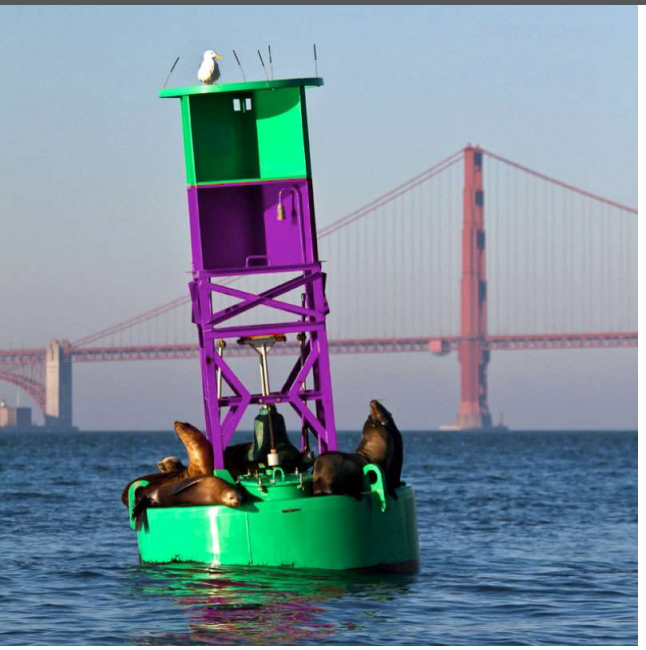


Pardee Annual Retreat:
1) Water Research Foundation Grant,
2) Group Annual Report, and
3) Recycled Water Update

September 18, 2020

Agenda

1. Water Research Foundation: Grant 4974
2. Group Annual Report 2020
   - 2019 Recap
   - 2020 Status and Schedule
3. Recycled Water Study
   - RFI Status + Preliminary Data Preview
   - Report Template
   - Plan to moving forward

1. Water Research Foundation Grant 4974

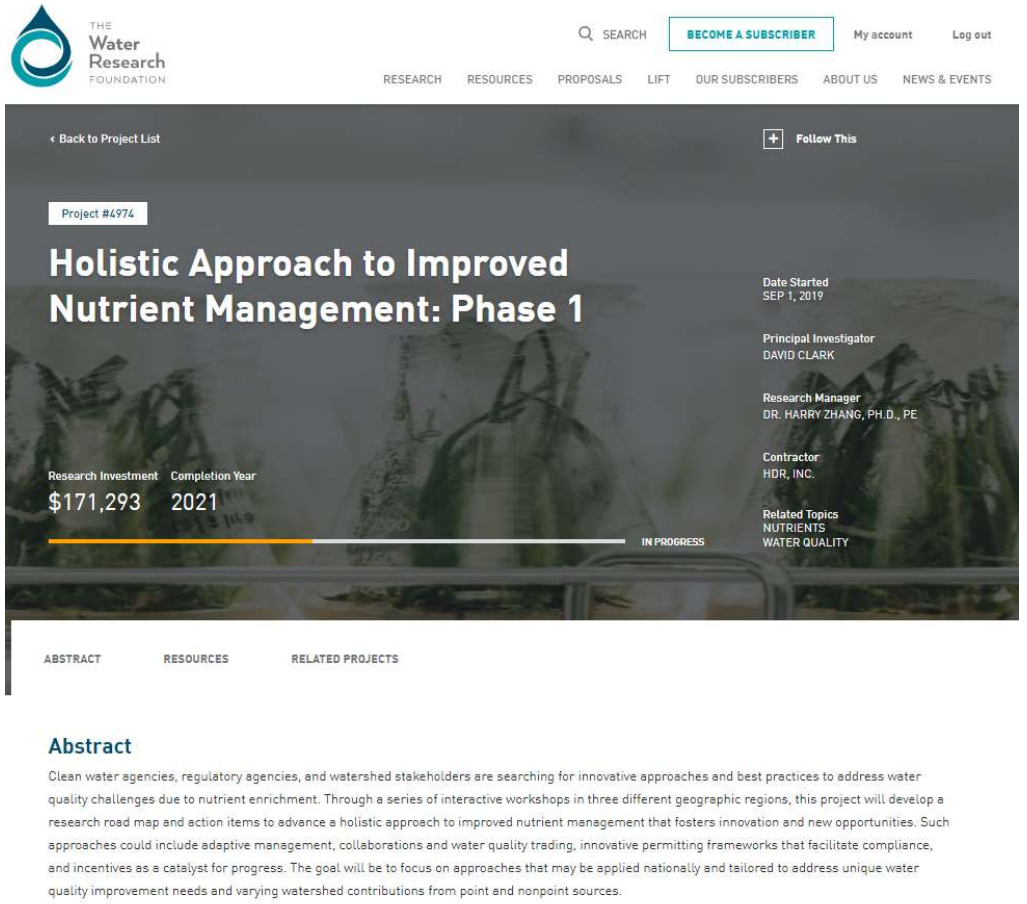
Water Research Foundation Grant 4974
(Holistic Approach to Improved Nutrient Management: Phase 1)

Focus Areas

- 3 Workshops:
  - The BACWA Story (3/2020)
  - The Delaware River Story (6/2020)
  - Where Ag meets Domestic (9/2020)
- Literature Review that captures experiences
- Solutions oriented nutrient strategies

BACWA Involvement

- In-kind support for Workshop #1 (host)
- Means to share the BACWA experience



https://www.waterrf.org/research/projects/holistic-approach-improved-nutrient-management-phase-1

2. Group Annual Report

Reporting Changes

1st Watershed Permit

- Discharge
- July – June

- Discharge:
  - Ammonia, Nitrite+ Nitrate, TKN, and TN
  - Phosphate and Total P
- Report Submittal: 10/1

2nd Watershed Permit

- Influent and Discharge
- October – September
- Influent:
  - Ammonia, TKN, Nitrite-Nitrate
  - Total P
- Discharge:
  - Ammonia, Nitrite-Nitrate, and TIN
  - Total P
- Report Submittal: 2/1

Reporting Period Impact

Constituent	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	7-Year Average
* Flow, mgd	453	434	421	425	510	434		
** Flow, mgd	451	428	415	430	515	433	480	450
* Ammonia, kg N/d	33,800	36,600	36,900	36,800	40,700	40,400		
** Ammonia, kg N/d	34,300	37,000	36,700	37,500	40,600	40,800	39,800	38,100
* TIN, kg N/d	48,700	51,200	51,000	50,800	55,000	52,900		
** TIN, kg N/d	49,300	51,300	50,900	51,100	55,000	53,200	53,100	52,000
* TP, kg P/d	3,950	3,770	3,720	3,940	4,110	4,080		
** TP, kg P/d	3,860	3,750	3,770	4,070	4,020	4,190	4,210	3,980

* Previous Reporting Period (July – June)

** New Reporting Period (October – September)

Observations:

1) Delta for the adjusted reporting period: $\leq$6 mgd per year; $\leq$700 kg N/d per year; TP<<130 kg P/d per year
2) 2018/2019 Data:
   - Flows: reflect a relatively wet year (as expected)
   - Ammonia/TIN: loads seem to be stabilized over last 2-3 years
   - TP: might be highest load since data collection started (albeit marginally higher than last year)

2020 Group Annual Report Status

- RFI sent out by HDR
- Date Range of required data is Oct 1, 2019 – Sep 30, 2020
- Influent Data
  - Not included in the 2019 submittal (limited to a single data point)
  - Report will cover 15 months of influent data (5 quarters of data)
- COVID-19 impacts on loadings due changes in working location, population movement, and other impacts from changes in our day to day lives.

3. Recycled Water Study Update

Project Elements

- Scoping and Evaluation Plan (Completed)
- Data Collection (Completed)
- Barriers and Drivers (Completed)
- Individual Plant Reports (Review Period)
- Overall Report (Not Started)

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

BACWA Recycled Water Survey 2015

Agency Name (Recycled Water Producer):
Recycled Water Distributors/Retailers:
POC:

CURRENT AND PROJECTED FUTURE AMOUNT OF RECYCLED WATER BY USE CATEGORY (in acre-feet)

	Total Distributed	Confidence (see Note B)	Golf Course Irrigation (See Note C)	Landscape (see Note D	Commercial (see Note E)	Industrial (see Note F)	Agricultural (see Note G)	Environmental Enhancement (see Note H)	Internal Use (see Note I)	GW Recharge for Indirect Potable Reuse	Surface Water Augmentation	Direct Potable Reuse	Other Non-potable Reuse (See Note J)	RO concentrate or other return flows (see Note K)	Not Defined	Comments
Type of RW (See Note A):																
Current 2015																
Future 2020																
Future 2025																
Future 2030																
Future 2035																
Future 2040																
Future 2045																

2015 MONTHLY RECYCLED WATER DISTRIBUTION DATA BY USE CATEGORY (in acre-feet)

	TOTAL		Golf Course	Landscape	Commercial	Industrial	Agricultural	Environ. Enhanceme	Internal Use	GW Recharge	Surface Water	Direct Potable	Other Non-potable	Return Flows		Comments
January																
February																
March																
April																
May																
June																
July																
August																
September																
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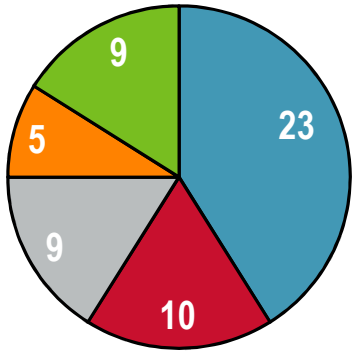
November																
December																
TOTAL																



Funding
Jurisdictional
Lack of Need
Institutional
Other

RFI Status

- Nearly all RFI Workbooks have been received and compiled by HDR and the NBS team
- NBS and RW Teams (SFEI, HDR, and W&C) are in active communication and share a Microsoft TEAMs Site.

BACWA Recycled Water Survey 2015

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DRAFT Recycled Water Data

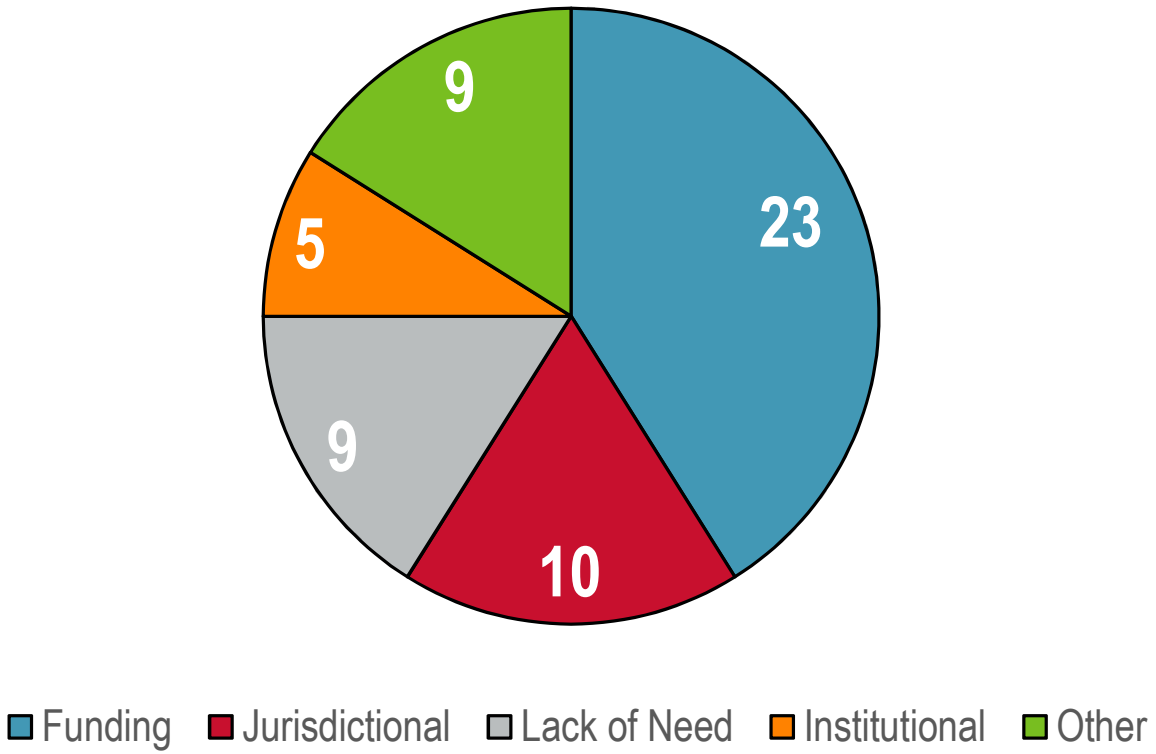
Subembayment	Units	Year 2015*	Year 2019	Year 2020	Year 2025	Year 2030	Year 2035	Year 2040	Year 2045
Suisun Bay	1,000 AFY (mgd)	20 (18)	21 (19)	21 (19)	23 (21)	23 (21)	23 (21)	24 (21)	25 (22)
San Pablo Bay	1,000 AFY (mgd)	8 (7)	11 (10)	11 (10)	18 (16)	20 (18)	21 (19)	23 (21)	22 (20)
Central Bay	1,000 AFY (mgd)	11 (10)	1 (1)	5 (4)	11 (10)	12 (11)	14 (13)	14 (13)	14 (13)
South Bay	1,000 AFY (mgd)	12 (11)	12 (11)	22 (20)	24 (21)	26 (23)	26 (23)	27 (24)	27 (24)
Lower South Bay	1,000 AFY (mgd)	8 (7)	11 (10)	15 (13)	19 (17)	22 (20)	25 (22)	27 (24)	30 (27)
Total	1,000 AFY (mgd)	58 (52)	57 (51)	75 (67)	96 (86)	104 (93)	111 (99)	115 (103)	118 (105)

* From 1st Watershed Permit Survey in 2016

Reference Point: Average flows to the Bay is approximately 450 mgd (7-year average since 2012)

Draft Recycled Water Barriers & Driver Results

1. **Barriers:** what do you see as your barriers for implementation of recycled water projects? Funding, Institutional, Jurisdictional, Lack of Need, Other



Recycled Water Barriers & Driver

1. **Barriers:** what do you see as your barriers for implementation of recycled water projects? Funding, Institutional, Jurisdictional, Lack of Need, Other
2. **Drivers:** what do you see as drivers for implementing your recycled water projects? Water Supply Need, Proposed Discharge Regulations, Institutional, Other
3. **Customer Type:** for your planned recycled water projects, are your proposed customers primarily existing businesses (e.g. existing parks, manufacturing) or are your proposed customers primarily new/redevelopment businesses (e.g. a new golf course, a new power plant)?
4. **Potable Reuse Regulatory:** do you believe the issuance of regulations for Direct Potable Reuse (expected by 2024) will impact your agency's decisions on recycled water project type and implementation going forward?
5. **List of Existing Customers:** please include an itemized list of existing industrial RW users.
6. **Synergistic Projects:** Are there any CIP projects planned that would have with a “synergistic benefit” for future recycled water and pollutant discharge load reduction (e.g., MBR to improve discharge water quality while simultaneously positioning your agency for future recycled water opportunities)?
7. **General Comments:** please include any comments on seasonal RW demand/production, as well as storage capabilities.

Report TOC

Contents

Executive Summary: Overall Summary Table

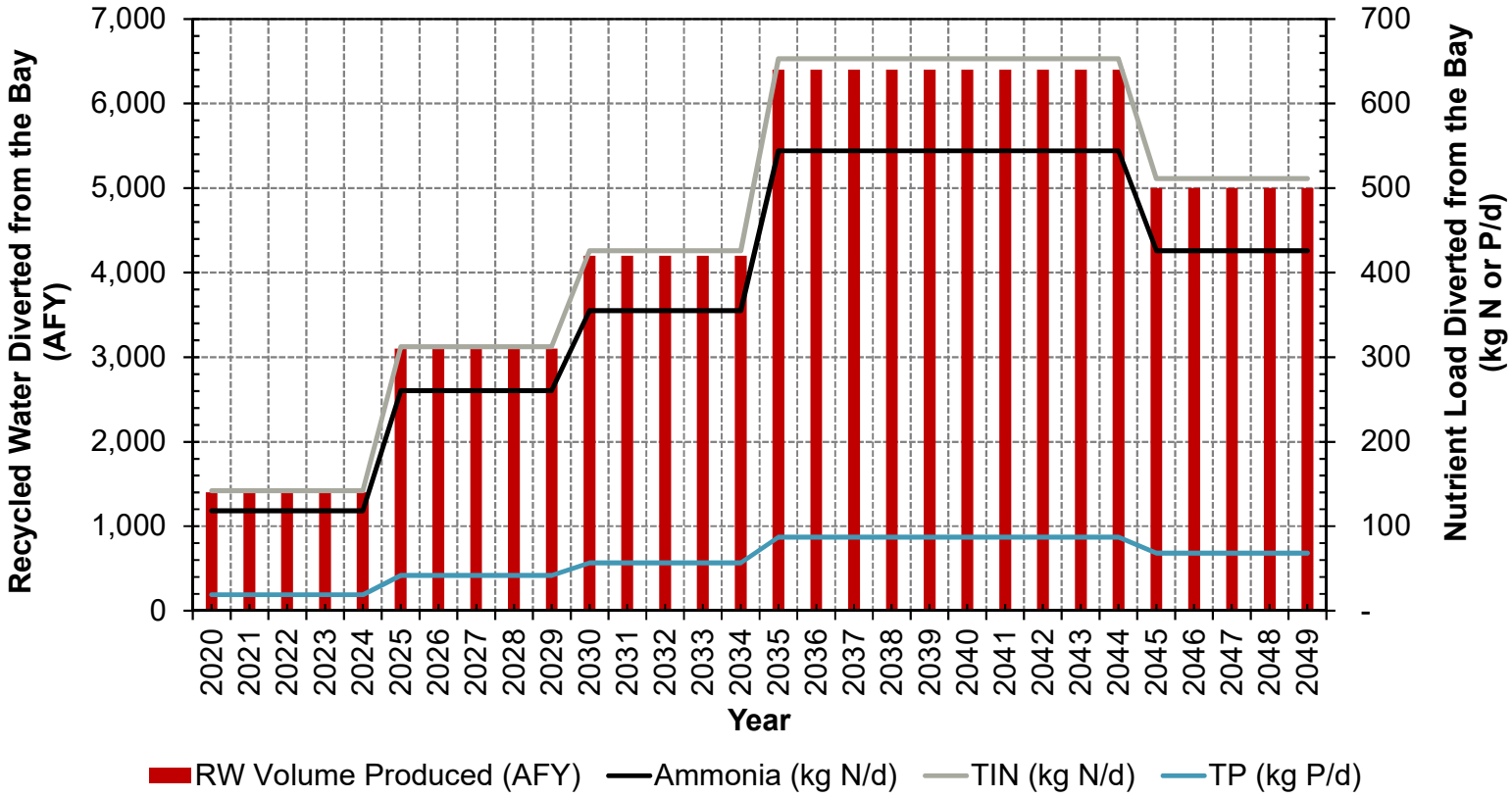
Summarizes the following:

- Flow diverted from bay
- Capital, NPV O&M, and NPV costs from Identified RW projects
- Flow based unit costs for RW projects ($/mgd or ($/AF))
- Nutrient loads diverted from the bay
- Diverted nutrient load based unit costs ($/lb diverted)

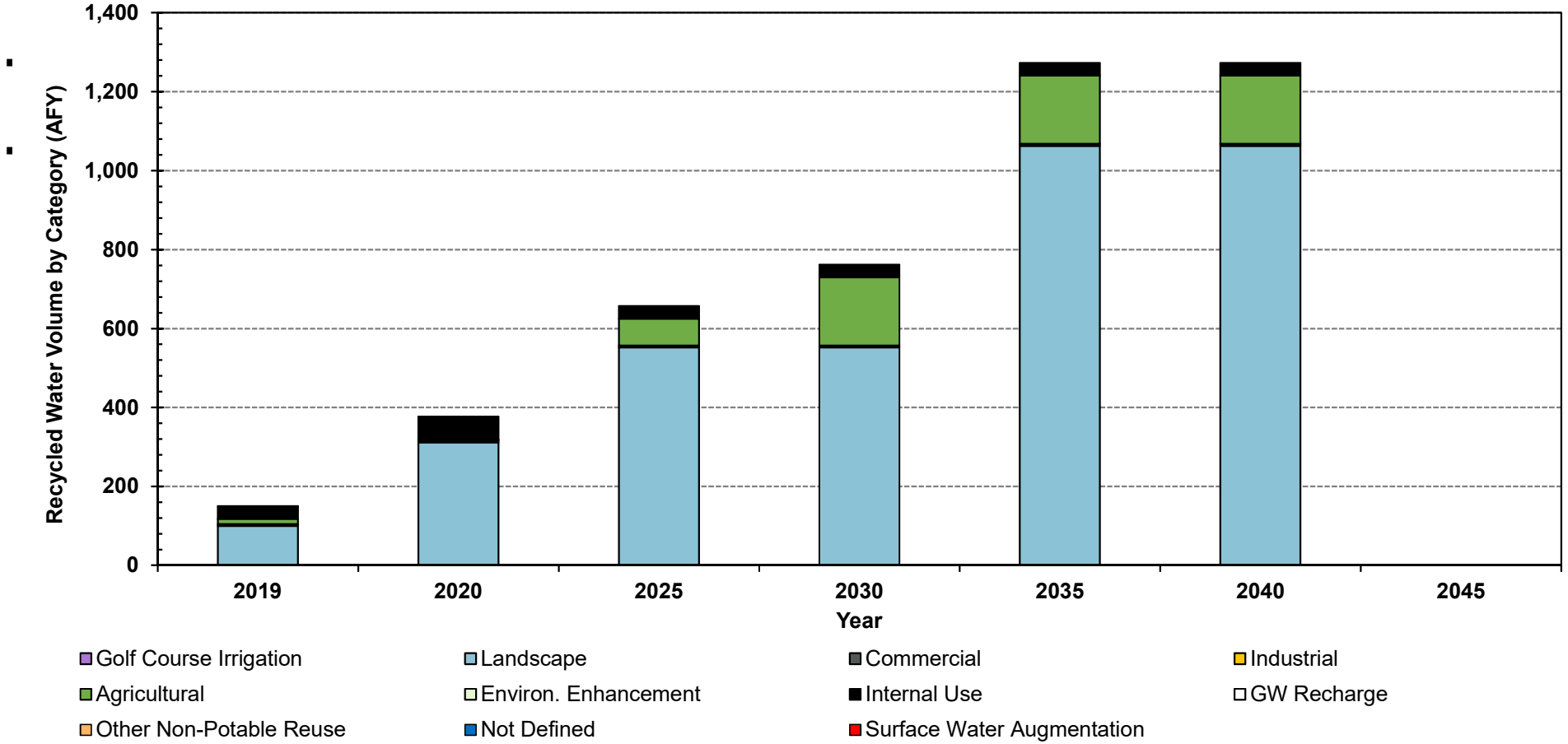
Parameter	Unit	Project 1	Project 2	Project 3	Total
Flow Diverted from the Bay					
Flow[1]	mgd				
Flow[1]	AFY				
Cost[2,3]					
Capital Cost	$ Mil				
NPV O&M	$ Mil				
NPV Total (Capital+NPV O&M)	$ Mil				
Unit Flow Cost[4]					
Unit Cost	$/mgd				
Unit Cost	$/AF				
Load Diverted from the Bay[5]					
Ammonia Load Diverted	kg N/d				
TIN Load Diverted	kg N/d				
TP Load Diverted	kg P/d				
Unit Load Cost[6]					
Ammonia Unit Cost	$/lb Ammonia Diverted				
TIN Unit Cost	$/lb TIN Diverted				
TP Unit Cost	$/lb TP Diverted				

Executive Summary: Flow/Load Diversion from Recycled Water Projects

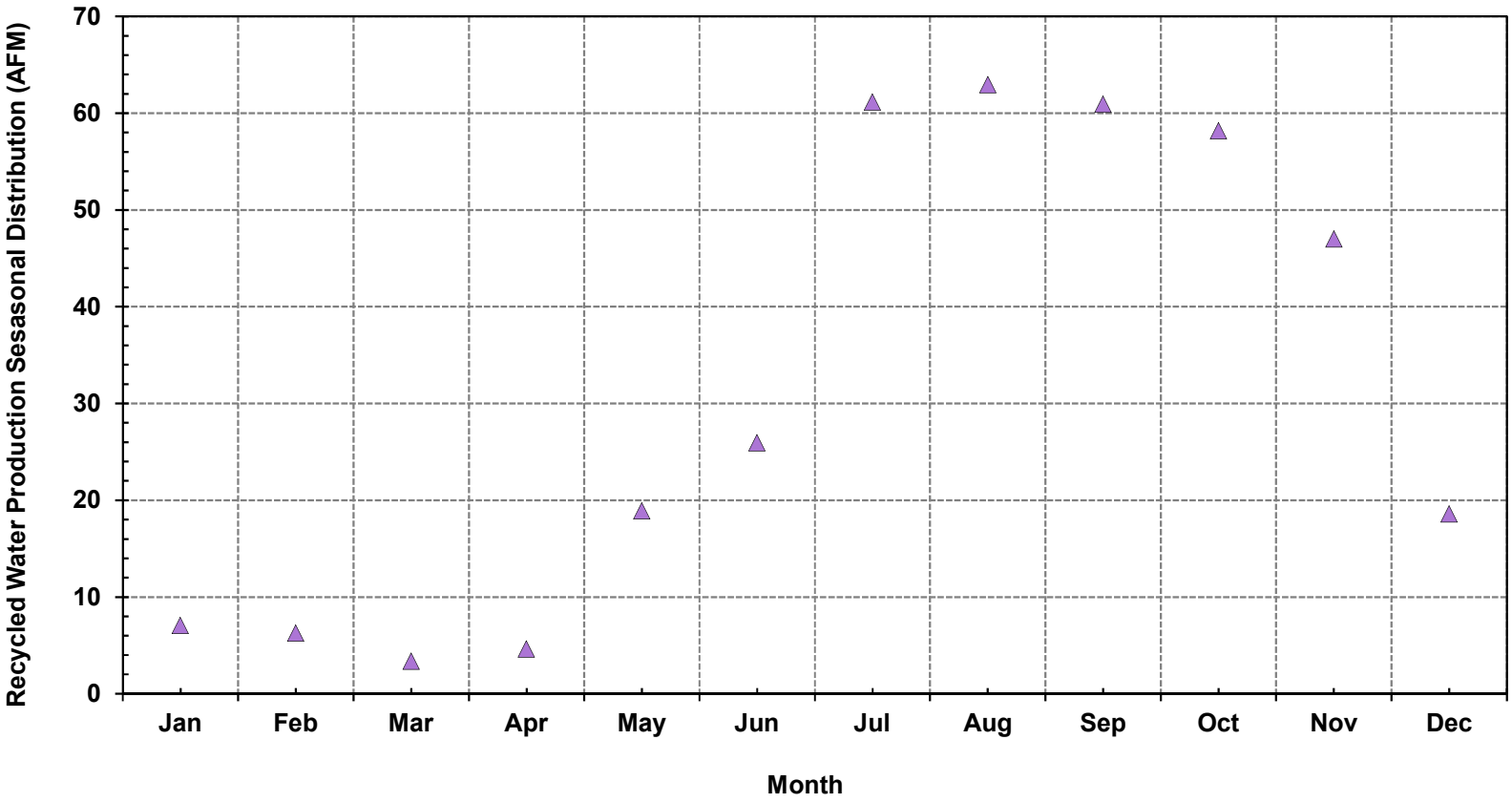
- Total RW distributed each year (specific to each identified project)
- Ammonia, TIN, and TP loads reduced from the bay by RW distribution



Recycled Water Use by Use Category



Recycled Water Seasonality Plots



Recycled Water Production and Load Diversion and Impacts Tables

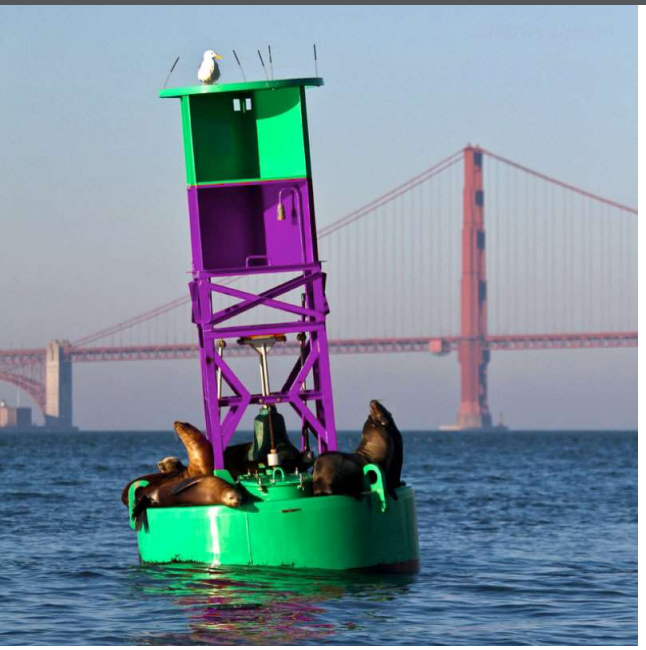
- RW Produced/Load Removal: summarizes total RW produced by year and potential load diversion
- Benefits & Adverse Effects Table: Lists the non-economic adverse and ancillary impacts for each identified RW project

Year	Confidence*	Total RW Distributed (mgd / AFY)	Ammonia Load Diverted (kg N/d)	TIN Load Diverted (kg N/d)	TP Load Diverted (kg N/d)
2019	0	150	12	15	15
2020	1	377	30	37	37
2025	1	657	52	65	65
2030	2	762	60	75	75
2035	3	1,273	100	126	126
2040	3	1,273	100	126	126
2045	0	0	0	0	0

Recycled Water Project	Ancillary Impacts	Adverse Impacts
Project 1	•	•
Project 2	•	•
Project 3	•	•

Recycled Water Study Plan Moving Forward

- Report Template will be presented to the BACWA RW Committee next week, followed by a 2-3 week period review/comments
- Upon approval of the template HDR/W&C reach out to plants to determine on-going and projected RW Projects/Costs
- HDR/W&C draft individual plant reports
- BACWA Agencies review individual plant reports and submit comments.
- HDR/W&C incorporate comments and prepare final drafts



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