

BACWA Annual Meeting: Group Annual Report and 2nd Watershed Permit Recycled Water Updates

May 6, 2022





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BACWA Impacts on Nutrient Mgmt Beyond the Bay Area

- Routinely EPA Referenced Watershed for the Developed Approach/Vision
- Water Research Foundation (WRF): Supporting Nutrient Mgmt Efforts (#'s 4973, 4974, and 5087)
- Puget Sound Clean Water Alliance (PSCWA): Provided Invaluable Input on the Benefits that Resulted in the Formation of PSCWA
- Delaware River Basin Commission: Relying on BACWA's Proven Watershed Based Approach for Nutrient Mgmt



Delaware River Basin Commission (12 Dischargers)





The Puget Sound Clean Water Alliance We analyze peer-reviewed, scientific, (PSCWA) provides a collective voice for clean environmental, and economic data and use it water agencies in the region that are dedicated to develop regional strategies aimed at to the effective stewardship of a healthy, vibrant protecting and enhancing Puget Sound. Puget Sound.

We strive to maintain and improve water quality through solutions based on sound, peerreviewed science. We believe that a watershed approach using adaptive management practices is essential to the long-term protection of Puget Sound.

Formation of the Puget Sound Clean Water Alliance



3 P's Framework for Successful Implementation: Holistic Approach to Improved Nutrient Management (WRF #4973)



Group Annual Report Update

Group Annual Report: Submitted to the Water Board in February 2022

- Influent Flows and Loads:
 - $_{\odot}\,$ 9 Quarters worth of data
 - Limited to Plants >10 mgd permitted capacity
- Discharge Flows and Loads:
 - 2020/2021 was relatively dry
 - $_{\odot}$ 2020/2021 dataset captures 12-months of COVID19 data
 - Dry season flows and loads lowest since sampling began in
 2012 (except total P)
- Several dischargers optimized (e.g., San Jose) and/or upgraded (e.g., Oro Loma, Pinole, etc.) for nutrients
- Future is unclear with impacts from drought/COVID19
- Recycled Water Volumes: included for 10/20-9/21



2021 Group Annual Report Summary: Flow

Averaging Period	Constituent	Units	2012/ 2013	2013/ 2014	2014/ 2015	2015/ 2016	2016/ 2017	2017/ 2018	2018/ 2019	2019/ 2020	2020/ 2021	9-Yr Average
Dry Season	Flow	mgd	393	374	351	372	396	383	394	363	339	374
Ave Annual	Flow	mgd	451	428	415	430	515	433	480	408	374	437



Flows for 2020/2021:

- Both dry and annual average flows are lowest since Section 13267 Letter data request in 2012
- Dry Season dropped ~7% since 2020 (~9% lower than 9-Year Average)
- Ave Annual dropped ~8% since 2019/2020 (~14% lower than 9-Year Average)

2021 Group Annual Report Summary: Flow and Precipitation



Flows for 2020/2021:

- Both dry and annual average flows are lowest since Section 13267 Letter data request in 2012
- Dry Season dropped ~7% since 2020 (~9% lower than 9-Year Average)
- Ave Annual dropped ~8% since 2019/2020 (~14% lower than 9-Year Average)

2021 Group Annual Report Summary: Ammonia

Averaging	Constituent	Units	2012/	2013/	2014/	2015/	2016/	2017/	2018/	2019/	2020/	9-Yr
Period			2013	2014	2015	2016	2017	2018	2019	2020	2021	Average
Dry Season	Ammonia	kg N/d	34,000	36,300	36,200	37,300	38,900	38,900	38,200	35,400	33,600	36,500
Ave Annual	Ammonia	kg N/d	34,300	37,000	36,700	37,500	40,600	40,800	39,800	38,000	35,300	37,800



- Dry season lowest since sampling began in 2012 (Ave Annual is the 2nd lowest)
- Dry Season loads dropped ~5% from previous year (~8% less than 9-Yr Ave)
- Ave Annual loads dropped ~7% from previous year (~7% less than 9-Yr Ave))

2021 Group Annual Report Summary: Total Inorganic Nitrogen (TIN)

Averaging	Constituent	Units	2012/	2013/	2014/	2015/	2016/	2017/	2018/	2019/	2020/	9-Yr
Period			2013	2014	2015	2016	2017	2018	2019	2020	2021	Average
Dry Season	TIN	kg N/d	47,300	48,100	48,700	48,400	50,600	50,000	49,100	45,700	43,100	47,900
Ave Annual	TIN	kg N/d	49,300	51,300	50,900	51,100	55,000	53,200	53,100	49,900	46,000	51,100



- Both dry and annual average loads are lowest since Section 13267 Letter data request in 2012
- Dry Season dropped ~6% since 2020 (~10% lower than 9-Year Average)
- Ave Annual dropped ~8% since 2019/2020 (~10% lower than 9-Year Average)

2021 Group Annual Report Summary: Total Phosphorus (TP)

Averaging Period	Constituent	Units	2012/ 2013	2013/ 2014	2014/ 2015	2015/ 2016	2016/ 2017	2017/ 2018	2018/ 2019	2019/ 2020	2020/ 2021	9-Yr Average
Dry Season	Total P	kg P/d	3,400	3,320	3,570	3,960	3,660	4,000	4,010	3,790	3,680	3,710
Ave Annual	Total P	kg P/d	3,860	3,750	3,770	4,070	4,020	4,190	4,210	4,010	3,670	3,950



Total Phosphorus (TP) for 2020/2021:

- Dry Season load reduction not as pronounced as flows/N species (~1% lower than 9-Yr Ave.)
- Ave Annual loads lowest since Section 13267 Letter data request in 2012

Overview and Potential Reasons for the 2020/2021 Reductions

- Dry Season flows/loads lowest for all parameters shown (except for total P)
- Potential Reasons for 2020/2021 Reductions:
 - $_{\odot}$ COVID19 seems to play a prominent role
 - Less daily commuters
 - Less tourists/business travelers
 - Smaller loads from restaurants, bars, gyms, etc
 - Population moved out of the Bay Area (unclear if temporary or permanent)
 - Plants improving nutrient reduction? Several agencies have implemented nutrient optimization (e.g., San Jose) and upgrades (e.g., Oro Loma/Castro Valley SD, Pinole, etc.)
 Lack of rain events as evidenced by the lowest flow peaking factors since sampling began
 Others?

2021 Group Annual Report: Year-Round Recycled Water Volumes

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Subembayment	Golf Course *	Landscape Irrigation *	Commercial *	Industrial *	Agricultural *	Potable Reuse *	Other *.**	Total for 2020/2021 **
Suisun Bay	690 (0.616)	528 (0.471)	41 (0.037)	8,800 (7.88)	968 (0.864)	-	34.2 (0.031)	11,100 (9.89)
San Pablo Bay	2,000 (1.79)	1,830 (1.63)	24.9 (0.022)	595 (0.531)	5,550 (4.96)	-	779 (0.695)	10,800 (9.63)
Central Bay	-	236 (0.21)	-	7,600 (6.79)	-	-	2.52 (0.002)	7,840 (7.00)
South Bay	1,040 (0.926)	3,520 (3.14)	1,800 (1.60)	1,750 (1.56)	-	-	10.5 (0.009)	8,120 (7.25)
Lower South Bay	341 (0.304)	375 (0.334)	2 (<0.01)	-	-	-	30.4 (0.027)	14,300 (12.7)
Total	4,070 (3.64)	6,490 (5.79)	1,860 (1.66)	18,770 (16.8)	6,520 (5.82)	-	856 (0.765)	52,100 (46.5)

Table 6-3. Recycled Water: Annual Average Recycled Water Volumes by Subembayment for 2020/2021, Acre-Feet (mgd)

* Refer to Section 3.6 for definitions for each recycled water user type.

** There are a few dischargers that were not able to provide recycled water volumes by use. For such instances, the volumes are limited to the right-hand column, titled "Total for 2020/2021 column".

Year-Round: i) approx. 11 percent of the effluent flow is recycled (46.5 mgd ÷ (374 mgd + 46.5 mgd) = 11%), ii) industrial is primary user, and iii) Lower South Bay has the highest demand

2021 Group Annual Report: Year-Round and Dry Season (5/1-9/30) Recycled Water Volumes

Table 6-3. Recycled Water: Annual Average Recycled Water Volumes by Subembayment for 2020/2021, Acre-Feet (mgd)

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Subembayment	Golf Course *	Irrigation *	Commercial *	Industrial *	Agricultural *	Reuse *	Other *.**	2020/2021 **
Suisun Bay	690 (0.616)	528 (0.471)	41 (0.037)	8,800 (7.88)	968 (0.864)	-	34.2 (0.031)	11,100 (9.89)
San Pablo Bay	2,000 (1.79)	1,830 (1.63)	24.9 (0.022)	595 (0.531)	5,550 (4.96)	-	779 (0.695)	10,800 (9.63)
Central Bay	-	236 (0.21)	-	7,600 (6.79)	-	-	2.52 (0.002)	7,840 (7.00)
South Bay	1,040 (0.926)	3,520 (3.14)	1,800 (1.60)	1,750 (1.56)	-	-	10.5 (0.009)	8,120 (7.25)
Lower South Bay	341 (0.304)	375 (0.334)	2 (<0.01)	-	-	-	30.4 (0.027)	14,300 (12.7)
Total	4,070 (3.64)	6,490 (5.79)	1,860 (1.66)	18,770 (16.8)	6,520 (5.82)	-	856 (0.765)	52,100 (46.5)

* Refer to Section 3.6 for definitions for each recycled water user type.

** There are a few dischargers that were not able to provide recycled water volumes by use. For such instances, the volumes are limited to the right-hand column, titled "Total for 2020/2021 column".

Table 6-4. Recycled Water: Dry Season Average Flows by Subembayment for 2020/2021, Acre-Feet (mgd)

Subembayment	Golf Course *	Landscape Irrigation *	Commercial *	Industrial *	Agricultural *	Potable Reuse *	Other *.**	Total for 2020/2021 **
Suisun Bay	526 (1.12)	374 (0.797)	37.2 (0.079)	4,130 (8.80)	744 (1.58)	-	22.6 (0.048)	5,830 (12.4)
San Pablo Bay	1,390 (2.96)	1,270 (2.70)	13.2 (0.028)	241 (0.513)	3,860 (8.22)	-	82.7 (0.176)	7,400 (15.7)
Central Bay	-	139 (0.296)	-	3,100 (6.60)	-	-	1.96 (0.004)	3,240 (6.90)
South Bay	744 (1.59)	2,180 (4.64)	862 (1.84)	589 (1.26)	-	-	5.19 (0.011)	4,380 (9.33)
Lower South Bay	258 (0.55)	219 (0.466)	0.76 (<0.01)	-	-	-	15.3 (0.033)	8,180 (17.4)
Total	2,920 (6.22)	4,180 (8.90)	913 (1.94)	8,060 (17.2)	4,600 (9.80)	-	128 (0.272)	29,000 (61.8)

Refer to Section 3.6 for definitions for each recycled water user type.

** There are a few dischargers that were not able to provide recycled water volumes by use. For such instances, the volumes are limited to the right-hand column, titled "Total for 2020/2021 column".

- Year-Round: i) approx. 11 percent of the effluent flow is recycled (46.5 mgd ÷ (374 mgd + 46.5 mgd) = 11%), ii) industrial is primary user, and iii) Lower South Bay has the highest demand
- Dry Season: i) approx. 15 percent of the effluent flow is recycled (61.8 mgd ÷ (61.8 mgd + 339 mgd) = 15%), ii) industrial is primary user, and iii) Lower South Bay has the highest demand

Group Annual Report: Next Year's

- Continue to understand flow and loading impacts from the global pandemic and another relatively dry year
- Influent:
 - Dataset will continue to grow (n = 14 vs currently 9)
 - $_{\circ}\;$ Ability to compare against discharge
- Recycled Water:
 - $_{\circ}$ Dataset will continue to grow (n = 24 vs currently 12)
 - $_{\circ}~$ Add feature to compare against discharge
- Statistical Approach: might modify for a more robust approach (TBD)

Bay Area Clean Water Agencies Nutrient Reduction Study

Group Annual Report Nutrient Watershed Permit Annual Report 2022

February 1, 2023





Recycled Water Update

2nd Watershed Permit: Recycled Water Task

- Scoping and Evaluation Plan: Completed and Approved (on BACWA website)
- Report (due on July 1, 2023):
 - o Overall Report: summarize the overall findings for individual plant reports
 - Individual Plant Reports (each will serve as an Appendix to the Overall Report):
 - Description of treatment facilities and service area
 - Estimate of nutrient load reduction
 - Ancillary and adverse impacts
 - Assessment of the feasibility, efficacy, reliability, and cost-effectiveness of each opportunity
 - Identification of potential challenges (e.g., regulatory barrier)
- Steps and Status for Individual Reports





San Francisco Bay Regional Water Quality Control Board

ORDER No. R2-2019-0017 NPDES No. CA0038873

WASTE DISCHARGE REQUIREMENTS FOR NUTRIENTS FROM MUNICIPAL WASTEWATER DISCHARGES TO SAN FRANCISCO BAY

The following dischargers are subject to waste discharge requirements (WDRs) set forth in this Order, for the purpose of regulating nutrient discharges to San Francisco Bay¹ and its contiguous bay segments:

Table 1. Discharger Information

Discharger	Facility Name	Facility Address	Minor/ Major
American Canyon, City of	Wastewater Treatment and Reclamation Facility	151 Mezzetta Court American Canyon, CA 94503	Major
Benicia, City of	Benicia Wastewater Treatment Plant	614 East Fifth Street Benicia, CA 94510	Major
Burlingame, City of	Burlingame Wastewater Treatment Plant	1103 Airport Boulevard Burlingame, CA 94010	Major
Central Contra Costa Sanitary District	Central Contra Costa Sanitary District Wastewater Treatment Plant	5019 Imhoff Place Martinez, CA 94553	Major
Central Marin Sanitation Agency	Central Marin Sanitation Agency Wastewater Treatment Plant	1301 Andersen Drive San Rafael, CA 94901	Major
Crockett Community Services District	Port Costa Wastewater Treatment Plant	End of Canyon Lake Drive Port Costa, CA 94569	Minor
Delta Diablo	Delta Diablo Wastewater Treatment Plant	2500 Pittsburg-Antioch Highway Antioch, CA 94509	Major
	EBDA Common Outfall Hayward Water Pollution Control Facility San Leandro Water Pollution		
East Bay Dischargers Authority (EBDA); Cities of Hayward and San Leandro; Oro Loma Sanitary District; Castro Valley Sanitary District; Union Sanitary District; East Bay Regional Parks District; Livermore-Amador Valley Water Management Agency;	Control Plant Oro Loma/Castro Valley Sanitary Districts Water Pollution Control Plant Raymond A. Boege Alvarado Wastewater Treatment Plant Hayward Marsh	EBDA Common Outfall 14150 Monarch Bay Drive San Leandro, CA 94577	Major
Dublin San Ramon Services District; and City of Livermore	Livermore-Amador Valley Water Management Agency Export and Storage Facilities Dublin San Ramon Services District Wastewater Treatment Plant		

¹ San Francisco Bay consists of the Sacramento/San Joaquin River Delta, Suisun Bay, Carquinez Strait, San Pablo Bay, Central San Francisco Bay, Richardson Bay, Lower San Francisco Bay, and South San Francisco Bay.

Recycled Water Represents an Opportunity to Divert Flows/Loads from the Bay

Discharge Flow to the Bay:

- Average Annual over the Last 9-Years: 489,000 AFY (437 mgd)
- Average Annual from 10/20 09/21: 419,000 AFY (408 mgd)

Recycled Water Volumes:

- 2020/2021 data: 52,100 AFY (46.5 mgd)
 - $_{\circ}$ 11% diversion from the Bay (15% during dry season)
 - $_{\odot}$ 29,000 AFY occurs in the dry season (May 1 Sept 30)
 - Future: recycled water demands likely to exceed raw influent flow projections
- Recycled Water Flows do not Necessarily = Load Diversions



Recycled Water: Individual Plant Report Steps

01

01: INITIAL RFI & 1ST WATERSHED PERMIT REPORT

- The 1st Watershed Permit Plant Reports: used for Plant Specific Background
- RFI: starting point for Results/Discussion



02: Second RFI (RW PROJECT WRITE- UPS & COST)

- Write-Ups: agency to provide additional project descriptions
- Cost: agency to provide

Drafted 20 of 40 Reports (Complete Drafts Summer 2022)

Status



03: DRAFT REPORT

- Consultant team to update the Results/Discussion with details
- Agency: period to review and provide comments

Draft Fall 2022/ Winter 2023



04: COMMENTS, REVIEW CALL, AND FINALIZE/ SIGN

- Agency Comments: agency to review and provide consultant
- Review Call: Consultant to update report and lead a call with client
- Finalize/Sign: Consultant to finalize and Agency to Sign-Off



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