TDS & TIN Waste Load Allocations for the 2020 - 2040 Planning & Permitting Period[1]

Permittee/Discharge	Primary Receiving Water(s)		Discharge *(mgd)*[2]	TDS *(mg/L)*	TIN *(mg/L)*
	Surface Stream(s)	Groundwater MZ(s)			
City of Beaumont[3]	Noble Cr, Cooper's Cr. to San Timoteo Cr.-R4	Beaumont & San Timoteo	6.3 (1.8)[4]	300 (400)	3.6 (6.0)
Yucaipa Valley Water District[5]	San Timoteo Cr.-R3	San Timoteo	8.0	400	6.7
East Valley Water District-SNRC	City Cr. to SAR-R5	Bunker Hill-B	8.5	500	6.0
City of San Bernardino: Geothermal Discharges	East Twin Cr. & Warm Cr. to SAR-R5	Bunker Hill-A & B	1.0	264	0.7
City of Rialto	SAR-R4	Riverside-A	18.0	490	10.0
RIX (Cities of Colton & San Bernardino)	SAR-R4	Riverside-A	34.5	550	10.0
City of Riverside-RWQCP[6]	SAR-R3	Chino-South[7]	46.0	650	10.0[8]
City of Corona: WWTP-1 & WWTP-2	Temescal Cr.-R1A	Temescal	15.0	700	10.0
Inland Empire Utilities Agency: RP1, RP4, RP5, & CC	Chino Cr. & Cucamonga Cr.	Chino-North (or PBMZ)[9]	107.0[10]	550	8.0
Western MWD: WRCRWA	SAR-R3	N/A (PBMZ)	15.3	625	10.0
Western MWD: Arlington Desalter	Temescal Cr.-R1A	N/A (PBMZ)	7.25	260	4.4
Temescal Valley Water District-TVWRF	Temescal Cr.-R2	Upper Temescal Vly.	2.3	650	10.0[11]
Elsinore Valley MWD: RWWRF-DP001	Temescal Cr.-R5	Upper Temescal Vly.	12.0	700	10.0[12]
Eastern MWD: SJV, MV, PV, SC, TV	Temescal Cr.-R5	Upper Temescal Vly.	52.5[13]	650	10.0

Source: Geosciences Support Services, Inc. Santa Ana River Wasteload Allocation Model Update – Summary Report. Nov. 12, 2019 (see Table 20).

[1] WLA is reviewed and revised approximately every ten 10 years; next WLA update, for the 2030-2050 planning period, is scheduled to occur in 2030.
[2] Maximum Expected Discharge = average daily flow of tertiary-treated wastewater to surface waters.
[3] Effluent limits revert to 320 mg/L for TDS and 4.1 mg/L for TIN if Reg. Bd. determines that Beaumont failed to comply with Maximum Benefit conditions.
[4] Higher effluent limits apply only to first 1.8 mgd. Lower effluent limits apply to discharges greater than 1.8 mgd.
[5] Effluent limits revert to 320 mg/L for TDS and 4.1 mg/L for TIN if Reg. Bd. determines that YVWD failed to comply with Maximum Benefit conditions.
[6] Includes the City's planned discharges to Anza Drain, Old Farm Rd. Channel, Tequesquite Arroyo & Evans Drain (all are tributary to SAR-R3).
[7] No significant streambed percolation occurs in the upper segment of SAR-R3 overlying the Riverside-A GMZ (i.e. the Riverside Narrows area).
[8] Effluent limit for TIN is more stringent than the 2004 WLA but is consistent with the requirements of Order No. R8-2013-0016 and current plant performance.
[9] The Prado Basin Management Zone (PBMZ) is a surface water feature where no significant groundwater storage or streambed percolation occurs.
[10] Compliance with the applicable effluent limit is evaluated collectively based on the volume-weighted average of all four POTW (aka "bubble permit").
[11] Effluent limit for TIN is more stringent than the 2004 WLA and is based on Best Practicable Treatment or Control for TIN by POTWs in the region.
[12] Effluent limit for TIN is more stringent than the 2004 WLA and based on the treatment plant's design and demonstrated performance.
[13] Discharge occurs only in years where average annual rainfall is greater than the long-term median value and only in the wettest 6 months of those years.

1) Discharges to surface waters overlying the Beaumont GMZ

(including: Noble Creek, Cooper's Creek and Reach 4 of San Timoteo Creek)

A) TDS:

Water Quality Metric	Concentration
Basin Plan Objective (Max. Ben.)	330 mg/L
Est. Average Concentration (2015)	290 mg/L
Est. Assimilative Capacity	40 mg/L

Highest Estimated Volume-Weighted Average TDS Concentration in Streambed Recharge during Critical Condition (10-Year Drought)

Planning Period	Maximum Discharge	Most Likely Discharge	Minimum Discharge
2020	172 mg/L	172 mg/L	173 mg/L
2040	157 mg/L	157 mg/L	157 mg/L

B) TIN:

Water Quality Metric	Concentration
Basin Plan Objective (Max. Ben.)	5.0 mg/L
Est. Average Concentration (2015)	2.9 mg/L
Est. Assimilative Capacity	2.1 mg/L

Highest Estimated Volume-Weighted Average TIN Concentration in Streambed Recharge during Critical Condition (10-Year Drought)

Planning Period	Maximum Discharge	Most Likely Discharge	Minimum Discharge
2020	1.40 mg/L	1.41 mg/L	1.43 mg/L
2040	1.16 mg/L	1.16 mg/L	1.16 mg/L

C) Key Finding(s):

i. Authorizing discharges consistent with the assumptions and requirements of the approved WLA will not result in lower water quality for TDS or TIN in the Beaumont Groundwater Management Zone.

ii. The Maximum Benefit Objectives were previously established, in accordance with SWRCB Res. No. 68-16, by Regional Board Order No. R8-2014-0005.

2) Discharges to surface waters overlying the San Timoteo GMZ

(including: Reaches 2, 3 & 4 of San Timoteo Creek)

A) TDS:

Water Quality Metric	Concentration
Basin Plan Objective (Max. Ben.)	400 mg/L
Est. Average Concentration (2015)	420 mg/L
Est. Assimilative Capacity	none

Highest Estimated Volume-Weighted Average TDS Concentration in Streambed Recharge during Critical Condition (10-Year Drought)

Planning Period	Maximum Discharge	Most Likely Discharge	Minimum Discharge
2020	337 mg/L	335 mg/L	333 mg/L
2040	280 mg/L	277 mg/L	265 mg/L

B) TIN:

Water Quality Metric	Concentration
Basin Plan Objective (Max. Ben.)	5.0 mg/L
Est. Average Concentration (2015)	2.0 mg/L
Est. Assimilative Capacity	3.0 mg/L

Highest Estimated Volume-Weighted Average TIN Concentration in Streambed Recharge during Critical Condition (10-Year Drought)

Planning Period	Maximum Discharge	Most Likely Discharge	Minimum Discharge
2020	3.84 mg/L	3.72 mg/L	3.57 mg/L
2040	2.98 mg/L	2.92 mg/L	2.61 mg/L

C) Key Finding(s):

i. Authorizing discharges consistent with the assumptions and requirements of the approved WLA will not result in lower water quality for TDS in the San Timoteo Groundwater Management Zone.

ii. Authorizing discharges consistent with the assumptions and requirements of the approved WLA will result in lower water quality for TIN in the San Timoteo GMZ. This lower water quality and the Maximum Benefit Objectives were previously authorized, in accordance with SWRCB Res. No. 68-16, by Regional Board Order No. R8-2014-0005.

3) Discharges to surface waters overlying the Bunker Hill-B GMZ

(including: City Creek, Reach 1 of San Timoteo Creek & Reach 5 of the Santa Ana River)

A) TDS:

Water Quality Metric	Concentration
Basin Plan Objective	330 mg/L
Est. Average Concentration (2015)	290 mg/L
Est. Assimilative Capacity	40 mg/L

Highest Estimated Volume-Weighted Average TDS Concentration in Streambed Recharge during Critical Condition (10-Year Drought)

Planning Period	Maximum Discharge	Most Likely Discharge	Minimum Discharge
2020	281 mg/L	249 mg/L	220 mg/L
2040	260 mg/L	250 mg/L	225 mg/L

B) TIN:

Water Quality Metric	Concentration
Basin Plan Objective	7.3 mg/L
Est. Average Concentration (2015)	5.8 mg/L
Est. Assimilative Capacity	1.5 mg/L

Highest Estimated Volume-Weighted Average TIN Concentration in Streambed Recharge during Critical Condition (10-Year Drought)

Planning Period	Maximum Discharge	Most Likely Discharge	Minimum Discharge
2020	3.09 mg/L	2.62 mg/L	2.27 mg/L
2040	2.74 mg/L	2.59 mg/L	2.21 mg/L

C) Key Finding(s):

i. Authorizing discharges consistent with the assumptions and requirements of the approved WLA will not result in lower water quality for TDS or TIN in the Bunker Hill-B Groundwater Management Zone.

ii.

4) Discharges to surface waters overlying the Colton GMZ

(including: Reach 4 of the Santa Ana River)

A) TDS:

Water Quality Metric	Concentration
Basin Plan Objective	410 mg/L
Est. Average Concentration (2015)	480 mg/L
Est. Assimilative Capacity	none

Highest Estimated Volume-Weighted Average TDS Concentration in Streambed Recharge during Critical Condition (10-Year Drought)

Planning Period	Maximum Discharge	Most Likely Discharge	Minimum Discharge
2020	317 mg/L	246 mg/L	217 mg/L
2040	290 mg/L	281 mg/L	233 mg/L

B) TIN:

Water Quality Metric	Concentration
Basin Plan Objective	2.7 mg/L
Est. Average Concentration (2015)	3.3 mg/L
Est. Assimilative Capacity	none

Highest Estimated Volume-Weighted Average TIN Concentration in Streambed Recharge during Critical Condition (10-Year Drought)

Planning Period	Maximum Discharge	Most Likely Discharge	Minimum Discharge
2020	3.12 mg/L	1.95 mg/L	1.64 mg/L
2040	2.87 mg/L	2.64 mg/L	1.81 mg/L

C) Key Finding(s):

i. Authorizing discharges consistent with the assumptions and requirements of the approved WLA will not result in lower water quality for TDS in the Colton Groundwater Management Zone.

ii. Authorizing discharges consistent with the assumptions and requirements of the approved WLA may result in lower water quality for TIN in the Colton Groundwater Management Zone under some conditions. Additional regulatory review and analysis of potential downstream impacts may be required in order to approve the proposed effluent limits for some of EVWD's planned discharges to City Creek from the new SNRC-POTW.

5) Discharges to surface waters overlying the Riverside-A GMZ

(including: Reach 4 of the Santa Ana River*)

A) TDS:

Water Quality Metric	Concentration
Basin Plan Objective	560 mg/L
Est. Average Concentration (2015)	440 mg/L
Est. Assimilative Capacity	120 mg/L

Highest Estimated Volume-Weighted Average TDS Concentration in Streambed Recharge during Critical Condition (10-Year Drought)

Planning Period	Maximum Discharge	Most Likely Discharge	Minimum Discharge
2020	477 mg/L	440 mg/L	436 mg/L
2040	457 mg/L	434 mg/L	417 mg/L

B) TIN:

Water Quality Metric	Concentration
Basin Plan Objective	6.2 mg/L
Est. Average Concentration (2015)	5.6 mg/L
Est. Assimilative Capacity	0.6 mg/L

Highest Estimated Volume-Weighted Average TIN Concentration in Streambed Recharge during Critical Condition (10-Year Drought)

Planning Period	Maximum Discharge	Most Likely Discharge	Minimum Discharge
2020	6.44 mg/L	5.96 mg/L	5.90 mg/L
2040	6.27 mg/L	5.90 mg/L	5.57 mg/L

C) Key Finding(s):

i. Authorizing discharges consistent with the assumptions and requirements of the approved WLA may result in lower water quality for TDS and TIN in the Riverside-A Groundwater Management Zone under some conditions.

ii. The Regional Board may need to allocate some of the available assimilative capacity, pursuant to SWRCB Res. No. 68-16, in order to reauthorize the existing effluent limits for TDS and TIN in RIX and Rialto's discharges (see Section #6, below).

Note: No significant streambed recharge occurs fin Reach 3 of the Santa Ana River overlying the Riverside-A GMZ due to rising groundwater in the Riverside Narrows.

6) Allocations of assimilative capacity in Riverside-A GMZ is justified

A) TDS:

i. Actual degradation unlikely; predicted only in Maximum Discharge scenarios
ii. Actual 10-yr avg. recharge quality during drought
    * 2007-16 = 413mg/L
    * Only 1 yr. >440 mg/L
iii. Existing permit limits already less than applicable TDS objective of 590 mg/L
    * Rialto = 490 mg/L
    * RIX = 550 mg/L
iv. Actual 10-yr. average effluent quality is much better than permit limits
    * Rialto = 401 mg/L
    * RIX = 492 mg/L)
v. Degradation, if any, is temporary (in most likely discharge scenario)
    * 52% years <440 mg/L
    * No single year >490 mg/L
    * 20-year average =434 mg/L in 2020 and 428 mg/L in 2040
    * Long-term (67-year average) = 399 mg/L
vi. Rising TDS concentrations in effluent is due to:
    * Drought (reduced availability of low-TDS state project water)
    * State and local conservation policies

B) TIN:

i. Actual average recharge quality during drought (2005-2016)
    * 12-year average = 4.5 mg/L
    * Only 1 year >5.6 mg/L
    * Worst single year = 5.9 mg/L (did not exceed WQO)
ii. Actual 10-year average effluent quality is much better than permit limits
    * Rialto = 8.9 mg/L (vs. limit of 10 mg/L) = BPTF
    * RIX = 7.5 mg/L (vs. limit of 10 mg/L) = BPTC
iii. Degradation, if any, is temporary (in most likely discharge scenario)
    * 75% of all 10-year running averages <5.6 mg/L
    * 30% of all 10-year running averages <5.0 mg/L
    * Long-term (67-yr. average) = 5.2 mg/L

C) Allocation of Assimilative Capacity for Temporary Degradation = Maximum Benefit

i. Facilitates groundwater recharge in Riverside-A (47,249 ac.-ft./yr.
ii. Max. upstream discharge improves TIN & TDS quality in Chino-South GMZ
iii. Max. upstream discharge essential to dilute high TDS groundwater @ Prado
iv. Increased compliance cost grossly disproportionate to water quality benefits
v. Dischargers will undertake site-specific N-loss study in next permit term

7) Discharges to surface waters overlying the Chino-South GMZ

(including: Reach 3 of the Santa Ana River)

A) TDS:

Water Quality Metric	Concentration
Basin Plan Objective	680 mg/L
Est. Average Concentration (2015)	940 mg/L
Est. Assimilative Capacity	none

Highest Estimated Volume-Weighted Average TDS Concentration in Streambed Recharge during Critical Condition (10-Year Drought)

Planning Period	Maximum Discharge	Most Likely Discharge	Minimum Discharge
2020	458 mg/L	466 mg/L	468 mg/L
2040	417 mg/L	419 mg/L	422 mg/L

B) TIN:

Water Quality Metric	Concentration
Basin Plan Objective	5.0 mg/L
Est. Average Concentration (2015)	27.8mg/L
Est. Assimilative Capacity	none

Highest Estimated Volume-Weighted Average TIN Concentration in Streambed Recharge during Critical Condition (10-Year Drought)

Planning Period	Maximum Discharge	Most Likely Discharge	Minimum Discharge
2020	3.20 mg/L	3.18 mg/L	3.16 mg/L
2040	2.96 mg/L	2.84 mg/L	2.82 mg/L

C) Key Finding(s):

i. Authorizing discharges consistent with the assumptions and requirements of the approved WLA will not result in lower water quality for TDS or TIN in the Chino-South Groundwater Management Zone.

ii.

8) Discharges to surface waters overlying the Upper Temescal Valley GMZ

(including: Reaches 2, 3, 4, 5 & 6 of Temescal Creek)

A) TDS:

Water Quality Metric	Concentration
Basin Plan Objective *(pending)*	820 mg/L
Est. Average Concentration (2014)	750 mg/L
Est. Assimilative Capacity	70 mg/L/none

Highest Estimated Volume-Weighted Average TDS Concentration in Streambed Recharge during Critical Condition (10-Year Drought)

Planning Period	Maximum Discharge	Most Likely Discharge	Minimum Discharge
2020	629 mg/L	354 mg/L	279 mg/L
2040	604 mg/L	374 mg/L	327 mg/L

B) TIN:

Water Quality Metric	Concentration
Basin Plan Objective *(pending)*	7.9 mg/L
Est. Average Concentration (2014)	4.7 mg/L
Est. Assimilative Capacity	3.2 mg/L

Highest Estimated Volume-Weighted Average TIN Concentration in Streambed Recharge during Critical Condition (10-Year Drought)

Planning Period	Maximum Discharge	Most Likely Discharge	Minimum Discharge
2020	6.80 mg/L	3.84 mg/L	2.92 mg/L
2040	6.50 mg/L	4.04 mg/L	3.44 mg/L

C) Key Finding(s):

i. Authorizing discharges consistent with the assumptions and requirements of the approved WLA will not result in lower water quality for TDS in the Upper Temescal Valley Groundwater Management Zone.

ii. Authorizing discharges consistent with the assumptions and requirements of the approved WLA may result in lower water quality for TIN in the Upper Temescal Valley Groundwater Management Zone under some conditions. The Regional Board may need to allocate some of the available assimilative capacity, or make other findings pursuant to SWRCB Res. No. 68-16, in order to reauthorize the existing effluent limits for TIN in EMWD and EVMWD's permitted discharges to Temescal Creek (see Section 9, below).

9) Allocation of assimilative capacity in Upper Temescal Valley GMZ is justified

A) No Lowering of Water Quality Compared to TIN Objective in Current Basin Plan

Total Inorganic Nitrogen	Existing
Water Quality Objective *(Res. R9-2004-0001)*	10.0 mg/L
Estimated Current Average Concentration (DBS, 2015)	10.9 mg/L
Estimated Available Assimilative Capacity	none
Highest 10-year Avg. in Maximum Discharge Scenarios	6.5-6.8 mg/L

B) WLAM Projects Lower Water Quality Only in the Maximum Discharge Scenarios

C) Max. Discharge Scenarios Rely on Extreme Worst-Case Assumptions

i. Assumes EVMWD discharges 8-12 mgd full-time (365 days/yr. for 10 years) to Temescal Creek. In reality, EVMWD only discharge 0.5 mgd full-time to Temescal Creek. The rest is discharged to Lake Elsinore in order to offset evaporation and stabilize water levels in the lake. Larger flows to Temescal Creek are unlikely to occur unless the elevation of Lake Elsinore is already <1247' msl or some other emergency condition occurs. In either case, such large-scale discharges are unlikely to persist for more than a year or two.

ii. Assumes Average TIN Concentration in EVMWD's effluent is 10 mg/L. In reality, the volume-weighted annual average TIN concentration in EVMWD's final effluent is <6 mg/L. This is required in order to comply with the more stringent waste load allocation for total nitrogen imposed on EVMWD's discharges to Lake Elsinore which are governed by a TMDL adopted by the Regional Board in 2004. If unusual conditions forced EVMWD to discharge all of its treated wastewater to Temescal Creek instead of Lake Elsinore, there is no reason to expect that the TIN concentration in the effluent would suddenly increase by 75% (from 6 mg/L to 10 mg/L).

iii. Assumes EMWD will discharge to Temescal Creek for 6 months in the wettest half of all years. Historically, EMWD rarely discharges to Temescal Creek (less than 20% of all years) and, even then, for only a few months.

iv. Assumes worst-case conditions occur simultaneously at EVMWD & EMWD

D) No Lowering of Water Quality in the Most Likely Discharge Scenarios.

In the 2020 land use condition, no single year had an average TIN concentration in the streambed recharge that was greater than the average TIN concentration in the UTV-GMZ. On the 2040 land use condition, only 1-of-67 years had and average concentration in the streambed recharge (4.8 mg/L) that was higher than the average TIN concentration in the UTV-GMZ (4.7 mg/).

10) Discharges to surface waters overlying the Orange County GMZ

(including: Reach 2 of the Santa Ana River)

A) TDS:

Water Quality Metric	Concentration
Basin Plan Objective	580 mg/L
Est. Average Concentration (2015)	600 mg/L
Est. Assimilative Capacity	none

Highest Estimated Volume-Weighted Average TDS Concentration in Streambed Recharge during Critical Condition (10-Year Drought)

Planning Period	Maximum Discharge	Most Likely Discharge	Minimum Discharge
2020	561 mg/L	610 mg/L	634 mg/L
2040	509 mg/L	597 mg/L	611 mg/L

B) TIN:

Water Quality Metric	Concentration
Basin Plan Objective	3.4 mg/L
Est. Average Concentration (2015)	3.0 mg/L
Est. Assimilative Capacity	0.4 mg/L

Highest Estimated Volume-Weighted Average TIN Concentration in Streambed Recharge during Critical Condition (10-Year Drought)

Planning Period	Maximum Discharge	Most Likely Discharge	Minimum Discharge
2020	2.88 mg/L	2.78 mg/L	2.33 mg/L
2040	3.10 mg/L	2.84 mg/L	2.30 mg/L

C) Key Finding(s):

i. Authorizing discharges consistent with the assumptions and requirements of the approved WLA may result in lower water quality for TDS and TIN in the Orange County Groundwater Management Zone.

ii. Because there is no available assimilative capacity for TIN or TDS, effluent limits for upstream discharges must be set no higher than the applicable baseflow objectives for SAR-R3 (TDS=700 mg/L and TIN=10 mg/L) pursuant to SWRCB Order Nos. 73-4 and 81-5. The effluent limits evaluated in the proposed WLA already conform to this requirement (see Section 11, below).

11) Basis for approving the TDS waste load allocation above Prado Dam

A) Relevant surface water objectives for TDS:

Basin Plan Objective	Concentration	Averaging Period
SAR - R3 (@ Prado Dam)	700 mg/L	Volume-Weighted Baseflow (August - September)
SAR - Reach 2	650 mg/L	Running 5-year Mean of Annual Vol. Wtd. Averages

B) Inconsistent conclusions regarding compliance

i. WLAM Projections for Baseflow in Santa Ana River - Reach 3 (@ Prado)

Highest Estimated Volume-Weighted Annual Baseflow Avg. TDS (mg/L)

Planning Period	Maximum Discharge	Most Likely Discharge	Minimum Discharge
2020	619	733	774
2040	617	730	761

ii. WLAM Projections for Santa Ana River - Reach 2

Highest Estimated 5-yr. Mean of Annual Vol-Wtd. Avg. TDS (mg/L)

Planning Period	Maximum Discharge	Most Likely Discharge	Minimum Discharge
2020	523	481	445
2040	522	464	421

C) POTW discharges not causing or contributing to projected exceedances of baseflow objective for TDS in SAR-R3 at Prado Dam.

Prior studies by WEI (2015) and current WLAM by GSS (2019) demonstrated that elevated TDS in rising groundwater (in the PBMZ) is the primary cause; POTW discharges dilute this TDS and improve water quality below Prado Dam. WLAM scenarios confirm that TDS concentrations in baseflow at Prado decrease as POTW discharges increase.

D) Baseflow exceedances are temporary

Most Likely Discharge Condition	2020	2040
Highest Annual Avg. for Baseflow	733 mg/L	730 mg/L
Highest 1-yr. Volume-Weighted Average	623 mg/L	610 mg/L
Highest 5-yr. Volume-Weighted Average	477 mg/L	460 mg/L
% of Individual Years Baseflow Avg. >700 mg/L	59%	60%
% of Individual Years Vol.-Wtd. Avg. <650 mg/L	100%	100%

E) All discharges to SAR-R3 w/ TDS in excess of 700 mg/L must be offset

F) Task Force commits to conduct source investigation and alternatives analysis