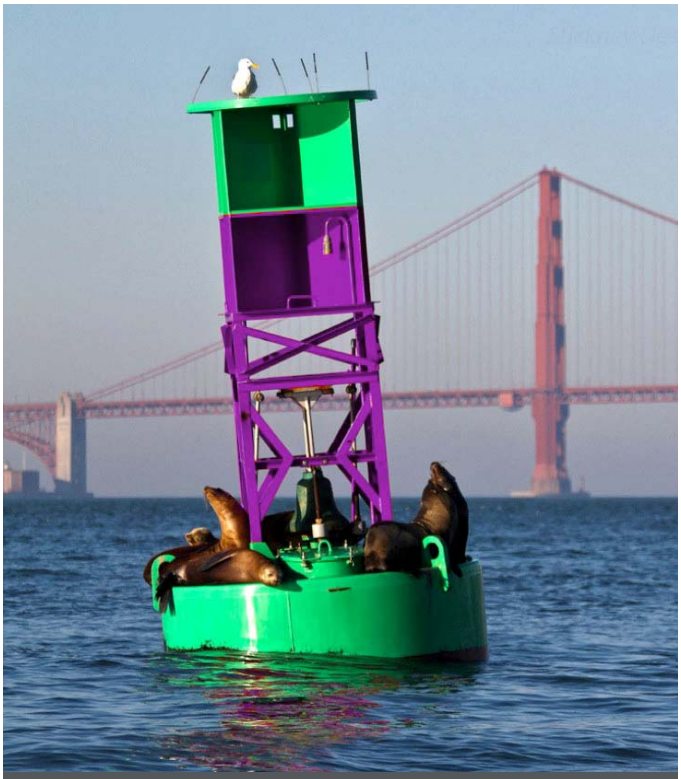

Bay Area Clean Water Agencies

Scoping and Evaluation Plan

Regional Evaluation of Potential Nutrient Discharge Reduction by Water Recycling

November 26, 2019

BACWA BAY AREA CLEAN WATER AGENCIES

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Introduction

On May 8, 2019, the San Francisco Regional Water Quality Control Board (Water Board) issued Order No. R2-2019-0017, *Waste Discharge Requirements for Nutrients from Municipal Wastewater Discharges to San Francisco Bay* (Watershed Permit). The Watershed Permit sets forth a regional framework to facilitate collaboration on studies that will inform future management decisions and regulatory strategies. The 2019 Watershed Permit has four special provisions to implement as follows:

1. Reopener provisions.
2. Regional evaluation of potential nutrient discharge reduction by natural systems.
3. Regional evaluation of potential nutrient discharge reduction by water recycling.
4. Monitoring, modeling, and subembayment studies.

This Scoping and Evaluation Plan for the Regional Evaluation of Potential Nutrient Discharge Reduction is a component of item 3, listed above. The other provisions of the 2019 Watershed Permit that require submittals to the Water Board (natural systems and modeling systems) are being addressed separately. The Regional Evaluation of Potential Nutrient Discharge Reduction by Water Recycling will result in a Recycled Water Study that will increase the understanding of potential effluent nutrient load reductions and the associated costs for water recycling projects by the publically owned treatment works (and other agencies) that discharge to the San Francisco Bay.

Forty four agencies, as listed in Appendix A, were identified in the 2019 Watershed Permit to conduct the water recycling evaluation. These agencies (the participating agencies) have agreed to conduct the evaluation collectively, as members of the Bay Area Clean Water Agencies (BACWA).

Scoping and Evaluation Plan

The 2019 Watershed Permit requires a Scoping and Evaluation Plan that describes the approach and schedule for completing the nutrient reduction studies by water recycling. The effluent nutrients of interest are nitrogen ion species and total phosphorus. The evaluation will consider both current and projected flows for water recycling. The evaluation includes the following steps:

- Issue a request for information (RFI) to each participating agency
- Compile data and planning documents and perform a preliminary assessment
- Review preliminary assessment with each participating agency
- Prepare draft report for each participating agency
- Review period for each agency to review their report
- Finalize each agency report based on report comments
- Prepare the Draft Recycled Water Study that summarizes the overall study findings
- Review period for BACWA to review the Draft Recycled Water Report
- Finalize the Recycled Water Report and submit to the Water Board

The following sections describe the study schedule and the tasks that will be implemented to complete the aforementioned steps.

Schedule

The 2019 Watershed Permit requires the submission of a status report by July 1, 2021 and again by July 1, 2022. The final report is due to the Water Board on July 1, 2023.

An overview of the schedule for completion of the water recycling study is presented in Table 1. The project schedule has been designed to efficiently execute the study ahead of the deadlines specified in the 2019 Watershed Permit.

Table 1. Schedule by Tasks

Task	Description	Permit Deadline	Proposed Completion Date	Comment
1. Scoping and Evaluation Plan	Prepare a combined document for review by BACWA and submission to the Water Board	Scoping Plan – 12/1/2019 Evaluation Plan - 7/1/2020	12/1/2019	These plans will be combined into one document that describes the project approach and schedule
2. Data Collection and Analysis	Issue RFIs to participating agencies; collect, review and compile data; perform analysis	N/A	2/2021	Collect agency information, including data and reports, provide guidance via webinar(s), compile data and consult with agencies for clarifications, and perform analysis
3. Status Report No. 1	Submittal to Water Board describing tasks completed	7/1/2021	7/1/2021	
4. Agency Reports and Validation	Prepare agency report template, individual agency reporting (draft and final), and collect agency validation letters	N/A	7/2022	Each agency will have an opportunity to review its respective draft agency report and provide comments. Upon receiving comments, a conference call will be held to review the comments prior to finalizing each agency report
5. Status Report No. 2	Submittal to Water Board describing tasks completed	7/1/2022	7/1/2022	
6. Recycled Water Study	Prepare Draft and Final Recycled Water Study	7/1/2023	7/1/2023	The study will summarize overall findings. The Final Study will be presented to the Water Board
7. Project Management	Participate in meetings to convey study progress and findings, manage the project, and perform QA/QC	N/A	6/2022	

Data Collection and Analysis

As part of the Nutrient Reduction Study that was conducted under the first Watershed Permit (R2-2014-0014), a series of RFIs were submitted to the participating agencies that focused initially on general plant information, plant facilities, and performance, followed by an RFI on future and projected recycled water projects. The recycled water survey from the first Watershed Permit (R2-2014-0014) focused on recycled water demands for various categories of recycled water use types, from existing through 2040 in five year increments. The RFI(s) associated with this Recycled Water Study will expand and refine the recycled water questionnaire from the first Watershed Permit (R2-2014-0014).

Following receipt of the requested information and documents, a preliminary assessment will be conducted, followed by a conference call with each agency to confirm the preliminary assessment and clarify any outstanding data needs.

The following sections provide additional detail regarding the data collection and analysis tasks.

Data Collection

The RFI will be submitted to each participating agency during the spring of 2020. This detailed request will expand and refine the recycled water questionnaire from the first Watershed Permit (R2-2014-0014). The expanded and refined RFI will seek the following information:

- Description of existing recycled water program and service area, including maps, figures, and details of existing demands and use types.
- Current recycled water flows and associated nutrient loads removed (if applicable and available).
- Updated status of previously identified recycled water projects, including the relative confidence that the project will be implemented (e.g., is the project conceptual, included in a CIP, currently in construction, etc.) and the anticipating timing of the project, and projected growth in recycled water use over time.
- Projected future recycled water use, in five-year increments. Where available, anticipated type of recycled water use will be collected to support the evaluation of nutrient loads removed. Recycled water seasonality demand will also be considered, particularly for those agencies with a dry season discharge prohibition
- Estimated capital and operations and maintenance (O&M) costs, for each respective anticipated project.

Once the RFIs have been issued to the participating agencies, consultant will confer with each agency to review and confirm the data provided and resolve any outstanding questions.

Analysis

Upon receiving the requested information, the data will be organized and compiled. The analysis for each participating agency will include the following:

- Recycled water flows by use type, in five year increments. Projected flows will be captured in acre-feet per year. An average daily use will be estimated in order to

estimate the reduction in the nutrient load discharged to San Francisco Bay. Projections will be presented in five year increments, beginning in 2020 (as current).

- Nutrient load reduction projections for Ammonia and Total Inorganic Nitrogen constituents. Not all recycled water use types result in a reduction in nutrient loads discharged to the bay. Some uses, such as potable reuse, could increase nutrient concentrations discharged to the bay due to the concentrated return streams created during the advanced treatment processes. Generally, irrigation uses (i.e., landscape, golf course, and agricultural) result in a decrease of nutrient loads since the water is consumed at the application site. However, uses such as potable reuse and some industrial uses, will have a concentrated stream that is either returned to the wastewater treatment plant for discharge or otherwise discharged to the bay. Thus, with respect to identifying the nutrient reductions associated with future recycled water uses, the use type will be captured (if available) and the load reduction will be estimated accordingly.
- Capital and operations and maintenance (O&M) costs will be included, if available. Costs will be escalated to the ENR CCI for the SF Bay Area for the most current period prior to completing the draft recycled water study. It is assumed that cost estimates will be available from existing master plans (or more detailed cost estimates) as provided by the participating agency. Development of new cost estimates is not anticipated.
- Develop unit metrics for comparison with the 2018 Nutrient Reduction Study and to allow comparisons between the participating agencies. Unit metrics will include the following:
    - Cost per acre-foot for recycled water project yield ($/acre-foot). A 30 year planning period will be used to allow comparison with 2018 Nutrient Reduction Study (HDR, 2018).
    - Cost per pound of nutrient removed ($/lb nutrient removed). A 30 year planning period will be used to allow comparison with 2018 Nutrient Reduction Study (HDR, 2018). To maintain consistency with the 2018 Study, the projected discharge concentrations will be based on the 2015 BACWA Nutrient Reduction Study Group Annual Report (which includes nutrient effluent data from 7/2012 through 6/2015) and projected to the midpoint of the planning period.
    - Capital and/or present value cost per gallon of recycled water used per day ($/gpd). Present value costs can only be prepared if estimated O&M costs are available. In the absence of O&M costs, only capital cost per gallon of recycled water used per day will be provided. This unit metric will be prepared to allow for comparison with the 2018 Nutrient Reduction Study.
- Qualitative identification of adverse effects and benefits from each project (e.g., reduction of natural water resource diversion, reduction of potable water demand, increase of nutrient concentration discharged to the bay, reduction of chemical fertilizer reliance, etc.).

- Assessment of feasibility, efficacy, and reliability for each project (e.g., low reliability for recycled water fill stations).
- Identification of potential challenges to implementation (e.g., regulatory barriers, disposal of concentrate from reverse osmosis (RO) treatment).

Agency Reporting

The results of the recycled water data collection and analyses will be documented in individual agency reports and provided to each participating agency for review and confirmation prior to finalization. Each individual report will have the following sections:

- Executive summary that includes a table (flow projections, load reduction, and cost of implementation in five-year increments) and a brief description of the future recycled water projects and uses.
- Introduction of each agency, plant and processes (limited to agencies with plant facilities), summary of relevant discharge requirements (e.g., dry season prohibition), and existing recycled water service area, flows, and use types.
- Description of study approach, including methods for projecting recycled water and nutrient load reductions from discharge, and unit cost calculations.
- Results that present the analysis in tables and figures and discusses the likelihood of implementation of future recycled water projects.
- Summary of adverse impacts and benefits, feasibility, and potential challenges to implementation.
- Appendices will include any relevant information from the RFI excluded from the main body and the agency acceptance letter.

Each agency will have an opportunity to review its draft agency report and provide comments prior to the report being finalized for inclusion in the Draft Recycled Water Study.

Recycled Water Study

Following completion of the agency specific reports, an executive summary style report will be prepared to summarize the information and results. The components of the Recycled Water Study will include:

- Executive summary that presents the overall findings and provides context on the role of recycled water as a means to reduce nutrient loads discharge to San Francisco Bay.
- Basis of evaluation that describes the approach and methodologies employed for the study.
- Results summarized by subembayment and bay-wide, presented with tables and graphics.

- Summary of study limitations.
- Key observations, as appropriate.
- Appendices, including each agency report, agency acceptance letters, scoping and evaluation plan, and other information if appropriate.

Appendix A – Participating Facilities

No.	Discharger	Facility Name	Facility Address	Minor/ Major
1	American Canyon, City of	Wastewater Treatment and Reclamation Facility	151 Mezzetta Court American Canyon, CA 94503 Napa County	Major
2	Benicia, City of	Benicia Wastewater Treatment Plant	614 East Fifth Street Benicia, CA 94510 Solano County	Major
3	Burlingame, City of	Burlingame Wastewater Treatment Plant	1103 Airport Boulevard Burlingame, CA 94010 San Mateo County	Major
4	Central Contra Costa Sanitary District	Central Contra Costa Sanitary District Wastewater Treatment Plant	5019 Imhoff Place Martinez, CA 94553 Contra Costa County	Major
5	Central Marin Sanitation Agency	Central Marin Sanitation Agency Wastewater Treatment Plant	1301 Andersen Drive San Rafael, CA 94901 Marin County	Major
6	Crockett Community Services District	Port Costa Wastewater Treatment Plant	End of Canyon Lake Drive Port Costa, CA 94569	Minor
7	Delta Diablo	Delta Diablo Wastewater Treatment Plant	2500 Pittsburg-Antioch Hwy Antioch, CA 94509 Contra Costa County	Major
8	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, Dublin San Ramon Services District, and City of Livermore	*EBDA Common Outfall*[A]	EBDA Common Outfall 14150 Monarch Bay Drive San Leandro, CA 94577 Alameda County	Major
9		Hayward Water Pollution Control Facility		
10		San Leandro Water Pollution Control Plant		
11		Oro Loma/Castro Valley Sanitary Districts Water Pollution Control Plant		
12		Union Sanitary District, Raymond A. Boege Alvarado Wastewater Treatment Plant		
13		East Bay Regional Parks District[B]		
14		*Livermore-Amador Valley Water Management Agency Export and Storage Facilities*[A]		
15		Dublin San Ramon Services District Wastewater Treatment Plant (LAVMA)		
16		City of Livermore Water Reclamation Plant		
17	East Bay Municipal Utility District	East Bay Municipal Utility District, Special District No. 1 Wastewater Treatment Plant	2020 Wake Avenue Oakland, CA 94607 Alameda County	Major
18	Fairfield-Suisun Sewer District	Fairfield-Suisun Wastewater Treatment Plant	1010 Chadbourne Road Fairfield, CA 94534 Solano County	Major
19	Las Gallinas Valley Sanitary District	Las Gallinas Valley Sanitary District Sewage Treatment Plant	300 Smith Ranch Road San Rafael, CA 94903 Marin County	Major
20	Marin County (Paradise Cove), Sanitary District No. 5 of	Paradise Cove Treatment Plant	3700 Paradise Drive Tiburon, CA 94920	Minor
21	Marin County (Tiburon), Sanitary District No. 5 of	Wastewater Treatment Plant	2001 Paradise Drive Tiburon, CA 94920	Minor
22	Millbrae, City of	Water Pollution Control Plant	400 East Millbrae Avenue Millbrae, CA 94030 San Mateo County	Major

No.	Discharger	Facility Name	Facility Address	Minor/ Major
23	Mt. View Sanitary District	Mt. View Sanitary District Wastewater Treatment Plant	3800 Arthur Road Martinez, CA 94553 Contra Costa County	Major
24	Napa Sanitation District	Soscol Water Recycling Facility	1515 Soscol Ferry Road Napa, CA 94558 Napa County	Major
25	Novato Sanitary District	Novato Sanitary District Wastewater Treatment Plant	500 Davidson Street Novato, CA 94945 Marin County	Major
26	Palo Alto, City of	Palo Alto Regional Water Quality Control Plant	2501 Embarcadero Way Palo Alto, CA 94303 Santa Clara County	Major
27	Petaluma, City of	Ellis Creek Water Recycling Facility	3890 Cypress Drive Petaluma, CA 94954 Sonoma County	Major
28	Pinole, City of	Pinole-Hercules Water Pollution Control Plant	11 Tennent Avenue Pinole, CA, 94564 Contra Costa County	Major
29	Rodeo Sanitary District	Rodeo Sanitary District Water Pollution Control Facility	800 San Pablo Avenue Rodeo, CA 94572 Contra Costa County	Major
30	San Francisco (San Francisco International Airport), City and County of	Mel Leong Treatment Plant, Sanitary Plant	Bldg. 924 Clearwater Drive San Francisco, CA 94128 San Mateo County	Major
31	San Francisco (Southeast Plant), City and County of	Southeast Water Pollution Control Plant	750 Phelps Street San Francisco, CA 94124 San Francisco County	Major
32	San Jose and Santa Clara, Cities of	San Jose/Santa Clara Water Pollution Control Plant	700 Los Esteros Road San Jose, CA 95134 Santa Clara County	Major
33	San Mateo, City of	City of San Mateo Wastewater Treatment Plant	2050 Detroit Drive San Mateo, CA 94404 San Mateo County	Major
34	Sausalito-Marin City Sanitary District	Sausalito-Marin City Sanitary District Wastewater Treatment Plant	1 East Road Sausalito, CA 94965 Marin County	Major
35	Sewerage Agency of Southern Marin	Wastewater Treatment Plant	450 Sycamore Avenue Mill Valley, CA 94941 Marin County	Major
36	Silicon Valley Clean Water	Silicon Valley Clean Water Wastewater Treatment Plant	1400 Radio Road Redwood City, CA 94065 San Mateo County	Major
37	Sonoma Valley County Sanitary District	Municipal Wastewater Treatment Plant	22675 8th Street East Sonoma, CA 95476 Sonoma County	Major
38	South San Francisco and San Bruno, Cities of	South San Francisco and San Bruno Water Quality Control Plant	195 Belle Air Road South San Francisco, CA 94080 San Mateo County	Major
39	Sunnyvale, City of	Sunnyvale Water Pollution Control Plant	1444 Borregas Avenue Sunnyvale, CA 94089 Santa Clara County	Major
40	U.S. Department of Navy (Treasure Island)	Treasure Island Wastewater Treatment Plant	1220 Avenue M, San Francisco, CA 94130-1807 San Francisco County	Major

No.	Discharger	Facility Name	Facility Address	Minor/ Major
41	Vallejo Flood and Wastewater District	Vallejo Flood and Wastewater District Wastewater Treatment Plant	450 Ryder Street Vallejo, CA 94590 Solano County	Major
42	West County Agency; West County Wastewater District; City of Richmond; and Richmond Municipal Sewer District	West County Agency Combined Outfall[B]	2910 Hilltop Drive Richmond, CA 94806 Contra Costa County	Major
43		West County Wastewater District (WCWD) Treatment Plant		
44		Richmond Municipal Sewer District Water Pollution Control Plant		

Note:

A. Conveyance; no treatment facilities.

B. No treatment facilities