Update on Regional Water Planning

May 3, 2018
Presentation Outline

• American River Basin Integrated Regional Water Management Plan (ARB IRWM Plan) Update
• What is conjunctive use?
• How do we recharge the basin?
• Overview of Regional Water Reliability Plan (RWRP)
• RWRP conjunctive use analysis
• Regional summary of recharge and recovery potential
• Next steps
ARB IRWM Plan Update

• ARB IRWM Plan most recently adopted in July 2013
• Department of Water Resources released new guidelines associated with Prop 1 in 2016
• Current update is fairly limited
• Supported by $250K grant from DWR
• Key updates include:
  • Water supply climate change vulnerabilities and mitigation measures
  • Updates associated with Sustainable Groundwater Management Act and Stormwater Resources Planning Act
• Minor boundary modification
ARB IRWM Plan Update (cont.)

- Draft released April 23rd
- Comments due May 25
- RWA Board to consider adoption on July 12
- Will also incorporate the ARB Stormwater Resources Plan (SWRP) and the West Slope SWRP on July 12 as required by Senate Bill 985
- DWR Prop 1 IRWM Implementation Grant applications expected in mid-2018
What is Conjunctive Use?

- Coordinated management of both surface water and groundwater to ensure supply reliability through variable hydrologic conditions
  - Maximize surface water during wet periods
  - Maximize groundwater during dry periods
- Requires availability of both sources of supply
- Requires suitable infrastructure to move different sources of water throughout region (e.g., Cooperative Transmission Pipeline, Freeport Pipeline)
How Do We Recharge Basin?

• In-lieu
  • Provide surface water to an existing groundwater user

• Direct
  • Surface recharge (impoundments/spreading)

• Wells
  • Dry wells
  • Aquifer storage and recovery (ASR) wells
Surface Recharge

- Much of area not conducive to direct recharge
- West Placer GSA recharge evaluation
- UC Davis work in central and south Sacramento County

Hydrofacies: Gravel, Sand, Muddy Sand, Mud

Cumulative Recharge Volumes (acre-ft) for each 1420-acre site

- **160,000 acre-ft** over 180 days for site 1
- **2500 acre-ft** over 180 days for site 5

Cumulative recharge volume (acre-ft) vs. time (days)
Dry Wells

- Used mostly for stormwater capture
- Used often to get through hardpan or other shallow clay
- Local stormwater stakeholders have been looking at ways to streamline permit process
- Biggest concern over water quality
- Expect to see expansion in future
ASR Wells

- Groundwater wells that can both inject and extract groundwater
- Typically inject at half rate of extraction
- Used in Roseville, Woodland
- Permit process has improved
- Local agencies interested in technical/financial feasibility
Regional Water Reliability Plan

- Plan to improve water supply reliability by assessing:
  - Vulnerabilities of each agency
  - Mitigation measures to help overcome vulnerabilities
- Intent is to have “basic levels of service” as defined by each water agency under varying conditions
- Look at expanding conjunctive use as a key strategy to help mitigate threats faced by region
- Begin exploring interest in a Regional Groundwater Bank
RWRP Conjunctive Use Analysis

• What is the conjunctive use potential of adjacent public water systems in the region through the increased coordinated use of surface water and groundwater?

  • **Recharge:** Store surface water in groundwater basin in wet years (i.e., increase surface water use)
  
  • **Recovery:** Withdraw stored water in dry years (i.e., increase groundwater use)

• Considered physical, operational, and water rights/contract constraints.

• Looked at current and near-term (<10 year) opportunities
Current Average vs. Dry Year Use

- Larger percentage of demand met by groundwater in dry years
- Lower reliance on surface water in dry years

**Historical Regional Surface Water vs. Groundwater Use**

Average 2011-2013

- Surface Water: 253,673 acre-feet/year (69%)
- Groundwater: 114,264 acre-feet/year (31%)

2015

- Surface Water: 166,434 acre-feet/year (64%)
- Groundwater: 94,684 acre-feet/year (36%)
Recharge Assumptions

• **Two Methods for Recharge Considered:**
  - In-lieu
  - Direct recharge (ASR)

• **Baseline Conditions:** average 2011 to 2013

• **Constraints Considered:**
  - Existing water rights/contract terms
  - Water treatment plant capacity
  - Conveyance/intertie capacity
  - Whether or not systems use fluoridation

• **Constraints Not Considered:**
  - Cost of water
  - Existing individual agreements
Recharge: Historical 2011-2013 Use

All Analysis Areas

Area 3

Surface Water

Groundwater

- 253,673
- 114,264

- 66,146
- 46,507
Area 3 Current Baseline

Avg. 2011-2013 Use

Surface Water Supplies

Available to Offset Groundwater Demand
66,146 56% Used
52,440 44%

46,507
66,146

200,000
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0

acre-feet/year
Area 3 Current Baseline (Avg. 2011-2013)

Available Surface Water Supplies from:
- SJWD
- CWD

Groundwater Demand

Graph showing monthly acre-feet/month and million gallon/day for January to December.
Area 3 Current Recharge Potential

**Recharge Potential**

Historical Groundwater Demand
Offset with Surface Water
31,085 acre-feet/year

Remaining Available Surface Water Supplies from:
- SJWD
- CWD

Remaining Groundwater Demand

Graph showing monthly recharge potential with data for each month from January to December.
Area 3 Current Recharge Potential

Potential to replace groundwater use with surface water by 31,085 acre-feet/year

(Average 2011-2013)
# Current Recharge Opportunities (Region-Wide)

<table>
<thead>
<tr>
<th>Basin Area</th>
<th>Existing Groundwater Demand (AF/year)</th>
<th>Recharge Potential (AF/year)</th>
<th>Key Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area 1</td>
<td>2,025</td>
<td>1,012</td>
<td>• Limited existing M&amp;I groundwater use</td>
</tr>
<tr>
<td>Area 2</td>
<td>0</td>
<td>5,823 (ASR)</td>
<td>• Limited existing M&amp;I groundwater use</td>
</tr>
</tbody>
</table>
| Area 3     | 46,507                               | 31,085                        | • Interties limitations  
|            |                                       |                               | • Need to maintain some groundwater production |
| Area 4     | 65,732                               | 25,302                        | • Interties limitations  
|            |                                       |                               | • Limited intra-district infrastructure  
|            |                                       |                               | • Uncertainty of future availability of surface water from Fairbairn WTP. |
| TOTAL      | 120,087                              | 63,221                        |                 |
Recovery Assumptions

• **Recovery Capacity**: correlated to groundwater production in dry years

• **Baseline Conditions**: Year 2015

• **Constraints Considered**: Conveyance capacity, groundwater production
Area 3 Current Baseline (Dry Year)

**2015 Use**

- Surface Water: 35,724 acre-feet/year
- Groundwater: 32,091 acre-feet/year

**Groundwater Production Capacity**

- Available to Offset Surface Water Use: 48,960 acre-feet/year (60%)
- Used: 32,091 acre-feet/year (40%)
Area 3 Current Baseline (Dry-Year)

Available Groundwater Capacity

Groundwater Use

Surface Water Use

acre-feet/month

millions gallon/day
Area 3 Current Recovery Potential (Dry-Year)

Remaining Available Groundwater Capacity

Groundwater Use

Recovery Potential

Historical Surface Water Use Offset with Groundwater
22,682 acre-feet/year

Remaining Surface Water Use
Area 3 Current Recovery Potential (Dry-Year)

Potential to replace surface water use with groundwater by 22,682 acre-feet/year

(Year 2015)
## Current Recovery Opportunities

<table>
<thead>
<tr>
<th>Basin Area</th>
<th>Existing Surface Water Use (AF/year)</th>
<th>Reduction in Surface Water Use (AF/year)</th>
<th>Key Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area 1</td>
<td>29,279</td>
<td>4,215</td>
<td>• Limited groundwater production capacity</td>
</tr>
<tr>
<td>Area 2</td>
<td>23,646</td>
<td>3,504</td>
<td>• Policies and customer preferences limiting M&amp;I groundwater use.</td>
</tr>
<tr>
<td>Area 3</td>
<td>37,724</td>
<td>22,682</td>
<td>• Regional intertie limitations</td>
</tr>
<tr>
<td>Area 4</td>
<td>77,785</td>
<td>27,433</td>
<td>• Regional intertie limitations</td>
</tr>
<tr>
<td>TOTAL</td>
<td>166,434</td>
<td>57,835</td>
<td></td>
</tr>
</tbody>
</table>
Regional Summary – Recharge Opportunity

Actual (2011-13 Average)
- Surface Water: 253,673, 69%
- Groundwater: 114,264, 31%

Potential (2011-13 Average)
- Surface Water: 316,894, 86%
- Groundwater: 51,043, 14%
Regional Summary – Recovery Opportunity

Actual (2015)
- Surface Water: 166,434, 64%
- Groundwater: 94,684, 36%

Potential (2015)
- Surface Water: 152,519, 58%
- Groundwater: 108,599, 42%
Regional Summary – Near-Term Options to Expand Conjunctive Use

Mitigation actions to address limitations to recharge and recovery:

- Construct 11 interties
- Improve in-district infrastructure for 3 agencies
- Address distribution system pressure for 4 agencies
- New/expanded ASR for 7 agencies
- Over 14 new well installation/rehabilitation
- Policy & operational changes
Regional Summary: Current vs. Near-Term Opportunities

<table>
<thead>
<tr>
<th></th>
<th>Wet Year</th>
<th>Dry Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recharge Potential</td>
<td>$100 - $170 million</td>
<td>$40 - $70 million</td>
</tr>
<tr>
<td>Recovery Potential</td>
<td>$100 - $170 million</td>
<td>$40 - $70 million</td>
</tr>
</tbody>
</table>

- **Existing Opportunities**
- **Near-Term Potential**
Next Steps

Regional Water Reliability Plan
Vulnerabilities, mitigation measures, look at current and expanded conjunctive use from near and long-term improvements, explore interest in groundwater bank

Regional Model Development
Technical analysis to further define yield created by expanded conjunctive use and evaluate impacts

Regional Groundwater Bank
Evaluate potential market, establish governance, and complete environmental analysis
Regional Groundwater Bank

- Increase water supply yield by using storage capacity of basin
  - Store in wet years
  - Recover in dry years

- Reduce impacts of future droughts and climate by establishing a local “reservoir” in the groundwater basin

- Promote investing in facilities and operations needed for local reliability