

Long-Term Reliable Water Supply Strategy

Phase II A Final Report Executive Summary



Long-Term Reliable Water Supply Strategy - Phase II A: Executive Summary

The Bay Area Water Supply and Conservation Agency's (BAWSCA's) water management objective is to ensure that a reliable, high-quality supply of water is available where and when people within the BAWSCA member agency service area need it. The Long-Term Reliable Water Supply Strategy (Strategy) will quantify the water supply need of the BAWSCA member agencies through 2035, identify the water supply management projects (projects) that could be developed to meet that need, and prepare the implementation plan for the Strategy. Successful implementation of the Strategy is critical to ensuring that there will be sufficient and reliable water supplies for the BAWSCA member agencies and their customers in the future.

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ES.1 Strategy Initiated to Address Key Water Supply Issues

At the request of the BAWSCA Board of Directors (Board) and its member agencies, BAWSCA initiated work on the Strategy in 2009 in response to the following circumstances:

1. Demand forecasts by the BAWSCA member agencies as part of their 2005 Urban Water Management Plans (UWMPs) suggested that additional supply would be needed to meet projected normal and drought year demands, even after accounting for aggressive conservation.
2. In October 2008, the San Francisco Public Utilities Commission (SFPUC) made the unilateral decision to establish a 184 million gallon per day (mgd) limitation on what the BAWSCA member agencies could purchase collectively from the San Francisco Regional Water System (SF RWS) through at least 2018.
3. In October 2008, SFPUC adopted a 20% level of service goal for the SF RWS. Based on the rules for drought allocation between SFPUC and the Wholesale

Customers that are documented in the 2009 Water Supply Agreement (WSA), this results in up to a 29% cutback to the BAWSCA member agencies during droughts. This has an estimated economic impact of up to \$7.7 billion per year in the BAWSCA member service area.

4. The reliability of the SFPUC supply could also be impacted by climate change and future regulatory actions or policy changes. As such, the BAWSCA member agencies expressed an interest in developing a source of supply that was independent of the SFPUC.

ES.2 Strategy Development Adapted to Changed Conditions to Use Resources Efficiently

The Strategy is being developed in phases to provide BAWSCA and the BAWSCA Board the opportunity to confirm the direction of the Strategy at key decision points, and redirect (reprogram) these efforts as appropriate to ensure that the goals of the Strategy are met. Figure ES-1 presents the general phasing of the Strategy development and implementation.

Phase I of the Strategy was completed in May 2010. The *Phase I Scoping Report* identified the range of anticipated demands and supply needs for the BAWSCA member agencies, described over 65 different projects that could potentially be developed in some combination to meet the identified needs, and provided the framework to evaluate those projects as part of the Strategy.

Phase II A of the Strategy is now complete and the results are documented in this report. These technical results and recommendations will be presented to the BAWSCA Board in July 2012. The associated policy decisions will be brought to the BAWSCA Board in September 2012 for anticipated action.

The Final Strategy Report is planned for completion by December 2014. This report will incorporate the results of additional work and present the recommended Strategy and the associated Strategy implementation plan (i.e., who will do what by when).



Figure ES-1
Strategy Development Phased to Ensure that the Desired Results will be Achieved

ES.3 More Water Supply is Needed in Normal and Drought Years

Phase II A of the Strategy updated the water demand and conservation projections and supply needs for the BAWSCA member agencies based primarily on information developed as part of the agencies' 2010 UWMPs. After

accounting for the impacts of passive and active conservation, the resulting projected water supply needs of 4 mgd to 13 mgd in normal years and 58 mgd to 62 mgd in drought years are shown in Figure ES-2.

The ranges in the projected needs reflect the current temporary and interruptible status of Santa Clara and San Jose (i.e., the higher end of the need range assumes that San Francisco will decide not to provide permanent supply to those cities in the future). Further, while the WSA allows for the permanent transfer of Individual Supply Guarantees (ISGs) between BAWSCA member agencies, as well as shorter-term transfers of drought allocations, no such transfers have occurred to date and the Strategy does not make any assumptions regarding these transfers occurring in the future.

The 2035 normal year need is potentially as little as 4 mgd and is localized to seven of the 26 BAWSCA member agencies. In contrast, the drought year need of up to 62 mgd is significant and is spread throughout the BAWSCA member agency service area as indicated in Figure ES-3. It is anticipated that future Strategy efforts will be most effectively focused on meeting the drought year need (rather than both normal and drought year needs) due to the magnitude of the economic and other impacts of drought to all of the BAWSCA member agencies.

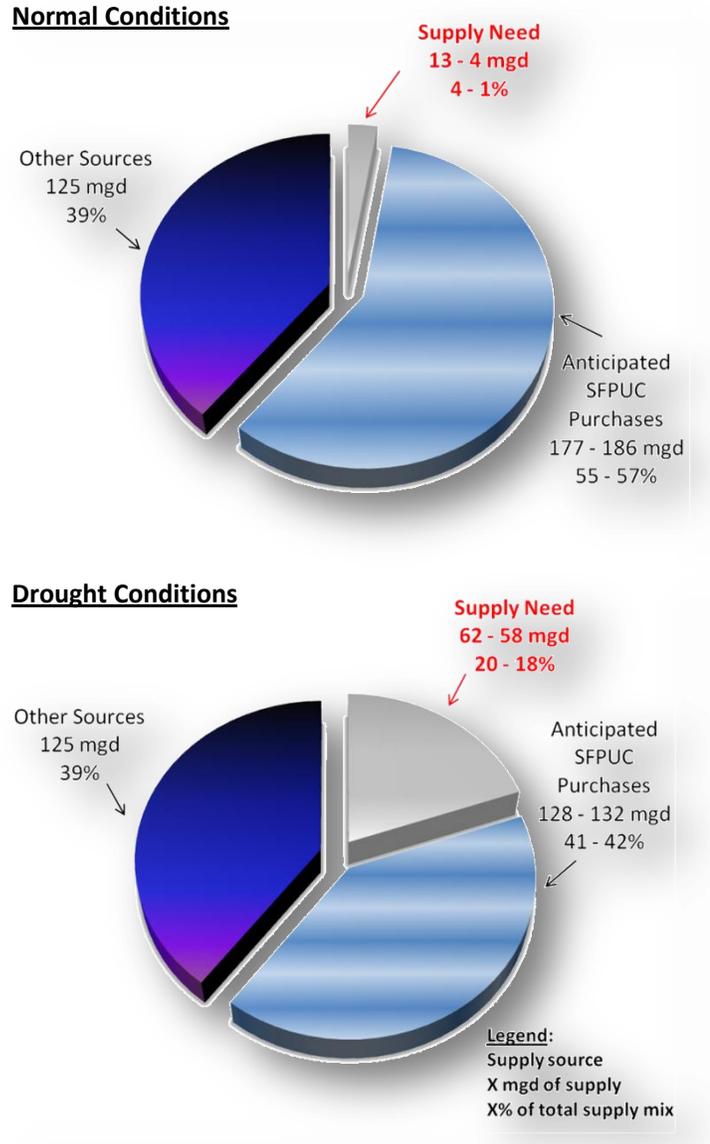


Figure ES-2
More Water Supply is Needed in Normal and Drought Years (2035)

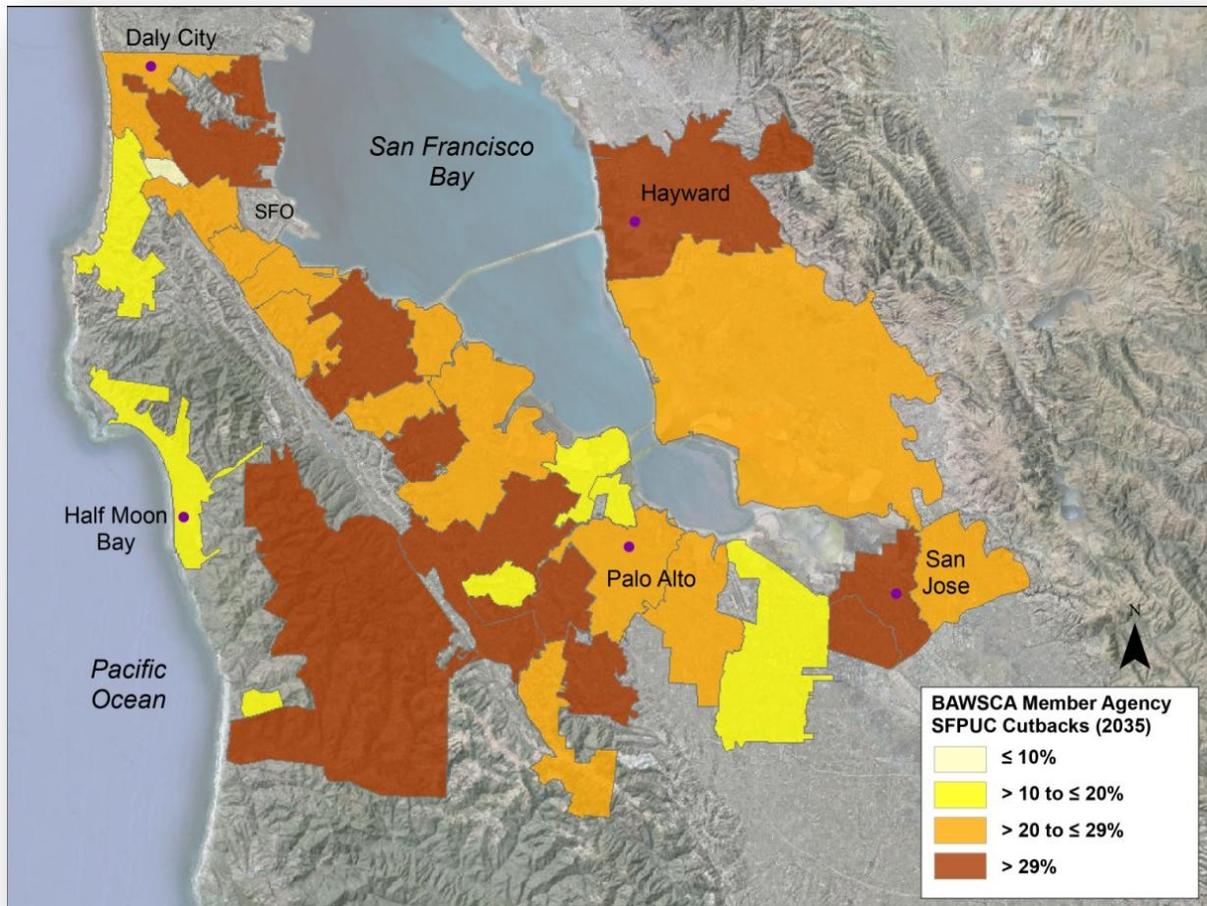


Figure ES-3
20% Supply Shortfalls on the SF RWS Result in an Average Cutback of 29% to the BAWSCA Member Agencies (2035)

ES.4 The Frequency and Magnitude of SFPUC Supply Shortfalls Have Significant Impacts to the BAWSCA Member Agencies

Based on the 2035 demand assumptions and using the SFPUC hydraulic system model, drought shortages of 10% to 20% on the SF RWS are estimated to occur up to 8 times during the 82-year historical hydrologic sequence (i.e., 1920 through 2002) that the SFPUC uses for water supply planning purposes. This is the equivalent of a drought event on the SF RWS every ten years, as shown in Figure ES-4.

If the 82-year hydrologic sequence is extended to include the recent droughts experienced by the SF RWS between 2002 and 2011, the frequency of shortages on the SF RWS appears to increase to 11 years over the last 92 years, with separate drought events occurring every eight years, on average. Two multiple dry year events, including the drought of record, occurred during the last 25 years.

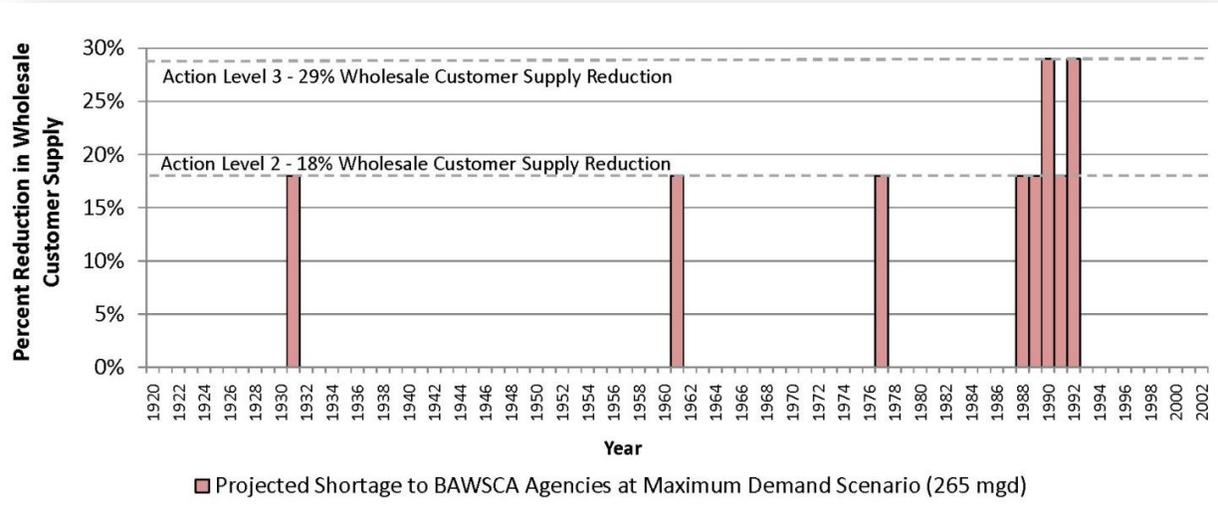


Figure ES-4
Drought Events that Create System-wide Supply Shortfalls of 10% to 20% Are Projected to Occur on Average Every Ten Years on the SF RWS

Based on the formula used in the 2009 WSA to allocate dry year water supplies between San Francisco and the Wholesale Customers (i.e., the Tier 1 Plan), a drought event that creates a 10% system-wide shortfall corresponds to an average 18% cutback to the Wholesale Customers, in aggregate, while a 20% system-wide shortfall corresponds to an average 29% cutback to the Wholesale Customers. The Tier 2 Plan, adopted by all 26 BAWSCA member agencies in March 2011, allocates the collective Wholesale Customer share among the BAWSCA member agencies. Under the rules of the Tier 2 Plan, the cutbacks vary for each BAWSCA member agency (i.e., under a 20% system-wide shortfall scenario, some agencies receive a cutback of up to 40% to their SFPUC supply, while some receive less than a 29% cutback).

Studies have estimated regional economic losses in the BAWSCA member agency service area of up to \$7.7 billion per year during a 20% system-wide shortfall on the SF RWS. Supply cutbacks of this magnitude can also result in voluntary or mandatory restrictions for outdoor water uses and increased water rates and excess use charges. These impacts are anticipated to be

Drought Impacts:

- Droughts occur 1 in every 10 years on the San Francisco Regional Water System
- Some BAWSCA agencies receive cutbacks of up to 40%
- Regional economic impacts up to \$7.7B annually

compounded in the future because per capita demand in the BAWSCA member agency service area is already low compared to other portions of the Bay Area and the State.

The potential impacts to the BAWSCA member agencies are regional and not just limited to the individual cities or water districts. For example, the severity of the potential drought’s impact to commercial and industrial sectors could cause relocation of businesses for which a reliable water supply is critical. The loss of this commercial and industrial base would undoubtedly weaken the regional economy. Furthermore, the residents and voters in one community often work or own businesses in

another community within the BAWSCA member agency service area or neighboring communities. Therefore, a future drought year water supply shortfall in one BAWSCA member agency that results in loss of jobs or other impacts can have a detrimental effect on the customers of another BAWSCA member agency, even if that agency itself is not facing a supply shortfall.

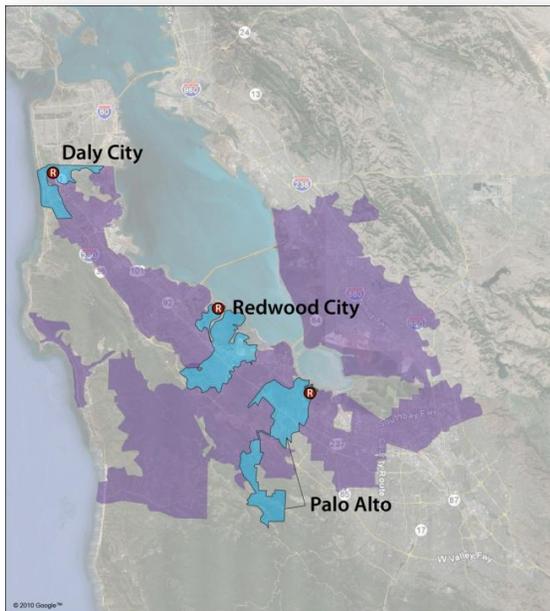
As a regional agency, it will be important for BAWSCA to have the necessary information (e.g., the cost of alternative water supplies and the economic impact of supply reductions) to consider the impacts of drought regionally when weighing the costs and benefits of investing in additional drought reliability.

ES.5 A Refined List of Water Supply Management Projects Was Preliminarily Evaluated

Over 65 projects were evaluated that could potentially be developed by BAWSCA and the BAWSCA member agencies to meet the identified supply needs through 2035. The project information developed to date has focused on preliminary estimates of the yield, cost, reliability, and implementation schedule. The objective has been to develop the information to a common level to the extent possible so that BAWSCA could begin to assess

which individual project or combination of projects could best meet the supply need. Four types of projects have emerged with the most promise for addressing the supply need (i.e., recycled water, local capture and reuse, desalination, and water transfer projects). These projects, and a preliminary summary of their characteristics, are presented below and on the following page.

Recycled Water Projects



- Three (3) Projects: Daly City, Redwood City, Palo Alto
- Yield ~ 1,000 acre-feet per year (AF/Year)
- Schedule ~ 6 to 8 years

Local Capture & Reuse Projects



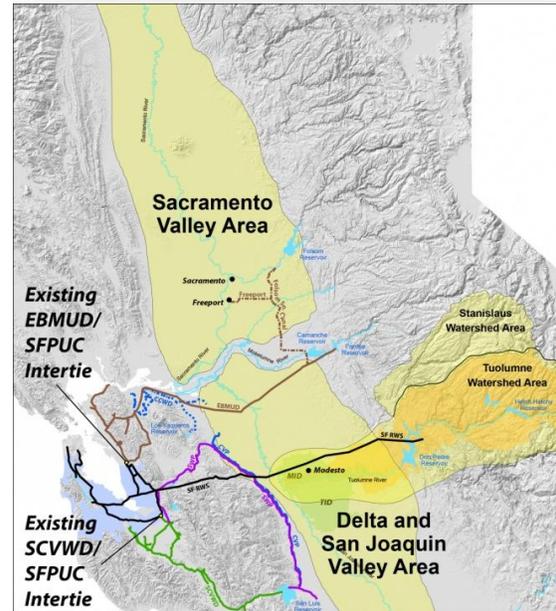
- Three (3) Projects: Rainwater, Stormwater, Greywater
- Yield ~ 200 to 700 AF/Year

Desalination Projects



- Nine (9) Projects: Coastal, Brackish Groundwater, Bay Water, BARDP
- Yield ~ 1,000 to 22,400 AF/Year
- Schedule ~ 6 to 15 years

Water Transfer Projects



- Two (2) Project Source Areas: Sacramento Valley, and Delta and San Joaquin Valley Areas
- Yield ~ 1,000 to more than 5,000 AF/Year
- Schedule ~ 2 to 5 years

ES.6 Criteria Have Been Developed to Evaluate the Projects

Both quantitative and qualitative criteria and metrics will be used to distinguish projects and portfolios and facilitate comparisons. The criteria objectives that have been developed are:

- Increase Supply Reliability;
- Provide High Level of Water Quality;
- Minimize Cost of New Water Supplies;
- Reduce Potable Water Demand;

- Minimize Environmental Impacts of New Water Supplies; and
- Increase Implementation Potential of New Water Supplies.

Once the project information has been sufficiently developed, the evaluation criteria would be used to compare projects and groups of projects (i.e., portfolios), in the ranking and evaluation step of the Strategy project evaluation and decision process.

ES.7 Critical Work is On-Going That Will Inform Final Strategy Recommendations

There is additional work currently being performed by other agencies. BAWSCA is coordinating closely with these agencies, as the results their efforts are expected to impact the the final Strategy recommendations and implementation plan. This work includes:

- East Bay Municipal Utilities District (EBMUD) Conveyance Capacity Study;
- BAWSCA member agency project development studies;
- The Bay Area Regional Desalination Project (BARDP) studies;
- SFPUC/Modesto Irrigation District water transfer agreement(s);

- SFPUC system hydraulic modeling that incorporates 2002 through 2011 hydrology; and
- SFPUC Economic Analysis to support the Federal Energy Regulatory Commission (FERC) re-licensing of New Don Pedro.

BAWSCA will continue to track and monitor these efforts and to work with the SFPUC and others to ensure that the full extent of potential impacts to the BAWSCA member agencies are identified. Results and findings from these efforts will be incorporated into the Final Strategy Report as appropriate.

ES.8 Recommendations for Board Action in September 2012

Three recommendations for the BAWSCA-led work efforts on the Strategy between now and December 2014 will be brought for action to the BAWSCA Board in September 2012:

Recommendation #1: Complete the Reprogrammed Phase II A Work and Other Identified Work to Complete the Strategy

To incorporate changed conditions (e.g., reduced demand and number of projects) and to present relevant solutions, the schedule, scope and focus of Phase II A was modified. To complete the Strategy, it is necessary to the complete the following tasks:

- Further refine project descriptions to (1) incorporate the additional project information that is being developed by BAWSCA and others, and (2) include all of the information needed to compare the projects against the project evaluation criteria;

Summary of Recommendations:

1. Complete the Reprogrammed Phase II A Work and Other Identified Work to Complete the Strategy
2. Develop a Plan for a Pilot Water Transfer with EBMUD and/or SCVWD
3. Update the Demand and Water Conservation Projections for BAWSCA Member Agencies Using a Common Methodology

- Complete analysis of the economic impacts of drought;
- Compare the benefits of alternative projects and cost allocations;
- Compare alternative costs of increased drought reliability to avoided economic impact and determine level of service goal;

- Evaluate and rank the projects, or groups of projects, against the project evaluation criteria;
- Prepare the implementation plan for developing the recommended project, or groups of projects, to achieve the Strategy results; and
- Prepare Final Strategy Report by December 2014.

During the development of Phase II A, several outstanding issues were identified associated with many of the Strategy elements (e.g., the demand projections, project information, etc.) that are not otherwise captured in the reprogrammed Phase II A work. The key recommended actions that should be taken by BAWSCA to resolve these outstanding issues include:

- Monitor changes in water demand in service area, including the implementation of water conservation measures;
- Work with BAWSCA member agencies to identify level of service goals; and
- Track and monitor existing local capture and reuse projects to evaluate potential benefits and support for these projects.

The completion of both the reprogrammed Phase II A work and the recommended BAWSCA actions by December 2014 is critical to the development the Final Strategy Report and implementation plan.

Recommendation #2: Develop a Plan for a Pilot Water Transfer with EBMUD and/or SCVWD

Water transfers appear to be a promising option to address the identified drought year needs of the BAWSCA member agencies. However, there are a limited number of facilities that could be used to convey water to the BAWSCA member agencies from sources originating outside the

Bay Area. Further, use of these facilities would require the resolution of several technical, legal and institutional issues. An efficient means to address these outstanding issues would be to conduct a pilot transfer of real water into the BAWSCA member agency service area. Additional reasons why the development of a Pilot Water Transfer Plan is recommended now are presented below:

- EBMUD and SCVWD have expressed an interest in potentially partnering with BAWSCA to enact a water transfer. Additional work would need to be done with these agencies to better assess the costs and feasibility of such transfers, including questions regarding water quality, system conveyance capacity constraints, and regulatory and permitting requirements.
- BAWSCA is in competition with other agencies for use of the available capacity in these other water systems. There may be a need for BAWSCA to act to secure (at a minimum) transfer capacity in a conveyance system, or risk losing that opportunity for good. Developing a Pilot Water Transfer Plan now would place BAWSCA in the best possible position to enact a water transfer as early as Fall 2013, and to make more informed decisions regarding water transfer options and conveyance capacity rights in the future.

Recommendation #3: Update the Demand and Water Conservation Projections for BAWSCA Member Agencies Using a Common Methodology

BAWSCA worked closely with its member agencies during Phase II A to combine the individual agency 2010 UWMP water demand and conservation projections for use at the regional level. However, given the inconsistencies in water demand and conservation projection methodologies, this process may not be sufficient for regional

planning purposes (i.e., as the basis for environmental documentation) or fully representative of the regional needs (i.e., may result in double-counting or exclusion of potential demands). Updating the water demand and conservation projections for the BAWSCA member agencies using a common methodology is recommended because:

- A more robust and consistent water demand and conservation projection methodology for the BAWSCA member agencies as a whole is necessary for effective planning at the regional level to support future local and regional investment decisions.
- Preparing updated water demand and conservation projections in advance of December 2014 will enable the agencies to use these demand estimates for their 2015

UWMPs and 20 by 2020 assessments. This will increase the level of consistency in regional planning among the BAWSCA member agencies and streamline their 2015 UWMP development process.

The adopted Fiscal Year (FY) 2012-13 BAWSCA Work Plan includes the selection of a water demand and conservation projection methodology and the development of a scope of work and budget to complete updated projections for all of the BAWSCA member agencies. It is anticipated that BAWSCA would present this information to the BAWSCA Board in Spring 2013, possibly as part of the FY 2013-14 budget process, and recommended that the Board act to fund the development of water demand and conservation projections for the BAWSCA member agencies using a common methodology.

ES.9 Potential Longer-Term Actions

Depending on the results of the work completed between now and 2014, additional recommendations for action may be presented to the Board. These recommendations for action could potentially include:

- ***Implement the pilot water transfer plan.*** In order to fully test BAWSCA's ability (both physically and institutionally) to import water to serve the member agencies during a drought, BAWSCA would need to, at a minimum, enact a pilot water transfer. Such a transfer would be based on the Pilot Water Transfer Plan and could occur as early as Fall 2013.
- ***Pursue long-term water transfer supplies and/or conveyance agreement.*** The Strategy analysis to date indicates that water transfers could be a viable option for meeting the long-term dry year water supply needs of the BAWSCA member agencies. Based on the information learned from the execution of a pilot water transfer, BAWSCA may recommend that the BAWSCA

Potential Long-Term Actions:

1. Implement the pilot water transfer plan
2. Pursue long-term water transfer supplies and/or conveyance agreement
3. Conduct project-specific field investigations

Board act to secure transfer capacity and/or transfer water.

- ***Conduct project-specific field investigations.*** While review of the available data and analytical and numerical modeling can provide some level of certainty regarding a project's characteristics, field investigations and testing are likely to be necessary to confirm key project elements. For example, in the case of the desalination projects, additional field investigations would be needed to verify subsurface yields, water quality, potential impacts on other

groundwater users, and project costs. If there is strong interest expressed by the BAWCSA Board or the member agencies to pursue development one of the identified

projects, BAWSCA may recommend that the BAWSCA Board act to authorize additional, project-specific investigations.

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