Task Force Planning Priorities - Task 1: Prepare Updated Surface Water Monitoring Program for TDS/N for the Santa Ana River Reaches, 2, 3 ,4 and 5

Draft 2022 Santa Ana River Water Quality Work Plan

January 26, 2023

WEST YOST

Water. Engineered.

Draft 2022 Santa Ana River Water Quality Work Plan

Received comments from:

- Regional Board
- Tess Dunham, KSC LLP
- Orange County Water District
- City of Riverside
- Inland Empire Utilities Agency
- Santa Ana Watershed Project Authority

Filed Comments at:

BMPTF - Comments on SW GW Monitoring Plans

Proposed edits/comments:

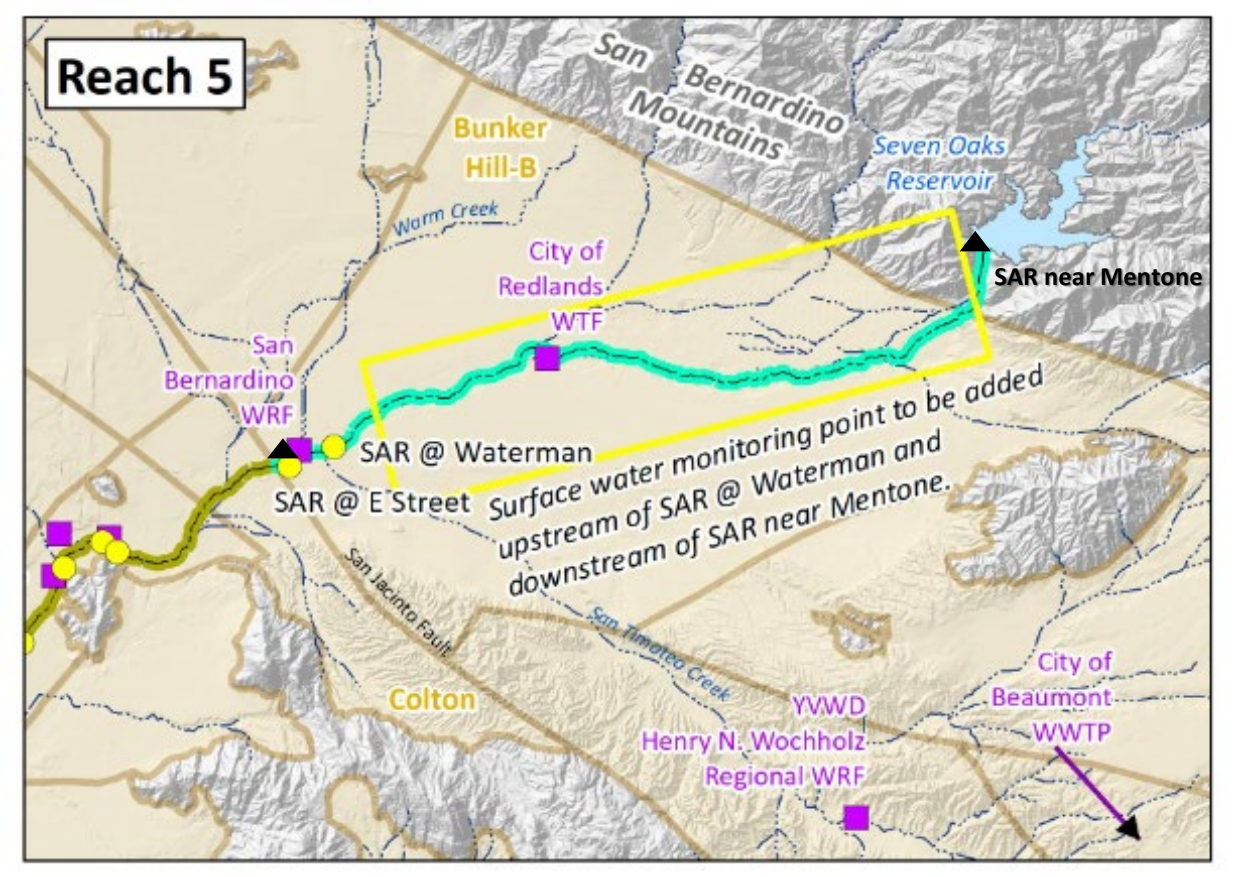
- Separate the Special Study into a separate document (in progress)

- Primary comments that need further Task Force discussion for consideration:
  1. **Monitoring locations in Reaches 5 & 4**
  2. **Surface water quality parameter list**
  3. **Monitoring for Reach 3 (Use of calculated EC and base flow definition)**

Primary Comments on the Draft 2022 SAR WQ Work Plan to Address and Discuss

1. Monitoring locations in Reaches 5 & 4
2. Surface water quality parameter list
3. Monitoring for Reach 3 (Use of TDS calculated from USGS daily EC measurements and baseflow definition)

Reach 5 Objectives: TDS = 300 mg/L and TIN = 5 mg/L



Monitoring Locations in Reach 5

Draft Work Plan Considerations:

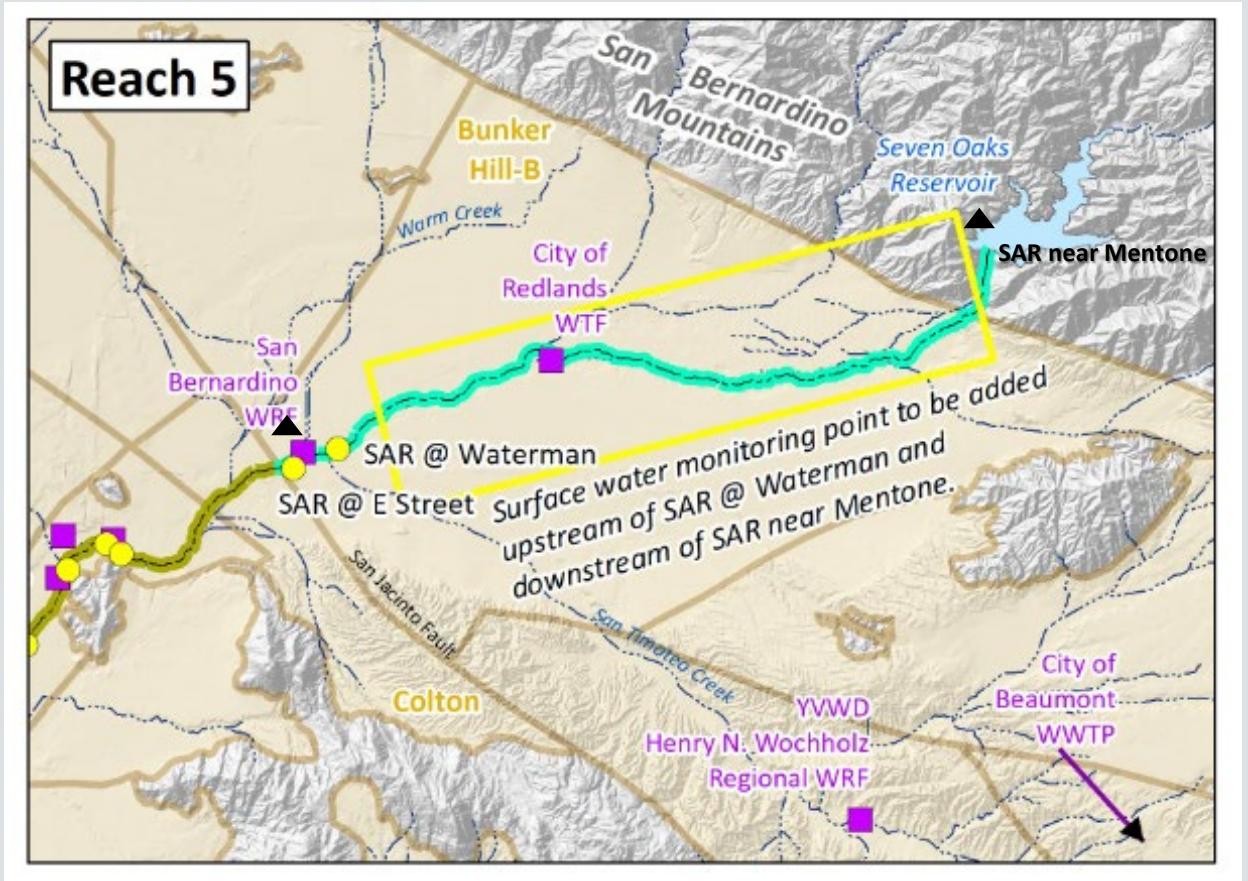
- If there are no POTW discharges in a reach or upstream is monitoring required? Exclusively storm water flow upstream.
- What type of monitoring (total flow, baseflows, stormflows), if any, is required for reaches that have little to no POTW discharges?
- Who's responsible if no compliance?

Proposed Reach 5 Monitoring in Draft 2022 Work Plan:

Site for Quarterly Monitoring	Monitoring Entity	
New Site (TBD) – between SAR near Mentone and SAR @ Waterman	Task Force	**Compliance Metric: Annual Average TDS and TIN of all samples collected during the year**
SAR @ Waterman	Task Force	
SAR @ E Street	Task Force	

Monitoring Locations in Reach 5

Reach 5 Objectives: TDS = 300 mg/L and TIN = 5 mg/L



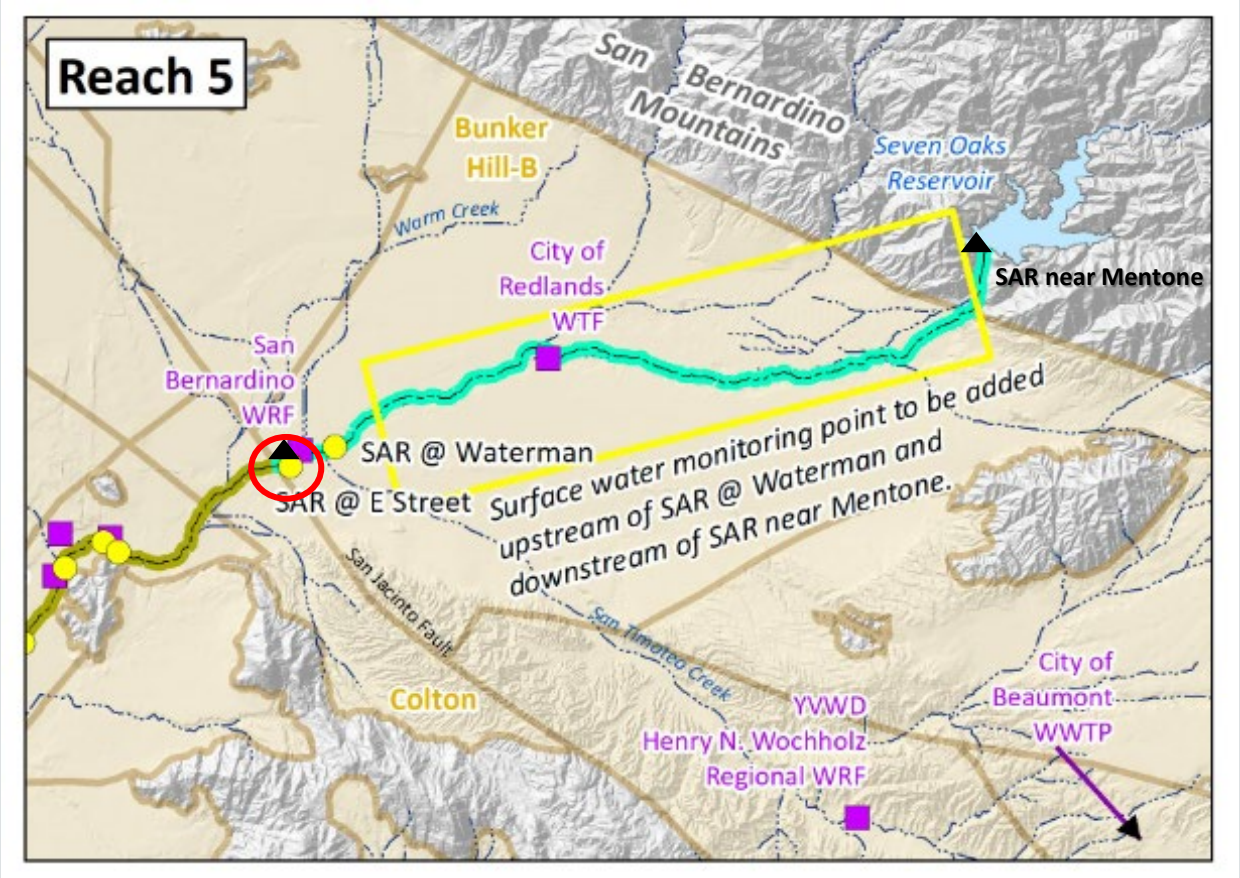
Discussion:

- The objective of the monitoring for the Work Plan is to assess impact of POTW discharges on SAR quality.
- POTW discharge in Reach 5 at and downstream of San Timoteo Ck → Cont. monitoring at E Street.
- One location in Reach 5 to understand the WQ. Challenges with Integrated Reporting exceedances → may need to revisit the monitoring program in future.
- Regional Board staff uses Task Force monitoring data to also assess exceedances for Integrated Reporting; but understand that Task Force Work Plan monitoring is intended to assess impact of POTW discharges. Consider bringing in other monitoring entities/purposes in the monitoring discussions (MS4).

Monitoring Locations in Reach 5

Revised Recommendation:

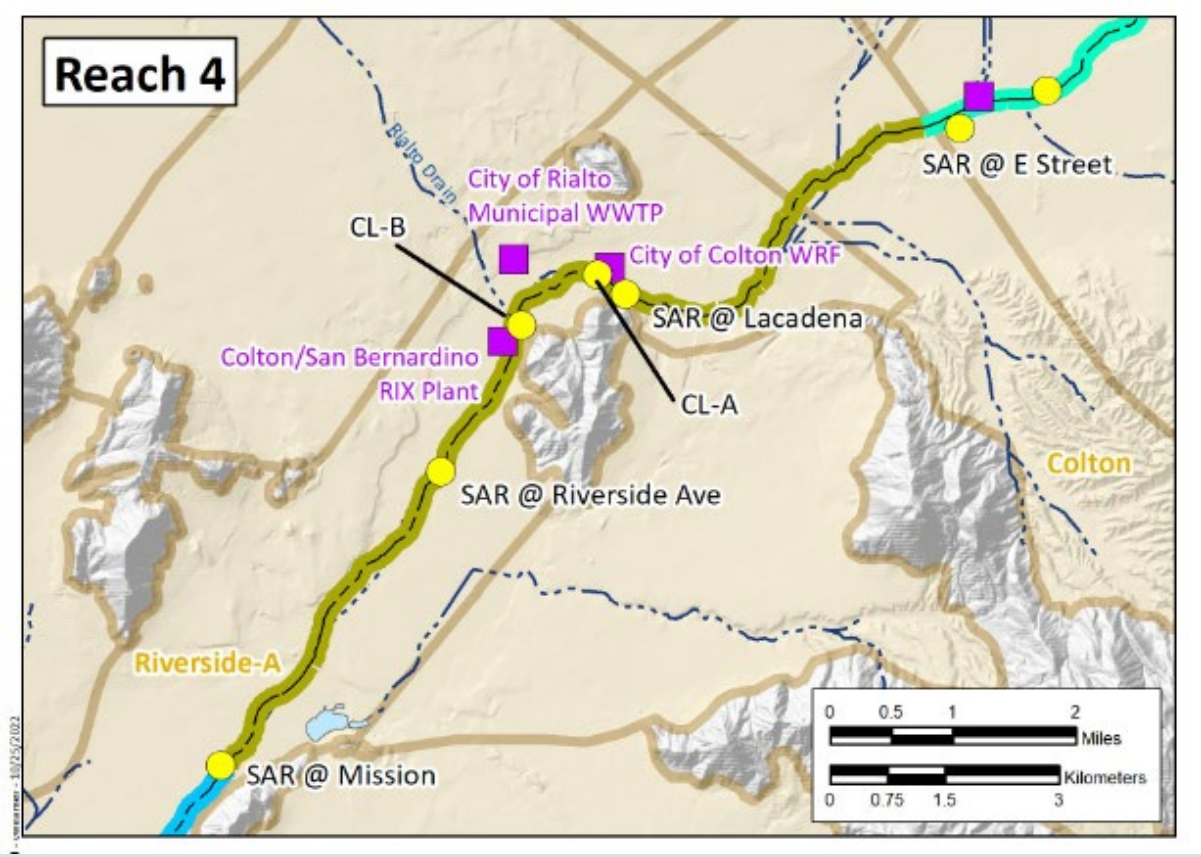
- Continue monitoring at just SAR @ E Street, quarterly



Proposed Reach 5 Monitoring in Draft 2022 Work Plan:

Site for Quarterly Monitoring		Monitoring Entity	
~~New Site (TBD) – between SAR near Mentone and SAR @ Waterman~~		~~Task Force~~ X	**Compliance Metric: Annual Average TDS and TIN of all samples collected during the year**
~~SAR @ Waterman~~		~~Task Force~~ X	
SAR @ E Street		Task Force	

Reach 4 Objectives: TDS = 550 mg/L and TIN = 10 mg/L



Monitoring Locations in Reach 4

Draft Work Plan Considerations:

- If there are no POTW discharges in a reach or upstream is monitoring required? Exclusively storm water flow upstream.
- What type of monitoring (total flow, baseflows, stormflows), if any, is required for reaches that have little to no POTW discharges?
- Who's responsible if no compliance?

Proposed Reach 4 Monitoring in Draft 2022 Work Plan:

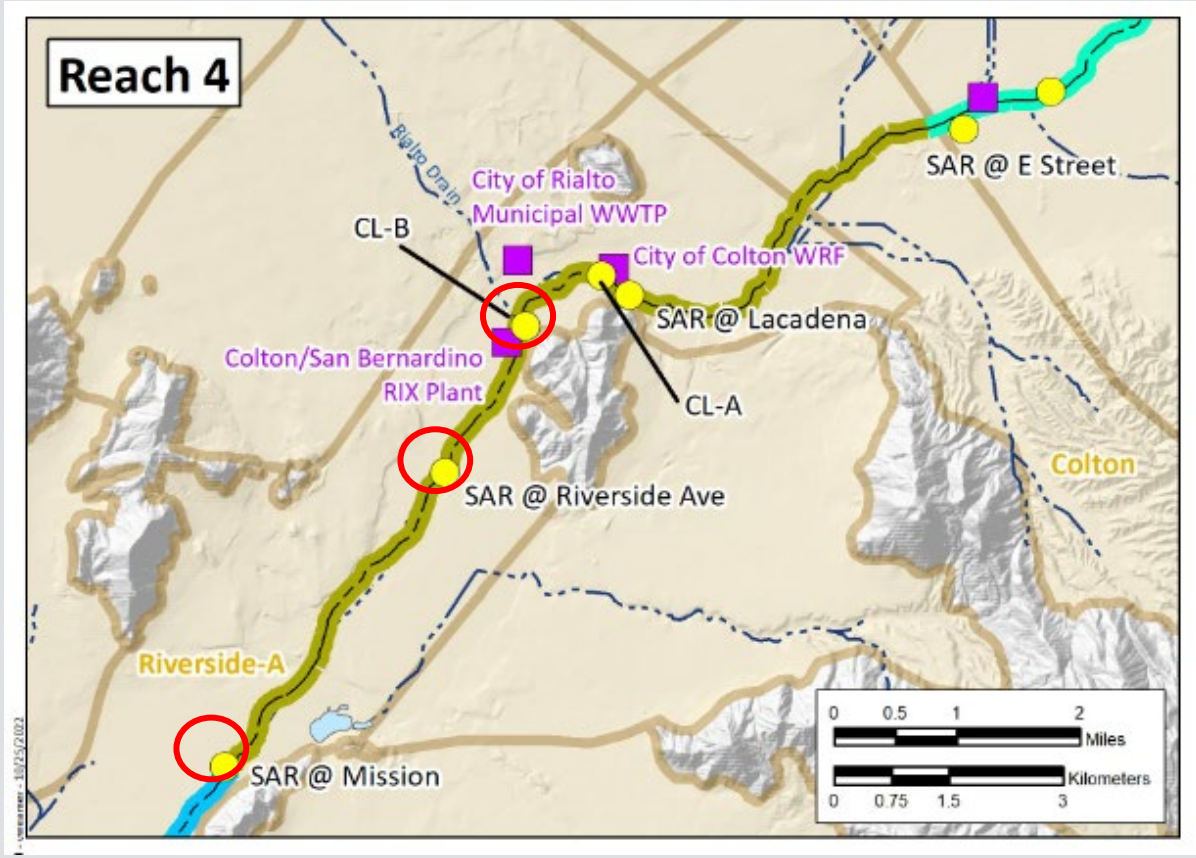
Site for Quarterly Monitoring	Monitoring Entity	
SAR @ Lacadena	Task Force	**Compliance Metric: Annual Average TDS and TIN of all samples collected during the year**
SAR @ Riverside Ave	Task Force	
SAR @ Mission	Task Force	
CL-A	County of San Bernadino	
CL-B	County of San Bernadino	

Monitoring Locations in Reach 4

Reach 4 Objectives: TDS = 550 mg/L and TIN = 10 mg/L

Revised Recommendation:

- Monitoring at SAR @ Riverside Ave and SAR @ Mission, quarterly
- Use of the Colton Landfill monitoring in the SAR at site CL-B



Proposed Reach 4 Monitoring in Draft 2022 Work Plan:

Site for Quarterly Monitoring	Monitoring Entity	
~~SAR @ Lacadena~~ X	Task Force	**Compliance Metric: Annual Average TDS and TIN of all samples collected during the year**
SAR @ Riverside Ave	Task Force	
SAR @ Mission	Task Force	
~~CL-A~~ X	County of San Bernadino	
CL-B	County of San Bernadino	

Surface Water Quality Monitoring Parameter List

Proposed Parameter List in Draft 2022 Work Plan*:

Parameter	
Alkalinity	Nitrite-nitrogen
Ammonia-Nitrogen	Nitrite-nitrogen
Bicarbonate	Total Inorganic Nitrogen, Calculated
Calcium	pH
Carbonate	Potassium
Chloride	Sodium
Chemical Oxygen Demand	Sulfate
Electrical Conductivity (Specific Conductance)	Total Hardness
Hydroxide	Total Dissolved Solids
Magnesium	

* Includes TDS, TIN, and general mineral and physical parameters that can be used to characterize source water and validate TDS data, and/or have surface water objectives (SWOs) in the Basin Plan for the SAR. Other SWOs include: Cl, SO4, Na, COD, hardness.

Draft Work Plan Considerations:

- Limit monitoring to just TDS and TIN
- Is it necessary to analyze for the other SWOs?

Surface Water Quality Monitoring Parameter List

Discussion:

- Do not include other parameters:
  - The other SWOs are antidegradation objectives (targets) not set to protect beneficial uses.
  - Do not have these other parameters be part of this compliance monitoring program

VS.

- Include other parameters:
  - Can use the to explore the results of compliance monitoring, and characterize surface water sources, which is beneficial to understanding the various influences to the SAR quality.

Proposed Parameter List in Draft 2022 Work Plan:

Parameter	
Alkalinity	Nitrite-nitrogen
Ammonia-Nitrogen	Nitrite-nitrogen
Bicarbonate	Total Inorganic Nitrogen, Calculated
Calcium	pH
Carbonate	Potassium
Chloride	Sodium
Chemical Oxygen Demand	Sulfate
Electrical Conductivity (Specific Conductance)	Total Hardness
Hydroxide	Total Dissolved Solids
Magnesium	

Surface Water Quality Monitoring Parameter List

Revised Recommendation:

- Include only TDS and TIN parameters
- Monitor the other parameters as part of the Special Study (characterize source water, rising groundwater, validate/enhance the compliance monitoring)

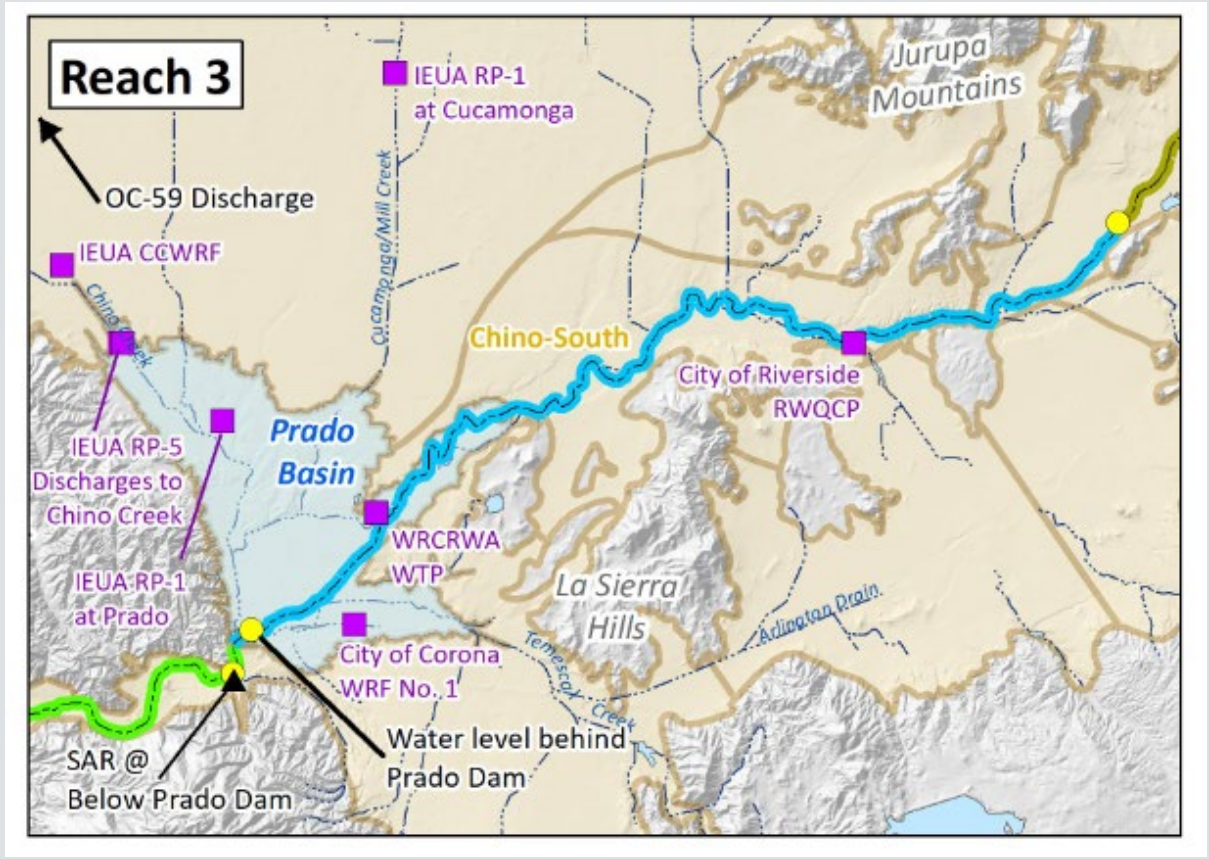
Proposed Parameter List in Draft 2022 Work Plan:

Parameter	
Alkalinity	Nitrite-nitrogen
Ammonia-Nitrogen	Nitrite-nitrogen
Bicarbonate	Total Inorganic Nitrogen, Calculated
Calcium	pH
Carbonate	Potassium
Chloride	Sodium
Chemical Oxygen Demand	Sulfate
Electrical Conductivity (Specific Conductance)	Total Hardness
Hydroxide	Total Dissolved Solids
Magnesium	

- Change name of the Work Plan to specify it is just monitoring for TDS and TIN objectives → *2022 Santa Ana River TDS and TIN Monitoring Work Plan*

Monitoring for Reach 3

Reach 3 Objectives: TDS = 700 mg/L and TIN = 10 mg/L



Proposed Reach 3 Monitoring in Draft 2022 Work Plan:

Site	Monitoring Performed	Monitoring Entity	Monitoring Frequency
USGS Gage at SAR @ Below Prado	EC Measurements *	USGS	Daily
SAR @ Below Prado	Water Quality inclusive of TDS/TIN	USGS and Others (OCWD)	Bi-weekly Monthly

***EC will be converted to TDS**

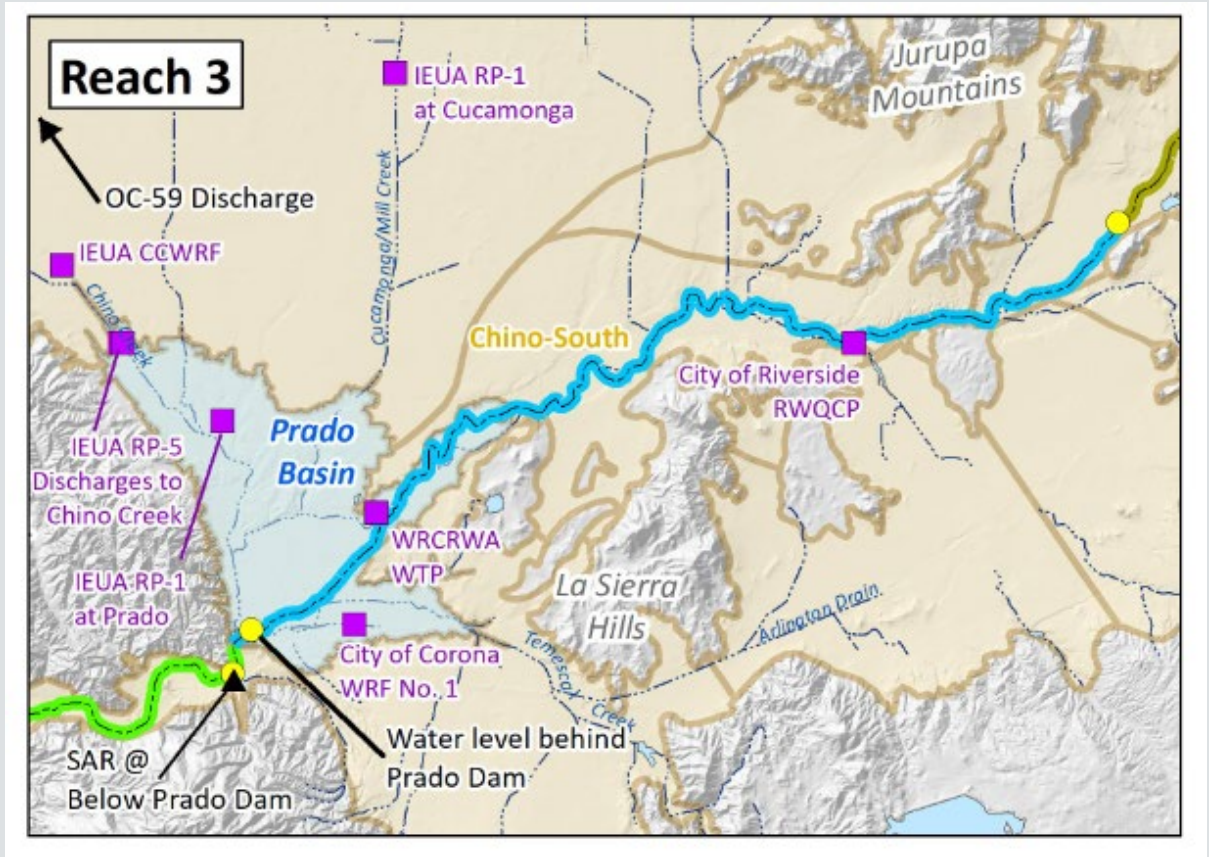
Compliance Metric: Annual Average of all TDS and TIN samples collected *during base flow conditions*

"Between March and October when there are no precipitation events and OC-59 discharge within the last four days, and the surface water level elevation of the conservation pool behind Prado Dam is at or below the level that is considered empty."

Monitoring for Reach 3 – Base Flow Definition

Draft Work Plan Considerations:

- The watershed receives regular storms through March. For this reason, it is recommended that the exclusion period for baseflow be expanded from November to April to align with the "flood season" which is commonly defined as October 31st thru March 31st.



Base flow conditions

"Between April and October when there are no precipitation events and OC-59 discharge within the last four days, and the surface water level elevation of the conservation pool behind Prado Dam is at or below the level that is considered empty."

Monitoring for Reach 3 – Use of Calculated TDS from EC

Draft Work Plan Considerations:

- OCWD continues to have concerns and disagrees with electrical conductivity (EC) data being used to evaluate compliance with the Reach 3 objective for the following:

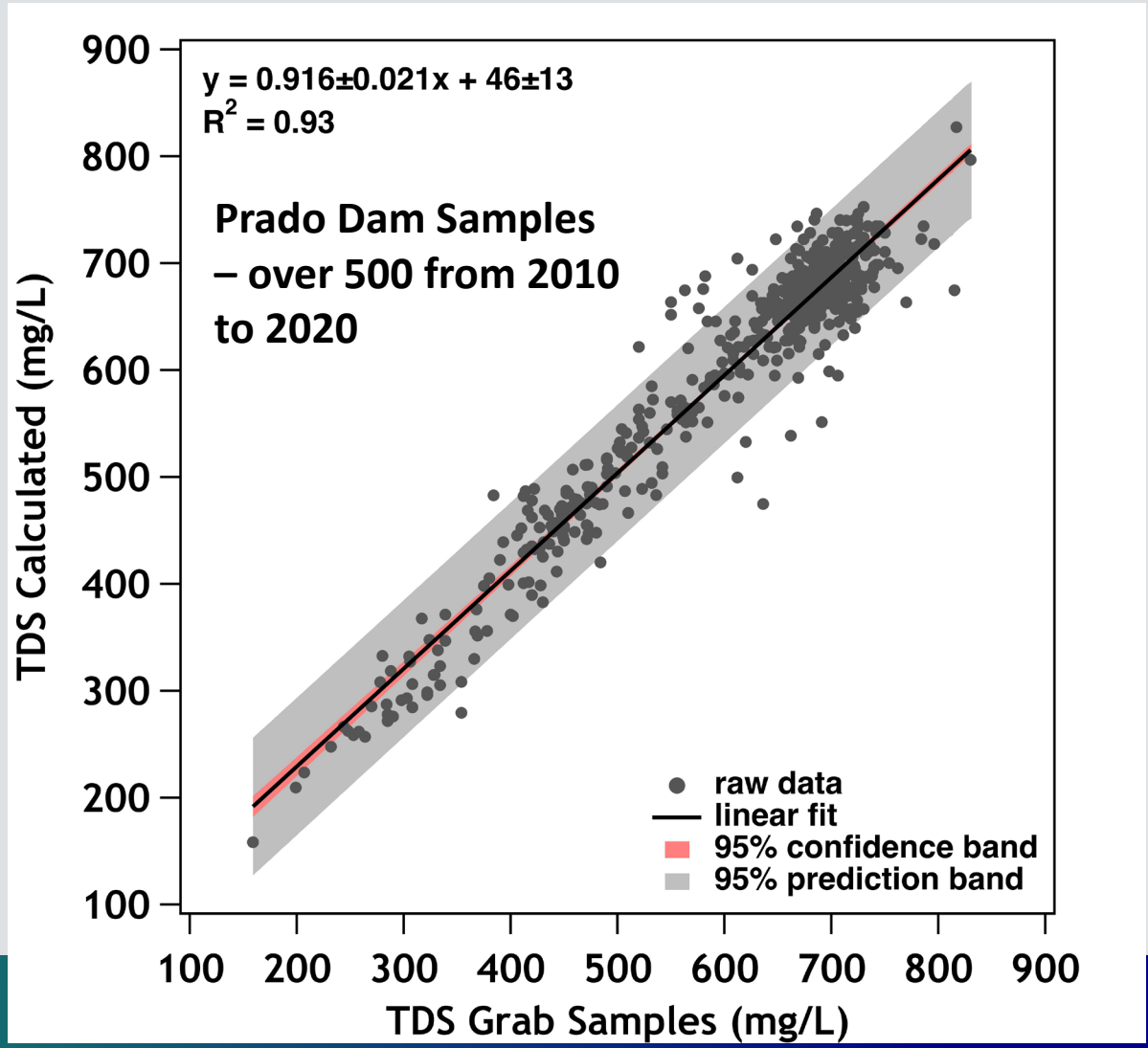
    1. EC cannot measure dissolved organic compounds (DOC) that are included in TDS and therefore EC will underrepresent the actual TDS.
    2. Additionally, it was OCWD's understanding that TDS data calculated from EC data may not be able to be input into CEDEN and therefore could not be included in the State Board's and EPA's evaluation of impairment. It is vital that the data considered by the Task Force are identical to the data used by the State Board/EPA to evaluate compliance.
    3. By expanding the baseflow time period and including samples from all agencies, not just the Regional Board, there will be significantly more data available (compared to current) to evaluate TDS compliance.

Monitoring for Reach 3 – Use of Calculated TDS from EC

1. EC cannot measure dissolved organic compounds (DOC) that are included in TDS and therefore EC will underrepresent the actual TDS.

Discussion:

- TDS measures the presence of inorganic salts and organic matter dissolved in water & EC is the measurement of water to conduct electrical current.
- DOC is organic material that is part of the dissolved solids measurement of TDS - not included in EC (if uncharged)
- DOC in the SAR at Prado is low (5 mg/L)
- TDS calculated from EC measurements are corrected to TDS lab results with DOC
- Grab samples vs. calculated – 2 methods well correlated, with a strong linear relationship (R^2 = 0.93)



Monitoring for Reach 3 – Use of Calculated TDS from EC

2. TDS data calculated from EC data may not be able to be input into CEDEN and therefore could not be included in the State Board's and EPA's evaluation of impairment.

Discussion:

- The daily USGS EC measurements can be uploaded to CEDEN
- The TDS grab samples can be uploaded to CEDEN
- The Basin Plan will need to clearly specify that TDS is based on both grab sample and calculated TDS and describe how the calculation is performed.

Monitoring for Reach 3 – Use of Calculated TDS from EC

3. Expanding baseflow time period and including all agency samples, not just Regional Board → significantly more data available (compared to current) to evaluate TDS compliance.

Discussion:

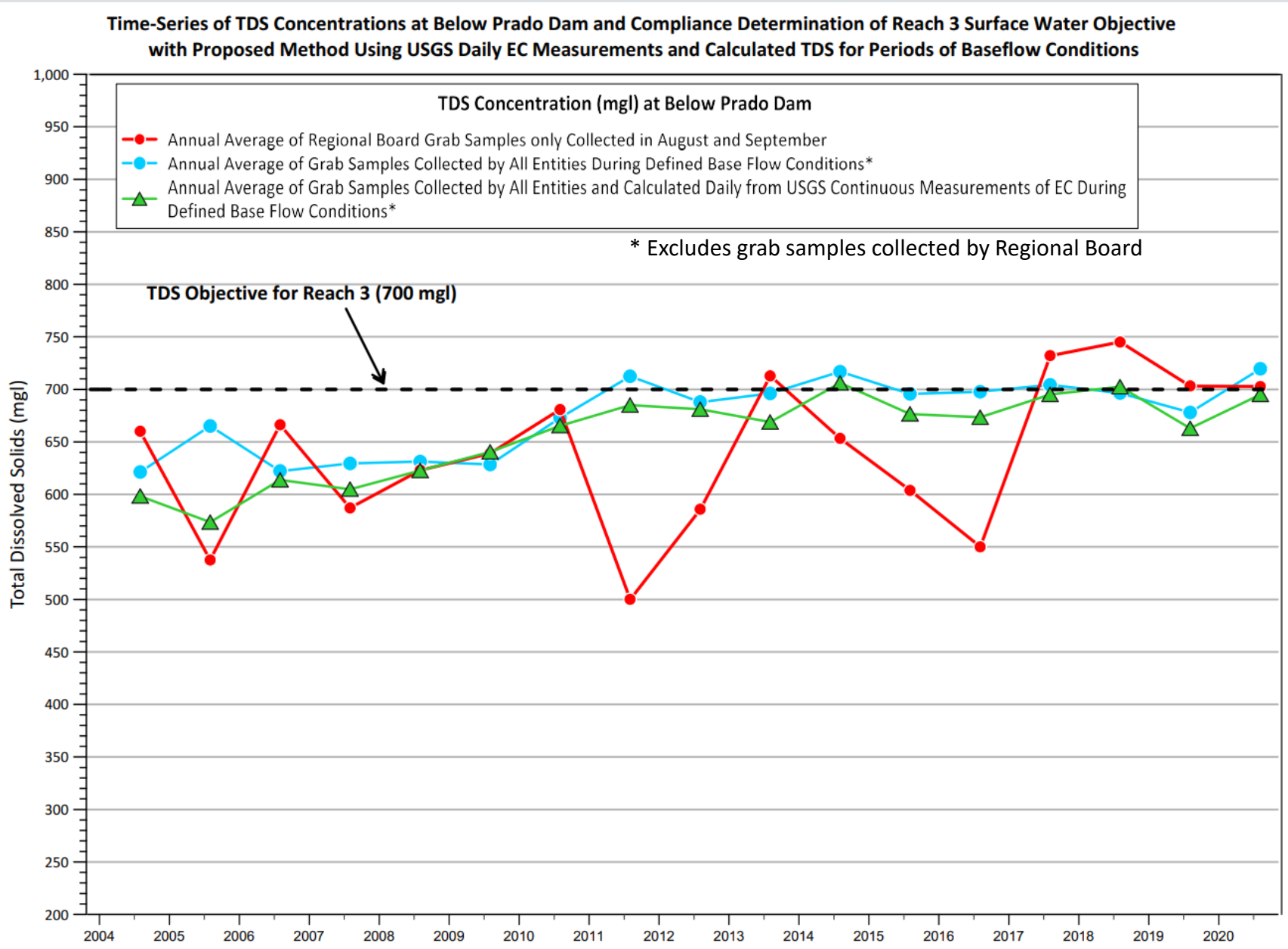
- Compare number of data points for each year

Summary of Number of TDS Data Points Each Year during Base Flow Conditions (between April - October)

Year	Number of Data Points		
	Regional Board Grab Samples	Grab Samples (1)	Grab Samples and TDS Calculated from EC (1)
2004	8	13	80
2005	8	1	12
2006	8	21	106
2007	4	34	158
2008	4	49	244
2009	7	24	150
2010	5	18	119
2011	7	5	34
2012	7	25	143
2013	5	23	186
2014	5	20	176
2015	5	17	70
2016	5	11	77
2017	6	24	174
2018	6	29	190
2019	5	15	114
2020	3	18	107

(1) - Excludes Regional Board grab sample data since it is proposed to not occur for future monitoring

Monitoring for Reach 3 – Use of Calculated TDS from EC



Compliance Assessment for Reach 3 – Options

Summary of Number of TDS Data Points Each Year during Base Flow Conditions (between April - October)

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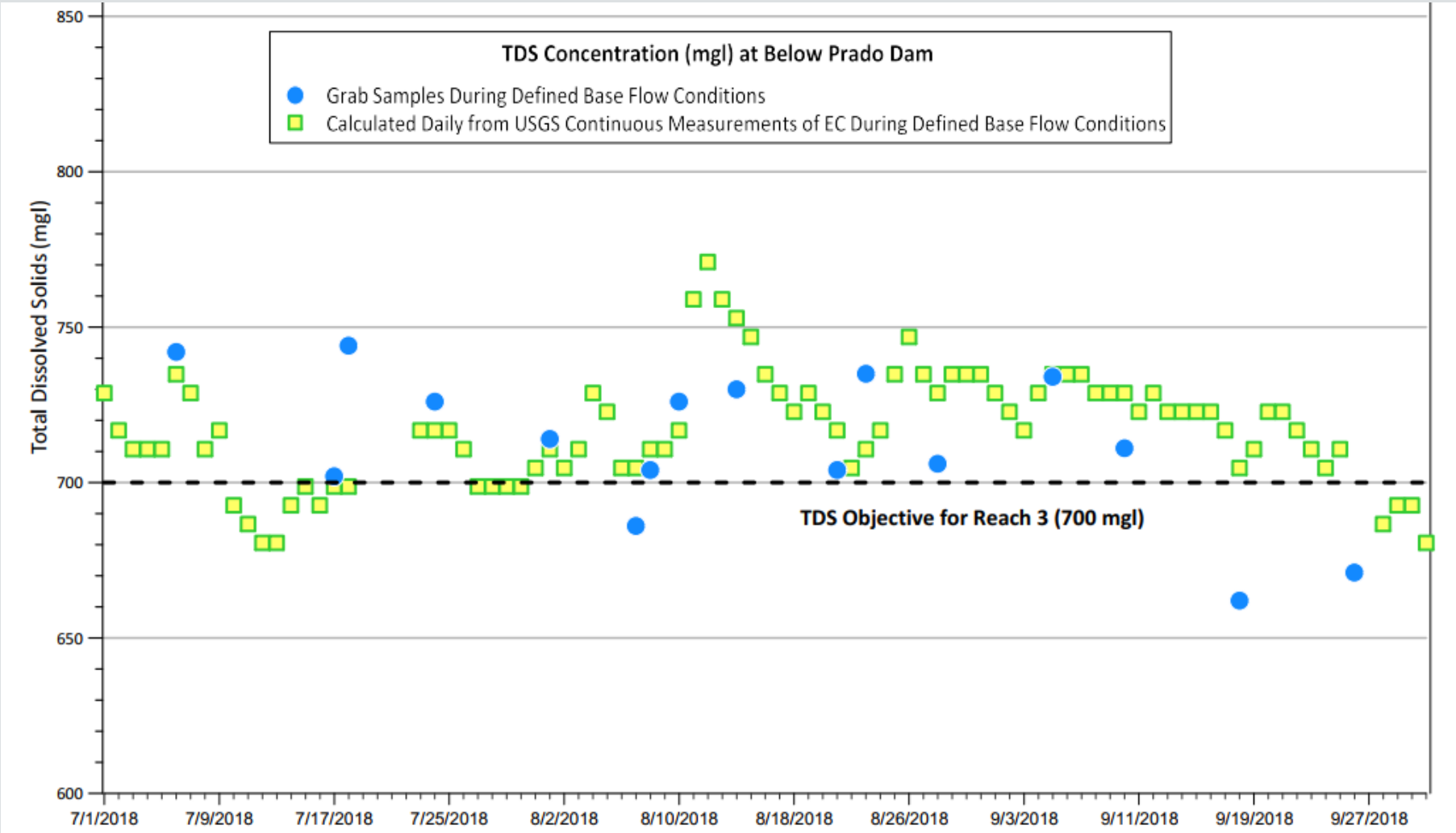
Monitoring for Reach 3 – Use of Calculated TDS from EC

Discussion:

Compare availability of TDS from calculated and grab samples during baseflow – look on a monthly interval

Should calculated TDS be used for Reach 3 compliance?



Next Steps

- **Week of February 20th, 2023** – Submit Final Work Plan for Task Force Review
  - Also, Special Study document will be prepared

- **Week of March 13th, 2023** – End of 3-week review period

- **March 31, 2023 –** Final Work Plan submitted to Regional Board