

American River Basin  
INTEGRATED REGIONAL WATER MANAGEMENT PLAN  
PLANNING FORUM

AGENDA

April 24, 2017, 1:30 pm  
Regional Water Authority  
5620 Birdcage Street, Suite 110  
Citrus Heights, CA

1. Introductions
2. Update on Proposition 1 IRWM Program
  - Disadvantaged Community Involvement Grants
  - IRWM Implementation Grants
3. Status of Existing IRWM Grant Projects Funded through Proposition 84
4. Update on Regional Storm Water Resources Plan Development
5. Update of ARB IRWM Plan
  - Discussion and Input on IRWM Governance
  - Discussion and Input on IRWM Objectives and Strategies
6. Other Items
  - Stanford Survey on IRWM
7. Next Meeting – October 23, 2017

# AMERICAN RIVER BASIN INTEGRATED REGIONAL WATER MANAGEMENT PLAN APRIL 2017 PLANNING FORUM

Monday, April 24, 2017; 1:30 pm  
5620 Birdcage Street, Suite 110  
Citrus Heights, CA 95610  
(916) 967-7692

## ATTENDEES

Carmichael Water District	Steve Nugent
Central Valley Regional Water Quality Control Board	Christine Joab
City of Lincoln	Jennifer Hanson
City of Roseville	Delyn Ellison-Lloyd
City of Roseville	Kelye McKinney
City of Roseville	Jim Mulligan
Department of Water Resources	Brad Arnold
Department of Water Resources	Jason Brabec
Environmental Justice Coalition for Water	Amanda Ford
Environmental Justice Coalition for Water	Angelica Ruiz
Golden State Water Company	Natalie Chow
Golden State Water Company	Larry Dees
HDR	David Beauchamp
Placer County	Bretty Storey
Placer County	Emily Zakowski
Placer County	Mary Keller
Placer County Flood Control	Brian Keating
Placer County Water Agency	Brian Rickards
Regional Water Authority	Rob Swartz
Regional Water Authority	John Woodling
Rio Linda/Elverta Community Water District	Ralph Felix
Sacramento Area Flood Control Agency	Mick Klasson
Sacramento Area Flood Control Agency	Tim Washburn
Sacramento County Water Agency	David Bolen
Sacramento County Water Agency	Mike Huot
Sacramento Regional County Sanitation District	Jose Ramirez
Sacramento State – Office of Water Programs	Christian Carleton
Sacramento Suburban Water District	Dan York
San Juan Water District	Rob Watson
Stantec	Vanessa Nishikawa
Stantec	Kirsten Pringle
Valley Foothill Watersheds Collaborative	Gregg Bates
Valley Foothill Watersheds Collaborative	Christine Flowers
City of Sacramento	Roshini Das
League of Women Voters, Sacramento Central Groundwater Authority	Rick Bettis

## MEETING SUMMARY

- Presentation topics included: Proposition 1 IRWM Program update, status of existing IRWM grant projects funded through Proposition 84, Regional Storm Water Resources Plan Development update, Stanford Survey on IRWM, and ARB IRWM Plan update.
- Meeting participants' questions and feedback ARB IRWM Plan update:

### Governance Structure

- Revisit IRWMP boundary.
- Keep the Advisory Committee to reinforce the objectivity of the project prioritization process. Membership will be divide geographically.
- No changes to Planning Forum or role of RWA/RWVG.

### General Comments on Framework

- As appropriate, add language to acknowledge:
  - Climate change
  - Social/environmental justice
  - Preservation of infiltration capacity
  - Conservation as a way of life

### Goals

- Revise first goal to read "Provide reliable and sustainable surface water and groundwater resources, sufficient to meet the existing and future needs of the Region."

### Principles

- Revise second principle ("Further integration...") to be more specific as to what we mean by integration.
- Consider language around preparing for hydrologic variability and uncertainty.

### Objectives

- Consider the following:
  - Objective 1: Sustainable groundwater management strategies and policies to create a nexus to the Sustainable Groundwater Management Act (SGMA).
  - Objective 3: Diversification of diversion points; use of the phrase "water needs" rather than "water demands."
  - Objective 5: Control of sources of contamination (in addition to remediation).
  - Objective 13: Reduce flood risk.
  - Objective 15: Energy production (in addition to energy efficiency).
- Potential new objectives (or reflect in existing objectives):
  - Meeting State and Federal requirements (e.g. SGMA, water loss, NPDES, etc.).
  - Resiliency.

## Strategies

- Add column in Strategies table listing the objective(s) addressed by each strategy.
- Consider the following:
  - Engagement of municipal community development directors/managers and/or other land-use agencies regarding the potential to preserve areas with high groundwater recharge potential.
  - Identify and encourage preservation of groundwater recharge areas; create a nexus to the Stormwater Resource Plan.
  - Diversification of diversion points.
  - Conjunctive use.
  - SGMA.
  - California Air Resources Board (CARB) changes.
  - Water policies and regulations related to drought and conservation.
  - Groundwater recharge via stormwater diversion permits specific to recharge\*
  - Groundwater recharge with recycled water.\*
  - In-lieu groundwater recharge via recycled water usage.\*
  - Groundwater banking.\*
- Next Planning Forum meeting scheduled for October 2017 at RWA office. If there are significant additional comments by stakeholders on the IRWMP goals, principles, objectives, and strategies, an interim meeting may be scheduled.
- **Action Items:**
  - **RWA** to send Word version of IRWMP Objectives and Strategies to stakeholders.
  - **Stakeholders** to provide comments on IRWMP Objectives and Strategies by Friday, May 19, 2017.
  - **RWA and Stantec** to revise IRWMP goals, principles, objectives, and strategies following receiving additional comments from stakeholders.
  - **RWA** to identify characteristics and geographic representation for potential Advisory Committee members.

\* Indicates comments provided via email.

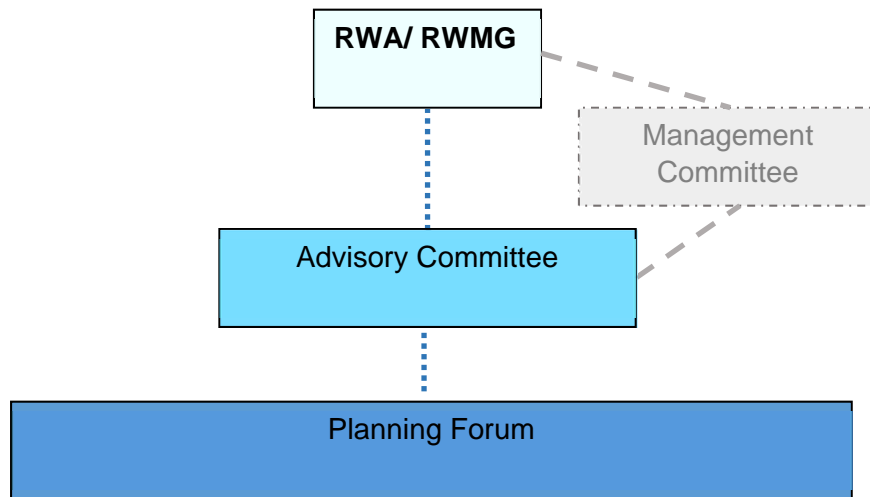
## IRWMP Governance

The Governance Structure is intended to encourage broad stakeholder involvement while providing a stable organization for the ongoing development, implementation, and maintenance of the ARB IRWMP based on RWA's demonstrated stability and accomplishments since its formation. The 2018 Update offers an opportunity to revisit and refresh the governance approach.

### Background

The 2013 IRWMP Governance Structure consisted of 4 components: Planning Forum, Advisory Committee, Management Committee, and the RWA (sitting as the Regional Water Management Group or RWMG). Formation of a RWMGs is an IRWMP requirement.

*Figure 1. 2013 IRWMP Governance Structure*



## Governance Structures

Following is a description of each of component, what was anticipated when the structure was formed, what has happened since that time, and potential options for Governance in the 2018 Update. In reviewing this list, the planning team would appreciate your assessment of how these structures are working and any suggestions for improvement.

ITEM	2013 UPDATE ORIGINAL DESIGN	CURRENT STATE	PERFORMANCE AND SUGGESTIONS FOR IMPROVEMENT	SUGGESTED CHANGES TO GOVERNANCE
<b>Planning Forum</b>	Served as the foundation for establishing the ARB IRWMP. Provided input to the ARB IRWMP development, especially on defining the plan Framework. Assesses and/or develops project concepts to meet regional objectives. Explores and discusses funding sources for the ARB IRWMP and its implementation.	Operating as anticipated. Has met semi-annually since adoption of ARB IRWMP in July 2013.	<i>Questions:</i> How is the current process working?  What if anything should be considered to improve the performance of this group?	No Changes.  <i>Question:</i> What, if any, other options should be considered?
<b>Advisory Committee</b>	Consisted of five individuals with broad knowledge of ARB Region issues that represented more than a single entity or project proponent. Considered input from the Planning Forum then provided recommendations to the Management Committee and RWMG.	The individuals originally selected to serve in this role have largely moved to new positions or are otherwise unavailable.  A role of the group was to expedite prioritization of projects in response to grants and other funding opportunities. In practice, grant and other funding requirements have driven the prioritization process and the original role has not been as important.	<i>Questions:</i> How is the current process working?  What if anything should be considered to improve the performance of the staff function?	Option 1: This role transfers to the RWA staff working with stakeholders as circumstances require.  Option 2: Reconvene the group with new members.  <i>Question:</i> What, if any, other options should be considered?
<b>Management Committee (no longer active)</b>	Served the function of funding the development of the IRWMP.	During development of the 2013 ARB IRWMP the Management Committee recognized its function was no longer necessary when the update was completed. It recommended sun-setting as a group with future maintenance and implementation of the IRWMP becoming an RWA responsibility.	Not applicable	No Changes
<b>RWA / RWMG</b>	Serves as the formal governing body for developing, maintaining, implementing, and updating the ARB IRWMP. Considers the input of stakeholders and the recommendations of the Advisory Committee to make final decisions on the content of the ARB IRWMP. Adopts the ARB IRWMP on behalf of the Region. Employs staff and consultants for development and implementation of the ARB IRWMP.	Operating as anticipated. RWA Board meets regularly every other month.	<i>Questions:</i> How is the current process working?	No Changes

ITEM	2013 UPDATE ORIGINAL DESIGN	CURRENT STATE	PERFORMANCE AND SUGGESTIONS FOR IMPROVEMENT	SUGGESTED CHANGES TO GOVERNANCE
RWA Staff	Charged with supporting the IRWMP. Led meetings of the Advisory Committee and Planning Forum. Coordinated with neighboring IRWM groups. Documented changes to the ARB IRWMP. Updated project database. Monitored funding opportunities. Tracked progress of implementation of projects in the ARB IRWMP.	Operating as anticipated	<i>Questions:</i> How is the current process working?  What if anything should be considered to improve the performance of the staff function?	No Changes

## 2018 ARB IRWMP Framework

### Objectives for this section:



- Review recent changes to the IRWM guidelines.
- Confirm the vision, goals, and principles for the 2018 ARB IRWMP framework.
- Revise the objectives and strategies for the 2018 ARB IRWMP framework to be consistent with the 2016 IRWM Guidelines and to reflect changed conditions in the region.

### 2016 IRWM Guidelines Related to Objectives Standard


1. Address adapting to changes in the amount, intensity, timing, quality and variability of runoff and recharge.
2. Consider the effects of sea level rise (SLR) on water supply conditions and identify suitable adaptation measures.
3. Reducing energy consumption, especially the energy embedded in water use, and ultimately reducing GHG emissions.
4. Consider the strategies adopted by CARB in its AB 32 Scoping Plan.
5. Consider options for carbon sequestration and using renewable energy where such options are integrally tied to supporting IRWM Plan objectives



2016 IRWM Plan Standard Requirements and Actions for ARB IRWM Plan 2018 Update

2016 IRWM Guideline	ARB IRWMP 2018 Update
<b>Region Description Standard</b>	
Describe water quality conditions. If the IRWM region has areas of nitrate, arsenic, perchlorate, or hexavalent chromium contamination, the Plan must include a description of location, extent, and impacts of the contamination; actions undertaken to address the contamination, and a description of any additional actions needed to address the contamination.	<b>Action:</b> Update <i>Ch2, Region Description</i> in Draft 2018 Update.
Describe likely Climate Change impacts on their region as determined from the vulnerability assessment.	 Complete. Climate Change Handbook standards were followed.
<b>Objectives Standard</b>	
Address adapting to changes in the amount, intensity, timing, quality and variability of runoff and recharge.	<b>Action:</b> Update <i>Ch5, IRWMP Framework</i> in April Workshop (Apr 2017).
Consider the effects of sea level rise (SLR) on water supply conditions and identify suitable adaptation measures.	
Reducing energy consumption, especially the energy embedded in water use, and ultimately reducing GHG emissions.	
In evaluating different ways to meet IRWM plan objectives, where practical, consider the strategies adopted by CARB in its AB 32 Scoping Plan.	
Consider options for carbon sequestration and using renewable energy where such options are integrally tied to supporting IRWM Plan objectives.	
<b>Resources Management Strategies Standard</b>	
Identify RMS incorporated in the IRWM Plan: Consider all California Water Plan (CWP) RMS criteria (29) listed in Table 3 from the CWP Update 2013	 Complete. 2013 RMS included in 2013 Update.
Consideration of climate change effects on the IRWM region must be factored into RMS. Identify and implement, using vulnerability assessments and tools such as those provided in the Climate Change Handbook, RMS and adaptation strategies that address region-specific climate change impacts. <ul style="list-style-type: none"> <li>• Demonstrate how the effects of climate change on its region are factored into its RMS.</li> <li>• Reducing energy consumption, especially the energy embedded in water use, and ultimately reducing GHG emissions.</li> <li>• An evaluation of RMS and other adaptation strategies and ability of such strategies to eliminate or minimize those vulnerabilities, especially those impacting water infrastructure systems.</li> </ul>	<b>Action:</b> Update <i>Ch5, IRWMP Framework</i> in April Workshop (Apr 2017).
<b>Project Review Process Standard</b>	
Project's contribution to climate change adaptation. <ul style="list-style-type: none"> <li>• Include potential effects of Climate Change on the region and consider if adaptations to the water management system are necessary.</li> <li>• Consider the contribution of the project to adapting to identified system vulnerabilities to climate change effects on the region.</li> <li>• Consider changes in the amount, intensity, timing, quality and variability of runoff and recharge.</li> <li>• Consider the effects of SLR on water supply conditions and identify suitable adaptation measures.</li> </ul>	<b>Action:</b> Update <i>Ch5, IRWMP Framework</i> in October Workshop (October 2017).

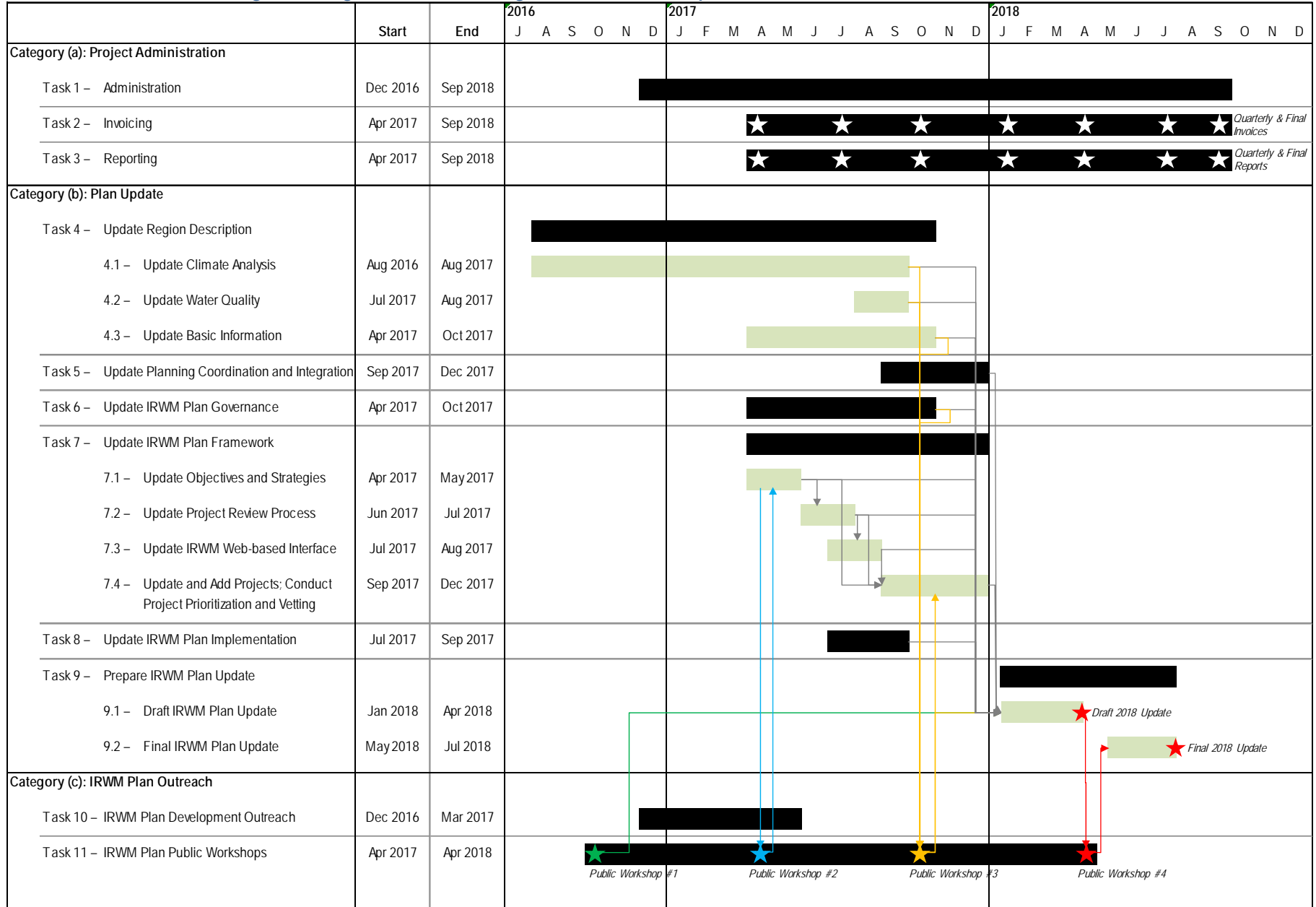
2016 IRWM Plan Standard Requirements and Actions for ARB IRWM Plan 2018 Update

2016 IRWM Guideline	ARB IRWMP 2018 Update
<p>Contribution of project in reducing GHGs compared to project alternatives.</p> <ul style="list-style-type: none"> <li>• Consider the contribution of the project in reducing GHG emissions as compared to project alternatives.</li> <li>• Consider a project's ability to help the IRWM region reduce GHG emissions as new projects are implemented over the 20-year planning horizon.</li> <li>• Reducing energy consumption, especially the energy embedded in water use, and ultimately reducing GHG emissions.</li> </ul>	<p><b>Action:</b> Update <i>Ch5, IRWMP Framework</i> in October Workshop (October 2017).</p>
<p>Specific benefits to critical water issues for Native American tribal communities.</p>	<p> Project review process already includes prioritization for project that benefit Native American tribal communities.</p>
<p><b>Plan Performance and Monitoring Standard</b></p>	
<p>Contain policies and procedures that promote adaptive management and, as more effects of Climate Change manifest, new tools are developed, and new information becomes available, adjust IRWM plans accordingly.</p>	<p><b>Action:</b> Update <i>Ch6, IRWMP Implementation</i> in October Workshop (October 2017)</p>
<p><b>Local Water Planning Standard</b></p>	
<p>Discuss how the plan relates to these other planning documents and programs. Same as 2012 GL with the following addition: "It should be noted that Water Code § 10562 (b)(7) requires the development of a stormwater resource plan and compliance with these provisions to receive grants for stormwater and dry weather runoff capture projects. Upon development of the stormwater resource plan, the RWMG shall incorporate it into IRWM plan. The IRWM Plan should discuss the processes that it will use to incorporate such plans." Minor wording differences - e.g. Groundwater Sustainability Plan example in the 2016 Guidelines instead of Groundwater Management Plan in the 2012 Guidelines.</p>	<p><b>Action:</b> Update <i>Ch2, Region Description</i> and <i>Ch3, Planning Coordination and Integration</i> in Draft 2018 Update.</p>
<p>Consider and incorporate water management issues and climate change adaptation and mitigation strategies from local plans into the IRWM Plan.</p>	<p><b>Action:</b> Update <i>Ch3, Planning Coordination and Integration</i> in Draft 2018 Update.</p>
<p><b>Local Land Use Planning Standard</b></p>	
<p>Demonstrate information sharing and collaboration with regional land use planning in order to manage multiple water demands throughout the state, adapt water management systems to climate change, and potentially offset climate change impacts to water supply in California.</p>	<p><b>Action:</b> Update <i>Ch5, IRWMP Framework</i> in Draft 2018 Update and through plan outreach.</p>
<p><b>Stakeholder Involvement Standard</b></p>	

2016 IRWM Plan Standard Requirements and Actions for ARB IRWM Plan 2018 Update

2016 IRWM Guideline	ARB IRWMP 2018 Update
Contain a public process that provides outreach and opportunity to participate in the IRWM plan. Per 2016 GL: "Native American tribes – It should be noted that tribes are sovereign nations, and as such coordination with tribes is on a government-to-government basis."	<b>Action:</b> Update <i>Ch5, IRWMP Framework</i> in Draft 2018 Update and through plan outreach.
Identify process to involve and facilitate stakeholders during development and implementation of IRWM plan regardless of ability to pay; include description of any barriers to involvement. "Stakeholder Involvement" in the 2012 GL is referred to "Native American Tribe and Stakeholder Involvement" in the 2016 GL and Tribes are referred to specifically.	<b>Action:</b> Update <i>Ch5, IRWMP Framework</i> in Draft 2018 Update and through plan outreach.
<b>Climate Change Standard</b>	
Evaluate IRWM region's vulnerabilities to climate change and potential adaptation responses based on vulnerabilities assessment in the DWR Climate Change Handbook for Regional Water Planning. Addition in 2016 GL - "At a minimum, the vulnerability evaluation must be equivalent to the vulnerability assessment contained in the Climate Change Handbook for Regional Water Planning, Section 4 and Appendix B."	<b>Action:</b> Update <i>Ch2, Region Description</i> in Draft 2018 Update.
Provide a process that considers GHG emissions when choosing between project alternatives. Addition in 2016 GL - "At a minimum, that process must determine a project's ability to help the IRWM region reduce GHG emissions as new projects are implemented over a 20-year planning horizon and consider energy efficiency and reduction of GHG emissions when choosing between project alternatives."	<b>Action:</b> Update <i>Ch5, IRWMP Framework</i> in October Workshop (October 2017).
Include a list of prioritized vulnerabilities based on the vulnerability assessment and the IRWM's decision making process. Addition in 2016 GL - "A list of prioritized vulnerabilities which includes a determination regarding the feasibility for the RWMG to address the priority vulnerabilities."	<b>Action:</b> Update <i>Ch2, Region Description</i> in Draft 2018 Update.
Address adapting to changes in the amount, intensity, timing, quality, and variability of runoff and recharge.	<b>Action:</b> Update <i>Ch5, IRWMP Framework</i> in April Workshop (Apr 2017).
Areas of the State that receive water imported from the Sacramento-San Joaquin River Delta, the area within the Delta, and areas served by coastal aquifers must also consider the effects of sea level rise (SLR) on water supply conditions and identify suitable adaptation measures.	<b>Action:</b> Update <i>Ch5, IRWMP Framework</i> in April Workshop (Apr 2017).

## American River Basin Integrated Regional Water Management Plan 2018 Update



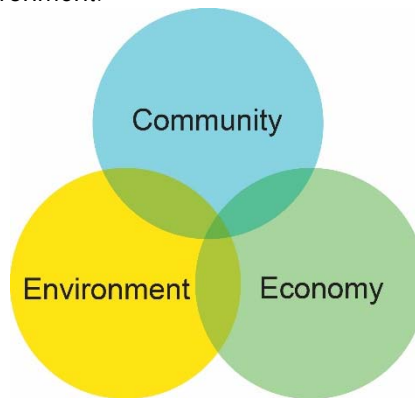
## 2018 IRWMP Vision, Goals, Principles, Objectives and Strategies

### Vision

*Definition: A compelling description of the future end state (in a time horizon) of the American River Basin Region that has resulted from the proactive, strategic activities undertaken by the IRWM.*

Vision from 2013 ARB IRWMP:

“The American River Basin Region will responsibly manage water resources for the last health of our community, economy, and the environment.”



## Goals

*Definition: Describe the “end state,” of activities and support the overall vision.*

Goals from 2013 ARB IRWMP:

- Provide reliable and sustainable water resources, sufficient to meet the existing and future needs of the Region.
- Protect and enhance the quality of surface water and groundwater.
- Protect and enhance the environmental resources of the watersheds within the Region.
- Protect the people, property, and environmental resources of the Region from damaging flooding.
- Promote community stewardship of our Region’s water resources.

## Principles

*Definition: Statements that articulate shared organizational values, underlie strategic vision and mission, and serves as a basis for integrated decision making.*

Principles from 2013 ARB IRWMP:

- Planning for sustainability of our water resources considers all aspects of our watershed.
- Further integration to achieve multiple benefits is employed throughout our water resources planning.
- Adaptive management techniques and active monitoring are employed in managing our water resources.
- A broader community is engaged as stewards of our water resources.

## Objectives

*Definition: The outcomes the will help the region determine if it has achieved its goals.*

Objectives from 2013 ARB IRWMP:

1. Meet current and future water resources needs.
2. Increase water use efficiency.
3. Remediate contaminated groundwater and reuse it to the extent feasible.
4. Improve ability to reliably meet water demands during dry or emergency conditions.
5. Increase the use of recycled water for appropriate uses.
6. Remediate contaminated groundwater and reuse it to the extent feasible.
7. Improve protection of beneficial uses of surface water and groundwater.
8. Recharge and reuse stormwater and urban runoff to the extent practicable.
9. Maintain and improve the ecosystem function of area streams and watersheds.
10. Maintain and improve habitat of area watersheds.
11. Conserve natural riparian buffers in undeveloped portions of local watersheds and restore buffers in developed areas when possible.
12. Increase the capacity of the flood management system to meet applicable standards for designated areas and land uses.
13. Maintain and improve levees and other flood-related infrastructure to reduce flood risk.
14. Maintain and restore/reconnect floodplains to provide flood storage and other benefits.
15. Improve management of residual flood risks.
16. Increase awareness of the need for, benefits of, and practices for maintaining sustainable water resources.
17. Improve integration of water resources planning with land-use planning.
18. Increase sharing of information, studies, and reports to further advance integrated regional water management.

## 2018 ARB IRWMP OBJECTIVES

The following table shows a list of proposed changes to the ARB IRWMP objectives. Please review the proposed changes *before* the meeting. Be prepared to answer the following questions:

- Do the proposed changes adequately address the 2016 IRWM guidelines?
- Do the proposed changes reflect the vision, goals and principles stated above?
- Are there changes to existing objectives you would like to include in the 2018 ARB IRWMP that are not reflected in the table below?
- Are there new objectives that you would like to include in the 2018 ARB IRWMP are not reflected in the table below? (Write proposed new objectives into the blank spaces provided.)

Objective	Description of Objective	Proposed Changes	Comments on Changes
1. Meet current and future water resources needs.	This objective includes actions to maintain, replace, and construct facilities, and to implement programs and activities as necessary to reliably meet varied water resources needs throughout the Region.	No proposed change	
2. Increase water use efficiency.	This objective includes actions to reduce the amount of water necessary for a given purpose and to comply with mandated conservation targets.	No proposed change	
3. Improve ability to reliably meet water demands during dry and emergency conditions	This objective focuses actions such as conjunctive use and improving water system connections for greater operational flexibility.	This objective focuses actions such as conjunctive use and improving water system connections for greater operational flexibility <u>in consideration of hydrologic variability and climate change (including sea level rise).</u>	
4. Increase the use of recycled water for appropriate uses.	In a region where recycled water use is not yet considered necessary, this objective aims to encourage its development and to explore its potential benefits.	No proposed change	
5. Remediate contaminated groundwater and reuse it to the extent feasible	This objective currently refers specifically to cleanup initiatives of groundwater contamination plumes.	No proposed change	
6. Improve protection of beneficial uses of surface water and groundwater.	This objective addresses water quality issues and covers potential actions such as improving wastewater treatment and infrastructure, meeting discharge standards, and improving stormwater runoff quality.	No proposed change; already addresses timing, quality and variability of runoff	
7. Recharge and reuse stormwater and urban runoff to the extent practicable.	This objective encourages considering runoff as a potential resource and identifying locations for groundwater recharge.	No proposed change; already addresses timing, quality and variability of runoff	
8. Maintain and improve the ecosystem functions of area streams and watersheds.	This objective highlights ecosystem function, recognizing that habitat restoration and related efforts may not improve the entire ecosystem function, which is also a vital component of environmental sustainability.	No proposed change	



Objective	Description of Objective	Proposed Changes	Comments on Changes
9. Maintain and improve habitat of area watersheds.	This objective includes actions that maintain, improve, and conserve terrestrial, riparian, and aquatic habitats, such as implementing restoration plans and mimicking pre-project hydrologic flow patterns.	No proposed change	
10. Conserve natural riparian buffers in undeveloped portions of local watersheds and restore buffers in developed areas when possible.	This objective applies to both the environmental resources and flood goals, with the recognition that preserving remaining riparian habitat also allows for flexible flood management.	No proposed change	
11. Increase the capacity of the flood management system to meet applicable standards for designated areas and land uses.	This objective signifies the importance of increasing the capacity of the flood system to handle extreme events, whether through increased conveyance and/or temporary storage.	No proposed change; addresses timing and variability of runoff	
12. Maintain and improve levees and other flood-related infrastructure to reduce flood risk.	This objective focuses on the need to maintain and improve levees and other flood-related infrastructure throughout the Region, actions that are often postponed even when the structures are not up to standard.	No proposed change	
13. Maintain and restore/recommend floodplains to provide flood storage and other benefits.	This objective recognizes that connecting floodplains would increase total habitat area as well as their connectivity while providing better flood protection.	No proposed change	
14. Improve management of residual flood risks.	This objective recognizes that even after all efforts to reduce the flood risk are completed, this risk of flood can never be completely eliminated. Residual risk is the exposure to loss remaining after other known risks have been countered, factored in, or eliminated.	No proposed change	
15. Increase awareness of the need for, benefits of, and practices for maintain sustainable water resources.	This objective covers the need to increase public and public officials' awareness of all water related issues, such as the role of a healthy ecosystem, water efficiency, and flood risk.	This objective covers the need to increase public and public officials' awareness of all water related issues, such as the role of a healthy ecosystem, water efficiency, flood risk, <u>climate change and energy efficiency</u> .	
16. Improve integration of water resources planning with land-use planning.	This objective recognizes the need to collaborate with land-use planning departments to effectively manage water resources and overall development into the future.	This objective recognizes the need to collaborate with land-use planning departments to effectively manage water resources and overall <u>sustainable</u> development into the future.	

Objective	Description of Objective	Proposed Changes	Comments on Changes
17. Increase sharing of information, studies, and reports to further advance integrated regional water management.	This objective deals with issues of lack of sharing of learned knowledge, which perpetuates the single-purpose oriented approach to water use or management. Increased data availability would also lead to better informed decision making.	No proposed changes.	
		<p><u>New objective: Promote regional and local water water-energy relationships and opportunities to achieve greater resource efficiency.</u></p> <p><u>Description of new objective: This objective encourages consideration of sustainable energy practices and reduction of GHG emissions consistent with the AB 32 Scoping Plan.</u></p>	

## Strategies

*Definition: General approaches or methods for achieving objectives and resolving specific issues. Should be measurable whenever possible, state a distinct target and a deadline for when to meet that target, and are flexible.*

### Strategies from 2013 ARB IRWMP:

#### Water Resource Strategies

- WR1. Increase surface water treatment capacity to 800 million gallons per day (MGD) by 2030.
- WR2. Increase groundwater production capacity to 550 MGD by 2030.
- WR3. Increase distribution system water storage capacity to 525 MG by 2030.
- WR4. Improve connections between water systems in the Region for greater operational flexibility.
- WR5. Increase use of recycled water to 55,000 acre-feet per year by 2030.
- WR6. Implement water conservation to reduce regional per capita water use by 20% by 2020.

#### Water Quality Strategies

- WQ1. Meet all appropriate treatment standards and discharge requirements for wastewater treatment.
- WQ2. Meet all nonpoint discharge requirements.
- WQ 3. Reduce source water pollution.
- WQ4. Increase the capture of stormwater runoff for infiltration or reuse where feasible.
- WQ5. Reduce the extent of groundwater contamination, consistent with regulatory cleanup programs.
- WQ6. Increase use of remediated groundwater for beneficial uses.
- WQ7. Coordinate with the CV-SALTS program to identify potential regional issues related to salt and nutrient management.

#### Environmental Resources Strategies

- ER1. Restore functional riparian and wetland habitat.
- ER2. Conserve functional riparian and wetland habitat.
- ER3. Implement local habitat and watershed conservation and restoration plans.
- ER4. Improve the quality, quantity, and connectivity of habitat communities.

- ER5. Actively manage the incidence of invasive species.
- ER6. Increase access, quality, and quantity of anadromous and native fish habitat.
- ER7. Improve flows, quality, and temperature of area streams and rivers.
- ER8. Improve groundwater levels to support and improve habitat.

#### Flood Management Strategies

- FM1. Provide a 200-year level of flood protection for urban areas by 2025, where feasible.
- FM2. Improve level of flood protection for levee-protected small communities and agricultural lands in the Region, where feasible.
- FM3. Promote restoration and conservation of floodplain function.
- FM4. Support a Folsom Dam Water Control Manual update that balances flood control, water, environmental and recreational needs.
- FM5. Coordinate with inter-jurisdictional, regional flood management efforts.
- FM6. Coordinate flood emergency planning and response efforts.

#### Community Stewardship Strategies

- CS1. Increase availability and access to educational material on sustainable water resources.
- CS2. Identify, summarize, and discuss the potential for partnering of existing regional outreach and education programs by 2015.
- CS3. Identify natural recharge areas and relay that information to relevant land-use planning agencies by 2015.
- CS4. Promote the use of Low Impact Development (LID) methods, where appropriate.
- CS5. Provide annual updates to city and county governments and other local agencies on accomplishments and continued challenges of integrated water management.
- CS6. Increase engagement of community leaders (e.g., using community-based social marketing where applicable).

#### ARB IRWMP Strategy "Parking Lot"

WR: Conjunctive use

WR: Implementation of cost-effective BMPs in UWMPs

WR: Non-revenue water reduction

WR: Regional and local water-energy relationships and opportunities to achieve greater resource efficiency

WR: Regional data management system for water supply systems

WR: Peak demand reduction

WQ: State Water Resources Control Board Biological Objectives

CS: Outreach strategy related to agricultural water management and efficiency

(N/A): Quantification of certain strategies

## 2018 ARB IRWMP STRATEGIES

The following table lists the strategies and descriptions of the strategies from the 2013 ARB IRWMP. The strategies are organized by topic area: water resource (WR), water quality (WQ), environmental resource (ER), flood management (FM) and community stewardship (CS). Please review the strategies *before* the meeting. Be prepared to answer the following questions:

- Do the existing strategies adequately address the 2016 IRWM guidelines?
- Should any of the 2013 IRWMP strategies be revised to address changed conditions in the American River Basin?
- Should new strategies be added to address changed conditions in the American River Basin?

Strategy	Description of Strategy	Comments on Strategy
<b>Water Resource Strategies</b>		
<p><b>WR1. Increase surface water treatment capacity to 800 million gallons per day (MGD) by 2030.</b></p>	<p>The need for increased surface water treatment capacity in the ARB Region stems from two primary drivers: (1) the need to accommodate planned urban growth, and (2) the need to more fully implement regional conjunctive use operations for regional water supply reliability. This strategy envisions a combination of new construction, and repair and maintenance of old infrastructure. The strategy was developed through a survey of public water suppliers in the ARB Region. Current capacity is slightly over 700 MGD, so the target represents an increase of about 100 MGD.</p> <p>Region-wide, urban water demands in 2030 are expected to be 718 thousand acre-feet (TAF) per year (see Section 2.9.1.2), and the increased need for surface water treatment and delivery is a certainty. The ARB Region in aggregate has sufficient surface water rights and contracts to meet future needs; however, overcoming legal and institutional constraints (infrastructure, place of use, perfection of rights, etc.) associated with surface water rights and contracts may preclude surface water delivery to the entire ARB Region. Continued surface water deliveries are expected to be a significant source of regional water supply.</p> <p>In addition to serving the needs of planned growth directly, additional surface water treatment capacity is needed to more fully implement (in combination with other strategies) the regional conjunctive use program, first prescribed by the Water Forum Agreement (WFA) in 2000. Expanded implementation of conjunctive use will be critical to meeting regional water needs, especially considering changes in upstream snowpack and revised reservoir operating rules due to climate change.</p>	
<p><b>WR2. Increase groundwater production capacity to 550 MGD by 2030.</b></p>	<p>The need for increased groundwater production capacity in the ARB Region stems from three primary drivers: (1) the need to accommodate planned urban growth; (2) the need to more fully implement regional conjunctive use operations for regional water supply reliability, and (3) the need to replace groundwater supplies (at alternate locations) lost to contamination. This strategy envisions new, expanded, and rehabilitated facilities. The strategy was developed through a survey of public water suppliers in the ARB Region. Current capacity is approximately 400 MGD, so the target represents an increase of about 150 MGD.</p> <p>Region-wide, urban water demands in 2030 are expected to be 718 TAF per year (see Section 2.9.1.2), and the increased need for groundwater production is a certainty. The ARB Region is generally underlain by robust groundwater supplies that are actively managed and balanced by Western Placer County, Sacramento Groundwater Authority (SGA), Sacramento Central Groundwater Authority (SCGA), and South Area Water Council that preserve, protect, and manage these important resources. Although both Sacramento and Placer counties have policies that require supplemental sources of supply to</p>	

Strategy	Description of Strategy	Comments on Strategy
	<p>support “no net groundwater take” for planned growth, groundwater is expected to continue to be a significant source of regional water supply.</p> <p>Additional groundwater production capacity is needed to more fully implement (in combination with other strategies) the regional conjunctive use program, as described previously. Increased implementation of conjunctive use will be critical to meeting regional water needs during shortage conditions, especially considering changes in surface water availability due to climate change. Replacement groundwater supplies will be needed where existing groundwater production capacity is impacted by contamination from known plume migration or new sources of contamination.</p>	
<p><b>WR3. Increase distribution system water storage capacity to 525 MG by 2030.</b></p>	<p>The water purveyors in the ARB Region have various operational strategies and practices for using local groundwater and/or surface water supplies to meet water demands. Water delivery system needs depend on topography, water quality, and demand patterns. Many agencies make use of storage reservoirs to balance diurnal flows and variable demands while other agencies rely on groundwater production and direct delivery to meet variable demands. While increased storage is generally desirable from an operational perspective, changes in regional electricity pricing to time-of-use rates may be a significant driver for investing in additional water storage capacity. As peak water and peak power demands roughly coincide, there will likely be increased incentives to avoid peak power rates by treating and storing water at off-peak times. Also, as water suppliers in the ARB Region continue to expand the regional conjunctive use program and interconnect their respective systems, storage reservoirs can be valuable tools to balance line service pressures, water demands, and water quality needs. The strategy was developed through a survey of public water suppliers in the ARB Region. Current capacity is slightly approximately 400 MGD, so the target represents an increase of about 125 MGD.</p>	
<p><b>WR4. Improve connections between water systems in the Region for greater operational flexibility.</b></p>	<p>Section 2.8 describes individual water suppliers and their known system interconnections with adjoining agencies. In some cases, these connections are for direct delivery (wholesaler to retailer), but in many cases the interconnections are for emergencies. As the ARB Region more fully implements the regional conjunctive use program, agencies will likely want to optimize their water supplies and facilities, especially with adjoining agencies so as to not overbuild capacity or duplicate facilities. Further, policies, water service contracts, or other agreements may contain timing or volumetric constraints that are more efficiently and effectively addressed by multiple agencies to more fully optimize resource use—again making increased system interconnections increasingly important. Operational flexibility also better prepares the Region for shortages and climate change.</p>	
<p><b>WR5. Increase use of recycled water to 55,000 acre-feet per year by 2030.</b></p>	<p>Recycled water is currently used to the extent practicable in the ARB Region considering the current availability of Title 22 supplies. As a nearly 100 percent reliable source of supply, recycled water is expected to eventually play an important role in the ARB Region for irrigation and industrial (process) water, and for direct and indirect groundwater augmentation. National Pollutant Discharge Elimination System (NPDES) permit requirements have become more stringent and most regional wastewater plants will produce Title 22 effluent at a minimum, in the very near future. City of Roseville has a robust recycled water system, and Sacramento Regional County Sanitation District (SRCSD) has set a goal to produce and reuse upwards of 55 MGD of recycled water per year by 2020. Because approximately 75 percent of regional water use is outdoors (irrigation), recycled water supplies are expected to offset or replace the need for other surface and/or groundwater sources, either directly or indirectly. Future challenges to fully utilizing recycled water include construction of new infrastructure as well as gaining social acceptance of this alternate water resource.</p>	

Strategy	Description of Strategy	Comments on Strategy
<p><b>WR6. Implement water conservation to reduce regional per capita water use by 20% by 2020.</b></p>	<p>Demand reduction is an integral part of water supply management, and it will become increasingly important as water supplies become less reliable. The Water Conservation Act of 2009 (SB7X-7) established a water conservation target of 20 percent (by urban water supply agency, per capita from a baseline reported to DWR in 2010) by the year 2020 to meet statewide water resource objectives. To track progress toward the 2020 target, water agencies are also required to meet an intermediate milestone of at least a 10 percent savings in per capita water use by 2015. Water agencies that do not meet these targets will not be eligible to receive state water grants or loans.</p> <p>Water agencies have the option to meet their targets either as an individual agency or through a regional partnership of multiple water agencies. One benefit of regional compliance is the increased regional coordination between agencies and across water sources. This coordination leads to a better understanding of regional water savings potential and the resulting effects on the region's water sources. For this reason and others, regional compliance may be considered in the future. Stakeholders have already identified the need to set a region-specific per capita water use target as the essential next step to this process.</p> <p>Regardless of the compliance method, there are many strategies, tools, and programs available to assist water agencies with achieving the 20 percent reduction by the 2020 target. The California Urban Water Conservation Council and DWR through their UWMP guidelines offer a list of demand management measures (DMM) or best management practices (BMP) to reduce water demand. Both distribution side (water loss control with leak repair, metering, etc.) and customer side (more efficient irrigation systems and landscape designs, fixture replacement, etc.) DMMs and BMPs should be considered. Some of these DMMs and BMPs appear as ARB Region strategies as well.</p> <p>The ARB Region and participating agencies have been proactively engaged in water conservation programs well in advance of SB7x7, both collectively through the RWA's Water Efficiency Program (WEP) and individually, to conserve water and manage demands. These efforts have and continue to reduce per-capita water use within the Region. While much progress has been made in recent years, continued meter installation to support volumetric pricing, expanded recycled water programs, and reduced outdoor water use are expected to further help meet this requirement in the coming years.</p> <p>A more detailed water conservation strategy specific to the ARB Region is still under development. Stakeholders identified the need to determine which BMPs or DMMs would be the most cost effective for the Region to guide such a strategy. This aspect of the strategy is currently listed as a parking lot item, but as interest and conditions warrant this strategy will be revisited.</p>	
<p><b>Water Quality Strategies</b></p>		
<p><b>WQ1. Meet all appropriate treatment standards and discharge requirements for wastewater treatment.</b></p>	<p>Wastewater treatment standards and waste discharge requirements help protect beneficial uses of receiving waters. If not properly treated, wastewater can introduce bacteria, viruses, and nutrient loads into receiving waters, among other contaminants. Excessive concentrations of contaminants can lead to negative ecological and habitat impacts, restrictions on water-based recreation, increased drinking water treatment costs, and, in extreme cases, decrease water supply availability. The ARB Region recognizes that federal and state water quality regulations and standards will continue to change, and this</p>	



Strategy	Description of Strategy	Comments on Strategy
	<p>strategy intends to allow for adaptation to such changes. In addition to public wastewater treatment plants (WWTP), private industrial plants must also meet discharge regulations, but are not specified in this strategy because they are not within the ARB Region's purview.</p> <p>The Clean Water Act (CWA) is implemented and enforced by the EPA. The EPA often delegates authority to state agencies (as is the case in California) to assist in implementation. The NPDES permitting is implemented and enforced by the Central Valley Regional Water Quality Control Board for the ARB Region. Within the CWA, the NPDES permit program regulates point source pollution, which is applicable to WWTPs and their effluent. Wastewater treatment standards vary based on receiving waters, but generally secondary treatment (physical and biological treatment) is considered the minimum treatment standard. Tertiary treatment (physical and biological plus filtration) is increasingly common for inland surface water discharges or where effluent is recycled. These standards are expected to become increasingly stringent in the future, potentially including nutrient (nitrogen and phosphorous) removal.</p> <p>Total maximum daily load (TMDL) is another CWA program, applies to both point sources and non-point sources (which is the focus of Strategy WQ2). TMDLs are intended to reduce pollutant loading in 303(d) impaired water bodies for identified, problematic contaminants, for which other efforts or programs have not been sufficient.</p>	
<p><b>WQ2. Meet all nonpoint discharge requirements.</b></p>	<p>Nonpoint sources of water pollution include urban (stormwater) and agricultural runoff. While nonpoint discharges have been found to significantly impact surface water quality, they have been more difficult to regulate because discharge locations are dispersed. Common urban and agricultural nonpoint source contaminants of concern in the ARB Region include pesticides, fertilizer (nutrients), total dissolved solids or salts, and mercury. TMDLs address both point and nonpoint source pollution in water bodies, and this program is described in Strategy WQ1.</p> <p>Urban nonpoint source pollution is regulated through Municipal Separate Storm Sewer System (MS4) programs, which focus on stormwater discharges. MS4 permit renewals have recently moved from qualitative, effort-based BMPs to quantitative, water-quality based standards. The ARB Region is mindful of and intends to learn from recent examples in Southern California (Los Angeles County) where water quality standards and program costs to implement solutions to address the new MS4 permit are increasing dramatically. The ARB Region recognizes that these water quality regulations and standards may change, and this strategy allows for adaptation to such changes.</p> <p>The state's Irrigated Lands Regulatory Program under the Waste Discharge Requirements (WDR) Program regulates discharges from irrigated agricultural lands. These discharges include irrigation runoff, flows from tile drains, and stormwater runoff. WDRs contain conditions requiring water quality monitoring and corrective actions when impairments are found. Most of the ARB Region is developed and urbanized, except for the northwestern and southern portions of the Region. While actions of agricultural stakeholders are not under the ARB Region's purview, the Region recognizes the importance of reaching out to these stakeholders and continuing increasing collaboration in the future.</p>	
<p><b>WQ 3. Reduce source water pollution.</b></p>	<p>An effective way of managing point and nonpoint source pollution and improving surface water quality is to isolate and/or reduce sources of contamination before these contaminants enter waterways. In contrast to regulations and permits that specifically target agencies, this strategy is dependent upon the general public's behavior and links directly to the need for</p>	

Strategy	Description of Strategy	Comments on Strategy
	<p>an increase in awareness. Source pollution reduction is similarly important for agricultural water users as well. Actions that can help reduce source water pollution include, but are not limited to:</p> <ul style="list-style-type: none"> <li>• Reducing and controlling the application of pesticides, herbicides, and fertilizer</li> <li>• Altering the timing of application of pesticides, herbicides, and fertilizer according to irrigation times and amount, or weather</li> <li>• Managing waste/garbage appropriately so it does not enter waterways</li> <li>• Maintaining vegetation, buffer strips, water detention areas, and other low impact development (LID) systems between sources of pollution and surface waters to also manage metals, hydrocarbons, and temperature of runoff</li> </ul> <p>Reducing source water pollution is an integral part of overall water pollution management. The success of this strategy, among other water pollution control strategies, can be measured by monitoring improvements in surface water quality.</p>	
<p><b>WQ4. Increase the capture of stormwater runoff for infiltration or reuse where feasible.</b></p>	<p>Most stormwater and flood management systems are currently designed and operated to capture, channelize, and convey stormwater runoff away from high-value properties and people as rapidly as possible during and after storm events. However, stormwater can also be a resource, if it can be captured and stored. Groundwater basins often provide the most effective means of storing stormwater. Additional benefits of capturing stormwater include the following:</p> <ul style="list-style-type: none"> <li>• Increased volume of groundwater in storage regionally for use during shortage periods.</li> <li>• Attenuation of storm flows. This helps reduce flooding and associated damages to development or habitats in adjacent areas.</li> <li>• Natural soil treatment processes to remove pollution. This in turn protects and improves receiving water quality and aquatic habitats.</li> </ul> <p>Revising existing stormwater and flood management systems to augment groundwater infiltration will require policy, management, design, and operational modifications. Decentralizing flood management requires collaboration between water and land-use agencies, and potentially making difficult decisions to restrict or redesign development. Decreasing impervious area is one example. Expansion of floodplains and associated habitat creates environmental water needs and requirements. This may necessitate changes in water operations to maintain enough flow for those habitats. Some other examples of efforts to increase infiltration include the following:</p> <ul style="list-style-type: none"> <li>• Aquifer Storage and Recovery, where stormwater is artificially pumped into aquifers</li> <li>• Increasing use of detention ponds or basins.</li> <li>• Other onsite capture of stormwater using LID techniques</li> </ul>	

Strategy	Description of Strategy	Comments on Strategy
	Stakeholders are working to develop a quantifiable target for this strategy for the near future.	
<b>WQ5. Reduce the extent of groundwater contamination, consistent with regulatory cleanup programs.</b>	There are several locations in the ARB Region where groundwater resources have been impacted by contamination. Some of these sources of contamination are localized, while others are of regional significance. These contamination locations are currently monitored and controlled, and are being remediated by or at the direction of state/federal government agencies. For example, the Aerojet General Corp., McClellan Air Force Base (AFB), and Mather AFB are accountable under the EPA's Superfund Program (Comprehensive Environmental Response, Compensation, and Liability Act). ARB stakeholders and project proponents need to be aware of these contamination sources and be mindful of ongoing prevention and remediation plans so as not to exacerbate existing contamination plumes. In particular, the water supply agencies should be mindful of groundwater extraction practices that (1) change underlying groundwater elevations (which may remobilize contaminants in the vadose zone of the soil matrix), or (2) change groundwater gradients, which may induce plume migration.	
<b>WQ6. Increase use of remediated groundwater for beneficial uses.</b>	There are several locations in the ARB Region that have been impacted by groundwater contamination for which there are ongoing and extensive remediation efforts. Remediation efforts entail the extraction of contaminated groundwater, treatment to remove contaminants, and discharge of treated effluent. As contamination impacts the ARB Region's underlying water supplies, it is important to put these remediated waters to beneficial use since some water agencies have had to decommission wells due to groundwater contamination. Depending upon the water quality characteristics of the treated water, remediated water can be used in a variety of ways including landscape irrigation, industrial water, or supplemental supply, in combination with other water supply sources. There are several inter-agency agreements to use remediated water (see Section 2.9.2.1). The ARB Region water agencies should monitor contamination, and they may have to cooperate and expand their remediated water program if further groundwater supplies are impacted. Stakeholders are working to develop a quantifiable target for this strategy for the near future.	
<b>WQ7. Coordinate with the CV-SALTS program to identify potential regional issues related to salt and nutrient management.</b>	<p>The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) program is a collaborative stakeholder driven and managed program to develop sustainable salinity and nitrate management planning for the Central Valley. Salt, nutrients, (primarily nitrogen and phosphorous), and salinity management are increasingly important water quality and environmental concerns in California. While the ARB Region naturally has lower levels of salts and nutrients compared to other areas of the state, urban and agricultural pollutants are found in the Region's impaired waters. As stated by CV-SALTS, salinity management is needed as part of near and long term sustainable water supply management (CV-SALTS 2013).</p> <p>A related regulation, the State Water Resources Control Board's 2009 Recycled Water Policy aims to address salt and salinity management issues to promote the use of recycled water. All groundwater basins are required to implement Salt and Nutrient Management Plans (SNMP) by 2014. Scientific and regulatory tools developed by CV-SALTS and these SNMPs will be incorporated into the objectives and implementation programs of each California EPA region's Basin Plan.</p> <p>Given the regulatory environment and available resources described above, the ARB Region stakeholders identified a strategy to coordinate with CV-SALTS. This coordination will likely happen through communication and collaboration with</p>	

Strategy	Description of Strategy	Comments on Strategy
	<p>SRCSD, a member of the CV-SALTS executive committee and a leader in the CV-SALTS program. Water management agencies that are required to engage in regional salt and nutrient planning efforts per the 2009 Recycled Water Policy will be the most interested in this strategy. This includes groundwater agencies, such as SGA, SCGA and Western Placer County who may want to consider the need for basin assessments of salt and nutrient trends in the future.</p>	
<p><b>Environmental Resource Strategies</b></p>		
<p><b>ER1. Restore functional riparian and wetland habitat.</b></p>	<p>California, and the ARB Region in particular, have lost the vast majority of the wetlands and riparian forests that existed before the Gold Rush. Ecosystem restoration improves the condition of natural landscapes and biological communities to provide for their sustainability and for their use and enjoyment by current and future generations (DWR 2009). Functioning ecosystems are necessary to sustain natural communities.</p> <p>Riparian habitats are in transitional areas between terrestrial and aquatic ecosystems and are distinguished by gradients in bio-physical conditions, ecological processes, and biota. They are areas through which surface and subsurface hydrology connect water bodies with their adjacent uplands. Riparian areas are found throughout the Region adjacent to streams, lakes, and estuarine shorelines. Wetland habitats are areas where water covers the soil, or is present either at or near the surface of the soil. Many wetlands are seasonal and may be wet only periodically. The quantity of water present and the timing of its presence in part determine the functions of a wetland and its role in the environment. Even wetlands that appear dry at times for significant parts of the year—such as vernal pools—often provide critical habitat for wildlife adapted to breeding exclusively in these areas.</p> <p>Restoration of riparian and wetland habitats can provide ecosystem benefits such as water quality improvements, improved in-stream aquatic habitat, recreational opportunities, and increased groundwater recharge. Successful restoration of aquatic, riparian, and floodplain species and communities ordinarily depends upon at least partial restoration of physical processes that are driven by water. These processes include the flooding of floodplains, the natural patterns of erosion and deposition of sediment, the balance between infiltrated water and runoff, and substantial seasonal variation in stream flow.</p> <p>Numerous municipal, watershed management, and environmental organizations are active in restoration efforts throughout the Region, often in collaboration with each other (see Section 2.6.2). These projects and programs are often multi-benefit and include flood management and recreational components. Projects that involve riparian and wetland restoration can be found along Coon Creek, Auburn Ravine, Alder Creek, Laguna Creek (that is a part of the Morrison Stream Group), and the Cosumnes River, among other locations. Stakeholders are working to develop a quantifiable target for this strategy for the near future.</p>	
<p><b>ER2. Conserve functional riparian and wetland habitat.</b></p>	<p>While restoration involves reversing environmental damages, conservation is focused on prevention of damages and the maintenance and protection of existing habitat functions and values. As mentioned in ER1, most original riparian and wetland habitat has been lost. Conserving remaining riparian and wetland habitats in the Region is important for reversing the ongoing trend of environmental decline. Conservation can also prevent the need for more costly restoration in the future. Conservation actions can include acquiring fee title to lands or conservation easements.</p>	

Strategy	Description of Strategy	Comments on Strategy
	<p>While Strategies ER1 and ER2 distinguish between restoration and conservation, in practice, projects often include components of both. Agencies identify areas and habitat to conserve from future development, and initiate restoration work as needed on and along those areas. Strategy ER1 and Section 2.6.2 describe some agencies and organizations active in watershed management, habitat restoration, and habitat conservation efforts. Stakeholders are working to develop a quantifiable target for this strategy for the near future.</p>	
<p><b>ER3. Implement local habitat and watershed conservation and restoration plans.</b></p>	<p>ARB Region stakeholders and other entities have established numerous local riparian and wetland habitat and watershed conservation and restoration plans (see Section 2.6.2). Substantial effort, funding, and local expertise has been put into developing these plans, and implementation of these local efforts is one of the most efficient ways to conserve and restore ecosystems in the Region. These plans are collaborative in nature, which is important for maintaining and improving ecosystems on a regional level. Examples of existing local plans include the Auburn Ravine/Coon Creek Ecosystem Restoration Plan, the Placer County Conservation Plan, the South Sacramento County Habitat Conservation Plan, and others.</p>	
<p><b>ER4. Improve the quality, quantity, and connectivity of habitat communities.</b></p>	<p>Habitats are the area where an organism lives, including the biotic and abiotic factors that affect it. Ecological communities are composed of populations of different species occupying a particular area, usually interacting with each other and their environment. Riparian and wetland habitats in the Region provide critical ecosystem functions and benefits, but have been reduced in their geographic extent and what remains has been degraded in quality. Large expanses of the ARB Region, and the Central Valley as a whole, lack connectivity between isolated blocks of remaining natural riparian and wetland habitats that support native biodiversity. Habitat connectivity is important for maintaining biological and genetic diversity, allowing seasonal migration or migration in response to habitat losses or climatic shifts, and allowing movement of individual organisms for needed resources. Within the Region, connected riparian corridors are of particular importance.</p> <p>This strategy can be achieved through restoration or conservation actions, as described in Strategies ER1 and ER2.</p>	
<p><b>ER5. Actively manage the incidence of invasive species.</b></p>	<p>Nonnative invasive species, which occur in every habitat type throughout the Region, strongly impact sensitive native species. Areas dominated by nonnative weeds prevent native plants from establishing, provide poor habitat quality for wildlife, and discourage recreational uses. Infestations of weed species increase hydraulic roughness during high-flow events, decrease the capacity of floodways, and adversely affect bank erosion and sedimentation processes. Invasive animal species are often able to outcompete native species and impact the food chain.</p> <p>Active invasive species management can include prevention of invasive species establishment through conservation of existing habitats, regular inspections and monitoring, and eradication programs. Well-designed restoration programs subsequent to eradication are essential to preventing reestablishment of invasive species.</p>	
<p><b>ER6. Increase access, quality, and quantity of anadromous and native fish habitat.</b></p>	<p>Anadromous fish species are those that migrate from the ocean to spawn in freshwater. In the ARB Region, these species include Chinook and Coho salmon, steelhead, Pacific lamprey, sturgeon, striped bass, shad, and others. Other important native fish species include Sacramento sucker, Sacramento pikeminnow, sculpins (prickly and ruffle), tule perch, and hardhead. Many of these species are state- and/or federally listed as threatened or endangered. They are inhibited by degraded habitat quality (water quality, temperature, and flows), and access to substantial amounts of upstream habitat is</p>	

Strategy	Description of Strategy	Comments on Strategy
	<p>impeded by barriers to fish passage. Salmonids provide substantial recreational and cultural value to the Region. Previous efforts to promote spawning in regional streams appear to have been helpful, especially in the American River where spawning gravels have been placed to support in-stream spawning.</p> <p>This strategy can be accomplished by improving flows, quantity, quality, and temperature of area streams and rivers (Strategy ER1 as well as water quality strategies), and by removal of passage barriers, especially to upstream spawning locations. Save Auburn Ravine Salmon and Steelhead, for example, has been active and successful in forming partnerships with Placer County and Nevada Irrigation District to develop alternative migration paths for salmon around barriers.</p>	
<p><b>ER7. Improve flows, quality, and temperature of area streams and rivers.</b></p>	<p>Sufficient in-stream flows, water quality, and temperatures are critical for maintaining aquatic habitats and species in the Region. In-stream flows are needed to protect and preserve resources, such as fish, wildlife, and recreation, in a waterway. Natural flow regimes are important factors in the health of aquatic and riparian ecosystems. Aquatic habitats and species are adapted to specific monthly, seasonal, annual, and inter-annual variabilities in flow. Sufficient flows must be available during the spring and fall months when a variety of anadromous fish are en route to the Sacramento-San Joaquin River Delta (Delta) or upstream spawning and rearing grounds.</p> <p>In-stream flows also need to meet temperature and water quality standards to support aquatic habitats. Water temperature is a major influence on biological activity and growth, and governs the kinds of organisms that can live in rivers and lakes. Aquatic species have preferred temperature ranges; as temperatures get too far above or below this preferred range, the ability of species to survive or perform life cycle functions (such as spawning) declines. Temperature is also important because of its influence on water quality; dissolved oxygen, an essential water quality parameter for aquatic life, is reduced in elevated water temperatures. Pollutants and sediment concentrations are also important for aquatic life. There are many types of pollutants that can affect aquatic life, including pesticides, toxic chemicals, sediments, and nutrients.</p> <p>Achieving ER7, by its nature, requires collaborative and integrated resources management, and is dependent on progress in other ARB strategies, such as the following:</p> <ul style="list-style-type: none"> <li>• Considering environmental flow needs in water operations (such as how dams are operated, see FM4)</li> <li>• Addressing water quality concerns (as described and addressed in water quality strategies)</li> </ul> <p>The ARB IRWMP effort will continue to bring these stakeholders together to address these interdependent concerns.</p>	
<p><b>ER8: Improve groundwater levels to support and improve habitat.</b></p>	<p>Maintaining sufficiently elevated groundwater levels supports and improves habitat by providing reliable base flows for streams. It also contributes to the supply of water for springs, seeps, and wetlands or for phreatophytes and other vegetation that reduce soil erosion. This strategy can be accomplished through active groundwater management and conjunctive use (see Section 2.6.3), artificial recharge (see Strategy WQ4), and in-lieu recharge projects (requires increases in regional water system efficiency, as discussed for example in Strategy WR4).</p>	

Strategy	Description of Strategy	Comments on Strategy
<b>Flood Management Strategies</b>		
<p><b>FM1. Provide a 200-year level of flood protection for urban areas by 2025, where feasible.</b></p>	<p>The potential for flooding presents significant risks for many areas in California. Floods can cause substantial economic, social, and environmental damage, as well as the potential for loss of life. Several bills, including Senate Bill 5, were passed by the State Legislature in 2007 adding to and amending state flood management and land-use laws. These laws were intended to improve local land use and other planning decisions by strengthening the link between flood management and land use.</p> <p>As part of the flood management legislation passed in 2007, all cities and counties within the Sacramento-San Joaquin Valley will be required to make findings related to the urban (200-year) level of flood protection before entering into a development agreement for a property, approving a discretionary permit or entitlement for any property development or use, or approving a ministerial permit that would result in construction of a new residence, or approving a tentative map/parcel map for a subdivision (see California Government Code Sections 65865.5, 65962, and 66474.5). This requirement applies to urban and urbanizing areas, as defined by California Government Code Section 65007, Paragraphs (j) and (k).</p> <p>After the Board's adoption of the Central Valley Flood Protection Plan (CVFPP) in 2012, cities and counties within the Sacramento-San Joaquin Valley have up to 24 months to amend local general plans, and 36 months to amend local zoning ordinances to be consistent with the CVFPP. Subsequently, by approximately 2015, cities and counties will be required to make findings regarding an urban level of flood protection when considering decisions about entering into a development agreement for a property, approving a discretionary permit or entitlement for any property development or use, or approving a ministerial permit that would result in construction of a new residence, or approving a tentative map/parcel map for a subdivision. After 2025, for urban and urbanizing areas protected by State Plan of Flood Control (SPFC) levees, cities and counties must find that the new development is protected to at least the urban level of flood protection.</p> <p>The Sacramento-San Joaquin Valley encompasses a larger geographic area than the areas currently protected by facilities of the SPFC (SPFC Planning Area). The ARB Region includes lands within the SPFC Planning Area, outside SPFC Planning Area (but in the Sacramento-San Joaquin Valley), and lands outside the Sacramento-San Joaquin Valley.</p> <p>This strategy recognizes that (1) agencies with flood management and/or land-use responsibilities in the ARB Region will need to work together and with state and federal agencies to meet the requirements of SB 5, (2) there will likely be different ways to achieve an urban level of flood protection and to make a successful finding of such, (3) urban level of flood protection may be determined to be economically infeasible, (4) some agencies may choose to NOT provide an urban level of flood protection, and (5) there are areas in the ARB Region that are outside the Sacramento-San Joaquin Valley.</p>	
<p><b>FM2. Improve level of flood protection for levee-protected small communities and agricultural lands in the Region, where feasible.</b></p>	<p>Sizable portions of the ARB Region are devoted to agricultural land uses (see Section 2.5). In 2011, agricultural production in Sacramento, Placer, and El Dorado counties totaled nearly \$500 million, contributing to the local and state economies, and providing food and fiber for worldwide consumption (California Department of Food and Agriculture 2013).</p>	

Strategy	Description of Strategy	Comments on Strategy
	<p>The continued viability of small communities is essential to the preservation of cultural and historical continuity and important social, economic, and public services to rural-agricultural populations, agricultural enterprises, and commercial operations. However, physical conditions of the levees and other flood management facilities in the ARB Region are varied.</p> <p>This strategy recognizes that (1) small communities and rural-agricultural areas will not be required to provide urban level of flood protection (as the name implies), (2) agencies with flood management and/or land-use responsibilities in the ARB Region will need to work together and with state and federal agencies reduce flood risks in small communities and rural-agricultural areas, (3) there will likely be different ways to reduce these flood risks (both structural and nonstructural improvements), (4) current federal engineering guidance and design standards may result in cost-prohibitive levee repairs, and (5) flood risk reduction projects that can achieve multiple resource benefits will likely be preferable to single-purpose projects and may provide greater long-term value.</p>	
<p><b>FM3. Promote restoration and conservation of floodplain function.</b></p>	<p>Floodplain restoration is the process of recovering the natural hydrologic, geomorphic, and biological functions and resources of an area adjacent to a stream or river that experiences occasional or periodic flooding. Floodplain restoration is often accomplished by reconnecting the floodplain to the stream or river through the removal of physical or human-made barriers. Restoring floodplains includes the attenuation of flows and enhancement of floodway capacities, the promotion of diverse habitats for aquatic and terrestrial species, the improvement of water quality, and the increased recharge of groundwater. Floodplains also support agricultural production, recreational opportunities, and scientific study and education. Floodplain restoration also reduces the potential for increased flood risks and damages over time associated with unwise commercial or residential development within floodplains.</p> <p>In the ARB Region, floodplains provide a broad area to spread out and temporarily store floodwaters. This attenuates flood peaks and reduces velocities and the potential for erosion. One acre of floodplain land flooded 1 foot deep holds 325,851 gallons of water. The natural and beneficial functions of floodplains should be valued and considered in future integrated water management projects and programs. Examples of ongoing floodplain restoration efforts in the ARB Region include those in the Lower Cosumnes River Floodplain, Lower Dry Creek Floodplain, North Laguna Creek Watershed, and Cross Canal Watershed.</p> <p>Conservation is included here as a means of emphasizing the need to restrict development into existing, functioning floodplains.</p>	
<p><b>FM4. Support a Folsom Dam Water Control Manual update that balances flood control, water, environmental and recreational needs.</b></p>	<p>Folsom Dam and Reservoir is a multipurpose project (flood risk management, water supply, hydroelectricity, water quality, fish and wildlife preservation, and recreation) operated by the Reclamation as part of the CVP. The U.S. Army Corps of Engineers (USACE) is responsible for prescribing operations pertaining to use of the storage allocated for flood risk management. The dam provides flood risk management benefits to the City of Sacramento and its surrounding areas by regulating runoff from approximately 1,860 square miles of drainage area.</p> <p>The Folsom Dam Joint Federal Project, consisting of a new auxiliary spillway currently under construction, will improve the ability of Folsom Dam to manager large flood events. To fully realize the benefits of the new auxiliary spillway, the current Folsom Dam and Reservoir Water Control Manual must be updated. The purpose of the ongoing update effort is to identify, evaluate, and recommend changes to the flood management operation rules of Folsom Dan and Reservoir that would reduce flood risk to the Sacramento area by using the new auxiliary spillway and by incorporating an improved</p>	



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	<p>understanding of the American River watershed upstream from Folsom Dam. The finding of the evaluation will be used to help define the dam's new flood operations plan, with the intention of meeting flood risk management objectives in a manner that conserves as much water as possible and maximizes all authorized Folsom Dam project uses to the extent practicable. A number of flood management operation alternatives are expected to be developed and the effect of those alternatives on Folsom Dam and Reservoir's other authorized purposes will be analyzed in an Environmental Impact Statement/Environmental Impact Report.</p> <p>This strategy recognizes that (1) proposed alternatives could have significant effects on the other authorized purposes of the project, and (2) a balanced manual update will be critical to achieving the ARB IRWMP goals.</p>	
<p><b>FM5. Coordinate with inter-jurisdictional, regional flood management efforts.</b></p>	<p>Developing and implementing integrated, multi-benefit projects often involves (1) a large number of local, regional, state, and federal agencies with complex and overlapping jurisdictional roles and responsibilities, inconsistent policies and regulations, and multiple management goals, and (2) a continual investment in stakeholder and public education and engagement. Projects with a flood management component often have effects both upstream and downstream, further expanding the geographic scope of the coordination effort. Flood management functions within a single geographic area may be carried out by a combination of city and county planning and public works departments, drainage districts, water supply districts, joint powers authorities, and others. Coordinating activities within this fragmented jurisdictional landscape can be challenging and costly, particularly for local entities.</p> <p>Participants in the ARB IRWMP Governance Structure are involved in the ongoing Lower Sacramento &amp; Delta North Regional Flood Management Plan (RFMP) effort, described in Section 2.7. At a minimum, this regional plan should include (1) an informational atlas describing the regional setting and available information, (2) a vision of flood management for the region, (3) a prioritized list of potential local/regional projects consistent with the 2012 CVFPP, and (4) a financial plan that includes local funding strategies and considers financial feasibility. Some of the outcomes of this regional plan will be reflected in the ARB IRWMP projects database as well as in future updates of this plan.</p> <p>Outside the geographic scope of the Lower Sacramento &amp; North Delta RFMP effort, RWA as the RWMG, participants in the Governance Structure, and project proponents have a long history of coordinating across geographic and jurisdictional boundaries in support of effective flood management and land-use planning.</p>	
<p><b>FM6. Coordinate flood emergency planning and response efforts.</b></p>	<p>Flood emergency planning and response is an element of residual risk management. It involves preparing for floods, effectively responding to flood events, and quickly recovering when flooding occurs. Often the first responders, local agencies play a key role in the management of flood emergencies in their jurisdictions. However, coordinated flood planning and operations among local agencies, cities and counties, the California Emergency Management Agency, the State-Federal Flood Operation Center, and USACE are critically important in successfully managing and fighting floods, and saving lives and properties.</p> <p>California Water Code Section 9621 requires that each county in the Sacramento-San Joaquin Valley collaborate with cities within its jurisdiction to develop a flood emergency plan within 24 months of the adoption of the CVFPP. In addition, to qualify for Federal Emergency Management Agency (FEMA) disaster funds, local agencies are required to prepare a Multi-</p>	

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	<p>Hazard Mitigation Plan, called an Emergency Action Plan, which includes planning for all potential emergencies in their jurisdictions, including flood emergencies.</p> <p>This strategy recognizes that (1) without proper planning, interagency coordination during a flood emergency can be disorganized and inefficient, (2) conflicting policies amongst agencies can lead to delayed response and recovery activities, and (3) in many cases, local agencies do not have sufficient resources to effectively prepare for and respond to major floods (DWR 2012c).</p>	
<b>Community Stewardship Strategies</b>		
<p><b>CS1. Increase availability and access to educational material on sustainable water resources.</b></p>	<p>Widespread awareness of the need to manage water resources sustainably is critical to develop, select, and implement effectively integrated projects and programs. Education of both citizens and natural resources managers across jurisdictional lines and differing fields will help develop a stronger common vision and goals. A common understanding provides support for and promotes sustainable, integrated projects. Availability and access to educational materials is one method that supports continued education of citizens and resource managers alike.</p> <p>Educational material could be public-friendly Web sites or fliers and brochures that could be distributed. Currently, RWA's WEP, for example, maintains a user-friendly Web site on water use efficiency and also provides educational classes. Watershed management groups and environmental organizations often incorporate outreach and education into their programs and associated efforts. Additionally, educational material such as informational signs could be placed near a project (e.g., a trail or a well site) with an explanation of how that water-related facility is a part of the larger water and sustainability picture and how it influences each citizen. Developing materials suitable for use directly in classrooms may also be important.</p>	
<p><b>CS2. Identify, summarize, and discuss the potential for partnering of existing regional outreach and education programs by 2015.</b></p>	<p>Working to leverage existing regional outreach and educational programs in the Region is a strategy focused on encouraging community stewardship of water and natural resources among citizens in the Region. These efforts include those being undertaken by local and regional water entities, as well as other local, state, federal, and non-government organizations that promote outreach to disadvantaged citizens, and public water education. This can include public events, including Earth Day and Creek Week, volunteer clean up initiatives of local waterways, classroom presentations, and regional water efficiency programs.</p> <p>By cataloguing and tracking existing regional outreach and education programs in the community, the ARB Region can find and leverage relationships between community-based organizations, the local water community, elected officials, and media organizations. For instance, through this IRWMP's Opti Web site's announcements and calendar, regional entities can communicate and collaborate on upcoming events and programs. RWA is also planning to update its strategic plan, which may include an evaluation of its current programs.</p> <p>Every public participation effort in the Region strengthens the relationship of the community to water resources, and builds upon existing partnerships in the Region. Regional water agencies and other organizations looking to reach out to citizens can maximize their impact and effectiveness by partnering and sharing local knowledge, expertise, and resources. The</p>	

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	benefits of an engaged and educated community include better planning in communities, more diverse and meaningful public participation, and building better connections between people and the planet.	
<b>CS3. Identify natural recharge areas and relay that information to relevant land-use planning agencies by 2015.</b>	Protecting natural groundwater recharge areas to facilitate and promote groundwater infiltration is important to maintain and protect groundwater levels and groundwater quality. Various infiltration investigations have occurred in the past, and water agencies can continue to study and identify the areas with soil/ground characteristics in their respective service areas that promote infiltration. However, only agencies with land-use planning authority (cities and counties) have the ability to make land decisions. This strategy specifically addresses the need for broader knowledge on the issue of regional groundwater infiltration and sets a deadline for communicating with land-use planning agencies about identified recharge areas. Efforts may continue thereafter to develop a common understanding with land-use planning agencies and to ensure the areas' protection into the future.	
<b>CS4. Promote the use of Low Impact Development (LID) methods, where appropriate.</b>	<p>According to the EPA, LID is “an approach to land development (or re-development) that works with nature to manage stormwater as close to its source as possible” (2013). LID could involve preserving landscape features, minimizing impervious areas, and onsite capturing rainwater/stormwater for later reuse or groundwater infiltration. Effective decentralized stormwater management delays and attenuates peaks of high water flows and improves water quality. This in turn protects receiving water quality and ecosystem habitats from degradation.</p> <p>A review of other regions implementing LID suggests that water managers, stormwater agencies, and land-use agencies need to work together well before attempting to implement a LID program. This strategy, therefore, intends to increase communications and to support manuals, zoning, and other regulations that would support LID. Education and support for these practices could become a part of water efficiency outreach.</p>	
<b>CS5. Provide annual updates to city and county governments and other local agencies on accomplishments and continued challenges of integrated water management.</b>	The various discussions that took place in developing the ARB Region goals, objectives, and strategies attested to the increasingly integrated nature of water and land resources as well as economics and people. The ARB Region recognizes that water management is getting more complex and thus more discussion across traditionally separate disciplines is imperative for understanding and eventual success in integrated water resources management. Dialogue must continue and increase in frequency into the future. This strategy, therefore, delineates that city and county governments will be provided with updates of integrated water management efforts yearly. This communication will lead to greater understanding and better integration of local/regional efforts in water management.	
<b>CS6. Increase engagement of community leaders (e.g., using community-based social marketing where applicable).</b>	Increasing the effectiveness of engagement to community leaders is critical to the future of the ARB Region. Elected officials, representatives of disadvantaged communities, and the business community all have a stake in the success and overall health of the ARB Region. By reaching out to these community leaders and inviting them to participate in the planning process and stakeholder forums, leaders and the organizations they represent can help build and sustain regional	

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	<p>knowledge and skills, recruit for volunteer efforts, networks, and partnerships that contribute to promote the health and sustainability of natural resources.</p> <p>Community-based social marketing can be described as a strategy that can help motivate communities, businesses, individuals, and institutions to foster behaviors that support sustainability. This could include reducing lawn watering, promoting safe disposal of household contaminants, or backyard composting. Social marketing retains the focus on customers that is the center of the more commonly known “commercial marketing,” but differs in that the tools and concepts promote social goals (like the triple bottom line). Actions can include but are not limited to; print and radio advertisements, e-mail distributions and online content. Engaging community leaders effectively is imperative to effectively working with the customers and communities that the Region would like to engage in these programs that promote community stewardship.</p>	
<b>Parking Lot Strategies</b>		
<b>1. WR: Conjunctive use</b>	<p>Conjunctive use has a long history in the ARB Region. Conjunctive use was a principal means to implement the WFA and to preserve portions of dry year surface water supplies for environmental needs. However, while many features of the regional conjunctive use program are planned or have been built by agencies or agency partnerships, full regional system integration is forthcoming. In time, and with additional funding full integration will be accomplished.</p>	
<b>2. WR: Implementation of cost-effective BMPs in UWMPs</b>	<p>Other strategies identified the need for increased water conservation and to comply with state law to reduce per capita demand. Regional water agencies have discussed the need to identify which BMPs are effective in this Region in meeting this target and to develop a strategy that was more customized to the ARB Region. At the time of the adoption of this IRWMP Update, this strategy is still under development.</p>	
<b>3. WR: Non-revenue water reduction</b>	<p>Non-revenue water is defined by the American Water Works Association as the “distributed volume of water that is not reflected in customer billings” (2013). Non-revenue water generally falls into one of these three categories: unbilled authorized consumption (water used for firefighting, hydrant flushing, etc.), apparent losses (meter inaccuracies, data handling errors, etc.) and real losses (system leakage, storage tank overflows, etc.). ARB water suppliers are investigating a strategy to focus on reducing non-revenue water associated with apparent losses and real losses through comprehensive system audits. Practices to reduce this water loss could include targeted leak detection and repair, systemwide metering, replacement of inaccurate meters, and billing systems upgrades.</p>	
<b>4. WR: Regional and local water-energy relationships and opportunities to achieve greater resource efficiency</b>	<p>The water-energy nexus is a term used to describe the dynamic relationship between water and energy. It takes water to produce energy and energy to produce water. For an individual water agency, energy use is often the highest operating expense, exceeding labor expenses; therefore, reducing energy use can reduce costs while saving water.</p> <p>ARB water suppliers recognize the importance of better understanding their energy use. This information would help many agencies prioritize infrastructure replacements, adjust revenue requirements, optimize use of different supply sources, and plan for long-term future demand. Coupling energy and water use data can also strengthen funding proposals and lead to</p>	

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	cost-sharing partnerships between the water and energy sectors. A concrete strategy to evaluate this water-energy relationship will be developed in the near future.	
5. WR: Regional data management system for water supply systems	The ARB water supply agencies recognize that water supply infrastructure and efficiencies can be improved region-wide only with support from adequate and consistent data collection and analyses across various entities. Such a data management system would be integral also to implementing an efficient and effective conjunctive use program. As meters are installed throughout the Region, this system would additionally help determine the effect of new rate structures on the long-term stability of the entire water supply system. This suggested new strategy will be developed in the next quarter of IRWMP implementation.	
6. WR: Peak demand reduction	Peak demand is the highest water use experienced by a water supply system, measured on an hourly, daily, monthly, or annual basis (Vickers 2001). Reducing peak demand is one way a water agency can decrease operational cost; reduce energy, chemical, and water use; and increase supply reliability. It also allows agencies to afford more replacement and rehabilitation of aging infrastructure rather than expand or build new infrastructure, which would require future investments in operations and maintenance (O&M). The ARB water agencies may consider and develop this strategy as both O&M costs and the need to refurbish existing infrastructure increases. Conserving water is necessary for utilities to keep water rates reasonable.	
7. WQ: State Water Resources Control Board Biological Objectives	The State Water Resources Control Board is currently developing Biological Objectives for freshwater streams in California. These objectives will help improve water quality using biological characteristics as a measure. The ARB Region is aware of Biological Objectives and intends to, monitor and incorporate objectives into the IRWMP as applicable.	
8. CS: Outreach strategy related to agricultural water management and efficiency	The southern portions of Sacramento County and western Placer County have strong agricultural interests and associated private water use. However, these areas are not required to develop Agricultural Water Management Plans. The ARB Region recognizes outreach to these interests is necessary moving forward.	
9. (N/A): Quantification of certain strategies	The ARB Region recognizes that quantifiable, measurable strategies are important whenever possible, so the Region can objectively measure progress during implementation. Some of the above strategies are qualitative at the time of the adoption of this IRWMP out of necessity (the strategy is not quantifiable) or out of lack of experience. In the latter case, numeric targets will be developed as experience is gained and is anticipated in the next update of strategies.	

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New Strategies		

Strategy	Description of Strategy	Comments on Strategy