Water Accounting Framework - Background

• SGA formed:
  • To maintain the long-term sustainable yield of the North Area Basin.
  • To facilitate implementation of an appropriate conjunctive use program by water purveyors.
WAF Approach – Focus on Problem Area
Level Analysis (’95 - ’05 data)

Change in Elevation vs. Groundwater Extraction
(head measured following Spring)

Average Annual Change in Groundwater Elevation (feet)

Extraction (acre-feet)
## Sustainability Goal

<table>
<thead>
<tr>
<th>Agency</th>
<th>Pumping Prior to SGA (ac-ft)</th>
<th>Sustainability Reduction (ac-ft)</th>
<th>Sustainable Target (ac-ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carmichael WD</td>
<td>7,516</td>
<td>870</td>
<td>6,646</td>
</tr>
<tr>
<td>City of Sacramento</td>
<td>23,287</td>
<td>2,696</td>
<td>20,591</td>
</tr>
<tr>
<td>California American Water</td>
<td>20,351</td>
<td>2,356</td>
<td>17,995</td>
</tr>
<tr>
<td>Del Paso Manor WD</td>
<td>1,657</td>
<td>192</td>
<td>1,465</td>
</tr>
<tr>
<td>Golden State WC</td>
<td>1,242</td>
<td>144</td>
<td>1,098</td>
</tr>
<tr>
<td>Rio Linda/Elverta Community WD</td>
<td>3,259</td>
<td>377</td>
<td>2,882</td>
</tr>
<tr>
<td>Sacramento County WA</td>
<td>4,850</td>
<td>562</td>
<td>4,288</td>
</tr>
<tr>
<td>Sacramento Suburban WD</td>
<td>39,622</td>
<td>4,587</td>
<td>35,035</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>101,784</strong></td>
<td><strong>11,784</strong></td>
<td><strong>90,000</strong></td>
</tr>
</tbody>
</table>
### WAF Status at beginning of 2020

<table>
<thead>
<tr>
<th>Status through 2019</th>
<th>Basin Sustainability Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carmichael WD</td>
<td>34,098</td>
</tr>
<tr>
<td>City of Sacramento</td>
<td>29,383</td>
</tr>
<tr>
<td>California American</td>
<td>57,259</td>
</tr>
<tr>
<td>Del Paso Manor WD</td>
<td>1,601</td>
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<tr>
<td>Golden State WC</td>
<td>1,484</td>
</tr>
<tr>
<td>Rio Linda/Elverta CWD</td>
<td>2,950</td>
</tr>
<tr>
<td>Sacramento County WA</td>
<td>-2,888</td>
</tr>
<tr>
<td>Sacramento Suburban WD</td>
<td>83,182</td>
</tr>
<tr>
<td>Central Area Total</td>
<td>207,069</td>
</tr>
</tbody>
</table>
Regional Water Reliability Plan

• 2013 RWA Strategic Plan called for development of Plan

• Approach was to identify:
  • Vulnerabilities to water supply of each agency
  • Mitigation measures to help overcome the vulnerabilities

• Objective was to help ensure a “basic level of service” for each public water supplier under all conditions within the region

• Considered both current and long-term (20 years) demands

• Plan completed in 2019

• Identified >100 mitigation actions
 Conjunctive use analysis was performed for agencies overlying the groundwater basin and contiguous with each other

Two fundamental questions
1. What we can do today by reoperating existing system?
2. What we can do over next 10 years with new facilities added to system?

Constraints Considered:
• Whether or not systems fluoridate
• Water rights/contracts
• Surface water treatment plant capacity
• Conveyance/intertie capacity
• Groundwater production capacity
• Operational issues identified by purveyors
We have significant conjunctive use potential, but we lack incentive to do more.

### Opportunities

<table>
<thead>
<tr>
<th>With Near-Term New Facilities</th>
<th>With Existing System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recharge Potential (Wet Year)</td>
<td>90,664</td>
</tr>
<tr>
<td>Recovery Potential (Dry Year)</td>
<td>94,570</td>
</tr>
<tr>
<td>27,443</td>
<td>36,736</td>
</tr>
<tr>
<td>63,221</td>
<td>57,835</td>
</tr>
</tbody>
</table>

### Barriers

- Our system is already seen as largely reliable today.
- For existing system, reoperations cost differential has typically been around $300 per acre-foot.
- For new facilities, capital costs estimated at about $288 million.
A Regional Water Bank can help overcome barriers

• Generate revenue needed to offset expense of expanding conjunctive use by
  • Storing and recovering water from internal and external partners
  • Continue to allow groundwater substitution transfers post-SGMA

• Improve water supply reliability by this expanded conjunctive use
  • Near-term – mitigate against return to drought
  • Long-term – adapt to shifting of reservoir systems resulting from climate change
Most rules for a Water Bank already exist

• Multi-year storage
• Storage before recovery
• Loss factor over length of storage
• Monitoring and mitigation

• Single year transfers
• Storage is not required
• One-time loss factor
• Monitoring and mitigation
Precise operations are to be determined through modeling, but principals will help basin sustainability.
Example of positive results from these operations

Groundwater Elevation (feet)

SSWD MW-5

Spring 2019 high  Spring 2020 high

Summer 2019 low

Groundwater Elevation (feet)

CWD Winding Way

Spring 2018 high  Spring 2019 high  Spring 2020 high

Summer 2019 low

Summer 2018 low
Transfer guidelines address protection of riparian areas and GDEs

- Wells within 1 mile of river no shallower than 150 feet to first perforated interval
- Each well within ½ mile of potential GDE has to demonstrate that groundwater not supporting GDE
The Water Bank can grow substantially through time

Sources of recharge

- Municipal in-lieu
- Recycled in-lieu
- Flood-MAR
- Agricultural in-lieu

The map shows the North American Subbasin and the South American Subbasin, with the Urban Core highlighted. The map indicates sources of recharge through time, including Municipal in-lieu, directly through ASR, Recycled in-lieu, Flood-MAR, and Agricultural in-lieu.
The path to Federal recognition of Water Bank and its expansion in the urban area

Planning to complete in 2022

- Technical tools/analysis
- Environmental
- Accounting/financial analysis
- Governance
- Approvals

Build additional facilities to expand on operations

- ~2030
- ~$288 million in urban area
- Expansion scalable as funds available
Questions and Discussion
Regional Municipal & Industrial Water Trends

Population, Water Use and GPCD in the Sacramento Region

Gallons per Capita Per Day (GPCD)

Population, Water Use (acre-feet)


Population and Water Use (acre-feet)
An example of the benefit of these operations

Sac Suburban South Area Water Supply in SGA Area
2020 Pilot Transfer

- Six agencies participating
- 68 production wells
- Using three interties
- 25 monitoring wells
- Weekly monitoring of elevations at all wells during transfer, monthly until March 2021
- Trigger levels established at each well
- Transfer July through September, with option for adding October and November
  - 11,700 acre-feet Jul-Sep
  - 4,400 acre-feet Oct-Nov