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

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 TN
  - Total P
- Report Submittal: 2/1
### Reporting Period Impact

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</tr>
</thead>
<tbody>
<tr>
<td><strong>Flow, mgd</strong></td>
<td>453</td>
<td>434</td>
<td>421</td>
<td>425</td>
<td>510</td>
<td>434</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ammonia, kg N/d</strong></td>
<td>33,800</td>
<td>36,600</td>
<td>36,900</td>
<td>36,800</td>
<td>40,700</td>
<td>40,400</td>
<td></td>
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</tr>
<tr>
<td><strong>TIN, kg N/d</strong></td>
<td>48,700</td>
<td>51,200</td>
<td>51,000</td>
<td>50,800</td>
<td>55,000</td>
<td>52,900</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TP, kg P/d</strong></td>
<td>3,950</td>
<td>3,770</td>
<td>3,720</td>
<td>3,940</td>
<td>4,110</td>
<td>4,080</td>
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</table>

* Previous Reporting Period (July – June)
** New Reporting Period (October – September)

**Observations:**
1) Delta for the adjusted reporting period: <6 mgd per year; <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)
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.
## DRAFT Recycled Water Data

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

* 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

![Pie chart showing the distribution of barriers]

- Funding: 23
- Jurisdictional: 10
- Lack of Need: 9
- Institutional: 5
- Other: 9

Funding | Jurisdictional | Lack of Need | Institutional | Other
---|---|---|---|---
23 | 10 | 9 | 5 | 9
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.
Contents

1 Introduction and Current Conditions ................................................................. 1
  1.1 Permits ........................................................................................................... 1
    1.1.1 National Pollutant Discharge Elimination System ........................................ 1
    1.1.2 Watershed Permit: Recycled Water Requirements ........................................ 1
    1.1.3 Reuse Water Treatment Requirements ...................................................... 2
  1.2 Process Flow Diagram .................................................................................. 3
  1.3 Existing Recycled Water Service .................................................................... 4
  1.4 Existing Discharge Flows and Loads to the Bay ............................................. 4

2 Methodology ...................................................................................................... 8
  2.1 Existing Discharges to the Bay ...................................................................... 8
  2.2 Request for Information ................................................................................. 8
    2.2.1 Recycled Water Production .................................................................. 8
    2.2.2 Nutrient Load Reduction .................................................................. 9
    2.2.3 Seasonality of Recycled Water Production ............................................. 10
    2.2.4 Cost Estimates .................................................................................. 10
    2.2.5 Questionnaire .................................................................................. 10
  2.3 Nutrient Balance .......................................................................................... 11

3 Results and Discussion ..................................................................................... 12
  3.1 Recycled Water Distribution & Load Reduction ............................................ 12
  3.2 Ancillary Benefits and Impacts for Recycled Water Projects ......................... 14
  3.3 Summary of Recycled Water Flows, Costs, Load Reductions, and Unit Costs per Project and Overall ................................................................. 14
  3.4 Drivers and Barriers .................................................................................... 16
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)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Project 1</th>
<th>Project 2</th>
<th>Project 3</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Flow Diverted from the Bay</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow(^1)</td>
<td>mgd</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow(^1)</td>
<td>AFY</td>
<td></td>
<td></td>
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<tr>
<td>Cost(^2,3)</td>
<td></td>
<td></td>
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<tr>
<td>Capital Cost</td>
<td>$ Mil</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>NPV O&amp;M</td>
<td>$ Mil</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPV Total (Capital+NPV O&amp;M)</td>
<td>$ Mil</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Unit Flow Cost(^4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit Cost</td>
<td>$/mgd</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit Cost</td>
<td>$/AF</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Load Diverted from the Bay(^5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Ammonia Load Diverted</td>
<td>kg N/d</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TIN Load Diverted</td>
<td>kg N/d</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TP Load Diverted</td>
<td>kg P/d</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit Load Cost(^6)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Ammonia Unit Cost</td>
<td>$/lb Ammonia Diverted</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TIN Unit Cost</td>
<td>$/lb TIN Diverted</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TP Unit Cost</td>
<td>$/lb TP Diverted</td>
<td></td>
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</tbody>
</table>
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

- Year:
  - 2019
  - 2020
  - 2025
  - 2030
  - 2035
  - 2040
  - 2045

- Categories:
  - Golf Course Irrigation
  - Landscape
  - Agricultural
  - Environ. Enhancement
  - Commercial
  - Internal Use
  - Industrial
  - GW Recharge
  - Other Non-Potable Reuse
  - Not Defined
  - Surface Water Augmentation

- Recycled Water Volume by Category (AFY):
  - 0
  - 200
  - 400
  - 600
  - 800
  - 1,000
  - 1,200
  - 1,400
Recycled Water Seasonality Plots

The graph shows the seasonal distribution of recycled water production (AFM) from January to December. The data points indicate a significant increase in production during the summer months (June to August) compared to other months.
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

<table>
<thead>
<tr>
<th>Year</th>
<th>Confidence*</th>
<th>Total RW Distributed (mgd / AFY)</th>
<th>Ammonia Load Diverted (kg N/d)</th>
<th>TIN Load Diverted (kg N/d)</th>
<th>TP Load Diverted (kg N/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>0</td>
<td>150</td>
<td>12</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>2020</td>
<td>1</td>
<td>377</td>
<td>30</td>
<td>37</td>
<td>37</td>
</tr>
<tr>
<td>2025</td>
<td>1</td>
<td>657</td>
<td>52</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>2030</td>
<td>2</td>
<td>762</td>
<td>60</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>2035</td>
<td>3</td>
<td>1,273</td>
<td>100</td>
<td>126</td>
<td>126</td>
</tr>
<tr>
<td>2040</td>
<td>3</td>
<td>1,273</td>
<td>100</td>
<td>126</td>
<td>126</td>
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<tr>
<td>2045</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<table>
<thead>
<tr>
<th>Recycled Water Project</th>
<th>Ancillary Impacts</th>
<th>Adverse Impacts</th>
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<tbody>
<tr>
<td>Project 1</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Project 2</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Project 3</td>
<td>•</td>
<td>•</td>
</tr>
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</table>
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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