California Bay-Delta Authority

STAFF PROPOSED IMPLEMENTATION APPROACH FOR AGRICULTURAL AND URBAN WATER USE MEASUREMENT

For Discussion at the February 18, 2004, Meeting
Of the Water Use Efficiency Subcommittee

Prepared by the California Bay-Delta Authority

California Bay-Delta Authority

Staff Proposed Implementation Approach for Agricultural and Urban Water Use Measurement

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California Bay-Delta Authority

Staff Proposed Implementation Approach for Agricultural and Urban Water Use Measurement

Section I: Background

Intent and Use of This Document
This document outlines the California Bay-Delta Authority's Staff Proposal on an implementation approach for agricultural and urban water use measurement.

This document represents nearly three years of technically focused work involving extensive stakeholder discussions, deliberations by an Independent Review Panel and numerous public workshops to solicit broad input.

Authority staff believes it is putting forward a balanced and necessary package of actions that are capable of affecting meaningful change. Though many elements in this package are supported by diverse stakeholder groups, there are some proposed actions that are not supported by all affected stakeholder communities.

The concepts and recommendations outlined in this document are intended to guide senior Authority leadership as it works with legislative, administration and stakeholder representatives to review and refine a final package of implementation actions.

Impetus for This Effort
As California's water resources have become increasingly scarce, diverse stakeholder groups have recognized the importance of measurement to state and federal agencies trying to manage a much-in-demand resource[1]. Measurement can assist state and federal agencies in their efforts to achieve the following four key *water management objectives*:

1. Fill critical data gaps to enable more effective statewide and regional water management planning and investment decisions;
2. Allow users to undertake and demonstrate the effects of water use efficiency measures;
3. Facilitate valid water transfers; and
4. Help the state more effectively administer the existing state water rights system.

Recognizing the potential impact of water use measurement on these overarching objectives and the intense stakeholder interest in this topic, the August 2000 CALFED

[1] CA Water Code calls for water to be put to beneficial use and for measures to be taken to prevent waste.

Record of Decision called for the California Bay-Delta Authority (Authority) to take a closer look at measurement, determine what is needed, and, as appropriate, put forward legislative or other strategies to bolster the current approach.

Process for Developing the Proposed Approach
To move forward with this task, the Authority undertook two distinct steps: framing the problem, and identifying solutions.

Framing the Problem. The first step was to develop credible definitions of appropriate water use measurement and sharpen the need for future actions, if any. On the agricultural side, as called for in the Record of Decision (ROD), the Authority convened an Independent Review Panel. The six-member Panel met for nearly two years – holding its final session in June 2003 – and, consistent with ROD guidance, successfully prepared a consensus definition of appropriate measurement for agricultural water use. On the urban side, Authority staff undertook an initial series of structured discussions with stakeholders and technical experts in the urban water arena and then convened extensive stakeholder discussions to help it develop a comprehensive definition. (Both definitions are available on the Authority's website.)

The findings of these two efforts paint a picture of a system struggling to and falling far short in adequately assessing water use in California. Key failings include inconsistent and redundant state requirements, and incomplete and incompatible measurement and reporting of crucial water use data by both local water suppliers and the State. These failings place an unnecessary burden on local water suppliers striving to comply with often times conflicting or redundant standards. More disturbingly, they undercut the State's ability to wisely manage its increasingly limited resources, effectively administer water rights, and make important long-term investment decisions such as constructing new surface storage facilities. These findings are discussed in greater detail elsewhere in this document.

Identifying Solutions. Given these concerns, the Authority convened ad hoc stakeholder work groups – one focused on agricultural water use, the other on urban – to serve as a sounding board for the Program as it drafted an implementation approach for measuring urban and agricultural water use. Program staff also convened a series of public workshop – still ongoing – to solicit broader feedback.

In crafting possible implementation approaches for discussion with Authority agencies and affected stakeholder communities, Authority staff relied on the following guiding considerations to create an approach it believes is warranted and pragmatic:

- Base implementation actions in the definitions of appropriate agricultural and urban water use developed through the earlier Authority-supported processes;

- Adhere to the Authority's overarching principles such as beneficiary pays and no redirected impacts;
- Streamline and rationalize state and federal reporting requirements to minimize redundancies and improve value of information;
- Use legislative remedies only when existing statutes and regulations are deemed insufficient to ensure effective implementation;
- Acknowledge and account for smaller water suppliers' current resource limitations;
- Foster meaningful progress within both the agricultural and urban sectors; and,
- Stress incentives over penalties.

The results of these deliberations – referred to as the Staff Proposal – are presented in Sections II, III and IV of this document.

Next Steps

The Water Use Efficiency Subcommittee is to review these materials at its February meeting. Authority staff intends to present a draft implementation approach to Authority advisory and decision-making bodies in the March/April 2004 timeframe.

Following these discussions, Authority staff will work with state policymakers, as necessary, to put forward an implementation approach. This approach will likely necessitate state legislative changes, administrative changes or both.

Authority staff will provide ongoing progress reports to the Authority as implementation-related discussions move forward.

Section II: Staff Proposal Overview

Summary of Actions:
This Staff Proposal is putting forward a package of actions that it believes would collectively make important contributions to the State's overarching water management needs. Key elements of the package include:

- Requiring urban water suppliers above a certain size threshold to measure service water deliveries. This measurement requirement would affect the approximately 7% of urban water suppliers not already measuring service water deliveries. Urban water suppliers above a certain size threshold would also be required to report in accordance with state water data collection standards and protocols.

- Requiring agricultural water suppliers above a certain size threshold to report aggregate farm-gate delivery data. This would impact all affected water suppliers, as this is a new requirement.

- Requiring agricultural water districts to measure diversions using the best available technologies and report the data annually to the State. The measurement requirement would affect about 20% of agricultural water suppliers; the increased reporting requirement would impact all affected agricultural water suppliers.

- Upgrading methods the State uses to measure crop consumption and net groundwater usage – an action that would have no impact on locals, but would drastically improve the State's ability to project water use. Total cost to the State is projected to be $3 million per year ($2.5 million for groundwater, $500,000 for crop consumption data).

- Developing and maintaining a coordinated database among the state agencies currently collecting water supplier water use data to minimize the impact of numerous and often redundant and inconsistent reporting requirements to locals and maximize the value of the data to the State and others.

- Undertaking a research and adaptive management program that would ensure emerging technologies and shifting economics keep the State's measurement approach current.

Several of these actions – reporting of agricultural farm-gate deliveries, increasing the frequency and format of reporting agricultural diversion data, requiring measurement of service meter deliveries, and changing the format for reporting urban water use data – may necessitate legislation action. The other elements would likely require either administrative and/or budgetary actions.

It is important to note that these recommended elements are being put forward as a comprehensive package – and not individual actions – as it is the aggregation of these different data that collectively supports state objectives. Moving forward with only a subset of the package would significantly diminish the value of the overall effort.

Rationale for Overall Package

As noted earlier, while discussions to-date suggest there is support among diverse stakeholders for many of the actions called for in this proposal, some elements of this package are not supported by all stakeholder groups; some stakeholders believe elements of the proposal go too far, others say not far enough. But staff believes this proposed package of actions is both necessary and appropriate and represents a balanced way forward:

- ***Results in meaningful change.*** The actions outlined above would dramatically improve the ability of state water managers to resolve disputes over Bulletin 160 projections; better inform decisions on future investment needs, including new storage, by generating better demand data; more effectively administer state water rights by diminishing disputes and fast-tracking new permits; and better prioritize and target limited public water conservation incentive funding.

- ***Represents a balanced package.*** The actions outlined above represent a significant departure from "business as usual" in both the agricultural and urban sectors and would reap critical benefits across all water uses. Both efforts include changes that would impact all users (reporting farm-gate deliveries for agriculture; changing reporting formats on water use data for urban). Both efforts would demand significant financial commitments. And both efforts would embed a significant enough shift from current policy to require legislative action (farm-gate for agriculture, service meters for urban.)

> *Agricultural vs. Urban Water Use*
>
> *The package proposed here does not always recommend parallel actions across agricultural and urban water use. These differences – most notable in end-user measurements – are due to important differences in the way the two systems work. Perhaps the most fundamental difference is their delivery systems. Urban water is available on-demand – a characteristic that makes it essential to track end-user deliveries with a recording measurement device. Agriculture end-uers, in contrast, take their water only periodically – a practice that for allows for a variety of methods (some directly*

- ***Minimizes impacts to locals.*** The package of actions is designed to meet state needs in a manner that minimizes impacts to locals. Proposed actions include cost-effectiveness and size exemptions; in many cases, funding and technical assistance is also provided. Moreover, where practical, the State has assigned data collection responsibilities to itself.

- ***Puts forward fiscally realistic options.*** Authority staff is mindful of the State's current fiscal realities and has tried to put together a cost-effective package. Total costs to the State are not expected to exceed $35 million, with much of that cost – $26 million – associated with helping urban suppliers overcome locally cost-effective

barriers to installing service meters. The total local burden is expected to be under $18 million.

Cost Summary

Cost projections associated with individual elements of this proposal are identified elsewhere in this document. Below, however, is a table summarizing preliminary overall costs associated with this initiative. Staff will continue to refine cost projections, as necessary, to inform future deliberations. (Staff anticipates, in particular, revising the cost split between local and state entities regarding measuring urban water deliveries.)

Preliminary Cost Estimate				
Action	**Ag ($Million/year)**		**Urban ($Million/year)**	
	Local	**State**	**Local**	**State**
Develop and maintain state database and protocols	0	0.3	0	0.3
Measure and report water sources	0.4	0	0	0
Measure and report water deliveries	0.7	0	16.7 (C. Valley purveyors)	26.0
Groundwater net usage and crop consumption	0	3.0	0	0.5
Research and adaptive management	0	1.8	0	1.8
TOTAL	**$1.1**	**$5.1**	**$16.7**	**$28.6**

It is important to reiterate that the actions included in this Staff Proposal have not been screened through a strict cost-benefit analysis. As the Independent Review Panel noted in its September 2003 Final Report, such an analysis is not possible when staff must compare qualitative benefits and quantitative costs. Still, staff takes seriously the imperative to justify any costs to State and local entities and has strived to articulate expected benefits throughout this document.

Sections III and IV of this document provide a detailed look – by sector – at the proposed actions, highlighting the rationale and summarizing the proposed implementation approach. Section V provides a synopsis of divergent stakeholder views and outstanding concerns.

Section III: Proposed Approach for Agricultural Water Use

Based on the Independent Review Panel's Final Report and the Authority's discussions with the stakeholder/agency work groups, Authority staff is putting forward a proposed implementation package focusing on a handful of key actions related to agricultural water use measurement.

These critical needs – detailed below – apply most directly to the overarching State water management objectives mentioned earlier. Implemented as a package, Authority staff believe these actions would significantly impact critical state activities related to planning, water rights and water use efficiency activities.

Based on a review of existing statutes and regulatory requirements, a mix of legislative, administrative and budgetary actions may be needed to implement these actions. Specific actions are called out within each section below.

Critical Needs

1. ***State standards/protocols for recording/reporting water use***

   Description of need: Current state regulations require water suppliers to provide data in multiple formats and to multiple agencies. These requirements can and often do place an unnecessary burden on water purveyors. Moreover, as there are no overarching standards and protocols to guide the way purveyors compile this data, the value of the information to the State is greatly diminished due to inconsistencies across water supplier data. Finally, data already reported to the State is unavailable to analysts because it is not kept in an accessible database. In fact, much of the data is not even converted into digital form, which – given the quantity of data submitted – is required for analysis, comparison and quality control

   Proposed Action: Standardize how agricultural water purveyors compile and provide data to the State. Working closely with local water purveyors and other concerned stakeholders, the Department of Water Resources (DWR) and State Water Resources Control Board (SWRCB) would establish standards and protocols for collecting, recording, and reporting agricultural water measurement data and develop an electronic system for receiving, compiling, storing, managing, quality-checking, and making available this data. Efforts would be made to eliminate data recording and reporting redundancies.

   Other key elements of this proposed approach include:

- Efforts to develop standards and protocols proposed to begin in July 2004. Proposed standards/protocols would be completed by July 2006, with an interim milestone at July 2005 to assess progress. (Milestones assume state funding.)

- Phased implementation of standards and protocols over five to 10 years, with ongoing reports to the Authority and public to summarize progress towards development and implementation of state standards and protocols.

- Moderate costs – $300,000 per year – projected to develop database. An additional $200,000 per year would be needed to maintain and confirm data provided by local water suppliers on an ongoing basis.

- Authority for this action would come from existing agency authorities; the Authority would serve as convenor for action given its composition and existing oversight and coordination role.

2. ***Farm-Gate Deliveries***

Description of need: The Independent Review Panel looked at the topic of farm-gate measurement and reached several consensus conclusions.

- Measurement of farm-gate deliveries is a necessary component of sound district and on-farm water management practices.

- Most farm-gate deliveries are directly measured; some are indirectly measured or estimated. For those indirectly measuring or estimating water use (approximately 11%), a shift to direct measurement may result in local and statewide benefits. However, due to the lack of available farm delivery data and the wide diversity of delivery conditions, no credible method is available to quantify these potential benefits. Therefore, the benefits[2] of upgrading measurement at those locations can not be demonstrated at this time to justify the cost of the improvements.

- The State needs – but is not now receiving – data on farm-gate delivery in order to support its various water management tasks. Accordingly, the State should require districts to report aggregated data on farm-gate deliveries.

Proposed Action: Require agricultural water suppliers (irrigation districts, water districts and mutual water companies) to report aggregated farm-gate delivery data to the State (DWR) annually; reports should summarize data on a monthly or every-

[2] The Panel's assessment of costs and benefits does not encompass costs and benefits associated with related district or on-farm water management changes.

other month basis, as this is needed by the State to develop accurate water balances and target limited water use efficiency incentive grants. Agricultural water suppliers would use best professional practices and take steps necessary to attain and maintain accuracy of measurement and reporting devices and methods.

Other key elements of this proposed approach include:

- Water suppliers with a conduit capacity of less than 25 cubic feet per second would be exempted from this requirement. This threshold is preliminarily recommended as it is expected to capture roughly 90% of all deliveries, impacts just 30% of diversions and generates a volume of data that can be handled by the implementing agency. Additionally, thresholds would be reevaluated – as part of a formal regulation-setting process – within five years to confirm its effectiveness.

- Local costs estimated to be $47 per farm per year. Total local costs would be approximately $700,000 per year – roughly half for hardware and half for reporting costs. Significant State-provided technical assistance beyond current levels is not anticipated. Additionally, State funding (grants or loans) may be needed to support water districts where actions are not locally cost-effective.

- Access to incentives (i.e., grants and loans) would be tied to compliance. DWR would verify compliance with reporting requirements and analyze reports to ascertain erroneous or incomplete information; review to focus on broad discrepancies.

- Districts would report aggregated farm-gate delivery data to the State within two to three years from DWR promulgation of measurement and reporting standards.

- The validity/adequacy of different measurement methodologies may shift as various conditions -- water availability, water pricing, on-farm economics – change. Accordingly, the Program would conduct an ongoing evaluation of farm-gate data and practices to ensure current methodologies remain effective and consistent with the Panel's intent. Additionally, as part of this ongoing evaluation, the Program would refine delivery data used by the Panel and ascertain, to the extent practicable, the correlation between measurement and on-farm water use efficiency.

- Legislation may be necessary to implement farm-gate reporting requirements, as this would represent a significant departure from current practice and legal authorities.

3. *Surface Water Diversions*

Description of need: Accurate data on surface water diversions is essential if state and federal water agencies are to adequately manage and plan for current and future needs. The completeness, consistency and accuracy of current reports do not now allow these managers to quantify the amount of water diverted. This data is also needed to more effectively administer the State's existing water rights system. Better data on individual diversions would facilitate faster and more efficient resolution of water rights disputes. Better aggregated data on diversions would allow the State Board to better determine whether individual streams are over-allocated, which would streamline the processing of future water rights permitting applications.

Proposed Action: Require direct diverters of surface water to measure all major surface water diversions using best available technologies such as flow-totaling devices, data loggers and telemetry. (Approximately 80% of all major diversions are already measured using such devices.) Additionally, direct diverters would be required to report this data to the State (State Water Resources Control Board) annually; reports should include summaries of diversion data on a monthly or every-other-month basis, as this is needed by the State to develop accurate water balances. Agricultural water suppliers would use best professional practices and take steps necessary to attain and maintain accuracy of measurement and reporting devices and methods.

Other key elements of this proposed approach include:

- Districts below a conduit capacity of 25 cubic feet per second would be exempted from this requirement. (These cutoffs only apply to diverters, such as individual or riparian users, that are not within formal districts.) This threshold is preliminarily recommended as it is expected to capture roughly 90% of all deliveries, impacts just 30% of diversions and generates a volume of data that can be handled by the implementing agency. This exception would not exempt suppliers from existing reporting requirements. Additionally, the threshold would be reevaluated – as part of a formal regulation-setting process – within five years to confirm its effectiveness.

- Districts would use best available technologies and reporting aggregated diversion data to the State within two to three years from State Board promulgation of measurement and reporting standards.

- Total local costs would be approximately $400,000 per year. State funding would be made available where costs of new measurement practices are not locally cost-

effective. Significant State-provided technical assistance beyond current levels is not anticipated.

- Access to incentives (i.e., grants and loans) would be tied to compliance. State Board would verify compliance with measurement and reporting requirements and analyze reports to ascertain erroneous or incomplete information; review would focus on broad discrepancies.

- Date would be collected and interpreted in a manner that helps assess the validity/adequacy of reporting requirements and practices.

- Legislation may be necessary due to the change in reporting requirements from current practices. Such legislative action would supplement the State Board's existing general authorities.

4a. Groundwater Use

Description of need: Current state and federal characterizations of groundwater resources are not conducted using consistent methods and are not done frequently enough to adequately characterize groundwater usage. This hampers the State's efforts to determine the amount of groundwater used in various regions and to characterize the extent of overdraft.

Proposed Action: The State (DWR) perform continuous regional characterization of groundwater net usage in all sub-basins statewide. This approach would enable the State to better monitor the overall status of groundwater in the State. It would not entail any additional measurement of individual self-supplied groundwater use outside of what is already required in adjudicated and managed basins. Implementation of this action would be coordinated with ongoing revisions to the California Water Plan.

Other key elements of this proposed approach include:

- Implementation of new methodologies would take place prior to preparation of Bulletin 160 (2008). DWR would phase in new methodology, focusing first on those basins with the most impacted groundwater resources. DWR would state in each Bulletin 160 the extent to which groundwater data is based on this approach.

- New measurement approach projected to cost the State an additional $3 million per year. (Cost estimate includes costs associated with measuring net groundwater usage in both agricultural and urban areas of the State.)

- Performing this assessment would fall under DWR's existing responsibilities related to preparing Bulleting 160 and Bulletin 118; no new legislation or regulation would be anticipated.

- Ongoing evaluation would determine the degree to which information coming from net groundwater usage measurement is satisfying state and federal water management information needs. The Program would re-evaluate the need for additional gross groundwater extraction data.

4b. Crop Water Consumption

Description of need: Current approaches to measuring crop water consumption rely on indirect and theoretical methods applied infrequently, a practice that means state estimates of crop consumption – the largest single element of the state's water balance – are not validated and could include significant error. Improved accuracy and precision is needed for adequate preparation of water plan updates and ongoing planning and analysis, such as CALSIM II modeling.

Proposed Action: The State (DWR) would incorporate into its ongoing estimate procedures the use of satellite-generate remote sensing of evaporative crop water consumption, with a monthly time step, during the growing season. This approach would have no direct impact on growers or districts. Implementation of this action would be coordinated with the next update to the California Water Plan.

Other key elements of this proposed approach include:

- Remote-sensing would be expected to cost the State an additional $500,000 per year.

- New methodology would be phased-in over a five-year period. DWR would report to the Authority on implementation status; additionally, DWR would describe water measurement actions taken in body of Bulletin 160.

- Performing this assessment would fall under DWR's existing responsibilities; no new legislation or regulation would be anticipated.

- Adaptive management component would include an ongoing effort during transition period to compare results of new measurement methodologies to old practices to validate efficacy of new measurement approach.

5. Research and adaptive management programs

Description of need: Improving the State's ability to forecast and plan for future agricultural water demands requires a fuller understanding of how water is used by the agricultural sector and how this is changing over time due to evolving land use and cropping patterns, demographics, technology, and economics. Previous State Water Plan Updates have been characterized by the use of very general and simplified assumptions to predict future agricultural water demand.

Proposed Action: Adopt a two-pronged strategy to address this concern:

a. *Research Program:* State agencies would work with water purveyors and universities/research organizations to develop and sustain an agricultural water use research program. The Authority's Science Board would establish a priority list for research to be performed. Likely have two tracks:

   - *Track One:* Initiate immediate studies related to return flow, water quality, in-stream flows (post July 2004). Develop recommendations related to measurement and reporting needs by July 2007.
   - *Track Two:* Develop initial priorities for other research by 2005. Focus could include items such as assessing costs and benefits of farm-gate measurement and direct measurement of groundwater extraction; and comparing remote-sensing and conventional crop consumption estimation methods. It also would likely incorporate efforts to improve key data gaps, such as better understanding the water use associated with different farm-gate structures in California.

b. *Adaptive management:* State agencies (Authority Science Board working in conjunction with DWR and other State Water Plan actors) would identify and pursue adaptive management needs for measurement as appropriate over time. This adaptive management program would serve to evaluate the adequacy of agricultural water use information available and the effectiveness of the measurement actions adopted. Likely topics could include, among other things:

   - Value of agricultural water use measurement data being collected to address state and federal objectives.
   - Efficacy of new system for recording, reporting and disseminating data.
   - Quality and comprehensiveness of agricultural water use measurement data being collected.

Other key elements of this proposed approach include:

- Funding for this effort would be expected to cost $1.95 million/year - $1.8 million for research, and $150,000 for adaptive management. Cost-sharing would be pursued to the extent possible. Activities would be prioritized and phased to meet actual funding levels.

- The Authority (Science Board) and DWR would be responsible for oversight and coordination of research program; key implementing partners would include water suppliers/users, university/college research institutions, USBR, AWMC and others. The Authority and implementing agencies would be responsible for ensuring ongoing focus on measurement. No legislation would be needed to support this action.

- The approach would incorporate annual review and reprioritization of research needs. Research implementation structure would be reviewed every five years to evaluate effectiveness of approach and results. Program-wide review of measurement and reporting approach would be carried out every three to five years.

Other Elements

This Staff Proposal incorporates other vital elements. These include:

- Recognizing the need to define and implement appropriate measurement as it relates to return flow, water quality and in-stream gauging. Authority staff recognizes the importance of the Panel's recommendation that it complete the technical work associated with these measurement needs and commit to moving forward in the near-future with a measurement strategy necessary to support state water management objectives.

- Endorsing current state policies and practices that require groundwater substitution transfer permittees to measure and report groundwater wells directly involved in substitution transfers at the highest technically practical level, including continuous measurement, monitoring and frequent reporting. Authority staff is confident that current practices will remain effective due to DWR's role as either (1) a purchaser of water, (2) an owner of facilities through which transferred water is wheeled; or, (3) a potentially injured downstream user. The Program believes these current efforts are appropriate and should continue to be supported and funded.

Section IV: Proposed Approach for Urban Water Use

Authority staff has worked with technical experts, agency staff and stakeholder representatives over the past year to take a comprehensive look at urban water use measurement needs in the areas of urban water purveyor supplies (surface water and groundwater) and deliveries and urban wastewater discharger collection and discharge.

Based on these efforts, Authority staff is putting forward a proposed implementation package focusing on a handful of key actions related to urban water use measurement.

These critical needs – detailed below – apply most directly to the overarching State water management objectives mentioned earlier. Implemented as a package, Authority staff believes these actions would significantly impact critical state activities related to planning, water rights and water use efficiency activities.

Based on a review of existing statutes and regulatory requirements, a mix of legislative, administrative and budgetary actions may be needed to implement these actions. Specific actions are called out within each section below.

Critical Needs

1. State standards/protocols for recording/reporting urban water use

Description of need: Current state regulations require water suppliers to provide data in multiple formats and to multiple agencies. These requirements can place an unnecessary burden on water purveyors. Moreover, as there are no overarching standards and protocols to guide the way purveyors compile these data or centralized system to store and retrieve the data, the value of the information to the State is greatly diminished due to inconsistencies across water supplier data.

Proposed Action: Standardize how urban water purveyors compile and provide data to the State. Working closely with local water purveyors, pertinent state agencies (e.g., the State Water Resources Control Board and the Department of Health Services), and other concerned stakeholders, the Department of Water Resources (DWR) would establish standards and protocols for collecting, recording, and reporting urban water measurement data and develop an electronic system for receiving, compiling, storing, managing, quality-checking, and making available this data. This computer-based data system would allow local purveyors to report data in a convenient format and data users to access targeted data. Efforts would be made to eliminate data recording and reporting redundancies.

Other key elements of this approach include:

- Development of standards and protocols would begin in July 2004. Proposed standards/protocols would be completed by July 2006, with an interim milestone at July 2005 to assess progress. (Milestones assume state funding.)

- Phased implementation of standards and protocols would take place over five to 10 years, with ongoing reports to the Authority and public to summarize progress towards development and implementation of state standards and protocols.

- Moderate costs – $300,000 per year – projected to initially develop database. An additional $200,000 per year is expected to be needed to maintain and confirm data provided by local water suppliers on an ongoing basis.

- Authority for this action would come from existing agency authorities; the Authority would serve as convenor for action given its composition and existing oversight and coordination role.

2. Metering of urban customer deliveries

Description of need: For decades, many of California's diverse regions have pursued a policy of metering urban water purveyor customer water deliveries. Empirical research conclusively demonstrates that metered water service coupled with volumetric pricing can reduce water demand by 20-25% or more. Currently, approximately 7% of urban water deliveries in the state have no requirement to meter[3]. While not all of these water savings constitute "net water savings," the demand reduction would enable purveyors to avoid the cost of purchasing new water. Metering also provides the basis for effective management of purveyor water systems.

Proposed Action: Require the use of suitable water meters at all customer connections to the water delivery system. This proposal is consistent with the Authority's proposed Urban Water Use Efficiency (WUE) Certification Program (BMP 4).

Other key elements of this proposed approach include:

- Smaller water purveyors would be exempted from the measurement requirement. Exemptions include community water systems which serve less than 15 service connections used by yearlong residents or regularly serve less

[3] These figures developed within the Staff Work Group on Urban Water Use Measurement -- Compilation of Background Information on Current Urban Water Use Measurement Practices, Costs, and Benefits. March 31, 2003.

than 25 yearlong residents, or a single well which services the water supply of a single family residential home.

- Implementation would occur within 10 years from the establishment of relevant state standards and protocols.

- Action would be locally funded by affected urban water purveyors. In cases where retrofitting is not locally cost effective, state grant funding would be provided. In instances where grant funding is not available, a process would be established for purveyors to seek DWR approval to defer implementation timeline. Grant funding to support this should be made available by the State. Calculations of local cost effectiveness would use the CUWCC's definition of local cost effectiveness.

- Total costs are expected to be $42.7 million per year; roughly $16.7 of that total would be covered by locals and approximately $26 million would be provided by the state to fund non-locally cost-effective actions.

- Legislation may be needed, as the administrative actions to strengthen required compliance, consistency, and quality assurance/quality control of urban customer water deliveries measurement would represent a significant departure from current practice.

3. *Reporting of urban water source and delivery data*

Description of need: Two existing state reporting systems currently call for collection of source and delivery data for most urban water suppliers. The Department of Health Services (DHS) requires data annually from virtually all urban water suppliers. However, the DHS system only collects this data with annual specificity. The Department of Water Resources (DWR) requires data with monthly specificity but only collects it every five years. DWR also collects data via an annual survey, but these surveys are frequently incomplete or improperly filled out and the data are at times unreliable. By combining these systems (see Action 1: State Standards and Protocols, above), a key data gap would be filled with negligible impact on local water agencies. Annual data is needed to help meet public safety requirements, to synchronize data submitted by local agencies in different years, and to show differences in water use across different water-year types. Monthly (or bi-monthly, in the case of deliveries) data is needed to show seasonal variation and allow computation of both indoor and outdoor water use.

Proposed Action: Require urban water purveyors to provide more specificity in their annual reports of water sources and customer deliveries as outlined below:

- Water production by month subtotaled by water source definitions conforming to state water data collection guidelines and protocols.

- Annual water deliveries subtotaled by customer class definitions conforming to state water data collection guidelines and protocols.

- Monthly or bi-monthly water deliveries, according to meter read frequency, subtotaled by customer class definitions conforming to state water data collection guidelines and protocols.

Urban water purveyors would use best professional practices and take steps necessary to attain and maintain accuracy of measurement and reporting devices and methods.

Other key elements of this proposed approach include:

- Per existing DHS standards, urban water purveyors serving less than 15 service connections used by yearlong residents or regularly serving less than 25 yearlong residents, or a single well which services the water supply of a single family residential home would be exempted from reporting of sources and deliveries.

- Urban water purveyors would be required to report source and delivery data to the State within two to three years from promulgation of measurement standards/protocols. Existing reporting requirements would guide reporting requirements prior to promulgation of new standards/protocols.

- State would provide technical assistance to assist local purveyors; no significant costs expected beyond current local and state outlays anticipated[4]. Staff recognizes that some suppliers may face upfront costs, but believes that, over time, consolidated reporting requirements may reduce the overall local administrative burden.

- Access to incentives (i.e., grants and loans) would be tied to compliance. DWR to verify compliance with measurement and reporting requirements and analyze reports to ascertain erroneous or incomplete information. Review would focus on broad discrepancies.

- Legislation may be needed.

[4] As water suppliers are already asked to provide much of this data on an annual basis to either DHS, DWR or both, reporting requirements tied to increasing the data specificity (eg., providing data on monthly or bi-monthly rather than annual timesteps) are not expected to significantly impact local water suppliers costs.

4. Groundwater Use

Description of need: State water planners currently have an incomplete understanding of water withdrawal and consumption by groundwater users. This pertains in particular to non-adjudicated basins, which constitute the majority of groundwater basins in the state. This impedes the State's (and regional/local government's) ability to plan for growth and more effectively manage groundwater resources in times of drought.

Proposed Action: The State (DWR) perform continuous regional characterization of groundwater net usage in all sub-basins statewide. This would enable the State to better monitor the overall status of groundwater in the state. It would not entail any additional measurement of individual self-supplied groundwater use outside of what is already required in adjudicated and managed basins. Implementation of this action would be coordinated with ongoing revisions to the California Water Plan.

Other key elements of this proposed approach include:

- Implementation of new methodologies would take place prior to preparation of Bulletin 160 (2008). DWR would phase in new methodology, focusing first on those basins with the most impacted groundwater resources. DWR would state in each Bulletin 160 the extent to which groundwater data is based on this approach.

- New measurement approach projected to cost the State an additional $3 million per year. (Cost estimate includes costs associated with measuring net groundwater usage in both agricultural and urban areas of the State.)

- Performing this assessment would fall under DWR's existing responsibilities related to preparing Bulleting 160 and Bulletin 118; no new legislation or regulation is anticipated.

- Ongoing evaluation would determine the degree to which information coming from net groundwater usage measurement is satisfying state and federal water management information needs. The Program would re-evaluate the need for additional gross groundwater extraction data.

5. Research and adaptive management programs

Description of need: Improving the State's ability to forecast and plan for future urban water demands requires a fuller understanding of how water is used in urban areas and how this is changing due to evolving land use patterns, demographics,

technology, and economics. Previous State Water Plan Updates have been characterized by the use of simplified assumptions to predict urban water demand.

Proposed Action: Adopt a two-pronged strategy:

a. *Research Program:* State agencies would work with water purveyors and universities/research organizations to develop and sustain an urban water use research program. The Authority's Science Board would establish a priority list for research to be performed.

b. *Adaptive management:* State agencies (the Authority Science Board working in conjunction with DWR and other State Water Plan actors) would identify and pursue adaptive management needs for measurement as appropriate over time. This adaptive management program would serve to evaluate the adequacy of urban water use information available and the effectiveness of the measurement actions adopted.

   Other key elements of this proposed approach include:

   - Funding for this effort is expected to cost $1.95 million/year - $1.8 million for research, and $150,000 for adaptive management. Cost-sharing would be pursued to the extent possible. Activities would be prioritized and phased to meet actual funding levels.

   - The Authority (Science Board) and DWR would be responsible for oversight and coordination of research program; key implementing partners include water suppliers/users, university/college research institutions, USBR, CUWCC and others. The Authority and implementing agencies would be responsible for ensuring ongoing focus on measurement. No legislation seen as necessary to support this action.

   - This approach would incorporate annual review and reprioritization of research needs. Review research implementation structure would be reviewed every five years to evaluate effectiveness of approach and results. Program-wide review of measurement and reporting approach would be carried out every three to five years.

Other Elements

This Staff Proposal recognizes the vital importance of ongoing measurement activities related to urban water use. These current efforts, described below, are appropriate and should continue to be supported and funded.

- *Measurement of urban water purveyor water sources/production.* Authority staff endorses current state policies requiring urban water purveyors to measure water at all source and production points (including surface water, groundwater, and recycled water) using suitable and suitably maintained water meters and to read these meters and record data at least once a month.

- *Measurement and reporting of urban wastewater discharges.* Authority staff endorses current state and federal policies requiring urban wastewater dischargers to install suitable measurement devices, read and maintain the accuracy of these devices, record and store both effluent and wastewater reclamation data per existing wastewater discharge standards and protocols, and report the specified information annually to the State. Authority staff is confident that the data management system currently being developed by the State Water Resources Control Board will be satisfactory for collecting this data and disseminating it to governmental agencies, wastewater dischargers, and other interested publics.

- *Measurement and reporting of self-supplied groundwater use in adjudicated basins.* Authority staff endorses the current measurement of groundwater use by self-supplied users in adjudicated basins as required by the existing governing adjudications. Authority staff acknowledges that the adjudications require reporting to watermasters and that these reports become public documents available to state water planners and managers once received by the watermasters.

- *Measurement and reporting of groundwater substitution transfers.* Authority staff endorses current state policies and practices that require groundwater substitution transfer permittees to measure and report groundwater wells directly involved in substitution transfers at the highest technically practical level, including continuous measurement, monitoring and frequent reporting. Authority staff is confident that current practices will remain effective due to DWR's role as either (1) a purchaser of water, (2) an owner of facilities through which transferred water is wheeled; or, (3) a potentially injured downstream user. Authority staff believes these current efforts are appropriate and should continue to be supported and funded.

Section V: Unresolved Stakeholder Concerns

Overview
As noted earlier in this document, this Staff Proposal represents nearly three years of technically focused work involving extensive stakeholder discussions, deliberations by an Independent Review Panel and other experts, and numerous public workshops to solicit broad input.

During these many discussions, staff has worked to identify and engage a series of stakeholder concerns. Most of the issues raised in stakeholder discussions have been satisfactorily addressed and are incorporated into the Staff Proposal. There is broad support for many of the proposed actions and a recognition of the tangible benefits they contribute to essential state water management objectives.

At the same time, the Program recognizes that stakeholders have divergent views regarding some proposed actions. These concerns – detailed below – fall into two broad categories: (1) areas of remaining disagreements regarding specific elements of the proposal; and, (2) stakeholder concerns regarding the broader context of the proposed actions.

Below is a discussion of these topics and a brief commentary from staff on why it believes these issues are satisfactorily addressed in the Staff Proposal. The intent of this section is to be transparent regarding the level of stakeholder support and provide sufficient comment to inform follow-on discussions among senior-level policymakers.

Additionally, staff has invited more detailed stakeholder and agency comment to amplify these and any other issues. Attached please find all stakeholder correspondence received to-date.

Remaining Unresolved Concerns
Certain elements of the proposed approach are not supported across all stakeholder groups. Key remaining disagreements are summarized below.

- ***Measurement requirements for farm-gate deliveries.*** Some environmental stakeholder groups believe the Staff Proposal should require all farm-gate deliveries to be measured using the rated flow-measurement structures described in the Independent Panel Report. In comments provided both during the Panel process and in the follow-on Staff Work Groups, these stakeholders articulated the view that accurate measurement is a necessary and widely recognized component of wise and efficient on-farm efficiency and a necessary building-block for volumetric pricing. Moreover, stakeholders noted that the proposed approach would be contrary to existing CVP measurement requirements and inconsistent with urban end-user measurement requirements. Finally, these stakeholders took exception to the

Program's acceptance of a Panel definition of appropriate measurement that is based on incomplete data. In particular, stakeholders cited the lack of a comprehensive statewide survey of farm-gate measurement structures that ascertained, with a high degree of certainty, the type of measurement devices now in use and the volume of water associated with these structures.

> ***Staff Commentary:*** Staff recognizes the strong and divergent viewpoints associated with this controversial topic. In putting forward its proposed approach, staff is relying heavily on the Independent Review Panel's consensus view that the costs associated with shifting all farm-gate deliveries to direct measurement methodologies would not likely to yield sufficient benefits. (The Panel recognized that some form of measurement – either directly measured or estimated – is already taking place at virtually all farm-gates in California. The Panel also expressed the view that – given other critical factors such as water pricing, existing water rights structures, water availability and on-farm economics – measurement accuracy alone would be unlikely to significantly impact on-farm efficiencies. And, finally, the Panel stated that given the lack of a credible method to quantify benefits of increased measurement accuracy, they could not justify mandating such a large local investment at this time.) Moreover, recent staff discussions with USBR indicate that the Bureau's current approach – requiring measurement accuracies of +/-6% or *other reasonable approaches* – is not inconsistent with the Panel's finding. Finally, staff believes its proposal to periodically re-evaluate the effectiveness of existing measurement methodologies and confirm current practices and impacts on on-farm efficiencies would be an important strategy for ensuring the State's approach to this topic adapts to shifting conditions. Staff also acknowledges a linkage between volumetric pricing and measurement, but notes that there is not currently a State mandate for such practice in California.

- ***Threshold levels for measuring and reporting agricultural diversions and deliveries.*** Some agricultural stakeholder groups believe the Staff Proposal's threshold for exempting measurement and reporting of agricultural diversion and delivery data – conduit capacity of 25 cubic feet per second (cfs) – is set too low. These stakeholders suggest that the cutoff may prove burdensome for smaller water users and would overwhelm resource-poor state agencies with more information than they will be able to adequately manage. Furthermore, some of these stakeholders suggest that a 25 cfs cutoff would not be consistent with the Panel's discussion of requiring the most rigorous level of measurement for only "major" diversions.

> ***Staff Commentary:*** In recommending its proposed threshold, staff sought to identify a cutoff that would capture a significant amount of data (nearly 90% of diverted water) with a limited impact on water suppliers (available data suggests that the requirement would affect roughly 30% of all diversions.) Based on

discussions with implementing agencies, staff believes this would represent a reasonable workload and not overwhelm resources. Moreover, to ensure the State is using its resources wisely and neither collecting unnecessary data nor letting data languish unanalyzed, the Staff Proposal calls for a re-evaluation of the threshold in five years and, as necessary, a revision to the cutoff through a regulatory-setting process.

- ***Cost-effectiveness requirements for service meter installation.*** Certain Staff Work Group members question whether state funding should be provided to assist in meter installation in those cases where it is not locally cost effective. These stakeholders voiced the view that service meter installation is a well-established practice that should not be dependent on state funding. Moreover, in a period of limited state resources, these stakeholders believe that grant funding is better targeted at other promising efficiency activities.

  Staff Commentary: Staff recognizes that the use of service meters is a long-standing practice in many parts of the state. However, staff also recognizes that the Water Use Efficiency Program is grounded in the principle that activities beyond the locally cost-effective level should be supported by state or federal funding. This is also consistent with the California Urban Water Conservation Council's Memorandum of Understanding. Additionally, the Staff Proposal would offer deferred implementation as a non-grant-funding alternative to locally cost-effective barriers.

- ***Measurement and reporting requirements for groundwater use.*** Some environmental stakeholders believe the Staff Proposal should require direct measurement and reporting of groundwater extractions (wellhead measurement) throughout the state. These stakeholders believe it is essential that, if the State is to develop a comprehensive understanding of current water use and identify at-risk basins in the state, state water managers must develop the best possible data on current groundwater extractions. Additionally, these stakeholders suggest that such measurement data – commonplace elsewhere – is essential to support appropriate groundwater management strategies. Finally, some stakeholders note that the reporting of urban groundwater uses – particularly commercial, industrial and institutional uses – provides important information to urban water purveyors who need to account for possible future water demands and identify possible future water sources.

  Staff Commentary: In putting forward its proposed approach, staff is relying heavily on the Independent Review Panel's consensus view that – given that the State does not now manage or allocate groundwater resources – the costs associated with wellhead measurement would not likely yield sufficient benefits to justify the expenditures. However, recognizing the potential importance of

these extractions, the Staff Proposal would include three actions intended to deepen the State's understanding of groundwater uses and inform future decisions. These actions would be: (1) requiring the State to use new and better methods for calculating net groundwater usage – an approach that staff believes would help identify non-sustainable situations and pinpoint specific areas that might warrant more direct measurement of extractions in the future; (2) endorsing current state practices that require direct measurement of groundwater wells for groundwater substitution transfers; and, (3) prioritizing a research activity that would study the contributions of self-supplied urban groundwater use (including industrial, commercial, and residential) to net groundwater usage.

Additional Concerns

Staff recognizes that stakeholder discussions and outreach briefings also highlight lingering concerns regarding the broader context for these proposed actions. Primary concerns – which may require additional attention – include the following:

- ***Articulating a strong, compelling rationale for proposed actions.*** In some workshops to-date, stakeholders have expressed the view that staff has not made a compelling argument for taking on the burden and costs associated with the proposed actions.

  Staff Commentary: Staff recognizes the absolute imperative to present grounded and compelling rationales for any new proposed actions. Staff has strived to better articulate the need for these actions in this Staff Proposal.

- ***Crafting a proposed timeline for legislative action.*** Again, in some of the public outreach workshops thus far, some stakeholders have suggested that the timeline for the Authority and legislative action is too aggressive and additional discussion is needed.

  Staff Commentary: Staff has carefully structured discussions over the past two years to involve stakeholder and agency views. Staff believes these technically focused discussions have sparked in-depth and comprehensive deliberations. Staff recognizes that the final steps of this effort – building a cohesive implementation strategy – require intensive discussions among senior policymakers. Staff believes the proposed schedule included in its proposal – Authority review of the Staff Proposal in April followed by ongoing discussions among senior decision-makers to refine the approach for consideration in the 2005 legislative session -- acknowledges stakeholder concerns.

- ***Achieving equity across proposed agricultural and urban requirements.*** Several stakeholders – in both the Staff Work Groups and in outreach meetings – have

questioned whether the actions included in the Staff Proposal represent a balanced approach across both agricultural and urban sectors.

> ***Staff Commentary:*** Staff believes the actions outlined in the Staff Proposal would represent a significant departure from "business as usual" in both the agricultural and urban sectors and would likely reap critical benefits for state water management objectives across all water uses. Both efforts include changes that would impact all users (reporting on farm-gate deliveries for agriculture; increasing reporting frequency on diversions for urban). Both efforts would demand significant financial commitments, yet would remain sensitive to issues of local cost-effectiveness. And both efforts would embed a significant enough shift from current policy to require legislative action (farm-gate for agriculture, service meters for urban.)

Staff welcomes further stakeholder views and responses to this Staff Proposal.

Contact Information

For more information, or to provide additional comments, please contact Authority staff as follows:

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