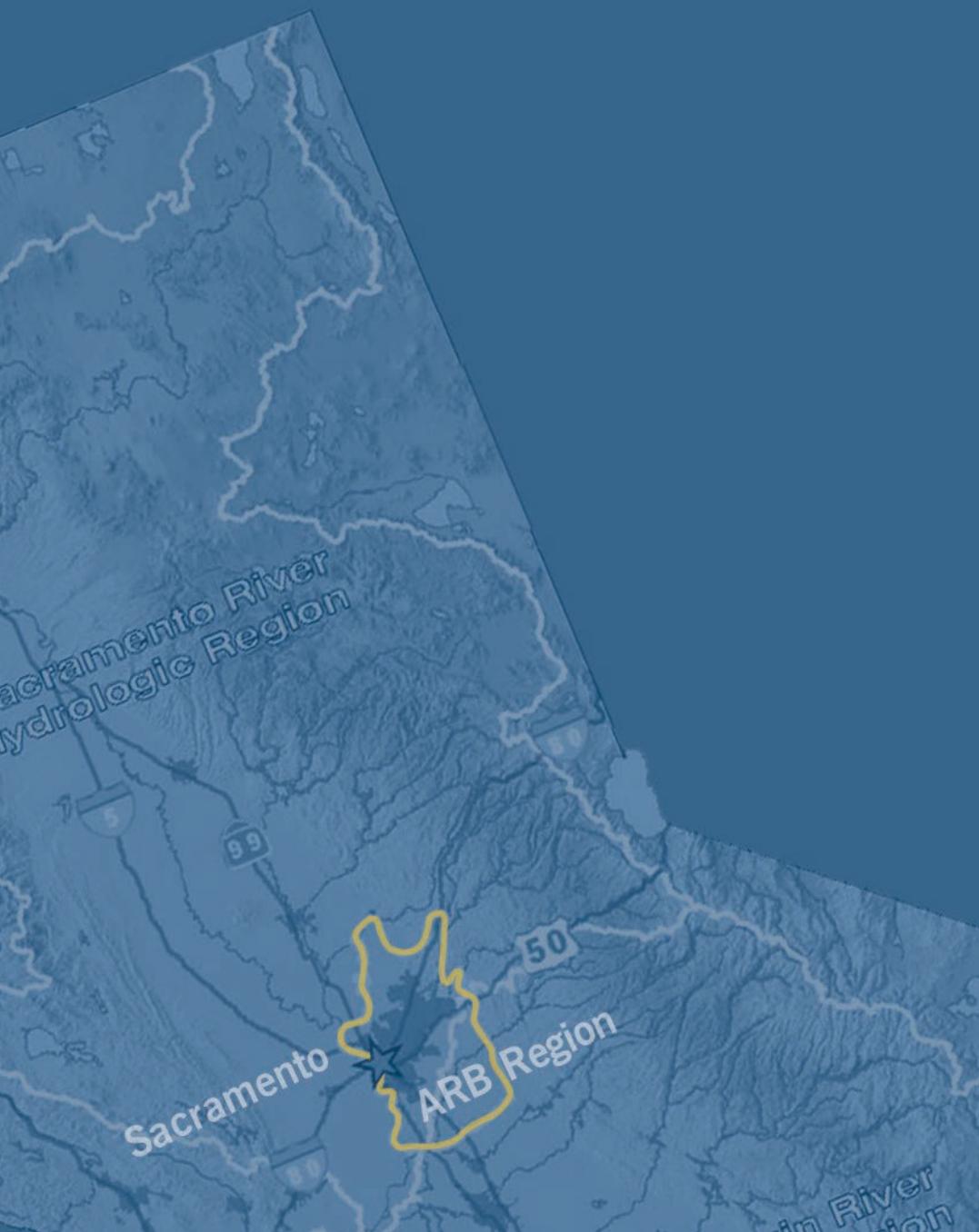


# SECTION 6

## IRWMP Implementation





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## **6. IRWMP IMPLEMENTATION**

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This section describes implementation of the American River Basin (ARB) Integrated Regional Water Management Plan (IRWMP) Framework elements. Implementation is achieved by advancing ARB IRWMP projects and monitoring their collective progress toward meeting the vision, goals, objectives, and strategies of the IRWMP. This section describes IRWMP and project financing, IRWMP performance monitoring, data management, benefits and impacts of implementation, and adaptability of the IRWMP to future situations.

### **6.1. IRWMP Financing**

Agencies in the ARB Region have progressively invested in regional integrated planning over the last two decades, including for example the Water Forum Agreement, American River Basin Cooperating Agencies' Regional Water Master Plan, four subregional groundwater management plans, and numerous watershed-wide plans in support of water quality, environmental, and flood management issues. Since beginning the effort to develop and maintain an IRWMP in 2004, the Regional Water Authority (RWA) and its partners have invested more than \$2.2 million. This has resulted in the 2006 ARB IRWMP and associated tools, such as a regional modeling tool update, and the 2013 ARB IRWMP. Sources of funding have included:

- RWA IRWMP Project Participants (\$549,758)
- U.S. Army Corps of Engineers (USACE) Water Resource Development Act (WRDA) Appropriation (\$698,087)
- California Department of Water Resources (DWR) Proposition 50 Planning Grant (\$500,000)
- DWR Proposition 84 Planning Grant (\$403,848),
- U.S. Department of the Interior, Bureau of Reclamation (Reclamation) WaterSMART System Optimization Review Grant awarded to San Juan Water District (SJWD) on behalf of the Region (\$129,279)

As the Regional Water Management Group (RWMG), RWA is committed to providing resources to maintain and support implementation efforts of the ARB IRWMP. As explained in **Section 4**, in September 2011, the RWA board of directors approved an action to "sunset" the Management Committee and to assume responsibility to maintain the ARB IRWMP as an RWA core function effective July 1, 2013. At that time, any remaining funds collected from project participants will be assigned to a funding designation that can only be used for purposes of maintaining the ARB IRWMP. Any additional funds

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that are needed for continued IRWMP implementation (e.g., monitoring, administration, stakeholder outreach) will be identified and collected during the annual RWA budget development process.

## **6.2. Project Financing**

Financing projects is always a challenge, and it sometimes prevents projects from proceeding to implementation. In recent years, with difficult economic times, these challenges have only increased. Municipal and agency revenues have been constrained due to pressures to keep user rate increases low, sluggish economic growth, few new development fees, and reduced water usage resulting in reduced revenues. State and federal funding sources are increasingly competitive and sometimes cause schedule delays. Further, some projects, such as environmental projects with benefits that are difficult to quantify, face challenges in securing external funding. The demands on these limited funds include increasing construction costs, aging infrastructure, and increased regulations.

To realize progress toward achieving the regionally accepted vision, goals, and objectives, projects will need to be implemented now and into the future. The ARB stakeholders and project proponents recognize the importance of maintaining the highest standards of cost effectiveness for priority projects. Financing options vary according to each project proponent. The various funding sources differ in their longevity and certainty as well. While extremely helpful in covering costs, grant program funds are dependent on continued success of applications. Grant funds are also better suited to finance construction or a one-time project cost, as opposed to covering operation and maintenance (O&M) costs. Generally, user fees and rates are more secure and reliable, and are better suited to cover O&M costs than relying on grant funding.

Financing for most of the ARB IRWMP implementation projects has not been identified at this time. One of the key roles of the IRWMP is to serve to identify the implementation needs of the Region's stakeholders. RWA will help its stakeholders move projects forward on an ongoing basis, by providing the IRWMP as a vehicle for other ARB stakeholders to identify, vet, prioritize, and promote projects. RWA's expectation is that natural partnerships will emerge for those projects that benefit multiple stakeholders in the Region. As the RWMG, RWA understands that project implementation should not be overly reliant on grants. The ARB project proponents will continue to pursue many types of appropriate funding, both external (e.g., grants and loans) and internal (e.g., user fees and user rates). The following sections describe some of the various methods for financing project implementation.

**Table 6-1** lists priority projects that are the most well defined at this time. Each of the projects has been vetted with ARB stakeholders and has secured grant funds to help support its implementation. This table illustrates the breakdown of how these projects are planned to be implemented.

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**Table 6-1. Funding Sources of Priority Projects**

<b>Project Name</b>	<b>Lead Agency/Organization</b>	<b>Approximate Total Cost</b>	<b>Funding Source and % of Total Cost</b>	<b>Funding Certainty</b>	<b>O&amp;M Finance Source</b>	<b>O&amp;M Finance Certainty</b>
1. Assessment and Development of Tools for Managing PCE Contamination in the North Sacramento County Groundwater Basin	Sacramento Groundwater Authority	\$232,040	Prop 84 Local Groundwater Assistance Grant (97%); SGA (3%)	Fairly certain—award recommended	N/A	N/A
2. City of Roseville ASR Program - Phase 2	City of Roseville	\$4,437,513	Prop 84 IRWM Grant (45%); City of Roseville (55%)	Certain—grant executed	Lead agency	High
3. Secret Ravine Fish Passage Improvement Project	City of Roseville and Dry Creek Conservancy	\$366,551	Prop 84 IRWM Grant (85%); Other Grant (15%)	Certain—grant executed	Lead agency	High
4. E.A. Fairbairn Groundwater Well	City of Sacramento	\$1,578,454	Prop 84 IRWM Grant (63%); City of Sacramento (37%)	Certain—grant executed	Lead agency	High
5. Shasta Park Reservoir and Well Project	City of Sacramento	\$13,609,693	Prop 84 IRWM Grant (7%); City of Sacramento (93%)	Certain—grant executed	Lead agency	High
6. Antelope Creek Integrated Flood Control Improvement Project	Placer County Flood Control and Water Conservation District	\$2,209,000	Prop 84 IRWM Grant (34%); PCFCWCD (66%)	Certain—grant executed	Lead agency	High
7. Regional Water Meter Retrofit Acceleration Project	Regional Water Authority	\$959,545	Prop 84 IRWM Grant (95%); local partners (5%)	Certain—grant executed	Various implementing agencies	High
8. Regional Indoor and Outdoor Water Efficiency Project	Regional Water Authority	\$1,004,439	Prop 84 IRWM Grant (98%); local partners (2%)	Certain—grant executed	Various implementing agencies	High
9. Recycled Water for the SMUD Co-Generation Facility	Sacramento Regional County Sanitation District	\$9,165,994	Prop 84 IRWM Grant (17%); SRCSD (83%)	Certain—grant executed	Lead agency	High
10. North Antelope Booster Pump Station	Sacramento Suburban Water District	\$918,412	Prop 84 IRWM Grant (29%); SSWD (71%)	Certain—grant executed	Lead agency	High
11. Coyle Avenue and Roseview Park Pump Stations and Water Treatment Systems Project	Sacramento Suburban Water District	\$5,706,162	Prop 84 IRWM Grant (26%); SSWD (74%)	Certain—grant executed	Lead agency	High
12. Willow Hill Pipeline Rehabilitation Project	City of Folsom	\$7,606,671	Prop 84 IRWM Grant (25%); City of Folsom (75%)	Certain—grant executed	Lead agency	High
13. Aquatic and Riparian Habitat Enhancement in the Lower American River at River Mile 0.5R	Sacramento Area Flood Control Agency	\$2,697,974	Prop 84 IRWM Grant (52%); SAFC (48%)	Certain—grant executed	Lead agency	High
14. Lower Cosumnes River Floodplain Restoration Project	Ducks Unlimited	\$2,557,195	Prop 84 IRWM Grant (16%); Ducks Unlimited (84%)	Certain—grant executed	Lead agency	High
15. Lower Cosumnes River Integrated Groundwater Recharge Project	Omochumne-Hartnell Water District	\$1,489,675	Prop 84 IRWM Grant (66%); OHWD (34%)	Certain—grant executed	Lead agency	High
16. Sleepy Hollow Detention Basin Retrofit	City of Elk Grove	\$973,384	Prop 84 IRWM Grant (23%); City of Elk Grove (77%)	Certain—grant executed	Lead agency	High
17. Antelope Creek Integrated Water Efficiency Project	Placer County Water Agency	\$536,416	Prop 84 IRWM Grant (71%); PCWA (29%)	Certain—grant executed	Lead agency	High
18. Lower Cosumnes River Integrated Groundwater Recovery Project	Rancho Murieta Community Services District	\$1,033,265	Prop 84 IRWM Grant (48%); Rancho Murieta (52%)	Certain—grant executed	Lead agency	High
19. Separating Fact from Fiction: Assessing the Use of Dry Wells as an Integrated Low Impact Development Tool to Reduce Stormwater Runoff While Protecting Groundwater Quality in Urban Watersheds	City of Elk Grove	\$741,114	Prop 84 Stormwater Grant (66%); City of Elk Grove (34%)	Certain—grant executed	Lead agency	High
20. Upper Unionhouse Creek Flood Protection Project	Sacramento Area Flood Control Agency	\$1,953,546	Prop 1E Grant (50%); SAFC (50%)	Certain—grant executed	Lead agency	High

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**Table 6-1. Funding Sources of Priority Projects (contd.)**

<b>Project Name</b>	<b>Lead Agency/Organization</b>	<b>Approximate Total Cost</b>	<b>Funding Source and % of Total Cost</b>	<b>Funding Certainty</b>	<b>O&amp;M Finance Source</b>	<b>O&amp;M Finance Certainty</b>
21. Downtown Combined Sewer Upsizing Project	City of Sacramento	\$13,109,359	Prop 1E Grant (47%); City of Sacramento (53%)	Certain—grant executed	Lead agency	High
22. City of Sacramento 16th Street Greenscape	City of Sacramento	\$813,000	Strategic Growth Council Urban Greening Grant (98%); City of Sacramento (2%)	Certain—grant executed	Lead agency	High
23. Florin Creek Multi-Use Basin	Sacramento Area Flood Control Agency	\$3,819,820	Prop 1E Grant (50%); SAFCA (50%)	Fairly certain—award recommended	Lead agency	High
24. Assessment and Development of Tools for Managing PCE Contamination in the North Sacramento County Groundwater Basin	Sacramento Groundwater Authority	\$232,040	Prop 84 Local Groundwater Assistance Grant (97%); SGA (3%)	Fairly certain—award recommended	N/A	N/A

Key:

% = percent

ASR = aquifer storage and recovery

IRWM = Integrated Regional Water Management

N/A = not applicable

O&M = operation and maintenance

OHWD = Omochumne-Hartnell Water District

PCE = tetrachloroethylene

PCFCWCD = Placer County Flood Control Water Conservation District

PCWA = Placer County Water Agency

Prop = Proposition

Rancho Murieta = Rancho Murieta Community Services District

SAFCA = Sacramento Area Flood Control Agency

SGA = Sacramento Groundwater Authority

SMUD = Sacramento Municipal Utility District

SRCSD = Sacramento Regional County Sanitation District

SSWD = Sacramento Suburban Water District

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### **6.2.1. External Funding Sources**

Throughout the IRWMP process, the Region has been fortunate to find a range of opportunities to help fund many identified priority projects. While the primary source of funds is generally from the more traditional sources (e.g., customer rates), external sources of funds have helped successfully move many projects into implementation. Of the 178 projects that are currently vetted in the ARB IRWMP, nearly two dozen have secured some additional funding since 2011, and many others are pursuing additional funds.

One of the roles of RWA in implementing the IRWMP is to track funding opportunity announcements and compare these to the projects included in the IRWMP. As specific opportunities emerge, RWA will work with stakeholders to confirm the project and current financing sources are aligned with the funding opportunity. Additionally, RWA will request that project proponents update their finance information for their projects on at least an annual basis.

Below is a brief description of some of the various supplemental funding opportunities available to the various projects within the ARB Region. This list is not exhaustive, but rather illustrates the diversity and extent of funding opportunities that may be available. Much of the information is from the California Financing Coordinating Committee Handbook, which is publically available at: <http://cfcc.ca.gov/>.

#### **6.2.1.1. State Funding**

California has various funding programs that can and do support projects identified in the ARB Region. The most significant funding sources to date have been Proposition 50, Proposition 84, and Proposition 1E, which created substantial opportunities for grant funding in the state. Brief descriptions of these and other state funding sources and their applicable projects are as follows.

##### ***California Department of Water Resources***

DWR “protects, conserves, develops, and manages” California’s water resources for natural and human environments. Their goals are broad, ranging from promoting local and regional water planning and education to developing and managing statewide water resources for supply, flood risk, and the environment. The ARB Region and its stakeholders have been successful in securing and are currently managing some of the proposition bond funds as described below.

- Proposition 84 promotes and assists the Integrated Regional Water Management (IRWM) Program, local levee projects, drinking water quality improvements, groundwater management, and urban stream restoration. RWA successfully applied for \$16 million from Proposition 84. There will at least one additional round of funding opportunities for this program, which is anticipated in 2014.

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- Proposition 1E focuses on disaster preparedness and flood protection and promotes nonstructural means toward those goals. Individual agencies within the ARB Region have successfully secured more than \$9 million from this program. It is uncertain if there will be any additional rounds of funding opportunities through this program, as nearly all of the funds have been allocated.
- Proposition 50 of 2002 provided the first source of funds for development of IRWMPS and implementation of projects. Additionally, Proposition 50 provided for improving agricultural water use efficiency and exploring new technology to improve drinking water quality. Currently, RWA is managing nearly \$27 million in grant funds from Proposition 50 on behalf of regional stakeholders for programs and projects that provide integrated, region-wide benefits. No additional rounds of funding are anticipated for this program.

### ***State Water Resources Control Board and Regional Water Quality Control Boards***

A part of the California Environmental Protection Agency, the five-member State Water Resources Control Board (State Water Board) handles water rights issues, develops statewide protection plans, and establishes water quality standards. Their Division of Financial Assistance provides funding for water quality- and wastewater-related projects. Four representative programs are listed below.

- Clean Water State Revolving Fund Program, which provides loans to wastewater, water recycling, and expanded use projects.
- The Water Recycling Funding Program issues loans and research grants for projects that promote use of treated wastewater to offset water supplies.
- The Small Community Wastewater Program aids Disadvantaged Communities (DAC) with wastewater project financing.
- The Central Valley Regional Water Quality Control Board (Central Valley Water Board) manages an ongoing supplemental environmental program that uses collected fines to support various projects.

### ***California Department of Public Health***

As a division of the California Health and Human Services Agency, the California Department of Public Health (CDPH) is “dedicated to optimizing the health and well-being of the people in California.” As a part of their effort to ensure public health, CDPH has a Safe Drinking Water State Revolving Fund (SDWSRF), which targets public water systems and drinking water infrastructure that currently pose public health risks and violate federal or state drinking water standards. The SDWSRF receives annual federal grants to finance long-term loans for construction projects and short-term planning grants. Special consideration and rates for DACs apply.

### ***California Infrastructure and Economic Development Bank***

The California Infrastructure and Economic Development Bank (I-Bank) was established in 1994 within the California Business, Transportation, and Housing Agency. Governed by five board members, the I-

Bank promotes economic revitalization, enables future development, and encourages a healthy climate for jobs in California. They have funding and bonds programs, such as the Infrastructure State Revolving Fund Program, which provides up to 30-year loans of a maximum \$10 million per annum to municipalities for public infrastructure. Drinking and wastewater treatment and distribution/collection systems are eligible under this program.

***California Department of Housing and Community Development***

This California Department of Housing and Community Development (HCD) is responsible for preserving and expanding safe and affordable housing opportunities and promoting strong communities. Located within the California Business, Transportation, and Housing Agency, the role of HCD ranges from developing housing policy and building codes to assisting housing finance and community economic development. Their Community Development Block Grant provides funding to cities and counties. The Community Development allocation provides for public improvements and public services programs, while the Planning and Technical Assistance helps fund that process, such as by assisting project feasibility studies or environmental reviews. Public water programs and improvements would be eligible for this funding.

***6.2.1.2. Federal Funding***

Over the past few years, the ARB Region has also been successful in securing several million dollars in federal grants, primarily through programs administered under Reclamation). This success has largely been because of the strong nexus between the Central Valley Project (CVP) and ARB Region's local water resources. In particular, the Region has been successful in garnering support for water efficiency measures, which directly benefit CVP operations.

With the 2013 federal sequestration, future federal funding opportunities are uncertain. Success in grant applications, again, is also not definite. Below is a non-exhaustive list of identified federal funding opportunities relevant to the ARB Region.

***U.S. Department of Agriculture, Rural Development***

The U.S. Department of Agriculture, Rural Development finances programs throughout the country to improve the economy and quality of life in rural areas. For their water-related programs, only towns with under 10,000 in population are designated as rural. The program supports public service utilities to local banks and credit unions to development of agricultural cooperatives. An example use of these funds for water-related programs includes construction and land acquisition for sewer collection system improvements.

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#### ***U.S. Environmental Protection Agency***

The U.S. Environmental Protection Agency (EPA) is a federal agency that strives to protect human health and the environment by providing research, standards, and policies that relate to issues such as air pollution, climate change, toxic waste, and drinking water.

- The California Water and Energy Program (CalWEP) recognizes that water and energy efficiency together reduce costs. CalWEP provides funding related to water and energy auditing and sustainability projects.
- Brownfields grants provide funding for groundwater contamination cleanup projects. Brownfields grants serve as the foundation of the Brownfields Program and support revitalization efforts by funding environmental assessment, cleanup, and job training activities. For example, sites contaminated with petroleum, hazardous substances, pollutants, or contaminants are eligible for up to \$200,000 through the Brownfields Cleanup grant.
- Water Infrastructure Finance and Innovation Authority (WIFIA) will be established under EPA management if the Water Infrastructure Finance and Innovation Act of 2013 passes. WIFIA would provide loans of at least \$20 million for large-scale construction or improvements of water treatment or community water systems; protection of groundwater and surface water sources; implementation of water efficient, energy efficient or renewable generation technologies; and wastewater and stormwater reuse and control.

#### ***U.S. Department of the Interior, Bureau of Reclamation***

Reclamation is a federal agency that operates in the 17 western states and manages, develops, and protects water resources. Their programs provide cost-shared funding to irrigation districts and urban water agencies for conservation or water management improvement-related activities. Some of their financial assistance programs include the following.

- Bay-Delta Restoration Water Use Efficiency Grants usually fund projects such as canal lining, groundwater banking, leak detection, and irrigation retrofits. This program is administered in partnership with the Natural Resources Conservation Service.
- Reclamation's WaterSMART Program funds water efficiency measures and focuses on water-energy efficiency projects. SJWD received this grant, which assisted the development of this IRWMP.
- Title XVI Water Reclamation and Reuse Program identifies and investigates water recycling and reuse of reclaimed waters. This program currently supports 37 such projects in California, with Sacramento Regional County Sanitation District (SRCSD) as a local and recent beneficiary.

#### ***U.S. Army Corps of Engineers***

The USACE is the largest federal water resources development and management agency. USACE is responsible for administering the public law, WRDA. WRDA authorizes flood control, navigation, and environmental projects and studies, and often provides congressional authorizations/appropriations to local agencies. For example, in the 2007 Act, Sacramento Area Flood Control Agency (SAFCA) was

awarded over \$20 million for the Natomas Levee Project. Administration of future WRDA programs is expected to continue providing congressional authorizations/appropriations to local agencies. WRDA of 2013 is currently in development in Congress.

#### **6.2.1.3. Mitigation/Settlement Funds**

These funds are provided for mitigation related to a project or settlement of a past lawsuit in the Region. Mitigation funds in the Region are generally associated with flood management projects and structures, which require mitigation for resulting habitat losses (e.g., Folsom Dam). Additionally, CVP mitigation funds have supported habitat restoration associated with water supply projects of Folsom Dam. A noteworthy case, the Sacramento County Abandoned Wells Program, was started using funds derived from a settlement of groundwater contamination in the Region.

#### **6.2.1.4. Special Assessment Districts**

Special Assessment Districts deliver specific voter-approved services within a limited area. Establishing a special assessment district is a common form of collecting needed projects funds. Districts that address flood issues have been one of the most successful of districts within the Region.

### **6.2.2. Other Funding Sources**

The following sections describe other potential funding sources for implementing projects. Many of these sources are internal to municipalities or water agencies, and result from fees or rates collected from constituents or users. While these funding sources are heavily influenced by economic conditions, these sources are generally more consistent and reliable. Internal funding sources generally cover O&M costs in addition to supporting new projects. Many of the project proponents have internal revenue sources.

#### **6.2.2.1. New Development Fees**

Development fees are used by water agencies almost universally as a measure to achieve and maintain equity among its past, present, and future customers. For a growing water agency, development fees can represent more than half of the total revenue in any given year, and as such are very important to existing as well as future customers. Development fees are typically charged per connection, measured in equivalent dwelling units (EDU). A single connection may encompass more than one EDU. In addition to the connection fee aspect of development fees, water agencies may also assess other fees (e.g., commercial acreage fees and other service fees).

In some cases, if a developer builds a water pipeline or large water facility required by a water agency as a condition of development, then as partial or full payment for the water facility, a water agency may give fee credits to the developer in lieu of the developer paying fees. If the value of the water facility exceeds

the amount of credits, a reimbursement agreement is typically executed authorizing payment to the developer of the remaining amount owed over a period of time (this does not typically exceed a defined time period). Since 2006, new development has decreased in the Region, causing this source of funding to significantly decrease. However, more recent trends indicate that development may accelerate somewhat in the near future.

#### **6.2.2.2. User Fees**

Monthly user fees are assessed by some water agencies where a nexus can be made that new facilities are directly benefiting the existing customers. This is especially true for water agencies that are developing conjunctive use water systems where the existing customers may have paid for the groundwater component when they paid the development fee (through the purchase of the home). The surface water and/or recycled water component is a new water supply for a water agency that is needed for conjunctive use with groundwater supplies. Income from this monthly revenue source is used in many cases to pay debt service on debt-financed assets.

#### **6.2.2.3. User Rates**

User rates pay for O&M of a water agency or public utility's system. Within the user rate for a water agency there is a fixed cost component that does not vary with the amount of supplied water, such as labor and overhead expenses, and a variable cost component, such as the electrical and chemical costs, that are based on the amount of pumping and applied chemicals to meet the water demands of the customers. A customer of a water agency pays a monthly fixed rate and a variable rate based on the metered usage. In cases where billing is not based on a metered usage, a single monthly flat rate is assessed that is the combined average of the fixed and variable rates.

#### **6.2.2.4. Bonded Debt Service (Revenue Bonds)**

Issuance of revenue bonds to pay for new capital is done in cases where a large facility is needed to support current and future growth. In this way, a large facility can be paid for by bonded debt service at the time of construction with repayment of the debt service over a 20- to 30-year time frame. This is a preferred approach to paying for a high-cost facility because it avoids the perceived over-collection of fees from past customers that go toward facilities that serve past and future customers. The downside to bonded debt is that it cannot be accomplished with development fees alone due to the variability and uncertainty of new development over time. A user fee or rate is needed as a bond document covenant in the event that development fees are not adequate to make the required annual payment for the debt service.

#### **6.2.2.5. Volunteer Contributions**

Volunteer contributions are typically associated with nonprofit organizations or nongovernmental organizations that work toward a given cause. There are many of these stakeholders that have proposed projects. This revenue source is typically not reliable in terms of paying for capital projects or long-term operations. Volunteer contributions are best used for preservation of native land and implementation of public outreach programs. Both are examples where the cost is incurred only if there are sufficient funds to support the activity. Other opportunities for these organizations are partnerships with other project proponents that have more means of generating funding.

### **6.3. IRWMP Performance Monitoring**

Plan performance monitoring is integral to having an effective and adaptive IRWMP into the future. As the RWMG, RWA is responsible for monitoring progress on the IRWMP and using that information to guide future changes in the IRWMP. There are two types of monitoring needs: one for progress and adaptation of the core IRWMP document, and another for reporting progress on and evaluating projects. Data management is also integral to plan monitoring, and this is described in **Section 6.4**.

#### **6.3.1. Tracking Progress of the IRWMP**

RWA is responsible for tracking the progress of the IRWMP. Conducting stakeholder meetings; monitoring progress on goals, objectives, and strategies; and coordinating with other IRWM regions are examples of activities that will continue into the future. Each project proponent is aware of the ARB Framework, including objectives and strategies, and project evaluation and scores are based on a project's ability to meet regional objectives. The relationship of these current strategies and the 17 objectives is shown in **Section 5.6**. Project proponents are encouraged to provide RWA with progress reports when practical, but at a minimum once per year. Examples of types of monitoring and data to report to RWA are described in **Section 6.3.2**. Each project proponent is responsible for managing and sharing project data as specified in **Section 6.4**.

RWA will revisit progress on implementing strategies annually, following up with relevant stakeholders and project proponents. Progress and lessons learned will then be reported to all stakeholders on the ARB list serve and through the Opti Web site. Reaching out to stakeholders has a twofold purpose:

- To inform the Region of ongoing progress and of those who are actively participating
- To report progress on strategies and projects to stakeholders and ensure relevant efforts are not going unnoticed and to promote continued participation in the IRWMP effort

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Progress on strategies implies that progress on objectives is also being made. Objectives related to each strategy will be listed in an annual progress summary that will be distributed to stakeholders. Distributing and communicating progress will in turn inform stakeholders on possible important projects that still need to be developed and implemented as well as any strategy additions or changes that may be needed.

#### **6.3.2. Monitoring Plan for Projects**

Depending on funding source requirements, each ARB project will have a monitoring plan, to measure progress not only for the purpose of the ARB IRWMP but also to ensure success of a specific project. Developing and submitting a project monitoring plan and measures to remedy encountered problems will usually be a requirement when receiving external funding (again, depending on funding source). It is important to note that RWA does not have authority to mandate monitoring plans absent requirements from funding sources. However, RWA will provide examples of monitoring plans when not required by specific funding sources, and will promote the value of these plans to regional stakeholders. From past experience, RWA typically obtains the following information in monitoring plans:

- Reports of any quantifiable data being collected that relates to ARB strategies, including what is being measured, units, and date and location of data collection
- Report of any qualitative information that relates to qualitative ARB strategies with the date of description
- Monitoring schedule and frequency of above data collection
- Funding sources of the monitoring plan
- List of any data that apply to this monitoring plan or procedures on how to manage collected data

Examples of types of monitoring a project proponent could engage in are listed by goal in **Table 6-2**.

**Table 6-2. Example Types of Monitoring**

ARB Goal Category	Types of Monitoring
Water Resources	<ul style="list-style-type: none"> <li>Stream flow data</li> <li>Surface water deliveries</li> <li>Recycled water deliveries</li> <li>Groundwater elevation and extraction</li> </ul>
Water Quality	<ul style="list-style-type: none"> <li>Water quality monitoring (surface water, groundwater, recycled water)</li> <li>Discharge monitoring</li> <li>Violations of any discharge requirements</li> </ul>
Environmental Resources	<ul style="list-style-type: none"> <li>HCP monitoring</li> <li>GHG monitoring</li> <li>CEQA/NEPA compliance</li> </ul>
Flood Management	<ul style="list-style-type: none"> <li>Discharge monitoring</li> <li>Improved level of flood protection</li> </ul>
Community Stewardship	<ul style="list-style-type: none"> <li>Customer/community participation</li> <li>Outreach to local officials</li> </ul>

Key:

ARB = American River Basin

CEQA = California Environmental Quality Act

GHG = greenhouse gas

HCP = Habitat Conservation Plan

NEPA = National Environmental Policy Act

## 6.4. Data Management

Data management is an important aspect of continued implementation of the ARB IRWMP and projects in the Region. Data management can be characterized by how data are collected, stored or maintained, and disseminated or made available to outside users. This section describes data management for projects and regional programs, starting with an overview of ARB project data needs and a description of common data sources for ARB projects. ARB stakeholders monitor data and also contribute to some of these data systems. Next, data gaps in the ARB Region are identified along with a potential way of addressing them. Finally, the last section specifically discusses data management efforts that support statewide data needs.

### 6.4.1. Overview of IRWMP Project Data Needs

ARB project proponents and their projects require data to plan, design, implement, and monitor their projects. The natural (e.g., hydrologic) and anthropogenic (e.g., land-use conversion) systems of the ARB Region have been extensively monitored for many years. Many of the historical, current, and future monitoring programs pertaining to the ARB Region are useful to the development and implementation of ARB IRWMP projects. Examples of ARB project data needs are listed in **Table 6-3**.

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**Table 6-3. Sample List of Data Needed for Current and Future IRWMP Projects**

Type of Data	Type of IRWMP Project				
	Water Resources	Water Quality	Environmental Resources	Flood Management	Community Stewardship
Surface Water Flows	X	X	X	X	
Surface Water Deliveries	X				
Recycled Water Deliveries	X	X			X
Groundwater Surface Elevations	X				
Groundwater Pumping	X	X			
Hydrogeologic Data	X				
Precipitation	X	X		X	
Water Demand	X				X
Water Related Facilities – Location and Size	X	X			
Surface Water, Groundwater, and Recycled Water Quality		X	X	X	
Discharge Monitoring		X	X	X	
Contaminant Plume Locations and Extents	X	X			
Violations of Discharge Requirements		X	X		
Locations of Sensitive Habitats and Species		X	X		
CEQA/NEPA Compliance			X		
Flooding and Floodplain Information				X	
Demographic Data	X	X	X	X	X
Land Use	X	X	X	X	X
Outreach-related Data (e.g., attendance)	X	X	X	X	X
Outreach to Local Officials	X	X	X	X	X

Note: This table shows general data needs for projects. Specific needs of each project will differ.

Key:

CEQA = California Environmental Quality Act

IRWMP = Integrated Regional Water Management Plan

NEPA = National Environmental Policy Act

#### **6.4.2. Frequently Used Data Sources**

The above-identified data are available from various sources, including federal, state, and local agencies.

**Table 6-4** lists some of the most frequently used databases, including data that were monitored and collected, as well as data outputs from existing numerical models often owned by these agencies.

Many of these databases are managed by federal or state entities, external to the ARB Region and authority of the RWA and ARB stakeholders. Collection techniques and quality assurance/quality control (QA/QC) procedures depend on each data management system. Many ARB stakeholders have monitoring and/or reporting requirements. These stakeholders often work with the relevant state or federal agency to collect and add these data to the larger scale databases. Examples include data collection and reports associated with Urban Water Management Plans (UWMP) (DWR requirement) and National Pollutant Discharge Elimination Program permits (EPA and Central Valley Water Board requirement). This local contribution of data to larger scale, statewide or national databases is identified in the last column of **Table 6-4**.

Other databases mentioned in **Table 6-4** are maintained by local ARB agencies, such as Sacramento Groundwater Authority's SHEDTOOL that monitors groundwater elevations and many other groundwater-related data items. Sacramento Area Council of Governments is another local agency that compiles, analyzes, and disseminates demographic and land-use related data for the local six-county (Sacramento, Placer, El Dorado, Yolo, Sutter, and Yuba counties) area.

The information contained in these data management systems, when shared, can provide a more accurate picture of the state of the ARB Region. As the RWMG, RWA will maintain and track progress of the IRWMP, which is also a regional database. As mentioned earlier, progress on IRWMP objectives and strategies will be reported to stakeholders via a list serve as well as through the Opti Web site. Any stakeholder may also post announcements and links pertaining to available data and project information on Opti.

**Table 6-4. Frequently Used Data Sources and Their Management Systems**

Type of Data	Name of Data Management System	Responsible Party	Location of Data Maintenance and Dissemination Method	ARB Stakeholders Contributing Data
Climatic Data	Western Region Climate Center	Desert Research Institute	<a href="http://www.wrcc.dri.edu">http://www.wrcc.dri.edu</a>	N/A
Evapotranspiration	California Irrigation Management Information System	DWR	<a href="http://wwwcimis.water.ca.gov/cimis/data.jsp">http://wwwcimis.water.ca.gov/cimis/data.jsp</a>	N/A
Watershed Delineations	Watershed Boundary Dataset	USDA, NRCS	<a href="http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/water/watersheds/dataset/">http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/water/watersheds/dataset/</a>	N/A
Stream and River Flows and Stages	California Data Exchange Center	DWR	<a href="http://cdec.water.ca.gov/">http://cdec.water.ca.gov/</a>	N/A
Stream and River Flows and Quality	Water Data for the Nation	USGS	<a href="http://waterdata.usgs.gov/nwis">http://waterdata.usgs.gov/nwis</a>	N/A
Stream and River Water Quality	303(d) Impaired Waters List	U.S. EPA and Central Valley Water Board	<a href="http://www.swrcb.ca.gov/rwqcb5/water_issues/tmdl/impaired_waters_list/index.shtml">http://www.swrcb.ca.gov/rwqcb5/water_issues/tmdl/impaired_waters_list/index.shtml</a>	Agencies with NPDES permits
Reservoir Operations Data	CVO Reports	Reclamation	<a href="http://www.usbr.gov/mp/cvo/">http://www.usbr.gov/mp/cvo/</a>	N/A
Surface Water Deliveries and its Quality; Water Related Facilities— Location & Size; Water Demand	Urban Water Management Plans, Capital Improvement Programs, and other water supply-related plans	Water Supply Agencies	See each plan or document. Contact RWA or each agency for available data.	Water Supply Agencies
Groundwater Surface Elevations and Quality	California Statewide Groundwater Elevation Monitoring	DWR	<a href="http://www.water.ca.gov/groundwater/casgem/">http://www.water.ca.gov/groundwater/casgem/</a>	Groundwater Agencies
Groundwater Surface Elevations and Quality; Hydrogeologic Data; Contaminant Plume Locations and Extents	Groundwater Management Plans	Groundwater Management Authorities (WPC, SGA, SCGA, SAWC)	Data exchange among managers has readily occurred. See GMPs and Basin Reports. Contact each agency for available data.	Groundwater Agencies
Groundwater Surface Elevations and Quality of North American Groundwater Subbasin	SHEDTOOL	SGA	Data exchange among managers has readily occurred. Contact SGA for available data.	SGA

**Table 6-4. Frequently Used Data Sources and Their Management Systems (contd.)**

Type of Data	Name of Data Management System	Responsible Party	Location of Data Maintenance and Dissemination Method	ARB Stakeholders Contributing Data
Groundwater Surface Elevations and Quality of South American Groundwater Subbasin	HydroDMS	SCGA	Data exchange among managers has readily occurred. Contact SCGA for available data.	SCGA
Underground Storage Tanks (UST) and On-site Wastewater Treatment Systems (OWTS)	N/A	Sacramento County EMD and Central Valley Water Board	<a href="http://www.waterboards.ca.gov/water_issues/programs/ust/">http://www.waterboards.ca.gov/water_issues/programs/ust/</a> ; <a href="http://www.waterboards.ca.gov/water_issues/programs/owts/">http://www.waterboards.ca.gov/water_issues/programs/owts/</a>	N/A
Contaminant Plume Locations and Extents	N/A	Air Force Bases (e.g., McClellan and Mather Field) and Corporations (Aerojet)	Reports monitoring to Central Valley Water Board.	Groundwater Authorities
Cleanup Sites and Hazardous Waste Facilities	EnviroStor	California Department of Toxic Substances Control	<a href="http://www.envirostor.dtsc.ca.gov/public/">http://www.envirostor.dtsc.ca.gov/public/</a>	N/A
Groundwater Pumping	UWMPs, GMPs	Water Supply Agencies	See UWMPs, GMPs, and water supply-related management plans. Contact each agency or groundwater management authority for available data.	Water Supply Agencies
Locations and information on Sensitive Species	California Natural Diversity Database	CDFW	<a href="http://www.dfg.ca.gov/biogeodata/cnddb/">http://www.dfg.ca.gov/biogeodata/cnddb/</a>	Environmental Resources-related agencies (e.g., TNC, Ducks Unlimited)
Locations and information on Sensitive Habitats	The Vegetation Classification and Mapping Program	CDFW	<a href="http://www.dfg.ca.gov/biogeodata/vegcamp/">http://www.dfg.ca.gov/biogeodata/vegcamp/</a>	Environmental Resources-related agencies (e.g., TNC, Ducks Unlimited)
Stormwater infrastructure, flows, and quality	SWMPs, NPDES permits	Counties and Cities, including Sacramento Stormwater Quality Partnership	See Stormwater Management Plans and monitoring requirements associated with NPDES permits. Contact each agency for information.	Counties and Cities

**Table 6-4. Frequently Used Data Sources and Their Management Systems (contd.)**

Type of Data	Name of Data Management System	Responsible Party	Location of Data Maintenance and Dissemination Method	ARB Stakeholders Contributing Data
Flood infrastructure and flooding data	CVFMPP and SFMPP documents	DWR	See state flood documents (includes information on federal structures)	N/A
Flood infrastructure and flood maps	N/A	Local flood agencies (e.g., SAFCA)	Contact each agency	Local flood agencies (e.g., SAFCA)
Demographic Data	U.S. Census	U.S. Census Bureau	<a href="http://www.census.gov/main/www/access.html">http://www.census.gov/main/www/access.html</a>	N/A
Demographic Data, Land Use Data	SACOG Information Center	SACOG	<a href="http://www.sacog.org/demographics/">http://www.sacog.org/demographics/</a>	Counties and Cities
Outreach-related Data (e.g., attendance)	N/A	ARB Project Proponents	Many agencies and projects require outreach and these data should be publically available	ARB Project Proponents

Key:

ARB = American River Basin

CDFW = California Department of Fish and Wildlife

Central Valley Water Board = Central Valley Water Quality Control Board

CVFMPP = Central Valley Flood Management Planning Program

CVO = Bureau of Reclamation, Central Valley Office

DMS = data management system

DWR = California Department of Water Resources

EPA = Environmental Protection Agency

GMP = groundwater management plan

NRCS = Natural Resources Conservation Service

Reclamation = U.S. Department of the Interior, Bureau of Reclamation

RWA = Regional Water Authority

SACOG = Sacramento Area Council of Governments

Sacramento County EMD = Sacramento County Environmental Management Department

SAFCA = Sacramento Area Flood Control Agency

SAWC = South Area Water Council

SCGA = Sacramento Central Groundwater Authority

SFMP = Statewide Flood Management Planning Program

SGA = Sacramento Groundwater Authority

TNC = The Nature Conservancy

USDA = U.S. Department of Agriculture

USGS = U.S. Geological Survey

UWMP = urban water management plan

WPC = Western Placer County

### **6.4.3. Data Gaps**

Holding the conversation among multiple stakeholders to develop the ARB IRWMP strategies made evident some data gaps in the ARB Region. Some strategies are geared towards filling these identified data gaps (e.g. Strategy WQ7 and CS3). Other strategies were placed in a “Parking Lot,” as shown in Table 5.5, and stakeholders are currently working together to compile data to form effective strategies. As the IRWMP is implemented, new data gaps will be identified, and these will continue to be addressed by either becoming a strategy itself or by initiating a data compilation effort to inform a strategy. The adaptive characteristic of strategies allows identifying data gaps and addressing them to be both an iterative and collaborative process.

### **6.4.4. Support of Statewide Data Needs**

As noted in **Section 6.4.2**, ARB stakeholders contribute data to some statewide databases, including programs administered by the State Water Board and DWR. ARB stakeholders have supported statewide data needs in the past by voluntary participation in the State Water Board’s Groundwater Ambient Monitoring Assessment program. ARB stakeholders are actively participating in the California Statewide Groundwater Elevation Monitoring program. In addition, data collection will continue to be coordinated and shared with the California Environmental Resource Evaluation System, Surface Water Ambient Monitoring Program, and other statewide efforts when appropriate and feasible.

## **6.5. Benefits and Impacts of IRWMP Implementation**

There are numerous potential benefits and impacts that will result from implementation of the IRWMP. Participation in an integrated, region-wide effort alone has inherent benefits, such as increased regional understanding, economies of scale, and fostering support. These are described briefly below:

- **Increasing Regional Understanding.** By working together as a cohesive group, each agency or participant gains a deeper understanding of the effects of their projects on other agencies, as well as the effects of other agencies’ projects on their own agency. This in turn assists agencies in developing projects that minimize the types of interagency conflicts that can ultimately prevent projects from gaining the support necessary for successful implementation.
- **Economies of Scale.** Many of the agencies in the Region use common sources, or combinations of sources of water supply. As a result, many agencies share the same water management challenges. By developing integrated regional approaches to water management together, resources can be pooled, maximizing efficiency on a regional scale. In this way, existing resources can be optimized, duplication of efforts can be avoided, and larger scale efforts can be established, potentially providing a greater benefit than from individual efforts alone.
- **Fostering Support.** When planning is conducted on a regional scale, more parties are involved in projects and more diversity of opinion is introduced in the process, which generally yields better, more informed projects. In collaborative processes, each stakeholder brings his or her own values

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and priorities to the process, which is ultimately reflected in the plan. This results in projects that not only minimize impacts to more stakeholders, but incorporate benefits to more stakeholders as well. When more benefits are realized and impacts avoided, more support follows.

In addition to these overall benefits, there are expected benefits and impacts of ARB IRWMP projects and programs. This section describes the benefits and impacts from plan implementation at a screening level, including:

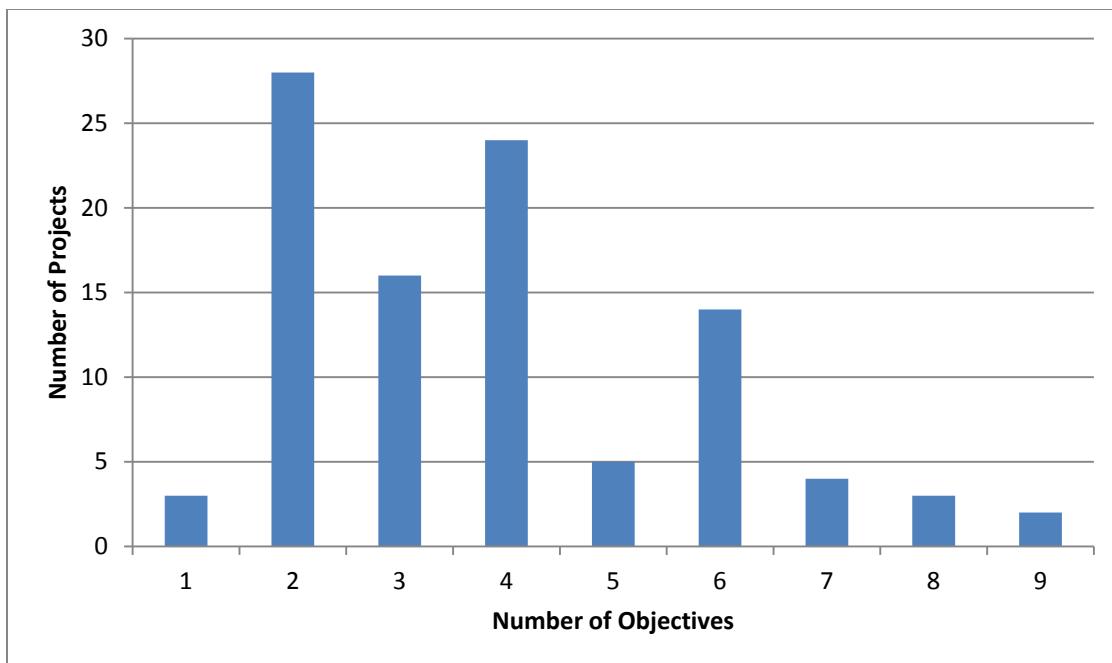
- Potential benefits within the Region
- Potential impacts within the Region
- Potential interregional benefits and impacts
- Benefits and impacts to DACs and native tribes

Project proponents quantified these project benefits and impacts where possible during the project submission process. While the project submission form asks about them, the ARB IRWMP itself does not require compliance with California Environmental Quality Act (CEQA), National Environmental Protection Act (NEPA), or other local, state, or federal permitting requirements. However, if it is determined that environmental compliance is required for individual projects, the project proponent will prepare appropriate documentation. Benefits and impacts are developed in more detail for each project as part of any required environmental documentation process. In addition to consideration of environmental impacts and benefits, project proponents are asked to consider impacts and benefits related to DACs and tribal communities.

#### **6.5.1. Potential Benefits Within the Region**

By their nature, IRWMPs are implemented through projects. As of June 27, 2013, the ARB Region's stakeholders have vetted 178 projects, of which 89 total projects have been scored. This set of projects will continuously evolve as project proponents can submit and update projects in Opti at any time.

Based on information provided by ARB project proponents, proposed projects will achieve multiple benefits by helping the Region meet its objectives. Each project proponent will further examine project-specific benefits as each project is implemented. **Figure 6-1** illustrates that of the 89 scored projects that had at least one objective identified, many had identified multiple objectives. Many projects meet two to four objectives. **Table 6-5** shows the number of projects that project proponents have identified that meet that objective.



**Figure 6-1. Distribution of Projects Meeting Multiple Objectives**

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**Table 6-5. Number of Projects that Meet Respective ARB Objectives**

Objective	No. of Projects	Objective	No. of Projects
1. Meet current and future water resources needs.	65	10. Conserve natural riparian buffers in undeveloped portions of local watersheds and restore buffers in developed areas when possible.	17
2. Increase water use efficiency.	38	11. Increase the capacity of the flood management system to meet applicable standards for designated areas and land uses.	11
3. Improve ability to reliably meet water demands during dry or emergency conditions.	60	12. Maintain and improve levees and other flood related infrastructure to reduce flood risk.	12
4. Increase the use of recycled water for appropriate uses.	15	13. Maintain and restore/reconnect floodplains to provide flood storage and other benefits.	6
5. Remediate contaminated groundwater and reuse it to the extent feasible.	2	14. Improve management of residual flood risks.	6
6. Improve protection of beneficial uses of surface water and groundwater.	37	15. Increase awareness of the need for, benefits of, and practices for maintaining sustainable water resources.	49
7. Recharge and reuse stormwater and urban runoff to the extent practicable.	4	16. Improve integration of water resources planning with land use planning.	18
8. Maintain and improve the ecosystem function of area streams and watersheds.	32	17. Increase sharing of information, studies, and reports to further advance integrated regional water management.	34
9. Maintain and improve habitat of area watersheds.	28		

Note: 89 of the 178 projects have been ranked. During the scoring process, some of these projects' explanations for meeting an objective may have been identified to be insufficient. This table, however, does not reflect those scoring comments.

Key:

ARB = American River Basin

**Table 6-6** below describes how the set of projects, vetted at the time of this IRWMP adoption, addresses each of the 17 objectives. Refer to **Table 5-2** for a description of each of these objectives.

**Table 6-6. Benefits of Plan Implementation per ARB IRWMP Objective**

<b>1. Meet current and future water resources needs.</b>
Projects help the Region achieve this broad objective from numerous perspectives. Water supply infrastructure maintenance, improvements, expansions, and construction projects increase the Region's water reliability and create additional opportunities for improved water operation and conjunctive use. Projects that involve resource management plans directly address future water needs. Some projects, such as water metering, improve potable water use efficiency, while others encourage recycled and reclaimed water use to expand the Region's water portfolio.  Many stormwater and flood-related projects approach this objective from perspectives of groundwater recharge and water quality protection, which both help to secure future water resources. A few projects specifically study groundwater contamination and its transport, which addresses groundwater quality concerns.
<b>2. Increase water use efficiency.</b>
Projects help the Region achieve this objective by encouraging use of recycled water for irrigation and industrial demands. This decreases the total amount of water used as a Region. Other projects focus on reducing water losses by upgrading infrastructure to require less operational water or to decrease seepage; by improving monitoring and controlling water transfers; and by decreasing water use by residents, land owners, and small farms.
<b>3. Improve ability to reliably meet water demands during dry or emergency conditions.</b>
Projects help improve the Region's ability to meet water demands during dry or emergency conditions by decreasing water demand, increasing redundancy in water supplies, protecting groundwater as a dry-year resource, and/or promoting drought-proof supplies. Projects that decrease demand emphasize end-user efficiency. Projects that increase redundancy in water supplies involve the construction of emergency interconnections and pumps to create new water wheeling opportunities. Some projects increase surface water storage and treatment capacity for use during dry years. Conjunctive use programs and projects that have groundwater recharge benefits will help dry and emergency situations as well. Groundwater quality protection is also important. Finally, many recycled and reclaimed water projects encourage and develop the use of this reliable resource.
<b>4. Increase the use of recycled water for appropriate uses.</b>
Wastewater agencies throughout the Region have proposed projects to expand the use of recycled water. These projects involve the financing and construction of new distribution pipelines and seasonal storage. Other projects focus on improving recycled water quality for wider acceptability. This improvement can occur through the installation of new technology (e.g., biological nutrient removal) or by improving wastewater quality before flows reach the wastewater treatment plant through an effective Fats, Oil, and Grease (FOG) program. Finally, recycled water projects involve finding new uses for this water supply, including power generation plants, wetlands, agriculture, and golf courses.
<b>5. Remediate contaminated groundwater and reuse it to the extent feasible.</b>
This objective encourages project proponents to view remediated groundwater as a potential resource. Projects that address this objective will attempt to find partners that can make use of reclaimed water. Pipelines, pumps, and other infrastructure will then be constructed to allow for adequate distribution. Only certain agencies within the Region have the opportunity to use remediated water, but use of this water source would decrease reliance on other water resources.

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**Table 6-6. Benefits of Plan Implementation per ARB IRWMP Objective (contd.)**

**6. Improve protection of beneficial uses of surface water and groundwater.**

This objective addresses water quality issues in the Region. Some projects provide water quality benefits by decreasing source pollution. This includes educating individuals and farmers about best management practices (BMP) to optimize the use of both water and potential runoff contaminants. Low Impact Development (LID) methods decrease urban runoff. Sanitation district FOG outreach programs help remove those constituents from wastewater and potential runoff from landfills. Projects that include improved wastewater treatment decrease nutrient loading into waterways. One project also involves stabilizing spillway channels to decrease sediment loading further downstream.

Other projects provide water quality benefits by increasing mitigation or creating a barrier between the contaminant source and waterways. Floodwater detention basins and the habitats they provide can help to physically and biologically treat runoff. Upgrading a water supply canal into a pipe protects raw water from runoff contamination. Projects that destroy abandoned wells effectively eliminate a route for contamination to enter the aquifer.

Several projects involve watershed or groundwater modeling studies of contaminants to determine the type of management activities that will be needed in the future. Projects to develop groundwater management plans provide similar benefits as well.

Finally, because water quality is influenced by water quantity, recycled water projects and some conjunctive use projects help decrease overall use, thus improving water quality by diluting contaminants in waterways.

**7. Recharge and reuse stormwater and urban runoff to the extent practicable.**

Several projects that promote LID methods, such as detention basins, wetland preservation, and floodplain reconnection, will help to increase groundwater recharge. Similarly, aquifer storage and recovery (ASR) projects artificially store runoff for future use.

**8. Maintain and improve the ecosystem function of area streams and watersheds.**

Ecosystem functions refer to various natural processes, such as stream meandering or nutrient cycling. Projects help maintain or improve ecosystem functions through preservation of open space, vernal pools, or riparian areas and by retiring farmland.

Many projects have benefits in hydrological and geomorphological processes by helping to restore surface flows, removing barriers, stabilizing or recontouring river banks, and capturing runoff in detention basins or floodplains.

Other projects provide benefits for nutrient cycling and aquatic processes by improving water quality. These projects range from installing better treatment plants to enhancing natural filtration, natural buffers, and BMPs.

Further, some projects include benefits to life cycles of species by removing barriers and reducing habitat fragmentation. These projects include benefits such as habitat restoration, management of invasive species, and enhancement of biodiversity. Improving nutrient and life cycles also has carbon sequestration benefits.

Finally, some projects involve modeling studies and water management plans, which will allow project proponents to consider ecosystem functions when making future water decisions.

**Table 6-6. Benefits of Plan Implementation per ARB IRWMP Objective (contd.)**

<p><b>9. Maintain and improve habitat of area watersheds.</b></p> <p>Projects that produce high-quality recycled water provide an additional water supply for wetlands and conservation easements, which serve as important habitat for many species. These projects also improve habitat quality in the Sacramento-San Joaquin River Delta (Delta) by redirecting treated wastewater flows to beneficial-use locations.</p> <p>Some projects provide increased instream flows by reducing surface water diversions during periods of drought. This helps to maintain aquatic and riparian habitats that provide breeding and foraging habitat for special-status species.</p> <p>Projects that use LID methods, such as detention basins and constructed wetlands, not only treat runoff, but also provide habitat benefits.</p> <p>Finally, other projects involve the direct creation, enhancement, or restoration of habitat areas, such as marches, woodlands, and floodplains, which support a variety of threatened and endangered species.</p>
<p><b>10. Conserve natural riparian buffers in undeveloped portions of local watersheds and restore buffers in developed areas when possible.</b></p> <p>This objective recognizes that conservation, not just restoration, of existing riparian habitat is important. Projects with conservation benefits include those that specifically preserve land adjacent to waterways by implementing conservation easements, creating open space preserves, or placing land under permanent county protection.</p> <p>Projects that include LID methods, such as drainage basins and corridor enhancements, as well as floodplain and riparian area restoration projects, will help to conserve existing native habitat. A project with invasive species management will help conserve native vegetation by removing nonnative competitors. Finally, other projects that restore groundwater levels near rivers or reduce the use of surface water will help restore surface flows.</p>
<p><b>11. Increase the capacity of the flood management system to meet applicable standards for designated areas and land uses.</b></p> <p>These projects improve the capacity of the flood management system by increasing channel capacities. This can involve infrastructure improvements of flood structures, but most flood projects involve creating detention basins to store runoff after large storm events or securing land next to waterways to expand the floodplain and diffuse floodwaters. These actions can provide greater protection for downstream communities during periods of flooding.</p> <p>Some of these projects create flood corridors that are reserved for wildlife habitat and flood protection, thus eliminating the possibility of future development in these flood-prone areas.</p>
<p><b>12. Maintain and improve levees and other flood related infrastructure to reduce flood risk.</b></p> <p>Some flood projects reduce flood risk by rehabilitating aging levees and channels. This increases conveyance capacity and reduces the possibility of erosion and levee breaches. Infrastructure improvements include levees, detention basins, drainage canals, and weirs. Weirs allow for better management of flood flows.</p>
<p><b>13. Maintain and restore/reconnect floodplains to provide flood storage and other benefits.</b></p> <p>Restoration, detention basins, conservation easements, and other projects will reconnect floodplains to adjacent channels by removing barriers and recontouring banks. These projects achieve both increased habitat functionality and flood storage capacity.</p>
<p><b>14. Improve management of residual flood risks.</b></p> <p>Residual flood risk is the flood risk that still remains after structural and nonstructural flood management measures have been implemented. This risk is managed by emergency and contingency plans. It may also involve increasing awareness and preparing citizens for such flood events.</p>

**Table 6-6. Benefits of Plan Implementation per ARB IRWMP Objective (contd.)**

<b>15. Increase awareness of the need for, benefits of, and practices for maintaining sustainable water resources.</b> For some projects, direct stakeholder or constituent participation is necessary for implementation, such as water efficiency education classes or a FOG program that collects oil from restaurants. These projects will directly increase awareness. Other projects, such as water metering, target increase in awareness of the public through economic incentives. For projects that create or enhance wildlife and floodplain areas, recreational facilities and interpretive signage will inform the public about the flood management and/or ecosystem benefits of these locations. Finally, other projects, such as recycled water projects, include outreach efforts in forms of brochures to garner support.
<b>16. Improve integration of water resources planning with land use planning.</b> Projects help integrate water resources planning and land-use planning by coordinating with land-use agencies in the project areas. Through this coordination, some projects will preserve floodplain property from development, ensuring that this flood-prone land is used instead as wildlife habitat or recreational fields. Such actions help to decrease the liability and damage that flooding can cause in these areas. Recycled water projects require coordination with land-use planning as well, to plan distribution pipelines.
<b>17. Increase sharing of information, studies, and reports to further advance integrated regional water management.</b> Data collected during the implementation of many of the projects will be compiled in studies and reports and will be made available to interested agencies and stakeholders within the Region. Some projects are pilot projects, where one of the purposes of the project would be information sharing. Many projects also have multiple partners, and many of these project proponents are members of multimember authorities or agencies. Information about these projects will be visible and will be accessible to agencies in these circles.  For projects involving regional surface and groundwater modeling, information will be collected from agencies throughout the Region to develop model inputs. Once the modeling is complete, the resulting outputs and analyses will be shared with the entire Region.

### **6.5.2. Potential Impacts within the Region**

Implementation of projects in the ARB IRWMP will also have impacts. Some anticipated impacts are local and temporary, associated with construction. Other potential impacts require appropriate foresight and management to mitigate or minimize them. There also may be financial impacts, related to costs to the community for implementing a project or program. Project-level impacts are unavoidable, but effective IRWM ensures that benefits from multiple projects outweigh the costs and that benefits are shared as equitably as possible. **Table 6-7** identifies potential impacts of different types of ARB projects.

**Table 6-7. Potential Impacts of a Subset of Projects**

<b>Project Type</b>	<b>Potential Impacts</b>
Water supply projects	<ul style="list-style-type: none"><li>Unless properly managed, increasing human water consumption and reliability to secure that water may decrease water availability for environmental needs.</li></ul>
Water efficiency projects	<ul style="list-style-type: none"><li>When effective, water efficiency projects may result in decreased water use, reducing revenue for water supply agencies.</li></ul>

**Table 6-7. Potential Impacts of a Subset of Projects (contd.)**

<b>Project Type</b>	<b>Potential Impacts</b>
Groundwater projects	<ul style="list-style-type: none"> <li>If improperly implemented these projects can damage the aquifer, introduce contaminants or further spread contamination plumes, and increase greenhouse gas emissions (through energy use for pumping).</li> </ul>
Wastewater and recycled water projects	<ul style="list-style-type: none"> <li>Advanced treatment may require more chemical and energy use, increasing costs and greenhouse gas emissions.</li> <li>Projects that increase recycled water use could detrimentally decrease the amount of wastewater (flow) returning to the environment and impact species that rely on this water.</li> <li>Recycled water projects could increase salt and nutrient loading to groundwater basins.</li> </ul>
Projects that involve construction, including restoration projects	<ul style="list-style-type: none"> <li>Construction creates temporal impacts from excavation, which disrupts the surrounding areas.</li> </ul>
Environmental resources projects	<ul style="list-style-type: none"> <li>Unless properly managed, environmental projects that create new habitats may also create a demand that may compete with human demand.</li> </ul>
Flood and stormwater management projects	<ul style="list-style-type: none"> <li>Projects that only examine local flooding effects may reallocate risk from the project location to another area in the watershed, by changing flow patterns and/or increasing contaminants.</li> <li>Reconnecting and expanding floodplain area requires taking that land out of current land uses, impacting that landowner.</li> <li>Better flood protection may minimize understanding of actual risks from flood by the public.</li> </ul>

Additionally, there could be impacts if the ARB IRWMP and/or its component projects are not managed or implemented well. These impacts may include:

- Increased project/program costs to agencies and rate payers/constituents
- Delayed construction/operation of planned facilities and programs, and therefore delaying or decreasing intended benefits (e.g., delayed water supply reliability benefits)
- Delayed construction/operation of planned facilities and programs, leading to increased or prolonged negative impacts (e.g., increased impacts on water quality and fisheries)

Specific impacts of projects would need to be identified by project proponents during preparation of environmental and permitting activities before project implementation.

### **6.5.3. Potential Interregional Benefits and Impacts**

Projects contained in the IRWMP not only benefit local agencies but will be beneficial to neighboring areas. This is especially true for projects that affect watersheds or groundwater basins, because these boundaries often extend beyond the ARB Region. Jurisdictional boundaries extend beyond the ARB Region as well, which may transfer project benefits/impacts (e.g., jurisdictions and nature of SAFCA and Placer County Water Agency). Specific interregional benefits and impacts would need to be considered at the time of implementation of projects that may have a relationship to adjacent IRWM management areas. Coordination is documented with these groups in **Section 3.4**. As the RWMG, RWA would ensure that communication of any relevant projects occurs prior to implementation activities.

### **6.5.4. Benefits and Impacts to DACs and Native Tribes**

As described in **Section 3.1.3**, DACs and environmental justice (EJ) concerns in the ARB Region are generally not characterized by isolated communities with water supply, water quality, or wastewater service availability concerns. The exception may be small pockets of the Region served by small water systems and/or private wells. Flood risk issues may also disproportionately affect DACs as well, as many DACs are located in high-risk floodplains. Some projects that will benefit DAC and EJ concerns could include the following:

- Infrastructure improvement projects that benefit DAC pockets within larger service areas
- Groundwater quality projects that improves water quality in small systems
- Flood management projects that help protect high-risk DAC communities

Moving forward, the ARB Region will ensure that implemented projects or programs do not create new DAC or EJ concerns.

Two groups of Native American tribes reside in the ARB Region. Some projects that will benefit tribes could include the following:

- Ecosystem and riparian improvement projects that support traditional uses such as fishing and gathering
- Flood management projects that protects heritage sites

The ARB Region does not believe there to be large tribal water concerns. However, outreach to encourage their participation in this IRWMP is still ongoing, as described in **Section 3.1.4**. Following additional collaboration, tribal-related water concerns and means to address them will be identified during IRWMP implementation.

## **6.6. IRWMP Adaptability to Future Situations**

The ARB IRWMP and associated planning is meant to be a living process that is routinely and continually updated to reflect the evolving needs of the ARB Region and stakeholder communities. Adapting the IRWMP to future situations will involve the update of specific elements, such as projects and strategies, on a fairly continuous basis. Other more static elements, such as the vision and goals, will require less frequent updates of an undetermined frequency.

As described in **Section 5**, the IRWMP Framework and its strategies and projects support adaptability to future situations, as both of these elements are designed to be dynamic and adaptive. The list of IRWMP projects will be updated and reported quarterly. Projects can be submitted on the Opti Web site at any time, as described in **Section 5.7**, and other stakeholders will have access to this information in real time. RWA will score these new projects every quarter, (unless the project is under a shorter funding application deadline), and stakeholders will vet the projects and their scores for formal addition to the IRWMP. Therefore, the list of approved projects will always be aligned to regional and statewide priorities. The Opti Web site also provides a means for stakeholders throughout the ARB Region to communicate, supporting ongoing awareness and integration. As noted in **Section 5.6**, new strategies can also be modified, suggested, reviewed by stakeholders, and added formally to the IRWMP quarterly. New strategies will likely be needed as older strategies are completed, with new stakeholders, or new needs becoming evident through implementation of the IRWMP.

Whether current projects are appropriate in meeting the set of objectives and strategies will become evident through consistent monitoring and analysis, as described in **Section 6.3**. Monitoring will also assist in determining the planned vs. actual ‘regional value’ of the project by creating a clear reporting mechanism for stakeholders, water managers, and other regional planners. Thus, monitoring will also inform necessary subsequent strategies or project changes, supporting adaptive management of the ARB Region. Further, RWA has adopted the maintenance of the IRWMP as one of the organization’s core functions (as opposed to a subscription program, which it has previously been), responsible for continued implementation and adaptation into the future.

Another component of the IRWMP subject to update is the narrative components of the plan itself. The IRWMP is to be published as an electronic document, with only a very limited number of hard copies to be made available to stakeholders that do not have access to the electronic version. As new information becomes available (e.g., new water supply and demand information published every 5 years in UWMPs), the RWMG may choose to update the regional description section (**Section 2**). Updated sections of the IRWMP would be posted to the Web site with appropriate version documentation being provided.

## **Section 6**

### **IRWMP Implementation**

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Other triggers may necessitate a larger scale update and readoption of the IRWMP. These triggers include, but are not exclusive to:

- New IRWM Guidelines or requirements
- A need to change the Region's boundary, such as contraction, expansion, or consolidation with another region
- Additional proposed studies or projects (e.g., regional modeling exercise) that may benefit overall planning within the ARB IRWMP
- New information (e.g., updated climate models) or policy/operational changes (e.g., federal or state water operation changes) that could have significant impacts to local water resources.

A summary of IRWMP actions or modifications, their anticipated frequencies, and whether or not RWMG approval is necessary is included in **Table 6-8** below. Actions subject to approval by the RWMG would be taken at regular, publicly noticed meetings of RWA.

**Table 6-8. Summary of Likely IRWMP Implementation Actions**

Action	Frequency	RWMG Approval
Adoption of the ARB IRWMP by additional stakeholders	Open	No
Updates to vision, goals, objectives	As needed	Yes
Updates to strategies and projects	Quarterly	No
Modifications to the project ranking method	As needed	Yes
Updates to ARB IRWMP Boundary	As needed	Yes
Changes to the ARB IRWMP governance structure	As needed	Yes
Changes to write-ups of individual sections of ARB IRWMP	As needed	No
ARB IRWMP Implementation Report	Annual	No, but to be presented to RWMG
Updates to comply with revised IRWMP Guidelines	As needed	Yes
Updates to respond to new information or other policy changes	As needed	Yes
Authorization of new studies that may benefit overall planning in the ARB IRWMP Region	As needed	Yes

Key:

ARB = American River Basin

IRWMP = Integrated Regional Water Management Plan

RWMG = Regional Water Management Group