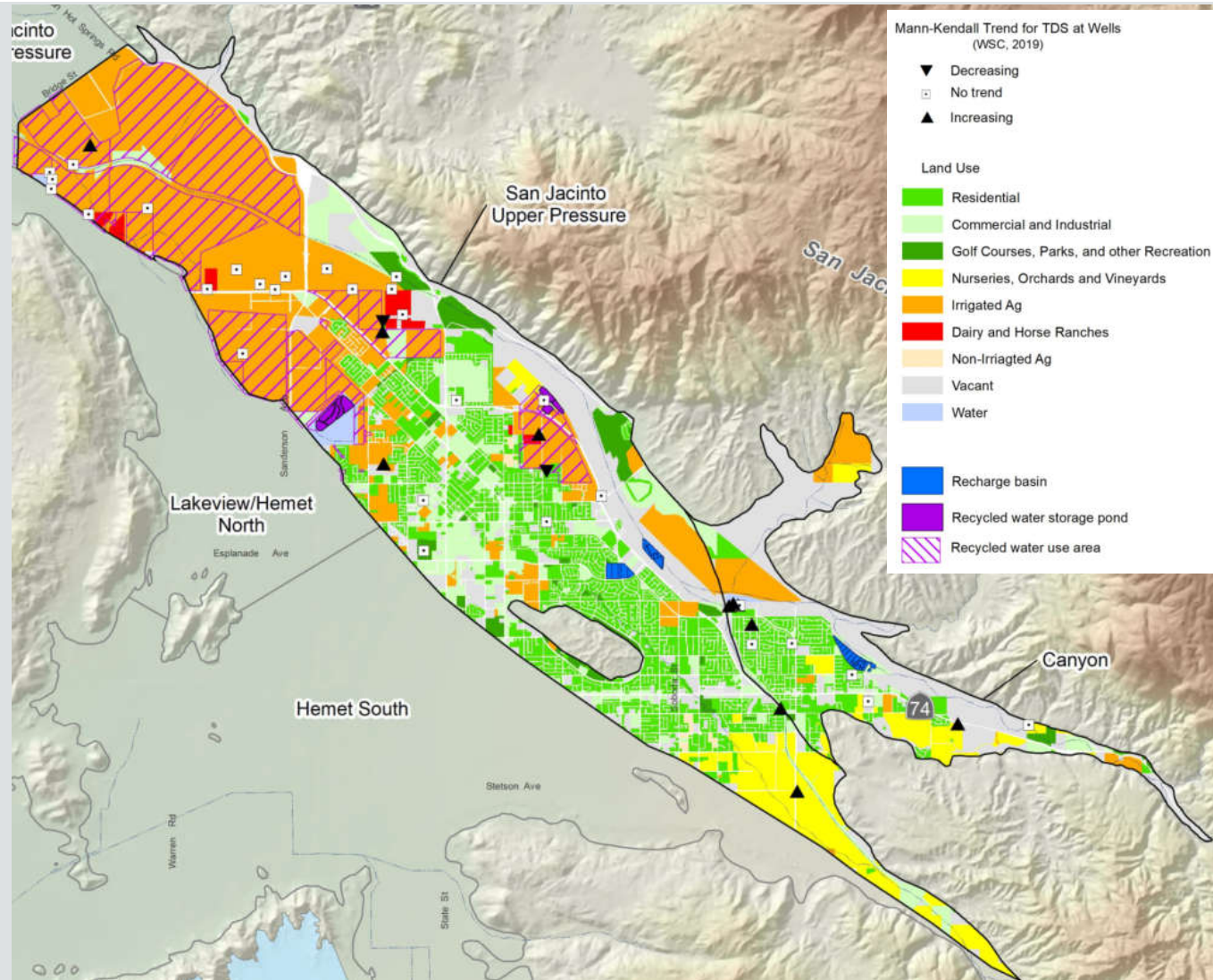
Basin Planning Priorities: Ambient Water Quality

Two key priorities for current scope of work

1. Define groundwater monitoring program
 - a. Define wells to be monitored and responsible parties
 - b. Identify data gaps
 - c. Define actions (and timeline) to improve monitoring networks to fill data gaps
2. Assess current ambient water quality methodology
 - a. What changes can we make, enabled by 2019 Recycled Water Policy?
 - b. What changes can we pilot for the required assessment due October 2023?

Advancements to Consider

- Selection of key wells rather than all wells available
- Applying tiered AWQ analysis approach to focus higher-cost efforts in most critical areas and simplify in other areas
- Mapping of loading factors
- Five-year frequency for analysis and reporting



Questions for Consideration in Ongoing Methods and Data Collection

- Should we continue to rely on a 20-year period of record?
 - → Generally, Yes. Focus on improved monitoring plan will improve data quality for analysis in the long term
 - → Suggestion to explore alternative time periods since improved data availability
- Should we continue to rely on a statistical analysis method developed in 2004?
 - → Generally, Yes
 - → Case-specific changes may be warranted in a GMZ, but must be done as part of a GMZ specific SNMP (e.g. Upper Temescal Valley SNMP)

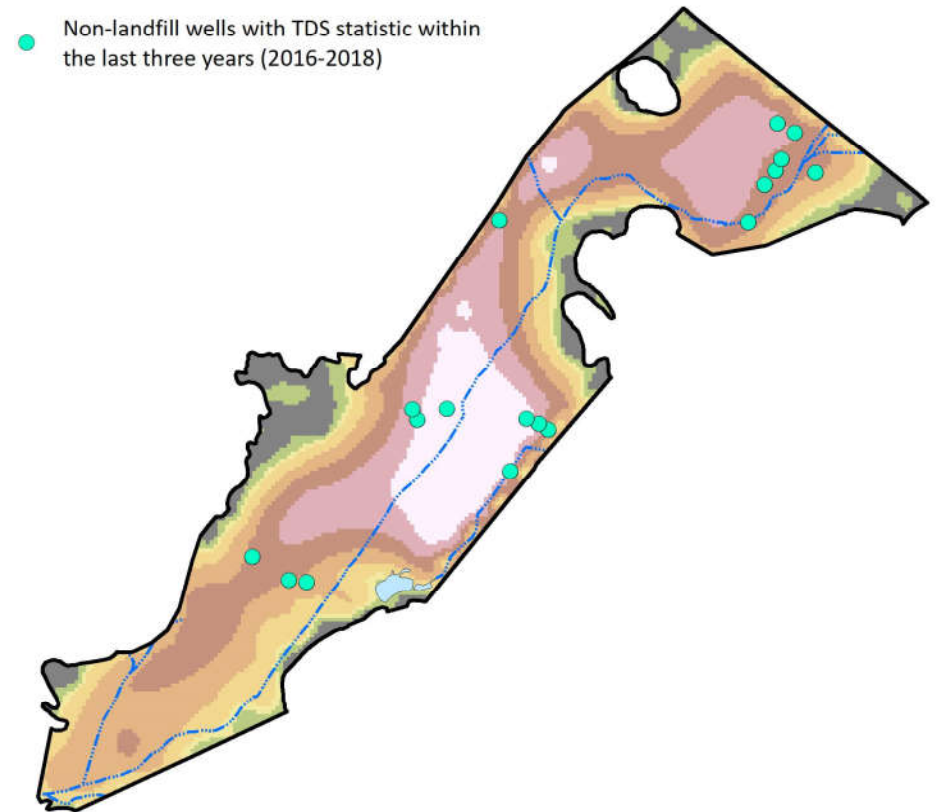
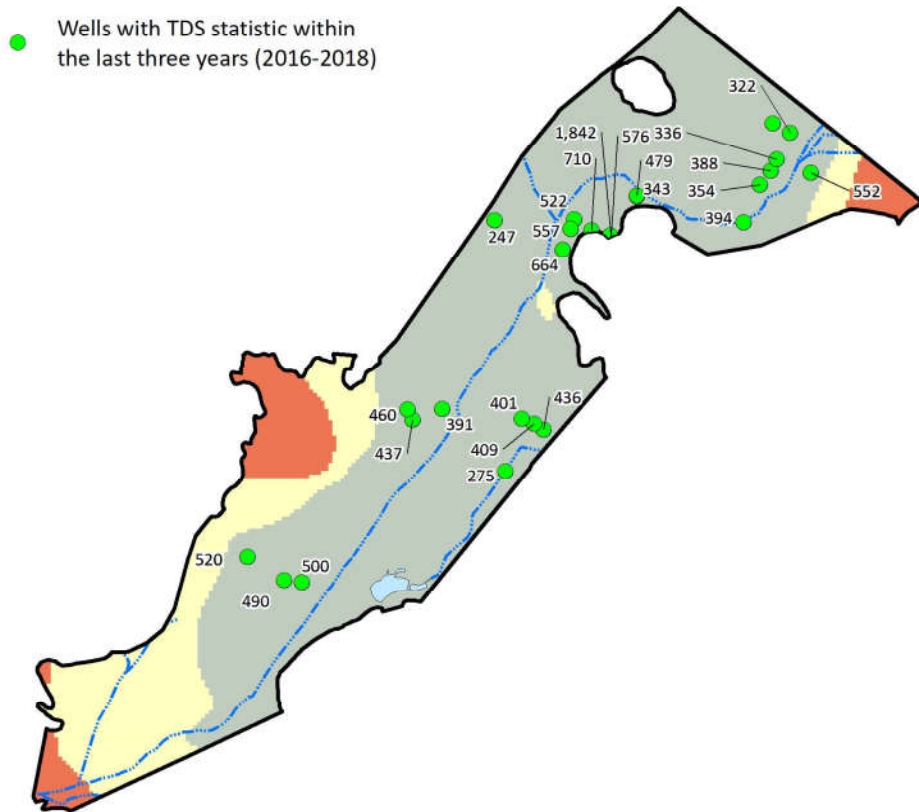
Questions for Consideration in Ongoing Methods and Data Collection

- Is all data good data?
 - Should we reduce the analysis to a set of key wells that MUST be monitored?
 - → NO, many GMZs are too complex to do this well. Focus on adequate spatial distribution of ongoing monitoring
 - Should we prioritize wells with recent data in statistical analysis (e.g. only include these data in the analysis)
 - → NO

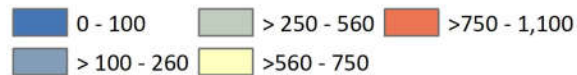
Questions for Consideration in Ongoing Methods and Data Collection

- Is all data good data?
 - Should the high TDS concentrations along the Pacific Coast of Orange County GMZ be included in the ambient concentration – especially in light of regional groundwater management actions to address seawater intrusion?
 - → YES, part of aquifer system
 - Should we include landfill monitoring wells? If so, which ones?
 - → Some, those within saturated aquifer system

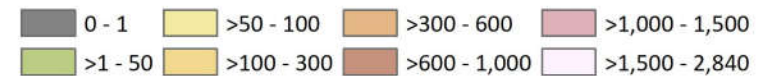
Riverside-A Groundwater Management Zone



2018 Ambient TDS (mg/l)
(TDS objective is 560 mg/l)



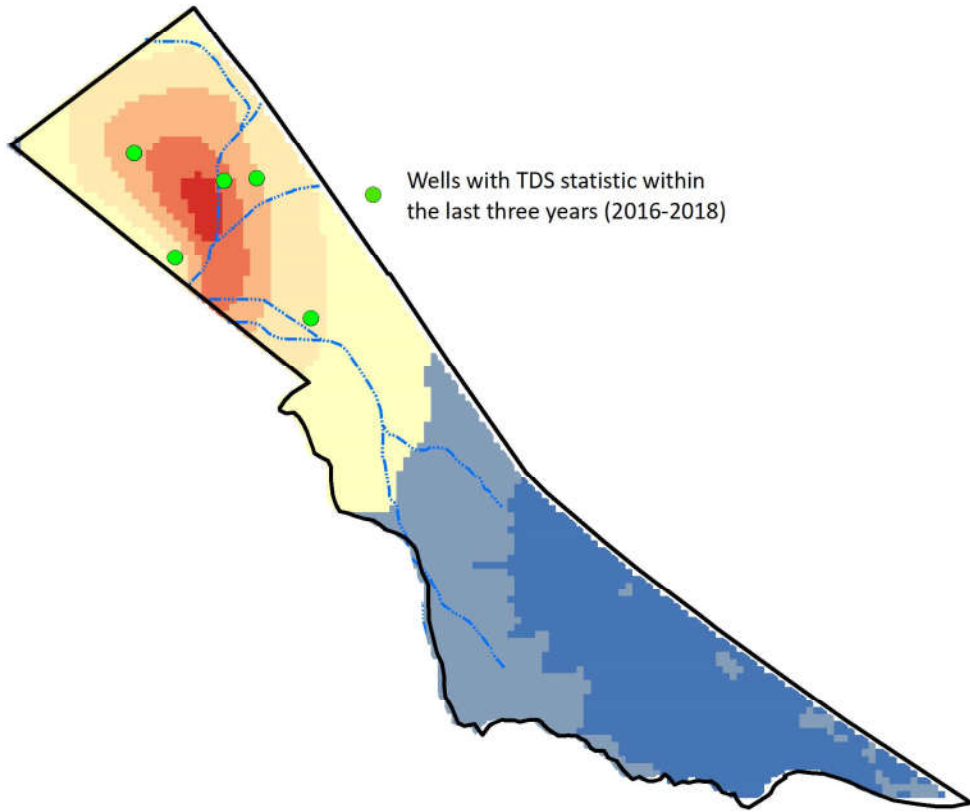
2018 Groundwater Storage (af)



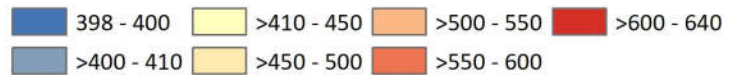
Questions for Consideration in Ongoing Methods and Data Collection

- What other improvements could be considered:
 - Should we consider the extent of the saturated aquifer system in contouring, statistical analysis, and map presentations?
 - → Yes
 - Should the aquifer parameters defined in 2004 be updated?
 - → Depends... Consider:
 - new work performed
 - timing of next update to aquifer parameters (e.g. Chino Basin model updates every five years)
 - Not all at once if it will trigger re-do of objectives

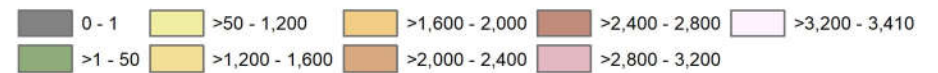
Colton Groundwater Management Zone



2018 Ambient TDS (mg/l)
(TDS objective is 410 mg/l)



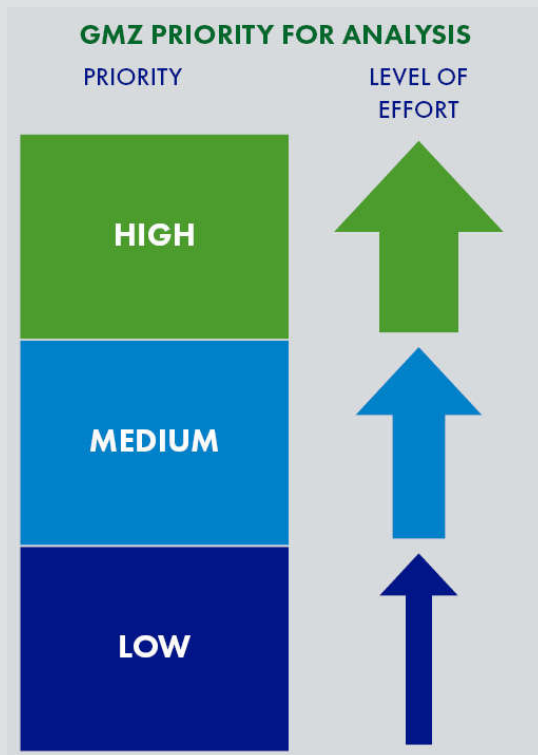
2018 Groundwater Storage (af)



Questions for Consideration in Ongoing Methods and Data Collection

- Should we prioritize addressing data gaps, if there are many?
 - → Yes
 - → Tiered approach: (1) time to identify existing wells, (2) well siting feasibility analysis to fill remaining gaps, if any, (3) construct wells if feasible
- How should we prioritize addressing data gaps, if there are many?
 - Not yet discussed
- Can we reduce the level of effort to perform ambient water quality analysis by prioritizing our GMZs based on historical results, current water quality, and regulatory compliance factors?
 - Not yet discussed

GMZ Prioritization



- Focus effort on GMZs with highest priority challenges
- Reduce costs in the long-term
- Create equitable distribution of costs in the long-term
- Reduce rigidity of current one-size-fits all approach
- Could also ultimately...
 - Decentralize work in high priority GMZs to centers of knowledge
 - Enable Task Force to focus on **coordinating** and **integrating** work products rather than being a technical expert on all GMZs

Recycled Water Policy

Section 6.1.3 of Policy

- All groundwater basins are different in size, hydrogeologic complexity, and loading factors, which necessitates:
 - Stakeholder engagement to develop appropriate plans
 - allowing variable levels of analysis and management efforts in developing and implementing SNMPs

Five-Year Assessments

Section 6.2.6 of Policy

The regional water boards, in consultation with stakeholders, shall assess and review monitoring data generated from [the SNMP] every five years, unless an alternate timeline has been established in a basin plan amendment. The assessment shall include an evaluation of:

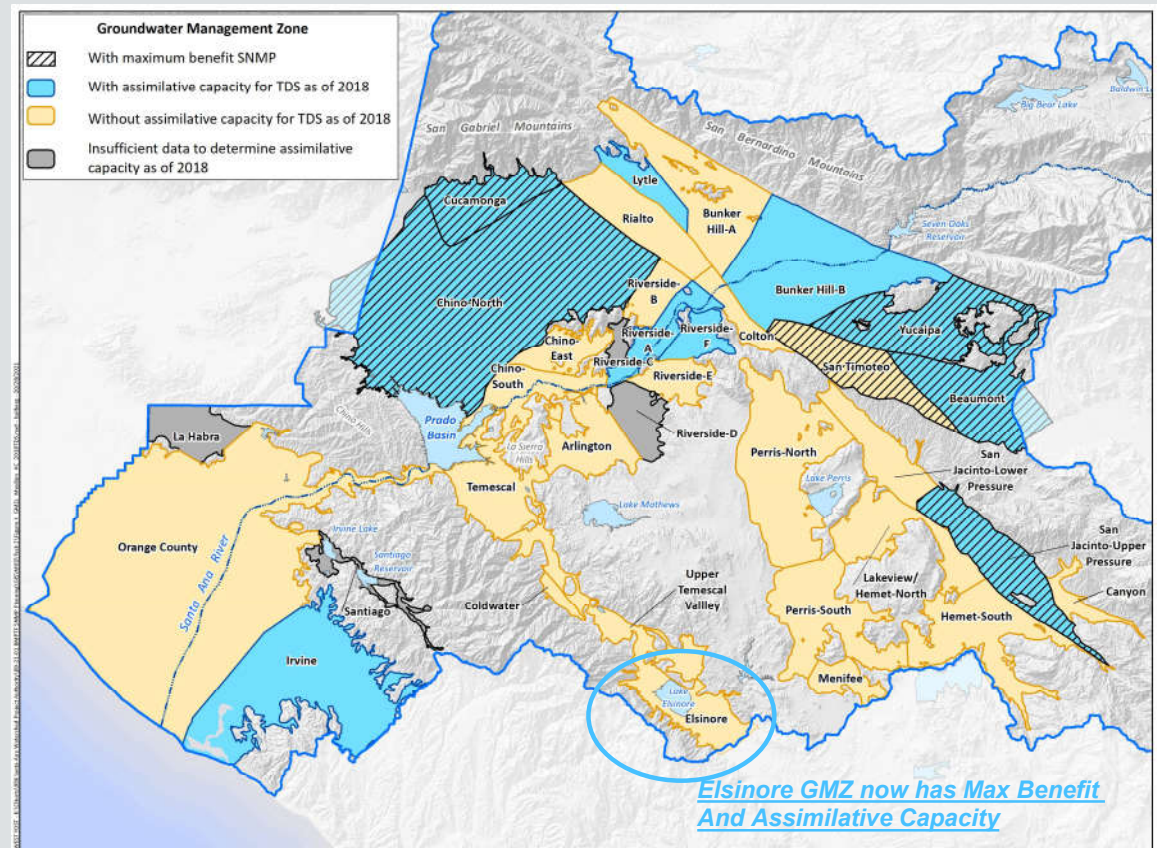
- 1 Observed trends in groundwater salinity with the predicted trends from the SNMP
- 2 The ability of the monitoring network to adequately characterize groundwater quality in each GMZ and
- 3 Potential new data gaps
- 4 The ability of any relied-upon models to adequately simulate groundwater quality
- 5 Available assimilative capacity based on observed trends and the most recent water quality data
- 6 The impact of new projects that are reasonably foreseeable at the time of the assessment

Prioritization – Decision Logic

- What are the trends in water quality over time – are they changing?
 - Historical record of ambient water quality findings from 2003 to 2018
 - Mann-Kendall Statistical Trend Analysis
- What is the regulatory implication of a change in ambient water quality compared to past recomputations?

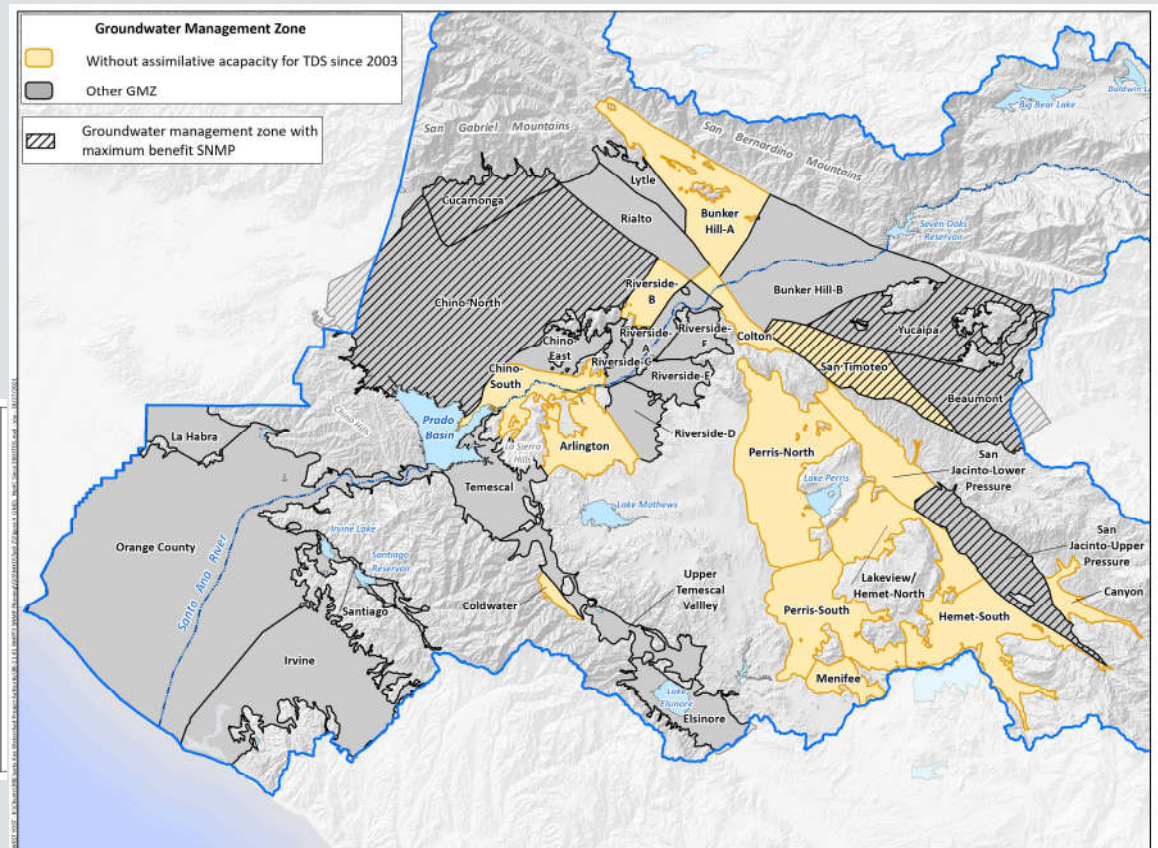
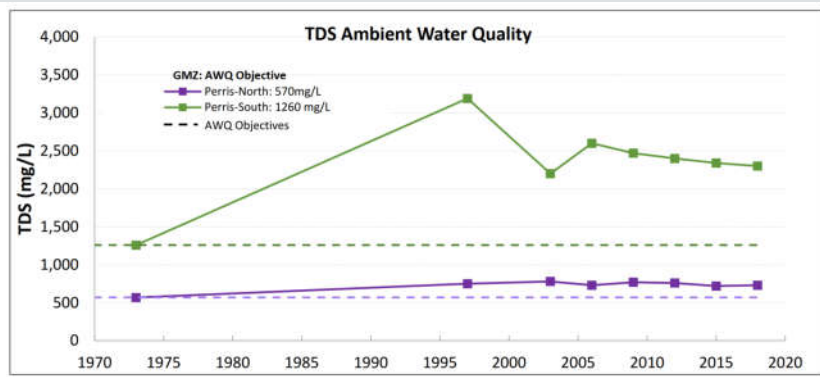
Assimilative Capacity for TDS As of 2018 AWQ

- 35 GMZs Total
- 11 GMZs with Assimilative Capacity
 - 6 are Maximum Benefit GMZs
- 20 with **NO** Assimilative Capacity
- 4 with no AWQ findings



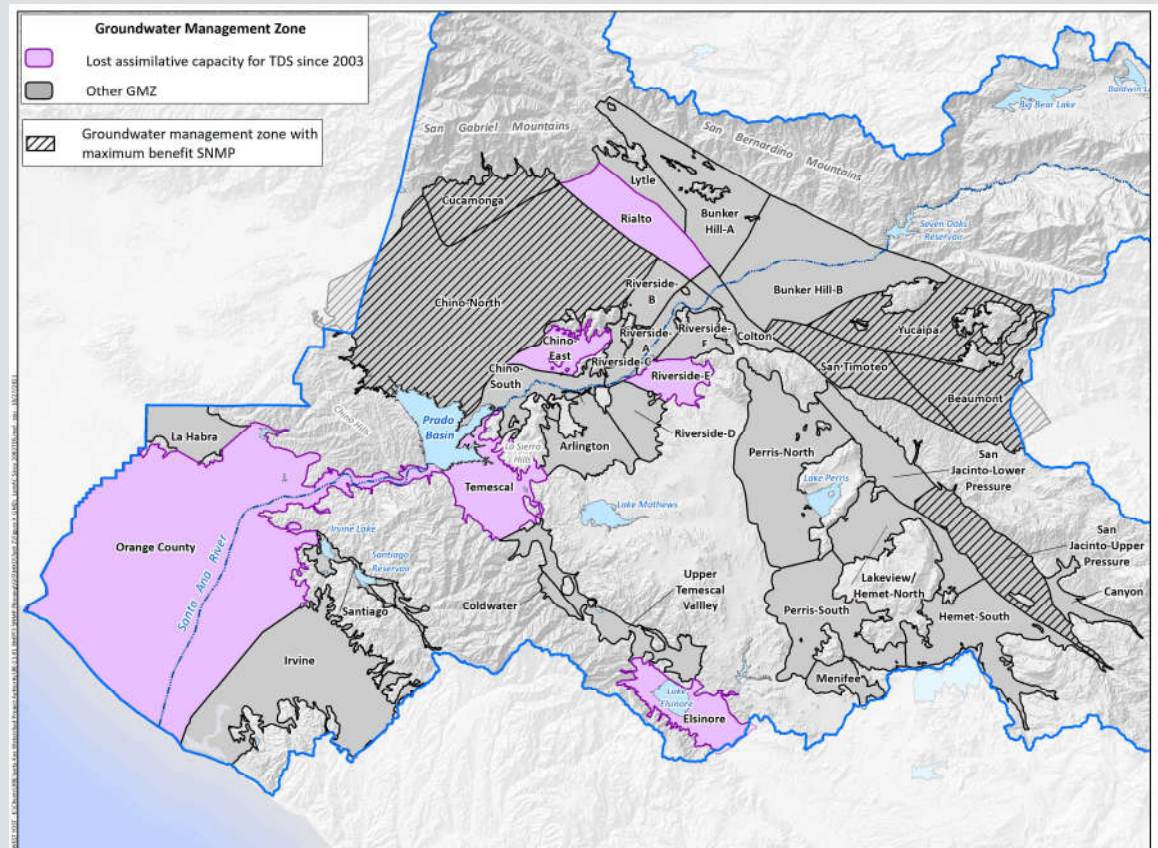
Assimilative Capacity for TDS Since 2004

- 14 GMZs have had NO Assimilative Capacity since 2003 AWQ recomputation



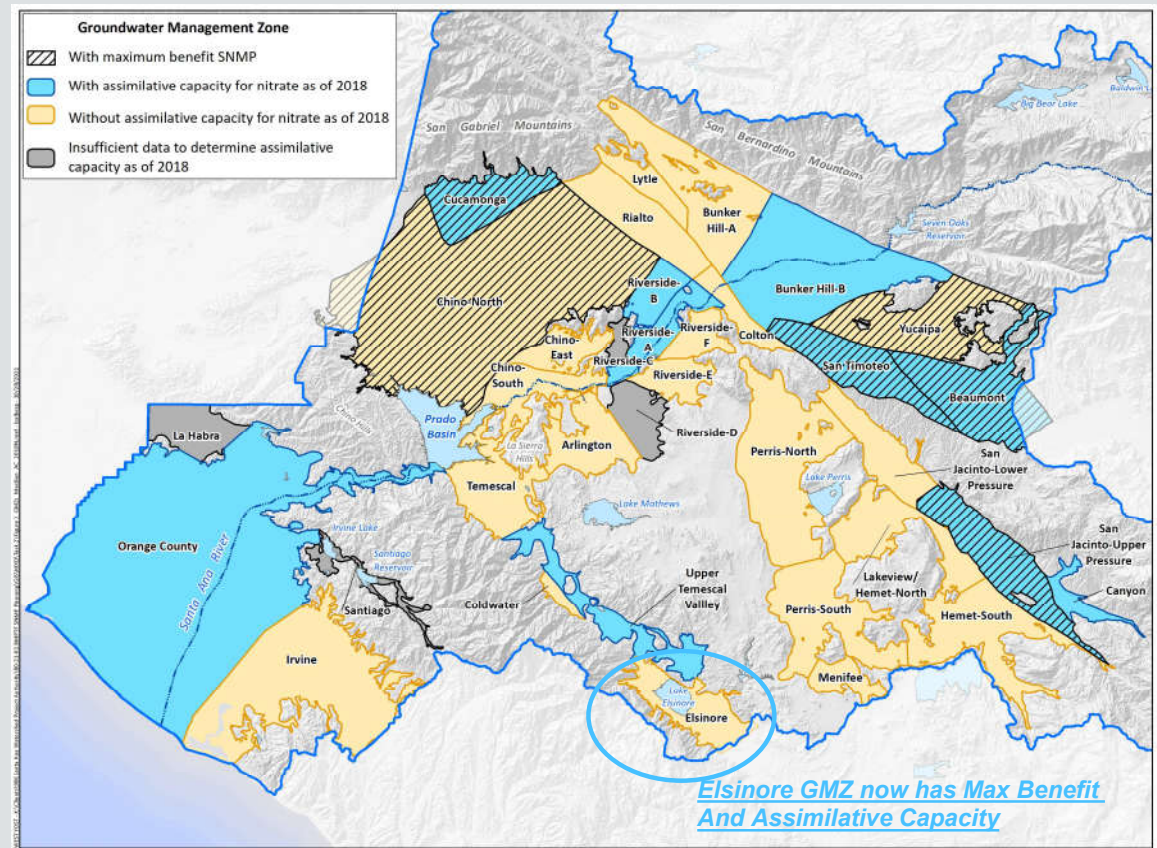
Assimilative Capacity for TDS Since 2004

- Six GMZs lost assimilative capacity for TDS since 2003
 - Rialto
 - Riverside-E
 - Chino East
 - Temescal
 - Elsinore
 - Orange County



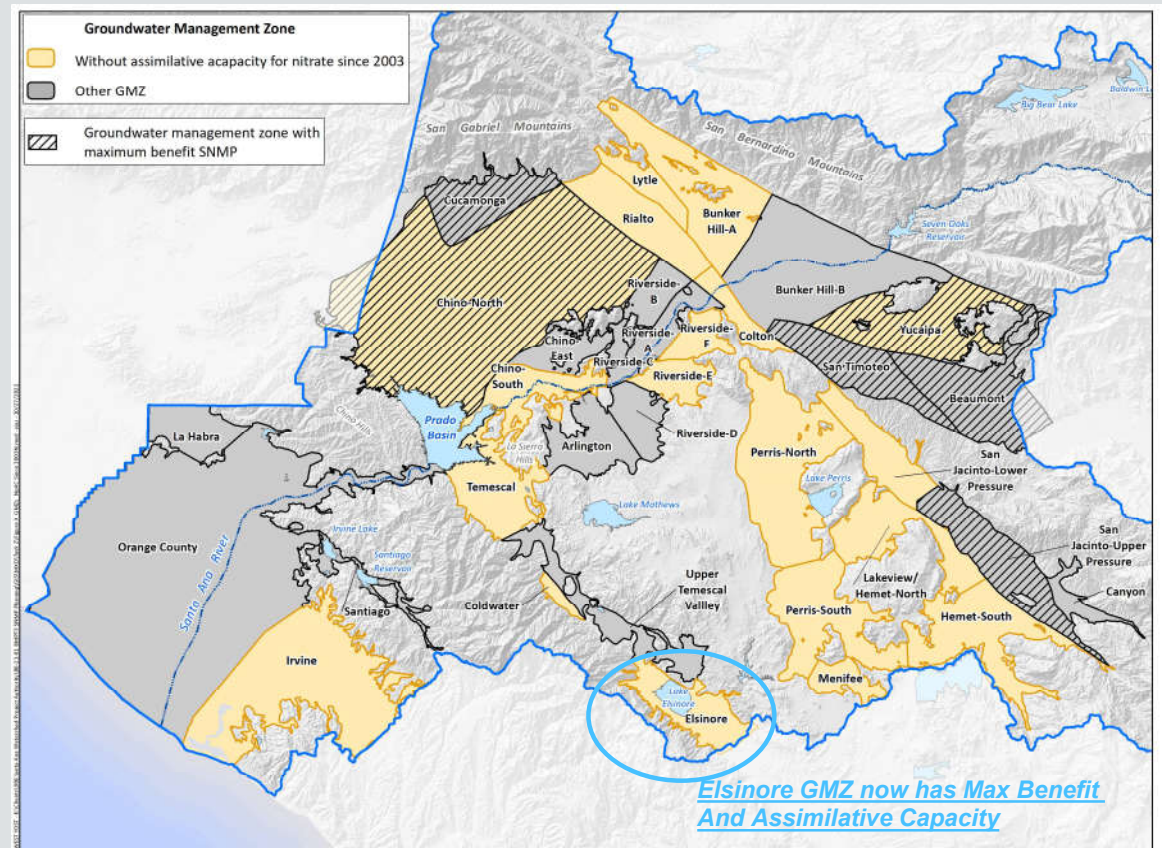
Assimilative Capacity for Nitrate As of 2018 AWQ

- 35 GMZs Total
- 11 with Assimilative Capacity
 - 5 are Maximum Benefit GMZs
- 20 with **NO** Assimilative Capacity
- 4 with no AWQ findings



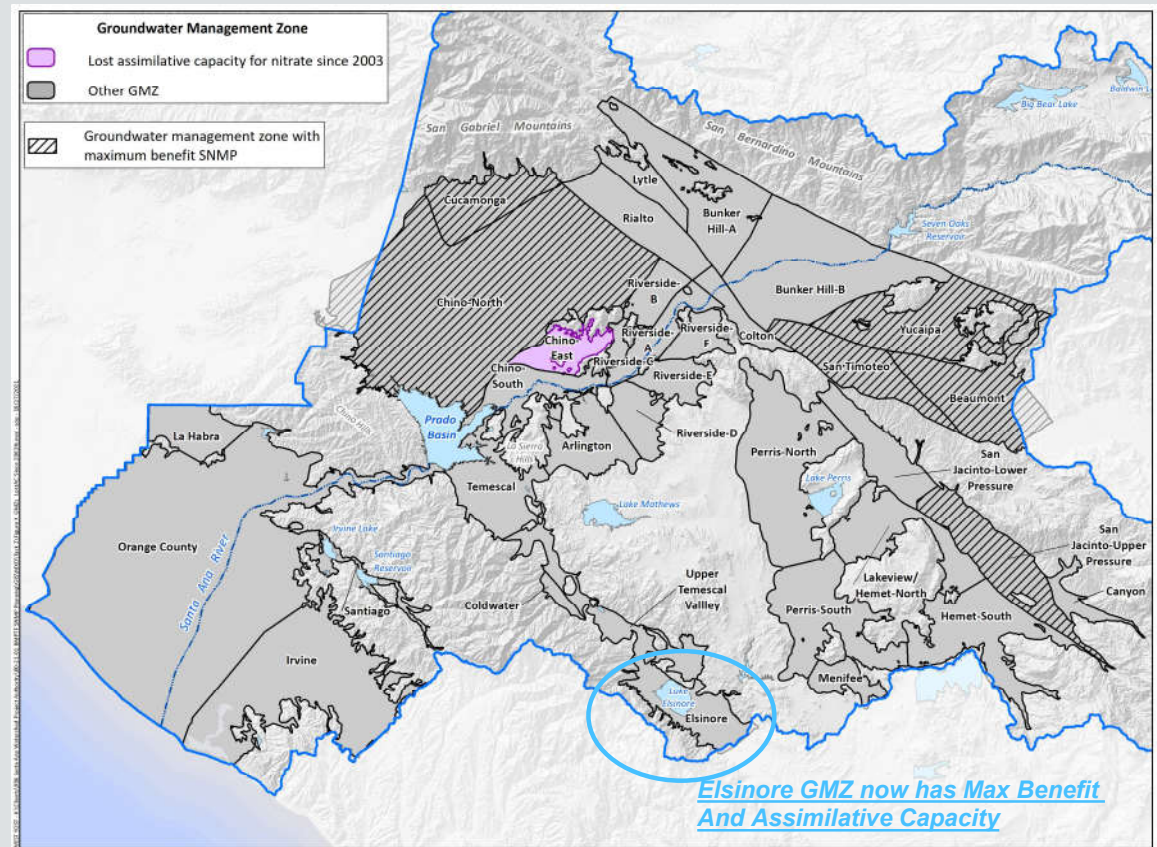
Assimilative Capacity for Nitrate Since 2004

- 18 GMZs have had **NO** Assimilative Capacity since 2003 AWQ recomputation

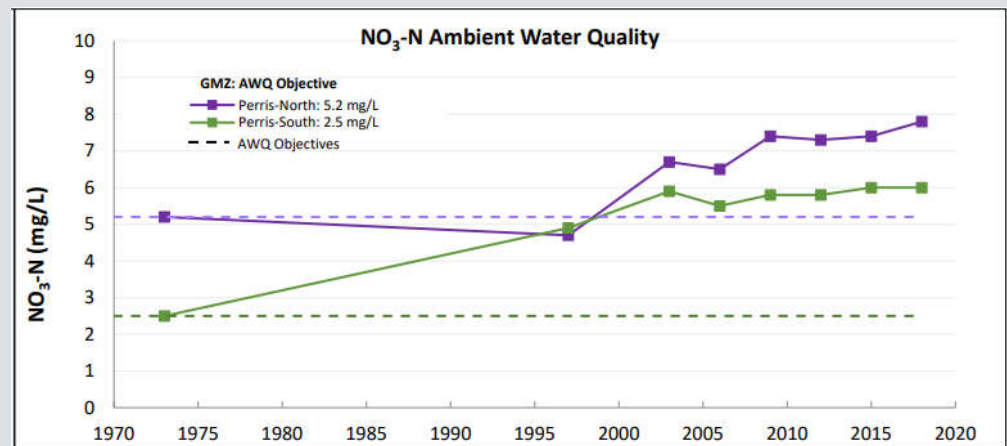
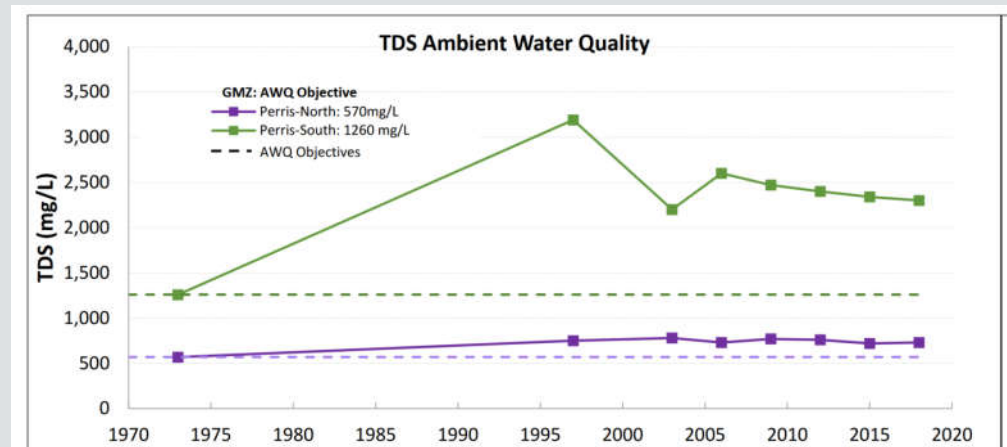
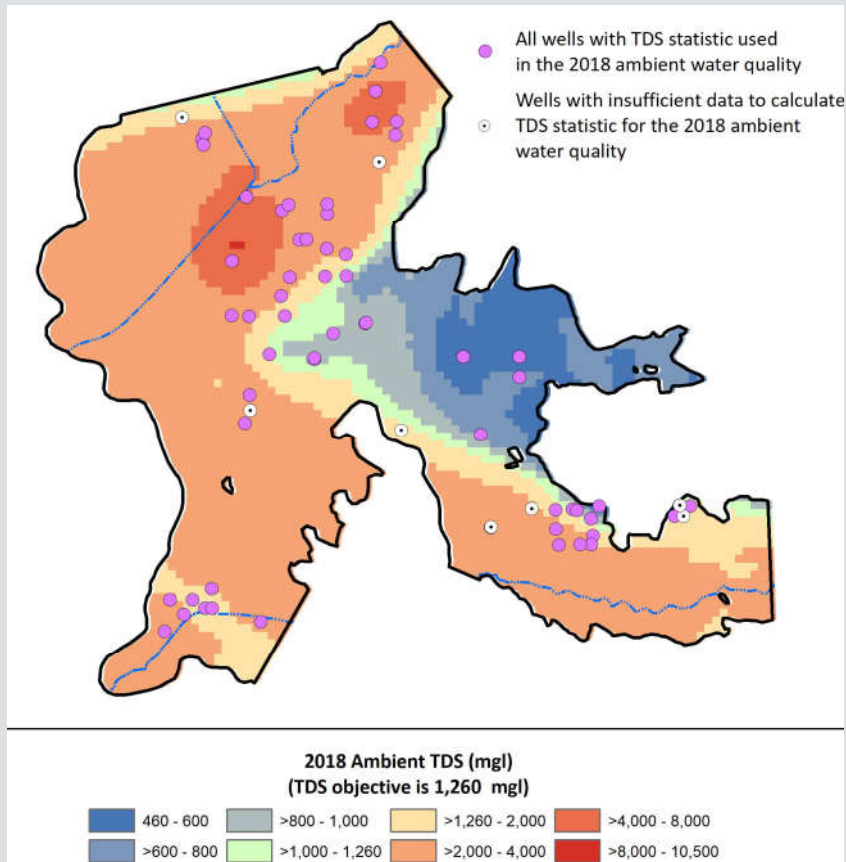


Assimilative Capacity for Nitrate Since 2004

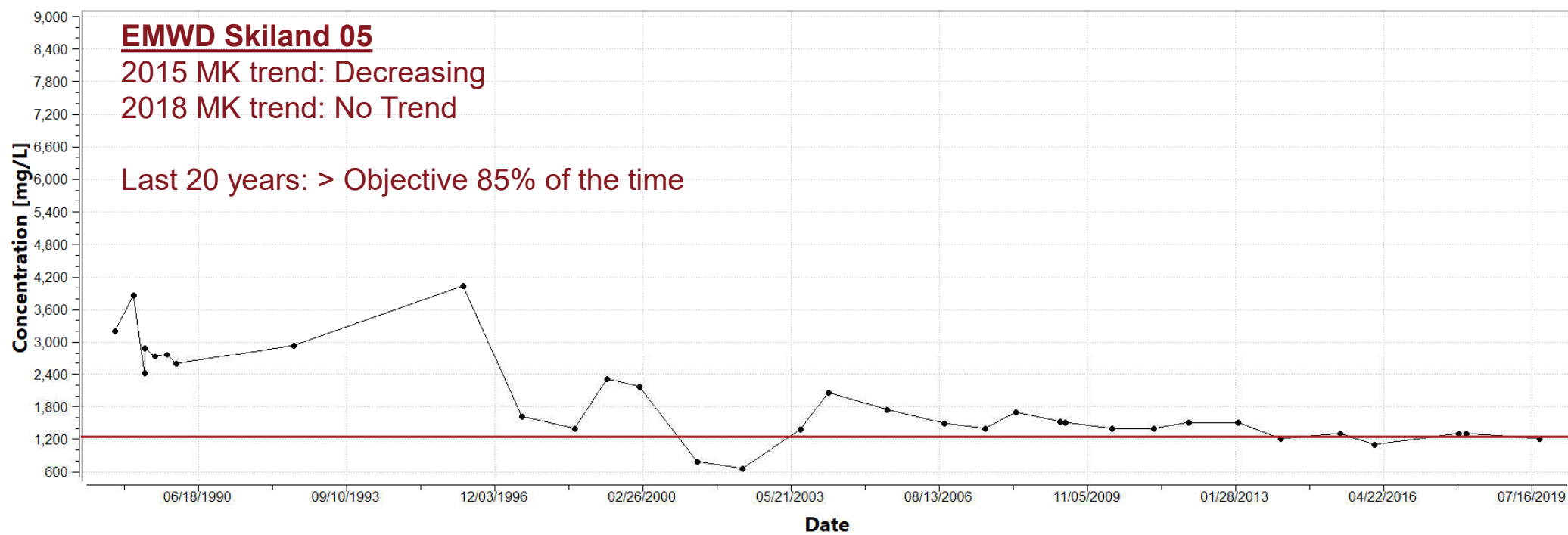
- One GMZ lost assimilative capacity for nitrate since 2003
 - Chino East GMZ
 - Methodological



No Assimilative Capacity Since 2004 – Perris South

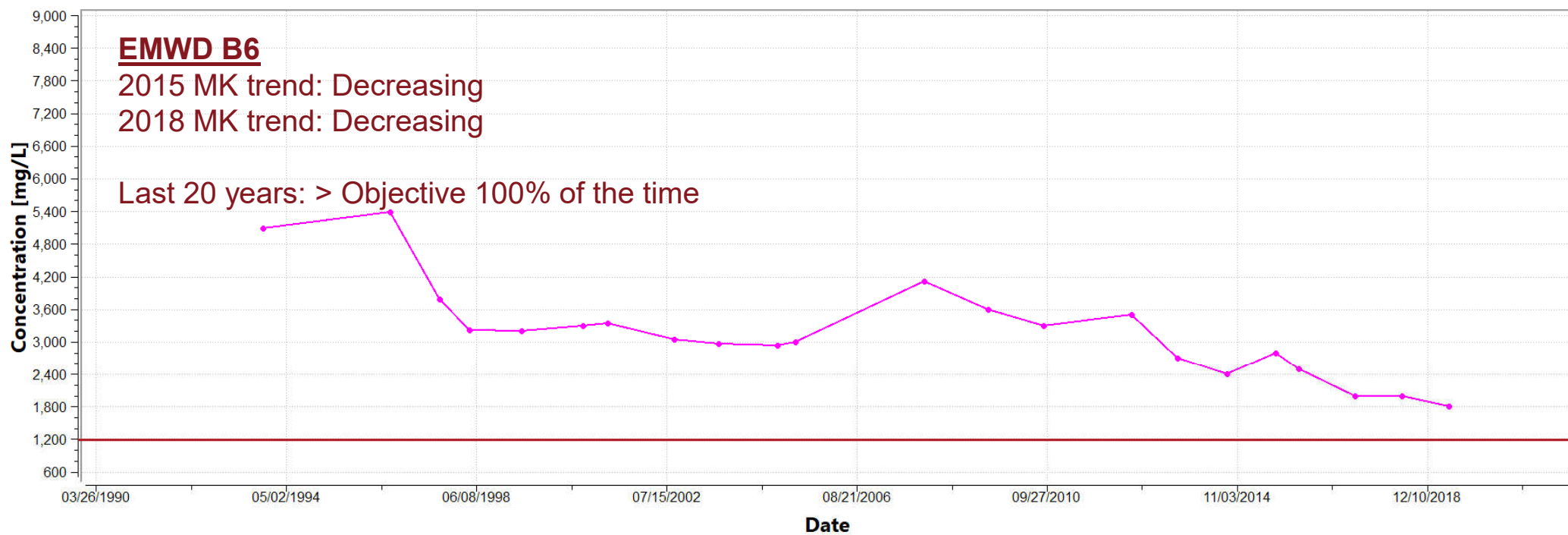


TDS



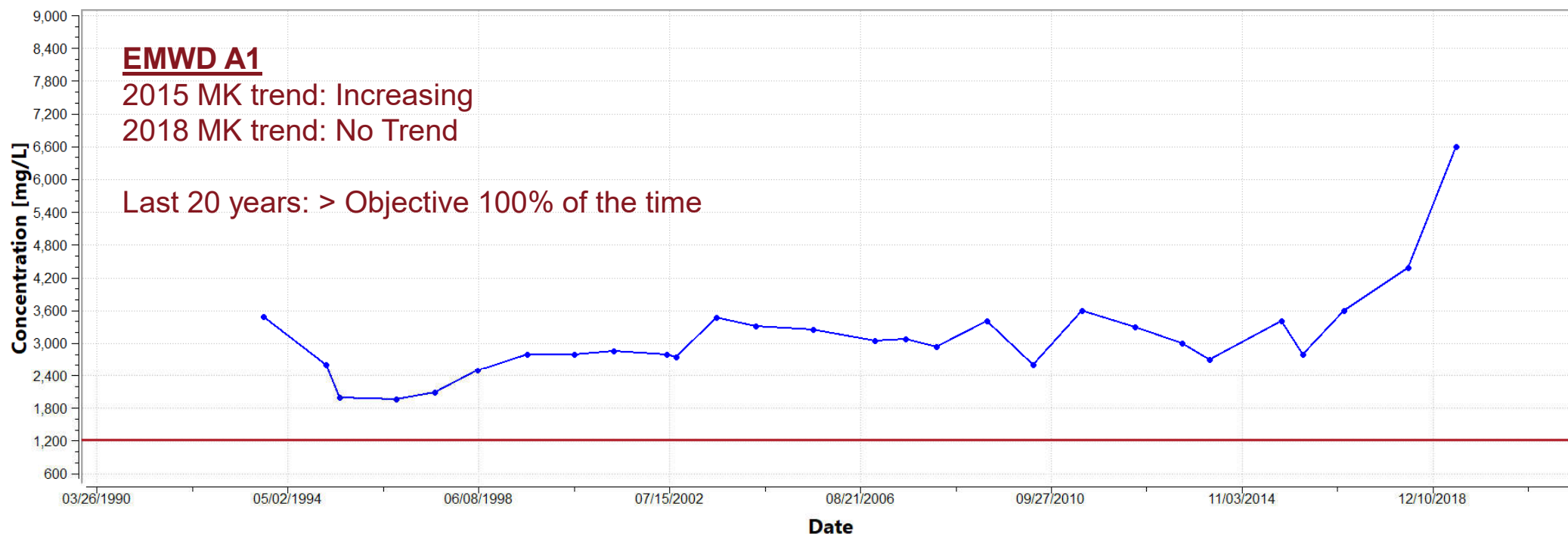
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TDS



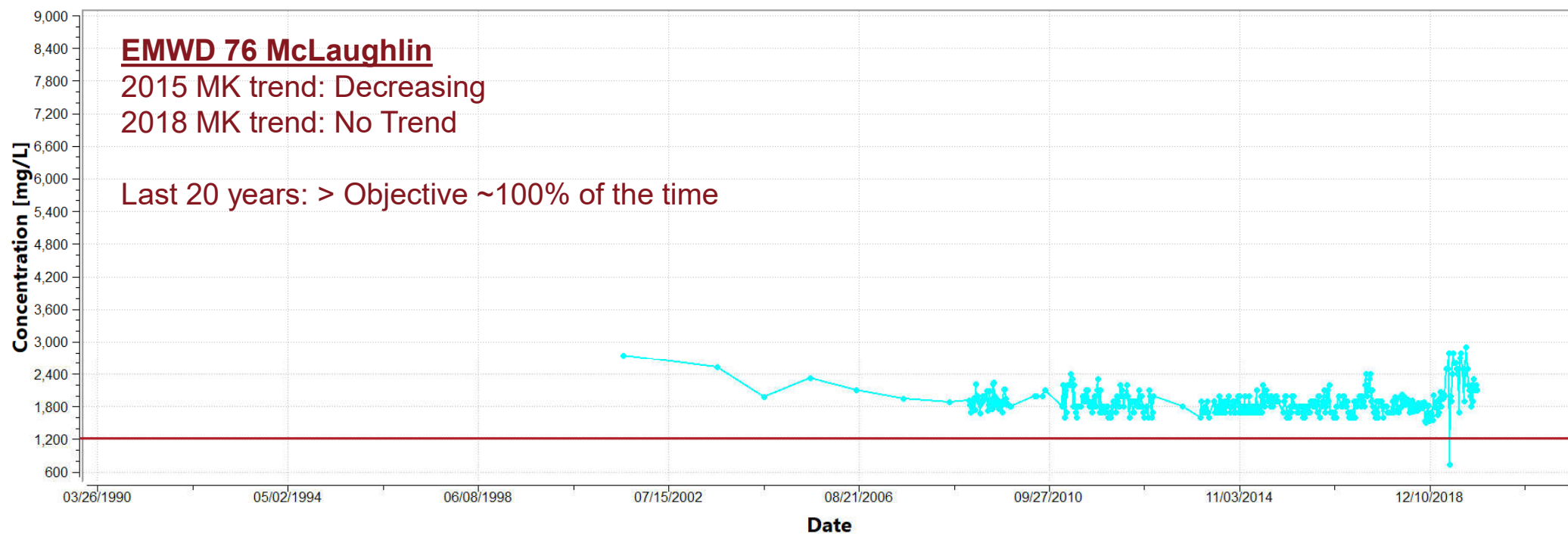
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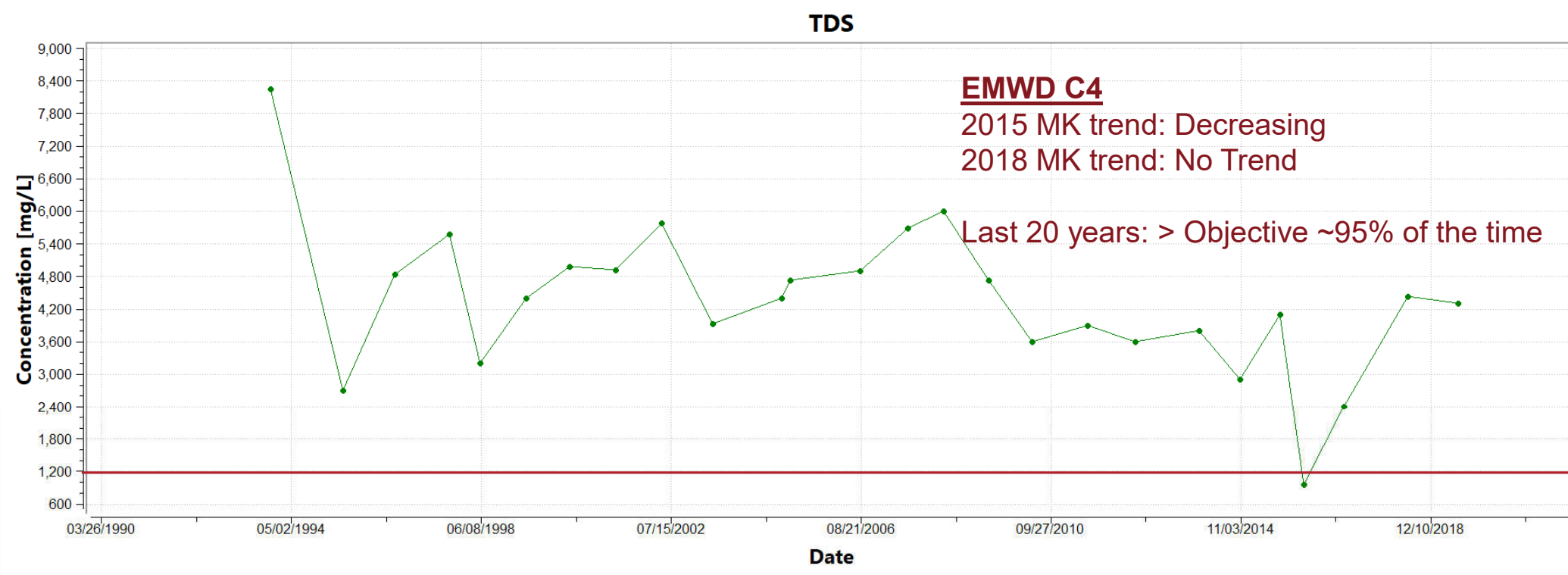


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TDS

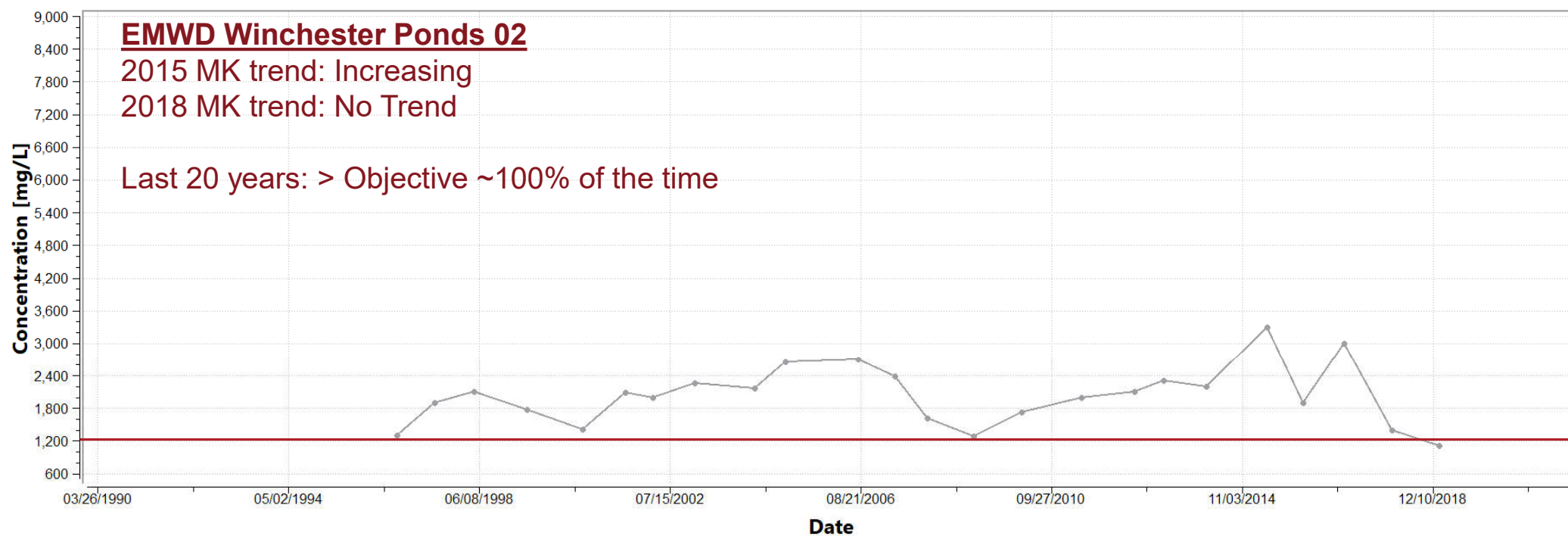


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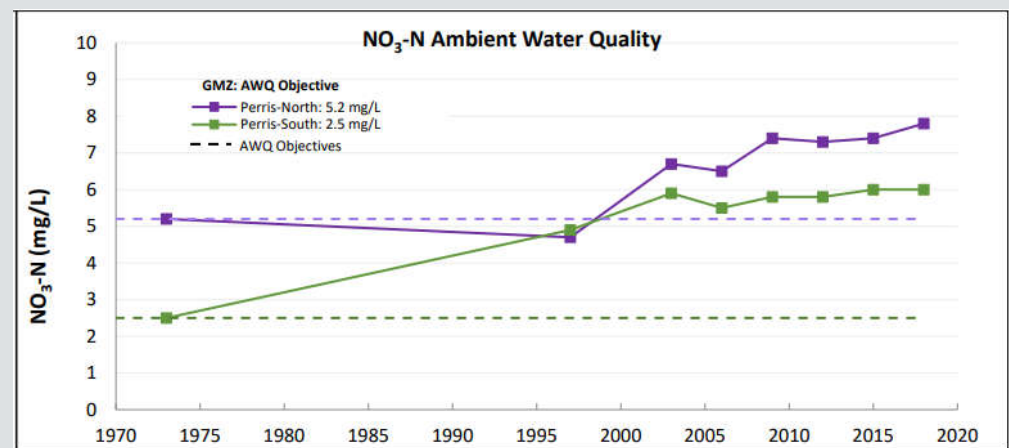
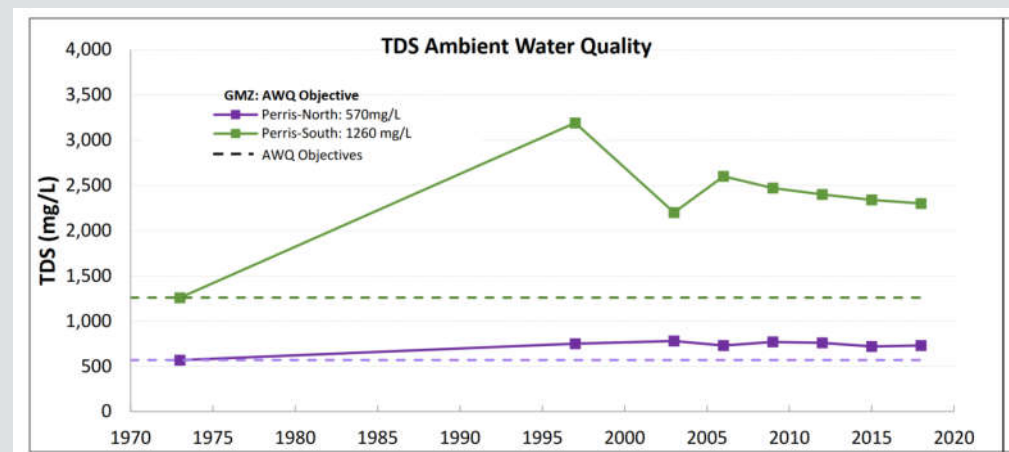
TDS



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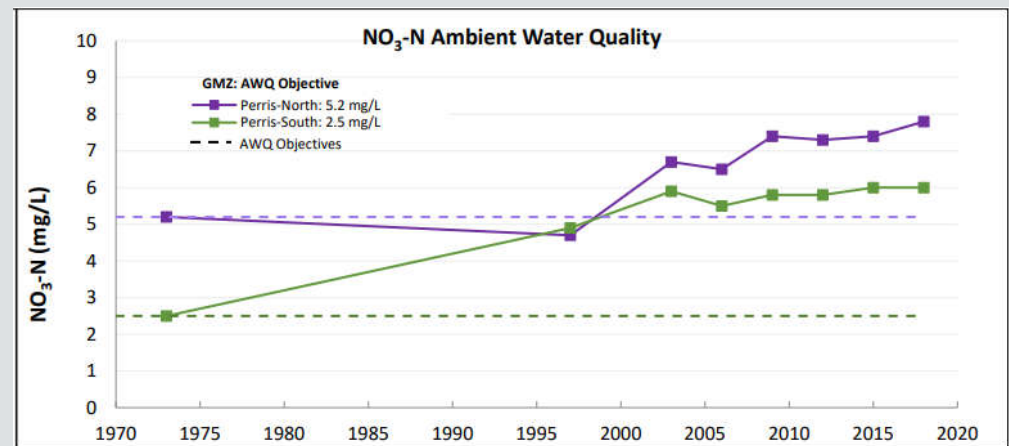
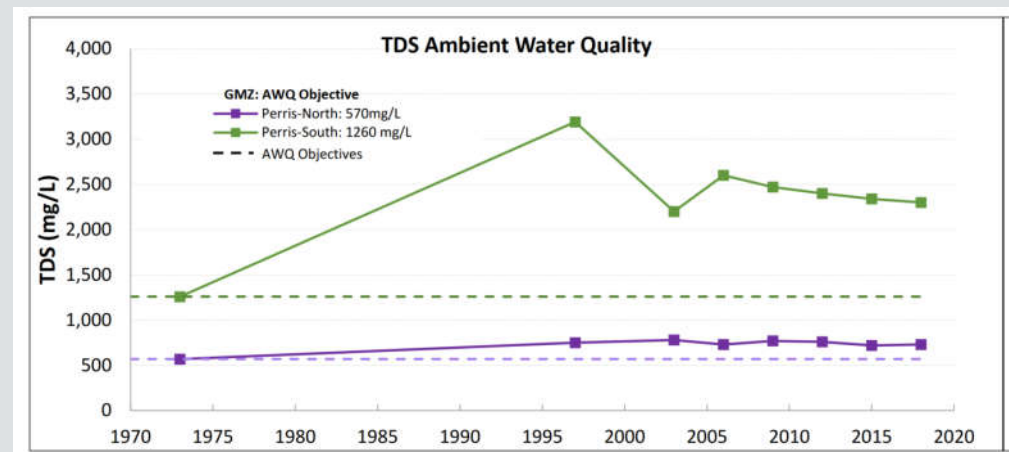
No Assimilative Capacity Since 2004 – Perris South

- If at majority of wells...
 - new data is still greater than the TDS objective
 - No significant change in trends across the basin
- Then, Perris South GMZ still has **no assimilative capacity**
- For 2018 – 49 wells with current data , 30% (13 wells) had concentrations < TDS objective

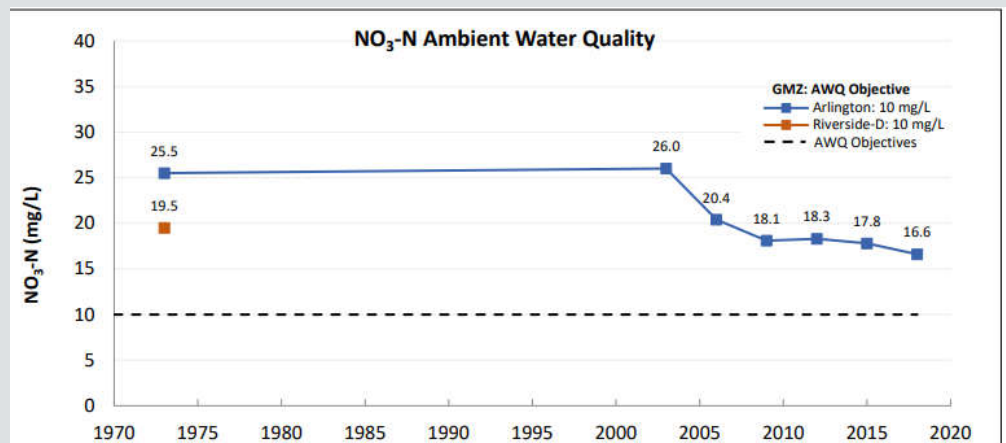
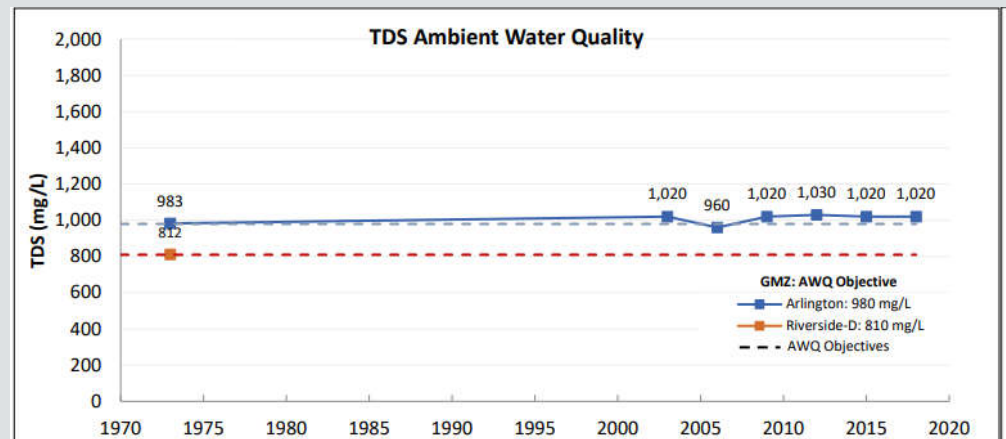
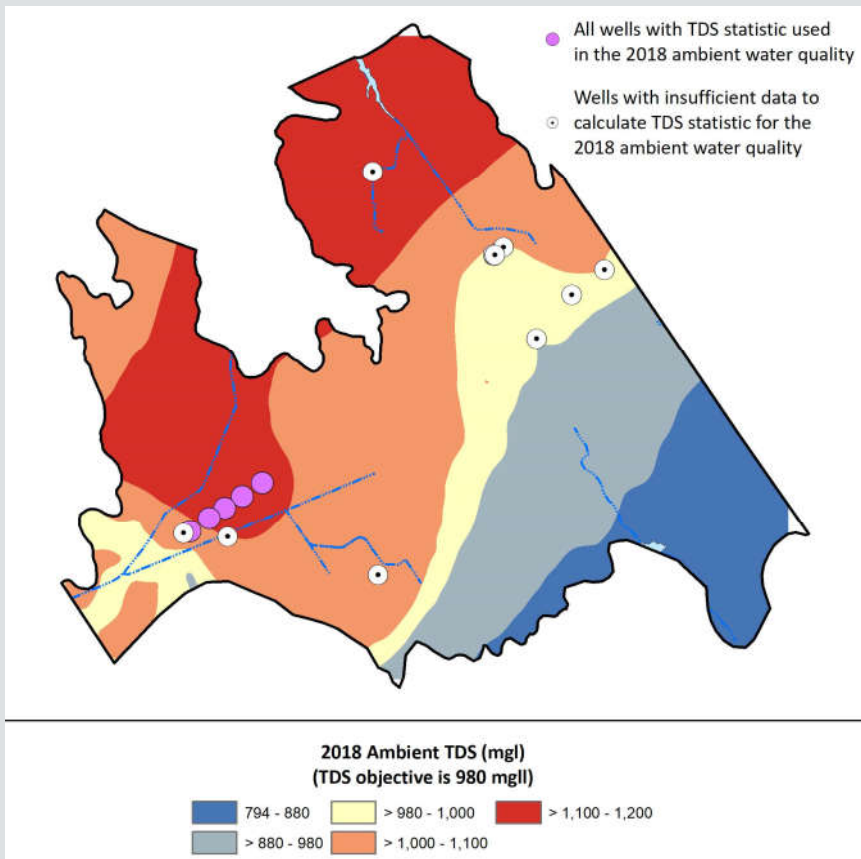


No Assimilative Capacity Since 2004 – Perris South

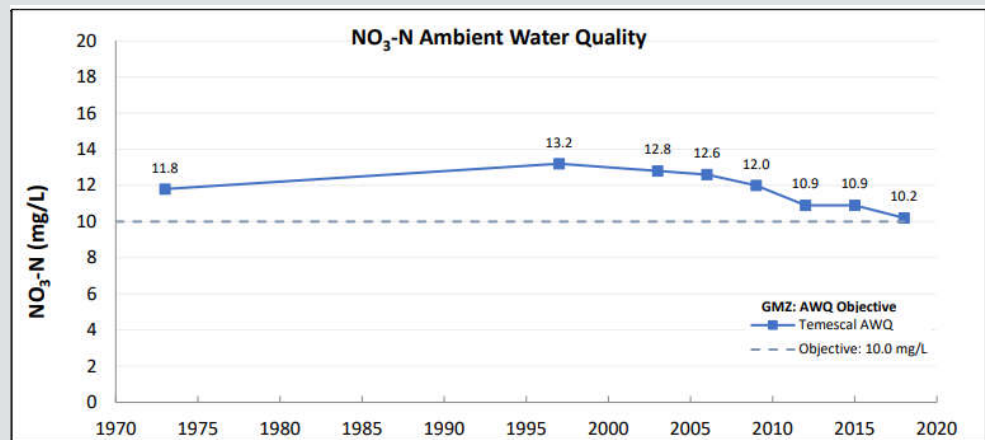
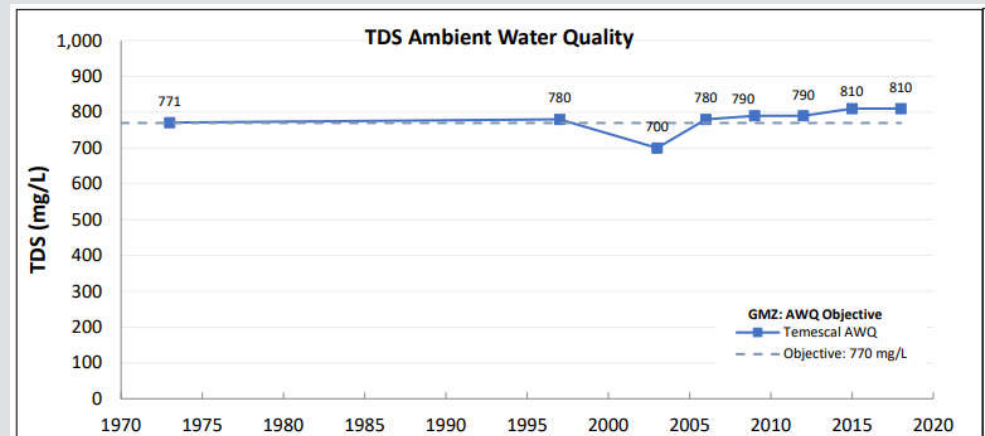
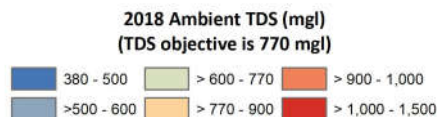
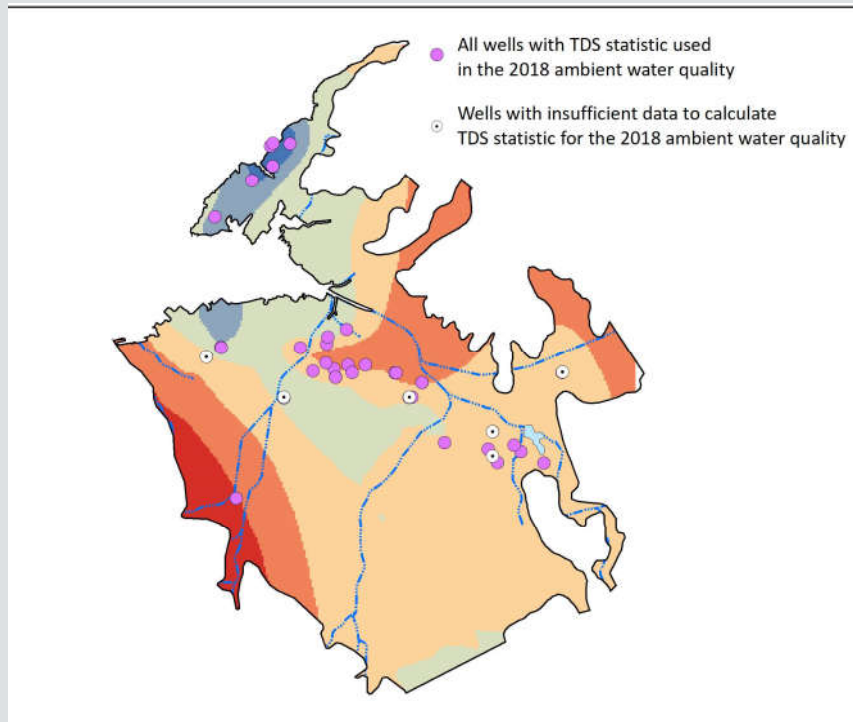
- Would change in the ambient water quality TDS concentration change the regulatory environment?
- No
 - TDS of RW used in GMZ is already less than objective of 1,200 mg/l
 - Salt offsets already in place



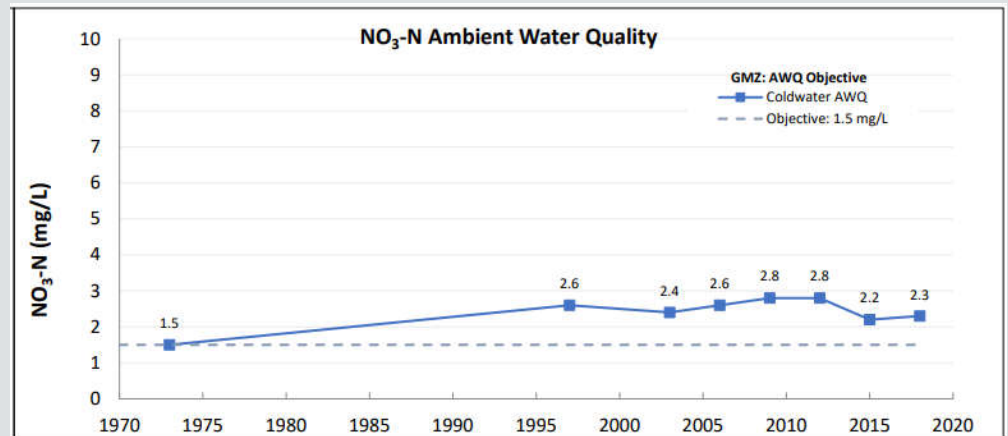
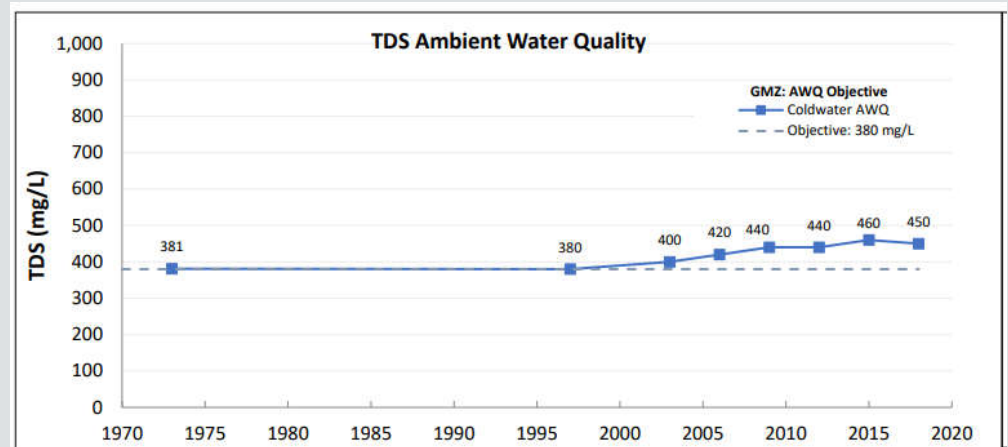
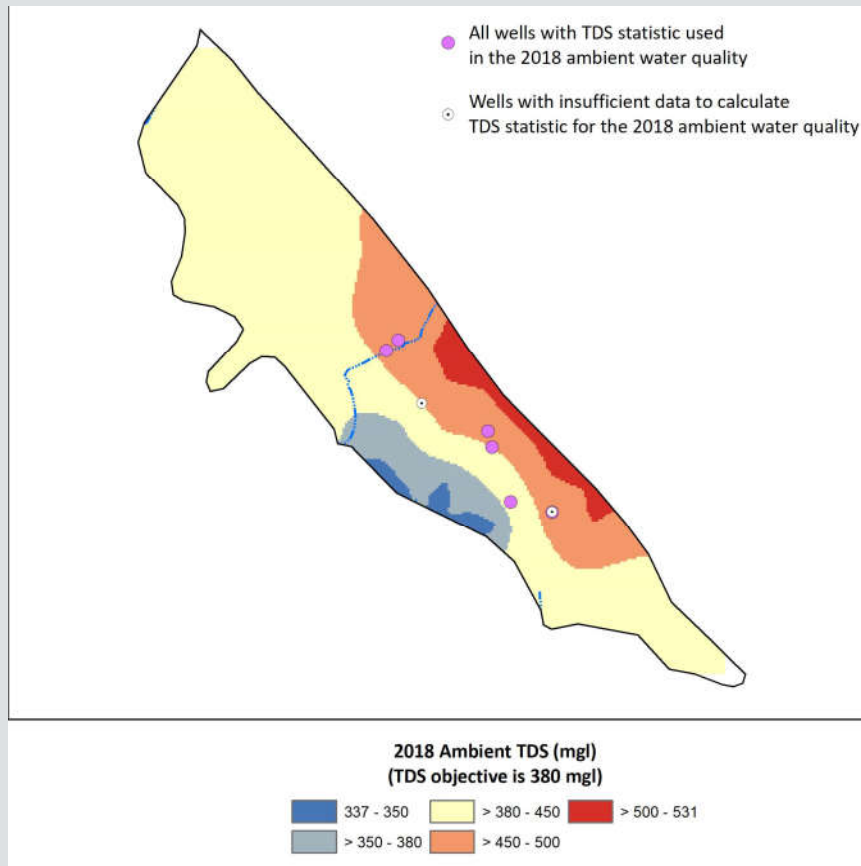
No Assimilative Capacity Since 2004 – Arlington



No Assimilative Capacity Since 2004 – Temescal



No Assimilative Capacity Since 2004 – Coldwater



Other GMZs with No Assimilative Capacity for TDS or Nitrate

- San Timoteo (TDS only)
- Yucaipa (N only)
- Bunker Hill A (TDS/N)
- Lytle (N only)
- Rialto (TDS/N)
- Colton (TDS/N)
- Riverside B (TDS only)
- Riverside F (N only)
- Riverside E (TDS/N)
- Chino North (N only)
- Chino South (TDS/N)
- Chino East (TDS/N)
- Perris North (TDS/N)
- Menifee (TDS/N)
- Hemet South (TDS/N)
- Lakeview Hemet North (TDS/N)
- San Jacinto Lower Pressure (TDS/N)
- Canyon (TDS only)
- Orange County (TDS only)
- Irvine (N only)

How Could Prioritization be Piloted for Recomputation of AWQ Through 2021?

1. Collect all data
2. Chart time histories and perform Mann-Kendall Trend Analysis
3. Make preliminary determination of AWQ based on water quality data and trends
4. Based on determination, select which GMZs to perform full method:
 - a. All GMZs with Maximum Benefit SNMP (required by Basin Plan) – 7 GMZs
 - b. GMZs with Assimilative Capacity where change in ambient will affect permitting considerations – likely to be 4-6 additional GMZs
 - c. GMZs with change in trends (including new data) – TBD based on data

How Could Prioritization be Piloted for Recomputation of AWQ Through 2021?

5. For GMZs where full ambient water quality will be performed, could also pilot:
 - a. Use of computer-assisted generation of contours (vs. hand contouring)
 - b. Update of aquifer parameters to assess how different AWQ result is (2-3 GMZs)
 - c. Limiting mapping to saturated aquifer (all GMZs)
6. For GMZs where data and trends used only, could pilot
 - a. Mapping of loading factors to support interpretation of water quality trends
 - b. Statistical trends based on 20-year period vs. entire time history of data available
7. Based on work performed, develop plan for ongoing ambient water quality methods and any pre-work to perform before the next assessment due (e.g. update aquifer properties and recompute objectives, if required)
 - a. If 5-year frequency allowed, next assessment would be due July 2028

Prioritization for Filling Data Gaps

- What are the trends in water quality over time – are they changing?
 - Historical record of ambient water quality findings from 2003 to 2018
 - Mann-Kendall Statistical Trend Analysis from 2018
- Do any existing or known new permits depend on having robust ambient water quality finding compared to past recomputations?
- Example prioritization to fill data gaps
 - High Priority
 - Maximum Benefit GMZs – direct responsible agencies to update monitoring plan
 - NPDES or WDR permitting depends on ambient water quality result
 - Low priority
 - GMZs with no regulated discharges

Comments/Questions?

- GMZ specific concerns/questions on what analysis might be done under proposed process?
- Other prioritization factors?
 - Feedback:
 - Degree to which GMZ provides municipal water supply as a prioritization factor (Greg – OCWD)
 - Consider where the current aquifer properties show no water, but we know based on revised models that there is saturated aquifer (Michael Cruikshank – WSC)
 - Landfill wells – room for improvement in some GMZs (Eric. L – Regional Board)
 - Extrapolation from wells outside the boundary, behind slurry walls
 - In some cases, new wells are needed when landfill is all we have.
 - Rising groundwater outflow as a prioritization factor (Greg – OCWD)

THANK YOU

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