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CITY OF MODESTO CALIFORNIA

March 16, 2017

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State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814-0100

Via Email to: commentletters@waterboards.ca.gov

Re: City of Modesto's Comment Letter – 2016 Bay-Delta Plan Amendment & SED

The City of Modesto appreciates the State Water Resources Control Board ("State Water Board") providing this opportunity for the City to review and comment on the draft 2016 Bay-Delta Plan Amendment and Substitute Environmental Document ("Revised Draft SED"). The City joins in the more detailed comments submitted by Modesto Irrigation District, the San Joaquin Tributaries Authority, the Stanislaus and Tuolumne Rivers Groundwater Basin Association, and the County of Stanislaus, and incorporates by reference the comments of these agencies. The City also offers the comments set forth below to supplement those agencies' materials and provide further explanation and context of issues that are more specific to the City.

A. The Revised Draft SED Fails to Consider the Demands on the Tuolumne River Water, and If These Demands Had Been Properly Considered, the Proposed Lower San Joaquin River Alternatives Would Not Withstand Scrutiny.

The Revised Draft SED does not appropriately balance the factors that the State Water Board must consider when setting or revising water quality objectives. In matters such as this, Water Code section 13241 compels the State Water Board to weigh the following factors:

(a) Past, present, and probable future beneficial uses of water,
(b) Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto,
(c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area,
(d) Economic considerations,
(e) The need for developing housing within the region, and
(f) The need to develop and use recycled water.

As the Proposed Project is set forth in the Revised Draft SED, it fails to account for and properly balance these factors. First, the proposed update to the 2006 Water Quality Control Plan ("WQCP") improperly establishes Water Quality Objectives that would apply

new regulations on the Tuolumne River and other waters outside the legal Delta without expanding the scope of the 2006 WQCP to protect these waters, designating beneficial uses for them, or undertaking the required statutory balancing of the competing interests in them. Second, the Revised Draft SED understates the importance of the City's existing and future beneficial uses of water to support its planned growth and development, including housing. The Revised Draft SED also fails to consider the impact of the proposed Water Quality Objectives in light of how they would damage the regional economy, including businesses within the City. Finally, the Revised Draft SED ignores the fact that recycling water is no longer a viable source of additional supply for the City. When these factors are given the appropriate level of importance, they militate against adopting a revised water quality objective that would have such severe impacts on the affordability and reliability of local water supplies.

1. The Statutory Requirements to Effect the Proposed Changes to the 2006 Bay-Delta Water Quality Control Plan Have Not Been Met, So the State Water Board Cannot Lawfully Adopt the Proposed Amendments.

Here, the Proposed Project consists of proposed amendments to certain water quality objectives imposed in the 2006 Bay-Delta WQCP. The Revised Draft SED specifically describes the Proposed Project as follows:

> The project (plan amendments) would establish the following updates to the 2006 Bay-Delta Plan:
>
> - New flow objectives on the Lower San Joaquin River (LSJR) and its three eastside tributaries for the protection of fish and wildlife beneficial uses.
> - Revised water quality objectives for the protection of agricultural beneficial uses in the southern Delta.
> - A program of implementation to achieve these objectives.
> - Monitoring and special studies necessary to fill information needs and determine the effectiveness of, and compliance with, the new objectives.
>
> The new LSJR flow objectives and revised southern Delta water quality (SDWQ) objective and associated program of implementation would replace the existing San Joaquin River (SJR) flow and southern Delta salinity objectives and associated program of implementation in the 2006 Bay-Delta Plan.

Revised Draft SED, p. 1-1.

Except as expressly set forth above, the Proposed Project would leave the provisions of the 2006 WQCP intact. The 2006 WQCP explicitly limits the scope of its application: "The water quality objectives in this plan *apply to waters of the San Francisco Bay system and the legal Sacramento-San Joaquin Delta*, as specified in the objectives." 2006 WQCP, p. 10, emphasis added. Furthermore, all of the beneficial uses designated within the 2006 WQCP, which serve as the basis for establishing appropriate water quality objectives, relate to uses of water within the legal Delta. 2006 WQCP, pp. 8 – 9. Thus, like its predecessors, the 2006 Bay-Delta WQCP protects the municipal and industrial uses of water *within the Delta* by users such as Contra Costa Water District. The 2006 WQCP also designates Lower San Joaquin River water quality objectives to be met *at Vernalis*, which is the southernmost point within the legal Delta.

In contrast, the waters of the Merced, Tuolumne, and Stanislaus Rivers, on the other hand, are *not* within the legal Delta. The Central Valley Regional Water Quality Control Board has set the water quality objectives for these rivers in the Central Valley Basin Plan. In setting these water quality objectives, the Central Valley Board balanced the competing uses of these sources of water and weighed the water needs of aquatic species against the other beneficial uses of the water. *See* Water Code §§ 13000 (when setting water quality objectives, the board must consider "all demands being made and to be made on those waters"), 13241 (requiring the boards to consider the water quality objective's impact on factors such as past, present and future beneficial uses of the water; economic considerations; and housing).

Here, the appropriate procedures have not been followed, and, as a result, the required statutory balancing has been neglected. As shown above, the description of the Proposed Project does *not* include expanding the scope of the 2006 WQCP to protect waters outside of the legal Delta. *See* Revised Draft SED, p. 1-1. Likewise, it does *not* propose to establish beneficial uses for any of the waters of the San Joaquin River or its tributaries that are outside of the legal Delta. *Id.*

However, the Revised Draft SED indicates that "the LSJR flow objectives would require flows below the rim dams on the Stanislaus, Tuolumne, and Merced Rivers, and the mainstem of the LSJR between the confluence of the Merced River to Vernalis to protect fish and wildlife beneficial uses in those reaches." Revised Draft SED, p. 1-1. In other words, the Proposed Project seeks to extend the regulations imposed by the Water Quality Objectives upstream, beyond the legal Delta, but State Water Board staff have not undertaken all of the steps necessary to amend the 2006 WQCP to effect this change. Before the Board amends the Bay-Delta Plan to impose new Water Quality Objectives on waters outside the legal Delta, it must first designate the beneficial uses of those waters. The Revised Draft SED fails to complete this necessary prerequisite. The Board then must develop Water Quality Objectives *to provide reasonable protection for the designated beneficial uses of these waters,* taking into account the other demands and beneficial uses. Water Code §§ 13000, 13241.

Here, the Revised Draft SED proposes to amend the 2006 Bay-Delta WQCP to impose new Water Quality Objectives on the tributaries to the San Joaquin River, which are not within the legal Delta, are not within the waters protected by the Bay-Delta WQCP, and are instead covered by the Central Valley Basin Plan. The Revised Draft SED does not identify or establish the beneficial uses of these waters. Thus, the Revised Draft SED does not comply with the statutory obligation to consider the other demands and beneficial uses of the waters *that will be subject to the regulation* before setting a water quality objective. Rather, like the WQCP that was disapproved in *United States v. State Water Resources Control Bd.*, 182 Cal. App. 3d 96 (1986), the analysis of the Proposed Project considers "only the water use of the Delta parties . . . and the needs of the customers served by the projects. . ." that take water from the Delta, while ignoring the beneficial uses of water upstream. *Id.* at 118. This approach violates the Board's obligations to consider all competing demands for water as well as "past, present, and probable future beneficial uses of water" and the other factors mandated by Water Code section 13241. *Id.* Yet the Revised Draft SED inexplicably repeats the same procedural mistake that Justice Racanelli disapproved in 1986.

In amending the 2006 Bay-Delta WQCP to extend Water Quality Objectives outside the legal Delta, the State Water Board cannot meet its statutory obligations without determining the beneficial uses of the waters to be included and performing the required balancing of interests. How the proposed new objective will affect the past, present and

future beneficial uses of water in the Bay-Delta, the economy of the Bay-Delta, and the housing of the Bay-Delta is not relevant when all of the impacts of this decision would be felt in the upstream areas outside of the legal Delta. The Proposed Lower San Joaquin River alternatives cannot be lawfully imposed until these necessary procedural steps – expanding the scope of the protected waters, making specific findings regarding their designated beneficial uses, and performing the required balancing of interests – are taken.

2. The Proposed Lower San Joaquin River Alternatives Do Not Reflect an Appropriate Weight for the City's Beneficial Uses of Water to Support Its Planned Growth and Development of Housing.

The City of Modesto delivers water that is then used for municipal, industrial and industrial processing purposes. These "beneficial uses" of water are protected by both the Water Quality Control Plan for the California Regional Water Quality Control Board, Central Valley Region (4th ed., July 2016) ["Central Valley Basin Plan"], and State Water Board Resolution No. 88-63, "Sources of Drinking Water Policy" ["SWRCB Drinking Water Policy"]. Central Valley Basin Plan, at IV-9.00, *citing* SWRCB Drinking Water Policy [other than under specifically defined exceptions, all surface and ground waters of the state are to be protected as existing or potential sources of municipal and domestic supply].

In its proposed updates to the Water Quality Objectives of the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, the State Water Board must therefore take into consideration the City's "past, present and probable future beneficial uses" of water for municipal, industrial, and industrial processing purposes. Water Code § 13050(f), (j).

The City of Modesto currently receives approximately half of its annual drinking water supply from Tuolumne River surface water through a contract it has with the Modesto Irrigation District, a true and correct copy of which is attached as Exhibit A. The City plans to use the surface water provided by Modesto Irrigation District to meet the City's long-term drinking water needs. In exchange for this supply, over 20 years ago, the City committed to fund the Modesto Regional Water Treatment Plant. This deal allowed the City to diversify its water portfolio and to help protect local groundwater supplies. Modesto is currently investing over $300 million in water infrastructure to provide reliability for residents, business, and major industry, including $160 million in the next 5 years based on extensive analysis and planning that included anticipated future use of current surface water supplies. As the Revised Draft SED reveals, though, the proposed amendments to the Water Quality Objectives will cut surface water deliveries by 38% in critically dry years. The proposed project's severe reductions in surface water deliveries threaten all of the City's long-term water planning efforts and investments.

Obviously, affordable and reliable water supplies in adequate quantities are a cornerstone to a city's ability to plan its growth and meet its general economic development goals. In fact, the California Water Code requires cities and counties to examine the sufficiency of water supplies before they approve new development. *See, e.g.,* Cal. Water Code §§ 10910, *et seq.* The Central Basin Water Quality Control Plan recognizes that "the protection and enhancement of beneficial uses require that certain quality *and quantity* objectives be met for surface and ground waters." *Id.* at II-1.00, emphasis added. Without water, the City's ability to attain the amount of growth planned under its General Plan – some of which is legally mandated – will be frustrated.

3. The Proposed Water Quality Objectives Threaten the City's Past, Present and Future Beneficial Use of Surface Water to Recharge Groundwater Supplies and Manage the Groundwater Basin in a Sustainable Manner.

Groundwater is an important source of water supply to the City, comprising the source of more than half of the water the City delivers. In many parts of the City's service area, groundwater provides the primary water source.

The City has been actively managing its groundwater pumping for decades, ahead of SGMA, to try to keep the withdrawals at a sustainable level. The City and the other local water supply agencies have been very successful in this regard: of all the groundwater basins in the areas of the San Joaquin Valley that have active agricultural communities, *Stanislaus County has the only basins that have not been designated as "critically overdrafted."* In fact, due to the City's efforts, the groundwater levels in the City of Modesto's contiguous system have been stable since 1995. *See, generally,* City of Modesto 2015 Urban Water Management Plan, a true and correct copy of which is attached as Exhibit B; DWR contour maps, true and correct copies of which are attached as Exhibit C.

Preventing that level of overuse of the local groundwater resources has taken a lot of effort, planning and expenditures by the City of Modesto and other local agencies. Aquifer Storage and Recovery, also known as "ASR," depends on additional surface water being available for recharge. To that end, the City entered into its surface water supply contract with Modesto Irrigation District and has made investments in the surface water treatment plant to allow it to incorporate greater surface water supplies in its portfolio.

If the Board adopts the alternative and reduces the City's available surface water supplies, the City has no source of water to treat or "bank" to continue to improve the status of the aquifer. By compromising the surface water supply that the City is using to balance its demand for groundwater, the staff-proposed alternative not only undermines the financial viability of the surface water treatment plant, but also threatens to undo all of the City's hard work to protect the local groundwater basins.

4. The Proposed Water Quality Objectives Would Unduly Hinder the Regional Economy, Including the Businesses within the City.

Water is also a key input to the region's – and the City's – financial health. To be financially viable in California after the passage of Proposition XIII, cities need to have healthy business tax bases. Modesto's economic development is largely based on a stable and vibrant agricultural economy.

Fortunately for our city, California does have a thriving agricultural economy. In fact, California is the nation's leading producer of agricultural products. In 2012, California's farms and ranches accounted for $42.6 billion in output, with milk production being California's largest agricultural industry. Dairy products such as milk, butter, cheese, evaporated products and frozen desserts, and dairy processing directly accounted for $3.37 billion in value added. California's grape production, the state's second largest industry, accounts for $3.65 billion in direct value added. Fruit and vegetable canning, pickling, and drying, along with soft drink and ice manufacturing, added another $6.58 billion in direct valued-added sales.

These sectors account for more than 220,000 California jobs. These are statewide figures, but each and every one of these sectors is largely representative of the businesses operating directly in and around the City of Modesto. Here, as is the case throughout the San Joaquin Valley, many of the commercial businesses depend on or support agricultural production, such as food and beverage processors, wineries, canneries, dairies and other enterprises that help to process, market and sell agricultural products. In 2012, the food and beverage processing industry in Stanislaus County employed approximately 25,000 people, generated more than $8.6 billion in sector output, and added over $2.3 billion in value to the local economy.

As several speakers at the Board's December 20, 2016 hearing on the SED noted, the City of Modesto's official motto is "Water, Wealth, Contentment, Health." This simple motto reflects not only civic pride, but also the paradigm that supports the regional community. Modesto is the largest city in Stanislaus County and home to major food and beverage processors such as Gallo Wines, Frito Lay, Del Monte, Stanislaus Foods, and Seneca Foods, all of which need a stable water supply to be productive and profitable.

By reducing the available water supply and impairing its reliability, the Proposed Project will have a devastating effect on the long-term viability of the local food and beverage processing operations. The reduction in water, with no identified source of replacement, means that the proposed Water Quality Objectives will likely result in huge job losses and huge reductions in agricultural output in the region.

A 2015 economic study confirms how water is and always has been essential to the vibrancy of Modesto. This study, "The Economic Impact of Food and Beverage Processing in California and Its Cities and Counties," which was undertaken by Professor Richard J. Sexton, Professor and Chair of the Department of Agricultural and Resource Economics at the University of California, Davis, found, "Food and beverage processing is responsible for 20% or more of all jobs in Kings, Merced, and Stanislaus Counties. . . . " (A true and correct copy of this study is attached as Exhibit D.)

More recent studies have further confirmed that the amount of water reductions imposed under the proposed project would cripple the City's local economy. At the December 20, 2016 hearing, the Board received testimony and a PowerPoint presentation from Stanislaus County consultants Dr. Rodney Smith and Jason Bass of Stratecon, Inc. regarding the direct economic impacts the proposed Water Quality Objectives would have on agricultural water users as well as the indirect effects the reduction in agricultural output would have on urban water users whose jobs and businesses are linked to agricultural water users. Page 31 of the Stratecon PowerPoint provides an economic Impact Summary that indicates that during non-peak and peak years, job losses resulting from the draft proposal (not including SGMA-caused job losses) would range from 1,513 to 6,653. (A true and correct copy of the Stratecon PowerPoint is attached as Exhibit E.) Simply put, the regional economy cannot absorb job losses of this magnitude. The severe economic impacts of the proposed project must be given appropriate weight, and the State Water Board must fulfill its statutory obligation to take account of these economic considerations.

5. The Proposed Water Quality Objectives Fail to Recognize That the City Cannot Make Up a Water Supply Deficit by Developing and Using Recycled Water, Since It Has Already Committed That Source.

The City of Modesto paid over $130 million to fund construction of a tertiary treatment plant to develop recycled water for delivery to Del Puerto Water District. That recycled water is delivered through the Delta-Mendota Canal and then put to beneficial use providing irrigation for agriculture within Del Puerto's service area. The City has also invested about $50 million more to cover its share of the $100 million in costs to build the recycled water delivery facilities. This project is currently under construction, and it is expected to be completed in December 2017. Ironically, the State Water Board and other state agencies supported and approved this project because it helps reduce Del Puerto's reliance on water imported from the Delta. However, because the City undertook this progressive project, which helps to protect water in the Delta, this source of recycled water is no longer available to the City. Given this existing commitment to Del Puerto, the SED's proposed Water Quality Objectives put the City in a worse position than it would have been if it had not undertaken this project.

B. The Revised Draft SED's CEQA Analysis Is Deficient.

1. The Revised Draft SED Fails to Analyze the Potential Impacts of the Proposed Changes to the Water Quality Objectives on the City's Water Supplies.

When a project will cause changes in streamflow or water supply, CEQA requires the lead agency to analyze the potential environmental effects of those changes. *Protect the Historic Amador Waterways v. Amador Water Agency*, 116 Cal. App. 4th 1099, 1109, 1101 (2004); *Santiago County Water Dist. v. County of Orange*, 118 Cal. App. 3d 818, 831 (1981) [EIR failed to provide adequate information about the project's impacts on water supplies where it was "silent on the effect of that delivery [to the proposed project] on water service elsewhere in the Water District's jurisdiction."]; *see also Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova*, 40 Cal. 4th 412, 430-32 (2007).

Water supply impacts constitute physical impacts on the environment. *See* Pub. Res. Code § 21060.5 [defining "environment" to include water conditions "which exist within the area which will be affected by a proposed project"]. Thus, when a project causes changes in the amount of water that the water suppliers will be able to deliver, the environmental impacts of those changes must be evaluated. *Central Delta Water Agency v. State Water Resources Control Bd.*, 124 Cal. App. 245, 271 (2004); *see also Voices for Rural Living v. El Dorado Irrig. Dist.*, 209 Cal. App. 4th 1096, 1112 (2012) [where combined effects of climate change, increased future demands and project will reduce water supplies available to district and exacerbate the severity or environmental effects of future drought conditions, the lead agency must analyze those potential environmental impacts].

To determine the scope of a project's water supply impacts, agencies perform hydrological modeling to estimate what the water supplies would be with and without the project. *See, e.g., Dry Creek Citizens Coalition v. County of Tulare*, 70 Cal. App. 4th 20, 32-33(1999); *see also Planning and Conservation League v. Dept. of Water Resources*, 83 Cal. App. 4th 892, 919 (2000) [faulting DWR for ignoring "repeated requests . . . to provide forecasts based on [hydrological] simulation models. . . ."].

The SED does not accurately model, and therefore fails to quantify or analyze, the water supply impacts to the City of Modesto. The City operates a conjunctive use water supply system. To serve the demand of its customers, the City uses both surface water obtained under a long-term contract with Modesto Irrigation District and groundwater pumped through the City's separately owned, managed and maintained facilities. The SED does not correctly evaluate the impacts to either one of the City's two water supply sources.

a. Because the Water Supply Effects Model Erroneously Assumes That the City Will Receive the Same Amount of Surface Water Even If the Proposed Water Quality Objectives Were Implemented, the Revised Draft SED Understates the Impact the Project Would Have on the City's Surface Water Supplies.

For each proposed Lower San Joaquin River alternative, the Revised Draft SED relies on the Water Supply Effects model to estimate the amount of diversions that would be available from the river with the implementation of the proposed Water Quality Objectives.

When the results of the Water Supply Effects modeling were post-processed, the volumes of water currently being used for municipal and industrial water supplies were "assumed not to be subject to a water shortage" and thus "were subtracted from the total diversions for each river to calculate how much water remained" for other users. In other words, for purposes of calculating Water Supply Effects, the *model simply assumes that supplies to municipal service providers would not be reduced*: the model projects that, even with the revised Water Quality Objective and the imposition of flow standards that reduce available surface water supplies, the City of Modesto will receive the same surface water deliveries as it is receiving under existing conditions. As the SWRCB's staff and consultants explained in the December 5, 2016 workshop on the Water Supply Effects modeling, the effects analysis "did not modify the amount of water available to the water treatment plants." In terms of the Water Supply Effects analysis, the presenters at the workshop explained "that [reduction in supply] falls on the irrigation districts rather than the municipalities." Subsequently, at the December 12, 2016 workshop, the State Water Board consultants and staff noted that the surface water supplies available to the City of Modesto were estimated as part of the water supplies available to Modesto Irrigation District. However, as noted at the December 5 workshop, rather than calculating the amount of water that the City would lose if the alternatives were implemented, the Revised Draft SED employs a "unique allocation scheme" that represents "simply a way of reoperating the system that constrains deliveries in a way that works." Using this reoperation scheme, the Revised Draft SED assumes that the surface water that Modesto Irrigation District delivers to the City was "fully delivered each year."

The assumptions that the system will be "reoperated" and deliveries to the City will continue at the same amount constitute fatal flaws in the model, which cause the Revised Draft SED to understate the Project's potential water supply impacts to the City. As the State Water Board has acknowledged, the City receives its surface water supply under a contract with Modesto Irrigation District. That contract does not prioritize the delivery of surface water to the City over deliveries to other Modesto Irrigation District customers. Rather, Section 17.1 of the agreement explicitly provides that the City's surface water supplies are subject to shortage when Modesto Irrigation District's supplies are short:

> District promises and agrees to treat District's agricultural customers and City on a parity basis. If District is required to reduce deliveries, it will cut back its deliveries to its agricultural customers and to City in equal proportions.

Exh. A, § 17.1. There is no factual basis to support the SED's assumptions that the system will be "reoperated" so that the impacts of the proposed actions will fall entirely on irrigation demands and the City's surface water supplies will be unaffected. Consequently, the modeling results understate the project's water supply impacts on the City.

b. The Water Supply Effects Model Understates the City's Future Level of Demand and Therefore Does Not Accurately Depict the Project's Impact on the City's Planned Future Beneficial Use of Water.

The Water Supply Effects model also erroneously assumes that the City's demand for surface water will remain at the 2009 baseline level throughout the duration of the Lower San Joaquin River Water Quality Objective. This assumption is unrealistic. As the economy has recovered since 2009, the City's water demand and deliveries have increased. Consistent with its legal obligations, the City has adopted a General Plan that plans for its long-term growth, and it has analyzed and planned for the additional water demand that this growth will generate. The City's agreement with Modesto Irrigation District accommodates the City's need for more surface water to meet future demand, but the Proposed Project undercuts that source of supply. By holding the City at an artificially low 2009 level of surface water demand, the Water Supply Effects model obfuscates the magnitude of the water supply deficit that the Proposed Project will cause for the City. By ignoring the City's planned future beneficial use of this water, the Revised Draft SED violates both CEQA and Water Code section 13241.

c. The State Water Board Must Correct the Faulty Assumptions of the Water Supply Effects Model and Re-Run the Model to Determine the Proposed Project's Potential Water Supply Impacts to the City.

As a result of the faulty assumptions detailed above, the Water Supply Effects model is defective. Where, as here, the model is clearly inadequate to forecast or evaluate the project's full spectrum of possible impacts, it does not constitute substantial evidence of the project's potential water supply impacts. *East Sacramento Partnership for a Livable City v. City of Sacramento*, 5 Cal. App. 5th 281, 299 (2016); *Town of Atherton v. California High-Speed Rail Authority*, 228 Cal. App. 4th 314, 349 (2014); *State Water Resources Control Bd. Cases*, 136 Cal. App. 4th 674, 795 (2006). As shown above, the false assumptions in the Water Supply Effects model render invalid its analysis of the Proposed Project's impacts on the City's surface water supply. For the State Water Board to determine the actual scope of this project's impacts on the City's surface water supply, it must correct these errors and re-run the modeling analysis.

d. The Errors in the Water Supply Effects Modeling Results Infect the Revised Draft SED's Calculation of the Impact on the City's Groundwater Supplies.

Because the Revised Draft SED erroneously assumes that the City will receive the same level of surface water supplies under the Proposed Project, it also understates the Proposed Project's impacts on the City's groundwater supplies. The results of the Water Supply Effects model were used as the input to the model that was used to estimate groundwater effects. As shown above, the Water Supply Effects model contains faulty assumptions, so it incorrectly indicated the City's surface water supplies would not be reduced. The Revised Draft SED used this result – no surface water supply reduction – as

the input for the groundwater effects model. The groundwater effects model therefore fails to account for the increased groundwater demand that the City will have due to the Proposed Project's reduction in the City's surface water supplies. Consequently, the groundwater effects model underestimates the impacts to the City's groundwater supplies.

e. The Groundwater Effects Model Fails to Include Accurate Estimates of the City's Groundwater Demands and Falsely Assumes the City Can Meet Future Needs by Increasing Pumping to 2009 Levels.

Although the Revised Draft SED models the impacts to the groundwater supplies for the irrigation districts, it inexplicably fails to model or quantify the impacts to the City's groundwater supply. The impacts to the City's groundwater supplies are reasonably foreseeable and capable of being estimated using the models; this step cannot be skipped. "When an agency preparing an EIR is obliged to examine future events that are difficult to forecast, the agency 'must use its best efforts to find out and disclose all that it reasonably can.'" *Planning and Conservation League v. Castaic Lake Water Agency*, 180 Cal. App. 4th 210, 242 (2009); State CEQA Guidelines, 14 C.C.R. § 15144. In fact, for the Turlock subbasin, the groundwater modeling neglects even to identify the City of Modesto as one of the users of that groundwater, when publicly available data confirm that the City withdraws about 5000 acre-feet per year from that subbasin. The Revised Draft SED's failure to include the City's demand in the Turlock subbasin confirms that the SED's groundwater modeling is clearly inadequate and cannot be used as substantial evidence to support the SED's conclusions about the project's impacts.

For the other subbasins, the SED's groundwater modeling identifies the City as a water user, but the Revised Draft SED simply assumes that future municipal demands can be met with increased groundwater pumping. At the December 12 workshop, State Water Board staff and consultants indicated that the groundwater model "assumes districts can increase their groundwater pumping up to the maximum capacity" using a 2009 baseline. Given the new legal framework imposed by SGMA, increasing pumping up to the maximum capacity does not appear to be a legally feasible method of resolving the water supply deficits imposed by the Proposed Water Quality Objectives. Indeed, at the workshop, the State Water Board staff was not willing to state whether the 2009 baseline level of groundwater pumping would be sustainable under SGMA. Considering that admission, the record lacks substantial evidence to support the conclusion that pumping can be increased up to the maximum capacity attained in 2009. Thus, the groundwater modeling contains inaccurate assumptions that mask the Proposed Project's potential impacts on the City's water supplies. In fact, if the City is not able to increase its groundwater pumping to make up for the reduction in surface water supplies and to cover additional future water demands, the Proposed Project will cause the City to suffer a water supply shortage.

2. The Proposed Project's Cumulative Impacts on the City's Water Supply Must Be Analyzed.

CEQA requires lead agencies to answer two questions to determine whether a project will have cumulative impacts. First, the agency must determine whether the effects of the proposed project, in combination with other projects, would be cumulatively considerable. If so, the agency must then evaluate whether the

project's incremental contribution is cumulatively considerable. *Communities for a Better Environment v. California Resources Agency*, 103 Cal. App. 4th 98, 120 (2002), *disapproved on other grounds in Berkeley Hillside Preservation v. City of Berkeley*, 60 Cal. 4th 1086, 1109 n. 3 (2015). When the project's incremental effect is cumulatively considerable, the EIR must discuss the project's cumulative impacts. *San Francisco Baykeeper v. State Lands Comm'n*, 242 Cal. App. 4th 202, 222 (2015). On the other hand, if the cumulative impact is insignificant or if the project's incremental contribution to the impact is not cumulatively considerable, the EIR need not conduct a full cumulative impacts analysis, but it must include a brief explanation of the basis for the agency's conclusions. *San Francisco Baykeeper v. State Lands Comm'n*, 242 Cal. App. 4th 202, 222 (2015).

A project's cumulative environmental impact cannot be deemed insignificant merely because its individual contribution to an existing environmental problem is relatively small. *San Francisco Baykeeper v. State Lands Comm'n*, 242 Cal. App. 4th 202, 223 (2015), citing *Kings County Farm Bureau v. City of Hanford*, 221 Cal. App. 3d 692, 718-21 (1990). To the contrary, "the greater the existing environmental problems are, the lower the threshold should be for treating a project's contribution to cumulative impacts as significant." *San Francisco Baykeeper v. State Lands Comm'n*, 242 Cal. App. 4th 202, 222 (2015); *Communities for a Better Environment v. California Resources Agency*, 103 Cal. App. 4th 98, 120 (2002).

Proper analysis of the cumulative impacts on groundwater supplies must consider the impacts of the Proposed Project in combination with all future conditions that will constrain these supplies, including implementation of SGMA, multi-year droughts, and more stringent drinking water standards. The Proposed Project will reduce surface water deliveries, which will cause increased demand for, and pumping of, groundwater. In the future, groundwater supplies will also be constrained as SGMA is implemented and parties are prohibited from extracting more than the "safe yield" of the groundwater basins. Furthermore, as we have seen during the recent drought conditions in 2014-15, water users turn to groundwater in critical dry periods when surface supplies are unavailable. Droughts are a reasonably foreseeable fact of life in California, and agencies must evaluate the potential impacts of a project during future drought conditions. *Voices for Rural Living v. El Dorado Irrig. Dist.*, 209 Cal. App. 4th 1096, 1111-12 (2012). Imposing higher instream flows and reducing surface water supplies to the City and other users while simultaneously curtailing their access to groundwater supplies will obviously affect the reliability of their water supplies. Those impacts will be even more severe in very dry years when demand for groundwater is higher.

The Revised Draft SED makes no attempt to analyze these impacts. Rather, it simply dismisses these reasonably foreseeable impacts as "speculative." At the "Technical State Water Board Staff/ Community Water Interests Meeting" held on November 18, 2016, the City's Director of Utilities, Larry Parlin, inquired about this and received the following response from Deputy Director of Water Rights Les Grober:

> MR. PARLIN: Reductions in water supply to the urban users. Because the primary focus that everybody is talking about and is appropriate is the agricultural community, and that's important. However, there are not -- Modesto is not the only urban water user that gets from an irrigation district in the local area. You have the cities of Manteca and others that get it from South San Joaquin Irrigation District. So did you look at the protection of that drinking water supply going forward as -- for the urban water users, or are you just considering this all as agricultural water use and not looking at the fact that the urban water users do use some of that water supply?

> MR. GROBER: As you pointed out, we identify the use in the -- in the documents, and that's why we identify -- and, again, it's the -- much of the same unsatisfying answer in terms of, you know, the speculative elements. We talk about, you know, water conservation, you know, what's happened in recent drought periods in terms of, you know, reduced reliance on water, what can be achieved. We also talk about water transfers and sales of water and the costs of water, marketing of water. So those were all things that -- you know, what the exact mix of that will be is, you know, cannot be determined with specificity so it would be speculative.
>
> But there for the cities, because it is the highest use of water, and I think we even have language in our water quality control plan in terms of, you know, protecting health and safety, things like that, there's -- there are opportunities for purchasing water and for water to get to cities.

A true and correct copy of the transcript of this meeting is attached as Exhibit F.

As discussed above, the City has two sources of water supply, surface water from the Tuolumne River under its contract with Modesto Irrigation District and groundwater. The Proposed Project will reduce the former and put increased strain on the latter, which will already be reduced due to SGMA and future drought conditions. The Revised Draft SED must disclose and analyze the Proposed Project's incremental contribution to these water supply impacts. *See, e.g., Napa Citizens for Honest Government v. Napa County Bd. of Supervisors*, 91 Cal. App. 4th 342, 373 (2001) [when project has uncertain impact on water supplies, EIR "cannot simply label the possibility that [water supplies] will not materialize as 'speculative,' and decline to address it"; the EIR must disclose whether other sources exist and what environmental impacts would result, in at least general terms, from the use of those other sources].

3. The Revised Draft SED Must Also Analyze the Urban Decay That Will Result If the State Water Board Adopts Any of the Proposed Lower San Joaquin River Alternatives.

The State Water Board must undertake a thorough analysis of the economic devastation that could befall Modesto (and other urbanized areas of the Central Valley) if the project were implemented as currently proposed. CEQA also requires the analysis of the physical impacts that will directly or indirectly result from the forecasted economic or social effects of a proposed project. Subdivision (e) of CEQA Guidelines section 15064 provides that when the economic or social effects of a project cause a physical change, this change is to be regarded as a significant effect in the same manner as any other physical change resulting from the project. "[I]f the forecasted economic or social effects of a proposed project directly or indirectly will lead to adverse physical changes in the environment, then CEQA requires disclosure and analysis of these resulting physical impacts." *Bakersfield Citizens for Local Control v. City of Bakersfield*, 124 Cal. App. 4th 1184, 1205 (2004).

The SED acknowledges that the surface water supply reductions imposed by the proposed Lower San Joaquin River alternatives will be substantial enough that current water users will need to seek new sources of water to support their future growth and development. As noted above, the State Water Board has not identified any sources of replacement water and has undertaken no study of the economic effects of the proposal on the City of Modesto's urban economy. Rather, the SED simply dismisses these impacts, saying they are all speculative to evaluate.

See p. 84-85.

As discussed above, the project's proposed surface water reductions will prevent growth and hinder proposed economic development, and the impacts will be of such a size and scope that they will alter the regional economy. As such, they will contribute to urban decay, which must be analyzed as an element of the State Water Board's environmental review.

Moreover, as also discussed above, many of the jobs and most of the households in Modesto are directly or indirectly dependent upon a vibrant agricultural economy. Given this fact, neither the City of Modesto nor the surrounding region can absorb job losses of the magnitude that will likely result from the implementation of the proposed project without substantial urban decay. As the *Bakersfield Citizens* court noted:

> It is apparent . . . that proposed new shopping centers do not trigger a conclusive presumption of urban decay. However, when there is evidence suggesting that the economic and social effects caused by the proposed [project] ultimately could result in urban decay or deterioration, then the lead agency is obligated to assess this indirect impact. Many factors are relevant, including the size of the project, the type of retailers and their market areas and the proximity of other retail shopping opportunities. The lead agency cannot divest itself of its analytical and informational obligations by summarily dismissing the possibility of urban decay or deterioration as a 'social or economic effect' of the project.

Loss of surface water supplies will result in a substantial loss of agricultural industry wealth in Modesto; loss of wealth will result in a substantial degradation of Modesto's urban environment. The potential for substantial urban decay in Modesto that would result from the project mandates that the Board undertake a comprehensive analysis of the physical impacts the project will have on urban water customers and the domestic economy prior to project approval.

CONCLUSION

The City of Modesto appreciates the opportunity to submit these comments on the proposed amendments to the Water Quality Objectives of the Bay-Delta Plan and the SED's environmental analysis of that project.

As shown above, implementation of the proposed Water Quality Objectives would impose severe reductions on the City's surface water supplies and cause increased demand for groundwater pumping, both of which will have direct and indirect impacts on the City as a municipality and as a utility. Moreover, the SED itself acknowledges that there are no known sources of replacement supplies. However, the Revised Draft SED fails to undertake the statutorily required balancing of interests, nor does it accurately disclose, quantify or analyze the impacts to the City. Thus, the Revised Draft SED is fatally deficient. More critically, if the impacts to the City had been properly assessed, the State Water Board would realize that the Proposed Project threatens to strike a potentially fatal blow to the City's growth, development and economy.

We urge the State Water Board to carefully consider these comments and the impacts that its decision will have in the real world, on the real people who make up our community. If this process continues and the matter comes before the Board for a decision, we hope that the State Water Board members will exercise the utmost care in carrying out their statutory obligation to strike an appropriate balance amongst the competing uses of

this water – and we respectfully suggest that none of the existing Lower San Joaquin River alternatives meets this standard.

Should you have any questions about the City's position or any of the comments set forth above, please do not hesitate to contact Larry Parlin, Director of Utilities.

Sincerely,

Ted Brandvold, Mayor
On behalf of the City of Modesto

cc: Members of the Modesto City Council (w/o exhibits)
Adam C. Gray, Assemblymember, Twenty-First District (w/o exhibits)
Stanislaus County Board of Supervisors (w/o exhibits)
Greg Salyer, General Manager, Modesto Irrigation District (w/o exhibits)

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Amended and Restated Treatment and Delivery Agreement

Between

Modesto Irrigation District and City of Modesto

TABLE OF CONTENTS

AMENDED AND RESTATED
TREATMENT AND DELIVERY AGREEMENT

AMONG

MODESTO IRRIGATION DISTRICT AND CITY OF MODESTO

1. PARTIES.

The Parties to this Amended and Restated Treatment and Delivery Agreement are Modesto Irrigation District, a California irrigation district, and City of Modesto, a California municipal corporation and charter city, who agree as follows:

2. RECITALS.

This Agreement is made with reference to the following facts and circumstances, among others:

2.1. District Formation and General Purposes. District was formed more than 100 years ago for the purpose of providing irrigation water to serve the needs of agriculture. To that end, District has perfected water rights sufficient to meet those needs. District's development of its water rights and its agricultural irrigation delivery system, and the careful attention to the needs of District's agricultural water users, have been prominent in making Stanislaus County one of the world's foremost agricultural areas. In recent years, population growth within District's boundaries has reduced the irrigated acreage while increasing the demand for municipal uses of water. The Parties desire to put to beneficial municipal use for the inhabitants of District certain amounts of surface water to which District has rights. In doing so, the Parties shall be mindful of the great importance of District's water rights, and the significant role of agriculture within District. The area to be served with water pursuant to this Agreement is within District's Irrigation District Boundary. The water to be supplied by District pursuant to this Agreement is not surplus water, but rather is water which has historically been put to beneficial agricultural use within District and is now necessary for municipal use within District.

2.2. [Not Used]

2.3. Water Management Study. District and City authorized, received, and accepted the Study, which was completed in 1984.

2.4. Problems of Reliance on Groundwater. The Study found, in part, that existing groundwater sources of City are limited and supplies are declining, and that a continued decline in the quantity of groundwater will result in a gradual degradation of the quality of the groundwater. This degradation of quality, combined with on-going Modifications to State and Federal drinking water standards, will make it increasingly difficult to meet domestic water supply demands solely through the use of groundwater.

2.5. Water Rights. District has certain water rights with respect to the waters of the Tuolumne River.

2.6. Study Recommendation. The Water Management Study recommended, in part, that City and DEW contract with District for treated surface water to supplement its groundwater supplies. This resulted in construction of the existing surface water treatment plant located at the Modesto Reservoir. The design, financing, construction, operation and maintenance of the water treatment plant was implemented pursuant to the Treatment and Delivery Agreement Among Modesto Irrigation District, City of Modesto, and Del Este Water Company that was approved in 1992.

2.7. Projection Expansion. Pursuant to the 1992 Agreement, District designed and constructed, and now owns, operates and maintains, the initial Project facilities, including the Modesto Regional Water Treatment Plant, which has a rated treatment capacity of 30 million gallons of treated water per day (mgd). The 1992 Agreement contemplates that the parties may agree at some time to expand the Project up to a capacity of 60 mgd.

2.8. Environmental Clearance. District, with the assistance of its environmental consultant, completed a final environmental impact report for the Initial Facilities and, on April 17, 1990, the Board of Directors of District adopted Resolution 90-50 which, among other things, certified the EIR and caused a Notice of Determination to proceed with the Project to be filed in accordance with the California Environmental Quality Act and the CEQA Guidelines. The parties prepared a Subsequent Environmental Impact Report on the First Expansion Facilities, and District and City cooperated as CEQA co-lead agencies of the preparation of the SEIR, which addresses the First Expansion Facilities and this Amended and Restated Agreement. The SEIR also studies other City water system improvements to be financed, designed,

constructed and operated by City outside of this Agreement. The parties have certified the SEIR and made appropriate CEQA findings. (See District Resolution No. 2005-92, pertaining to SEIR Certification; District Resolution No. 2005-158, pertaining to CEQA Findings; City Resolution No. 2005-378, pertaining to the SEIR Certification; City Resolution No. 2005-515, pertaining to the CEQA Findings.)

2.9 Use of Available Water to Carry Out Recommendations of the Urban Water Management Plan. It is in the best interests of the Parties and their respective water users to utilize District's available water to expand the present capacity of the MRWTP to provide treated water to City in an environmentally acceptable manner, which is not injurious to agricultural water users or any other interests of District.

2.10. Enterprise Fund. It is the intention of the Parties that, except as specifically provided otherwise herein, the Project shall be financially operated as an enterprise fund with costs borne by City, and with neither profits nor losses accruing to District as a result of the Project. All terms of this Agreement shall be construed in accordance with the intent of this Section 2.10.

2.11. Long Term Water Supply. By this Agreement, the Parties intend to provide for and increase the long-term source of domestic Treated Water supply for City.

2.12. Conservation. In entering into this Agreement, the Parties recognize that it is important to continue to encourage both urban and agricultural water users within District to utilize water conservation practices, which are effective, practical, and economical.

2.13. Groundwater. The Parties recognize the importance of an adequate supply of good quality groundwater. The Parties in the future, as they deem appropriate, shall cooperate in necessary ground water management efforts as may be required by future State or Federal legislation or regulations.

2.14. DEW Acquisition. In 1995, City acquired certain assets of DEW, including all of the Company's rights, interests and obligations in and to the Project and 1992 Agreement. The parties acknowledge and confirm that (a) District has consented to this transfer and assignment pursuant to the 1992 Agreement, (b) DEW is no longer a party to the 1992 Agreement, and (c) all DEW's rights, interests and obligations in and to the 1992 Agreement have been transferred to and accepted by City. Consequently, DEW no longer has any right or interest in the 1992 Agreement or the Project and therefore is not a party to this Agreement.

2.15. Purpose of Agreement. The Parties desire to amend the 1992 Agreement to (a) provide for expansion of the MRWTP to 60 mgd and construction of related facilities, (b) address City's acquisition of DEW's interests in the 1992 Agreement and Project, and (c) make certain other changes. In order to simplify and clarify the applicable contract terms and consolidate all current contract terms and conditions into a single document, the parties have incorporated the amendments into this amended and restated agreement, which includes the 1992 Agreement as amended.

3. AMENDMENT AND RESTATEMENT OF 1992 AGREEMENT.

The 1992 Agreement is hereby amended and restated in full with the amendments as set forth in this Amended and Restated Treatment and Delivery Agreement. The 1992 Agreement therefore is hereby terminated and superseded by this Agreement. Any right, debt, obligation or liability under or secured by the 1992 Agreement shall be deemed a right, debt, obligation or liability under or secured by this Agreement.

4. DEFINITIONS.

4.1. Advances. All costs advanced by District pursuant to Section 10.1 during the Design Phase, except Sunk Costs, together with an estimate made just prior to the Financing and agreed upon by the Parties with respect to all advances, which are to be made by District prior to the end of the Design Phase.

4.2. Advisory Committees. The committees created pursuant to Section 18.6.

4.3. Agreement. This Amended and Restated Treatment and Delivery Agreement between District and City.

4.4 1992 Agreement. The Treatment and Delivery Agreement Among Modesto Irrigation District, City of Modesto, and Del Este Water District that was approved in 1992.

4.5. Approvals. The licenses, permits, entitlements, and privileges necessary for the construction, operation, and maintenance of the Project.

4.6. Board. The Board of Directors of District.

4.7. Chief Executive Officers. The City Manager and the General Manager of District, or their respective designees.

4.8. City. City of Modesto.

4.9. City Gross Water Revenues. All gross income and revenue received or receivable by City from the ownership and operation of City Municipal Water System, which gross income

and revenue shall be calculated in accordance with generally accepted accounting principles, including all rates, fees, and charges received by City for water service and connection and hook-up fees and all other income and revenue however derived by City from the ownership and operation of or arising from City Municipal Water System, but excluding in all cases any proceeds of taxes and any refundable deposits made to establish credit, federal or state grants, or advances or contributions in aid of construction, or monetary recoveries in lawsuits on behalf of City's water rate payers for environmental and other torts and actions at law.

4.10. City Municipal Water System. The municipal water system of City existing on the effective date of this Agreement and all additions, betterments, extensions, and improvements thereto hereafter acquired or constructed.

4.11. Commercial Operation Date. The first day following the Test Period.

4.12. Commercial Operation Phase. The (a) ongoing operation and maintenance of the Initial Facilities, and (b) for the First Expansion Facilities, the Period beginning with the Commercial Operation Date and continuing thereafter.

4.13. Construction Phase. The Period during which the First Expansion Facilities are constructed, ending with the end of the Test Period.

4.14. Debt Service. The payments required to be made for principal, interest, and other charges, if any, to the holders of evidences of indebtedness or certificates of participation issued by District pursuant to this Agreement to finance the Project. If bond insurance is used in connection with Fixed Financing, Debt Service shall include bond insurance premiums.

4.15. Debt Service Reserve Fund. The fund established and maintained pursuant to Section 12.2 of this Agreement.

4.16. Design Phase. The Period of First Expansion Facilities environmental review and design ending with the start of construction of the Project.

4.17. DEW. Del Este Water Company.

4.18. District. Modesto Irrigation District.

4.19. District Interest Rate. For the Period for which interest is to be calculated, interest at the same average monthly yield as District earns on its general fund portfolio, provided, however, that if at any time District's average cost of borrowing money exceeds District's rate of return on its general fund portfolio, the interest on amounts advanced by District shall be District's cost of borrowed money. In no event shall the rate of interest determined pursuant to

this Section 4.18 as applied exceed the legal limit. Interest shall accrue monthly beginning at the time District actually expends the funds on which the interest is to accrue.

4.20. District's Electrical Service Area Boundary. The boundary of the electrical service area of District as shown on the official maps and records of District.

4.21. District's Irrigation District Boundary. The irrigation district boundary of District, as opposed to District's Electrical Service Area Boundary, as shown on the official maps and records of District.

4.22. Domestic Water Year. Each 12 month period commencing on May 1 and ending on the next succeeding April 30.

4.23. Finance Committee. A committee consisting of the Director of Finance of City and the chief financial officer of District, or their respective designees.

4.24. Financing. The actual putting into place of Variable Financing or Fixed Financing to the point of the disbursement of funds as needed to allow construction of the First Expansion Facilities to proceed.

4.25. First Expansion Facilities. The expansion of the MRWTP as described in the SEIR (but excluding those water system transmission and storage facilities to be financed, designed and constructed by City), or such other First Expansion Facilities description as may be approved by the parties in writing.

4.26. Fixed Costs. All costs other than Debt Service which must be borne by District in connection with the Project irrespective of whether the Project is producing Treated Water or not.

4.27. Fixed Financing. Long term Project Financing with fixed terms and rates extending for the length of the repayment period.

4.28. Initial Amount. The amount to be initially deposited to the Reserve and Contingency Fund pursuant to Section 12.1 and thereafter the amount currently required to be maintained in the Reserve and Contingency Fund pursuant to Section 12.1.3.

4.29. Initial Facilities. The diversion facilities, 30 million gallons per day water treatment facilities, pipelines, pumps, storage facilities, and other improvements as described in and completed during the original project pursuant to the 1992 Agreement to deliver Treated Water to City.

4.30. Maximum Annual Debt Service. The largest amount of Debt Service to be paid under Fixed Financing during any Year.

4.31. Modifications. Any improvements or alterations in the Project mandated by regulatory agencies, or required to meet the provisions of Section 9.4, or changes in the Project agreed upon as necessary by the Parties.

4.32. MRWTP. District's Modesto Regional Water Treatment Plant.

4.33. Next Turnout. The first point of diversion onto private land or into a smaller canal or pipeline below any point at which City discharges groundwater into an irrigation canal as provided in Section 9.8.1.

4.34. Other City Water. All groundwater and surface water supplies available to City for municipal and industrial purposes excluding Raw Water and Treated Water.

4.35. Parity Debt. Loans, bonds, notes, advances or indebtedness, or other obligations of City payable from and secured by a pledge of water rates, and charges of City on a parity with the obligations to be paid by City pursuant to this Agreement.

4.36. Parties. District and City.

4.37. Period. One or more Calendar Years or Domestic Water Years and/or any portion thereof.

4.38. Phases. The Design Phase, the Construction Phase, and the Commercial Operation Phase.

4.39. Policy Committee. The Committee created pursuant to Section 18.6.1 of this Agreement.

4.40. Prior Agreement. The Advance Funding and Reimbursement Agreement executed by the parties October 7, 2003, as amended, which identifies environmental review and preliminary design costs to be funded by District and later reimbursed by the First Expansion Facilities Financing.

4.41. Project. The Initial Facilities (as described in and constructed pursuant to the 1992 Agreement) plus the First Expansion Facilities. If the First Expansion Facilities are terminated pursuant to section 22.2 prior to completion, then "Project" shall mean and be limited to the Initial Facilities.

4.42. Project Manager. The person or entity as is appointed pursuant to Section 18.1.2 of this Agreement.

4.43. Project Observer. The observer or observers that may be appointed pursuant to Section 8.2.

4.44. Property Cost. As to an interest in real property either owned or acquired by City and then acquired by District for the Project pursuant to Section 7.1.2, (i) the fair market value of already owned property at the time it is conveyed to District, and (ii) the purchase price of newly acquired property, including, but not limited to, incidental costs such as legal fees, appraisal fees, and title fees.

4.45. [Not Used]

4.46. Raw Water. Water of District diverted to the Project.

4.47. Raw Water Charge. The cost of Raw Water for the year as set forth in Section 14.2.

4.48. Reserve and Contingency Fund. The reserve and contingency fund established and maintained pursuant to Section 12.1 of this Agreement.

4.49. SEIR. The Subsequent Environmental Impact Report for the MRWTP Phase Two Expansion Project dated June 2005.

4.50. Service Area. City municipal water system service areas as shown and described in the Urban Water Management Plan, as the same may be adopted by City from time to time.

4.51. Surface Water Service Area. The portion of the Service Area located within District's Irrigation District Boundary.

4.52. Study. The Water Management Study, prepared by James M. Montgomery Consulting Engineers, dated November 1984.

4.53. Sunk Costs. Those costs associated with the First Expansion Facilities incurred by the Parties and set forth in Exhibit A of this Agreement.

4.54. Technical Committee. The committee created pursuant to Section 18.6.2 of this Agreement.

4.55. Termination. A termination of the Agreement pursuant to section 22.1.

4.56. Test Period. The seven day Period immediately following the completion of the construction of the First Expansion Facilities during which those facilities are tested as to their ability to operate and produce Treated Water meeting the standards of Section 9.4 in the quantity specified in Section 9.2. If during the initial seven day Period the First Expansion Facilities fail to operate and produce Treated Water meeting the standards of Section 9.4 in the quantity

specified in Section 9.2, the Test Period shall be extended until the time when the First Expansion Facilities have in fact demonstrated their ability to operate and produce Treated Water meeting the standards of Section 9.4 in the quantity specified in Section 9.2.

4.57. TIC. "True Interest Cost" as the term is commonly applied in municipal finance.

4.58. Treated Water. All water meeting the standards of Section 9.4 delivered from the Project to City at point or points of delivery.

4.59. Trustee. The trustee or trustees, if any, appointed in the documents executed in connection with any Financing.

4.60. Urban Water Management Plan. The 2000 Urban Water Management Plan dated October 2001, which was adopted by District with District Resolution No. 2001-134 and by City with City Resolution No. 2001-480, as the same may be adopted by the parties from time to time.

4.61. Variable Financing. Project Financing with variable rates and terms during the First Expansion Facilities Construction Phase and until Fixed Financing is put in place.

4.62. Water Shortage Condition. Any Period in which pursuant to Section 17.2 the Treated Water available to City falls below 33,602.1 acre-feet during a full Domestic Water Year because of a reduction in District's water supply due to a cause beyond District's control, whether due to drought, new or amended federal or state statute or regulation, court order, federal or state government agency license, permit, order or ruling, or good faith settlement agreement in lieu of a court order or federal or state government agency order or ruling. Upon completion of the First Expansion Facilities (as evidenced by the Commercial Operation Date), this quantity shall be changed to 67,204.2 acre-feet per year.

4.63. Year. Each 12 month period commencing on January 1 and ending on the next succeeding December 31.

5. TERMINATION OF PRIOR AGREEMENT.

By execution of this Agreement the Parties intend to, and do, hereby terminate and cancel the Prior Agreement, provided, that to the extent provisions of this Agreement are the same or have the same meaning as provisions of the Prior Agreement, those provisions shall be deemed to have been continuously in effect since the date of the Prior Agreement.

6. PROJECT AND FIRST EXPANSION FACILITIES.

6.1. Obligations of District and Expansion. Pursuant to sections 4.41 and 6.1 of the 1992 Agreement, the parties agree to expand the Project to include the First Expansion Facilities.

District shall finance, design, acquire lands and rights-of-way for, acquire licenses and permits for, construct, own, operate and maintain the First Expansion Facilities pursuant to applicable provisions of this Agreement, including, but not necessarily limited to, sections 6 through 13, inclusive and 18. In designing, constructing, operating and maintaining the First Expansion Facilities, District also shall comply with applicable provisions of the SEIR, the related mitigation monitoring plan, and Urban Water Management Plan. The configuration, design, construction, and financing of the First Expansion Facilities shall be determined in accordance with this Agreement.

6.1.1. The parties acknowledge that City intends to concurrently finance, design, acquire lands and rights-of-way for, acquire permits for, construct, own, operate and maintain certain water system transmission, distribution and storage facilities that are described and analyzed in the SEIR but not part of the First Expansion Facilities for purposes of this Agreement.

6.1.2. The Project facilities owned, operated and maintained by District and the points of delivery to City water system are shown on the map attached as Exhibit B and incorporated herein. All municipal water system facilities downstream of such points of delivery are owned by and the responsibility of City. The meters at District-City points of delivery shall be owned and operated by District as part of the Project.

6.2. First Expansion Facilities Phases. Implementation and completion of the First Expansion Facilities shall be undertaken in three Phases consisting of the Design Phase, the Construction Phase, and the Commercial Operation Phase, as described in sections 4.38 and 6 through 9, inclusive.

6.3. Area to be Served by Project. The area to be served by the Project is the Surface Water Service Area. District acknowledges that City's entire Service Area extends beyond the Surface Water Service Area, that the portions of the Service Area located outside of the Surface Water Service Area are served by City with City groundwater and City water supplies other than the Treated Water, and that the Treated Water and Other City Water are commingled in a single water distribution system that serves the entire Service Area. City shall have the right to continue to commingle the Treated Water and Other City Water for use throughout the Service Area, provided that in no event shall water from the Project be transported outside the Surface Water Service Area that is not replaced with an equal or greater amount of Other City Water in

accordance with section 17.6 below. Subject to all other limitations in this Agreement, Treated Water may be used outside the Surface Water Service Area without replacement by Other City Water if the Parties have approved that use after any environmental processing required by law has taken place.

6.4. Ownership, Assignment, and Sale of Project Water to Others.

6.4.1. District Sole Owner. District shall be the sole owner of the Project, however City shall have rights in the Project as set forth in this Agreement.

6.4.2 Sale, Transfer, or Assignment. Except as to management and operation as expressly provided in section 6.4.3, District shall not sell, transfer, or assign any interest in the Project. This section 6.4.2 does not prohibit District from disposing of excess or surplus personal property or land, provided that the proceeds of the disposition shall be credited to the Project.

6.4.3. Assignment of Management and Operations. In the event that District contemplates the assignment or transfer of the management and operation of its interest in the Project to an entity other than City, then, prior to the assignment or transfer, the Parties shall meet and confer to determine whether it is practical to make the assignment or transfer to City. District shall not assign, transfer, contract out, or subcontract all or substantially all of District's operation and maintenance obligations under the Commercial Operation Phase without the prior written consent of City.

6.4.4. Interest of City. Upon completion of the Construction Phase and during the life of this Agreement throughout the Commercial Operation Phase, including after retirement of the Fixed Financing or other debt for the Project, City shall have and continue to have a permanent beneficial interest in the output of the Project in accordance with the terms of this Agreement.

6.4.5. Assignment By City. City shall not assign or transfer its right or interest in the Project, in whole or in part, without the prior written consent of District, which consent shall not be unreasonably withheld. Any assignment or transfer by City without consent of District shall be void. No assignee or transferee of City shall obtain any right or interest in this Agreement until it assumes by written instrument all obligations under this Agreement with respect to the right or interest transferred or assigned, and it becomes a Party to this Agreement by executing this Agreement or an amendment thereto also executed by the Parties.

6.4.6. Sale of Treated Water to Other Entities. District shall not sell, lease, transfer, or in any other manner direct or convey Treated Water from the Project to any person or entity other than City without the prior written consent of City, which consent shall not be unreasonably withheld. Prior to selling, leasing, transferring, or conveying Treated Water from the Project to any person or entity other than City, District shall first offer the water to City. City may take all or a portion of the Treated Water offered. Unless parties otherwise agree, the price of any Treated Water sold, leased, transferred, or conveyed by District to any person or entity other than City shall not be less than the full cost of producing the water including Sunk Costs and Raw Water, capital, treatment, operation, maintenance, and administrative costs, and in any event shall not be lower than the price to City. In the event the cost of furnishing water to any person or entity other than City is less than the charges to that person or entity, the excess revenue shall be applied to the operation of the Project. Subject to the provisions of Section 6.4.5, this Agreement shall inure to the benefit of and be binding upon the Parties and their respective successors and assignees.

6.5. Disposition of Plans. City, upon request, shall be entitled to obtain and keep copies of all reports, drawings, studies, plans, specifications, other engineering documents, and all other documents pertaining to the Project, provided that City has fully paid its share of all costs due up to the time of the request, as those costs are due and owing pursuant to this Agreement.

6.6. Cooperation in Proceeding with First Expansion Facilities. District shall, to the extent it has not already done so, utilize its best efforts to acquire and maintain ownership of all easements, water conveyance rights, water rights, and Approvals necessary for the construction, operation, and maintenance of the First Expansion Facilities. City shall utilize its best efforts to support the First Expansion Facilities and its Financing and assist District in regard to the matters set forth in this Section 6.6 in order to facilitate the Financing, construction, operation, and maintenance of the First Expansion Facilities.

7. DESIGN PHASE.

7.1. Design Phase Work. Under the Advance Funding and Reimbursement Agreement, Design Phase work on the First Expansion Facilities has been commenced and is currently under way. District has retained various engineers and consultants to perform the work. District may utilize different engineers and consultants on the First Expansion Facilities, subject

to City's approval of engineering services contracts pursuant to Agreement section 18.3.1. To the extent items are not already completed or under way, during the Design Phase each of the following shall occur:

7.1.1. District to Obtain Approvals. To the extent practical, District shall obtain all Approvals during the Design Phase. Approvals, which cannot be obtained during Design Phase, shall be obtained as soon thereafter as practical.

7.1.2. Property Interests. District shall acquire all land, easements, and rights of way required for the construction, operation, and maintenance of the First Expansion Facilities including real property interests owned by City where applicable. City shall assist with the identification and acquisition of all water storage sites within its respective Service Areas. If City either acquires real property for District's portion of the First Expansion Facilities, or agrees to the utilization of already owned property for District's portion of the Project, then District shall acquire the real property from City at the Property Cost.

7.1.3. Preliminary and Final Design. The First Expansion Facilities engineers shall prepare preliminary design development plans and specifications and a preliminary cost estimate, and, after approval by the Parties of the preliminary design and cost estimate as provided in Sections 18.3 and 18.4, the engineers shall prepare final and complete construction documents and a final cost estimate.

7.1.4. Preliminary Financing Work. The financial advisor, underwriter, bond counsel, and District shall perform preliminary work necessary for the Financing of the First Expansion Facilities and shall make a Financing proposal to City.

7.2. Costs for Design Phase to be Advanced. Costs for all work performed during the Design Phase shall be advanced in accordance with the provisions of Section 10.1.

7.3. Reimbursement of Advanced Design Phase Costs. Reimbursement of the costs advanced pursuant to Section 10.1 shall be made in accordance with Section 10.2. The SEIR and First Expansion Facilities environmental review costs shall be considered design costs to be advanced by District and reimbursed pursuant to sections 4.1, 7.2, 7.3, 10.1 and 10.2; provided, however, that SEIR, First Expansion Facilities environmental review and other costs paid or advanced by City pursuant to the Prior Agreement shall not be reimbursed to District, but shall be reimbursed to City through the First Expansion Facilities Financing.

8. CONSTRUCTION PHASE.

8.1. Finalization of Financing and Construction. The Construction Phase shall consist of finalization of the Financing and the construction of the First Expansion Facilities. Prior to the commencement of the Construction Phase all necessary agreements for the Financing and construction, purchase, and sale of water, and operation and maintenance of the First Expansion Facilities shall be executed.

8.2. First Expansion Facilities Observer. City may designate a First Expansion Facilities Observer to function during the Construction Phase. City shall pay all costs for the First Expansion Facilities Observer, including, but not limited to, salary and fringe benefits. A First Expansion Facilities Observer may: (i) be at the construction site of the First Expansion Facilities at any time he/she elects; (ii) observe on-going and completed construction; and (iii) have access to all of District's records, files, and documents related to the design and construction of the First Expansion Facilities. He/she shall not direct, comment to, correct, advise, or otherwise deal with personnel of any contractor or District except that the First Expansion Facilities Observer may bring to the attention of the Project Manager any concerns noted by him/her and may bring those concerns to City. The First Expansion Facilities Observer shall observe all applicable requirements of the Occupational and Health Safety Act and all other statutes, rules, and regulations applicable to employee safety on construction sites. The Project Manager may exclude from the construction site any First Expansion Facilities Observer who, after warning, fails to observe the limitations and requirements of this Section 8.2.

9. COMMERCIAL OPERATION PHASE.

9.1. Commercial Operation Phase. District shall continue the Commercial Operation Phase as to the Initial Facilities. The Commercial Operation Phase for the First Expansion Facilities shall commence immediately following the Test Period. Any water produced during the Test Period, which meets the standards of Section 9.4, shall be delivered to City.

9.2. Test Quantity. During the Test Period after completion of the First Expansion Facilities, Treated Water from the MRWTP shall be produced at a rate of 60 million gallons per day or at the highest rate below 60 million gallons per day which City system is able to accept. During the Test Period every reasonable effort shall be made to produce Treated Water at the rate of 60 million gallons per day. The Parties shall cooperate during the Test Period in an effort to maximize production of water and acceptance of water by City system.

9.3. District Obligations During Commercial Operation Phase. During the Commercial Operation Phase District shall: (i) operate and maintain the Project in as economic a manner as practical in accordance with generally accepted waterworks practices as evidenced by well designed and operated potable water treatment plants of a similar size in Northern California; and (ii) deliver Treated Water to City consistent with the terms of this Agreement. Until the Commercial Operation Date for the First Expansion Facilities, District's operation and maintenance responsibilities shall be limited to the Initial Facilities. After the Commercial Operation Date for the First Expansion Facilities, District's operation and maintenance responsibilities shall include the First Expansion Facilities.

9.4. Standards of Treated Water. Throughout the term of this Agreement, or any successor or substitute agreement, or extensions thereof, District shall deliver to City Treated Water which meets all state and federal drinking water quality standards applicable to the Project at the time of delivery to City system.

9.5. Obligation of City to Take Water. City at all times shall exercise its best efforts to take all Treated Water made available to City, up to the amount identified in Sections 14.8 and 17.3.

9.6. Cooperation in Operation. The Parties shall cooperate and remain in frequent telephonic or other communication so as to efficiently operate the domestic water system and fully put to use the Treated Water produced by the MRWTP.

9.7. Expansion of Groundwater Capacity and Commingling of Groundwater. Throughout the term of this Agreement, City shall maintain and, to the extent it deems necessary, expand, its well system so that the groundwater used in conjunction with the Treated Water will best enable City to be able to meet its customer demands. It is understood that District's obligations to deliver Treated Water are as otherwise set forth in this Agreement. Groundwater is to be delivered by City through its same water pipelines which will carry the Treated Water, resulting in a physical commingling of the groundwater and surface supplies.

9.8. Exchange of Groundwater for Treated Water. Subject to the absolute limitation of 67,204.2 acre feet per Domestic Water Year, and subject to approval of District as to time and place of delivery, which approval shall not be unreasonably withheld, City, at its option, may deliver groundwater to District irrigation canal system in exchange for an additional amount of

Treated Water from District equal to the quantity of groundwater delivered to District irrigation canal system, provided that each of the following conditions is met:

9.8.1. Delivery. Any groundwater delivered by City shall be delivered into one of the irrigation canals of District. After blending the groundwater discharged with the water then in the canal, the quality of the water, sampled at the Next Turnout, shall be of a quality suitable for agricultural use, including without limitation, use for crops, orchards or livestock.

In the event that water samples at the Next Turnout demonstrate, based upon the quality standards set forth above, that the groundwater after mixing is not suitable for agriculture, City shall immediately cease making those discharges which contribute to the unsuitability of the water at the point at which the sampling occurred

9.8.2. Costs. City shall bear all costs, including the cost of additional capital facilities, if any are necessary, associated with delivering exchange groundwater supply to District irrigation canal system.

9.8.3. Records. City shall maintain a record of the quantity of exchange groundwater delivered to District irrigation canal system and the quality of blended water in the canal at the Next Turnout below each point of introduction of groundwater.

9.8.4 Use of District Pumps. In order to facilitate the exchange of groundwater pursuant to this Section 9.8, City may enter into an agreement with District for the use of District owned or controlled pumps to accomplish the exchange. City shall reimburse District for all costs incurred, including electric rates normally charged for pumping and costs of operations, maintenance, repair, administration, and personnel. Agreements pursuant to this Section 9.8.4 shall be at the sole discretion of District.

9.9. Force Majeure. District shall be excused from its obligation to deliver Treated Water in the event that District is rendered unable, wholly or in part, by force majeure to carryout its obligations under this Agreement. Upon the occurrence of an event of force majeure, District shall give notice and full particulars of the force majeure in writing, or by telephone followed by a writing. District's performance shall be suspended during the continuance of the force majeure. The term "force majeure" as used herein shall mean acts of God, strikes, lock-outs, failure or refusal of any person or entity to comply with then existing agreements to obtain or ship materials or equipment, or industrial disturbances, acts of a public enemy, wars, blockades, insurrections, riots, epidemics, landslides, lightning, earthquakes, volcanic eruptions,

fires, flood, washouts, or other natural disasters, threat of physical harm or damage resulting in the evacuation or shutdown of facilities necessary for the supply, treatment, and distribution of water, arrests and restraints of governments and people, civil disturbances, insurrection, explosions, sabotage, restraint by court order or public authority, other than District, having jurisdiction over the Project, and action or non-action by, or failure to obtain authorizations or approvals from, any governmental agency or authority of competent jurisdiction, and any other causes, whether of the kind herein enumerated or otherwise, not within the control of the Party claiming force majeure and which, by the exercise of due diligence, the Party is unable to prevent or overcome. District shall use its best efforts to promptly bring to an end any condition falling within the definition of force majeure. District shall prepare, revise from time to time as appropriate, and implement when necessary an operational plan to deal with strikes and lockouts so as to minimize interruption of the delivery of Treated Water to City in the event of a strike or lockout. It is understood and agreed that the settlement of strikes or lockouts shall be entirely at the discretion of the Party having the difficulty. In the event of a strike or lockout, District's obligation to perform under this Agreement shall not be suspended for a Period of more than 60 days. If District gives notice of a force majeure event which impacts District's ability to deliver Treated Water, then the provisions of Section 13 shall be determinative as to whether City is excused from its obligation to pay Debt Service and Fixed Costs. Upon the occurrence of any event of force majeure which may render District wholly or in part unable to carry out its obligations under the Agreement, to the extent reasonably practical District shall use its best efforts to promptly implement a plan to ensure the continued operation of the Project and continued delivery of Treated Water to City.

10. ADVANCE OF PRE-CONSTRUCTION COSTS.

10.1. Advances by District, City, Sunk Costs, and Approval of Other Costs. City shall be liable for the payment of all costs and expenses of all Phases of the Project in accordance with this Agreement. To facilitate the planning and construction of the First Expansion Facilities, and pursuant to the Prior Agreement, District has already advanced certain First Expansion Facilities costs. Some costs have been advanced by City. District shall advance all costs reasonably necessary for completion of all engineering and design work, feasibility studies, permit, and licensing costs, and all other work required and conducted during the Design Phase of the First Expansion Facilities. The costs shall be reimbursed by City as set forth in Section 10.2; however,

in order for costs incurred by District to be reimbursed by City, the costs must be either included as Sunk Costs identified in Exhibit A or approved by City. Separate approval shall not be required as to costs approved as a part of a Project milestone as provided in Sections 18.3 and 18.4. Any cost not approved by City shall be subject to further review in the manner provided in Section 18.6. As also indicated on Exhibit A, City has also advanced a portion of Sunk Costs.

10.2. Reimbursement. Upon Termination, City shall reimburse District for all Sunk Costs and Advances not previously reimbursed or incorporated into a Financing, unless the Parties agree otherwise. In the event of a Termination of the First Expansion Facilities pursuant to Section 22.2, and the Parties abandon the First Expansion Facilities, City shall not be required to reimburse District pursuant to this Section 10.2. If the Project proceeds to Financing, reimbursement of Sunk Costs and Advances to District and reimbursement of Sunk Costs to City shall be included in the principal amount of the financed obligation. District and City shall be reimbursed for Sunk Costs and District shall be reimbursed for Advances from the proceeds of the Financing.

10.3. Interest on Advances. Amounts advanced by the Parties pursuant to Section 10.1 shall bear interest at District Interest Rate until repaid.

10.4. Costs of Studies and Negotiation Borne by Each Party. Costs of studies conducted by either Party for its own purposes and costs associated with the preparation and negotiation of this Agreement or subsequent or other agreements between the Parties shall be borne by the Party incurring the costs and shall not be advanced pursuant to Section 10.1, nor reimbursed pursuant to Section 10.2.

11. DRAINAGE.

11.1. Responsibility. District shall not be responsible for any drainage pumping or facilities necessary to maintain water tables so as to avoid damage to structures and crops within the Service Area of City. City shall not be responsible for any drainage pumping or facilities necessary to maintain water tables so as to avoid damage to structures and crops outside the Service Area of City.

11.2. Indemnification. Each Party shall indemnify, protect, defend, and hold harmless the other Party, and its respective officers, directors, officials, employees, agents, and volunteers, from and against any and all liabilities, claims, damages, losses, judgments, penalties, costs or expenses (including attorney fees) arising from rising groundwater tables within the service area

of the indemnifying Party. For the purposes of this Section 11.2, District's service area shall be that portion of District lying outside of the Service Area of City.

12. RESERVE FUNDS.

12.1. Reserve and Contingency Fund. District shall continue to maintain a Reserve and Contingency Fund. The Initial Amount shall be $500,000.

12.1.1. Additional Deposits to Reserve and Contingency Fund. If the balance in the Reserve and Contingency Fund shall fall below the Initial Amount as of the end of any Year, then the amount of the shortfall shall be added to the amount to be paid by City pursuant to Section 15 during the next ensuing Domestic Water Year.

12.1.2. Withdrawals From Reserve and Contingency Fund. The Reserve and Contingency Fund shall be subject to withdrawals by District for the following purposes:

12.1.2.A. Unbudgeted Items. The cost of (i) unbudgeted necessary repairs and replacements required to maintain the Project in good order in keeping with the standards evidenced by similar sized potable water treatment plants in Northern California and at all times able to produce Treated Water meeting the standards of Section 9.4; plus (ii) all unbudgeted Modifications.

12.1.2.B. Costs in Excess of Budget Amount. Costs, including, among other things, Fixed Costs and Debt Service, for the operation and maintenance of the Project, which exceed the funds available pursuant to Section 15 for any Period.

12.1.2.C. Budgeted Items. The cost of budgeted repairs, replacements, and Modifications if so agreed by all of the Parties.

12.1.3. Increase or Decrease in Reserve and Contingency Fund. From time to time, as a part of and subject to the budget process set forth in Section 18.7.2, District may, if experience reasonably indicates, increase or decrease the Initial Amount and in the event of an increase in the Initial Amount, provide for necessary additional payments by City during the next ensuing Domestic Water Year so as to increase the balance in the Reserve and Contingency Fund. In the event of a decrease in the Initial Amount, the excess balance in the Reserve and Contingency Fund shall be credited against payments due from City during the next Domestic Water Year.

12.1.4. Reserve and Contingency Fund Advances. If at any time because the Reserve and Contingency Fund is depleted or contains insufficient funds so that District must

advance funds which otherwise would be obtained from withdrawals from the Reserve and Contingency Fund under Section 12.1, then the aggregate amount of the advances during any Year and the amount necessary to replenish the Reserve and Contingency Fund to its established balance shall be added to the amount to be paid by City pursuant to Section 15 during the next ensuing Domestic Water Year. The amount of advances by District to the Reserve and Contingency Fund while outstanding shall bear interest at District Interest Rate. Funds received monthly by District by payments from City pursuant to this Section 12.1.4 shall be applied first to interest and then to the replenishment of the Reserve and Contingency Fund.

12.1.5. Interest on Reserve and Contingency Fund. Funds in the Reserve and Contingency Fund shall be invested by District and actual interest earned on the funds shall be credited to the Reserve and Contingency Fund.

12.1.6. Reports. District shall submit to the Technical Committee no less often than quarterly a report setting forth the current balance of the Reserve and Contingency Fund, income and expenditures from the Fund, and anticipated expenditures, if any during the remainder of the year.

12.2. Debt Service Reserve Fund. District shall establish and maintain a Debt Service Reserve Fund. There shall be deposited into the Debt Service Reserve Fund from the Fixed Financing, an amount equal to the Maximum Annual Debt Service. The Debt Service Reserve Fund shall be held by the Trustee. If the First Expansion Facilities proceed to Financing, then the amount of the Debt Service Reserve Fund under this section shall be increased by an amount equal to the Maximum Annual Debt Service for the Fixed Financing of the First Expansion Facilities. In the alternative, District may establish and maintain under this section a second, separate Debt Service Reserve Fund in this amount for the First Expansion Facilities.

12.2.1. Withdrawals From Debt Service Reserve Fund and Replenishment of Debt Service Reserve Fund. Withdrawals from the Debt Service Reserve Fund shall only be made for the purpose of making current payments of Debt Service obligations. If any such withdrawal is made from the Debt Service Reserve Fund, due at any time that funds available under the provisions of Section 15 and/or Section 12.1 are insufficient to meet current Debt Service Reserve Fund, City shall pay pursuant to Section 14.1 and Section 15.1 that amount necessary to replenish the amount on deposit in the Debt Service Reserve Fund to an amount

equal to the Maximum Annual Debt Service no later than one year following such withdrawal from the Debt Service Reserve Fund.

12.2.2. Interest On Debt Service Reserve Fund. Funds in the Debt Service Reserve Fund held by the Trustee shall be invested by District and actual interest earned on the funds shall be credited annually as a part of each Year's budget to sums otherwise due from City pursuant to Section 15 after deducting from interest earnings any amounts which must by law be paid to the United States. It is anticipated that the Debt Service Reserve Fund will be invested in an investment vehicle such as Guaranteed Investment Contingent Fund or a state and local government securities fund.

12.2.3. Final Disposition. The balance on hand in the Debt Service Reserve Fund shall be applied to the final payment or payments of Debt Service.

12.2.4. No Duplication. To the extent the Financing documents provide for a Debt Service Reserve Fund, the provisions of the Financing documents shall prevail. In the event that any reserve requirements set forth in any Financing documents duplicate or parallel the requirements of this Section 12.2, it is agreed that in no event shall contributions to the Debt Service Reserve Fund and any similar fund exceed an aggregate amount equal to the Maximum Annual Debt Service.

13. FINANCING AND TAKE OR PAY PROVISION.

13.1 District to Arrange Financing, Take or Pay Provision, Excuse from Take or Pay. District, subject to Section 18.5, shall use its best efforts to arrange Financing for the construction of the First Expansion Facilities using bonds or other evidences of indebtedness or certificates of participation, which shall be secured in part by the provisions of this Agreement.

City shall pay the Fixed Costs and Debt Service of the Project whether or not the Project or any part of it is operating or operable or its output or capability is suspended, interrupted, interfered with, reduced or curtailed, or terminated in whole or in part except as excused below. The payments of Fixed Costs and Debt Service shall not be subject to reduction whether by offset, counterclaim, recoupment, or otherwise and shall not be conditioned upon the performance or nonperformance by either Party to any agreement or for any other cause or reason whatsoever. The "take or pay" obligation of City with respect to Debt Service shall commence at the time that Debt Service payments actually commence under the applicable Financing. The "take or pay" obligation of City with respect to Fixed Costs shall commence at

the time of the commencement of the Commercial Operation Phase, which shall occur at the end of the Test Period. City shall not be required to pay Debt Service or Fixed Costs if any of the following specific conditions shall occur:

13.1.1. Excuse, 50 Percent of Contracted Water Not Delivered. District for any reason other than Drought shall fail to deliver at least 50% of the Treated Water that City is scheduled to receive for any Domestic Water Year (as determined pursuant to sections 17.1 and 17.2 of the Agreement) for a Period in excess of 18 consecutive months. For purposes of this provision, the particular Domestic Water Year shall be that year in effect at the beginning of the 18-month term.

13.1.2. Excuse, 50 Percent of Water Supply. 50 percent or more of District's total annual water supply, as adjusted as provided in Section 17.2 shall be lost or unavailable for physical reasons beyond District's best efforts to control, other than Drought, for a Period in excess of 24 consecutive months.

13.1.3. Excuse, 80 Percent of Water Treatment Plant Destroyed. 80 percent or more of the water treatment plant, which is a part of the Project, shall be destroyed or disabled for a period in excess of 24 consecutive months.

13.2. New Period of Excuse. A new 18 month, and if applicable, 24 month Period, shall not commence for the purpose of Section 13.1 until a consecutive 12 month Period, during which at least 75 percent of the Treated Water which City is to receive pursuant to Sections 17.1 and 17.2 of this Agreement has been delivered, has passed.

14. PAYMENT FOR WATER BY CITY.

In exchange for District agreeing to make available to City Treated Water in the manner set forth in this Agreement, City shall pay each Domestic Water Year in equal monthly installments the sum of the items set forth below. The sum shall be calculated and paid to District as set forth in Section 15 regardless of the amount of Treated Water actually delivered to City, or, subject to the exceptions found in Section 13.1, whether any Treated Water is delivered. The sum to be paid shall be comprised of the following:

14.1. Debt Service. Debt Service, so long as there is outstanding indebtedness incurred by District in connection with the Project, plus the amounts, if any, necessary to replenish the Debt Service Reserve Fund pursuant to Section 12.2.1.

14.2. Raw Water Charge. District shall charge City for Raw Water at the same rate as District charges for water furnished by District to its agricultural water users. The Raw Water Charge shall be charged only for water actually delivered to the Water Treatment Plant. In setting the rates for Raw Water, District shall be guided by the following principles:

(i) The economy of District is, to a great extent, dependent upon fair, reasonable, and economical irrigation water rates, and District, in setting such irrigation water rates shall be mindful of the impact that increases in water rates would have on agriculture and the economy of District.

(ii) District shall not derive a profit from its Raw Water diverted to the Project.

(iii) City shall be fully advised through the budget process set forth in Section 18.7 of the proposed water rates to be set by District.

(iv) The rates established for Raw Water and water furnished to District's agricultural water users shall be adopted by the Board only after a public hearing for which at least ten days' notice has been given in writing to City.

(v) Water rates shall be fair, reasonable, and economical as to both District's agricultural water users, and to City.

In order to observe the foregoing principles, it will be necessary to convert the agricultural water users supply to acre feet and the agricultural water users charge to a "per acre foot charge." The cost of Raw Water shall then be calculated as follows:

14.2.1. Agricultural Allocation in Acre Feet. District provides a water supply to its agricultural water users during each irrigation season. In some seasons, it is possible to allow irrigation water to each agricultural water user to the extent of demand. In other seasons it is found necessary by the Board to allocate, that is to reduce, the amount of water available to agricultural water users. When allocation is necessary it is the practice of the Board to announce, usually in March or April, the allocation for the season allowing a certain number of inches of water for the season for each agricultural acre to which agricultural water is provided. For the purposes of this Agreement, if no allocation of agricultural water is announced for any agricultural season, then the allocation for that season shall be presumed to be 42 inches. The

allocation for agricultural water for each irrigation season shall be converted to acre feet by taking the number of inches of water allocated and dividing by 12. In some Years the Board may provide for an allocation on an optional basis. For example, the Board may provide for a base supply of 33 inches of water for each agricultural acre at a charge of $7.50 per acre with an option of up to another 12 inches for $7.50 per acre with a limited option in certain cases for additional water at $15.00 per acre-foot. Under such an allocation, a maximum allocation of 42 inches would be assumed and the allocation of 42 inches would be divided by 12 to obtain acre-feet.

14.2.2. Acre Foot Charge. Presently, District charges for water furnished to agricultural water users on a per acre basis; Raw Water furnished pursuant to this Agreement shall be charged on a per acre foot basis. Accordingly, the per acre charge for agricultural water set for each irrigation season by District shall then be divided by the number of acre feet derived pursuant to Section 14.2.1 and the result shall be the charge for each acre foot of Raw Water supplied to the Project for that irrigation season. In the event of an allocation similar to the example, as described in Section 14.2.1, the first 33 inches would be divided by 12 and the quotient would be divided into $7.50. The remaining nine inches of the total of 42 inches would be divided by 12 and would be charged at the rate of $7.50 per acre-foot.

14.2.3. Irrigation Season not Concurrent with Year. Each irrigation season, depending upon need, commences at some time after the beginning of each Year. Thus, two Raw Water rates may be applicable for portions of each Year; the actual Raw Water charges for each Year shall be calculated accordingly.

14.2.4. Raw Water Charge not Applicable. Treated Water delivered in exchange for groundwater delivered to District irrigation canals pursuant to Section 9.8 shall be subject to the same costs as all other Treated Water except there shall be no charge for Raw Water provided for in this Section 14.2.

14.2.5. Change in Method for Charging for Agricultural Water. In the event that District adopts a new method of charging for, or allocating, agricultural water, the Parties shall agree upon a new method of calculating the Raw Water charge devised so that the Project shall bear the same cost per acre foot as is borne by the agricultural water users of District.

14.2.6. Measurement of Raw Water. Raw Water shall be measured at its point of entry into the MRWTP.

14.3. Operation and Maintenance Costs. The actual operation, maintenance, repair, replacement, and Modification costs directly attributable to the operation of the Project for the Year, less sums drawn against the Reserve and Contingency Fund pursuant to Section 12.1.2, except any sum drawn against the Reserve and Contingency Fund for Debt Service. It is agreed that no item for depreciation shall be included in the sums calculated and paid pursuant to this Section 14 and Section 15.

14.4. Administrative Services. An amount equal to the reasonable actual cost of administrative services fairly attributable to the operation of the Project and the administration of this Agreement including, but not limited to, legal, accounting, and consulting engineering services, and the actual cost of paying agents or other services which District requires in processing and making payments to the holders of indebtedness incurred by District in connection with the Project.

14.5. Insurance. The actual cost of all insurance required by this Agreement to be maintained by District.

14.6. Electric Energy. The cost of electric energy provided to the Project. Electric energy will be provided by District. District shall charge the Project, from time to time, consistent with District policy as to use and applicable rate structure and cost the same as would be charged to District itself.

14.7. Other Payments and Costs and Deductions From Payments and Costs. The amount of payments or costs and deductions from payments or costs specified by Sections 12.1.1, 12.1.3, 12.1.4, and 12.2.2, and 16.3.2.

14.8. Payments by City to District for Raw Water Only. To assist District in planning its budget, City will pay District on an annual Domestic Water Year basis in accordance with the following:

1. City shall estimate and provide its estimate to District no later than thirty (30) days prior to the commencement of each Domestic Water Year, its anticipated usage of Treated Water.
2. District shall multiply the raw water charge determined in accordance with Section 14.2, above, by City's estimate to obtain a total estimated annual Raw Water Charge to City for budget planning purposes.

3. At the end of each Domestic Water Year, District shall calculate City's actual total Raw Water Charge in accordance with Section 14.2 of this Agreement, based on actual Raw Water used and use this cost for calculation of City's payments pursuant to Sections 15.3 and 15.4.

14.9. First Expansion Facilities. Upon completion of the First Expansion Facilities (as evidenced by the Commercial Operation Date), the application of the billing and payment provisions in this section shall be modified to provide for billing and payment to include the operation and maintenance of the First Expansion Facilities.

15. TIME AND MANNER OF PAYMENT BY CITY TO DISTRICT.

15.1. Monthly Payments. Payment of the total sum due for each Year pursuant to Section 14 shall be as set forth in this Section 15. Each monthly payment to be made pursuant to this Section 15 shall be made on the first day of each month.

15.2. Proration. Any payment made pursuant to this Agreement which covers less than a full month or which covers less than a Year shall be prorated accordingly.

15.3. Calculation of Monthly Payments. Prior to December 31 of each Year, District shall prepare and adopt a budget for the forthcoming Year pursuant to section 18.7 of this Agreement. The budget shall include all of the items listed in section 14. The budget for a Year shall determine and set forth a monthly payment amount to be made by City which shall be the net amount of budgeted expenses for the Year, less any refunds or credits allowed to District in connection with the Project pursuant to the Agreement, divided by 12. Each Year, the new monthly payment calculated as provided in this section 15.3 shall take effect at the beginning of the next ensuing Domestic Water Year (i.e., the new monthly payment for a Year shall take effect on May 1 of that Year). Regarding the First Expansion Facilities, (a) the budget and City payments shall be increased to include Debt Service for the First Expansion Facilities Financing for the Year in which the Debt Service payments for such Financing become due, and (b) the budget and City payments shall be increased to include the other expense items for the First Expansion Facilities listed in section 14 after the Commercial Operation Date for the First Expansion Facilities.

At the conclusion of each Year, District shall prepare an accounting of the actual expenses for the Year as compared with the Year's budget and City payments for the Year, and determine whether City made overpayments or underpayments for the Year based on the actual

City payments compared to actual expenses. City shall pay the amount of any underpayment for a Year in a lump sum payment to District. District shall pay the amount of any overpayment for the Year in a lump sum payment to City. The amount of any such overpayment or underpayment shall be reflected in the first invoice for the Domestic Water Year immediately following the completion of the accounting, and shall be due and payable at the time payment of such invoice is due and payable.

15.4 Late Payments. Any amounts owed by one Party to the other Party under this Agreement that is not paid in full when due shall thereafter bear interest at the rate of 1% per month of the unpaid balance, or at the maximum lawful rate, whichever is less.

16. GENERAL PAYMENT PROVISIONS.

16.1. Percentages. [Not Used].

16.2. Records. District shall (i) keep and maintain and provide to City detailed cost accounting reports documenting the Project costs, (ii) keep and maintain separate accounting and bookkeeping records with a separate account and fund for the Project, and (iii) allow City and its employees, accountants, attorneys and agents to review, inspect, copy and audit the accounting and bookkeeping records of District, including all source documents. District shall have the right to review, inspect, copy, and audit all accounting and bookkeeping records of City, including all source documents, as may pertain to the receipt, delivery, and sale of water received from the Project.

16.3. Security for Payment, Rate Covenant by City. Prior to obtaining the Financing for the First Expansion Facilities as set forth in Section 13.1, District shall be entitled to the assurances it may reasonably deem necessary, and be entitled to the financial information as may be necessary, to ascertain that City is in the financial condition as will allow it to fulfill its financial commitments to the First Expansion Facilities.

16.3.1. [Not Used]

16.3.2. Security from City. City's security obligation pursuant to this Section 16.3 shall be satisfied by the following rate covenant and pledge of City Gross Water Revenues which shall be effective and binding upon City upon the execution of this Agreement by the Parties:

16.3.2.A. Rates and Charges. City shall fix, prescribe, and collect water rates and charges which shall be at least sufficient to yield City Gross Water Revenues during

each fiscal year of City in an amount equal to: (i) the payment obligations of City under this Agreement during the fiscal year other than Debt Service; (ii) City maintenance and operations costs to the extent not included in clause (i) above; plus (iii) one hundred twenty-five percent (125%) of the Debt Service to be paid during the fiscal year.

16.3.2.B. Pledge. All City Gross Water Revenue and all money on deposit in the funds established by this Agreement are hereby irrevocably pledged to the punctual payment of the interest on and principal of and redemption premiums if anyone the obligations evidencing the Financing and all obligations of City under any Parity Debt. This pledge shall constitute a lien on and security interest in City Gross Water Revenues and funds established by this Agreement and shall attach, be perfected, and be valid and binding from and after the consummation of the Financing or the issuance of Parity Debt, without any physical delivery thereof or further act. If City gives any additional collateral to secure the payment of the Financing, City agrees that such collateral shall also secure all obligations of City under any Parity Debt on a pari passu basis.

16.3.2.C. Similar Covenant. City hereby covenants and agrees that it shall require a covenant substantially similar to clauses (i), (ii), and (iii) of Section 16.3.2.A with respect to all Parity Debt.

16.3.2.D. Parity Debt. In addition to its obligations hereunder, City may issue or incur Parity Debt in such principal amount as shall be determined by City in accordance with Section 16.3.2.C.

16.3.2.E. Subordinated Debt. In addition to its obligations hereunder, City may issue or incur loans, bonds, notes, advances or indebtedness payable from City Gross Water Revenues on a junior and subordinated basis with its obligations hereunder in such principal amount as shall be determined by City.

16.3.2.F. Amendment To Obtain Financing. This Section 16.3.2 may be amended from time to time by the Parties to the extent necessary to obtain the Financing as set forth in Section 13.1 and, after the Financing is obtained and so long as it remains unpaid, may only be amended in accordance with the terms and conditions of the legal documents for the Financing.

16.3.2.G. Alternative Security. City may be relieved from its obligation to perform any of the covenants set forth in this Section 16.3.2 by providing to District for

deposit with Trustee a policy of municipal bond insurance, irrevocable letter of credit, surety bond or similar credit facility assuring payment of Debt Service due and payable by City pursuant to this Agreement, and which is acceptable to District and Trustee in accordance with the terms and conditions of the Financing.

17. DELIVERY OF WATER.

17.1. Water Supply to City. Subject to Sections 4.41 and 17.2, District shall make available to City an amount of Treated Water equal to 30 million gallons per day. District shall consult with City on a regular basis during the Commercial Operation Phase to determine the schedule of deliveries, and, consistent with the terms of this Agreement, District shall use its best efforts to meet the requirements of City. Notwithstanding any other provision of this Agreement, in a Drought situation the delivery of surface water by District for agricultural uses to its agricultural customers and for municipal uses to City shall be reduced in equal proportions in accordance with the formula in Section 17.2.

Upon completion of the First Expansion Facilities (as evidenced by the Commercial Operation Date), the Treated Water quantities as set forth in sections 17.1 to 17.7 shall be changed from 33,602.1 acre-feet per year and 30 million gallons per day to 67,204.2 acre-feet per year and 60 million gallons per day.

District promises and agrees to treat District's agricultural customers and City on a parity basis. If District is required to reduce deliveries, it will cut back its deliveries to its agricultural customers and to City in equal proportions. In keeping with the foregoing, District agrees that its commitments to its agricultural customers and to City shall be met before any subsequent water transfers for delivery of water outside District's boundaries. It must be understood, however, that "transfers" between District and Turlock Irrigation District made in the ordinary course of operations are not included in the foregoing, as District and Turlock Irrigation District regularly deliver water to each other in the interest of maximizing beneficial use of their water rights and facilities.

17.2. Formula for Water Allocation. During each Domestic Water Year, District shall make available to City 33,602.1 acre feet of Treated Water provided that the allocation of City shall be reduced in any Domestic Water Year that the following calculation results in a sum less than 33,602.1 acre feet:

$$(Y/42) \times 33,602.1 = X$$

"Y" shall be the actual number of inches of water allocated by the Board to agricultural water users for the subject irrigation season commencing immediately prior to each Domestic Water Year. In the event a portion of the water allocation is optional as in 1991 as described in Section 14.2.1 and the fixed and optional amounts equal or exceed 42 inches, then City shall be assumed to have exercised the available option up to a total of 42 inches for the purposes of the above calculation. If no allocation is made for any irrigation season, the allocation shall be presumed to be 42 inches. The actual maximum Treated Water allocation of City for the subject Domestic Water Year shall be 33,602.1 acre feet of Treated Water or the amount calculated as "X" in the above formula, whichever is less. It is anticipated that from time to time District may modify its current agricultural water allocation. When District makes changes in its agricultural water allocation that result in the above allocation formula no longer ensuring that reductions or increases in available water are in equal proportions as between District's agricultural customers and City, subject to the limitation of 33,602.1 acre feet of Treated Water, the Parties shall meet and confer and agree upon necessary changes in the above allocation formula so as to ensure that reductions and increases in available water are in equal proportions as between District's agricultural customers and City.

Except as provided in Section 17.3, in no event shall District be required to make available to City, more than 33,602.1 acre feet of Treated Water for First Expansion Facilities during any Domestic Water Year. If the applicable formula during any Domestic Water Year provides for an annual allocation of less than 33,602.1 acre feet, there shall be no suspension in the payment obligations of City, set forth in Section 14, regardless of the length of the Period during which deliveries of Treated Water shall be less than 33,602.1 acre feet for each Domestic Water Year. Nothing contained in this Section 17.2 shall be deemed to modify in any way District's right to suspend, curtail, or reduce water deliveries as provided in Section 9.9 and in this Section 17.2. Nothing in this Agreement shall be construed to require District to curtail deliveries of water during any Period.

17.3. Treated Water Delivery Schedule. The parties acknowledge that City's water needs vary throughout the Domestic Water Year with high peak day demands in summer and lower demands in winter. City shall have the right to specify, on a daily basis, its water delivery requirement for the following day (or longer period of time as agreed between the parties) and

District shall be obliged, subject to its engineering, operating, maintenance, regulatory, safety and other practical requirements, to make a good faith effort to meet the daily (or longer period) demands specified by City.

17.4. Adjustment of Curtailment. In the event that a severe and prolonged drought threatens the ability of City to deliver adequate drinking water to its customers despite its efforts to impose rationing and to utilize all water resources available to it, the Parties shall meet and confer to determine whether, and upon what terms, water allocations other than those provided for in this Agreement could be implemented which would alleviate hardships to the customers of City without unduly or disproportionately injuring agriculture. In the event that water deliveries during a Domestic Water Year must be curtailed pursuant to Section 17.2, for the reasons set forth in the preceding sentence or for any other reason, the Parties shall meet and confer for the purpose of reaching an agreement as to an alternative curtailment formula or water allocation basis which more equitably and more fairly meets the then current needs of the agricultural and municipal water users within District's boundaries. The Parties shall also endeavor to reach agreement upon other terms and conditions necessary to implement an agreement. The duration of an adjustment agreement shall be specified in the agreement. In the event that no agreement can be reached, the deliveries shall be curtailed in accordance with the formula set forth in Section 17.2 of this Agreement.

17.5. Exchange for Groundwater. During a Domestic Water Year in which City's allocation is reduced below 33,602.1 acre feet of Treated Water, City shall continue to have the option to deliver groundwater to the irrigation canal system in exchange for additional surface water as provided by Section 9.8.

17.6. Water to Remain in District's Irrigation District Boundary. No Treated Water delivered by District to City, not offset by City groundwater and City water supplies other than the Treated Water within District's Irrigation Boundary, shall be allowed to flow outside District's Irrigation District Boundary. In order to demonstrate and ensure compliance with this Section 17.6, City shall install and maintain meters to monitor flow and usage at appropriate locations on its water delivery systems to determine (i) the amount of all Other City Water delivered to the Service Area, and (ii) the amount of all water (whether Treated Water or Other City Water) transported outside District's Irrigation District Boundary. City shall monitor these records to ensure that the amount recorded under (i) is at all times greater than or equal to the

amount recorded under (ii). City shall maintain records as to the items set forth above in this Section 17.6 which records shall be open to reasonable inspection by District, and its officers, directors, officials, employees, agents, and volunteers. A monthly summary of the applicable records shall be provided to District by City .

17.7. Conjunctive Use. It is understood by the Parties that from time to time water allocations for a Domestic Water Year to City may be reduced below 33,602.1 acre feet by the application of the formula set forth in Section 17.2. Accordingly, City shall exert its best efforts to maintain, in its judgment, reasonable groundwater pumping capacity to meet the needs of its Service Area during times of reduced surface water allocations. City's obligation to maintain reasonable groundwater pumping capacity shall be subject to the constraints of the groundwater basin underlying City as described in the Urban Water Management Plan and other City records, and City's obligation shall be subject to what is feasible and cost-effective.

18. PROJECT MANAGEMENT.

18.1. District's Board of Directors.

18.1.1. Final Decisions. Subject to the Approvals set forth in Section 18.3 and Section 18.5 and subject to the review set forth in Section 18.5 and Section 18.6, the Board shall be the final decision making authority with regard to the Project. The Board shall consider the recommendations of the Project Manager. All Board decisions shall be made at duly noticed regular meetings or special meetings.

18.1.2. Project Manager. The Board shall appoint a Project Manager, who shall perform those duties set forth in Section 18.2.

18.2. Duties of Project Manager.

18.2.1. Implementation of this Agreement. The responsibility for implementing and administering this Agreement and for carrying out the tasks necessary for the successful completion of each of the Phases of the First Expansion Facilities shall be vested in the Project Manager.

18.2.2. Notice to Advisory Committees. The Project Manager, in the course of fulfilling his responsibilities, shall provide the Advisory Committees reasonable advance notice of impending major decisions as defined in Section 18.6.1.C.

18.2.3. Specific Duties. The Project Manager shall have the following powers, duties, and responsibilities:

18.2.3.A. Work Plans. Developing a work plan for each Phase of the Project.

18.2.3.B. Progress Reports. Submitting periodic progress reports to the Parties and to the Board.

18.2.3.C. Administering Contracts. Administering this Agreement and any contracts as are entered into pursuant to this Agreement.

18.2.3.D. Public Information. Serving as public information officer for the Project.

18.2.3.E. Recommending Consultants. Recommending the hiring or utilization of consultants, engineers, contractors, attorneys, underwriters, and other services necessary to carry out the Project.

18.2.3.F. Financial Report. Preparing an annual financial report within three months of the end of each Year of the operation of the Project for review by the Advisory Committees. The annual financial report shall include the amount of water delivered by District to its agricultural customers and to City during the preceding Year. To the extent permitted by data available at the time of preparation of the report, the report shall also include estimates of the amount of water which will be available during the current Year for delivery to the agricultural water users of District and to City. In the event that during the Year changed water conditions modify the projections of the availability of water to District's customers, the Project Manager shall promptly notify the Advisory Committees.

18.2.3.G. Emergency Plans. Developing emergency plans for dealing with reasonably anticipated events of force majeure so as to minimize, to the extent practical, the interruption or curtailment of the operation of the Project and, to the extent practical, ensure the continued delivery of Treated Water to City.

18.2.3.H. Other Duties. Other duties as are necessary and proper to carry out the Project.

18.3. City Approval of First Expansion Facilities Milestones. Since City will be paying virtually all costs associated with design, construction, operation, maintenance, repair, reconstruction, and Modifications of and to the First Expansion Facilities, the Parties agree and consent that City shall have the authority to approve or disapprove major First Expansion Facilities milestones as follows:

18.3.1. Engineering Services. Prior to District's approval of any engineering services contract concerning the design and engineering of the First Expansion Facilities, City shall review the contract or contracts and each shall provide District with written authorization to proceed.

18.3.2. Review of Preliminary Design. Prior to proceeding with the final Design Phase under an engineering services contract, City shall review the preliminary design plans and preliminary cost estimate and each shall provide District with its written authorization to proceed.

18.3.3. Acceptance of Final Design. Prior to accepting the final design work, including construction ready final plans and specifications and final cost estimate, City shall review the final design work and cost estimate and shall provide District with its written authorization to proceed.

18.3.4. Construction Contracts. Prior to District's approval of a construction contract or contracts for the construction of the First Expansion Facilities, City shall review the construction contract documents and shall provide District with its written authorization to proceed.

18.4. Processing Milestone Approvals. City shall act promptly in giving or refusing to give any of the written authorizations to proceed as set forth above. The written authorizations to proceed to be given by City shall not be unreasonably withheld. If City fails to provide its written authorization to proceed, or written refusal of authorization, within 45 days from the date of the written request for authorization from District, then City shall be deemed to have authorized District to proceed with the milestone in question. If City refuses to authorize any of the foregoing Project milestones, it shall set forth in writing its reason or reasons for the refusal and shall timely provide the writing to the other Party. Thereafter either (i) District shall work to address and resolve City's concerns and then re-request the written authorization to proceed for the particular Project milestone, or (ii) either Party may terminate the First Expansion Facilities pursuant to Section 22.2.

18.5. Project Financing Approvals. Prior to issuing bonds or other evidences of indebtedness or certificates of participation for the purpose of Financing the First Expansion Facilities, District shall give written notice to City that the time to commence Financing has arrived. Within 30 days of the notice, the Finance Committee shall meet and confer at least once

and within 60 days of the notice City shall advise District in writing as to whether Fixed Financing or Variable Financing shall be used. If City advises in writing that Fixed Financing is to be used or fail to give their written advice within 60 days of the notice, the Fixed Financing shall be used.

18.5.1. Fixed Financing. If Fixed Financing is to be used, District shall give written notice to City that Fixed Financing is to be used and shall request that City give to District a not-to-exceed TIC within 30 days of the notice and request. Within 15 days of the notice and request by District, the Finance Committee shall meet at least once. Upon receipt of a not-to-exceed TIC from City, District shall thereafter be responsible for marketing the Financing subject to the not-to-exceed TIC approved by City. The members of the Finance Committee shall be present at the time and place of marketing and they and their financial advisers shall consult with the persons responsible for the marketing for District and the terms and conditions of the Financing, but all final decisions shall be made by District, provided that the TIC of the issue is (i) the lowest then available, and (ii) at or below the not-to-exceed TIC approved by City. In the event City fails to approve a not-to-exceed TIC within 30 days of the notice from District that Fixed Financing is to be used, then the Parties shall seek to reach agreement as to a not-to-exceed TIC or either Party may terminate the First Expansion Facilities pursuant to Section 22.2. It is understood that bond insurance shall be used with Fixed Financing if, when the cost of bond insurance premiums is included in Debt Service, the result is the lowest Fixed Financing alternative available at the time of Fixed Financing.

18.5.2. Variable Financing. Variable Financing shall be used only during the Construction Phase, except as otherwise provided herein. If City agrees that Variable Financing should be undertaken, District shall issue Variable Financing for the duration of the Construction Phase. No later than 60 days after the Commercial Operation Date, the Variable Financing shall be replaced entirely by Fixed Financing unless the Parties unanimously agree to the contrary. It is understood that Variable Financing may require the use of a letter of credit and, if that is the case, the cost of the letter of credit shall be financed out of the Variable Financing.

18.5.2.A. Initial Financing. Variable Financing shall initially be issued in the maturities and at the interest rates as, in the judgment of District after consulting with the Finance Committee, provides the most cost-effective combination of maturities and interest rates.

Thereafter, as the securities mature, District shall be solely responsible for the remarketing of the securities until the Issuance of the Fixed Financing.

18.5.2.B. Conversion During Construction Phase. If Variable Financing is issued for the First Expansion Facilities, City may, during the Construction Phase, request that District convert the Variable Financing to Fixed Financing. The request may be conditioned upon the ability of District to secure the Fixed Financing at a TIC specified in City's request.

18.5.2.C. Conversion Upon Commercial Operation. If no request to convert Variable Financing to Fixed Financing has been made prior to the Commercial Operation Date, District shall convert the Variable Financing to Fixed Financing on the Commercial Operation Date, or within 60 days thereafter without regard to the provisions of Section 18.5.1, provided, however, that District shall consult with the Finance Committee during the time it is converting the Variable Financing to Fixed Financing unless the Parties unanimously agree to the contrary.

18.6. Advisory Committees. In order to assist District and the Project Manager with the implementation of the Project, the following committees are formed and shall have the following duties, responsibilities, and authority:

18.6.1. Policy Committee. A Policy Committee consisting of two City Council members and two members of the Board. The Policy Committee shall meet at least twice each Year, and at other times when a meeting is called by the Project Manager. Each member of the Policy Committee shall serve at the pleasure of the Party selecting that member. The Policy Committee shall function during all three Phases, and shall have the following responsibilities and authority:

18.6.1.A. First Expansion Facilities Milestones. To review and make recommendations to City concerning the request for authorization to proceed with First Expansion Facilities milestones pursuant to Section 18.3. District and the Project Manager shall not request written authorization to proceed with any of the First Expansion Facilities milestones until after the Policy Committee has reviewed the proposal and made a recommendation to City.

18.6.1.B. Budget Functions. To perform the functions with respect to District budget for the Project as set forth in Section 18.7. All expenditures of District concerning the Project shall be consistent with the approved budget.

18.6.1.C. Major Decisions and Design Changes (In Excess of $100,000). To review and advise District and the Project Manager concerning major decisions or changes in the Project or design of the First Expansion Facilities. A major decision shall be defined as any contract, change order, purchase, change in policy, or any other action with an estimated cost in excess of $100,000. A major change in the design of the First Expansion Facilities shall be defined as any change involving an estimated increase or decrease in the cost of the First Expansion Facilities in excess of $100,000. A major decision shall not include any budgeted expenditure in a budget that has been approved pursuant to Section 18.7.

18.6.2. Technical Committee. A Technical Committee, consisting of one staff person appointed by each Party, and one alternate member as each Party deems necessary. Each member of the Technical Committee shall serve at the pleasure of the Party selecting that member. The Technical Committee shall meet at least once each month, and at all other times as requested by the Project Manager. During the Construction Phase of the Project, the Technical Committee shall meet once a month. If additional meetings are required, any of the parties, with five days prior notice, may schedule a Technical Committee meeting. The Technical Committee shall function during all three Phases of the Project, and shall have the following responsibilities and authority:

18.6.2.A. Consultation With Project Manager. To advise and consult with the Project Manager and District, to exchange information, and to make any necessary recommendations relating to the Project design, construction, operation, and maintenance. The Project Manager shall, from time to time, inform the Technical Committee of any material event, incident, occurrence, or condition that the Project Manager anticipates may impair District's ability to perform its obligations under this Agreement, including, but not limited to, labor disputes and threatened or pending litigation.

18.6.2.B. Recommendations to Policy Committee. To review and make recommendations to the Policy Committee for all matters within the scope of authority and responsibility of the Policy Committee.

18.6.2.C. Advice Relative to Minor Decisions ($5,000 to $100,000). To review and advise the Project Manager concerning any minor decision affecting the Project. A minor decision shall be defined as any contract, change order, purchase, change in policy, or any other action with an estimated cost between $5,000 and $100,000, and any action involving

changes in Treated Water quality beyond the range of normal plant operation variability. A major decision shall not include any budgeted expenditure in a budget that has been approved pursuant to Section 18.7.

18.7. Budget.

18.7.1. Budget Principles. In preparing and reviewing budgets for the Project, the Parties shall be guided by the principle that the Project shall be operated in as economic a manner as practical in accordance with generally accepted waterworks practices as evidenced by well designed and operated similar sized potable water treatment plants in Northern California.

18.7.2. Budget Process.

18.7.2.A. Preparation. For each Year during the Commercial Operation Phase, District shall prepare a budget for the Project prior to December 31 for the next ensuing Year. All Project budgets shall include both operating and capital components and shall include a monthly payment to be paid during the next ensuing Domestic Water Year in accordance with Sections 14 and 15. Upon completion of the First Expansion Facilities (as evidenced by the Commercial Operation Date), the budget shall be expanded to include the First Expansion Facilities costs and the increased Treated Water allocation of 67,204.2 acre-feet per year.

18.7.2.B. Technical Committee Review and Recommendation. Prior to completion of the first administrative draft of each Year's budget by District, the Project Manager shall meet with the Technical Committee at least once to discuss and receive input from the Committee concerning development of the budget. Prior to submission of the budget to the Policy Committee, the Technical Committee may make a recommendation with respect to the budget to the Policy Committee. Upon completion of the first administrative draft of a Year's budget and not later than September 15 of each Year, the Project Manager shall forthwith furnish it to the members of the Technical Committee. Within 15 days of receipt of the draft budget, the Technical Committee members may individually or collectively submit to the Project Manager their recommendations and/or comments regarding draft budget. The documents shall not be mailed to City as provided in Section 18.7.2.C until after the expiration of this 15 day Period.

18.7.2.C. Information to City. At least 10 days before the mailing of the annual budget to City as provided in this Section 18.7.2.C, the Project Manager shall mail copies of the budget to the Technical Committee and during the 10 day Period the Project Manager shall arrange at least one meeting of the Technical Committee for review of the budget. After the

expiration of the above 10 day Period and at least 20 days before the submission of each annual budget to District Board, the Project Manager shall mail to City copies of the proposed budget for the ensuing Year and a detailed calculation of the proposed monthly payment obligations of City for the ensuing Domestic Water Year calculated pursuant to Section 15.3 of this Agreement. Commencing after the first Year of operation, the Project Manager shall also at the same time mail copies of the most recent update of the current Year's expenditures and revenues, and the balance sheet and income statement for the most recent Year, if available.

18.7.2.D. Policy Committee Review. Approximately 10 days before the submission of the budget to District Board, the Policy Committee shall meet to review and discuss the proposed budget for the ensuing Year. District staff at this meeting shall explain and justify the need for all of the various budget items and proposed expenditures. At this meeting, the Parties shall strive to agree upon a budget for the ensuing Year.

18.7.2.E. Consideration of Budget by Policy Committee. The budget shall be deemed approved by the Policy Committee unless, at the meeting, the Committee by an affirmative vote of at least two members of the Committee objects to one or more of the budget items. If the Policy Committee objects to one or more budget items, the Committee members objecting shall specify the item or items of the budget which are objectionable, and why the item or items are objectionable.

18.7.2.F. Revision of Budget, Alternate Budget and Report. If one or more budget items are objected to by the Policy Committee, District shall either (i) revise the budget at the Policy Committee meeting so that it is acceptable to at least three members of the Policy Committee, (ii) continue the Policy Committee meeting and thereafter consider the objections raised at the meeting and prepare a revised budget for consideration by the Policy Committee at a subsequent meeting, or (iii) District may determine to submit the budget to District Board over the objections of the Policy Committee. In the latter event, District shall give written notice to the Policy Committee, and the Policy Committee may, within 10 days after receipt of this notice, submit an alternative to the objectionable budget item or items to District Board to be considered along with the budget submitted by District. The alternative budget item or items shall be accompanied report as to the reasons the alternate budget should be adopted in place of the budget submitted by District.

18.7.3 Public Hearing. The annual budget for the Project shall be adopted by the Board only after a public hearing for which ten days' notice has been given by publication in a newspaper of general circulation published and circulated within District. The period of notice commences on the first day of publication and terminates on the 10th day following, including the day of publication.

18.7.4. Appearance at Hearing. The foregoing provisions on review concerning the budget are not intended to, and shall not, preclude City, and its officers, , officials, employees, agents, and volunteers, from appearing before District Board regarding the proposed budget.

18.7.5. Increase. If, during the course of any Year, District proposes to make any budget increase, then the provisions of Sections 18.7.1 through 18.7.2.F concerning review of budgets shall apply to the budget increase.

19. LIABILITY AND INSURANCE.

19.1. Insurance, General. During all Phases of the Project, District shall procure and maintain Project Insurance, including coverage for the construction, operation, and maintenance of the Project, and all operation and activities concerning all Phases of the Project. Such Project insurance coverage shall be primary insurance coverage for all claims related to this Project and City shall be named as an additional insured. Any insurance or self insurance maintained by City, District or their respective directors, officers, officials, employees, agents or volunteers shall be excess of the Project insurance and shall not contribute with it.

19.1.1. Project General Liability. Project General Liability insurance in an amount not less than $1,000,000 per occurrence, combined single limit for bodily injury and property damage, $3,000,000 aggregate.

19.1.2. Commercial Automobile Liability Insurance. Commercial Automobile Liability insurance including, as applicable, owned, non-owned and hired automobiles, in an amount not less than $1,000,000 per occurrence combined single limit for bodily injury and property damage.

19.1.3. Umbrella or Excess Liability Insurance. Umbrella or Excess Liability insurance in an amount not less than $10,000,000 over and above the underlying limits with the Umbre1la or Excess Liability policy containing insuring agreements, exclusions and conditions of coverage substantially similar to the underlying policies.

19.1.4. Workers' Compensation Insurance. Workers' Compensation Insurance as required by the State of California, including employer's liability limits of not less than $1,000,000 per accident. All rights of subrogation against City, its officers, elected officials, officials, employees, and volunteers shall be waived by the insurer for losses arising from work performed by District. All costs for the waiver of subrogation shall be borne by the Project.

19.1.5 Property Insurance.

19.1.5.A. Course of Construction Insurance. District shall maintain this coverage in its insurance policy portfolio protecting the First Expansion Facilities.

19.1.5.B. Buildings and Equipment Insurance. Special form (all risks subject to approved exclusions) insurance for the Project shall be placed on a replacement cost basis, including the agreed amount or comparable endorsement, all buildings and structures comprising the Project and all fixtures, equipment, and facilities located in, on, or connected with the Project, excluding the pipeline and its associated equipment and fixtures. Such insurance shall include coverage for loss of use, loss of rents, or loss of financing payment. Loss payee under this policy mentioned in this Section 19.1.5.B shall be determined by the Financing documents.

19.1.6. Insurance Provisions. Each insurance policy required by this Agreement shall contain the following clauses:

19.1.6.A. Cancellation. This insurance shall not be cancelled, limited in scope or coverage or non-renewed until 30 days after prior written notice has been given to District and City. Upon receipt of a notice of cancellation of non-payment, District shall give City immediate notice of non-payment of any insurance policy premium required to maintain the insurance coverage required by this Agreement.

19.1.6.B. City to be Named. On all policies, City and its officers, elected officials, officials, employees, agents, and volunteers are to be covered as additional insureds as respects to claims or losses arising out of activities related to the Project. This additional insured requirement shall not apply to Workers' Compensation Insurance.

19.1.6.C. Special Limitations. No policy shall contain any special limitation as to the scope of protection afforded City or its officers, elected officials, officials, elected officials, employees, agents, and volunteers.

19.1.6.D. Approval by City. The policies of insurance required by this Agreement shall be issued by an insurer, or insurers, and shall be in a form approved by City, which approval shall not be unreasonably withheld. Any deductible, and/or self insured retention must be declared to City. District and City shall meet annually to review Project insurance and, if changes are necessary, make recommendations to the Technical Committee.

19.1.7. Insurance Provision in All Contracts. In any and all contracts entered into concerning the construction, operation, or maintenance of the Project, District shall include a provision requiring that the contractor and all of its subcontractors provide insurance protection in an amount agreed by City and District.

19.2. Indemnification and Hold Harmless.

19.2.1. Indemnification by District. Except as provided in Sections 19.3 through 19.6, District shall indemnify, defend, protect, and hold harmless City, and its officers, elected officials, officials, employees, agents, and volunteers from any and all liabilities, claims, damages, losses, judgments, penalties, costs, or expenses (including attorneys' fees) arising out of or relating to the performance of the Project caused in whole or in part by any negligent act or omission of District or contractors, any subcontractors, or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, except where caused by the active negligence, sole negligence, or willful misconduct of City, its officers, officials, elected officials, employees and volunteers.

19.2.2. Cost of Litigation. Subject to the other provisions of this Agreement, the reasonable cost of the prosecution and defense of litigation and the payment of settlements or judgments in connection with litigation necessary to perform, or arising from, the construction, financing, operation, or maintenance of the Project by District shall be a cost of the Project.

19.2.3. Notification. District shall advise City in writing promptly as to any litigation the cost of which, including settlements or judgments, District proposes be a cost of the Project.

19.2.4. Objections. If City raises any objection in writing within 10 days of notification pursuant to Section 19.2.3 as to the cost of litigation being a cost of the Project, then the matter shall be subject to review by the Parties. In the event that City takes the position that the cost of particular litigation should not be an expense to be passed on to the Project or that only a portion of the cost of particular litigation should be an expense to be passed on to the

Project, then City Attorney, and the General Counsel of District shall meet and endeavor to reach an agreement relative to the sharing of the costs related to the particular litigation. If the attorneys are unable to promptly come to an agreement, the issue shall be submitted to the Chief Executive Officers. If the Chief Executive Officers are unable to promptly come to an agreement, the Parties shall promptly agree upon an independent attorney or retired judge to determine the matter. If the Parties cannot, within thirty (30) days of the dispute first arising, agree upon a decision relative to the dispute or an independent attorney or retired judge to determine the matter, any Party may request the American Arbitration Association to appoint an independent attorney or retired judge. For purposes of calculating the foregoing 30 day period, the dispute shall be deemed to have arisen on the day City gave notice to District of an objection pursuant to this Section 19.2.4. Upon appointment, the independent attorney or retired judge shall promptly decide the dispute based upon whether the litigation involved is necessary to perform, or arises from, the construction, financing, operation, or maintenance of the Project by District.

19.3. Third Party Claims Not Covered by Insurance; Willful. With respect to claims and lawsuits against one or more of the Parties by third parties concerning injury, death, property damage, or construction claims resulting from the construction, operation or maintenance of the Project, which claims and lawsuits are not covered by insurance, including self insurance, maintained by District pursuant to Section 19.1, and which are the result of willful misconduct, intentional tort, or gross negligence of one of the Parties, the Party whose willful misconduct, intentional tort, or gross negligence resulted in the damage claimed by the third party shall indemnify, defend, protect, and hold harmless the other Party, and its respective officers, elected officials, officials, employees, agents, and volunteers from any and all liabilities, claims, damages, losses, judgments, penalties, costs, or expenses (including attorneys' fees) resulting from a claim or lawsuit by a third party. This Section 19.3 shall not apply if the lack of insurance coverage is because of a denial of coverage based on District's failure to comply with any claim reporting requirement of any applicable insurance.

19.4. Third Party Claims Not Covered by Insurance; Ordinary. With respect to claims and lawsuits against one or more of the Parties by third parties concerning injury, death, or property damage resulting from the construction, operation or maintenance of the Project, which claims and lawsuits are not covered by insurance, including self insurance, maintained by

District pursuant to Section 19.1, and which are not the result of willful misconduct, intentional tort, or gross negligence of one of the Parties, District shall defend the claim or lawsuit on behalf of either or both of the Parties to this Agreement which are named in the claim or lawsuit, and District shall pay any settlement entered into by District or judgment entered against District or City. City shall reimburse District for its defense costs (including attorneys' fees and litigation expenses), settlement and judgment amounts incurred pursuant to this provision, in accordance with their respective percentage obligations to reimburse all Project costs pursuant to this Agreement, provided, however, that City shall not be obligated to pay any settlement of any Project related claim unless City approves the settlement. This Section 19.4 shall not apply if the lack of insurance coverage is because of a denial of coverage based upon District's failure to comply with any claim reporting requirement of any applicable insurance.

19.5. Claims Between Parties. With respect to claims and lawsuits by one of the Parties against the other, the claims and lawsuits shall be processed and resolved in accordance with (i) the Tort Claims Act and/or (ii) breach of contract remedies provided by this Agreement, or applicable law. Nothing in this Agreement shall relieve either Party of any contractual liability or duty imposed by this Agreement.

19.6. Workers' Compensation Claims. Each Party shall bear the costs of discharging all liability imposed, including costs and expenses for attorneys' fees and other costs of defending, settling, or otherwise administering claims arising out of workers' compensation or employers liability claims brought by its employees.

19.7. Replacement of Pro Rata Right of Contribution. The insurance, indemnification, hold harmless, and reimbursement provisions set forth above in Sections 19.1 through 19.4 are intended to and shall replace, and be applicable instead of, the pro rata right of contribution provisions of Government Code Section 895.6, to the extent that Section is applicable.

19.8. Defense by Modesto City Attorney. For any claim or lawsuit against City (whether or not also against District) which falls under Section 19.4, City may defend its own interests through its City Attorney's office; provided, however, that if District is also named in the claim or lawsuit, defense of District by the Modesto City Attorney shall only be with the consent of District, which consent shall not be unreasonably withheld. City shall bear all costs and expenses in representing its own interests pursuant to this Section 19.8. If the Modesto City Attorney represents both parties, then its costs and expenses shall be divided equally among the

Parties to the claim or lawsuit. If City decides not to represent its own interests pursuant to this Section 19.8 , then District shall defend the claim or lawsuit on behalf of City pursuant to Section 19.4.

20. RELATIONSHIP OF PARTIES.

Except as provided in Section 19, the covenants, obligations, and liabilities of the Parties are intended to be several and not joint or collective, and nothing herein contained shall ever be construed to create an association, joint venture, trust, or partnership, or to impose a trust or partnership covenant, obligation, or liability on or with regard to one or both of the Parties. Each Party shall be individually responsible for its own covenants, obligations, and liabilities pursuant to this Agreement. No Party shall be under the control of or shall be deemed to control any other Party or the Parties as a group. No Party shall be the agent of or have a right or power to bind any other Party without its express prior written consent, except as expressly provided in this Agreement.

21. GENERAL PROVISIONS GOVERNING AGREEMENT.

21.1. Severance. In the event that any of the terms, covenants or conditions of this Agreement or the application of any term, covenant or condition shall be held invalid as to any Party or circumstance by any court having jurisdiction over the Parties or subject matter of this Agreement, all other terms, covenants or conditions of this Agreement and their application shall not be affected thereby, but shall remain in force and effect unless a court holds that the provisions are not separable from all other provisions of this Agreement.

21.2 Waiver. The waiver at any time by any Party of its rights with respect to a default or other matter arising in connection with this Agreement shall not be deemed a waiver with respect to any subsequent default or matter.

21.3. Counterparts. This Agreement may be executed in counterparts.

21.4. Supporting Resolutions. Each Party represents that it has legal authority to enter into this Agreement and to perform its obligations hereunder, and shall attach to this Agreement a duly authorized resolution evidencing the authority and authorizing the person executing this Agreement to do so.

21.5. No Rights in Other Parties. This Agreement is for the sole benefit of the Parties and shall not be construed as granting rights to any person other than the Parties or, except as

specifically set forth in this Agreement, imputing to any person the obligations imposed on a Party.

21.6. Amendment. This Agreement may be amended only by a written instrument duly executed by both of the Parties hereto.

21.7. Obligations Prior to Termination. The obligations of the Parties incurred pursuant to this Agreement prior to Termination of this Agreement shall survive the Termination.

21.8. Captions. The captions and the headings in this Agreement are inserted merely to facilitate reference and shall have no bearing upon the interpretation of any of the terms and provisions hereof.

21.9. Additional Documents. Each Party agrees to make, execute, and deliver any and all documents reasonably required to implement this Agreement.

21.10. Governing Law. This Agreement shall be interpreted, governed by, and construed under the laws of the State of California.

21.11. Shall and May. "Shall" is mandatory and "may" is permissive.

21.12. Non-Discrimination. In performing the obligations of this Agreement, there shall be no discrimination against any employee or applicant for employment because of race, color, religion, sex, or national origin.

22. TERM AND TERMINATION.

22.1. Execution by Both Parties. This Agreement shall not become effective until it has been executed by both Parties. Following execution by both Parties, this Agreement shall continue in effect until the earlier of the following:

22.1.1. Superseded by Other Agreement. This Agreement is superseded by another, or an amended, agreement which, by its terms, supersedes this Agreement.

22.1.2. Termination by Mutual Agreement. Termination by mutual agreement of the Parties.

22.2. Termination of Participation in First Expansion Facilities Prior to Financing. Notwithstanding any other provision in this Agreement to the contrary, either Party, prior to the time District issues either Variable Financing or Fixed Financing, whichever occurs first, for the purpose of Financing the First Expansion Facilities, upon not less than 30 days' written notice to the other Party, shall be entitled to terminate its participation in the First Expansion Facilities at any time (i) the Party determines that the First Expansion Facilities is not feasible because of

technical, engineering, or economic reasons, or if adequate insurance is not, or probably will not, be available at a commercially reasonable price, or for other reasons as would cause a reasonably prudent utility in the same or similar circumstances to terminate its participation in a First Expansion Facilities as is contemplated by this Agreement (failure of District to permanently secure a permit to divert sufficient water for urban purposes to meet its obligations under this agreement shall be such cause for termination), or (ii) City determines that District has failed to meet its Design Phase or, if Financing has not yet been obtained, its Construction Phase obligations, and has failed to pursue those obligations with due diligence. If the First Expansion Facilities is terminated pursuant to the provision, then this Agreement shall remain in effect as to the Initial Facilities.

23. UNDERTAKINGS. [Not Used]

24. WATER RIGHTS AND OWNERSHIP.

City shall not own or acquire any of District's water rights, but shall have an absolute right to the delivery of Treated Water in accordance with the terms of this Agreement. City shall not have any ownership rights in any of the facilities of the Project except as specified in this agreement. District shall use its best efforts to exercise and utilize all of its available water rights and supplies to ensure that it delivers the full allocation of Treated Water to City to the extent feasible. District, though, retains the discretion and flexibility to exercise its water rights in such a manner as to reasonably and prudently manage and plan for single and multiple-year Droughts. District also agrees to vigorously defend its water rights and oppose any litigation or regulatory proceeding that could adversely impact District's ability to provide the full allocation of Treated Water to City.

24.1. The parties contemplate that City may increase its reclamation of waste water from its primary or secondary wastewater treatment plants by additional advanced treatment/ technologies and/or methods for groundwater recharge, resale, or any other use whatsoever, inside or outside District's irrigation district boundary. District agrees that City has the right to utilize its reclaimed water in this manner, and shall not object to any such reclaimed water usage, transportation or sale to any, court, administrative agency or other body or tribunal with jurisdiction over any such use, or in the press.

24.2. Nothing in the agreement shall restrict, prohibit, or inhibit in any way, City's right to acquire from third parties and/or exercise water rights additional to or apart from those enumerated in this agreement.

25. NOTICES.

Any notice, demand, or request provided for in this Agreement shall be in writing, and shall be deemed properly served, given, or made if delivered in person or if sent by registered or certified mail, postage prepaid, to the persons specified below:

District: General Manager
Modesto Irrigation District
Post Office Box 4060
Modesto, CA 95352

City: City Manager
City of Modesto
Post Office Box 642
Modesto, CA 95353

MODESTO IRRIGATION DISTRICT

By: _____
General Manager

Approved as to form:

_____
General Counsel

Attest:

_____
Secretary

CITY OF MODESTO

By: _____
City Manager

Approved as to form:

_____
City Attorney

Attest:

_____
City Clerk

RESOLUTION NO. 2005-159
ADOPTION OF AND AUTHORIZATION FOR THE GENERAL MANAGER TO EXECUTE THE AMENDED AND RESTATED TREATMENT AND DELIVERY AGREEMENT BETWEEN THE MODESTO IRRIGATION DISTRICT AND THE CITY OF MODESTO AND PERTAINING TO THE MODESTO REGIONAL WATER TREATMENT PLANT PHASE TWO EXPANSION PROJECT

WHEREAS, in the early 1990's the Modesto Irrigation District (MID), City of Modesto (City), and the former Del Este Water Company (DEW) collaborated together for the purpose of utilizing MID's surface water rights for domestic drinking water purposes; and

WHEREAS, the existing Modesto Regional Water Treatment Plant (MRWTP) Treatment and Delivery Agreement was executed in April 1992, for the purposes of designing, constructing and operating the MRWTP; and

WHEREAS, the MRWTP, which consists of a 30 million gallon per day regional water treatment plant, and storage and delivery facilities, was completed in 1995; and

WHEREAS, at the direction of the MRWTP Policy Committee, the MID and the City, planning and engineering design studies have been undertaken to expand the capacity of the MRWTP to treat up to 67,200 acre-feet per year or 60 million gallons per day (mgd) on an average annual daily basis; and

WHEREAS, work on the Phase Two Expansion Project to date has been accomplished under an advanced funding and reimbursement agreement between the City and MID, wherein MID has initially funded the entire cost of the CEQA work and preliminary engineering; and

WHEREAS, MID will recover these funds once the project financing is completed, pursuant to the terms and conditions of the Amended and Restated Treatment and Delivery Agreement; and

WHEREAS, a Subsequent Environmental Impact Report (SEIR; State Clearinghouse Number 2004022013) for the MRWTP Phase Two Expansion Project was completed and certified by both MID and the City on July 12, 2005; and

WHEREAS, MID received approval on September 12, 2005, from the State Water Resources Control Board (WR Order No. 2005-0022-DWR) to change the purpose of use of up to 67,200 acre-feet per year of water from agricultural to municipal and industrial purposes; and

WHEREAS, the SEIR for the MRWTP Phase Two Expansion Project was approved by MID and the City, pursuant to the California Environmental Quality Act, on October 11, 2005; and

WHEREAS, it is now time to execute the Amended and Restated Treatment and Delivery Agreement between MID and the City pertaining to the MRWTP Phase Two Expansion Project.

NOW, therefore, BE IT RESOLVED, that the Modesto Irrigation District Board of Directors authorizes the General Manager to execute the Amended and Restated Treatment and Delivery Agreement between the Modesto Irrigation District and the City of Modesto pertaining to the Modesto Regional Water Treatment Plant (MRWTP) and directs staff to initiate the final design process related to the Phase Two Expansion of the MRWTP.

Moved by Director Warda, seconded by Director Kidd, that the foregoing resolution be adopted.

The following vote was had:
Ayes: Directors Billington, Hensley, Kidd, Van Groningen and Warda
Noes: Directors None
Absent: Directors None
The President declared the resolution adopted.

o0o

I, Vickie Ehrler, Secretary of the Board of Directors of the MODESTO IRRIGATION DISTRICT, do hereby CERTIFY that the foregoing is a full, true and correct copy of a resolution duly adopted at a regular meeting of said Board of Directors held the 11th day of October 2005.

Secretary of the Board of Directors
of the Modesto Irrigation District

EXHIBIT A – MID SUNK COSTS

(Through October 1, 2005)

Consultants = $982,773.00

Kind Labor = $501,580.46

Materials & Supplies = $18,558.08

Advertising = $9,271.65

Meals & Lodging = $2,701.07

Transportation = $2,666.26

Miscellaneous = $940.73

Meetings = $ 875

TOTAL = $1,519,366.25*

*Detailed accounts, reported by date and expenditure type, are included on the attached spreadsheets.

PHASE TWO DOMESTIC WATER EXPANSION PROJECT-COSTS FRONTED BY MID
EXPENDITURES THROUGH MAY 28, 2005

Line No.	Project	Task	Employee/Supplier	Expnd Type	Item Date	Quantity	UOM	Burdened Cost	Comment	Expnd Org
1	701620	1.0	COLBY, DAVID W (DAVE)	1	08-Jan-05	12	Hours	$640.00		8420-Civil Engineering
2	701620	1.0	COLBY, DAVID W (DAVE)	1	22-Jan-05	12	Hours	$640.00		8420-Civil Engineering
3	701620	1.0	COLBY, DAVID W (DAVE)	1	05-Feb-05	4	Hours	$213.33		8420-Civil Engineering
				Total Labor				**$1,493.33**		
4	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	22-Sep-01	20	Hours	$1,242.13		8420-Civil Engineering
5	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	06-Oct-01	48	Hours	$2,981.12		8420-Civil Engineering
6	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	20-Oct-01	48	Hours	$2,981.12		8420-Civil Engineering
7	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	17-Nov-01	50	Hours	$3,105.34		8420-Civil Engineering
8	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	01-Dec-01	24	Hours	$1,490.56		8420-Civil Engineering
9	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	15-Dec-01	40	Hours	$2,584.12		8420-Civil Engineering
10	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	29-Dec-01	44.5	Hours	$2,874.85		8420-Civil Engineering
11	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	12-Jan-02	60	Hours	$3,876.19		8420-Civil Engineering
12	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	26-Jan-02	45	Hours	$2,907.14		8420-Civil Engineering
13	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	09-Feb-02	46	Hours	$2,971.74		8420-Civil Engineering
14	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	23-Feb-02	51	Hours	$3,294.76		8420-Civil Engineering
15	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	09-Mar-02	58.25	Hours	$3,763.13		8420-Civil Engineering
16	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	09-Mar-02	6	Hours	$387.62		8420-Civil Engineering
17	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	23-Mar-02	25	Hours	$1,615.08		8420-Civil Engineering
18	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	06-Apr-02	25.5	Hours	$1,647.39		8420-Civil Engineering
19	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	20-Apr-02	45	Hours	$2,907.14		8420-Civil Engineering
20	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	04-May-02	44	Hours	$2,842.54		8420-Civil Engineering
21	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	18-May-02	40	Hours	$2,584.12		8420-Civil Engineering
22	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	01-Jun-02	38	Hours	$2,454.92		8420-Civil Engineering
23	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	15-Jun-02	44	Hours	$2,842.54		8420-Civil Engineering
24	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	29-Jun-02	43	Hours	$2,777.93		8420-Civil Engineering
25	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	13-Jul-02	39	Hours	$2,519.52		8420-Civil Engineering
26	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	11-Jan-03	16	Hours	$1,099.56		8420-Civil Engineering
27	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	25-Jan-03	10	Hours	$687.23		8420-Civil Engineering
28	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	08-Feb-03	24	Hours	$1,649.34		8420-Civil Engineering
29	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	22-Feb-03	20	Hours	$1,374.45		8420-Civil Engineering
30	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	08-Mar-03	15	Hours	$1,124.42		8420-Civil Engineering
31	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	22-Mar-03	20	Hours	$1,499.23		8420-Civil Engineering
32	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	05-Apr-03	21	Hours	$1,574.19		8420-Civil Engineering
33	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	19-Apr-03	30	Hours	$2,248.85		8420-Civil Engineering
34	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	03-May-03	25	Hours	$1,874.04		8420-Civil Engineering
35	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	17-May-03	26	Hours	$1,949.00		8420-Civil Engineering
36	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	31-May-03	20	Hours	$1,499.23		8420-Civil Engineering
37	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	14-Jun-03	48	Hours	$3,598.16		8420-Civil Engineering
38	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	28-Jun-03	12	Hours	$899.54		8420-Civil Engineering
39	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	12-Jul-03	22	Hours	$1,854.02		8420-Civil Engineering
40	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	26-Jul-03	2	Hours	$168.55		8420-Civil Engineering
41	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	09-Aug-03	12	Hours	$1,011.28		8420-Civil Engineering
42	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	06-Sep-03	22	Hours	$1,854.02		8420-Civil Engineering
43	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	20-Sep-03	18	Hours	$1,516.92		8420-Civil Engineering
44	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	04-Oct-03	25	Hours	$2,106.84		8420-Civil Engineering
45	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	18-Oct-03	32	Hours	$2,696.76		8420-Civil Engineering
46	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	01-Nov-03	33	Hours	$2,781.03		8420-Civil Engineering
47	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	15-Nov-03	40	Hours	$3,370.94		8420-Civil Engineering
48	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	29-Nov-03	17	Hours	$1,432.65		8420-Civil Engineering
49	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	13-Dec-03	20	Hours	$1,744.48		8420-Civil Engineering
50	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	27-Dec-03	19	Hours	$1,657.25		8420-Civil Engineering
51	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	10-Jan-04	38	Hours	$3,028.84		8420-Civil Engineering
52	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	24-Jan-04	43	Hours	$3,427.37		8420-Civil Engineering
53	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	07-Feb-04	61.5	Hours	$4,887.12		8420-Civil Engineering
54	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	21-Feb-04	50.5	Hours	$4,013.01		8420-Civil Engineering
55	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	06-Mar-04	60.5	Hours	$4,828.07		8420-Civil Engineering
56	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	20-Mar-04	58.5	Hours	$4,668.46		8420-Civil Engineering
57	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	03-Apr-04	55	Hours	$4,389.15		8420-Civil Engineering
58	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	17-Apr-04	32	Hours	$2,553.68		8420-Civil Engineering
59	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	15-May-04	59	Hours	$4,708.36		8420-Civil Engineering
60	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	29-May-04	38.5	Hours	$3,072.41		8420-Civil Engineering
61	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	12-Jun-04	44	Hours	$3,511.32		8420-Civil Engineering
62	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	26-Jun-04	20	Hours	$1,596.05		8420-Civil Engineering
63	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	10-Jul-04	24	Hours	$1,915.26		8420-Civil Engineering
64	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	24-Jul-04	28	Hours	$2,234.47		8420-Civil Engineering
65	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	07-Aug-04	40.5	Hours	$2,978.29		8420-Civil Engineering
66	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	21-Aug-04	12	Hours	$882.46		8420-Civil Engineering
67	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	04-Sep-04	38	Hours	$2,794.44		8420-Civil Engineering
68	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	18-Sep-04	38	Hours	$2,794.44		8420-Civil Engineering
69	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	02-Oct-04	34	Hours	$2,500.29		8420-Civil Engineering
70	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	16-Oct-04	42	Hours	$3,088.59		8420-Civil Engineering
71	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	30-Oct-04	52	Hours	$3,823.97		8420-Civil Engineering
72	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	13-Nov-04	54	Hours	$3,971.05		8420-Civil Engineering
73	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	27-Nov-04	36	Hours	$2,647.37		8420-Civil Engineering
74	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	11-Dec-04	30	Hours	$2,206.14		8420-Civil Engineering
75	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	25-Dec-04	41	Hours	$3,015.06		8420-Civil Engineering
76	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	08-Jan-05	8	Hours	$588.30		8420-Civil Engineering
77	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	08-Jan-05	25	Hours	$1,838.45		8420-Civil Engineering

Line No.	Project	Task	Employee/Supplier	Expnd Type	Item Date	Quantity	UOM	Burdened Cost	Comment	Expnd Org
78	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	22-Jan-05	56	Hours	$4,118.12		8420-Civil Engineering
79	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	05-Feb-05	58	Hours	$4,265.20		8420-Civil Engineering
80	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	19-Feb-05	43	Hours	$3,162.13		8420-Civil Engineering
81	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	05-Mar-05	41	Hours	$3,015.06		8420-Civil Engineering
82	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	19-Mar-05	47	Hours	$3,559.56		8420-Civil Engineering
83	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	02-Apr-05	52	Hours	$4,506.01		8420-Civil Engineering
84	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	16-Apr-05	62.5	Hours	$5,415.88		8420-Civil Engineering
85	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	30-Apr-05	62	Hours	$5,372.55		8420-Civil Engineering
86	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	14-May-05	52	Hours	$5,099.58		8420-Civil Engineering
87	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	28-May-05	28	Hours			8420-Civil Engineering
				Total Labor				**$220,399.49**		
88	701620	1.0	DOMECQ, ALLEN ROSS (ALLEN)	1	27-Dec-03	5	Hours	$286.61		8220-Modesto Dom Water
				Total Labor				**$286.61**		
89	701620	1.0	DURRER, CHARLES L (CHUCK)	1	27-Dec-03	4	Hours	$162.25		8220-Modesto Dom Water
90	701620	1.0	DURRER, CHARLES L (CHUCK)	1	10-Jan-04	20	Hours	$741.32		8220-Modesto Dom Water
91	701620	1.0	DURRER, CHARLES L (CHUCK)	1	24-Jan-04	10	Hours	$370.66		8220-Modesto Dom Water
				Total Labor				**$1,274.23**		
92	701620	1.0	EDWARDS, KENNETH W (KEN)	1	27-Dec-03	8	Hours	$647.84		8220-Modesto Dom Water
93	701620	1.0	EDWARDS, KENNETH W (KEN)	1	10-Jan-04	30	Hours	$2,220.00		8220-Modesto Dom Water
94	701620	1.0	EDWARDS, KENNETH W (KEN)	1	24-Jan-04	14	Hours	$1,036.00		8220-Modesto Dom Water
95	701620	1.1	EDWARDS, KENNETH W (KEN)	1	07-Feb-04	10	Hours	$737.76		8220-Modesto Dom Water
96	701620	1.0	EDWARDS, KENNETH W (KEN)	1	07-Feb-04	10	Hours	$737.76		8220-Modesto Dom Water
97	701620	1.1	EDWARDS, KENNETH W (KEN)	1	21-Feb-04	5	Hours	$368.88		8220-Modesto Dom Water
98	701620	1.0	EDWARDS, KENNETH W (KEN)	1	21-Feb-04	2	Hours	$147.55		8220-Modesto Dom Water
99	701620	1.1	EDWARDS, KENNETH W (KEN)	1	06-Mar-04	10	Hours	$740.89		8220-Modesto Dom Water
100	701620	1.1	EDWARDS, KENNETH W (KEN)	1	20-Mar-04	5	Hours	$370.45		8220-Modesto Dom Water
101	701620	1.1	EDWARDS, KENNETH W (KEN)	1	01-May-04	6	Hours	$444.54		8220-Modesto Dom Water
102	701620	1.0	EDWARDS, KENNETH W (KEN)	1	01-May-04	8	Hours	$592.72		8220-Modesto Dom Water
103	701620	1.0	EDWARDS, KENNETH W (KEN)	1	29-May-04	10	Hours	$740.89		8220-Modesto Dom Water
104	701620	1.1	EDWARDS, KENNETH W (KEN)	1	16-Oct-04	8	Hours	$546.19		8220-Modesto Dom Water
105	701620	1.0	EDWARDS, KENNETH W (KEN)	1	30-Oct-04	20	Hours	$1,365.46		8220-Modesto Dom Water
106	701620	1.0	EDWARDS, KENNETH W (KEN)	1	13-Nov-04	10	Hours	$682.73		8220-Modesto Dom Water
				Total Labor				**$11,379.66**		
107	701620	1.0	GUMM, DALE E (DALE)	1	27-Dec-03	4	Hours	$170.50		8220-Modesto Dom Water
				Total Labor				**$170.50**		
108	701620	1.0	HARMON, KATE C (KATE)	1	27-Dec-03	4	Hours	$170.50		8220-Modesto Dom Water
				Total Labor				**$170.50**		
109	701620	1.0	HAUGH, JEFFREY CARL (JEFF)	1	27-Dec-03	4	Hours	$229.29		8220-Modesto Dom Water
				Total Labor				**$229.29**		
110	701620	1.0	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	01-May-04	10	Hours	$608.08		8220-Modesto Dom Water
111	701620	1.0	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	15-May-04	20	Hours	$1,216.17		8220-Modesto Dom Water
112	701620	1.0	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	29-May-04	20	Hours	$1,216.17		8220-Modesto Dom Water
113	701620	1.0	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	12-Jun-04	12	Hours	$729.70		8220-Modesto Dom Water
114	701620	1.0	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	26-Jun-04	8	Hours	$486.47		8220-Modesto Dom Water
115	701620	1.0	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	10-Jul-04	8	Hours	$486.47		8220-Modesto Dom Water
116	701620	1.0	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	07-Aug-04	10	Hours	$560.35		8220-Modesto Dom Water
117	701620	1.0	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	21-Aug-04	10	Hours	$588.73		8220-Modesto Dom Water
118	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	04-Sep-04	10	Hours	$588.73		8220-Modesto Dom Water
119	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	18-Sep-04	10	Hours	$588.73		8220-Modesto Dom Water
120	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	02-Oct-04	10	Hours	$588.73		8220-Modesto Dom Water
121	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	16-Oct-04	10	Hours	$588.73		8220-Modesto Dom Water
122	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	30-Oct-04	10	Hours	$588.73		8220-Modesto Dom Water
123	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	13-Nov-04	10	Hours	$588.73		8220-Modesto Dom Water
124	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	27-Nov-04	6	Hours	$353.24		8220-Modesto Dom Water
125	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	11-Dec-04	5	Hours	$294.37		8220-Modesto Dom Water
126	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	25-Dec-04	2	Hours	$117.75		8220-Modesto Dom Water
127	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	08-Jan-05	8	Hours	$470.98		8220-Modesto Dom Water
128	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	08-Jan-05	4	Hours	$235.49		8220-Modesto Dom Water
129	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	22-Jan-05	4	Hours	$235.49		8220-Modesto Dom Water
130	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	05-Feb-05	12	Hours	$706.48		8220-Modesto Dom Water
131	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	19-Feb-05	16	Hours	$941.97		8220-Modesto Dom Water
132	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	05-Mar-05	14	Hours	$824.22		8220-Modesto Dom Water
133	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	19-Mar-05	8	Hours	$485.15		8220-Modesto Dom Water
134	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	02-Apr-05	10	Hours	$693.86		8220-Modesto Dom Water
135	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	16-Apr-05	10	Hours	$693.86		8220-Modesto Dom Water
136	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	30-Apr-05	22	Hours	$1,526.49		8220-Modesto Dom Water
137	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	14-May-05	10	Hours	$785.26		8220-Modesto Dom Water
138	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	28-May-05	10	Hours			8220-Modesto Dom Water
				Total Labor				**$17,789.13**		
139	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	22-Sep-01	8	Hours	$576.28		8420-Civil Engineering
140	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	06-Oct-01	6	Hours	$432.21		8420-Civil Engineering
141	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	20-Oct-01	8	Hours	$576.28		8420-Civil Engineering
142	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	03-Nov-01	4	Hours	$288.14		8420-Civil Engineering
143	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	17-Nov-01	4	Hours	$288.14		8420-Civil Engineering
144	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	01-Dec-01	4	Hours	$288.14		8420-Civil Engineering
145	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	12-Jan-02	10	Hours	$749.06		8420-Civil Engineering
146	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	26-Jan-02	20	Hours	$1,498.12		8420-Civil Engineering
147	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	09-Feb-02	14	Hours	$1,048.69		8420-Civil Engineering
148	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	23-Feb-02	24	Hours	$1,797.75		8420-Civil Engineering
149	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	09-Mar-02	4	Hours	$299.62		8420-Civil Engineering

Line No.	Project	Task	Employee/Supplier	Expnd Type	Item Date	Quantity	UOM	Burdened Cost	Comment	Expnd Org
150	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	19-Oct-02	1	Hours	$76.62		8420-Civil Engineering
151	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	25-Jan-03	2	Hours	$159.38		8420-Civil Engineering
152	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	08-Feb-03	2	Hours	$159.38		8420-Civil Engineering
153	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	05-Apr-03	2	Hours	$173.85		8420-Civil Engineering
154	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	14-Jun-03	8	Hours	$695.39		8420-Civil Engineering
155	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	12-Jul-03	1	Hours	$97.72		8420-Civil Engineering
156	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	09-Aug-03	2	Hours	$195.44		8420-Civil Engineering
157	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	18-Oct-03	4	Hours	$390.89		8420-Civil Engineering
158	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	01-Nov-03	4	Hours	$390.89		8420-Civil Engineering
159	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	15-Nov-03	4	Hours	$390.89		8420-Civil Engineering
160	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	29-Nov-03	4	Hours	$390.89		8420-Civil Engineering
161	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	15-May-04	6	Hours	$555.22		8420-Civil Engineering
162	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	29-May-04	2	Hours	$185.07		8420-Civil Engineering
163	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	26-Jun-04	6	Hours	$555.22		8420-Civil Engineering
164	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	10-Jul-04	4	Hours	$370.15		8420-Civil Engineering
165	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	07-Aug-04	4	Hours	$341.09		8420-Civil Engineering
166	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	21-Aug-04	6	Hours	$511.64		8420-Civil Engineering
167	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	04-Sep-04	4	Hours	$341.09		8420-Civil Engineering
168	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	18-Sep-04	6	Hours	$511.64		8420-Civil Engineering
169	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	02-Oct-04	12	Hours	$1,023.27		8420-Civil Engineering
170	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	16-Oct-04	8	Hours	$682.18		8420-Civil Engineering
171	701620	1.1	KETSCHER, WILLIAM M (BILL)	1	30-Oct-04	10	Hours	$852.73		8420-Civil Engineering
172	701620	1.1	KETSCHER, WILLIAM M (BILL)	1	13-Nov-04	10	Hours	$852.73		8420-Civil Engineering
173	701620	1.1	KETSCHER, WILLIAM M (BILL)	1	27-Nov-04	2	Hours	$170.55		8420-Civil Engineering
174	701620	1.1	KETSCHER, WILLIAM M (BILL)	1	11-Dec-04	6	Hours	$511.64		8420-Civil Engineering
175	701620	1.1	KETSCHER, WILLIAM M (BILL)	1	25-Dec-04	8	Hours	$682.18		8420-Civil Engineering
176	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	08-Jan-05	30	Hours	$2,558.19		8420-Civil Engineering
177	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	22-Jan-05	24	Hours	$2,046.55		8420-Civil Engineering
178	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	05-Feb-05	24	Hours	$2,046.55		8420-Civil Engineering
179	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	19-Feb-05	8	Hours	$682.18		8420-Civil Engineering
180	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	05-Mar-05	8	Hours	$682.18		8420-Civil Engineering
181	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	19-Mar-05	8	Hours	$702.69		8420-Civil Engineering
182	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	02-Apr-05	16	Hours	$1,608.00		8420-Civil Engineering
183	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	16-Apr-05	16	Hours	$1,608.00		8420-Civil Engineering
184	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	30-Apr-05	10	Hours	$1,005.00		8420-Civil Engineering
185	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	14-May-05	24	Hours	$2,729.73		8420-Civil Engineering
186	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	28-May-05	10	Hours			8420-Civil Engineering
187	701620	1.0	LOSCHKE, CARRIE E (CARRIE)	1	27-Dec-03	5.3	Hours	$225.92		8220-Modesto Dom Water
				Total Labor				**$35,005.16**		
188	701620	1.0	MASON, JOSEPH EDWARD (JOE)	1	27-Dec-03	4	Hours	$183.61		8220-Modesto Dom Water
189	701620	1.0	MASON, JOSEPH EDWARD (JOE)	1	10-Jan-04	30	Hours	$1,258.36		8220-Modesto Dom Water
190	701620	1.0	MASON, JOSEPH EDWARD (JOE)	1	24-Jan-04	10	Hours	$419.45		8220-Modesto Dom Water
191	701620	1.0	MICAL, WILLIAM ANDREW (ANDY)	1	10-Jan-04	9	Hours	$471.44		8220-Modesto Dom Water
192	701620	1.0	MICAL, WILLIAM ANDREW (ANDY)	1	24-Jan-04	1	Hours	$52.38		8220-Modesto Dom Water
193	701620	1.0	MICAL, WILLIAM ANDREW (ANDY)	1	01-May-04	2	Hours	$104.89		8220-Modesto Dom Water
				Total Labor				**$2,490.13**		
194	701620	1.0	MILLER, JEFFERY LEE (JEFF)	1	10-Jan-04	5	Hours	$289.04		8220-Modesto Dom Water
195	701620	1.0	MILLER, JEFFERY LEE (JEFF)	1	24-Jan-04	60	Hours	$3,468.44		8220-Modesto Dom Water
196	701620	1.1	MILLER, JEFFERY LEE (JEFF)	1	07-Feb-04	34.5	Hours	$1,988.33		8220-Modesto Dom Water
197	701620	1.0	MILLER, JEFFERY LEE (JEFF)	1	07-Feb-04	5	Hours	$288.16		8220-Modesto Dom Water
198	701620	1.1	MILLER, JEFFERY LEE (JEFF)	1	06-Mar-04	10	Hours	$578.77		8220-Modesto Dom Water
199	701620	1.0	MILLER, JEFFERY LEE (JEFF)	1	29-May-04	10	Hours	$578.77		8220-Modesto Dom Water
200	701620	1.1	MILLER, JEFFERY LEE (JEFF)	1	13-Nov-04	4	Hours	$213.33		8220-Modesto Dom Water
201	701620	1.0	MILLER, JEFFERY LEE (JEFF)	P04 (overtime)	29-May-04	0	Hours	$72.35		8220-Modesto Dom Water
				Total Labor				**$7,477.19**		
202	701620	1.0	NIEMI, MICHAEL JOHN (MICHAEL)	1	08-Jan-05	13	Hours	$541.78		8410-Water Use, Planning & Conservation
203	701620	1.0	NIEMI, MICHAEL JOHN (MICHAEL)	1	22-Jan-05	20	Hours	$833.50		8410-Water Use, Planning & Conservation
204	701620	1.0	NIEMI, MICHAEL JOHN (MICHAEL)	1	05-Feb-05	12	Hours	$500.10		8410-Water Use, Planning & Conservation
205	701620	1.0	NIEMI, MICHAEL JOHN (MICHAEL)	1	19-Feb-05	3	Hours	$131.34		8410-Water Use, Planning & Conservation
206	701620	1.0	NIEMI, MICHAEL JOHN (MICHAEL)	1	19-Mar-05	39	Hours	$1,758.64		8410-Water Use, Planning & Conservation
207	701620	1.0	NIEMI, MICHAEL JOHN (MICHAEL)	1	02-Apr-05	8	Hours	$412.75		8410-Water Use, Planning & Conservation
208	701620	1.0	NIEMI, MICHAEL JOHN (MICHAEL)	1	16-Apr-05	20	Hours	$1,031.89		8410-Water Use, Planning & Conservation
209	701620	1.0	NIEMI, MICHAEL JOHN (MICHAEL)	1	30-Apr-05	30	Hours	$1,547.83		8410-Water Use, Planning & Conservation
210	701620	1.0	NIEMI, MICHAEL JOHN (MICHAEL)	1	14-May-05	3	Hours	$175.17		8410-Water Use, Planning & Conservation
211	701620	1.0	NIEMI, MICHAEL JOHN (MICHAEL)	P12 (overtime)	19-Mar-05	0	Hours	$45.09		8410-Water Use, Planning & Conservation
				Total Labor				**$6,978.09**		
212	701620	1.0	NOFFSINGER, GARY J (GARY)	1	27-Dec-03	4	Hours	$126.77		8220-Modesto Dom Water
				Total Labor				**$126.77**		
213	701620	1.0	RYAN, PATRICK J (PAT)	1	27-Dec-03	14.5	Hours	$1,296.25		8220-Modesto Dom Water
214	701620	1.0	RYAN, PATRICK J (PAT)	1	10-Jan-04	4	Hours	$326.76		8220-Modesto Dom Water

Line No.	Project	Task	Employee/Supplier	Expnd Type	Item Date	Quantity	UOM	Burdened Cost	Comment	Expnd Org
215	701620	1.0	RYAN, PATRICK J (PAT)	1	07-Feb-04	8	Hours	$651.55		8220-Modesto Dom Water
216	701620	1.0	RYAN, PATRICK J (PAT)	1	21-Feb-04	11	Hours	$895.89		8220-Modesto Dom Water
217	701620	1.0	RYAN, PATRICK J (PAT)	1	06-Mar-04	24	Hours	$1,962.96		8220-Modesto Dom Water
218	701620	1.0	RYAN, PATRICK J (PAT)	1	20-Mar-04	5	Hours	$408.95		8220-Modesto Dom Water
219	701620	1.0	RYAN, PATRICK J (PAT)	1	03-Apr-04	3	Hours	$245.37		8220-Modesto Dom Water
220	701620	1.0	RYAN, PATRICK J (PAT)	1	17-Apr-04	2	Hours	$163.58		8220-Modesto Dom Water
221	701620	1.0	RYAN, PATRICK J (PAT)	1	01-May-04	10	Hours	$817.90		8220-Modesto Dom Water
222	701620	1.0	RYAN, PATRICK J (PAT)	1	15-May-04	10	Hours	$817.90		8220-Modesto Dom Water
223	701620	1.0	RYAN, PATRICK J (PAT)	1	29-May-04	12	Hours	$1,031.16		8220-Modesto Dom Water
224	701620	1.0	RYAN, PATRICK J (PAT)	1	12-Jun-04	10	Hours	$859.30		8220-Modesto Dom Water
225	701620	1.0	RYAN, PATRICK J (PAT)	1	26-Jun-04	10	Hours	$859.30		8220-Modesto Dom Water
226	701620	1.0	RYAN, PATRICK J (PAT)	1	10-Jul-04	10	Hours	$859.30		8220-Modesto Dom Water
227	701620	1.0	RYAN, PATRICK J (PAT)	1	24-Jul-04	10	Hours	$859.30		8220-Modesto Dom Water
228	701620	1.0	RYAN, PATRICK J (PAT)	1	07-Aug-04	10	Hours	$791.84		8220-Modesto Dom Water
229	701620	1.0	RYAN, PATRICK J (PAT)	1	21-Aug-04	5	Hours	$395.92		8220-Modesto Dom Water
230	701620	1.0	RYAN, PATRICK J (PAT)	1	04-Sep-04	10	Hours	$791.84		8220-Modesto Dom Water
231	701620	1.0	RYAN, PATRICK J (PAT)	1	18-Sep-04	10	Hours	$791.84		8220-Modesto Dom Water
232	701620	1.0	RYAN, PATRICK J (PAT)	1	02-Oct-04	17	Hours	$1,346.13		8220-Modesto Dom Water
233	701620	1.0	RYAN, PATRICK J (PAT)	1	16-Oct-04	10	Hours	$791.84		8220-Modesto Dom Water
234	701620	1.0	RYAN, PATRICK J (PAT)	1	30-Oct-04	15	Hours	$1,187.76		8220-Modesto Dom Water
235	701620	1.0	RYAN, PATRICK J (PAT)	1	13-Nov-04	10	Hours	$791.84		8220-Modesto Dom Water
236	701620	1.0	RYAN, PATRICK J (PAT)	1	27-Nov-04	7.5	Hours	$593.89		8220-Modesto Dom Water
237	701620	1.0	RYAN, PATRICK J (PAT)	1	11-Dec-04	12	Hours	$950.21		8220-Modesto Dom Water
238	701620	1.0	RYAN, PATRICK J (PAT)	1	25-Dec-04	15	Hours	$1,187.76		8220-Modesto Dom Water
239	701620	1.0	RYAN, PATRICK J (PAT)	1	08-Jan-05	4	Hours	$316.74		8220-Modesto Dom Water
240	701620	1.0	RYAN, PATRICK J (PAT)	1	08-Jan-05	12	Hours	$950.21		8220-Modesto Dom Water
241	701620	1.0	RYAN, PATRICK J (PAT)	1	22-Jan-05	17	Hours	$1,346.13		8220-Modesto Dom Water
242	701620	1.0	RYAN, PATRICK J (PAT)	1	05-Feb-05	12	Hours	$950.21		8220-Modesto Dom Water
243	701620	1.0	RYAN, PATRICK J (PAT)	1	19-Feb-05	26	Hours	$2,058.79		8220-Modesto Dom Water
244	701620	1.0	RYAN, PATRICK J (PAT)	1	05-Mar-05	8	Hours	$633.47		8220-Modesto Dom Water
245	701620	1.0	RYAN, PATRICK J (PAT)	1	19-Mar-05	29	Hours	$2,365.38		8220-Modesto Dom Water
246	701620	1.0	RYAN, PATRICK J (PAT)	1	02-Apr-05	10	Hours	$933.24		8220-Modesto Dom Water
247	701620	1.0	RYAN, PATRICK J (PAT)	1	16-Apr-05	14	Hours	$1,306.53		8220-Modesto Dom Water
248	701620	1.0	RYAN, PATRICK J (PAT)	1	30-Apr-05	16	Hours	$1,493.18		8220-Modesto Dom Water
249	701620	1.0	RYAN, PATRICK J (PAT)	1	14-May-05	8	Hours	$844.94		8220-Modesto Dom Water
250	701620	1.0	RYAN, PATRICK J (PAT)	1	28-May-05	12	Hours			8220-Modesto Dom Water
				Total Labor				**$34,875.16**		
251	701620	1.0	SMALLING, MARCINE A (MARCINE)	1	27-Dec-03	5.5	Hours	$192.44		8220-Modesto Dom Water
				Total Labor				**$192.44**		
252	701620	1.0	ULM, AARON REYNOLDS (AARON)	1	04-Sep-04	2	Hours	$50.85		8420-Civil Engineering
253	701620	1.0	ULM, AARON REYNOLDS (AARON)	1	18-Sep-04	4	Hours	$101.69		8420-Civil Engineering
				Total Labor				**$152.54**		
254	701620	1.0	WARD, WALTER PAUL (WALT)	1	22-Sep-01	2.5	Hours	$199.28		8010-AGM-Water Operations
255	701620	1.0	WARD, WALTER PAUL (WALT)	1	06-Oct-01	3	Hours	$239.13		8010-AGM-Water Operations
256	701620	1.0	WARD, WALTER PAUL (WALT)	1	20-Oct-01	2	Hours	$159.42		8010-AGM-Water Operations
257	701620	1.0	WARD, WALTER PAUL (WALT)	1	03-Nov-01	2	Hours	$159.42		8010-AGM-Water Operations
258	701620	1.0	WARD, WALTER PAUL (WALT)	1	17-Nov-01	4	Hours	$318.85		8010-AGM-Water Operations
259	701620	1.0	WARD, WALTER PAUL (WALT)	1	01-Dec-01	4	Hours	$318.85		8010-AGM-Water Operations
260	701620	1.0	WARD, WALTER PAUL (WALT)	1	15-Dec-01	6	Hours	$497.40		8010-AGM-Water Operations
261	701620	1.0	WARD, WALTER PAUL (WALT)	1	29-Dec-01	10	Hours	$829.00		8010-AGM-Water Operations
262	701620	1.0	WARD, WALTER PAUL (WALT)	1	12-Jan-02	9	Hours	$746.10		8010-AGM-Water Operations
263	701620	1.0	WARD, WALTER PAUL (WALT)	1	26-Jan-02	6	Hours	$497.40		8010-AGM-Water Operations
264	701620	1.0	WARD, WALTER PAUL (WALT)	1	09-Feb-02	6	Hours	$497.40		8010-AGM-Water Operations
265	701620	1.0	WARD, WALTER PAUL (WALT)	1	23-Feb-02	12	Hours	$994.80		8010-AGM-Water Operations
266	701620	1.0	WARD, WALTER PAUL (WALT)	1	09-Mar-02	12	Hours	$994.80		8010-AGM-Water Operations
267	701620	1.0	WARD, WALTER PAUL (WALT)	1	23-Mar-02	6	Hours	$497.40		8010-AGM-Water Operations
268	701620	1.0	WARD, WALTER PAUL (WALT)	1	06-Apr-02	8	Hours	$663.20		8010-AGM-Water Operations
269	701620	1.0	WARD, WALTER PAUL (WALT)	1	20-Apr-02	1.5	Hours	$124.36		8010-AGM-Water Operations
270	701620	1.0	WARD, WALTER PAUL (WALT)	1	04-May-02	4	Hours	$331.60		8010-AGM-Water Operations
271	701620	1.0	WARD, WALTER PAUL (WALT)	1	18-May-02	4	Hours	$331.60		8010-AGM-Water Operations
272	701620	1.0	WARD, WALTER PAUL (WALT)	1	01-Jun-02	6	Hours	$497.40		8010-AGM-Water Operations
273	701620	1.0	WARD, WALTER PAUL (WALT)	1	15-Jun-02	10	Hours	$829.00		8010-AGM-Water Operations
274	701620	1.0	WARD, WALTER PAUL (WALT)	1	29-Jun-02	4	Hours	$331.60		8010-AGM-Water Operations
275	701620	1.0	WARD, WALTER PAUL (WALT)	1	13-Jul-02	2	Hours	$165.80		8010-AGM-Water Operations
276	701620	1.0	WARD, WALTER PAUL (WALT)	1	10-Aug-02	2	Hours	$169.59		8010-AGM-Water Operations
277	701620	1.0	WARD, WALTER PAUL (WALT)	1	24-Aug-02	4	Hours	$339.18		8010-AGM-Water Operations
278	701620	1.0	WARD, WALTER PAUL (WALT)	1	21-Sep-02	4	Hours	$339.18		8010-AGM-Water Operations
279	701620	1.0	WARD, WALTER PAUL (WALT)	1	16-Nov-02	4	Hours	$339.18		8010-AGM-Water Operations
280	701620	1.0	WARD, WALTER PAUL (WALT)	1	08-Feb-03	4	Hours	$352.76		8010-AGM-Water Operations
281	701620	1.0	WARD, WALTER PAUL (WALT)	1	22-Feb-03	4	Hours	$352.76		8010-AGM-Water Operations
282	701620	1.0	WARD, WALTER PAUL (WALT)	1	08-Mar-03	2	Hours	$192.40		8010-AGM-Water Operations
283	701620	1.0	WARD, WALTER PAUL (WALT)	1	22-Mar-03	4	Hours	$384.79		8010-AGM-Water Operations
284	701620	1.0	WARD, WALTER PAUL (WALT)	1	19-Apr-03	2	Hours	$192.40		8010-AGM-Water Operations
285	701620	1.0	WARD, WALTER PAUL (WALT)	1	03-May-03	3	Hours	$288.59		8010-AGM-Water Operations
286	701620	1.0	WARD, WALTER PAUL (WALT)	1	14-Jun-03	3.5	Hours	$336.70		8010-AGM-Water Operations
287	701620	1.0	WARD, WALTER PAUL (WALT)	1	28-Jun-03	4	Hours	$384.79		8010-AGM-Water Operations
288	701620	1.0	WARD, WALTER PAUL (WALT)	1	12-Jul-03	8	Hours	$865.18		8010-AGM-Water Operations
289	701620	1.0	WARD, WALTER PAUL (WALT)	1	26-Jul-03	4	Hours	$432.59		8010-AGM-Water Operations
290	701620	1.0	WARD, WALTER PAUL (WALT)	1	09-Aug-03	3.5	Hours	$378.53		8010-AGM-Water Operations
291	701620	1.0	WARD, WALTER PAUL (WALT)	1	23-Aug-03	4	Hours	$432.59		8010-AGM-Water Operations

Line No.	Project	Task	Employee/Supplier	Expnd Type	Item Date	Quantity	UOM	Burdened Cost	Comment	Expnd Org
292	701620	1.0	WARD, WALTER PAUL (WALT)	1	06-Sep-03	4	Hours	$432.59		8010-AGM-Water Operations
293	701620	1.0	WARD, WALTER PAUL (WALT)	1	20-Sep-03	6	Hours	$648.89		8010-AGM-Water Operations
294	701620	1.0	WARD, WALTER PAUL (WALT)	1	04-Oct-03	5	Hours	$540.74		8010-AGM-Water Operations
295	701620	1.0	WARD, WALTER PAUL (WALT)	1	18-Oct-03	5	Hours	$540.74		8010-AGM-Water Operations
296	701620	1.0	WARD, WALTER PAUL (WALT)	1	15-Nov-03	3	Hours	$324.44		8010-AGM-Water Operations
297	701620	1.0	WARD, WALTER PAUL (WALT)	1	29-Nov-03	6	Hours	$648.89		8010-AGM-Water Operations
298	701620	1.0	WARD, WALTER PAUL (WALT)	1	13-Dec-03	4	Hours	$447.72		8010-AGM-Water Operations
299	701620	1.0	WARD, WALTER PAUL (WALT)	1	27-Dec-03	10	Hours	$1,119.30		8010-AGM-Water Operations
300	701620	1.0	WARD, WALTER PAUL (WALT)	1	10-Jan-04	4	Hours	$409.13		8010-AGM-Water Operations
301	701620	1.0	WARD, WALTER PAUL (WALT)	1	24-Jan-04	6	Hours	$613.70		8010-AGM-Water Operations
302	701620	1.0	WARD, WALTER PAUL (WALT)	1	07-Feb-04	6	Hours	$611.84		8010-AGM-Water Operations
303	701620	1.0	WARD, WALTER PAUL (WALT)	1	21-Feb-04	12	Hours	$1,223.69		8010-AGM-Water Operations
304	701620	1.0	WARD, WALTER PAUL (WALT)	1	06-Mar-04	20	Hours	$2,048.14		8010-AGM-Water Operations
305	701620	1.0	WARD, WALTER PAUL (WALT)	1	20-Mar-04	6	Hours	$614.44		8010-AGM-Water Operations
306	701620	1.0	WARD, WALTER PAUL (WALT)	1	03-Apr-04	4	Hours	$409.63		8010-AGM-Water Operations
307	701620	1.0	WARD, WALTER PAUL (WALT)	1	17-Apr-04	8	Hours	$819.26		8010-AGM-Water Operations
308	701620	1.0	WARD, WALTER PAUL (WALT)	1	01-May-04	12	Hours	$1,228.88		8010-AGM-Water Operations
309	701620	1.0	WARD, WALTER PAUL (WALT)	1	15-May-04	8	Hours	$819.26		8010-AGM-Water Operations
310	701620	1.0	WARD, WALTER PAUL (WALT)	1	29-May-04	10	Hours	$1,024.07		8010-AGM-Water Operations
311	701620	1.0	WARD, WALTER PAUL (WALT)	1	12-Jun-04	15	Hours	$1,536.11		8010-AGM-Water Operations
312	701620	1.0	WARD, WALTER PAUL (WALT)	1	26-Jun-04	8	Hours	$819.26		8010-AGM-Water Operations
313	701620	1.0	WARD, WALTER PAUL (WALT)	1	10-Jul-04	8	Hours	$819.26		8010-AGM-Water Operations
314	701620	1.0	WARD, WALTER PAUL (WALT)	1	24-Jul-04	5	Hours	$512.04		8010-AGM-Water Operations
315	701620	1.0	WARD, WALTER PAUL (WALT)	1	07-Aug-04	18	Hours	$1,698.62		8010-AGM-Water Operations
316	701620	1.0	WARD, WALTER PAUL (WALT)	1	21-Aug-04	8.5	Hours	$802.13		8010-AGM-Water Operations
317	701620	1.0	WARD, WALTER PAUL (WALT)	1	04-Sep-04	20	Hours	$1,887.36		8010-AGM-Water Operations
318	701620	1.0	WARD, WALTER PAUL (WALT)	1	18-Sep-04	10	Hours	$943.68		8010-AGM-Water Operations
319	701620	1.0	WARD, WALTER PAUL (WALT)	1	02-Oct-04	11	Hours	$1,038.05		8010-AGM-Water Operations
320	701620	1.0	WARD, WALTER PAUL (WALT)	1	16-Oct-04	4	Hours	$377.47		8010-AGM-Water Operations
321	701620	1.0	WARD, WALTER PAUL (WALT)	1	30-Oct-04	2	Hours	$188.74		8010-AGM-Water Operations
322	701620	1.0	WARD, WALTER PAUL (WALT)	1	13-Nov-04	2	Hours	$188.74		8010-AGM-Water Operations
323	701620	1.0	WARD, WALTER PAUL (WALT)	1	27-Nov-04	4	Hours	$377.47		8010-AGM-Water Operations
324	701620	1.0	WARD, WALTER PAUL (WALT)	1	11-Dec-04	2	Hours	$188.74		8010-AGM-Water Operations
325	701620	1.0	WARD, WALTER PAUL (WALT)	1	11-Dec-04	5	Hours	$471.84		8010-AGM-Water Operations
326	701620	1.0	WARD, WALTER PAUL (WALT)	1	25-Dec-04	9	Hours	$849.31		8010-AGM-Water Operations
327	701620	1.0	WARD, WALTER PAUL (WALT)	1	22-Jan-05	1.5	Hours	$141.55		8010-AGM-Water Operations
328	701620	1.0	WARD, WALTER PAUL (WALT)	1	05-Feb-05	4	Hours	$377.47		8010-AGM-Water Operations
329	701620	1.0	WARD, WALTER PAUL (WALT)	1	19-Feb-05	3	Hours	$283.10		8010-AGM-Water Operations
330	701620	1.0	WARD, WALTER PAUL (WALT)	1	19-Mar-05	4	Hours	$388.82		8010-AGM-Water Operations
331	701620	1.0	WARD, WALTER PAUL (WALT)	1	02-Apr-05	4	Hours	$444.88		8010-AGM-Water Operations
332	701620	1.0	WARD, WALTER PAUL (WALT)	1	16-Apr-05	7	Hours	$778.54		8010-AGM-Water Operations
333	701620	1.0	WARD, WALTER PAUL (WALT)	1	30-Apr-05	5	Hours	$556.10		8010-AGM-Water Operations
334	701620	1.0	WARD, WALTER PAUL (WALT)	1	14-May-05	2	Hours	$251.74		8010-AGM-Water Operations
335	701620	1.0	WARD, WALTER PAUL (WALT)	1	28-May-05	3	Hours			8010-AGM-Water Operations
				Total Labor				**$46,451.39**		
336	701620	1.0	MILLER, JEFFERY LEE (JEFF)	4	29-May-04	2.5	Hours	$144.70		8220-Modesto Dom Water
337	701620	1.0	NIEMI, MICHAEL JOHN (MICHAEL)	12	19-Mar-05	2	Hours	$90.19		8410-Water Use, Planning & Conservation
338	701620	1.0	DIAS, GREGORY PAUL (GREG)	15	29-Dec-01	0	Hours	$0.00		8420-Civil Engineering
339	701620	1.0	DIAS, GREGORY PAUL (GREG)	15	04-Oct-03	0	Hours	$0.00		8420-Civil Engineering
340	701620	1.0	DIAS, GREGORY PAUL (GREG)	15	01-Nov-03	0	Hours	$0.00		8420-Civil Engineering
341	701620	1.0	WARD, WALTER PAUL (WALT)	15	29-May-04	0	Hours	$0.00		8010-AGM-Water Operations
342	701620	1.0	WARD, WALTER PAUL (WALT)	15	18-Sep-04	0	Hours	$0.00		8010-AGM-Water Operations
343	701620	1.0	DIAS, GREGORY PAUL (GREG)	16	09-Feb-02	0	Hours	$0.00		8420-Civil Engineering
344	701620	1.0	DIAS, GREGORY PAUL (GREG)	16	18-Oct-03	0	Hours	$0.00		8420-Civil Engineering
345	701620	1.0	DIAS, GREGORY PAUL (GREG)	16	01-Nov-03	0	Hours	$0.00		8420-Civil Engineering
				Total Misc. Labor				**$234.89**		
346	701620	1.0	ACCRUALS/ADJUSTMENTS	111-Labor Accrual/Reversal	31-Dec-04	905.04	Currency	$905.04	2004 LABOR ACCRUAL - PERIOD 12/26/04 - 12/31/04	0000-Balance Sheet
347	701620	1.1	ACCRUALS/ADJUSTMENTS	111-Labor Accrual/Reversal	31-Dec-04	470.98	Currency	$470.98	2004 LABOR ACCRUAL - PERIOD 12/26/04 - 12/31/04	0000-Balance Sheet
348	701620	1.0	ACCRUALS/ADJUSTMENTS	111-Labor Accrual/Reversal	01-Jan-05	-905.04	Currency	-$905.04	2004 LABOR ACCRUAL - PERIOD 12/26/04 - 12/31/04	0000-Balance Sheet
349	701620	1.1	ACCRUALS/ADJUSTMENTS	111-Labor Accrual/Reversal	01-Jan-05	-470.98	Currency	-$470.98	2004 LABOR ACCRUAL - PERIOD 12/26/04 - 12/31/04	0000-Balance Sheet
350	701620	1.0	ACCRUALS/ADJUSTMENTS	112-Labor Corrections	05-Mar-05	64	Currency	$64.00	ADJ FOR RETRO PAY ALLOCATION 12/1/04-3/5/05	8010-AGM-Water Operations
351	701620	1.0	ACCRUALS/ADJUSTMENTS	112-Labor Corrections	05-Mar-05	252	Currency	$252.00	ADJ FOR RETRO PAY ALLOCATION 12/1/04-3/5/05	8220-Modesto Dom Water
352	701620	1.0	ACCRUALS/ADJUSTMENTS	112-Labor Corrections	05-Mar-05	60	Currency	$60.00	ADJ FOR RETRO PAY ALLOCATION 12/1/04-3/5/05	8410-Water Use, Planning & Conservation
353	701620	1.0	ACCRUALS/ADJUSTMENTS	112-Labor Corrections	05-Mar-05	1012	Currency	$1,012.00	ADJ FOR RETRO PAY ALLOCATION 12/1/04-3/5/05	8420-Civil Engineering
354	701620	1.1	ACCRUALS/ADJUSTMENTS	112-Labor Corrections	05-Mar-05	115	Currency	$115.00	ADJ FOR RETRO PAY ALLOCATION 12/1/04-3/5/05	8220-Modesto Dom Water
355	701620	1.0	SMITH CLEARING	112-Labor Corrections	01-Oct-03	2981.12	Currency	$2,981.12	Sunk Cost 14-Jul-01 DIAS, GREGORY PAUL (GREG) 48.00 HOURS	0000-Balance Sheet
356	701620	1.0	SMITH CLEARING	112-Labor Corrections	01-Oct-03	576.28	Currency	$576.28	Sunk Cost 14-Jul-01 KETSCHER, WILLIAM M (BILL) 8.00 HOURS	0000-Balance Sheet
357	701620	1.0	SMITH CLEARING	112-Labor Corrections	01-Oct-03	2856.91	Currency	$2,856.91	Sunk Cost 28-Jul-01 DIAS, GREGORY PAUL (GREG) 46.00 HOURS	0000-Balance Sheet
358	701620	1.0	SMITH CLEARING	112-Labor Corrections	01-Oct-03	288.14	Currency	$288.14	Sunk Cost 28-Jul-01 KETSCHER, WILLIAM M (BILL) 4.00 HOURS	0000-Balance Sheet
359	701620	1.0	SMITH CLEARING	112-Labor Corrections	01-Oct-03	1863.2	Currency	$1,863.20	Sunk Cost 11-Aug-01 DIAS, GREGORY PAUL (GREG) 30.00 HOURS	0000-Balance Sheet
360	701620	1.0	SMITH CLEARING	112-Labor Corrections	01-Oct-03	993.71	Currency	$993.71	Sunk Cost 25-Aug-01 DIAS, GREGORY PAUL (GREG) 16.00 HOURS	0000-Balance Sheet

Line No.	Project	Task	Employee/Supplier	Expnd Type	Item Date	Quantity	UOM	Burdened Cost	Comment	Expnd Org
361	701620	1.0	SMITH CLEARING	112-Labor Corrections	01-Oct-03	1490.56	Currency	$1,490.56	Sunk Cost 8-Sep-01 DIAS, GREGORY PAUL (GREG) 24.00 HOURS	0000-Balance Sheet
362	701620	1.0	SMITH CLEARING	112-Labor Corrections	01-Oct-03	200.65	Currency	$200.65	Sunk Cost 14-Jul-01 LIMA, JOSEPH M. (JOE) 3.00	0000-Balance Sheet
363	701620	1.0	SMITH CLEARING	112-Labor Corrections	01-Oct-03	267.53	Currency	$267.53	Sunk Cost 28-Jul-01 LIMA, JOSEPH M. (JOE) 4.00	0000-Balance Sheet
364	701620	1.0	SMITH CLEARING	112-Labor Corrections	01-Oct-03	66.88	Currency	$66.88	Sunk Cost 11-Aug-01 LIMA, JOSEPH M (JOE) 1.00	0000-Balance Sheet
365	701620	1.0	SMITH CLEARING	112-Labor Corrections	01-Oct-03	133.77	Currency	$133.77	Sunk Cost 22-Sep-01 LIMA, JOSEPH M (JOE) 2.00	0000-Balance Sheet
366	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	1374.45	Currency	$1,374.45	Sunk Cost 28-Dec-02 DIAS, GREGORY PAUL (GREG) 20.00 HOURS	0000-Balance Sheet
367	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	2405.29	Currency	$2,405.29	Sunk Cost 14-Dec-02 DIAS, GREGORY PAUL (GREG) 35.00 HOURS	0000-Balance Sheet
368	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	726.89	Currency	$726.89	Sunk Cost 30-Nov-02 DIAS, GREGORY PAUL (GREG) 11.00 HOURS	0000-Balance Sheet
369	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	1354.66	Currency	$1,354.66	Sunk Cost 16-Nov-02 DIAS, GREGORY PAUL (GREG) 20.50 HOURS	0000-Balance Sheet
370	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	462.56	Currency	$462.56	Sunk Cost 02-Nov-02 DIAS, GREGORY PAUL (GREG) 7.00 HOURS	0000-Balance Sheet
371	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	1354.66	Currency	$1,354.66	Sunk Cost 19-Oct-02 DIAS, GREGORY PAUL (GREG) 20.50 HOURS	0000-Balance Sheet
372	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	2196.51	Currency	$2,196.51	Sunk Cost 27-Jul-02 DIAS, GREGORY PAUL (GREG) 34.00 HOURS	0000-Balance Sheet
373	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	299.62	Currency	$299.62	Sunk Cost 29-Jun-02 KETSCHER, WILLIAM M (BILL) 4.00 HOURS	0000-Balance Sheet
374	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	4493.48	Currency	$4,493.48	Sunk Cost 24-Aug-02 DIAS, GREGORY PAUL (GREG) 68.00 HOURS	0000-Balance Sheet
375	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	1817.22	Currency	$1,817.22	Sunk Cost 07-Sep-02 DIAS, GREGORY PAUL (GREG) 27.50 HOURS	0000-Balance Sheet
376	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	1585.93	Currency	$1,585.93	Sunk Cost 21-Sep-02 DIAS, GREGORY PAUL (GREG) 24.00 HOURS	0000-Balance Sheet
377	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	2511.06	Currency	$2,511.06	Sunk Cost 05-Oct-02 DIAS, GREGORY PAUL (GREG) 38.00 HOURS	0000-Balance Sheet
				Total Labor Corrections				**$33,804.08**		
378										
379			**Total Labor**	**$420,980.58**						
380									**LINES 381-405 ARE MEMBRANE PILOT PLANT**	
381	701620	1.1	BANK ONE, NA	201-Materials	15-Jan-04	440.22	Currency	$440.22	MCMASTER-CARR SUPPLY 14-JAN-04	8220-Modesto Dom Water
382	701620	1.1	BANK ONE, NA	201-Materials	15-Jan-04	375.14	Currency	$375.14	HARRINGTON PLASTICS 14-JAN-04	8220-Modesto Dom Water
383	701620	1.1	BANK ONE, NA	201-Materials	16-Jan-04	174.88	Currency	$174.88	MCMASTER-CARR SUPPLY 15-JAN-04	8220-Modesto Dom Water
384	701620	1.1	BANK ONE, NA	201-Materials	22-Jan-04	-18	Currency	-$18.00	HARRINGTON PLASTICS 21-JAN-04	8220-Modesto Dom Water
385	701620	1.1	BANK ONE, NA	201-Materials	22-Jan-04	82.72	Currency	$82.72	ORCHARD SUPPLY #201 20-JAN-04	8220-Modesto Dom Water
386	701620	1.1	BANK ONE, NA	201-Materials	29-Jan-04	1275.12	Currency	$1,275.12	USA BLUE BOOK 27-JAN-04	8220-Modesto Dom Water
387	701620	1.1	BANK ONE, NA	201-Materials	31-Jan-04	185.09	Currency	$185.09	USA BLUE BOOK	0000-Balance Sheet
388	701620	1.1	BANK ONE, NA	201-Materials	14-Jan-05	716.04	Currency	$716.04	MCMASTER-CARR SUPPLY 13-JAN-05	8220-Modesto Dom Water
389	701620	1.1	BANK ONE, NA	201-Materials	17-Jan-05	324.57	Currency	$324.57	MCMASTER-CARR SUPPLY 14-JAN-05	8220-Modesto Dom Water
				Total Bank One Material Purchases				**$3,555.78**		
390	701620	1.0	CENTER STATE PIPE & SUPPLY	201-Materials	30-Dec-03	1100.71	Currency	$1,100.71	PO 44100	0000-Balance Sheet
391	701620	1.0	CENTER STATE PIPE & SUPPLY	201-Materials	07-Jan-04	92.3	Currency	$92.30	PO 44100	0000-Balance Sheet
392	701620	1.0	CENTER STATE PIPE & SUPPLY	201-Materials	07-Jan-04	36.61	Currency	$36.61	PO 44100	0000-Balance Sheet
393	701620	1.0	CENTER STATE PIPE & SUPPLY	201-Materials	14-Jan-04	6.12	Currency	$6.12	PO 44100	0000-Balance Sheet
394	701620	1.1	CENTER STATE PIPE & SUPPLY	201-Materials	26-Jan-04	150.49	Currency	$150.49	PO 44100	0000-Balance Sheet
395	701620	1.1	CENTER STATE PIPE & SUPPLY	201-Materials	01-Feb-04	4.08	Currency	$4.08	PO 44100	0000-Balance Sheet
396	701620	1.1	CENTER STATE PIPE & SUPPLY	201-Materials	01-Feb-04	14.18	Currency	$14.18	PO 44100	0000-Balance Sheet
				Total Center State Pipe Purchases				**$1,404.49**		
397	701620	1.1	SAFE-T-LITE	201-Materials	22-Oct-04	1407.2	Currency	$1,407.20	PO 42930	0000-Balance Sheet
				Total Safe-T-Light Material Purchases				**$1,407.20**		
398	701620	1.0	WARDEN'S OFFICE	201-Materials	04-Feb-04	47.68	Currency	$47.68	PO 44670 / WATER OPS	0000-Balance Sheet
				Total Warden's Office Material Purchases				**$47.68**		
399	701620	1.0	WATERFORD FARM SUPPLY	201-Materials	07-Jan-04	161.5	Currency	$161.50	PO 43010	0000-Balance Sheet
				Total Waterford Farm Supply Material Purchases				**$161.50**		
400	701620	1.0	WILLE ELECTRIC SUPPLY COMPANY, INC.	201-Materials	07-Jan-04	3.89	Currency	$3.89	PO 43410	0000-Balance Sheet
401	701620	1.1	WILLE ELECTRIC SUPPLY COMPANY, INC.	201-Materials	13-Jan-04	276.64	Currency	$276.64	PO 43410	0000-Balance Sheet
402	701620	1.1	WILLE ELECTRIC SUPPLY COMPANY, INC.	201-Materials	13-Jan-04	209.58	Currency	$209.58	PO 43410	0000-Balance Sheet
403	701620	1.1	WILLE ELECTRIC SUPPLY COMPANY, INC.	201-Materials	13-Jan-04	81.42	Currency	$81.42	PO 43410	0000-Balance Sheet
404	701620	1.1	WILLE ELECTRIC SUPPLY COMPANY, INC.	201-Materials	29-Jan-04	78	Currency	$78.00	PO 43410	0000-Balance Sheet
405	701620	1.1	WILLE ELECTRIC SUPPLY COMPANY, INC.	201-Materials	29-Jan-04	446.94	Currency	$446.94	PO 43410	0000-Balance Sheet
				Total Willie Electric Supply Purchases				**$1,096.47**		
406	701620	1.0	BANK ONE, NA	203-Stationary Supplies	15-Mar-04	481.35	Currency	$481.35	DITTOS 11-MAR-04	8220-Modesto Dom Water
				Total Bank One Stationary Supplies				**$481.35**	**COLOR COPIES FOR DSEIR**	
407	701620	1.0	OFFICE DEPOT BUSINESS SERVICES DIVISION - 1161	204-Office Supplies	01-Feb-04	12.54	Currency	$12.54	DOM WATER PHASE 2 / SUMMARY BILLING - 1/1/04 - 1/31/04	0000-Balance Sheet
				Total Office Depot Office Supplies				**$12.54**		
408	701620	1.0	FEDERAL EXPRESS CORPORATION	205-Postage/Express	21-Dec-01	10.74	Currency	$10.74	5634495300 / GREG DIAS	0000-Balance Sheet
409	701620	1.0	FEDERAL EXPRESS CORPORATION	205-Postage/Express	18-Oct-02	15.28	Currency	$15.28	000977240305 / INVOICE SUMMARY OCT 18 2002 / ACCT #0952-0270-5	0000-Balance Sheet
410	701620	1.0	FEDERAL EXPRESS CORPORATION	205-Postage/Express	18-Jul-03	11.83	Currency	$11.83	G. DIAS / ACCT #0952-0270-5 / SUMMARY THROUGH JULY 18, 2003	0000-Balance Sheet
411	701620	1.0	FEDERAL EXPRESS CORPORATION	205-Postage/Express	21-Nov-03	12.39	Currency	$12.39	G. DIAS / ACCT #0952-0270-5 / SUMMARY NOV 21, 2003	0000-Balance Sheet
412	701620	1.0	FEDERAL EXPRESS CORPORATION	205-Postage/Express	19-Dec-03	13.46	Currency	$13.46	ACCT #0952-0270-5 / SUMAMRY DEC 19, 2003	0000-Balance Sheet
413	701620	1.0	FEDERAL EXPRESS CORPORATION	205-Postage/Express	18-Feb-05	12.21	Currency	$12.21	G DIAS / ACCT 0952-0270-5 / SUMMARY 2/18/05	0000-Balance Sheet
414	701620	1.1	FEDERAL EXPRESS CORPORATION	205-Postage/Express	18-Feb-05	22.75	Currency	$22.75	C HIDAHL / ACCT 0952-0270-5 / SUMMARY 2/18/05	0000-Balance Sheet

Line No.	Project	Task	Employee/Supplier	Expnd Type	Item Date	Quantity	UOM	Burdened Cost	Comment	Expnd Org
415	701620	1.0	FEDERAL EXPRESS CORPORATION	205-Postage/Express	21-Mar-05	11.19	Currency	$11.19	G DIAS / ACCT 0952-0270-5 / SUMMARY 3/21/05	0000-Balance Sheet
416	701620	1.0	FEDERAL EXPRESS CORPORATION	205-Postage/Express	21-Mar-05	17.39	Currency	$17.39	W WARD / ACCT 0952-0270-5 / SUMMARY 3/21/05	0000-Balance Sheet
417	701620	1.0	FEDERAL EXPRESS CORPORATION	205-Postage/Express	21-Mar-05	25.66	Currency	$25.66	G DIAS / ACCT 0952-0270-5 / SUMMARY 3/21/05	0000-Balance Sheet
418	701620	1.1	FEDERAL EXPRESS CORPORATION	205-Postage/Express	21-Mar-05	18.07	Currency	$18.07	C HIDAHL / ACCT 0952-0270-5 / SUMMARY 3/21/05	0000-Balance Sheet
				Total Fed Ex Postage				**$170.97**		
									LINES 419-438 ARE MEMBRANE PILOT PLANT	
419	701620	1.1	BANK ONE, NA	207-Freight	03-Feb-04	43.1	Currency	$43.10	FEDEX FREIGHT WEST INC 02-FEB-04	8220-Modesto Dom Water
				Total Bank One Freight				**$43.10**		
420	701620	1.0	BANK ONE, NA	214-Repair Parts	26-Dec-03	1014.78	Currency	$1,014.78	USA BLUE BOOK 23-DEC-03	8220-Modesto Dom Water
421	701620	1.1	BANK ONE, NA	214-Repair Parts	05-Feb-04	21.45	Currency	$21.45	ORCHARD SUPPLY #201 03-FEB-04	8220-Modesto Dom Water
422	701620	1.1	BANK ONE, NA	214-Repair Parts	06-Feb-04	29.46	Currency	$29.46	ORCHARD SUPPLY #201 04-FEB-04	8220-Modesto Dom Water
423	701620	1.1	BANK ONE, NA	214-Repair Parts	23-Feb-04	514.65	Currency	$514.65	USA BLUE BOOK 19-FEB-04	8220-Modesto Dom Water
				Total Bank One Repair Parts				**$1,580.34**		
424	701620	1.1	WATERFORD FARM SUPPLY	214-Repair Parts	09-Jul-04	16.83	Currency	$16.83	PO 43010 / REF 92030	0000-Balance Sheet
				Total Waterford Farm Supply Repair Parts				**$16.83**		
425	701620	1.1	BANK ONE, NA	217-Small Tools	04-Oct-04	162.15	Currency	$162.15	MCMASTER-CARR SUPPLY 01-OCT-04	8220-Modesto Dom Water
426	701620	1.1	BANK ONE, NA	217-Small Tools	20-Oct-04	1303.6	Currency	$1,303.60	TRANSCAT 18-OCT-04	8220-Modesto Dom Water
				Total Bank One Small Tool Purchases				**$1,465.75**		
427	701620	1.1	SAFE-T-LITE	248-Safety Equipment Cost	27-Apr-04	1299	Currency	$1,299.00	PO 42930	0000-Balance Sheet
				Total Safe-T-Lite Safety Equipment				**$1,299.00**		
428	701620	1.0	BANK ONE, NA	255-Material Sales Tax	31-Dec-03	67.45	Currency	$67.45	KENNETH EDWARDS 31-DEC-03	0000-Balance Sheet
429	701620	1.1	BANK ONE, NA	255-Material Sales Tax	31-Jan-04	84.81	Currency	$84.81	JEFF L MILLER 31-JAN-04	0000-Balance Sheet
430	701620	1.1	BANK ONE, NA	255-Material Sales Tax	31-Jan-04	6.49	Currency	$6.49	KENNETH EDWARDS 31-JAN-04	0000-Balance Sheet
431	701620	1.1	BANK ONE, NA	255-Material Sales Tax	29-Feb-04	35.21	Currency	$35.21	SALES TAX / USA BLUE BOOK 19-FEB-04	0000-Balance Sheet
432	701620	1.0	CENTER STATE PIPE & SUPPLY	255-Material Sales Tax	30-Dec-03	81.18	Currency	$81.18	PO 44100	0000-Balance Sheet
433	701620	1.0	CENTER STATE PIPE & SUPPLY	255-Material Sales Tax	07-Jan-04	6.81	Currency	$6.81	PO 44100	0000-Balance Sheet
434	701620	1.0	CENTER STATE PIPE & SUPPLY	255-Material Sales Tax	07-Jan-04	2.7	Currency	$2.70	PO 44100	0000-Balance Sheet
435	701620	1.0	CENTER STATE PIPE & SUPPLY	255-Material Sales Tax	14-Jan-04	0.45	Currency	$0.45	PO 44100	0000-Balance Sheet
436	701620	1.1	CENTER STATE PIPE & SUPPLY	255-Material Sales Tax	26-Jan-04	11.1	Currency	$11.10	PO 44100	0000-Balance Sheet
437	701620	1.1	CENTER STATE PIPE & SUPPLY	255-Material Sales Tax	01-Feb-04	0.3	Currency	$0.30	PO 44100	0000-Balance Sheet
438	701620	1.1	CENTER STATE PIPE & SUPPLY	255-Material Sales Tax	01-Feb-04	1.05	Currency	$1.05	PO 44100	0000-Balance Sheet
439	701620	1.0	OFFICE DEPOT BUSINESS SERVICES DIVISION - 1161	255-Material Sales Tax	01-Feb-04	0.92	Currency	$0.92	DOM WATER PHASE 2 / SUMMARY BILLING - 1/1/04 - 1/31/04	0000-Balance Sheet
440	701620	1.1	SAFE-T-LITE	255-Material Sales Tax	27-Apr-04	95.81	Currency	$95.81	PO 42930	0000-Balance Sheet
441	701620	1.1	SAFE-T-LITE	255-Material Sales Tax	22-Oct-04	103.78	Currency	$103.78	PO 42930	0000-Balance Sheet
442	701620	1.0	WARDEN'S OFFICE	255-Material Sales Tax	04-Feb-04	3.52	Currency	$3.52	PO 44670 / WATER OPS	0000-Balance Sheet
443	701620	1.0	WATERFORD FARM SUPPLY	255-Material Sales Tax	07-Jan-04	11.91	Currency	$11.91	PO 43010	0000-Balance Sheet
444	701620	1.1	WATERFORD FARM SUPPLY	255-Material Sales Tax	09-Jul-04	1.24	Currency	$1.24	PO 43010 / REF 92030	0000-Balance Sheet
445	701620	1.0	WILLE ELECTRIC SUPPLY COMPANY, INC.	255-Material Sales Tax	07-Jan-04	0.28	Currency	$0.28	PO 43410	0000-Balance Sheet
446	701620	1.1	WILLE ELECTRIC SUPPLY COMPANY, INC.	255-Material Sales Tax	13-Jan-04	20.4	Currency	$20.40	PO 43410	0000-Balance Sheet
447	701620	1.1	WILLE ELECTRIC SUPPLY COMPANY, INC.	255-Material Sales Tax	13-Jan-04	15.46	Currency	$15.46	PO 43410	0000-Balance Sheet
448	701620	1.1	WILLE ELECTRIC SUPPLY COMPANY, INC.	255-Material Sales Tax	13-Jan-04	6.01	Currency	$6.01	PO 43410	0000-Balance Sheet
449	701620	1.1	WILLE ELECTRIC SUPPLY COMPANY, INC.	255-Material Sales Tax	29-Jan-04	5.76	Currency	$5.76	PO 43410	0000-Balance Sheet
450	701620	1.1	WILLE ELECTRIC SUPPLY COMPANY, INC.	255-Material Sales Tax	29-Jan-04	32.96	Currency	$32.96	PO 43410	0000-Balance Sheet
451				**Total Sales Tax**				**$595.60**		
452			**Total Materials and Supplies**	**$13,338.60**						
453										
454	701620	1.0	BLACK & VEATCH	401-Consulting	05-Sep-03	3050	Currency	$3,050.00	REF 65518 / 8/1/03-8/29/03 / PROF SVCS / WTP	0000-Balance Sheet
455	701620	1.0	BLACK & VEATCH	401-Consulting	02-Oct-03	14761.86	Currency	$14,761.86	CLIENT REF 65518 / PROF SVCS 8/29/03-9/26/03 / WTP PHASE II	0000-Balance Sheet
456	701620	1.0	BLACK & VEATCH	401-Consulting	05-Nov-03	56476.2	Currency	$56,476.20	PROF SVCS / MRWTP PHASE 2 / 9/26/03-10/31/03	0000-Balance Sheet
457	701620	1.0	BLACK & VEATCH	401-Consulting	04-Dec-03	27361.5	Currency	$27,361.50	PROFESSIONAL SERVICES - NOV 03 BILLING / MRWTP PHASE TWO EXPANSION PROJECT	0000-Balance Sheet
458	701620	1.0	BLACK & VEATCH	401-Consulting	31-Dec-03	5570	Currency	$5,570.00	PROFESSIONAL SERVICES - MRWTP PHASE TWO EXPANISON PROJECT / DEC 03 BILLING	0000-Balance Sheet
459	701620	1.1	BLACK & VEATCH	401-Consulting	11-Feb-04	63533.2	Currency	$63,533.20	PROF SVCS 12/26/03-1/30/04 FOR PHASE 2 EXPANSION MRWTP	0000-Balance Sheet
460	701620	1.1	BLACK & VEATCH	401-Consulting	05-Mar-04	48858	Currency	$48,858.00	PROFESSIONAL SERVICES / FEB 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT	0000-Balance Sheet
461	701620	1.1	BLACK & VEATCH	401-Consulting	05-Apr-04	25788.81	Currency	$25,788.81	PROF SVCS 2/27/04-3/26/04 FOR MRWTP PHASE 2 EXPANSION	0000-Balance Sheet
462	701620	1.1	BLACK & VEATCH	401-Consulting	13-May-04	33628.68	Currency	$33,628.68	PROFESSIONAL SERVICES - APR 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT	0000-Balance Sheet
463	701620	1.1	BLACK & VEATCH	401-Consulting	03-Jun-04	38684.87	Currency	$38,684.87	PROFESSIONAL SERVICES - MAY 04 BILLING / MRWTP PHASE TWO	0000-Balance Sheet
464	701620	1.1	BLACK & VEATCH	401-Consulting	06-Jul-04	15218.67	Currency	$15,218.67	PROFESSIONAL SERVICES / JUN 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT	0000-Balance Sheet
465	701620	1.1	BLACK & VEATCH	401-Consulting	04-Aug-04	32358.65	Currency	$32,358.65	PROFESSIONAL SERVICES / JUL 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT	0000-Balance Sheet
466	701620	1.1	BLACK & VEATCH	401-Consulting	02-Sep-04	34883.74	Currency	$34,883.74	PROFESSIONAL SRVICES / MRWTP PHASE TWO EXPANISON PROJECT AUG 04 BILLING	0000-Balance Sheet
467	701620	1.1	BLACK & VEATCH	401-Consulting	30-Sep-04	59764.5	Currency	$59,764.50	PROFESSIONAL SERVICES / AUG 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT	0000-Balance Sheet
468	701620	1.1	BLACK & VEATCH	401-Consulting	08-Nov-04	61809.18	Currency	$61,809.18	PROF SVCS / 9/24/04-10/29/04 / MRWTP PHASE 2 EXPANSION PROJECT	0000-Balance Sheet
469	701620	1.1	BLACK & VEATCH	401-Consulting	01-Dec-04	25424.5	Currency	$25,424.50	PROFESSIONAL SERVICES / NOV 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT	0000-Balance Sheet
470	701620	1.1	BLACK & VEATCH	401-Consulting	31-Dec-04	18609.56	Currency	$18,609.56	PROF SVCS / MRWTP PHASE 2 EXP PROJ / 11/26/04-12/31/04	0000-Balance Sheet

Line No.	Project	Task	Employee/Supplier	Expnd Type	Item Date	Quantity	UOM	Burdened Cost	Comment	Expnd Org
471	701620	1.1	BLACK & VEATCH	401-Consulting	01-Apr-05	15532.81	Currency	$15,532.81	CLIENT 65518 / PROF SVCS / MRWTP PHASE 2 EXP PROJ / 1/1/05-2/4/05	0000-Balance Sheet
472	701620	1.1	BLACK & VEATCH	401-Consulting	01-Apr-05	35873.36	Currency	$35,873.36	CLIENT 65518 / PROF SVCS / MRWTP PHASE 2 EXP PROJ / 2/5/05-3/4/05	0000-Balance Sheet
				Total Black & Veatch Consulting				**$617,188.09**		
	701620	1.1	JOHNSTON, WILLIAM R. P.E. RESEARCH & CONSULTING	401-Consulting	31-Dec-04	10075.00	Currency	$10,075.00	77.5 hrs @ $130 per hr for Water Rights consulting	
			JOHNSTON, WILLIAM R. P.E. RESEARCH & CONSULTING	401-Consulting	03-May-05	4200.00	Currency	$4,200.00	30 hrs @ $140 per hr for Water Rights consulting	
				Total William Johnston Consulting				**$14,275.00**		
473	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	14-Jan-04	8411.6	Currency	$8,411.60	PROFESSIONAL SERVICES - MRWTP PHASE TWO EXPANISON PROJECT SEIR / NOV 24- DEC 28, 2003	0000-Balance Sheet
474	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	08-Feb-04	13196.85	Currency	$13,196.85	PROF SVCS - MRWTP PHASE 2 EXPANSION PROJECT SEIR / 12/29/03-1/25/04	0000-Balance Sheet
475	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	10-Mar-04	35368.47	Currency	$35,368.47	PROFESSIONAL SERVICES - FEB 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR	0000-Balance Sheet
476	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	08-Apr-04	13399.51	Currency	$13,399.51	PROFESSIONAL SERVICES - MAR 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR	0000-Balance Sheet
477	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	10-May-04	19462.78	Currency	$19,462.78	PROFESSIONAL SERVICES - APR 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR	0000-Balance Sheet
478	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	08-Jun-04	5366.49	Currency	$5,366.49	PROFESSIONAL SERVICES - MAY 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR	0000-Balance Sheet
479	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	13-Jul-04	7978.92	Currency	$7,978.92	JUN 04 BILLING / MRWTP PHASE TWO EXPANSIONS PROJECT SEIR	0000-Balance Sheet
480	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	10-Aug-04	4255.84	Currency	$4,255.84	PROFESSIONAL SERVICES / JUL 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR	0000-Balance Sheet
481	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	01-Sep-04	17635.27	Currency	$17,635.27	PROFESSIONAL SERVICES / AUG 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR	0000-Balance Sheet
482	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	13-Oct-04	22229.32	Currency	$22,229.32	PROFESSIONAL SERVICES - AUG 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR	0000-Balance Sheet
483	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	03-Nov-04	11132.79	Currency	$11,132.79	PROF SVCS - 9/27/04-10/24/04 / MRWTP PHASE 2 EXPANSION PROJECT SEIR	0000-Balance Sheet
484	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	01-Dec-04	4946.92	Currency	$4,946.92	PROFESSIONAL SERVICES / NOV 04 BILLNG / MRWTP - PHASE TWO EXPANSION PROJECT SEIR	0000-Balance Sheet
485	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	10-Jan-05	11080.32	Currency	$11,080.32	PROF SVCS - 11/22/04-12/26/04 / MRWTP PHASE 2 EXPANSION PROJECT SEIR	0000-Balance Sheet
486	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	04-Feb-05	3400.14	Currency	$3,400.14	PROF SVCS - 12/27/04-1/23/05 / MRWTP PHASE 2 EXPANSION PROJECT SEIR	0000-Balance Sheet
487	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	01-Mar-05	2906.1	Currency	$2,906.10	PROF SVCS - 1/24/05-2/20/05 / MRWTP PHASE 2 EXPANSION PROJECT SEIR	0000-Balance Sheet
488	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	12-Apr-05	1496.47	Currency	$1,496.47	PROJ 03564.03 / PROF SVCS - 2/21/05-3/2705 / MRWTP PHASE 2 EXPANSION PROJECT SEIR	0000-Balance Sheet
489	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	03-May-05	705.18	Currency	$705.18	PROJ 03564.03 / PROF SVCS - 3/28/05-4/24/05 / MRWTP PHASE 2 EXPANSION PROJECT SEIR	0000-Balance Sheet
				Total Jones & Stokes Consulting				**$182,972.97**		
490	701620	1.1	KATZ & ASSOCIATES	401-Consulting	01-Apr-04	2145	Currency	$2,145.00	PROF SVCS OF CRAIG MOYLE THRU 2/29/04	0000-Balance Sheet
491	701620	1.1	KATZ & ASSOCIATES	401-Consulting	01-Apr-04	163.7	Currency	$163.70	PROFESSIONAL SERVICES - MAR 04 BILLING	0000-Balance Sheet
492	701620	1.1	KATZ & ASSOCIATES	401-Consulting	01-Jun-04	279.38	Currency	$279.38	PROFESSIONAL SERVICES / APR 04 BILLING / CLIENT #SC1123L	0000-Balance Sheet
				Total Katz & Associates Consulting				**$2,588.08**		
									LINE 493 IS COURT REPORTER	
493	701620	1.1	AL CALA & ASSOCIATES	425-Other Outside Services	31-Dec-04	230	Currency	$230.00	2 PUBLIC MTGS FOR MRWTP PHASE 2 EXPANSION	0000-Balance Sheet
				Total Al Cala & Associates Consulting				**$230.00**	**COURT REPORTER**	
494	701620	1.1	BANK ONE, NA	425-Other Outside Services	12-Apr-04	10.74	Currency	$10.74	AUDIO VIDEO HQ 09-APR-04	8220-Modesto Dom Water
495	701620	1.1	BANK ONE, NA	425-Other Outside Services	12-Apr-04	42.95	Currency	$42.95	AUDIO VIDEO HQ 08-APR-04	8220-Modesto Dom Water
				Total Bank One Outside Services				**$53.69**		
									LINES 496-520 ARE MEMBRANE PILOT PLANT COSTS FOR SIMULATED DISTRIBUTION STUDIES	
496	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	23-Aug-04	900	Currency	$900.00	PO 41760	0000-Balance Sheet
497	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	01-Feb-05	300	Currency	$300.00	PO 41760	0000-Balance Sheet
498	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	07-Feb-05	240	Currency	$240.00	PO 41760	0000-Balance Sheet
499	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	07-Feb-05	320	Currency	$320.00	PO 41760	0000-Balance Sheet
500	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	07-Feb-05	565	Currency	$565.00	PO 41760	0000-Balance Sheet
501	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	09-Feb-05	390	Currency	$390.00	PO 41760	0000-Balance Sheet
502	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	18-Feb-05	239	Currency	$239.00	PO 41760	0000-Balance Sheet
503	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	23-Feb-05	35	Currency	$35.00	PO 41760	0000-Balance Sheet
504	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	24-Feb-05	170	Currency	$170.00	PO 41760	0000-Balance Sheet
505	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	25-Feb-05	900	Currency	$900.00	PO 41760	0000-Balance Sheet
506	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	01-Mar-05	35	Currency	$35.00	PO 41760	0000-Balance Sheet
507	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	10-Mar-05	2265	Currency	$2,265.00	PO 41760	0000-Balance Sheet
508	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	17-Mar-05	207.5	Currency	$207.50	PO 41760	0000-Balance Sheet
509	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	21-Mar-05	60	Currency	$60.00	PO 41760 / SUBM #2005030799	0000-Balance Sheet
510	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	21-Mar-05	185	Currency	$185.00	PO 41760 / SUBM #2005030323	0000-Balance Sheet
511	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	22-Mar-05	317	Currency	$317.00	PO 41760 / SUBM #2005021298	0000-Balance Sheet
512	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	24-Mar-05	207.5	Currency	$207.50	PO 41760	0000-Balance Sheet
513	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	07-Apr-05	230	Currency	$230.00	PO 41760	0000-Balance Sheet
514	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	11-Apr-05	2250	Currency	$2,250.00	PO 41760	0000-Balance Sheet
515	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	14-Apr-05	155	Currency	$155.00	PO 41760	0000-Balance Sheet
516	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	25-Apr-05	185	Currency	$185.00	PO 41760	0000-Balance Sheet
517	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	06-May-05	339	Currency	$339.00	PO 41760	0000-Balance Sheet
518	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	11-May-05	445	Currency	$445.00	PO 41760	0000-Balance Sheet
519	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	24-May-05	495	Currency	$495.00	PO 41760	0000-Balance Sheet

Line No.	Project	Task	Employee/Supplier	Expnd Type	Item Date	Quantity	UOM	Burdened Cost	Comment	Expnd Org
520	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	24-May-05	3075	Currency	$3,075.00	PO 41760	0000-Balance Sheet
				Total BSK Analytical Lab Outside Services				**$14,510.00**		
521	701620	1.0	CALIFORNIA CAD SOLUTIONS	425-Other Outside Services	28-Dec-04	2815	Currency	$2,815.00	SCAN, PLACE & RUBBER SHEET 10 AERIAL PHOTOS	0000-Balance Sheet
				Total California CAD Solutions Outside Services				**$2,815.00**	**ACREAGE MAP FOR SWRCB**	
522	701620	1.0	MARTINO GRAPHIC DESIGN	425-Other Outside Services	08-Jun-04	1779.92	Currency	$1,779.92	PO 44563 / WTP NEWSLETTER	0000-Balance Sheet
				Total Martino Graphic Design Outside Services				**$1,779.92**		
523	701620	1.0	SMITH CLEARING	425-Other Outside Services	02-Oct-03	1715	Currency	$1,715.00	Sunk Cost 01-Jun-02 KATZ & ASSOCIATES	0000-Balance Sheet
524	701620	1.0	SMITH CLEARING	425-Other Outside Services	02-Oct-03	6701.25	Currency	$6,701.25	Sunk Cost 01-Jun-02 KATZ & ASSOCIATES	0000-Balance Sheet
525	701620	1.0	SMITH CLEARING	425-Other Outside Services	02-Oct-03	808.25	Currency	$808.25	Sunk Cost 01-Jun-02 KATZ & ASSOCIATES	0000-Balance Sheet
526	701620	1.0	SMITH CLEARING	425-Other Outside Services	02-Oct-03	2572.94	Currency	$2,572.94	Sunk Cost 01-Jun-02 KATZ & ASSOCIATES	0000-Balance Sheet
527	701620	1.0	SMITH CLEARING	425-Other Outside Services	02-Oct-03	5290.91	Currency	$5,290.91	Sunk Cost 21-Jun-02 KATZ & ASSOCIATES	0000-Balance Sheet
528	701620	1.0	SMITH CLEARING	425-Other Outside Services	02-Oct-03	-8544.17	Currency	-$8,544.17	Sunk Cost 10-Jul-02 ACCOUNTS RECEIVABLE	0000-Balance Sheet
				Total Financial Adjustments to Outside Services				**$8,544.18**		
529	701620	1.0	CALIFORNIA CAD SOLUTIONS	455-Outside Services Sales Tax	28-Dec-04	1.11	Currency	$1.11	SCAN, PLACE & RUBBER SHEET 10 AERIAL PHOTOS	0000-Balance Sheet
530	701620	1.0	MARTINO GRAPHIC DESIGN	455-Outside Services Sales Tax	08-Jun-04	131.27	Currency	$131.27	PO 44563 / WTP NEWSLETTER	0000-Balance Sheet
531				**Total Outside Services Sales Tax**				**$132.38**		
532			**Total Outside Services**	**$845,089.31**						
533									**LINES 534-538 Scottsdale Wtr Campus; Mesa CAP**	
534	701620	1.1	AMERICAN EXPRESS	501-Transportation-Commercial	26-Feb-04	292.3	Currency	$292.30	G. DIAS / ACCT #3782-911358-11007 / FEB 04 BILLING	0000-Balance Sheet
535	701620	1.1	AMERICAN EXPRESS	501-Transportation-Commercial	26-Feb-04	20	Currency	$20.00	SERVICE FEE / ACCT #3782-911358-11007 / FEB 04 BILLING	0000-Balance Sheet
536	701620	1.1	AMERICAN EXPRESS	501-Transportation-Commercial	26-Feb-04	40	Currency	$40.00	SERVICE FEE / ACCT #3782-911358-11007 / FEB 04 BILLING	0000-Balance Sheet
537	701620	1.1	AMERICAN EXPRESS	501-Transportation-Commercial	26-Feb-04	255.3	Currency	$255.30	P. RYAN / ACCT #3782-911358-11007 / FEB 04	0000-Balance Sheet
538	701620	1.1	AMERICAN EXPRESS	501-Transportation-Commercial	26-Feb-04	255.3	Currency	$255.30	W. WARD / ACCT #3782-911358-11007 / FEB 04	0000-Balance Sheet
									LINES 539-545 OCWD WWTP - Submerged	
539	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Jun-04	209.7	Currency	$209.70	W. WARD / ACCT #3782-911358-11007 / MAY 04	0000-Balance Sheet
540	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Jun-04	209.7	Currency	$209.70	G. DIAS / ACCT #3782-911358-11007 / MAY 04	0000-Balance Sheet
541	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Jun-04	209.7	Currency	$209.70	P. RYAN / ACCT #3782-911358-11007 / MAY 04	0000-Balance Sheet
542	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Jun-04	-209.7	Currency	-$209.70	P. RYAN / ACCT #3782-911358-11007 / MAY 04	0000-Balance Sheet
543	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Jun-04	209.7	Currency	$209.70	K. EDWARDS / ACCT #3782-911358-11007 / MAY 04 BILLING	0000-Balance Sheet
544	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Jun-04	209.7	Currency	$209.70	C. HIDAHL / ACCT #3782-911358-11007 / MAY 04	0000-Balance Sheet
545	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Jun-04	100	Currency	$100.00	W. WARD / ACCT #3782-911358-11007 / MAY 04	0000-Balance Sheet
546	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Mar-05	138.39	Currency	$138.39	P RYAN / ACCT #3782-911358-11007 / FEB 05 BILLING	0000-Balance Sheet
547	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Mar-05	20	Currency	$20.00	SERVICE CHARGE / ACCT #3782-911358-11007 / FEB 05 BILLING	0000-Balance Sheet
	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Mar-05	215.39	Currency	$215.39	P RYAN / ACCT #3782-911358-11007 / FEB 05 BILLING	
	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Mar-05	60	Currency	$60.00	3 SERVICE CHARGES	
	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Mar-05	215.39	Currency	$215.39	K. EDWARDS / ACCT #3782-911358-11007 / FEB 05	
	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Mar-05	215.39	Currency	$215.39	J. MILLER / ACCT #3782-911358-11007 / FEB 05	
548										
549			**Total Transportation Costs**	**$2,666.26**						
550										
551	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	11-Jan-02	58.81	Currency	$58.81	THE FRUIT YARD 09-JAN-02- ENGR SEL PROCESS	5220-Accounting/Budgeting
552	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	17-Jan-02	19.68	Currency	$19.68	THE FRUIT YARD 15-JAN-02 - ENGR SEL PROCESS	5220-Accounting/Budgeting
553	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	12-May-03	34.94	Currency	$34.94	THE FRUIT YARD 08-MAY-03 - CEQA RFP	8420-Civil Engineering
554	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	09-Jun-03	29.39	Currency	$29.39	PICCADILLY DELI & SAND 06-JUN-03 - EIR	8420-Civil Engineering
555	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	24-Nov-03	63.27	Currency	$63.27	SMART & FINAL CO. SCL 21-NOV-03	8010-AGM-Water Operations
556	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	29-Jan-04	35.94	Currency	$35.94	PICCADILLY DELI 27-JAN-04	8220-Modesto Dom Water
557	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	04-Feb-04	72.73	Currency	$72.73	PICCADILLY DELI 02-FEB-04 EROOM TRAINING	8220-Modesto Dom Water
									LINES 558-561PHOENIX FIELD TRIP	
558	701620	1.1	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	27-Feb-04	36	Currency	$36.00	FIVE STAR PARK00100107 25-FEB-04	8220-Modesto Dom Water
559	701620	1.1	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	27-Feb-04	98.6	Currency	$98.60	AMERISUITES TEMPE 25-FEB-04	8220-Modesto Dom Water
560	701620	1.1	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	27-Feb-04	98.6	Currency	$98.60	AMERISUITES TEMPE 25-FEB-04	8220-Modesto Dom Water
561	701620	1.1	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	27-Feb-04	98.6	Currency	$98.60	AMERISUITES TEMPE 25-FEB-04	8220-Modesto Dom Water
562	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	01-Oct-04	104.47	Currency	$104.47	PICCADILLY DELI 29-SEP-04	8220-Modesto Dom Water
563	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	20-Oct-04	45.38	Currency	$45.38	PICCADILLY DELI 18-OCT-04	8220-Modesto Dom Water
564	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	16-Dec-04	23.01	Currency	$23.01	SMART & FINAL CO. SCL 14-DEC-04	8220-Modesto Dom Water
									LINES 565-570 SALT LAKE CITY FIELD TRIP	
565	701620	1.1	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	21-Feb-05	91.19	Currency	$91.19	LITTLE AMERICA SLC LOD 19-FEB-05	8220-Modesto Dom Water
566	701620	1.1	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	21-Feb-05	19.46	Currency	$19.46	HMSHOST-SMF-AIR #01 17-FEB-05	8220-Modesto Dom Water
567	701620	1.1	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	21-Feb-05	24	Currency	$24.00	SACRAMENTO CNTY ARPRT 18-FEB-05	8220-Modesto Dom Water
568	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	21-Feb-05	10.76	Currency	$10.76	LITTLE AMERICA SLC LOD 19-FEB-05	8220-Modesto Dom Water
569	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	21-Feb-05	20.27	Currency	$20.27	SQUATTERS AIRPORT PUB 18-FEB-05	8220-Modesto Dom Water
570	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	21-Feb-05	182.38	Currency	$182.38	LITTLE AMERICA SLC LOD 19-FEB-05	8220-Modesto Dom Water
571	701620	1.1	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	28-Feb-05	67.74	Currency	$67.74	HOUSE OF BEEF 24-FEB-05-SO CTY WTP TOUR	8220-Modesto Dom Water
									MEMBRANE CONFERENCE-PAT RYAN	
572	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	02-Mar-05	211.81	Currency	$211.81	WYNDHAM HOTELS PHOENIX 01-MAR-05	8220-Modesto Dom Water
573	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	11-Mar-05	11.53	Currency	$11.53	HRC-PHOENIX 10011435 09-MAR-05	8220-Modesto Dom Water
574	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	11-Mar-05	468.53	Currency	$468.53	WYNDHAM HOTELS PHOENIX 09-MAR-05	8220-Modesto Dom Water
				Total Bank One Meals/Lodg/Park/RentCar				**$1,927.09**		
575	701620	1.0	DIAS, GREGORY PAUL (GREG)	503-Meals/Lodg/Park/RentCar	16-Dec-04	20	Currency	$20.00	EXPENSES - PBLIC MTG PHASE TWO EXPANSION PROJECT PUBLIC MTG	0000-Balance Sheet
				Total Greg Dias Meals/Lodg/Park/RentCar				**$20.00**		
576	701620	1.0	JAKE SONKE, CONTROLLER	503-Meals/Lodg/Park/RentCar	20-Jun-03	7.55	Currency	$7.55	CASH AND CARRY / PURCHASES- W.E. 6/20/03 - REIMBURSE THE PETTY CASH ACCT FOR MONEY ISSUED	0000-Balance Sheet
577	701620	1.0	JAKE SONKE, CONTROLLER	503-Meals/Lodg/Park/RentCar	27-Jun-03	33.12	Currency	$33.12	CASH AND CARRY	0000-Balance Sheet

Line No.	Project	Task	Employee/Supplier	Expnd Type	Item Date	Quantity	UOM	Burdened Cost	Comment	Expnd Org
578	701620	1.0	JAKE SONKE, CONTROLLER	503-Meals/Lodg/Park/RentCar	22-Jul-03	11.2	Currency	$11.20	OLDE TYME PASTRY / PURCHASES THRU 7/21/03 - REIMBURSE THE PETTY CASH ACCT	0000-Balance Sheet
579	701620	1.0	JAKE SONKE, CONTROLLER	503-Meals/Lodg/Park/RentCar	11-Mar-04	11	Currency	$11.00	CITY OF SACRAMENTO -PARKING / PURCHASES W.E. 3/10/04 - MEETING WITH SWRCB	0000-Balance Sheet
580	701620	1.0	JAKE SONKE, CONTROLLER	503-Meals/Lodg/Park/RentCar	28-Sep-04	7.8	Currency	$7.80	CASH & CARRY / PURCHASES - W.E. 9/27/04 / REIMBURSE THE PETTY CASH FOR FUNDS ISSUED	0000-Balance Sheet
581	701620	1.0	JAKE SONKE, CONTROLLER	503-Meals/Lodg/Park/RentCar	19-Oct-04	6.49	Currency	$6.49	CASH & CARRY / PURCHASES / W.E. 10/19/04 / REIMBURSE THE PETTY CASH FOR FUNDS ISSUED	0000-Balance Sheet
582	701620	1.0	JAKE SONKE, CONTROLLER	503-Meals/Lodg/Park/RentCar	17-Dec-04	14.97	Currency	$14.97	SAVEMART / PURCHASES W.E. 12/16/04 / REPLENISH THE PETTY CASH ACCT FOR FUNDS	0000-Balance Sheet
				Total Petty Cash Meals/Lodg/Park/RentCar				**$92.13**		
583	701620	1.0	RYAN, PATRICK J (PAT)	503-Meals/Lodg/Park/RentCar	18-Mar-05	49.5	Currency	$49.50	REIMB EXP / MEMBRANE TECH CONF IN PHOENIX, AZ 3/9/05	0000-Balance Sheet
				Total Pat Ryan Meals/Lodg/Park/RentCar				**$49.50**		
584	701620	1.0	WARD, WALTER PAUL (WALT)	503-Meals/Lodg/Park/RentCar	28-Feb-04	60	Currency	$60.00	MRWTP PHASE II PROJECT LUNCH MTG / FEB 18,	0000-Balance Sheet
585	701620	1.0	WARD, WALTER PAUL (WALT)	503-Meals/Lodg/Park/RentCar	09-Mar-04	75	Currency	$75.00	3/2/04 SWRCB MTG	0000-Balance Sheet
586	701620	1.0	WARD, WALTER PAUL (WALT)	503-Meals/Lodg/Park/RentCar	12-May-04	52	Currency	$52.00	LUNCH STRATEGY MTG 5/3/04	0000-Balance Sheet
587	701620	1.0	WARD, WALTER PAUL (WALT)	503-Meals/Lodg/Park/RentCar	19-May-04	110	Currency	$110.00	OC WTP TOUR W/BLACK & VEATCH & US FILTER,	0000-Balance Sheet
588	701620	1.0	WARD, WALTER PAUL (WALT)	503-Meals/Lodg/Park/RentCar	17-Dec-04	90	Currency	$90.00	EXPENSES - PBLIC MTG PHASE TWO EXPANSION PROJECT MTG	0000-Balance Sheet
589				**Total Walter Ward Meals/Lodg/Park/RentCar**				**$387.00**		
590			**Total Meals/Lodge/Park/RentalCars**	**$2,475.72**						
591										
592	701620	1.1	BANK ONE, NA	504-Seminars/Training/Meetings	02-Feb-05	675	Currency	$675.00	AMERICAN WATER WORKS 27-JAN-05 (MEMBRANE CONF.)	8220-Modesto Dom Water
593										
594	701620	1.1	BANK ONE, NA	504-Seminars/Training/Meetings	17-Feb-05	200	Currency	$200.00	AMER WATER WORKS LB 15-FEB-05 (MEMBRANE	8220-Modesto Dom Water
595										
596			**Total Seminars/Training/Meetings**	**$875.00**						
597										
598	701620	1.1	EL SOL	601-Advertising	01-Feb-04	172.5	Currency	$172.50	PO 44568 / JAN 03 BILLING	0000-Balance Sheet
599	701620	1.0	EL SOL	601-Advertising	01-Mar-04	172.5	Currency	$172.50	PO 44568 / FEB 04 ADS	0000-Balance Sheet
600	701620	1.0	EL SOL	601-Advertising	01-Dec-04	205.6	Currency	$205.60	PO 44568 / ACCT 90000005	0000-Balance Sheet
601	701620	1.0	EL SOL	601-Advertising	26-Dec-04	179.9	Currency	$179.90	PO 44568	0000-Balance Sheet
602	701620	1.0	MODESTO BEE	601-Advertising	01-Feb-04	1726.73	Currency	$1,726.73	ADVERTISING 1/31 & 2/1/04 / WATER FACILITIES	0000-Balance Sheet
603	701620	1.0	MODESTO BEE	601-Advertising	01-Mar-04	1547.04	Currency	$1,547.04	ACCT 40061705 / VARIOUS ADS 2/2/04-2/29/04	0000-Balance Sheet
604	701620	1.0	MODESTO BEE	601-Advertising	28-Nov-04	1843.2	Currency	$1,843.20	PO 44564 / 11/7-11/21/04 NOA-WATER	0000-Balance Sheet
605	701620	1.0	MODESTO BEE	601-Advertising	26-Dec-04	2281.38	Currency	$2,281.38	PO 44564 / ACCT 40061705 / 11/29/04-12/26/04	0000-Balance Sheet
606	701620	1.0	STANISLAUS FARM NEWS	601-Advertising	01-Feb-04	50	Currency	$50.00	PO 44558 / DISPLAY ADS	0000-Balance Sheet
607	701620	1.0	STANISLAUS FARM NEWS	601-Advertising	01-Mar-04	50	Currency	$50.00	PO 44558 / FEB 04 / WATER FAC PHASE 2	0000-Balance Sheet
608	701620	1.0	WATERFORD NEWS	601-Advertising	09-Feb-04	179.25	Currency	$179.25	AD 2/3/04 / WATER FACILITIES EXPANSION	0000-Balance Sheet
609	701620	1.1	WATERFORD NEWS	601-Advertising	10-Dec-04	358.5	Currency	$358.50	PO 44557 / W/E 12/10/04 ADS	0000-Balance Sheet
610	701620	1.0	WATERFORD NEWS	601-Advertising	17-Dec-04	358.5	Currency	$358.50	PO 44557 / W.E. 12/15/04 BILLING / PUBLIC MTGS	0000-Balance Sheet
611										
612			**Total Advertising**	**$9,125.10**						
613										
614	701620	1.0	STATE WATER RESOURCES CONTROL BOARD	612-Permits	31-Dec-03	900	Currency	$900.00	ADDT'L FILING FEE FOR LONG TERM WATER TRANSFER TO THE CITY OF MODESTO / RECENT ADOPTED FEE SCHEDULE WAS CHANGED	0000-Balance Sheet
615	701620	1.0	JAKE SONKE, CONTROLLER	621-Publications/Subscriptions	15-Jun-04	10.73	Currency	$10.73	PURCHASES W.E. 6/14/04 / REIMBURSE THE PETTY CASH FOR FUNDS ISSUED-Videos City Council	0000-Balance Sheet
			Total Misc. Expenses	**$910.73**						

Labor	$420,980.58	32.5%
Consultants/Outside Services	$845,089.31	65.2%
Meals/Lodging/Parking/RentCar	$2,475.72	0.2%
Transportation	$2,666.26	0.2%
Materials, Postage, Parts, Supplies	$13,338.60	1.0%
Seminars/Training/Meetings	$875.00	0.1%
Advertising	$9,125.10	0.7%
Misc. Expenses	$910.73	0.1%

check sum $1,295,461.30 100.0%
OK

$450,371.99

PHASE TWO DOMESTIC WATER EXPANSION PROJECT-COSTS FRONTED BY MID

EXPENDITURES- MAY 29, 2005 THROUGH OCTOBER 1, 2005

Project	Task	Expnd Type		Item Date	Employee/Supplier	Quantity	UOM	Project Burdened Comment	Expnd Org
Total From 6-1-05 Report (Expenditures through May 28 2005)								**$1,295,461.30**	
701620	01.0		1	11-Jun-05	DIAS, GREGORY PAUL (GREG)	46	Hours	$4,511.17	8420-Civil Engineering
701620	01.0		1	25-Jun-05	DIAS, GREGORY PAUL (GREG)	50	Hours	$4,903.44	8420-Civil Engineering
701620	01.0		1	9-Jul-05	DIAS, GREGORY PAUL (GREG)	51	Hours	$5,001.51	8420-Civil Engineering
701620	01.0		1	23-Jul-05	DIAS, GREGORY PAUL (GREG)	34	Hours	$3,334.34	8420-Civil Engineering
701620	01.0		1	6-Aug-05	DIAS, GREGORY PAUL (GREG)	36	Hours	$3,530.48	8420-Civil Engineering
701620	01.0		1	20-Aug-05	DIAS, GREGORY PAUL (GREG)	24	Hours	$2,353.65	8420-Civil Engineering
701620	01.0		1	3-Sep-05	DIAS, GREGORY PAUL (GREG)	58	Hours	$5,688.00	8420-Civil Engineering
					Total Greg Dias Labor			**$29,322.59**	
701620	01.1		1	20-Aug-05	DURRER, CHARLES L (CHUCK)	20	Hours	$912.12	8220-Modesto Dom Water
					Total Charles Durrer Labor			**$912.12**	
701620	01.1		1	9-Jul-05	EDWARDS, KENNETH W (KEN)	15	Hours	$1,366.11	8220-Modesto Dom Water
701620	01.1		1	23-Jul-05	EDWARDS, KENNETH W (KEN)	10	Hours	$910.74	8220-Modesto Dom Water
701620	01.1		1	6-Aug-05	EDWARDS, KENNETH W (KEN)	25	Hours	$2,276.85	8220-Modesto Dom Water
701620	01.1		1	20-Aug-05	EDWARDS, KENNETH W (KEN)	20	Hours	$1,821.48	8220-Modesto Dom Water
					Total Ken Edwards Labor			**$6,375.18**	
701620	01.1		1	23-Jul-05	EICHMAN, MARK A (MARK)	8	Hours	$412.90	8220-Modesto Dom Water
701620	01.1		1	6-Aug-05	EICHMAN, MARK A (MARK)	20	Hours	$1,032.26	8220-Modesto Dom Water
701620	01.1		1	20-Aug-05	EICHMAN, MARK A (MARK)	25	Hours	$1,290.33	8220-Modesto Dom Water
701620	01.1		1	3-Sep-05	EICHMAN, MARK A (MARK)	8	Hours	$412.90	8220-Modesto Dom Water
					Total Mark Eichman Labor			**$3,148.39**	
701620	01.1		1	11-Jun-05	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	3	Hours	$235.58	8220-Modesto Dom Water
701620	01.1		1	25-Jun-05	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	8	Hours	$628.21	8220-Modesto Dom Water
701620	01.1		1	9-Jul-05	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	8	Hours	$628.21	8220-Modesto Dom Water
701620	01.1		1	23-Jul-05	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	5	Hours	$392.63	8220-Modesto Dom Water
701620	01.1		1	6-Aug-05	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	12	Hours	$942.31	8220-Modesto Dom Water
701620	01.1		1	20-Aug-05	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	25	Hours	$2,062.45	8220-Modesto Dom Water
701620	01.1		1	3-Sep-05	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	28	Hours	$2,309.94	8220-Modesto Dom Water
					Total Claudia Hidahl Labor			**$7,199.33**	
701620	01.0		1	11-Jun-05	KETSCHER, WILLIAM M (BILL)	4	Hours	$454.95	8420-Civil Engineering
701620	01.0		1	25-Jun-05	KETSCHER, WILLIAM M (BILL)	8	Hours	$909.91	8420-Civil Engineering
701620	01.0		1	9-Jul-05	KETSCHER, WILLIAM M (BILL)	10	Hours	$1,137.39	8420-Civil Engineering
701620	01.0		1	23-Jul-05	KETSCHER, WILLIAM M (BILL)	10	Hours	$1,137.39	8420-Civil Engineering
701620	01.0		1	6-Aug-05	KETSCHER, WILLIAM M (BILL)	12	Hours	$1,364.86	8420-Civil Engineering
701620	01.0		1	20-Aug-05	KETSCHER, WILLIAM M (BILL)	8	Hours	$909.91	8420-Civil Engineering
701620	01.0		1	3-Sep-05	KETSCHER, WILLIAM M (BILL)	6	Hours	$682.43	8420-Civil Engineering
					Total Bill Ketscher Labor			**$6,596.84**	
701620	01.1		1	9-Jul-05	MASON, JOSEPH EDWARD (JOE)	4	Hours	$206.45	8220-Modesto Dom Water
701620	01.0		1	23-Jul-05	MASON, JOSEPH EDWARD (JOE)	2	Hours	$103.23	8220-Modesto Dom Water
701620	01.1		1	6-Aug-05	MASON, JOSEPH EDWARD (JOE)	8	Hours	$412.90	8220-Modesto Dom Water
701620	01.1		1	20-Aug-05	MASON, JOSEPH EDWARD (JOE)	20	Hours	$1,032.26	8220-Modesto Dom Water
					Total Joe Mason Labor			**$1,754.84**	
701620	01.0		1	6-Aug-05	MAZARIEGOS, LEISSER PATRICIA (LEISSE	42	Hours	$1,424.14	8420-Civil Engineering
					Total Leisser Mazariegos Labor			**$1,424.14**	
701620	01.1		1	9-Jul-05	MILLER, JEFFERY LEE (JEFF)	50	Hours	$3,556.80	8220-Modesto Dom Water
701620	01.1		1	9-Jul-05	MILLER, JEFFERY LEE (JEFF)	-50	Hours	-$3,556.80	8220-Modesto Dom Water
701620	01.1		1	9-Jul-05	MILLER, JEFFERY LEE (JEFF)	42	Hours	$2,987.71	8220-Modesto Dom Water
701620	01.1 P12			9-Jul-05	MILLER, JEFFERY LEE (JEFF)	0	Hours	$106.70	8220-Modesto Dom Water
701620	01.1		12	9-Jul-05	MILLER, JEFFERY LEE (JEFF)	3	Hours	$213.41	8220-Modesto Dom Water
701620	01.1		1	23-Jul-05	MILLER, JEFFERY LEE (JEFF)	30	Hours	$2,134.08	8220-Modesto Dom Water
701620	01.1		1	20-Aug-05	MILLER, JEFFERY LEE (JEFF)	16	Hours	$1,138.18	8220-Modesto Dom Water
					Total Jeff Miller Labor			**$6,580.08**	
701620	01.0		1	6-Aug-05	RATTO, VALERIE I (VALERIE)	1	Hours	$33.91	8420-Civil Engineering
					Total Valerie Ratto Labor			**$33.91**	

701620	01.0	1	11-Jun-05	RYAN, PATRICK J (PAT)	8	Hours	$844.94		8220-Modesto Dom Water
701620	01.0	1	25-Jun-05	RYAN, PATRICK J (PAT)	19	Hours	$2,006.73		8220-Modesto Dom Water
701620	01.0	1	23-Jul-05	RYAN, PATRICK J (PAT)	17	Hours	$1,795.49		8220-Modesto Dom Water
701620	01.0	1	6-Aug-05	RYAN, PATRICK J (PAT)	15	Hours	$1,584.26		8220-Modesto Dom Water
701620	01.0	1	20-Aug-05	RYAN, PATRICK J (PAT)	15	Hours	$1,584.26		8220-Modesto Dom Water
701620	01.0	1	3-Sep-05	RYAN, PATRICK J (PAT)	53	Hours	$5,597.71		8220-Modesto Dom Water
				Total Pat Ryan Labor			**$13,413.39**		
701620	01.0	1	11-Jun-05	WARD, WALTER PAUL (WALT)	2.5	Hours	$314.68		8010-AGM-Water Operations
701620	01.0	1	25-Jun-05	WARD, WALTER PAUL (WALT)	6	Hours	$755.23		8010-AGM-Water Operations
701620	01.0	1	23-Jul-05	WARD, WALTER PAUL (WALT)	2	Hours	$251.74		8010-AGM-Water Operations
701620	01.0	1	6-Aug-05	WARD, WALTER PAUL (WALT)	4	Hours	$503.48		8010-AGM-Water Operations
701620	01.0	1	20-Aug-05	WARD, WALTER PAUL (WALT)	8	Hours	$1,006.97		8010-AGM-Water Operations
701620	01.0	1	3-Sep-05	WARD, WALTER PAUL (WALT)	8	Hours	$1,006.97		8010-AGM-Water Operations
				Total Walter Ward Labor			**$3,839.07**		
	Total Labor							**$80,599.88**	
701620	01.1 201-Materials		7-Jul-05	CENTER STATE PIPE & SUPPLY	59.99	Currency	$59.99	PO 44100	0000-Balance Sheet
701620	01.1 255-Material Sales Tax		7-Jul-05	CENTER STATE PIPE & SUPPLY	4.42	Currency	$4.42	PO 44100	0000-Balance Sheet
				Total Center State Pipe & Supply Materials			**$64.41**		
701620	01.1 201-Materials		1-Jul-05	DELTA RUBBER	835.61	Currency	$835.61	PO 42750	0000-Balance Sheet
701620	01.1 201-Materials		8-Jul-05	DELTA RUBBER	111.84	Currency	$111.84	PO 42750	0000-Balance Sheet
701620	01.1 201-Materials		1-Sep-05	DELTA RUBBER	285.94	Currency	$285.94	PO 42750	0000-Balance Sheet
701620	01.1 255-Material Sales Tax		1-Jul-05	DELTA RUBBER	61.67	Currency	$61.67	PO 42750	0000-Balance Sheet
701620	01.1 255-Material Sales Tax		8-Jul-05	DELTA RUBBER	8.25	Currency	$8.25	PO 42750	0000-Balance Sheet
701620	01.1 255-Material Sales Tax		1-Sep-05	DELTA RUBBER	21.1	Currency	$21.10	PO 42750	0000-Balance Sheet
				Total Delta Rubber Materials			**$1,324.41**		
701620	01.1 201-Materials		10-Aug-05	WATERFORD FARM SUPPLY	15.76	Currency	$15.76	PO 43010	0000-Balance Sheet
701620	01.1 255-Material Sales Tax		10-Aug-05	WATERFORD FARM SUPPLY	1.16	Currency	$1.16	PO 43010	0000-Balance Sheet
				Total Waterford Farm Supply Materials			**$16.92**		
701620	01.1 207-Freight		4-Jul-05	BANK ONE, NA	62.66	Currency	$62.66	FEDEX FREIGHT WEST INC 30-JUN-05	8220-Modesto Dom Water
				Total Bank One Freight			**$62.66**		
701620	01.1 214-Repair Parts		29-Jun-05	BANK ONE, NA	264.89	Currency	$264.89	MCMASTER-CARR 27-JUN-05	8220-Modesto Dom Water
701620	01.1 214-Repair Parts		29-Jun-05	BANK ONE, NA	388.38	Currency	$388.38	MCMASTER-CARR 27-JUN-05	8220-Modesto Dom Water
701620	01.1 214-Repair Parts		30-Jun-05	BANK ONE, NA	416.61	Currency	$416.61	MCMASTER-CARR 28-JUN-05	8220-Modesto Dom Water
701620	01.1 214-Repair Parts		1-Jul-05	BANK ONE, NA	43.8	Currency	$43.80	MCMASTER-CARR 29-JUN-05	8220-Modesto Dom Water
701620	01.1 214-Repair Parts		1-Jul-05	BANK ONE, NA	52.06	Currency	$52.06	MCMASTER-CARR 29-JUN-05	8220-Modesto Dom Water
701620	01.1 214-Repair Parts		1-Jul-05	BANK ONE, NA	483.51	Currency	$483.51	MCMASTER-CARR 29-JUN-05	8220-Modesto Dom Water
701620	01.1 214-Repair Parts		7-Jul-05	BANK ONE, NA	244.55	Currency	$244.55	MCMASTER-CARR 05-JUL-05	8220-Modesto Dom Water
701620	01.1 214-Repair Parts		18-Jul-05	BANK ONE, NA	100.38	Currency	$100.38	MCMASTER-CARR 13-JUL-05	8220-Modesto Dom Water
701620	01.1 214-Repair Parts		18-Jul-05	BANK ONE, NA	114.57	Currency	$114.57	MCMASTER-CARR 14-JUL-05	8220-Modesto Dom Water
701620	01.1 214-Repair Parts		18-Jul-05	BANK ONE, NA	1336.96	Currency	$1,336.96	MCMASTER-CARR 13-JUL-05	8220-Modesto Dom Water
701620	01.1 214-Repair Parts		28-Jul-05	BANK ONE, NA	74.53	Currency	$74.53	MCMASTER-CARR 26-JUL-05	8220-Modesto Dom Water
701620	01.1 214-Repair Parts		29-Jul-05	BANK ONE, NA	230.84	Currency	$230.84	MCMASTER-CARR 27-JUL-05	8220-Modesto Dom Water
				Total Bank One Repair Parts			**$3,751.08**		
	Total Materials and Supplies							**$5,219.48**	
701620	01.1 401-Consulting		1-Jun-05	BLACK & VEATCH	16841.86	Currency	$16,841.86	CLIENT 65518 / PROF SVCS / MRWTP PHASE 2 EXP PROJ / 3/5/05-4/1/05	0000-Balance Sheet
701620	01.1 401-Consulting		22-Jun-05	BLACK & VEATCH	34983.76	Currency	$34,983.76	CLIENT 65518 / PROF SVCS / MRWTP PHASE 2 EXP PROJ / 4/2/05-6/3/05	0000-Balance Sheet
701620	01.1 401-Consulting		15-Jul-05	BLACK & VEATCH	18137.81	Currency	$18,137.81	CLIENT 65518 / PROF SVCS / MRWTP PHASE 2 EXP PROJ / 6/4/05-6/30/05	0000-Balance Sheet
701620	01.1 401-Consulting		1-Sep-05	BLACK & VEATCH	47247.97	Currency	$47,247.97	PROFESSIONAL SERVICES - JUL 05 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR	0000-Balance Sheet
				Total Black & Veatch Consulting			**$117,211.40**		
701620	01.1 401-Consulting		6-Jun-05	JONES & STOKES ASSOCIATES	2100.15	Currency	$2,100.15	PROFESSIONAL SERVICES / MAY 05 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR	0000-Balance Sheet
701620	01.1 401-Consulting		7-Jul-05	JONES & STOKES ASSOCIATES	7475.79	Currency	$7,475.79	PROJ 03564.03 / PROF SVCS - 5/23/05-6/26/05 / MRWTP PHASE 2 EXPANSION PROJECT SEIR	0000-Balance Sheet
701620	01.1 401-Consulting		1-Aug-05	JONES & STOKES ASSOCIATES	4260.25	Currency	$4,260.25	PROFESSIONAL SERVICES - MRWTP PHASE TWO EXPANSION PROJECT SEIR / JUL 05 BILLING	0000-Balance Sheet
701620	01.1 401-Consulting		1-Sep-05	JONES & STOKES ASSOCIATES	786.1	Currency	$786.10	PROFESSIONAL SERVICES - JUL 05 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR	0000-Balance Sheet
				Total Jones & Stokes Consulting			**$14,622.29**		

701620	01.1 425-Other Outside Services	30-May-05	BSK ANALYTICAL LABORATORIES	1350	Currency		$1,350.00	PO 41760	0000-Balance Sheet
701620	01.1 425-Other Outside Services	2-Jun-05	BSK ANALYTICAL LABORATORIES	185	Currency		$185.00	PO 41760	0000-Balance Sheet
701620	01.1 425-Other Outside Services	8-Jun-05	BSK ANALYTICAL LABORATORIES	240	Currency		$240.00	PO 41760	0000-Balance Sheet
701620	01.1 425-Other Outside Services	15-Jun-05	BSK ANALYTICAL LABORATORIES	2025	Currency		$2,025.00	PO 41760	0000-Balance Sheet
701620	01.1 425-Other Outside Services	17-Jun-05	BSK ANALYTICAL LABORATORIES	365	Currency		$365.00	PO 41760	0000-Balance Sheet
701620	01.1 425-Other Outside Services	21-Jun-05	BSK ANALYTICAL LABORATORIES	495	Currency		$495.00	PO 41760	0000-Balance Sheet
701620	01.1 425-Other Outside Services	21-Jun-05	BSK ANALYTICAL LABORATORIES	150	Currency		$150.00	PO 41760	0000-Balance Sheet
701620	01.1 425-Other Outside Services	21-Jun-05	BSK ANALYTICAL LABORATORIES	185	Currency		$185.00	PO 41760	0000-Balance Sheet
701620	01.1 425-Other Outside Services	23-Jun-05	BSK ANALYTICAL LABORATORIES	150	Currency		$150.00	PO 41760	0000-Balance Sheet
701620	01.1 425-Other Outside Services	30-Jun-05	BSK ANALYTICAL LABORATORIES	150	Currency		$150.00	PO 41760	0000-Balance Sheet
701620	01.1 425-Other Outside Services	13-Jul-05	BSK ANALYTICAL LABORATORIES	150	Currency		$150.00	PO 41760	0000-Balance Sheet
701620	01.1 425-Other Outside Services	8-Aug-05	BSK ANALYTICAL LABORATORIES	30	Currency		$30.00	PO 41760	0000-Balance Sheet
701620	01.1 425-Other Outside Services	8-Aug-05	BSK ANALYTICAL LABORATORIES	375	Currency		$375.00	PO 41760	0000-Balance Sheet
			Total BSK Analytical Lab Outside Services				**$5,850.00**		
	Total Consulting & Outside Services					**$137,683.69**			
701620	01.1 503-Meals/Lodg/Park/RentCar	1-Aug-05	BANK ONE, NA	66.67	Currency		$66.67	DOUBLETREE MODESTO F & 28-JUL-05	8220-Modesto Dom Water
701620	01.0 503-Meals/Lodg/Park/RentCar	24-Jun-05	EDWARDS, KENNETH W (KEN)	43.56	Currency		$43.56	EXP REIMB / AWWA IN SF ON 6/15/05	0000-Balance Sheet
701620	01.0 503-Meals/Lodg/Park/RentCar	24-Jun-05	EICHMAN, MARK A (MARK)	26.12	Currency		$26.12	EXP REIMB / AWWA IN SF ON 6/14/05	0000-Balance Sheet
701620	01.0 503-Meals/Lodg/Park/RentCar	6-Sep-05	JAKE SONKE, CONTROLLER	4	Currency		$4.00	PURCHASES W.E. 9/6/05 / REIMBURSE PETTY CASH FOR FUNDS ISSUED	0000-Balance Sheet
701620	01.1 503-Meals/Lodg/Park/RentCar	26-Jul-05	WARD, WALTER PAUL (WALT)	85	Currency		$85.00	MRWTP PHASE TWO EXPANSION PROJECT MEMBRANE PRE-SELECTION REVIEW TEAM LUNCHOEN / MODESTO , CA / JUL 25, 2005	0000-Balance Sheet
			Total Meals/Lodg/Park/RentCar				**$225.35**		
701620	01.0 601-Advertising	31-Jul-05	MODESTO BEE	146.55	Currency		$146.55	PO 44564 / ACCT #10133800 / JUL 05 BILLING	0000-Balance Sheet
			Total Advertising				**$146.55**		
701620	01.0 642-Trash Removal/Dumping Fees	31-Aug-05	GILTON RESOURCE RECOVERY	30	Currency		$30.00	ACCT #00000386-00 / AUG 05 BILLING / PO 44573	0000-Balance Sheet
			Total Misc. Expenses				**$30.00**		

Task 01 Totals

Labor	$501,580.46	33.0%
Consultants/Outside Services	$982,773.00	64.7%
Meals/Lodging/Parking/RentCar	$2,701.07	0.2%
Transportation	$2,666.26	0.2%
Materials, Postage, Parts, Supplies	$18,558.08	1.2%
Seminars/Training/Meetings	$875.00	0.1%
Advertising	$9,271.65	0.6%
Misc. Expenses	$940.73	0.1%

Check sum for this report	$223,904.95	
Total from June 1 2005 report	$1,295,461.30	
Total for All 01 Task Charges	**$1,519,366.25**	100.0%

MID Modesto Irrigation District
Water and Power

BOARD AGENDA REPORT

Meeting Date: October 11, 2005
Item No.: 11 20 97
Tab No.:

Subject: Amended and Restated Treatment and Delivery Agreement between the Modesto Irrigation District (MID) and the City of Modesto (City) pertaining to the Modesto Regional Water Treatment Plant (MRWTP).

Recommended Action:

By resolution, the Modesto Irrigation District Board of Directors authorizes the General Manager to execute the Amended and Restated Treatment and Delivery Agreement between the Modesto Irrigation District and the City of Modesto pertaining to the Modesto Regional Water Treatment Plant (MRWTP) and direct staff to initiate the final design process related to the Phase Two expansion of the MRWTP.

Background and Discussion:

In the early 1990's the City of Modesto, Modesto Irrigation District, and the former Del Este Water Company collaborated together for the purpose of utilizing MID's surface water rights for domestic drinking water purposes. The Modesto Regional Water Treatment Plant (MRWTP) was the result of this effort. The MRWTP consists of a 30 million gallon per day regional water treatment plant, and storage and delivery facilities, which were completed in 1995. At the direction of the MRWTP Policy Committee, the MID Board and the City Council, planning and engineering design studies are underway for the project to expand the capacity of the MRWTP to treat up to 67,200 acre-feet per year.

Work on the expansion project to date has been accomplished under an advance funding and reimbursement agreement between the City and MID. MID has initially funded the entire cost of the CEQA work and preliminary engineering. MID will recover these funds once the project financing is completed.

At this time, the Subsequent Environmental Impact Report (SEIR) has been completed. Both MID and the City certified the document on July 12, 2005. The MID and City will be considering to adopt findings and approve the project. In addition, MID has received approval from the State Water Resources Control Board to change the use of up to 67,200 acre-feet per year of water from agricultural to municipal and industrial purposes. It is now appropriate to consider the amended and restated Treatment and Delivery Agreement (TDA) for formal execution between MID and the City.

The original TDA was executed in 1992 and provided the terms and conditions under which the City would receive 30 MGD from the first phase of the project. Through extensive discussions between MID and the City, the original agreement has been amended and restated to include the Phase Two project which will change the amount of water the City receives not-to-exceed 67,200 acre-feet per year, or 60 mgd on an annual average daily basis.

The terms of the amended and restated TDA, for the most part, are the same as the original TDA but have been amended where appropriate to account for the additional 30 MGD.

Some of the key points of the amended and restated TDA:

- The City will continue to receive raw water at the same unit cost as MID agricultural users.
- The City will reimburse MID for all capital, operating and maintenance costs associated with treatment of the water.
- If necessary during a drought, the City and MID agricultural customer allocations will be reduced in equal proportions.
- MID agrees that its commitment to its agricultural customers and to the City shall be met before any subsequent water transfers for delivery of water outside the District's boundaries.
- The Policy Committee, which advises the MID Board and the City Council on matters related to the project, shall consist of two City Council members and two MID Board members.

The proposed amended and restated TDA is the product of extensive discussions and negotiations between MID and the City. Both staffs believe it represents a comprehensive, equitable document on which we can continue the partnership between the City and MID.

Alternatives/Pros and Cons of Each Alternative:

No Surface Water Treatment Plant Expansion

Under this scenario, the City of Modesto will have to rely exclusively on the use of ground water to meet all of its future needs in terms of both population growth and industrial use. This is not a sustainable option due to the resulting drawdown of the aquifer system. This drawdown would likely result in a significant reduction in ground water storage in the basin and possible water quality degradation. Under this alternative, as lands that were once irrigated by MID-supplied surface water become urbanized, such water supply could be lost if MID does not continue to provide water to these urbanized areas.

Water Plant Treatment Capacity Expansion

The opportunities offered by expanding the capacity of the surface water treatment plant and only using ground water to meet peaking purposes, provides the COM with the most economical, highest quality, and most reliable potable water supply. In addition, a well managed conjunctive use program further protects the ground water for times when it is most needed such as during extended drought periods when adequate surface water supplies are not fully available. The plant expansion further provides a high degree of reliability and certainty for civic leaders and planners regarding the ability to continue to meet the potable water needs of the urban community

MID Modesto Irrigation District
Water and Power

BOARD AGENDA REPORT

Concurrence:

The MRWTP Policy Committee unanimously recommended that the MID Board of Directors and City Council execute the Amended and Restated Treatment and Delivery Agreement and has directed MID and City staff to make the necessary arrangements for approval by the MID Board of Directors and City of Modesto City Council. The MID and the City plan to take action on this matter on October 11, 2005.

Fiscal Impact:

The restated and amended TDA will supercede the advance funding agreement, which was last amended on July 12, 2005. Under the terms of the advance funding agreement the City is obligated to reimburse MID up to $1,507,000 in consultant costs plus any other MID labor and expenses attributable to the project. As of June 1, 2005, MID labor and expenses for the project totaled $450,372. Additional MID expenses occurring after June 1, 2005, will be identified and trued up at the time of project financing. The total cost of the construction of the MRWTP Phase Two Expansion was estimated at $40 million in February 2004. A more current cost estimate is expected from the Project Engineer in November 2005. Under the terms of the TDA, these costs will be recovered through the project financing.

Recommendation:

By resolution, the Modesto Irrigation District Board of Directors authorizes the General Manager to execute the Amended and Restated Treatment and Delivery Agreement between the Modesto Irrigation District and the City of Modesto pertaining to the Modesto Regional Water Treatment Plant.

Attachments:

None

Presenter	Asst. General Manager	General Manager	Legal Review Obtained
	Walter P. Ward	Allen Short	

Modesto Groundwater Basin

Spring 2010, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer

Scale of Miles

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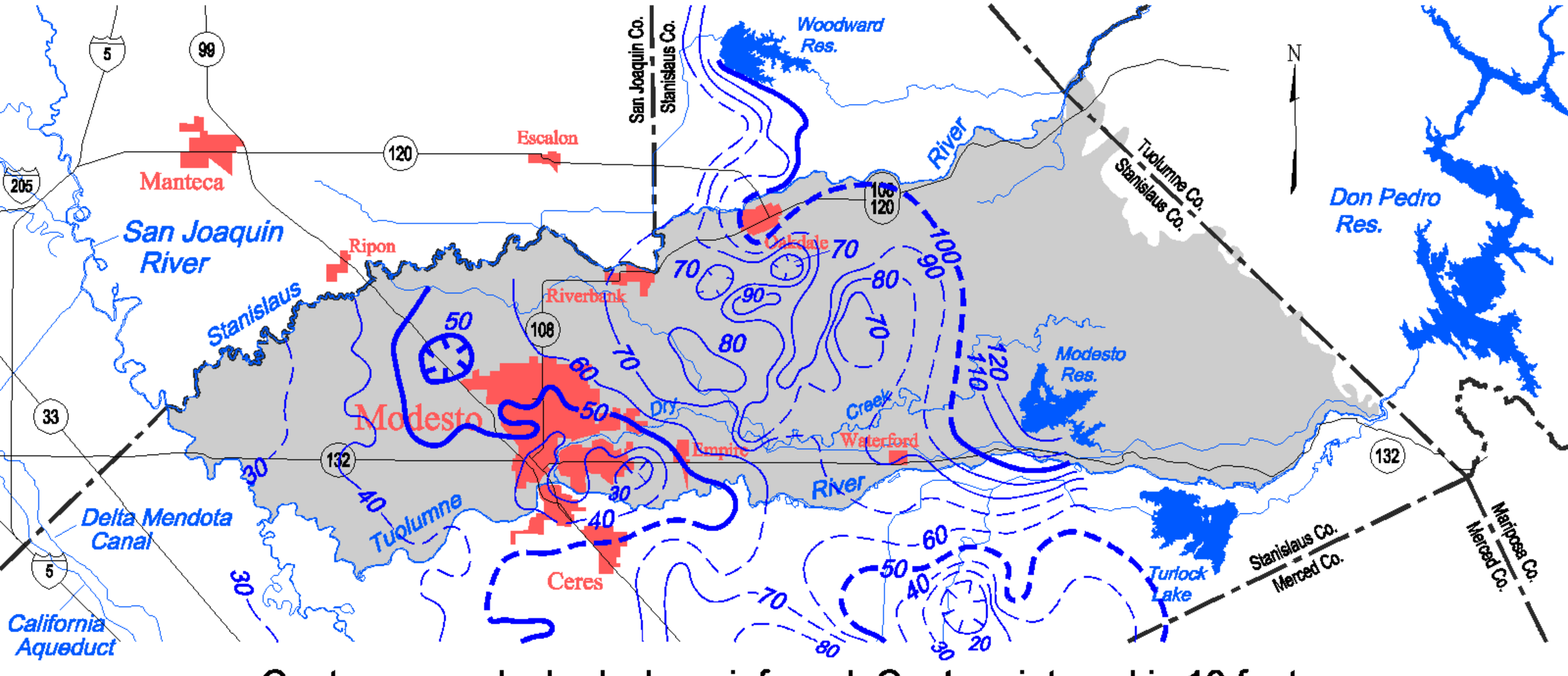

Contours are dashed where inferred. Contour interval is 10 feet.

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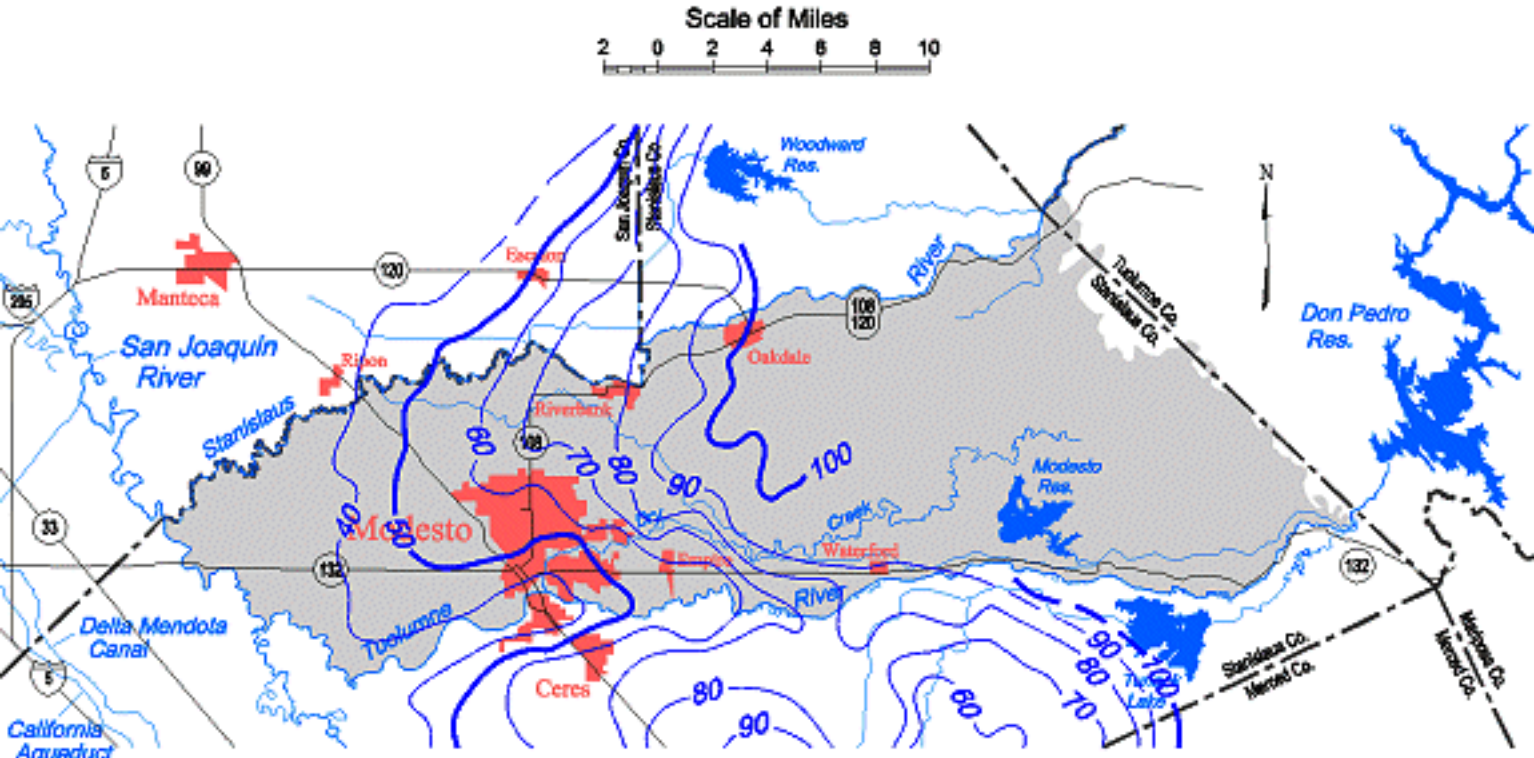

Contours are dashed where inferred. Contour interval is 10 feet.

TECHNICAL STATE WATER BOARD STAFF/
COMMUNITY WATER INTERESTS MEETING

November 18, 2016

9:00 AM - 3:30 PM

Meeting held at:

City of Modesto/Stanislaus County Administration Building

Board Chambers, Basement Floor

1010 Tenth Street

Modesto, CA

Audio transcribed by:

LISA S. COELHO, CSR #9487

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SUPERVISOR WITHROW: Good morning, guys, everyone. Thank you for being here today. I'm going to -- we're going to get started. We appreciate all of you being here. We appreciate the State Water Resource Control Board being here, and we appreciate our technical panels that we're going to have here today.

This is -- this is going to be a day -- hopefully very informational day for all of us. We hope to -- to really go through this document and with our experts and with the State Water Resource Control Board and to -- and to really get into the -- into the weeds a little bit here today. This won't be a back-and-forth/question-and-answer session here at all. It will be -- it will be with the technical panels that we have here and the State Water Resource Control Board. So we're looking to get a lot of -- get into a lot of the details, like I said, here this morning.

I want to thank the county for putting this together. I want to thank Walt Ward, Keith Boggs, all our staff here at the county that helped put this meeting together. It took a lot of work to get everybody here this morning. So I appreciate all of you being here today. So we're going to start off this morning with -- we've got an agenda here. Hopefully we're going to stick to this. Everybody hopefully has this.

And we're going to start off with the State Water Resource Control Board staff, and they will start off with a ten-minute presentation here and then we'll move into

groundwater, drinking water. So off we go here, guys. Thank you. You're up.

MR. GROBER: Good morning. My name is Les Grober. I'm the deputy director for water rights and here today to talk with some of the team that has worked on the development of the water quality control plan update for San Joaquin River flow and Southern Delta salinity objectives.

To my right is Tim Nelson. To his right is Xuan Gao. Over at the other table, Will Anderson, Anne Huber, and Mark Roberson.

So just a very brief introduction about what we're covering today. Where it seems the focus is, one part of this update of the water quality control plan, in particular having to do with San Joaquin River flow objectives for the protection of fish and wildlife in the San Joaquin River, looking specifically at the Merced, the Tuolumne, and Stanislaus rivers, the salmon-bearing tributaries of the San Joaquin River.

In the interest of time, that's the brief introduction. I'm going to move to just a few key points that -- those of you who have seen the presentations that we've been making up and down the Valley, just to make -- to put context on this proposal is that we're doing it because the current plan is significantly out-of-date. The last big update was 21 years ago, 1995, and we've identified the need for doing an update for several years, including in the minor update of the plan in 2006.

There's been Endangered Species Act, water restrictions. There's been this update of the plan as part of the administration's water action plan, and it's really part of the state's overarching goals of attaining the co-equal goals of fish and wildlife protection, ecosystem protection, and water supply.

Oops. Sorry.

Why are we focusing on flow? Flow -- because flow is really the -- a major element of the protection for fish and wildlife. Lots of scientific studies have shown that it's a major factor in the protection of fish and wildlife and survival of fish like salmon, steelhead. There's many benefits to flow, including, as you'll see as we describe it, habitat. It provides temperature, outmigration, many other things.

That being said, the document we prepared -- and the board is mindful that there's other things that can be done, nonflow measures that can be brought to bear, which gets at how the proposal was crafted. It has adaptive implementation that allows adjustment with an adaptive range of 30 to 50 percent of unimpaired flow.

The board is also very mindful that this is very, very hard. This is going to come at a significant water supply cost, which is why we're here today is to look at really -- and some of the focus for today's discussion is for the technical elements of the analysis that was done to inform this update of the water quality control plan because these are large blocks of water that we're talking

about providing for augmenting instream flow, and that would come from water supply in this affected area.

So the board is quite mindful of how hard that balancing is, and the proposal isn't even going all the way towards what the science supports is needed, the 60 percent of unimpaired flow. When we do this water quality control plan, we do the analysis that informs, well, how do you reasonably protect the fish and wildlife? It's not an absolute protection.

So that's a lot of what this document is about. It's about informing that selection of the adaptive range. And because it's hard, settlements are encouraged because settlements might prefer -- may provide more durable solutions to the proposal and allow for the smartest possible implementation of the proposal and potentially at the lower end of flows.

So with that, and to provide context for today's discussion, we start with the very big problem in a very large area here looking at Google map, looking at the affected area. To try to impose some order on the analysis, you take this large area. This just shows -- and I'll show in a moment the highlights -- the schematic of where the Merced, the Tuolumne, and the Stanislaus rivers are from south to north and the major reservoirs. And on the left side, the up arrow, the San Joaquin River.

So to provide order to the analysis, this is con -- provides the conceptual model, if you will, of how to understand this very difficult problem. And on top of

this, we know we have -- it is on the key there. Yeah, we have existing requirements shown in green for different flows, part of FERC flows. We also have in the San Joaquin River Vernalis that shows the current flow objectives that are currently in place in various forms as part of RPAs for FERC licenses or conditions on the permits for the reservoirs and the current water quality control plan objectives.

But this proposal is proposing unimpaired flows at the confluences of the Merced, the Tuolumne, and Stanislaus. So what to do if you have -- now you want to understand the nature of this problem and quantitatively assess it? Well, this spaghetti network, this is the CalSim model which has -- for those of you familiar with it, has a lot of detail. We've chosen to amplify this model to more directly understand and assess how ag water management plans, operations of the local districts could potentially affect water supplies both with regard to surface water and groundwater.

So we've used this thing called the Water Supply Effects Model, which takes the logic of CalSim and improves on it by adjusting it to what's in the more recent ag management plans and other information. And from that, we get to understand some of the physical changes that can occur to the environment. We understand surface water supply deficits, applied water needs. We can come up with -- and groundwater use estimates to make up for lost water supply.

We can then use the SWAP model and ag production model to see what kind of cropping would be affected as a result of the net water supply deficit and then finally IMPLAN to understand the economics that fall out from that change in cropping pattern. So there's a -- that's the method to the Water Supply Effects and in a nutshell all of the analysis that inform the -- the SED and the environmental document.

It also informs the other part of it. What are the benefits? You can take that output from the Water Supply Effects Model, see how you have the flow augmentation, run it through a temperature model, also see how it affects floodplain. So you get outputs for fish benefits. That provides that balancing of what's the water supply effect for current uses as opposed to the benefit for fish and wildlife.

So to punch and provide context for the rest of the discussion for today, we've done a programmatic analysis. We've (unintelligible) the quantitative information using models and formed physical changes that could result from the plan amendments and have the potential for quantifiable impacts on environmental resources including river flows, reservoir operations, surface water diversions, groundwater pumping. And the potential environmental impacts then of these physical changes are evaluated in Chapters 5 through 17 of the SED.

Before I hand it off to Tim Nelson to drill down to more detail on the groundwater, and Xuan for the

drinking water, I just want to remind folks that this is an opportunity today for a technical discussion, and we hope to have a lot of good, productive questions so that folks, the panel and the public, can understand the nature of the proposal. But the time to hear comments is at these five days of hearing: two days in Sacramento on January -- on November 29th, the first day, and finishing up on January 3rd, as well as three days down in Stockton, Merced, and Modesto.

So with that, I'm going to hand --

MR. WARD: Can you hear me now?

MR. GROBER: Can hear you now.

MR. WARD: Okay. All right. That was perfect, Les. Right at the ten-minute mark.

So we're not going to interject any questions at this point. We just want to move right into the next part.

Tim, you're going to pick that up?

MR. GROBER: We like perfect. Thank you.

MR. NELSON: Oh, hello.

UNIDENTIFIED SPEAKER: Hello.

MR. NELSON: My name is Tim Nelson, and I'm an engineer at the State Board and I will be introducing our groundwater and drinking water analysis as part of -- that was used as part of the SED.

So the topics I'm going to cover include the purpose of the analysis, an overview of the geographic area we covered in the modeling, the agricultural

groundwater assessment including the methods, assumptions, and results, and then the analysis of potential impacts to drinking water.

So the purpose of this analysis was, one, to estimate the relative effects of the (unintelligible) alternatives on the groundwater subbasins and, two, to support other quantitative and qualitative analyses throughout the Substitute Environmental Document. So most of the groundwater modeling related to the assumptions, methods, and results are presented in Appendix G. While in other chapters, such as Chapter 9 and 11, we applied those results as part of impact determinations or qualitative analyses, support for qualitative analyses.

So what is the logic behind this modeling? So we know from the Water Supply Effects Model that surface water diversions could be reduced in implementing the proposed unimpaired flow objectives. With the -- with the reduction in surface water diversions, there's less water available for irrigating crops and, if possible, the affected water users would likely increase groundwater pumping to compensate for lost surface water.

Now, there are negative effects associated with increasing groundwater pump -- potentially negative effects associated with increasing groundwater pumping, including falling groundwater tables, which could affect wells used for drinking water. Groundwater pumping would currently be limited by the infrastructure capacity of the irrigation districts, but in the future, it may be limited

by the Sustainable Groundwater Management Act, SGMA.

So here's a map of our modeling area. It includes four groundwater subbasins: the Merced, Turlock, Modesto, and Eastern San Joaquin. The boundaries here are defined based on DWR's Bulletin 118 from 2003. All four basins are considered high-priority basins in need of management to maintain sustainability, and the Merced and Eastern San Joaquin are considered critically overdrafted.

Overlying these four basin -- subbasins are seven irrigation districts that are responsible for the -- most of the surface water diversions from the east side tributaries, the Merced, Tuolumne, and Stanislaus rivers. These districts are Merced Irrigation District, Turlock Irrigation District, Modesto Irrigation District, Oakdale Irrigation District, and South San Joaquin Irrigation District, and two CVP contractors, the Central San Joaquin Water Conservation District and Stockton East Water District.

So as part of this analysis, we performed a simple groundwater balance for in-district water use. So here we have a tributary and groundwater subbasin at the bottom and then a generic irrigation district and its irrigated area. So it begins with the district making surface water diversions into its distribution system. From the distribution system, there will be some losses for evaporation and surface water returns to the tributary and then some distribution seepage into the subbasin as our first recharge (unintelligible).

Some districts may make deliveries from municipal use, but most of their water will be delivered as applied surface water to irrigation for crops. Now, if there's a shortage in applied surface water, we assume that they will pump groundwater to avoid unmet demands and then the total applied surface and groundwater will be used consumptively by the crops through evapotranspiration and with some portions seeping past (unintelligible) zone and back into the groundwater subbasin.

And to provide context for the in-district groundwater use, we also looked at a subbasin-wide groundwater balance. So for this we include the recharge terms and groundwater pumping from the district as well as potential municipal groundwater pumping and agricultural groundwater pumping from private wells in areas outside the districts and associated deep percolation.

So what are the assumptions of this analysis? So for -- within a district, we assumed that groundwater pumping occurring at the farm-gate is only used to satisfy the crop applied water demand. It's a consumptive use and deep percolation. We assume that the districts can pump as much as they need up to their maximum pumping capacity. And for SEWD and CSJWCD, only the -- we only modeled the portion that they contract for on the Stanislaus River assuming that -- and assume that the districts can fully replace any shortage of this amount.

For areas outside of the districts but within the groundwater basins, we include estimates of municipal

pumping based on the 2003 version of Bulletin 118 and we assume agricultural areas are supplied complete with groundwater with a few exceptions such as areas in the Merced Irrigation District's sphere of influence.

So for this analysis, we wanted to use the best available information, the most accurate information to represent these irrigation districts. So the first -- so one of the most important sources of information were the district agricultural water management plans. In addition, we also -- in September 2015 we sent out informational request letters to each of the modeled irrigation districts asking them for more detailed information about their operations and groundwater use.

So some of the parameters that are based on these sources include district M & I deliveries, seepage from regulating reservoirs such as Turlock, Modesto, and Woodward, the minimum annual groundwater pumping estimate for each of the districts which represents groundwater pumping regardless of year type to supply areas that don't have access to surface water distribution system because the area's on a hill, the maximum groundwater pumping capacity of each district as of 2009, distribution loss factors that relate the distribution seepage and evaporation to the total diversions made by the district, and deep percolation factors that determine what portion of the total applied water will be lost -- will seep past (unintelligible) and into the groundwater subbasin.

So here we have a time series from 1922 to 2003

of Merced Irrigation District average annual applied water demand under baseline conditions and with the source used to satisfy that demand. So at the bottom there's a purple section that represents the minimum annual groundwater pumping formed by the district. It's regardless of year type. And the blue -- or the light blue section are the district's surface water diversions. And, of course, those get cut in these severe drought years such as 1977, 1991.

During these shortage times, surface water shortage times, the district will increase its groundwater pumping up to its groundwater pumping capacity, which is represented by the red section, and if the district reaches its pumping capacity but there's still unmet demand, well, then there's a shortage, which is represented by the white portion beneath the black line. So that was under baseline conditions.

Under a 40 percent unimpaired flow objective, there is a lot more surface water shortage and, correspondingly, a lot more groundwater pumping. Now, with this increase in groundwater pumping, the district reduces its potential agricultural impact, but it's transferring impacts to the groundwater subbasin.

So here we have the modeled groundwater pumping across all the irrigation districts. So for baseline conditions and the 40 percent unimpaired flow objective, the X axis is year types and the Y axis is the total annual -- or the average annual groundwater pumping in

each of these corresponding year types. So overall in all year types under baseline, there's about 260,000 acre-feet of groundwater pumping with most of that occurring in critically dry years as that's when there's the surface water shortage.

With a 40 percent unimpaired flow objective, the average annual groundwater pumping increases by about 100,000 acre-feet, with most of the increase in dry critical -- or below normal, dry, and critical years. On the other side -- in addition, there is also groundwater recharge. So here we have the model groundwater recharge across all the irrigation districts, or baseline and 40 percent objective.

Under baseline conditions there is about 730,000 acre-feet of recharge, and under our unimpaired flow objective, this decreases by about 80,000 acre-feet because of the reduced surface water deliveries for applied water. So there's less deep percolation and less distribution losses with the reduced diversions. Most of this reduction in recharge comes in dry and critical years.

So if you subtract the district's groundwater pumping from its -- from recharge associated with the operations, you get an estimate of the net input to the groundwater basin associated with district operations. So here we have the average annual net input to the basin for each irrigation district under each of the potential unimpaired flow objectives. What's important to notice

here is that even under a 40 percent unimpaired flow objective, all the districts remain positive contributors to the groundwater subbasin. And even under a 50 percent unimpaired flow objective, only Merced Irrigation District becomes a net user of groundwater.

So with that, I'm going to hand it over to Xuan Gao who will go over our potential impacts to drinking water.

MS. GAO: Good morning, everyone. My name is Xuan Gao, and I am also an engineer. I am going to give you an overview of the drinking water in the four groundwater subbasin and how it might be impacted by our proposal.

According to the 2010 U.S. Census, there were approximately 1.25 million people living in the area overlying the four subbasin. Of that population, 1.12 million peoples are connected to public water system. The rest of the -- the rest of the populations relies on domestic, that is, private wells for their drinking water supply. And the population -- the percentage of population connected to public water system is about 89 percent, and population that relies on domestic well solely is about 11 percent.

So we identified 93 public water suppliers within the four groundwater subbasin. In year 2014, these public water supplier delivered 323,000 acre-feet of water. Of that, about 48 percent is surface water and 52 percent is groundwater. If we assume that the people that are --

that are not connected to a public water supply system and rely solely on domestic well for their drinking water supply have similar per capita usage of drinking water, like those connected to a public water supplier, then they would have produced -- or consumed 8 -- 38 TAF in 2014, and together the total water production in 2014 would be 361 TAF.

The reduction in surface water supply would, therefore, affect entity that rely upon groundwater by increasing the need to deepen their wells or build more wells in order to continue to assess -- access groundwater, increasing groundwater pumping cost, degrading groundwater quality, making groundwater unavailable in some area when the groundwater dropped to a level that makes pumping no longer economically feasible.

Our 40 percent unimpaired flow requirement would reduce net groundwater input by about 186,000 acre-feet per years as compared to baseline. And what does this potentially means to groundwater supply? As you know, the Eastern San Joaquin and Merced subbasins are listed as critically overdrafted. Actually, all of the four subbasins have experienced groundwater level declines and overdraft in the past. The rates of overdraft for the four subbasins are estimated to be 155,000 acre-feet per year, so if we pick this number -- if you pick this number, this is 100 and -- okay. So if we pick the 186 and add it to the 155, then we would get 341 TAF per year as the resulted overdraft.

And so in (unintelligible) such level of overdrafts can be sustained, and a study on a total groundwater storage carried out by USGS in 1960 estimated that the total groundwater storage in the four subbasin was about 125 million acre-feet. So the existing draft of -- rate of overdraft, 155, is about 0.12 percent of the total groundwater storage, and the combined 341 TAF per years of overdraft is about 0.7 percent of the total -- total groundwater storage.

These low percentage, however, do not means that we still have a long way to go to complete -- to deplete the groundwater resource -- resources because there would be substantial subsidence that occur long before our water in aquifer could be removed; therefore, actions are needed to address groundwater overdraft which for without our proposal and SGMA will help.

So in our SED, we provided a range of existing overdrafts in the four subbasin. The 155 that I mentioned just now, it's presented in Chapter 9 in another estimate which is 144 -- 144 TAF per year is presented in the executive summary.

Lowering the groundwater table would affect groundwater quality in the following way. It could accelerate migration of surface contaminant to the well. It could increase saline -- saline water intrusion to the aquifers, and it could mobilize naturally occurring trace elements and elevate their concentration in the aquifer.

However, the impact of groundwater pumping on

groundwater quality depends upon many factors. Such example of those factors are location (unintelligible) of the well, the amount of groundwater pumped, and the frequency at which pumping occurred, hydrogeological characteristics of the aquifers, and contaminant characteristics.

In addition, it is impossible to predict how the affected party could respond to the reduction of surface water. They might deepen the existing well or build a new well. If they build new wells, we wouldn't know the number of new wells and their location; therefore, while it is true groundwater pumping might affect groundwater quality -- groundwater quality and flow, it is speculative to determine the exact impact on groundwater quality due to our proposal.

So during the recent drought, the amount of groundwater pumped greatly increased, as we know, and yet there was no greater number of violations of the maximum contaminant level as compared to wet year based on the consumers' confidence reports prepared by the service provider. This suggests that for public water systems, a substantial increase in groundwater pumping would not necessarily result in more violation of drinking water quality standard. This is because service provider are required to take action that -- to ensure that water is in compliance with relevant drinking water standards before it serves to the public. If any exceedance -- exceedances are detected, service providers are required to bring the

contaminated well off-line and treat the water.

There might be potential impact on domestic well users because unlike public water system, there's no systematic monitoring of water quality in domestic well. As such, it is a very important for the domestic well owners to test their water and follow the recommended best practices as set forth in the SED. It is also important for the local groundwater agency to implement SGMA to address overpumping and avoid water quality degradation.

In the past, the State Water Board provided financial assistance to help schools, communities, and public water suppliers to address drinking water issues. Examples of those financial programs are shown here. For example, a well in an elementary school in Merced County went dry, and the board provided $180,000 for them to build a new well nearby. And another program that we had been providing water funding to the public is the Drinking Water State Revolving Fund. In 2015 we provided about $6,060,000 to the City of Hughson for them to replace a well that had arsenic problem.

For further informations about impact on groundwater resources, service providers, and service providers, you can refer to Chapter 9, 13, 22, and Appendix G of our SED. These chapters and associated analysis can be downloaded at this link. Think you can see. Okay. Thank you.

MR. WARD: Is this on still?

UNIDENTIFIED SPEAKER: Yes.

MR. WARD: Don't push anything. All right. Can you hear me? All right. Thanks.

You know, one of the aspects of this entire approach is that you folks have been working on this for quite a few years. At least four; right? Go back to 2012 in the first version, and I don't know how many years before the first version; right? Our community has essentially had, you know, maybe the last 60 days. Certainly you've been working with some of the other irrigation districts for longer than that.

But what we're tasked with is, you know, looking at in-depth a heck of a lot of information, and imbedded in it, a lot of assumptions and approaches and methodologies that were used in your analysis. And so I was asked -- and a whole bunch of people volunteered to step forward to assemble some technical teams to begin to explore that -- those questions.

We realized that today is not enough time to resolve any of this, and we're just really at the beginning point. We appreciate and recognize that there's other opportunities coming up with the workshops in Sacramento on the 5th and the 12th, the number of public hearings, and ultimately the written comments. So I don't want to talk too much because I'm going to use up our time, so I won't.

With me today is some professional folks that stepped forward to begin talking to you about the analysis. We don't have anybody here today to talk about

fisheries and flows. That's not the discussion. It's not taken as a given that there's the foundational science for that, but that will be explored in a different forum. What we're here today to is to talk about the groundwater and the drinking water impacts and basically in four areas: One of those is the analysis itself and CEQA compliance; the other is agricultural impacts; and then breaking the drinking water into two parts, the large urban -- the cities and then the small urban and the rural.

So I -- today over on the audience's left is Ali Taghavi with RMC. Next to Ali, Ron Rowe with Merced County. Ms. Valerie Kincaid with O'Laughlin & Paris, and Mike Tietze with Jacobson James & Associates. Mike is -- is the sub team leader for this, and so I'll just turn it over to Mike to begin the discussion.

MR. GROBER: Mr. Ward, if I may?

MR. WARD: Yes.

MR. GROBER: Just a comment. Because this is a very rich, deep topic, you know, we raced through a lot of information here. And I just want to let the panel know -- I think they know, but also the public -- we're going to have two days of technical workshop. I don't think I pointed that out. On December 5th and 12th.

MR. WARD: Right.

MR. GROBER: So there will be additional opportunity. This is an initial opportunity to ask some questions.

MR. WARD: Right.

MR. GROBER: Really the focus should be -- because there's going to be a lot of differences of opinion, thoughts on policy, and I think you mentioned CEQA compliance, things like that. But really the purpose here today is to make sure that the nature of our technical work is understood so we can exchange that information.

MR. WARD: Right.

MR. GROBER: So we just want to kind of circle back to that kind of core -- you know, core intent here because we have our technical people here today. We don't -- though our attorneys are in the audience, I just -- you know, and I see we have an attorney on your panel, but I want to make sure that we circle back to and focus on the technical elements of what we've prepared today.

MR. WARD: That's the idea, yes.

MR. TIETZE: Yeah, Les, I think you -- you stole my opening remarks and I couldn't have said it better myself. The intent is to focus on technical issues regarding the analysis and supporting science. This first panel is focused on the resource analysis and supporting science piece. And specifically, you know, we all agree that unimpaired flow will have significant impacts that reach far beyond the rivers, and the purpose of this SED is to characterize and understand those impacts. And we want to understand better the analysis that went into

that.

So with that said, I'll turn it over to Ron to start with our first questions.

MR. ROWE: Am I -- can you guys hear me? Good morning. Les, thank you very much, and your team. Appreciate you coming down to Modesto.

The general topic area that I have to discuss is CEQA impact analysis and evaluation for potential and desirable results under Sustainable Groundwater Management Act. And I have an interest in how or where the SED evaluated the potential for significant adverse impacts related to subsidence in water quality in particular. And we have concerns about drawdown, as you've mentioned, storage depletion, surface water depletion, and impacts to groundwater-dependent ecosystems of course, like in Appendix G.

But how did the SED account for the fact that these adverse impacts in these areas are typically dependent on and understood in our terms which are local conditions? Was there specificity in that?

MR. GROBER: That's -- that's a good question and that's kind of -- it will be important to identify. And I think that was in one of my lead slides the programmatic nature of our analysis because the proposal, what we are -- at the core of the proposal is a proposed change in flow objectives in the Merced, the Tuolumne, and Stanislaus River. So that's the physical change that would be occurring.

But then the analysis identifies that in response to the physical change, we observe what's happened in the area in the past during times of water shortage. So as -- as Tim had pointed out, it kind of has that next step. If you reduce that surface water supply, the response that we would be seeing -- and actually, Walt, you made the comments about the number of intervening years. Some of those intervening years have been very instructive because those were the very hard drought years which hopefully were -- those are -- the worst of those years are behind us.

But we got the additional information to observe what happens during drought, and it's that graphic that Mr. Nelson presented showing, well, in response to surface water shortage, there would be additional groundwater pumping. Because that's what happens now already during times of scarcity. So what we'd take into account from those ag water management plans, maximum pumping, you know, capacities, things like that, that's then that next step, you know, once removed from the initial proposal for augmenting instream flows resulting in reduced surface water supplies. But in response to reduced surface water supplies, we expect what's the most likely outcome. That would be additional groundwater pumping.

And I think it's worth noting for those that have been tracking this for a number of years, when we went out with the original SED, we took a different approach to that. We said, well, if there is a reduced surface water

supply, you could have one of two things happening in the extreme: You could have no additional groundwater pumping on the one hand or you replace it all with groundwater pumping. Neither one of those -- I think we got comments from the area, and we've got comments from our board members. Neither one of those is realistic.

So in this round, we (unintelligible), well, what's the most likely response to reduced surface water supplies? And that most likely response is some increased level of groundwater pumping. And I understand the SGMA concerns that we talked about, you know, what can happen over the long term and the requirements under SGMA, but it's a -- it's a problem that we've wrestled with, which is why in our documents we looked at even different possible maximum rates of groundwater pumping.

We looked at what was available in 2009, what was possible in response to the drought 2014 levels of groundwater pumping. You get different answers if you look at it in those two different ways, and the different answer is reflective of what we did the first time. If you have more groundwater pumping, you'll have a greater effect on the groundwater resources but a lesser effect on the agricultural production and ag economic resources and vice versa. If you do less pumping, then you'd have more of a reduction in the overall water supply and a greater effect on cropping, you know, reduced cropping and fallowing and economic effects.

So what we've done is we've tried to strike a

balance in what we thought based on the observed is the most likely outcome. And -- and this is the opportunity to hear if we got it wrong, if it should be some other number. That's going to be important to hear. But an important take-home from all of that, this is a programmatic analysis, so we don't look at a high level of detail because we can't know what the response is going to be, the local response is going to be. It's going to depend on crop prices, the value of water, how much additional development there is.

We identify things like additional groundwater recharge, active recharge, more than just the conjunctive use that's currently going on. So many of those things start becoming speculative. So we tried to strike a balance. I'm curious to hear your thoughts on if we got that balance right or what else we should be looking at or what else it should be.

MR. ROWE: Thanks, Les. More specifically, I think for Merced County, one of our larger concerns is subsidence. It's not so much of an issue that we currently observe north of the Merced River, but as we potentially impact water supply and its relationship to depth to groundwater, upper unconfined zones become less reliable over time. Wells potentially going deeper below the -- let's say the Corcoran clay layer and further potentially impacting subsidence is a major concern of ours.

And we don't need to look too far further south

than the Tulare basin to look at accumulated salt problems. It's something -- we have some work that we're doing now, and it is difficult to quantify, but it would appear to us that salinity in general will increase over time. And our concern is was it analyzed and is the programmatic level assessment really appropriate in the first place, because without the detail, you really don't see the localized impact.

We had over 125 wells go dry that went on a tanked water program for emergency water in that short time frame for this drought period, so we see what shortage does. And our concern is the long-term horizon and how it may exacerbate that over time.

MR. GROBER: So (unintelligible) what's the question in that? I mean because that's -- I mean those are -- we share those overarching concerns, and SGMA is going to be part of the solution obviously. And SGMA is going to be something that will have to be locally implemented because I think, as the information we presented initially, there's already a groundwater problem.

But this -- if this added stressor occurs in terms of greater reliance on groundwater, there's going to be, even at least an initial response, greater reliance on groundwater pumping. But all of those problems you identify appear possible, and I think we've identified those: the potential for subsidence, the potential for, you know, water quality issues, things like that. But

it's at a programmatic level and some of the further information that's in the chapters that are still on the screen.

MR. ROWE: All right. So I think more specifically is we'd like to see more analysis of water quality, and we'd like to see more analysis related to subsidence specifically. And the most sensitive entities for us are disadvantaged communities that may be disproportionately affected.

MR. GROBER: And this is -- and I'm -- sorry if I refer back to other slides. And then it's important, I mean, for comments like that, that's then -- those are certainly comments that should be made at the -- you know, at the hearing certainly, because the board needs to hear -- needs to hear those things.

MR. ROWE: So for -- you know, to summarize it from a technical perspective, our most interest is in water quality and how that may be impacted, not just on the short term but long term.

MR. GROBER: And short term and long term, it's the --

MR. ROWE: Go ahead. I mean that was another question is, you know, what was the planning horizon considered for the impact analysis?

MR. GROBER: We update our water quality control plan on my intro slide. It's been 21 years since the last round for the major update. We did a minor update in 2006. We are required under federal law to do, you know,

a triannual review. We do periodic reviews and periodic updates. So if there's new information in -- within -- after this plan is adopted to suggest that there are additional problems, say, with groundwater and having to do with water quality and things like that, then the plan can be opened up to make changes.

But the -- the planning horizon here is over the next several years and based on what -- based on the current condition. But this is a plan that is periodically updated, so if there is a change -- and now looking at the SGMA time frame in terms of as that's developed and implemented, there's certainly opportunity to make changes in the plan.

MR. ROWE: All right. Thank you.

MR. TIETZE: You know, I think, Les, you may have misunderstood the question. The planning horizon question was regarding how long a forecast period did the SED contemplate when evaluating impacts. You know, in other words, usually in environmental impact assessment, you have -- you evaluate a project or a program over a certain number of years and assess what the impacts will be over that time. Can you clarify for us what that time period was over which the impacts were forecasted?

MR. GROBER: I don't know that we have -- I'm looking over to -- to Anne and Tim. I don't think that we had an explicit time horizon, but -- Anne and Will, uh-huh.

MS. HUBER: Our assumption is that the

groundwater impacts will continue until the -- oops -- how about now?

UNIDENTIFIED SPEAKER: Talk into it.

MS. HUBER: Now?

UNIDENTIFIED SPEAKER: Yep.

MS. HUBER: Okay. Our assumption is that the groundwater impacts would continue through time up until the point at which SGMA is fully implemented. So it's a little difficult to say exactly when that point in time will be, but the groundwater sustainability plans are supposed to be completed by 2020 or 2022, depending on the status of the subbasin. And then sustainability is supposed to be achieved by the year 2040 or 2042. So the exact transition point at which groundwater pumping may become more restricted is -- it's hard to say.

MR. GROBER: So another way to get at this --

MR. WARD: There's a, in my mind, a fundamental point of discussion right here. The cart and the horse; right? Is SGMA leading this and the SED follows it, or in your mind and your approach is the SED the leader and SGMA has to conform? I mean there's a disconnect. I mean --

MR. GROBER: I don't see that as a --

MR. WARD: Hold on, hold on, hold on. There's a significant disconnect between SGMA compliance and all the things that we've been working on through the drought with the impacts of dry wells. And now loss of additional surface supply is going to exacerbate the situation, cause more groundwater pumping.

The question of scale and the impact analysis, apparently you guys didn't do that; right? Because it's programmatic, so a lot of averaging, a lot of smoothing things out because it's impossible, quote, your word, too speculative; right? One has to lead before the other, and in our mind, SGMA is the driver. And we've got a whole lot of work to do to better understand our groundwater system, No. 1, and the long-term impacts of utilizing that resource in conjunction with surface water.

You know, if you look at the map of the basins in the Valley and you look at those that are not high priority but those that are critical condition of overdraft, why do you think it is that the Modesto and Turlock basins are not listed as critical condition of overdraft and every other basin north and south of it are? That's a question.

MR. GROBER: Well, you have -- you have excellent surface water supplies, and you will continue to have excellent surface water supplies. But actually the question gets at some of the difficulty of providing that answer and knowing what the future is many years out. Because SGMA's before you. It's before us. It's before the people of the State of California. It's intended to provide, you know, a good thing, to develop sustainable groundwater basins.

And I hear your point. Is it here from -- the perspective is like here we have sustainable basins. This is what this report acknowledges. This is adding another

stressor because this is saying that a certain quantity of surface water is now proposed to augment instream flows for the reasonable protection of fish and wildlife. That makes it at least in part unavailable for uses, which is what this document is all about.

That being said, as identified in the document, there is even greater opportunities for doing enhanced groundwater recharge during wet times, to do more efficiency in both ag and urban. So there is so many things that are happening, will happen, that as unsatisfying as it is, it is speculative to try to figure out all of those elements.

SGMA -- and complying with SGMA and developing sustainable groundwater is a local issue, as it should be. This proposal adds that other stressor of less water available during that February through June period. And we've described that general effect in trying to get at the time value because I hear the -- -- I hear the concern with the time horizon, but things are going to be changing very quickly.

We've based the analysis on -- and, actually, that's looking back, but it's on an 82-year record using the current levels of demand, current infrastructure, things like that. So it's what's happening in the moment and would be continuing to happen over the next 10 or 20 years, and that's within the planning horizon of revisiting this water quality control plan when we have more information about how the local area has responded to

SGMA, how this water quality control plan is implemented, where we are within the adaptive range of 30 to 50 percent. So it's just a lot of -- there's a lot of details and a lot of potential outcomes, so that's --

MR. WARD: Yeah, there are.

MR. GROBER: -- that's why.

MR. WARD: Absolutely. So in your mind and from your approach, the SED is driving the locals' response to now SGMA? You don't see SGMA as the lead and the SED fits in and conforms behind it?

MR. GROBER: I'm not -- I don't see one so much as a lead. They're both -- they are two things that are happening, and the change related to the SED informs other things. It's another stressor, another thing to consider for SGMA.

MR. WARD: Okay. All right. Thank you. Let's move on. I'm sorry. I just wanted to explore that a little bit.

MR. TIETZE: So we had some questions about drawdown significance threshold of 1 inch -- or the significance threshold of 1 inch of storage reduction or water level reduction. But to -- it's related to the questions regarding CEQA analysis really, and one of the things that we're interested in is this is programmatic. There's a lot of uncertainty, a lot of generalization about the analysis outside of the rivers.

Typically when you have uncertainty, if you want to evaluate what that means, you do some kind of a

sensitivity analysis so that you can say that, well, if we're wrong about this or if we're wrong in terms of where we place the impact, this is what could happen to a particular receptor, particular disadvantaged community, a particular adverse outcome.

Was there any sensitivity analysis that was done as part of the investigation in terms of the range of possible impacts that could actually occur?

MR. GROBER: Your question was first asking about the threshold, but then was there a sensitivity in terms of picking different thresholds?

MR. TIETZE: Well, let me -- let me be clear. The threshold we think generalizes the impact analysis and makes it very nonspecific. With a 1-inch threshold established for a very large area, it's impossible to evaluate what areas will be adversely affected by subsidence, for example, or what disadvantaged communities may be impacted adversely.

And I think I'm hearing you are saying that, yep, that's the case. We know those impacts may occur, but we don't know where. And so I'm saying the threshold raises the question of uncertainty. How did you deal with that uncertainty?

MR. GROBER: Well, I think -- and, Anne, correct me if I'm wrong, but -- you speak to the 1-inch, please.

MS. HUBER: Well, you may already know this, but the 1-inch threshold was developed to -- in order to prepare the different alternatives, and we focused on the

main part of the water budget that was likely to change in response to the alternatives. And we wanted to assess that change in the budget in terms of real units, namely, volume of water compared to subbasin area. And the main goal was to get an idea of the magnitude of the change.

Now, it's true that some areas will be more affected than others, and I think in a lot of places we tried to address the potential unevenness in impacts with qualitative discussion of those impacts. For a subsidence, for example, we primarily considered the Merced subbasin, the southern edge of the sub -- Merced subbasin and northern edge of the Chowchilla subbasin, which we had combined together -- well, let me go back.

We combined the northern edge -- northern portion of the Chowchilla subbasin in with this Merced subbasin because we felt that it needed to be included in our assessment, and that region is the region that's most likely susceptible to subsidence. So there's some discussion of that in the document.

MR. TIETZE: But in terms of understanding the impact, say, understanding what the actual potential is for damage to public infrastructure and risk to public safety from subsidence, for example, do you provide a range of what the possible outcomes would be and how serious those consequences might be to the public?

MR. GROBER: So you're saying a range within -- so how it might range in specific areas from a high to a low based on different levels of pumping and response to

lack of available --

MR. TIETZE: Yeah, from my limited read, I understand that you're saying that additional subsidence is possible and may be more likely in certain areas, but I don't understand how much subsidence, what the potential impacts are on public safety and public infrastructure. So that's -- that's -- where is that analysis or how was it handled in the SED, or was it not handled in the SED?

MR. GROBER: Just in terms of -- without knowledge of what the specific responses would be and making, you know, assumptions about many other things, it would start becoming speculative to come up with that level of detail.

MR. TIETZE: Okay. And then one final question on -- it's kind of along the same lines. When you have fairly specific science that's being applied to assess what's happening in the streams and the science is very broadly applied to what's happening outside of the streams, how have you dealt with the possibility of having the science be -- or maintaining policy neutrality in your analysis? In other words, if what's happening outside of the stream is generalized and what's happening inside of the stream is not, how do you protect against favoring a particular policy in your analysis overall?

MR. GROBER: Well, I don't understand. When you say "inside the stream" or "outside the stream," what are you -- what are you referring to?

MR. TIETZE: You know, I think that the state has

very specific studies and in-depth studies regarding the potential benefits to fish of implementing unimpaired flow, which is why this is being proposed, and yet the effects outside of the streams are being very generally evaluated. So the potential exists for the science to be applied in a policy-biased fashion, and I'm wondering how the SED has accounted for that.

MR. GROBER: Well, actually, and that gets -- the direct physical change that would occur would be changes in flow with an increase in flow in February through June. So that's -- that's the thing that is closest to the proposal, the requirement, the proposed project, if you will, so we have the most certainty and information about that.

So it's not a bias. It's rather just that's what we know. You know, that's the proposal. It's the nature of the proposal. Everything else starts -- as it moves further away, that becomes once, twice, several times removed from the proposal and starts becoming more speculative.

MR. TIETZE: Okay. So with that, I think, Ali, you were going to ask some questions.

MR. TAGHAVI: Thank you again for being here to -- to be addressing our questions. I would like to approach my questions in two folds: one is the scale of the problem and then the tools, technology that has been used to evaluate the conditions. And the question with regards to the scale kind of piggybacks on what Mike was

alluding earlier, and that is even though the problem is addressed in a programmatic -- at a programmatic level, it appears that, A, looking at either hydrologic variability within the reverse systems and, B, evaluation of benefits to the fish, requires a lot more detailed analysis at even on a daily basis looking at daily fish flows and daily fish conditions.

And so to that end, I -- my question, I guess, is would programmatic evaluation of this condition, would that address the benefits to the fisheries at the very, very highest scale? And looking at the charts that Tim presented earlier, looking at the hydrology level and the water balance and the water budget at the long-term average annual case, it just seems to me that it doesn't do the right level of justice in terms of evaluation of the benefit, whether that's a 30 percent, 40, or 50 percent unimpaired flow to the -- to the -- you know, from the -- from the river system. So that's my first question, the scale of the issue and whether or not the programmatic level actually does justice to looking at the benefits.

And my second question then is, again, related to that is the CalSim, the HEC 5 models, these are operations models. The state uses them for looking at the operations of the system. They do not necessarily reflect the hydrology. Even though it does have 1922 to 2000 -- I believe CalSim is now to 2013 just about, it simulates the operations of the system, but the hydrology in the

baseline is pretty much fixed. That's the accretions, the depletions within the river system. And so any changes to the river system and any changes to the groundwater system and the interaction between the river and the groundwater system are not necessarily reflected dynamically within the CalSim system. And so that's why the state typically relies on the C2VSim which is their hydrology model that supports the CalSim-III, which is not published yet or released yet, as well as the state -- the feds rely on CVHM, the Central Valley Hydrological Model, to look at the hydrology of this system.

And so to that end, my question is has there been any attempt on using either of those two models or models of similar nature that would look at the groundwater and the surface water system on hydrologic level rather than operational flow and also the impacts on the river system and the groundwater system.

MR. GROBER: Let me start with your first question, which actually is curious because it's not -- we don't have our fish experts here. It seems to be that's tied to a fish question, but I think I can provide the general answer of scale and maybe combine it with the second question.

The reason -- and I'll ask Will for some -- he'll give us all the details about it, but one of the reasons we moved from CalSim to -- well, there were several reasons, but one of the reasons we moved to the Water Supply Effects Model is to better capture the changes that

we would be proposing, something that CalSim couldn't handle, but also to take into account the more local and updated operations information. And I'll let Will expand on that, and then I'd like to return to the fish question.

UNIDENTIFIED SPEAKER: Microphone.

MR. ANDERSON: In terms of the question of scale -- can you hear me? Is that working? Okay. I'll just go to his first point and then try to elaborate on Les's point. But when we present to you here, we've rolled up the summary statistics of the long-term impacts, and those include annual impacts over 82 years in terms of the temperature model. It runs on a sub daily time step, and so you'll see temperature effects. We have 28 years of that, but then we have to roll it back up and summarize it to present it in the report in these other fashions.

So there's -- again, we're not here to talk fish, but the summary statistics of benefits really do have to be examined at that level. That's an accurate point. But then we'll come back and summarize them for you. We've used estimates of the water balance from the ag water management plans which are a snapshot in time from the reports in 2012 that look back. Some look at just a few years; some look at more than a dozen years and have had to generalize that into, more or less, an average condition of where it goes, is it percolated or what the particular field efficiencies are. I think it's a valid point that these could change in time, so we can't really speculate on how the numbers exactly would play out, but

we could certainly continue to work on that.

MR. GROBER: I just was talking to Dan Worth, and he could provide an expanded answer. But getting to the -- what I think is the thrust of your question about the first one, you certainly have to evaluate some of these things at a shorter duration time step, and we did. We have that in our -- several chapters of the report, appendices, and the executive summary. We talk about the increased frequency of complying with temperature standards in terms of, you know, number of days and spatially, also floodplain inundation.

That being said, to try to understand, you know, you have to roll this back up, as Will had said, into monthly averages to the bigger numbers. But it is frequently a question of scale and what level of detail do you go into to assess certain problems, and we tried to strike that balance to -- enough to inform the decisions, enough to inform the effects.

But if there's -- if there's a thought behind -- you know, if there's a comment or an observation behind the question, even though that's going to be important to provide as a written comment or oral comment before the board, this is intended to be a workshop; I'll be interested to hear, you know, what -- what should we be doing different or better in terms of this analysis.

But also as Will had said for the hydrology, we looked at, you know, the 82 years of hydrology and we actually augmented it with some more recent years even.

We looked at, you know, all of the dry years and we tried to roll this up. We have summary statistics, but we also -- in the executive summary, we look at what happens during critically dry years, dry years. So we try to look at that and present that in a number of different ways, including in terms of how far the ag -- you know, the cropping effects and all of that.

So we've -- we presented this in any number of ways, but if you have comments on what else would be useful, please ask because maybe it is in the document. And, if not, it might be an important question to pass along to the board.

MR. TAGHAVI: And, again, not having had sufficient time or -- you know, since the document has been released to go through all the details, I guess my thoughts are analysis at a programmatic level, yet dropping down to a, you know, localized level, those are the scale issues. And so the unimpaired flow imposition during the critical years, those are exact same years that typically we've observed, and it is natural that the groundwater pumping is increased. And so then the circulation of the -- effects of the groundwater pumping on the stream system, that needs to be evaluated on a much more level of detail. And so is there actually the benefits that you expect is realized? That's No. A. And then how is that system evaluated? What tools -- the technology has been used and that's my question. That goes back to the Central Valley Hydrologic model, or as

opposed to the CalSim which has a very, very static and unflexible, I would say, hydrology within it.

MR. GROBER: And that's a very simple answer. We did not -- this is not -- the modeling that we did doesn't have that dynamic component to see the response or changes in recharge, the interaction of surface water, groundwater. It does not have that.

MR. WARD: Yeah, we understand it's just the -- a volume smoothed-over an area, which is not groundwater analysis. Right?

MR. GROBER: I'm sorry. Which is not what?

MR. WARD: It is not a groundwater impact analysis. It's just water budget approach, water balance.

MR. GROBER: Well, it's using the water budget to determine what the --

MR. WARD: I mean is it -- it doesn't take into account heterogeneity. It didn't take into account scale. It doesn't take into account local impacts. Doesn't take into account water quality degredation, subsidence. Everything is, in your words, just too speculative to use those kind of available tools.

MR. GROBER: It's to come up with the detail, but what the report acknowledges for many of those things, there would be a significant and unavoidable --

MR. WARD: Right.

MR. GROBER: -- impact. But, yes, the details --

MR. WARD: Well, actually, probably beyond that.

MR. GROBER: And for much of that, it's the

nature of the CEQA documents and the analysis, it -- you know, there are -- there are things that are identified such as additional groundwater recharge and, as I said, increased efficiencies, conservation, things like that that can be brought to bear that can reduce those impacts. But those too, though they are available, the effect of those has become speculative in terms of how much could be achieved.

MR. WARD: Yeah, just time check. I'm going to ask Debbie if you'd go ahead and bring up your ag group, and we'll have this panel still sit, but we want to make a smooth transition. Valerie happens to be on both, so we can continue on. There's much more to explore. It's just barely scratching the surface. I mean there's a lot more. You'll be seeing more of us and others, you know, at the other -- at the upcoming workshops and the -- certainly with the written comments, but...

Thank you, Mike.

And, Valerie, why don't we just go ahead --

MS. KINCAID: Sure.

MR. WARD: -- and continue with your question with regards to the ag --

MS. KINCAID: Sure. That sounds good.

Can everyone hear me? One of the -- as I go through the document, one of the fundamental issues for me is the assumption of how much groundwater pumping will happen. And as Les mentioned, and I think provided some explanation, those assumptions have changed since the 2012

document. And I guess I just want to run -- run through and unpack those technical assumptions, meaning how -- I guess my two questions are how you calculated what I think is referred to as the 2009 minimum and the 2009 maximum groundwater extractions. And I don't mean generally. I mean specifically how -- what is your calculation to get to those numbers.

MR. NELSON: Well, the 2009 minimums, they're all -- so some of them are from the agricultural water management plans based on the reported minimum of whatever time period they're reporting, and some were from the 2015 response letter -- information request responses from the districts themselves on their annual minimum groundwater pumping.

MS. KINCAID: So that's a static number in the SED and, as you noted, that purple band at the bottom of one of your charts. So if that's a static number -- you said some of them are from ag water management plans. Are you saying that's a number that represents in the SED just the minimum amount of groundwater that would be pumped in a year?

MR. NELSON: Yes.

MS. KINCAID: And that's calculated by the reports from ag water management plans in -- and that doesn't vary by year?

MR. NELSON: No.

MS. KINCAID: And how do you calculate your maximum 2009 groundwater pumping?

MR. NELSON: So the maximum -- so the annual maximum is also a static value. It -- some of them are from -- so all the 2009 values are from the agricultural water management plans. They are -- so --

MR. WARD: What ag plan? What date?

MR. NELSON: Do I have --

MS. KINCAID: The 2012.

MR. NELSON: 2012 version. I don't think I have the page number with me.

MR. WARD: Okay.

MS. KINCAID: Go ahead.

MR. NELSON: So I guess whatever time period they represented, we looked at whatever their maximum pumping historically was, and that's what we used as the maximum possible. And it includes both district capacity and private capacity for pumping within a district.

MS. KINCAID: But in the SED, the number changes depending on average year, dry year. On page G15 you guys have a chart that talks about the average annual groundwater use, and it's an interesting chart. And it provides baseline estimates, and then it provides how much increased groundwater pumping will be under the project. And you note for the 40 percent, the preferred project, it's 105 increased groundwater pumping in average years, and then those numbers change. So it looks like it's a calculation rather than just an importation from ag water management plan numbers. Do you have a calculation for that?

MR. NELSON: Yeah. The -- so it's a static capacity to pump, but they pump either up to that -- they pump what they need up to that capacity. So like on this chart here -- I don't know if you can see it. So when there's a surface water shortage, so it checks what's the shortage of surface water up to their demand? And they will pump that, unless that number is greater than the capacity we took from the agricultural water management plans.

MS. KINCAID: But I guess that's my question. So the capacity in this chart is 626,000 acre-feet. Okay? Not this chart, which is interestingly inconsistent with your --

MR. NELSON: Well, no. This is just for Merced Irrigation District.

MS. KINCAID: Okay.

MR. NELSON: This is for all the districts combined.

MS. KINCAID: Great. So the 626 number, as you can see in the top of the chart, is the actual maximum capacity.

MR. NELSON: Yes.

MS. KINCAID: So my question is what is the calculation you came up with to get the 105 for average years and the 302,000 acre-feet increase in critically dry years? How did you come up with those numbers? What's the -- there must be a calculation in there, and I don't -- I don't find it.

MR. NELSON: It's exactly what I said. So we --

MR. GROBER: Let me -- let me take a -- say it a different way, and this gets back to, you know, the general schematic. There's -- the proposal will cause a surface water supply deficit.

MS. KINCAID: Right.

MR. GROBER: So when there's -- now currently there's surface water supply deficit that happens in critically dry years, and that's in this chart that's shown here, that's when there's the biggest augmentation of groundwater pumping.

MS. KINCAID: That's right.

MR. GROBER: With the proposal, there would be --

MS. KINCAID: Increased.

MR. GROBER: -- more times when there would be a surface water supply deficit, so --

MS. KINCAID: Right.

MR. GROBER: -- there would be more groundwater pumping.

MS. KINCAID: Right.

MR. GROBER: Those numbers, 105, that's the average over all those years.

MS. KINCAID: Right.

MR. GROBER: So you get the 82-year record --

MS. KINCAID: Yeah.

MR. GROBER: -- and then the other number you (unintelligible), then you can come up with the average, what it is for critically dry years.

MS. KINCAID: Right. And I understand the numbers, but I'm wondering how you came up with those numbers, how you came up with 105. Remember, in 2012 the assumption was it was a one-to-one. If you shorted us one, we'd pump groundwater one.

MR. GROBER: It's an average. So if you take -- so this is -- this next one is just for the Merced. So if you just took that -- the numbers that are in the red, so you'd see if you came up with this now, just the time series over the 82 years, you'd come up with some very big years of groundwater pumping --

MS. KINCAID: Right.

MR. GROBER: -- some years of no groundwater pumping. If you take that long-term average, that's the 105.

MS. KINCAID: No, I understand how you got the average. I'm wondering how you figured -- how you estimated what people would pump. It's not -- I mean the ag water management plan could be kind of a basis for the numbers, but why did you estimate that an average -- I understand in average years that you got the numbers, but in each specific year, how did you estimate -- what is the calculation by which you estimated what people would pump and wouldn't pump? It's not a maximum capacity number.

MR. ANDERSON: Les, can I help?

MR. GROBER: Yes. So -- sure.

MR. ANDERSON: Specifically it's a calculation of the applied water needed to meet a demand in a certain

year, and that's at the field scale. So first we translate surface water availability at the diversion from the stream, and then we have a certain -- we've got water that's lost through percolation, through regulating reservoirs and conveyance systems --

MS. KINCAID: Sure.

MR. ANDERSON: -- and taken for other uses. But what's actually a crop demand is compared to the surface water that can be conveyed to the farm-gate, and then if there's a shortage in that, that would be the field scale demand that would then translate into if there's enough capacity at that point.

MS. KINCAID: Right. So I guess my question is when there's capacity to pump more groundwater but the SED assumes that it's not pumped, who -- what -- where did that assumption come from or where did those numbers come from? So when you have 105 -- if you look at this chart, you have 105 in average years; right?

MR. ANDERSON: Right.

MS. KINCAID: You have only six in wet years, but you're --

MR. ANDERSON: Right. That's because there's adequate surface water in those wet years that's used.

MS. KINCAID: Right. But then as you get into dryer years, there's a point where there is more demand than you're making up with surface water; right? So maybe -- maybe large scale numbers are better. So the SED generally says there is about a 294,000 acre-foot in

average year shortfall of surface water. Okay? So about 300,000. And the estimate is that there will be an increase in those average years of 100,000 acre-feet of groundwater pumping; right?

So why didn't -- I guess my question is how did you come up with the 100? Why isn't it 150? Why isn't it 200? And there's a mathematical algorithm that goes in here that I don't think is disclosed in your SED. I'm asking to explain it or disclose it later.

MR. ANDERSON: Right. Les is --

MR. GROBER: It's a simple long-term average. It's just averaging some years just like you would just -- you would take the numbers -- sorry I don't have the table here -- and you'd -- that's the average.

MS. KINCAID: I understand how you get the average. How do you get the inputs?

MR. GROBER: So the first step is if there's a surface water supply deficit, you make up that surface water supply deficit to meet crop water use needs up to the capacity that can be provided through groundwater pumping.

MS. KINCAID: But that's my question. Where -- how did you put the capacity of the groundwater pumping? Because it's not the capacity of the facilities, which in this chart, it is 626. It's static. So there's a group of numbers in here that are assumptions --

MR. GROBER: So if it's --

MS. KINCAID: -- and I'm wondering --

MR. GROBER: -- a deficit -- so if the deficit is 500, it can be fully met. If the deficit is 700, it cannot.

MS. KINCAID: Right, but that's a good example. If the deficit is 700, it can't be fully met.

MR. GROBER: Yes.

MS. KINCAID: But you're stopping short at, like, 4 and not going to the -- to maximum capacity. I don't know if you guys have this chart in front of you, but I guess one of the questions -- and obviously you don't have it on hand here, but going forward --

MR. GROBER: And which chart are you referring to? Because perhaps -- because maybe we should pull up the chart.

MS. KINCAID: You should.

MR. GROBER: You have it or we can pull it up from the document.

MS. KINCAID: It's Table G2-5.

MS. HUBER: I just want to add a minor point, which is the calculation is done irrigation district by irrigation district and --

MR. GROBER: (Unintelligible).

MS. HUBER: -- some have a minimum -- well, have little ability to replace a water supply shortage with groundwater pumping. So the result for each year depends on sort of which district has the shortage and whether or not they can replace their water.

MS. KINCAID: And is that calculation provided in

the SED or is that --

MS. HUBER: Appendix G has a detailed description of that calculation. It's summarized in Chapter 9, but Appendix G has --

MS. KINCAID: All right. And --

MS. HUBER: -- a lot of details.

MR. WARD: Let me make sure I understand. So you've got a 300,000 acre-foot on average, and I've got some questions about that. But 300,000 acre-foot shortfall of surface water made up by 100,000 acre feet of groundwater pumping because you've reached some sort of maximum withdrawal capacity; right? And --

MS. HUBER: Yeah.

MR. WARD: Am I getting that right?

MS. HUBER: I don't have the numbers memorized, but yes.

MR. WARD: So there's still the shortfall -- right? -- of 200,000. It gets back to speculative responses are unpredictable and unknown. Don't you think a reasonable response would have been for local -- the local community to drill more wells and pump additional groundwater, and that was not analyzed?

MS. HUBER: Well, we used 2009 as the --

MR. WARD: Yeah, but I'm talking about response to --

MS. HUBER: Well, so the -- for that reason, we also did evaluate the 2014 maximum groundwater pumping numbers.

MR. WARD: I'm talking about beyond that. Did you analyze making up the entire shortfall?

MR. GROBER: So if I may, since we -- this is -- is this the table that --

MS. KINCAID: Yeah, that's the table. And sorry. I'll try to be quick on this, but to be honest, I don't want to act like I'm belaboring a point. This is a fundamental -- this is the fundamental assumption of our groundwater.

MR. GROBER: So I think this might -- I think I understand what the concern is, what the question might be now. These are still averages of those year types. So the response is not the same at all, dry years not the same, nor critically dry years. So you're not up to the maximum in any one of those because you're meeting -- there's still -- there's going to be a mix of different augmentation of groundwater -- additional groundwater pumping. So those are taking the average of just a subset of years in the record, so --

MS. KINCAID: Right.

MR. GROBER: -- 20 years roughly for each --

MS. KINCAID: Okay. Let me make --

MR. GROBER: So you would -- so --

MS. KINCAID: -- sure I have this right.

MR. GROBER: So there's not a number -- so this isn't like a target number.

MS. KINCAID: No, I know.

MR. GROBER: These are also averages of the --

MS. KINCAID: It's an estimated 2009 groundwater pumping capacity, which is what it's called. So --

MR. GROBER: Based on estimated 2009 groundwater pumping capacity. So it's still using that maximum. It's saying over that 82-year record.

MS. KINCAID: Can you explain that -- that's my question. Can you explain the maximum? So when you have this 105, 302, so I'm looking at the Alt 3, 40 percent unimpaired flow. In average year -- and I understand how you get the average year of 105 increase. That obviously is not the maximum capacity. So clearly there's an assumption made that there is groundwater pumping but not to the capacity.

My question is what is the assumption or what is the calculation that was used to assume when groundwater pumping would stop, if it stops short of the full capacity?

MR. GROBER: It's -- so the example that I gave initially, so let's just assume -- just use easy, round numbers. If the surface water supply deficit is 700,000 acre-feet, the maximum groundwater pumping capacity is 600,000 acre-feet, then the -- then you would --

MS. KINCAID: How did you get the 600? If the 600 --

MR. GROBER: That's based on the information that we have. That's a fixed number. That's the maximum rate that we have. Based on the plans and the information we solicited in 2015, what's the maximum pumping capacity

within each district? It's the sum of all of that. So that's the maximum. We assume it can't be any higher than that.

MS. KINCAID: Right. But if it's a fixed number, then why does it differ by critical, dry, and below normal year? I mean are you saying that you just took the ag water management plan numbers and imported them here? It looks like there's a calculation that's --

MR. GROBER: Yeah, the calculation is -- and Tim just pointed it out. It's -- this is why math is good. So that -- this reminds me when I did my master's and part of my dissertation coming up with a full page of partial differential equations. This is not a partial differential equation, but it is an equation, nonetheless, that actually answers your question. So it's taking --

MS. KINCAID: Can you walk me through it?

MR. GROBER: Yes. So it's saying the additional groundwater is the minimum of the additional demand minus the applied surface water demand and the minimum groundwater -- is that the groundwater -- minimum groundwater pumping?

UNIDENTIFIED SPEAKER: Yeah.

MS. KINCAID: And that's my question. So what's the minimum groundwater pumping? It's just a number straight out of ag water management plans?

UNIDENTIFIED SPEAKER: Yeah.

MS. KINCAID: And there's no calculation behind that?

MR. GROBER: Because it's simpler than looking at the equation. It's saying it's -- basically it's that -- it's the example that I've given. It's like the demand in any given year. You have to look at that demand that you have because you don't have the surface water supply, and then you say, can I meet it with the -- within the max pumping? If I can, great. If not, you go up to the max pumping, but your demand might be less than the max pumping and then you'll come up with something less.

So for all years and for all year types, you'll get a range that goes up to the max pumping, the additional groundwater pumping, but it could be something also very close to zero. And you take an average of all those year types, and you'll come up with the numbers that are in that table.

MS. KINCAID: Okay. So that -- so that what you're saying is that minimum groundwater pumping or the maximum groundwater pumping, those are not calculations. Those are literally just imported from the ag water management plans?

MR. GROBER: That's correct. Those are -- those are caps, basically, on those two numbers.

MS. KINCAID: And did you guys provide that calculation in the SED? And, if not, can you provide that?

MR. GROBER: That's -- here it is.

MS. KINCAID: No, no. I mean the actual numbers.

MR. GROBER: Oh, the numbers? They're in the

SED, yes. And, actually, we've -- and --

MS. KINCAID: They're not.

MR. GROBER: -- this is -- yes, and --

MS. KINCAID: The calculation is in there, but if you could provide the numbers of how you got to that number because, obviously, all the ag water management plans didn't come up with the same number.

MR. GROBER: Is that in here? Is that in here?

MS. KINCAID: We don't have to take it now, but if you could provide that, those numbers, off-line. They're not in the SED.

MR. GROBER: Sure, sure.

MS. KINCAID: That would be great.

MR. GROBER: We've actually -- and we've gone, you know, one step even beyond this. Because as arduous as this is, especially looking -- looking at math in a public meeting is always kind of hard.

MS. KINCAID: You wanted technical; right?

MR. GROBER: Yes, this is technical. It's great, but we didn't look at it just for 2009 as this next table shows. These are here. This is the annual maximum groundwater pumping based on 2009 and 2014 estimates. So that shows it district by district. And depending on then what you use, you come up with different results, and these results are important.

And a lot of thought went behind using the 2009 because, as I think I said early in the presentation, if you use the 2014, it has the effect of reducing the unmet

demand. So it reduces the ag -- it reduces the crop fallowing. It reduces that ag economic impact, but it puts more of a burden on groundwater. And it's also looking at numbers that are less sustainable.

Even 2009, as the numbers we present, is that sustainable over the long term? That's going to be a big issue for SGMA, but we've presented it two different ways. I think one of the questions is have we done sensitivity analysis for things like this? This is an example of like we can't know exactly what the answer is.

And arguments could be made, well, that's not the right 2009 -- you know, that's not sustainable pumping. Well, we've looked at it a couple of different ways, and it will counterbalance in the end. And if there's better information in terms of what's currently going on and what's expected to go on in the future, that's good information to receive. But we're showing our work as to how this all comes together in terms of groundwater effects versus cropping and economic impacts.

MR. ANDERSON: I believe we've also provided a spreadsheet that covers all the calculations, and it's not a -- it's a fairly simple calculation, but there's a lot of years and a lot of different areas that it goes through.

Just to clarify on your original question on the year types, it's important to remember that those year types are composites, so we don't -- we don't average the dry year demand and then take the capacity off of that.

It's a composite of multiple years, some of which will reach capacity, some of which won't need it. If that makes sense.

MS. KINCAID: It does. And I guess that's the calculation I was asking about and how you got to those composite numbers. Because they look awfully round, but they're obviously calculation, so...

MR. WARD: I have a question about the -- and then I'll let Debbie kick off the ag, although we're kind of skewing into that. We're talking about averages; right? And it kind of smooths things out from the real year-to-year, what we might realize. So we talked about this 293,000 acre-feet shortfall and available surface water. So let's just call that 300,000. Where in your document is that distribution and what does that look like?

First of all, what is your average? Can you show me the formula? Can I derive from your data? Can I get to the answer of 293,000 as an average? Is that a mean? Is it a middle of the range? Is it a -- what is it? That's a question.

The other one would be what does the distribution of that look like? Is it uniform? I bet it isn't. So is it skewed which way? Is it skewed to the left? Is it skewed to the right? It would be helpful for us to understand that because I think it might be more revealing than using averages.

And with that, what would be that standard

deviation? Over what range -- you know, statistics can be very misleading. And so looking at the actual numbers, notwithstanding the premise in the first place, but just recognizing and taken as a given for our part that 300,000 acre-feet of less surface water is going to be available to this region, our response is going to be pumping more groundwater.

I mean that's what we're faced with, and that is going to affect all the ag communities, all the cities, all the rurals, all the domestic wells. And we're trying to understand what that impact is going to be because ultimately that merges into economy. This ultimately becomes an economic impact to this region, to the entire vitality of this region.

So helping us understand that would be very beneficial, to help us frame some questions so we can explore with you better means, perhaps, of trying to analyze and respond to -- to what you're proposing.

MR. GROBER: So here I've just pulled up a couple of tables just from the executive summary which is still --

MR. WARD: I don't want to see a table. I want to see a histogram, No. 1.

MR. GROBER: We have exceedance plots and full data sets. We have the full model and --

MR. WARD: Okay. Where is that? Where -- what -- can you tell me where in your document?

MR. ANDERSON: Well, do you want to go to --

MR. WARD: (Unintelligible) we can spend some time with it.

MR. ANDERSON: Right. Appendix F1 will be --

MR. WARD: F1?

MR. ANDERSON: Yes.

MR. WARD: What is it, size font 2?

MR. ANDERSON: It is fairly sizable.

MR. WARD: I had to say that.

MR. ANDERSON: Right. And I understand the agenda today is to focus on -- on these items, and we've kind of set aside the larger, you know, hydrologic modeling aspects of that, but the -- this 293,000 acre-foot number is an annual average and --

MR. WARD: Is it a mean or a median, or what's an average?

MR. ANDERSON: That is an average of supply volume, so we've got -- it's --

MR. WARD: You just took total years, added up what that cumulative was, and divided by the number of years? What did you do?

MR. ANDERSON: Right. So in order to evaluate the system, we have -- we've got the CalSim hydrology. We've got a set baseline, and then there's -- we're comparing 82 years under baseline conditions versus the 40 percent flow alternative. And to do that, we have to reoperate the entire system. We've got to evaluate each year for the surface water demand that's required based on the climate, how much rain there is that year, and CalSim

gives us a basis for that.

MR. WARD: And you have an output number for each year.

MR. ANDERSON: So for each year we see what's -- what's needed for diversion, and then if there's available supply that's met. And then that requires operational constraints such as carryover storage guidelines just for the sake of the analysis so that no particular years are -- well, to minimize the years of low supply, we have to kind of -- we have to reoperate the system. And so I think that --

MR. WARD: Does that include reservoir flood space?

MR. ANDERSON: It does. It does include what's available, flood space and so on. Just how CalSim would do it, we've used those parameters and basically had to come up with an allocation scheme saying, well, if we've got to put this, you know, amount in the river instead of 20 percent of unimpaired flow, how it might be under an existing condition, a biological opinion or so on, up to 40 percent, then that water would not be available for use.

And it would -- and so each month, not just annual but monthly operations of the reservoir would be considered in that. And so that's the topic of the December 5th workshop that we will be presenting, and so --

MR. WARD: Or we can spend some time with

Appendix F (unintelligible).

MR. GROBER: So, Will, if you wanted to come here and do some driving on the -- on F1 to find any other specific table. And I'm not sure if this is -- if this is -- the short answer to your question is at least twofold. We have provided the models which were available when we released the SED, which has not just all of the information, but it allows anyone to duplicate that information and also check the model logic to see how these calculations are made.

These appendices have all of the -- I'm showing example of a form, of tabular information just for one tributary at 1 percent of unimpaired flow so we have that type of information. What I think is far more useful, though you didn't want to see a summary table, is something from the executive summary which really gets at your point which I think is that averages can be misleading.

So this is a table from the executive summary showing the mean annual water supply effects. It's showing it for the Stanislaus, the Tuolumne, and the Merced. And that's where you have then -- for the total for the plan area, you get where I'm showing here where that occurs, or that average, that overarching average of 293,000 acre-feet per year. That's the reduction in water supply that would be available.

So that's a 14 percent reduction, and we show it then for each 5 percent of unimpaired flow, shows how it

varies. So it's important to see how it varies within that 30 to 50 percent range of the proposal. That's why we highlighted for the 40 percent, but also for the plan area, it ranges from a 7 percent to a 23 percent reduction. Those are big numbers, and that's not all of the story.

But getting directly at your point, on the next page of the executive summary, we have another summary chart that shows it again for the Stanislaus, the Tuolumne, and the Merced for the total plan area but shows under the 40 percent flow proposal what the variation is by year. So not all the years are the same. In wet years for the overall plan area, it's only a 2 percent reduction because there's plenty of water available for everything.

But when you get to those dry and critically dry years, those are much bigger than the annual average. That's a 673 and 624 thousand acre-foot, respectively, reduction in water supply in those years. And that gets directly at what the proposal is doing, because though we don't have the fish panel here today, we're not talking about the fish rate, but it's those years when the percent of unimpaired flow in the tributaries can be in the single digits during that February through June period, rather than what would be flowing down under an unimpaired condition without consumptive use and storage.

Where you'd have 100 percent, you're getting 5, 6, 7 percent of the flow that would actually normally occur. So that gets at the crux of the impetus for the

proposal, why you need some level of flow to protect fish and wildlife, and that's also because that's when there's consumptive use needs, that's why you see the biggest water supply effects.

MR. WARD: Okay. There's something we need to further explore.

MR. GROBER: Sure. But I assure you --

MR. WARD: A statistical approach --

MR. GROBER: I assure you that all the numbers, all the numbers -- there's a lot of numbers in the executive summary.

MR. WARD: Yeah, I'd like to see if the 20 percent through whatever it was for each of the 82 years of hydrology, that needs to be teased out somewhere because I believe --

MR. GROBER: Is that something --

MR. WARD: It's not a uniform distribution; right?

MR. GROBER: Right.

MR. WARD: You're going to have more years where there's going to be greater impact to the region than when you just look at it as an average.

MR. GROBER: What would you like me to pull up, Will?

MR. ANDERSON: Page F179 for Mr. Ward.

MR. WARD: And, Debbie, I'm sorry. I -- I told you ahead this would be sort of organic and we'd be free flow. So let's move on to this next panel. I apologize.

And we'll get back with you, Will.

We have Eric Thorburn over on audience's left with Oakdale Irrigation District, Julianne Phillips with the San Joaquin County Farm Bureau, Mr. David Robinson who is the ag commissioner for Merced County, Valerie Kincaid with O'Laughlin & Paris, and Debbie Liebersbach, water manager with Turlock Irrigation District. So Debbie is the sub lead on this one, and she can maybe kick it off with one of her group's questions as it pertains to agricultural impacts directly attributed to the proposed unimpaired flow proposal.

MS. LIEBERSBACH: Thank you, Walt.

MR. GROBER: And if I -- if I may, just because I've been intervening time. You know how engineers are. So since I pulled it up, I have to draw attention to the exceedance plots because --

UNIDENTIFIED SPEAKER: Can you zoom in?

MR. GROBER: Sure. So for the -- for engineers, this is the -- you know, this is the way to view the data.

MR. WARD: Okay. We'll look at it.

MR. GROBER: So that's an example of showing for the different proposals, and this actually shows for what percent of the time. That's why the -- it's the exceedance plot, what percent of the time you have reductions in diversions on each of the three tributaries, so -- sorry.

MS. LIEBERSBACH: It's all right. Thank you.

Okay. So we have a variety of questions, and

thank you again for coming to talk with us. I guess I thought I'd start by asking, you know, you've recognized in your presentation that we have varying levels of overdraft existing within the basins already, and that combined with the requirement that SGMA bring this into the requirements for groundwater sustainability.

One thing that occurred to me is that the groundwater -- or the agricultural impacts were evaluated based on a variety of groundwater pumping scenarios. You know, you proposed 2009 as a possible amount of water that could be pumped and 2014 volumes with an amount that could potentially be pumped, but you didn't really look at what it might be if groundwater isn't able to be used to make up the difference. And that would in my mind kind of bracket what the impacts may or may not be. Unless, perhaps, it's in the SED someplace and I didn't find that.

Could you -- could you talk about that?

MR. GROBER: Sure. So I think, as I said, that's -- in the last round, that's what we looked at. We looked at no pumping or full pumping. This time, based on many of the comments that we received in this area from others, we'd rather answer the question as, well, what's likely? Because neither seems likely that there would be no additional pumping or full pumping. So, no, we don't have that in the SED. We don't look at a scenario where there is no additional pumping.

MS. LIEBERSBACH: But from an agricultural impact perspective, that would be the worst-case scenario; would

it not be?

MR. GROBER: That would have a bigger -- that continuum that I referred to, if you didn't replace the supplies with groundwater, there would be a bigger effect on -- in terms of reduced cropping and economic.

MS. LIEBERSBACH: Okay.

MS. PHILLIPS: To that point, while you were discussing the last item of interest, you did say that, you know, the relationship between the agricultural economic impact and the groundwater impact, and I think that to the extent that those are two divorced ideas in the SED is to the detriment of the local communities because -- especially in agriculture.

If you're looking at a groundwater impact, that is an agricultural economic impact, and those have not been fully vetted in the SED. And if they have, we would like to know what is the worst-case scenario. If under SGMA there's not allowed to be any more additional pumping in these high-priority basins, what is that economic impact going to be?

MR. GROBER: Well, and this is -- you know, this is one of the questions that we had in the last round. It becomes -- to make determinations about what the specific responses will be and over what time frame, combining that with what other additional groundwater recharge that could be, increases in water use efficiency, water conservation, change in cropping patterns. That starts becoming all quite speculative.

We're confident in the analysis that we've done, and that's why the intervening drought, if there's anything good about it, it provided useful information on what -- how would this area specifically respond to reduced water supply, surface water supply. And we used the information on what the response was, recognizing that there's that question, that big question about sustainability and for how long.

But that's why we've provided all of this -- the information that we have. That's the big, open question. That's something this local area is going to have to wrestle with, long-term groundwater sustainability. But in the moment, the analysis shows this is a likely response to the -- to reduced surface water supplies.

MR. THORBURN: Sorry. Can we talk about inputs a little bit here? What assumptions did you make for land conversion? Because I know that in our district, we've seen 3,000 acres of ground being converted to permanent crops every year. So what assumptions did you make on those trends?

MR. GROBER: I'm sorry. Assumptions about land conversion --

MR. THORBURN: Conversion to permanent crops.

MR. GROBER: That there was certain thresholds -- can I pass this one off in terms of when -- when determination in terms of conversion as opposed to fallowing?

MR. ANDERSON: Well, we're starting with a 2010

baseline of crop use, and perhaps Tim can say it. We don't address --

UNIDENTIFIED SPEAKER: I feel like this is more of a Josué question.

MR. GROBER: Yeah.

MR. ANDERSON: We may have to defer that.

UNIDENTIFIED SPEAKER: He couldn't make it here today, but he'll be at the technical meetings, so...

MR. THORBURN: So it seems like you're using a lot of old data. So in your presentation, you used an estimate of what the available groundwater supply was in the basin. That was from 1960; is that correct?

MR. GROBER: That's -- that was provided to just -- there's always a concern in providing a number, big numbers like what's the current level, estimated levels of overdraft. And we presented those numbers, you know, what we came up with, two different ways, and then what is -- what could potentially happen with the increased levels of groundwater pumping based on the 2009.

There's a lot of assumptions in there, but to try to add perspective to those numbers, those levels of groundwater overdraft, that's the reason we just provided the only number that we're aware of in terms of what's the total, you know, yield of the -- the combined of the aquifer in the area. It's a very big number, but that's -- again, that's -- we disclaimed what -- how that can be used and how not. It shouldn't be taken as just a bank account that you can drain down.

MR. THORBURN: Right. But you did -- but you did do -- later in your presentation, you stated the amount that is currently being drafted from the aquifer, assuming that all the other assumptions that you made and inputs were correct, you stated a percentage per year that we're pulling now and a percentage that we're pulling in the future and gave us a perspective that basically this is how many years you have. But did you account for the years that have been pumped since 1960 and the draft --

MR. GROBER: This was just -- that's why I was just looking at those. That's the number that was out in the literature. Just --

MR. THORBURN: But if you don't -- if you don't correctly account for those, then you aren't correctly accounting for the economic impacts; correct?

MR. GROBER: Well, no. This is to provide -- this is a very big question. This gets to be the SGMA question, which is why this and other areas have a lot of work to do to determine what are the current numbers in terms of sustainability yield and how the groundwater will be managed. That's -- that's a much bigger question than what we have here with regard to the SED. This is adding one stressor to the overall SGMA question in terms of ground water sustainability.

MR. THORBURN: So getting back to the quantity question, the 2003 Bulletin 118 boundary analysis was used as the basis for estimating the agriculture that is outside the improvement -- or the irrigation districts; is

that correct? So was there any look considering the fact that a lot of that east side ag and that -- in our area specifically -- and some other districts around us outside of this district, there's been a lot of development. You used 2003 numbers to estimate that ag and that demand; is that correct?

MR. ANDERSON: It was the 2003 boundaries that were established by Department of Water Resource but 2010 land use data.

MR. THORBURN: So there were no trends since 2010, and no one else has -- since 2010 of what has occurred out in those areas?

MR. GROBER: This is -- this project -- this project -- this is -- the proposal in this project is not SGMA, and it's not about --

MR. THORBURN: But it goes into the impacts and how those impacts are quantified; right?

MR. GROBER: But --

MR. THORBURN: So the information's important in utilizing those --

MR. GROBER: Well, what we have to find is the relative impact, the relative change. We don't know those absolute numbers, and to the extent those absolute numbers, that would certainly inform SGMA and other things that need to happen. But we're showing how the relative number -- and we've provided some relative numbers. I think your point is, well, the -- I think what you're saying is that the level of overdraft is actually much

greater than some number that we've presented. And that --

MR. THORBURN: But my point is the number that you used doesn't appear to be accurate. If you're using a snapshot in time and it's 2003 and 1960 --

MR. GROBER: I would ask what --

MR. THORBURN: You have 2012 plans versus the 2015 plans.

MR. GROBER: What is the -- what is the intent or what's -- how does that question inform what we're doing? Because I'm -- and, again, I'm not -- I don't want to put words in your mouth, but I think what you're suggesting, and I think I've heard others discuss that, that there's been much more groundwater pumping going on the east side in areas that don't have surface water supply and, therefore, some of the information we have isn't the latest in terms of the current level of overdraft that's happening in the basin.

That -- perhaps that's the case, but if there's information like that, I'd say two things. That's going to be very important for SGMA, and in terms of informing the policy decisions, that would be a comment to make as part of this process, but I don't think that it changes the nature of the assessment or the impact analysis for what we've done for the -- for the SED.

MR. THORBURN: Yeah, I disagree. I think that if you have old data for supply that's available and for really the demand on the aquifer, I think that's a big

problem with -- affecting your economic analysis.

MS. GAO: Just to clarify it, we didn't use the 1960's total storage number in any of our models. That number was provided in this presentation to give everybody a general context of how the -- our estimated overdraft compared to the total available water. So we never used that number in our assessment. And, also, we -- we never used the estimated overdraft in our assessment. It's just to provide us a context of what is happening.

MS. LIEBERSBACH: Could you explain why in the agricultural impacts analysis it wasn't considered what impacts there might be outside of the five irrigation district boundaries? Because the other analyses recognized that there's a larger basin and those areas rely upon the groundwater that's being recharged within those districts. And so it seems to be missing as a part of the impact analysis.

MR. GROBER: You probably will -- if you haven't -- if you're not hating it already, you'll probably hate it even more. This is -- it's a programmatic analysis. We've done much more detail than generally is done for such things, but the -- when we look at the effect, it's a total water supply deficit. And we've looked at the ag -- the cropping effects and their -- the ag economic effects focusing on the districts. To the extent that that would be -- there would be a shortage, something outside of that area, it would be similar but not significantly different or bigger

effect is what's built into the analysis. So it's --

MS. LIEBERSBACH: But isn't it a cumulative? I mean, if you're going to have the impacts in the district, you're also going to have impacts outside of the district and so it's -- you're missing --

MR. GROBER: I wouldn't (unintelligible) it's cumulative for that. It's the total -- we've identified the total water supply effect, and from that, the total cropping and economic effect. Where exactly that will be happening, it could shift. Some might be more out of district and not within district. Because it's an important point both for this but also for SGMA, it's curious.

This is why it's another thing to wrestle with is I'm not sure if the point was driven home in the slide that Tim had shown. The districts themselves for the most part currently now provide significant recharge to the aquifers, and even under this proposal would continue to do so until you get to the higher end. And particularly Merced Irrigation District would start drifting into not necessarily recharge at the 50 percent, but where exactly these water supply effects and where the ag effects would occur, it's going to be somewhere within the plan area but where exactly is getting into a detail that would be speculative to determine.

MR. WARD: Just a time check. We're five minutes -- we've slipped five minutes on our schedule. So we're doing pretty well.

Dave, do you have any follow --

MR. ROBINSON: Yeah, I do. I'm interested in crop production. You know, the groundwater within the area is of varying quality. What process did you undertake to assess the impacts on ag production from the increased use of poor quality groundwater?

MR. GROBER: You know, I think we might need to check that. I don't think that we -- we looked at that, we determined anything about the quality, though I'd have to check that. That's a -- that's -- I don't believe -- someone correct me if I'm wrong, but I don't think that we made determinations about changing water quality with regard to the surface -- the flow element of the proposal.

MR. ROBERSON: Yeah, hi. Mark Roberson with ICF, and I worked on the ag resources chapter. And regarding a change in groundwater quality for suitability for irrigation, we did look at what -- I believe it's in Bulletin 118 -- we had for background information and did not see that it was a significant issue with irrigation. But if there's other information, you are welcome -- we welcome it.

MS. PHILLIPS: That's very curious to me because my growers also have to pay Water Quality Coalition to measure the quality of their groundwater, and they're consistently being told that they need to do better and that dilution is the solution to the problem. Now you're not getting any surface water that we can recharge that groundwater with, and then you're having to recycle it and

pump it -- and pump the lower quality groundwater onto the land. And that's going to cause an impact in crop production.

MR. WARD: I had a question, and then I think we'll take about a ten-minute break and then we'll bring up the large urban -- Michael, I saw you out there somewhere. Yeah, here you are.

In your demand forecast, and you show the deficit, lack of surface water, pumping more groundwater up to the capacity, 2009, 2014, that discussion, that demand forecast is fixed; right? And so that crop demand, is it ET replacement with applied water efficiency? In other words, in your SED, do you take into account -- do you do anything on the demand side? Do you assume some conversion of the irrigated method to drip and micro away from what is irrigated today by flood? That's one question. And if there's a yes to that, did you consider then the loss of recharge to the basin as a result of the shift in irrigation methodology?

MR. ROBERSON: I'll go ahead with the irrigation question. We -- we assume using the DWR's applied water, which encompasses different efficiency practices and kept those --

MR. WARD: Okay.

MR. ROBERSON: -- as they were --

MR. WARD: But did you assume any demand reduction in the region as a result of -- as one of the speculative responses to the lack of surface water, that

there would be, I'll just call it, a reasonable response to shift to more efficient application methods, therefore, reducing groundwater recharge?

MS. HUBER: I'm pretty sure that there's a discussion of how increased efficiency is a likely response to reduce water supply.

MR. WARD: Did you assume (unintelligible)?

MS. HUBER: It's not built into the calculations.

MR. WARD: It isn't? Okay.

MR. GROBER: No, and --

MR. WARD: Will looks like he wants to say something.

MR. ANDERSON: I'm not sure that it will be satisfying, but the need for applied water incorporates the actual ET demand and then excess either, you know, leaching or otherwise a percolation that does occur as part of the process. The surface water has efficiency issues to get there, but we've assumed the rates that we've seen published based on that snapshot in time in the management plans. The groundwater application is at the field and without -- it's assumed to be at the field, just to simplify things; whereas, some of it might be into a conveyance system and lost, but there is a greater efficiency there. But, again, the rates are the same.

Back to Les's original point. If we take the reduced surface water, it's either going to have an effect, so if -- if the district takes the cut, then they'll -- there would be a major -- you see the maximized

economic impact. If the district gets more efficient, then that passes the impact along to the groundwater basin.

MR. GROBER: And this is an interesting and very important question. And I heard this came up with -- you know, I was fortunate -- a meeting just earlier this week in front of the San Joaquin County Board of Supervisors, where, you know, an observation was made. You know, lot of investment inefficiencies and drip and conversion, things like that. Then all of a sudden you start noticing, well, now groundwater reach (unintelligible) has gone down, so this is -- but it's a zero sum gain with that. And it's like, though, you can -- you could achieve some goals by becoming more efficient, but in an area like this where there's already successful conjunctive use of water going on, that, you know, it only gets you so much.

There's the efficiencies, of course, and that's -- you know, and there's methods there when -- I think we're going to be hearing that, you know, we should have identified some of those things to show how you would reduce the costs and the economic costs and ag costs here because, as we know, there are some methods of applying water inefficiency where you can do both. You can just cut down on the, you know, the evaporation of water so you're -- you know, you're not cutting down on groundwater recharge and you're using more just to satisfy directly the drop ET requirements. But those are the smaller margins, you know.

It's like it's not as simple as saying move from flood irrigation and everything is great because, well, you'll maybe use less water, less water in the moment, but you'll also get less recharge. So it's a problem this and other areas will have to wrestle with, but we didn't -- and for that reason, because this all gets very complicated and what exactly is going to happen with this, we did not look at that level of detail.

That being said, I think we make a comment in there to the extent that you can employ water efficiency methods that don't result in the reduced recharge, or if it does, at least you're gaining those gains in terms of reducing evaporation. That's where the gain is. If you improve efficiency in that way, you can get more with less.

MR. WARD: All right. Let's take a ten-minute break. By the clock on the wall, it's 12:04. Let's be back here -- 11:04. Let's be back here at 11:15 and reconvene with the -- and we're going to shift gears to drinking water.

(Recess.)

MR. WARD: Okay. Everybody take your seats. We're going to get going again. Okay. We're going to get started now with a smaller panel, but that doesn't mean that it's any less important; right? And this is the -- what we're calling the large urban. This is the city water supply.

And representing here today to your left is Ken

Elwin who's public works director with the City of Merced. Sitting next to Ken is Larry Parlin with the City of Modesto, and then Michael Cooke with the City of Turlock. And they've been asking and graciously agreed to sit on this panel to talk about impacts of the SED and the shift in additional groundwater pumping and how that would impact their city water supply.

So, Michael, I'll let you kick that --

MR. COOKE: I'll be happy to kick it off. I want to start -- and (unintelligible) I want to thank you to the State Board. We met with you a couple years ago and found that the earlier version of the SED didn't even consider impacts to urban suppliers of the -- of the proposed flow proposal. So thank you for Chapters 13, 16, and 22. They provide a lot of information on how we would be impacted, but with that thank you comes a concern that when you start analyzing those impacts, they're significant and, as you say, they're unavoidable, and that raises some significant concerns for us.

With my background, I'm a geographer by trade. As a little kid I used to like watching *National Geographic* shows. And I always remember watching the shows of those poor African kids with a standpipe pumping the water and care -- with coffee cans and milk jugs, whatever else to carry water around. And when I read this SED, I see something very, very similar that you say people in rural areas may have to switch to bottled water. There will be significant impacts to residents, declining

groundwater quality, a whole cavalcade of events, and we're knowingly and deliberately creating that impact in the San Joaquin Valley. And that to me is beyond the CEQA impacts, and that stuff is very concerning as a resident, someone who lives here.

So I want (unintelligible) to Larry Parlin to start with and talk about how water under the California Water Code, that the highest and best use is municipal supply.

MR. PARLIN: Thanks, Michael.

Well, one of the things that we're concerned with primarily in Modesto is we contract for surface water for treatment for our water supply with the Modesto Irrigation District. And under reading the water code, when you're contracted to an irrigation district, then that water is not considered the highest protected water for domestic use for your urban suppliers. So, you know, how -- did you address that in the SED or why did you not look at what the highest and best use of water is?

Because the water code recognizes that drinking water is the highest, best use, but it's not necessarily the case when it's supplied by contract from a supplier. Did anybody take a look at that, how the drinking water is procured in the region and whether or not the irrigation districts could, in fact, reduce the supply to the urban water community?

MR. GROBER: I'm not sure -- when you say, "take a look at that," meaning what would be the effects of

reduction in water supply or --

MR. PARLIN: Reductions in water supply to the urban users. Because the primary focus that everybody is talking about and is appropriate is the agricultural community, and that's important. However, there are not -- Modesto is not the only urban water user that gets from an irrigation district in the local area. You have the cities of Manteca and others that get it from South San Joaquin Irrigation District.

So did you look at the protection of that drinking water supply going forward as -- for the urban water users, or are you just considering this all as agricultural water use and not looking at the fact that the urban water users do use some of that water supply?

MR. GROBER: As you pointed out, we identify the use in the -- in the documents, and that's why we identify -- and, again, it's the -- much of the same unsatisfying answer in terms of, you know, the speculative elements. We talk about, you know, water conservation, you know, what's happened in recent drought periods in terms of, you know, reduced reliance on water, what can be achieved. We also talk about water transfers and sales of water and the costs of water, marketing of water. So those were all things that -- you know, what the exact mix of that will be is, you know, cannot be determined with specificity so it would be speculative.

But there for the cities, because it is the highest use of water, and I think we even have language in

our water quality control plan in terms of, you know, protecting health and safety, things like that, there's -- there are opportunities for purchasing water and for water to get to cities.

MR. PARLIN: Well, I would -- yeah, I think to frame it a little bit better, we might -- we might comment that we've had to be very specific in the cities in long-term planning (unintelligible) regional water management invested hundreds of millions of dollars, still are currently working with the State Water Resources Control Board on these projects. Also looking forward to -- which entails our growth. We have hundreds of millions of dollars worth of infrastructure existing, and so going forward, this was all planned and accommodated, not only the available surface water supplies that we have contracted for, but the conjunctive use, protection of the groundwater, the delivery of recycled water to the agriculture community. All these things were planned on, conditions that were ascribed, and now a change in that surface water will have a dramatic impact on that.

And then earlier you mentioned the groundwater. Well, you really didn't consider water quality, but at the same time we've tried to do the integration, groundwater quality is a huge concern for the cities because on the other side of your building, they're implementing new MCLs for new constituents which are going to further limit the groundwater supply or require hundreds of millions of dollars more in treatment. And I don't even think the SED

addressed the future MCLs that are coming or the potential for future water quality issues. And those have a huge economic impact going forward for the city.

MR. GROBER: We did consider, you know, the general plans in terms of cumulative impacts, you know, growth that's going to occur in the area, but I mean I just -- just because of the comments that I heard, you know, this is -- because there's an audience here as well, I just want to bring us back to the proposal and the -- the background upon which that proposal is being made.

The current withdrawals from the river are at times taking out 90 plus percent of the February through June flows. So this proposal, getting back at its core, is about maintaining a certain percent of unimpaired flow, 30 to 50 percent, for February through June. That's just a portion of the year. So it's just putting a portion of the total water supply back towards the fish and wildlife beneficial use to reasonably protect the fish and wildlife beneficial use.

Stemming from that then, it has a water supply effect on the entire area for ag and municipal that we identify, but I just want to make sure to make that comment because that still means that there are going to be the opposite of that, that range of unimpaired flow, that 30 to 50 percent. It means that the opposite of that, that means 50 to 75 percent of the flow February through June, plus the whole rest of the year, is still available for consumptive uses: for agriculture,

municipal. So this is a very rich water area. Add to it that you have storage capacity in wet years, things like that.

So this -- the whole SED and the analysis does not get away from what are very real impacts to ag and water supply, but there is a lot of water in this basin to work with, and we think that we've identified the potential effects, the costs. We identify the costs of purchasing water for cities, things like that. But if you have more -- if you have comments and policy considerations that the board should know about, that's something that should be provided in written and oral form at the upcoming hearings.

MR. PARLIN: And it will. I appreciate that. You know, the fact is, we are blessed with a good water supply in this basin; however, just since 2011, because of the reduction in surface water supply due to the drought, our groundwater levels have dropped about 10 feet. And that's after tremendous recovery when the surface water went into conjunctive use in 1995.

On the economic front -- and our people have done a great job managing the water around here as well, but they're also paying a premium price now for the cost of water because of mandated reductions by the state on the other hand.

So I think those are important things that will be addressed at the board hearing and as a policy, but they -- also they play into the availability of water and

all the planning going forward for the future vitality of the city, the existing population, the existing businesses which, by the way, is prime -- the biggest employers are food and beverage processors here, ag-based industries, is really important to consider, and it looks like -- it doesn't look like it got due consideration in the SED, so...

MR. GROBER: And, again, for the policy considerations, it's going to be important to make that then -- those comments before the board. But I can't emphasize enough -- because we agree about a lot, but this is -- really gets at how much we collectively as a society value water. And we value it for doing, you know, lots of things.

In the parlance of our board chair, which he says all the time, how do we maximize the beneficial use of water? It's really how do we get the best bang for the buck. And here we have this very real need to protect fish and wildlife, and this document, if it does nothing else, it shows what the costs are of doing so. But it's a cost that the policy decision before the board, is that -- are those costs reasonable?

And some of that cost will fall, as we described, to the affected area, but when I hear about the costs of water, we work -- you know, throughout statewide, this area, because of foresight and developing the water projects here is very fortunate to have very good water supply, but we've also seen during the drought how both in

the cities and ag rises to the challenge, you know. I've seen some of the high crop production numbers, you know, values that, you know, through the drought we survived and actually excelled. And we've seen water conservation happening here in the cities, and I'm confident that that will continue to happen. This is -- but this is clearly adding another stressor to the area.

MR. COOKE: I'm going to add to Larry's point. You know, the cities around here have cut back use over the last 20 years probably 40 percent on a -- (unintelligible) per capita per day basis, but we're still seeing the aquifer decline. Like you said, it's a new stressor. The state, basically to mitigate that stress is -- you know, the local agencies need to involve this problem for us and there's two ways: one, through reduced consumption through SGMA, so things like that. And if you know the -- you know the SGMA deadlines as much as I do. You have until 2040 to reach sustainability. You add this in, I don't know how we get to that point. And that's a long -- a lot of bad things could happen by 2040.

The other issue is it talks about in a number of projects the cities need to undertake to keep supplying water to their citizens, like transfer sale of service water, substitution service water, groundwater, aquifer storage and recovery, recycled water sources, in-Delta diversions, desalination, and new surface water supplies. I don't know how we build those in an area that's economically depressed like this one. Okay? People can't

afford 100, $200 for their water bill. It's simply not feasible.

So the economic impact and analysis hasn't been done. But if we're looking at -- I would love to be able to purchase some surface water, but after this proposal goes into effect, I don't know where we get that water from. I think the SED has failed significantly in that chapter to look at, okay, if the cities want to bring in new supplies of surface water to (unintelligible) transfers, where does that water come from? It certainly doesn't come from any tributaries of the San Joaquin River, and it can't -- it won't in the future come from tributaries to the Sacramento River because you're working on Phase 2 already of this.

So I don't know where there's this huge pile of water sitting around that somehow cities can magically transfer to their region and turn its drinking water to offset the impacts of the SED. And Larry and I have been involved in one of the single largest recycled water conveyance projects in the country, not just the state. If you ever tried to get one of these things approved, permitted, and developed, it's incredibly expensive and incredibly time-consuming. And just to say, hey, just go solve it with these -- with these answers, I don't see how we can necessarily do that. I know it's policy and CEQA wrapped up together but, again, the state says, you know, the -- we -- you know, we're creating this issue, but we can't solve it because we're not in charge unless these

local agencies drill wells, local agencies develop drinking water plants and, therefore, it's up to them -- up to them to solve that problem.

And that's a fundamental problem with the SED, just keeps deferring that mitigation for someone else to take care of. And, you know, you really need to follow up with your legal counsel because CSU Monterey Bay went through this exact same thing with the City of Marina. They said: We're expanding our campus. There will be horrendous traffic problems in the City of Marina. They'll need new traffic signals. There will be new impacts.

But CSU Monterey Bay said: You know what? We have no -- we have no control outside of the campus. That's up for the city to solve that problem. And they lost in court, and the state -- state appeals court said, you know, it's up to the state agencies that's creating that problem to go to the state legislature and ask for funding to mitigate their impacts. And I think you really need to consider that. It's called the Marina dictum.

Now it's just upheld again in City of San Diego. Same thing, university trying to expand, not offset its impacts. And what you're trying to do is push the mitigation for your impacts onto other people without willing to kick in the money. And I know in Chapter -- a chapter at the end, it talks about, hey, there's Prop 1 money. There's Prop 64. There's Prop 84. Just apply for that money. If you've tried in this region to get that

money, you know how hard that is. It's competitive. It helps to be politically connected, and unfortunately we're not. We struggle with that.

So to say: Here's the impacts, it's significant and unavoidable, here's what the cities need to do to solve this problem, I think you're really missing something there in the document. And that's what we'll be following up with later with our written comments.

MR. WARD: Could you repeat the question? It was a joke.

MR. COOKE: The question is what -- is specifically how much money will the State of California give these three cities to solve the problem associated with the SED to improve their drinking water supply that you admit will start to suffer once the SED goes into effect -- or the flow proposals go into effect?

MR. GROBER: We can't provide a dollar amount. We provided in one of the earlier slides, you know, different prop money, water that -- money that would be available. I'd rather like to answer the question, because I didn't spend a lot of time on it in my introduction, if the cities are not part of the discussions that are happening with regard to settlement -- because that's an important part of this. The -- it's important part of settlement. I encourage you to do so because it's important to the administration. It's not something that the State Water Board is leading. We're proposing flow objectives here.

There's also -- there's actions going on, as you referred to, in Phase 2, the rest of the Bay-Delta. The administration is very interested in achieving settlement with regard to these because, as I said, that will provide the durable solutions to these problems, both to reasonably protect the fish and wildlife but also how -- how do you get at some of these big-picture solutions?

So if you in the cities have not been involved in those discussions, I know there's -- in reaching out to the districts and the counties, that I encourage you to do so because I think the cities are an important part of those discussions.

MR. ELWIN: I'd like to add to -- can you hear me? Sorry. I've been sitting in the audience this morning listening to all the comments from the -- from you and the panelists. And living in the city of Merced and the county, unlike Modesto, the city relies solely upon groundwater. I mean we do have a urban water (unintelligible) plan that talks about conjunctive use of the Merced Irrigation District. I guess for the most part what I've been hearing, it seems to go back to, well, your plan is speculative, it's programmatic. Yet still we have a nonspeculative take of 40 percent of surface water that impacts us starting from the agricultural point of view. If there isn't surface water for them, they're going to be pumping more groundwater, which affects us, affects us as a city from a groundwater quality perspective, also from lowering of the groundwater table.

We do have our general plan that goes to 2030. I know earlier I think Ron Rowe sort of asked what is the timing that you guys evaluated, and I (unintelligible) said that you guys went up until probably 2020 because it got punted to the SGMA. Everything sort of falls back to SGMA. You guys didn't really evaluate what the worst case might be with SGMA kicking in. It seems that it was left to the cities to come up with the details on how we're going to mitigate against the 40 percent take of surface water.

I really think that's really unacceptable because if we were doing a project like that, we couldn't say we have speculative and it's programmatic. We have to be more conclusive on the long-term effects, and I don't think the SED does any justice in trying to figure out what those long-term effects are going to be for cities like ours which (unintelligible) communities.

And you said you can't quantify what those long-term water quality effects might be in the localized areas, which is still unacceptable because what that does for us is we have to know -- have more for the treatment facilities to treat those waters, and that's going to impact (unintelligible) which we are in economically disadvantaged communities. That's going to affect those people. How -- how do we mitigate against that? It doesn't address it. It just says there's going to be significant and unavoidable consequences. I don't think that's acceptable, so...

MR. GROBER: The document does describe, you know, a suite of actions. I already mentioned, you know, transfers, you know, there -- you know, there's different aquifer storage recovery. I just had a side conversation here. Again, these are things that are positive, but they are still in the details certainly speculative. But the area is water rich, and so one of the solutions would be enhanced groundwater recharge in wet years. There's been kind of basically a passive conjunctive use that has occurred in the area just because of the nature of the distribution systems and the way water is used. But with more active recharge, there can be gains there.

That all being said, what's continued to be the unsatisfying answer is that this is all speculative. But the point I would make again is that as SGMA identified and as you're very well aware, they were -- already there are some issues, depending where you are in terms of groundwater and overdraft, things like that. As disclosed in this document, this will increase some of that. It adds to that stressor based on our observation of the response to the reduced surface water supply. So that is something that I think is best and must be handled by the local area.

MR. PARLIN: Yeah, I guess I'd follow up with the fact that we -- which is a good thing. We measure every drop of water now. We know where every drop of water goes. We report that to the state now. So we have to be very detailed in our numbers. And what I heard earlier

was that, well, you have these averages and you have this and that number, and it's going to spread out over that. And the level of detail that we're dealing with to manage our water supply in our local water area is incredible, yet the SED is going forward with these numbers that are -- just appear to be pulled out of air. Well, that number works so we'll use that number, and we'll estimate this number and that number. There's a real disconnect there from the cities' perspective.

And I'd also just follow up with in your groundwater recharge in Modesto, we already did a large storm drain project with (unintelligible) and will be accepting a $5 million Prop 84 grant next week to do another one, similar recharge of the park. There are issues going forward with water rights battles over storm water. So -- and I don't know that the state's even considered that yet.

But there are large water districts in this state that consider runoff that's been historically there as part of their water right. It's been appropriated or riparian. That's -- that's something else that has to be looked at as well before we go and invest hundreds of more millions of dollars in different projects and someone else up in Sacramento: Well, that's not your water; you can't take that water. So we have a number of concerns that those things haven't been looked at.

MR. COOKE: You mentioned new water -- new surface water supplies. Chapter 16, starting on page

16-75 talks about new surface water supplies cities can maybe invest in to augment their water supplies. And the City of Turlock's a partner with the City of Ceres and the Turlock Irrigation District looking at a project that may now potentially not be happening because of the unimpaired flows.

But one of the things you don't consider is raising the height of some of the local dams like Don Pedro, Exchequer, New Melones to increase storage in existing reservoirs, which could then be captured and used for cities and irrigation districts for municipal and irrigation supply. So you talk about developing new reservoirs and how that's speculative and difficult (unintelligible). We have existing reservoirs that (unintelligible) irrigation districts talked with over the years that potentially increasing the capacity in those by raising the height of the dams. So, again, that's something that I think really should be analyzed in the document.

MR. GROBER: Though we didn't explicitly look at those, again, specific projects, we did look at and evaluate just increased storage in general. But, yeah, we didn't look at the, you know, any specific proposals to enhance the storage of any existing reservoirs. So I think that might be covered in terms of that's one mechanism is increased storage.

MR. PARLIN: Also would just like to point out on the cost basis, once again, another arm of your agency is

now putting together a low-income statewide water rate discount program. So while you're -- you're recommending in the SED that we go out and do these projects and go ahead and fund these things, you're also going to require us now to not be able to charge the full cost of service for a certain constituency.

So, once again, we have -- you know, on one hand we have you telling us build these projects. We can't fund it but, by the way, you can't collect as much money. We've got you telling us don't use, you know, use more groundwater but, by the way, we're going to increase the water quality requirements so that water may not be available, but it's going to cost you a lot more money.

So there's diametrically opposed objectives coming out of the State Board right now, not to mention the SGMA, that they're really -- as an urban water supplier, you can't manage those objectives the way they're being proposed.

MR. COOKE: And just -- one of the things the SED really misses, it kind of brushes over groundwater quality. It says, well, we looked at your Consumer Confidence Reports for 2014. We didn't see an impact from the drought. We assume there's no -- there's no relationship between declining aquifer levels and water quality. I disagree with that. The 2014 CCR's will be 2013 water data. We've had three years of drought since then that have exacerbated water quality conditions, at least I know for the City of Turlock and other cities in

our region.

So we have seen an impact from the drought. It's not captured in the SED because the data you used was too old, is when the drought was just kind of starting to take hold. But if you look at -- we keep track of our wells to see which ones are within 80 and 90, 95 percent of the MCL. Those numbers of wells have increased. So we've definitely seen a decline in groundwater quality as aquifer levels have dropped. I don't think that's picked up.

And as we mentioned earlier, since that time we've had (unintelligible) six regulations proposed, 1, 2, 3-trichloropropane regulations. So those things are known issues. They have not shown up in the SEDs. It's that -- again, that gets brushed over really quickly, the groundwater quality stuff using that general assumption that we looked at some cities. The 2014 Consumer Confidence Reports didn't show anything. I think you need to spend a little bit more time with that. And, again, the Division of Drinking Water has a ton of water quality data through the electronic data transfers we do. You could delve into that and see some of the trends.

MR. GROBER: We -- we -- I thought we did look at the Division of Drinking Water water quality data, the recent reports, but I mean we'll take your comment and we'll -- we'll review that. But I was under the understanding that we checked the recent information, even a response to the drought, but I think I'm hearing you

saying that even the most recent now, just in the last year or two. Okay.

MR. ELWIN: I think that we --

MR. WARD: I have a question. Can you hear me now? Okay. A little bit different than their concerns and back on the ag side. And you looked at the planning horizon, 2040, 2042, sort of tied to SGMA; right? A fixed demand ag that was unmet surface water depletion made up by groundwater. On the urban side, did you do any demand forecasts growth like tied to the general plans or -- and is that addressed in the SED or is the demand for urban flat?

MR. GROBER: No. We considered that and in the general plans and the cumulative impacts.

MR. WARD: Okay. So growth is included in there?

MR. GROBER: Yes. Yep.

MR. WARD: Okay. I -- and that's where? In what section?

MR. GROBER: In the cumulative impacts.

MR. WARD: Cumulative impacts. The other one was the -- in relation to this 125 million acre-feet, the 1960, you know, that's a pretty darn gross number. So did you look into the -- as a means of mitigation, ASR you mentioned. Did you evaluate the base to freshwater and recalculate what that actual available yield might be? Did you consider -- I mean the 125 million acre-feet is just a very gross calculation over -- you know, it hardly makes sense. But what did you -- did you really take a

look at the reasonableness of these alternatives that you're expecting these people to explore?

MR. GROBER: That seemed to change the question. We -- the -- we provided that number, and a citation to that number provide some perspective in terms of -- and limited. That's why we just --

MR. WARD: But did you look at the base to freshwater? Did you consider that in any part of your analysis?

MR. GROBER: Well, that -- that was in part of some of those estimates, looked to the base of freshwater, but we didn't try to independently calculate our own or -- and we're not aware of information that has come up with a better recent estimate.

MR. WARD: Okay.

MR. GROBER: To the extent you have that or that's available, certainly providing it, but also providing it, the relevance of it, becomes important because what we've already described that though that's a big number, we would expect to start seeing problems like subsidence and water quality --

MR. WARD: Well, before --

MR. GROBER: -- and lack of available well before. That's not -- so it's -- but it's -- but the reason for the perspective is that -- and there's some sense, I think, and this is not a SGMA -- this is not a SGMA project proposal. I think we've made that clear. But there's opportunity, especially in this area, that

has, you know, generally good water conditions compared to many other areas of the state, depending -- and depending on the specific area, but both within the horizons of SGMA and also within the planning horizons of when we update the plan, there's -- there's both opportunity to make major improvements, respond to and in the implementation of the flow objectives to see what happens, and then we would be updating the plan, as we periodically do, based on new information and new conditions.

MR. WARD: Okay. Thank you.

Michael, you got --

MR. COOKE: No.

MR. PARLIN: Well, I just want to follow up on the comment. It's not luck that this region has a good solid supply of water. It's through good management and proper management throughout the region that we're in the situation that we're in right now. And, you know, it's similar to the 20 by 2020 that we went through before where we all reduced and we -- we all conserved water and we met that goal ten years ahead of time almost. And what do we get for that? A 36 percent mandated reduction in drinking water. Where if we would have dragged our feet like a lot of the other areas in the state, we wouldn't have been penalized again in further reduction.

So I think it's important not to look at, well, this area's got water so that should be a prime source of unimpaired flows, when, in fact, the reason we have water is because the people that have been here in the past and

are here today have done an excellent job protecting that water resource, and they've also done an excellent job of planning the future with the availability of water resources. And what the -- what the unimpaired flows will do will pull the rug out from under all those efforts going forward and have a huge, devastating economic impact. Sorry for editorializing.

MR. GROBER: But I -- I have to loop it back to the proposal again, especially because we're not discussing the fish benefits part. We're not really discussing the nature of the proposal, but this speaks to why this is so hard. This area has done a fantastic job of developing the local water supplies. You know, you've got three great reservoirs, great supply, conjunctive use of surface water, groundwater. But in some ways what this proposal is saying, you've done such a good job but you've taken too much of the water out of the system so that the fish and wildlife beneficial use is no longer being reasonably protected. So that gets at the crux of this proposal. How do you bring it more back into the balancing? And that's the very hard thing this board does.

And to put that in perspective, again, the numbers that I'm citing for the San Joaquin River where a small fraction of the flow that would have otherwise occurred, that unimpaired flow, when I say again that sometimes in this critical period it's less than 10 percent; in contrast, the Sacramento River provides 40, 50

percent of unimpaired flow now under current conditions. So we're not even talking about bringing it up to that level.

But the San Joaquin has been so highly developed, that it's taken so much water out of these tributaries, that's why we have such a problem. And that's why the Merced, the Tuolumne, and Stanislaus, those are the tributaries that have the lowest returns of salmon, the lowest populations, the most critical condition anywhere in the Central Valley. So that's at the crux of this proposal.

And it's all about the balancing. How do you provide not absolute protection, but reasonable protection? And the entirety of this document acknowledges and discloses what we think would be the costs and how to inform this decision. So I -- so I hear all of your comments, but it's going to be important to bring that before the board, but that's what the board is wrestling with.

MR. PARLIN: Okay.

MR. WARD: Okay.

MR. COOKE: Just to make a final point. Page 1365. Drinking water source from domestic wells will be affected similarly, and it's assumed that those affected will need to find alternative drinking water supply such as bottled water or drill additional wells and the impacts will be significant. And then one of the side issues of this is it increases flows to the Delta, allows for

increased CVP and state water contract removal of water. So basically what you're saying to people in the San Joaquin Valley, (unintelligible) bottle of water or leave that water in the river, and then that can go down to L.A. and Bel Air and the wet Prince of Bel Air can put more water in his lawn and you guys can suck up bottled water. It's just not acceptable.

MR. WARD: Okay. Thank you.

MR. GROBER: And I wouldn't be doing my -- what I think is my responsibility -- because I hear -- I hear a lot of local areas and concerns for water, but one thing that I hear, and I have to point out, we're all very good at, in our individual areas, of vilifying or pointing the finger at the other area. So that's one, and that doesn't serve us well because this is -- particularly here. How do we -- it's all about reasonably protecting the use in the San Joaquin.

What you just mentioned, Mr. Cooke, it's suggestive of opportunities for how can this be managed, how could it provide the seeds of settlement. But I see statewide all areas trying to do a better job at using water. So I just need to point that out because this isn't about -- because I've -- I hear the conspiracy concerns all the time that this is about something else. This is certainly not about something else. This is about reasonably protecting fish and wildlife in the San Joaquin River.

MR. ELWIN: I do have a question too. You say

it's all about balance. In Merced County we're already designated as being critically overdrafted. And in some of the slides you have earlier this morning, with the 40 percent unimpaired flows, the recharge is being less. So how do you balance that? I mean without curtailing water use.

MR. GROBER: I'm not sure I (unintelligible) the question. How would you --

MR. ELWIN: Balance it. You say it's all about the balancing act.

MR. GROBER: Well, no. When I -- oh, when I was referring to balancing, now this is -- and that's maybe using shorthand. The tough job that the board has before it, it's balancing how do you protect -- reasonably protect fish and wildlife, recognizing that there is costs to other uses of water for agriculture, for cities. The decision the board -- before the board is that is it reasonable to provide 30 to 50 percent of unimpaired flow to protect the fish and wildlife beneficial use given these costs and effects on other beneficial uses of water. So that's the balancing that the board has to wrestle with.

MR. PARLIN: I would just add that I'm not sure everybody, at least in the urban range, has done that great of a job. You saw what happened when the State Board lifted the mandatory conservation rates, and 300 of the 400 urban water users went to zero conservation standard. And I don't know that that's necessarily a

great job by all the urban water suppliers. And I think the people in this area did a remarkable job holding the line and making sure that people do treat it as a valuable resource. And they also did that at an increased cost, a significant increased cost here in the City of Modesto as our ratepayers. Rates went up 25 percent just this year, so...

MR. COOKE: And Turlock and Modesto, one of the few cities in the state that still have required reduction of water use based on the stress tests and the things the State Board developed. So most cities right away went to zero conservation. We have maintained our level, and I know the City of Modesto did. And I appreciate, you know, comments. This is a difficult balancing act.

MR. ELWIN: So did the City of Merced too.

MR. COOKE: Yeah, City of Merced, so...

MR. GROBER: Say good job.

MR. COOKE: Yeah, thank you. We're trying -- and, again, we're using less water than we did 25 years ago even though our population's grown 25 percent. I know TID hasn't expanded their service area. Don Pedro's the same size it was in 1976. But for whatever reason, something's changed, and you feel there's -- with the salmon, fisheries, I understand that and there's a need to look at that. But just recognize it does have impacts. They are significant, they are right now unavoidable, and I think we do need to work together to figure out how do we balance the competing interests so fewer people are

harmed.

MR. WARD: Okay. I want to thank you guys. Obviously you'll be hearing more from the urban suppliers as we move into the future phases of our, you know, investigation and discovery.

So let's bring up the last group. We've slipped a little bit off the schedule, but I think we're okay. You know, as I'm hearing this discussion, there's a lot of overlapping themes and redundancies. I mean these issues all sort of merge; right? You can't just distinctly take them apart and put them in, you know, nice little boxes because they all link.

And so this last group is -- for the morning session represents the smaller urban and rural water suppliers. And Stan Feathers right next to me is with the Delhi County Water District. And Rachel Riess is with the Stanislaus County Department of Environmental Resources, and she handles a lot of the permits of these smaller systems and water quality issues and all sorts of water supply issues. David Odom is with Denair Community Services District, and Michael Jones is with the Keyes Community Services District.

So these are the faces of people that have the daily job of taking care of a lot of unrepresented people who have very limited resources, and these are the people that do that. And so they've got some information to share with you and some questions and, like I said, probably some overlapping themes. And that's okay because

if you -- you probably need to hear it again from a different angle.

So, Stan, I'll let you --

MR. FEATHERS: (Unintelligible). How about now?

MR. WARD: Yeah.

MR. FEATHERS: Great. Well, you know, first of all, thanks for members of the state coming down to talk with us and hear us and hear us. And I guess, first of all, I'd just like to say that I'd like to echo some of the comments by the larger urban users because we have the same problems they do, but -- and, again, we have sort of a special set of problems that are different than theirs. And I say that because I've worked for some larger cities and I'm a general manager for a small water district, but I'm also a former retired city manager too. So I have a little bit of a diverse experience.

And small water districts, small entities kind of have a special set of issues they have to deal with, and part of that involves a limited technical capacity because we just don't have the staffs to deal with some of these issues as they come along. We do hire consultants, but we also are constrained by our financial abilities. My district in particular had huge rate increases on the water and the sewer side not more than a couple years ago.

And, you know, we've been doing capital planning for, you know, ten plus years, infrastructure development, and now we see these impacts as huge obstacles to continuing. You know, if -- from a practical perspective,

if we have to go back to our ratepayers in another two years with huge, huge impacts, I mean, I don't even know if we can get that through the 218 process. And then where do we go from there? It places us at a tremendous risk.

We've also made tremendous efforts in -- to attract development, and if we cannot serve new development, then our area can be -- is devastated. And we're an economically disadvantaged area. We need jobs. We need influx of commercial. Under those kind of conditions, that's probably not going to happen. So just with that as an introduction, I'm going to go ahead and open some questions for members of this group. But it presents a huge problem for us, and we don't see any of those issues addressed in the SED, especially where it relates to small entities with those kind of constraints, so...

MS. RIESS: As Walt mentioned previously, I do facilitate the regulation of small water systems within Stanislaus County, and it's with that that I would like to frame some of my questions because in -- though I do admit that the SED is a very large document and a place where things can get hidden and maybe I didn't come across it, but as I was reading the applicable sections for the SED, I had great concern that the small water systems, and specifically meaning under 200 service connections, those that might be regulated by local agencies such as our counties do not seem to be reflected in this document.

And I appreciate the comments -- or the updates that you have made to reflect the large water systems, as Mr. Cooke had mentioned, but I'd like you to maybe talk to us a little bit about where in this document you're addressing the potential ramifications to water systems with under 200 service connections.

And I also wanted to ask about the 93 public water systems that you identified in your presentation earlier this morning. Where did you determine that number? Because in Stanislaus County alone, we have -- well, we have over 170 small water systems that are reported to the water boards. So just taking a snapshot of the small water systems within Stanislaus County, we have a very large portion that are not being represented in this SED, let alone in the additional counties affected by this SED.

MS. GAO: The 94 public water supplier that were mentioned in the slide were identified by -- through a GIS database published by the Department of Environmental Health, and they now integrated that portion now integrated with the Division of Drinking Water (unintelligible). And they have developed a database that shows all the public water suppliers in different -- throughout California, but that is a self-reporting database, meaning the service provider would supply that information to them and then they put them in that database.

So some of the small service provider might not

have reported to them, and we might miss those service provider. That's why we said that we identified 94. We didn't say that (unintelligible) 94 in the four subbasins. And we -- and, also, we try to -- actually, less than 94 were identified in that database, but we try our other ways to identify more community water supplier there. And the point is that the -- those -- about 28 of them account for 90 percent of the entire water productions.

So there might be some that we miss, but the point is that we try our best to identify them. And those that we identify represent the majority of the water production in the four subbasins, and that number didn't really impact our determinations of the significance of our proposal -- significant impact of our proposal.

MS. RIESS: Okay. Well, I can appreciate that, but I will challenge that it should be looked at again because the data is available to the water boards. A hundred -- over a hundred -- I think it's 173 water systems in Stanislaus County are regularly reported to the water boards in the drinking water division. This is data that is available for you to examine and easily examined.

MS. GAO: We could identify those are within the counties, but we -- we don't really know if they fall into our planned area. But if -- but thanks for the comment, and we will go back and take a closer look at it.

MR. GROBER: Yeah, if you have that information, please, you know, provide that. But as Xuan was saying, this is -- it wasn't so much to get the count right but

the total population within the plan area and the nature of small water supplies and getting that across. But if you have information about more of them within the plan area that should be name listed, please provide that.

MS. RIESS: Absolutely. I'll give you the contact with the water boards. I can give you that information. But the reason why I bring that matter up, why it's so important is, as you know, small water systems have a reduced number of BATs or best available treatment technologies that they can utilize in order to compensate for potential contamination to groundwater. That limits their ability to actually rectify any impacts on groundwater quality.

So I am bringing up the fact that these water systems are not fairly represented in this document because they are more severely impacted than the larger water systems. A large water system has increased number of BATs that they can utilize in order to bring their water into compliance with drinking water standards that aren't reflected with these small water systems. They also have increased number of sources that they may utilize in order to blend, to put off-line, or to bring online.

I think in your presentation you had mentioned that one applicable way of handling water quality issues would be to take a source off-line. Of those 173 water systems, there is a good majority of them that rely on a single source as their drinking water supply. It is not

feasible for them to take a source off-line due to contamination and move forward.

And so, again, I implore you guys to drill down on the matter of small water systems and to reflect on the effects that it might have and, you know, understand that drinking water is something that people cannot go without. It is not Starbucks coffee; it's not optional. You must have that water to drink. You must have that water to flush your toilets. So it is very, very important that these 170 water systems be examined for Stanislaus County and for Merced County and any other county that's affected by this SED.

MR. GROBER: Okay. Thank you.

MR. WARD: I think that again kind of gets back to this question of scale and the lack of specificity with regards to the impact analysis and kind of overlooking these small systems that are really rigid and inflexible to absorb these kinds of hits. As Stan was pointing out, you know, just the economic resources, the staff resources are so limited, but yet they're -- you know, they count as much as -- these people count as much as anybody else; right? And we feel that in this analysis, they've -- they've either been just totally ignored or just sort of pushed to the side. We think they need a little bit more recognition.

David, I don't know if you want to --

MR. ODOM: Yeah.

MR. WARD: -- add into the Denair situation,

but...

MR. ODOM: We just -- to echo what Michael Cooke said earlier about the water quality. We do -- we do have the same issue with certain contaminants becoming more -- increasing to the MCL level or half the MCL level. For us nitrates is the biggest issue, and we're wanting to know if there's any proof or disproof to using groundwater as the primary irrigation. Because less surface water, is that going to be something that you guys can see or deny is going to be an increase in our nitrates? To just irrigate with nitrated water over and over, as far as our data shows, is being a major cause in the nitrate increase for us.

MR. GROBER: Yeah, and I think we've identified that there can be water quality problems, subsidence problems, the need to deepen wells, but we don't get granular in terms of where, you know, those specific effects are.

MR. ODOM: Is there going to be -- is the state going to be giving some of these smaller urban communities a little easier way to get some of the grant money to do on-site treatment? Because they're very costly.

MR. GROBER: And that's -- I mean that would be good, to provide that comment. We've identified what -- their current funding sources, but I think this will be an important point to make to the board.

MR. JONES: So funding for -- we have an arsenic treatment facility about to start, and we are absorbing

some of these small systems Rachel was talking about. And it took us close to -- I think it's almost ten years for this to happen. So is that type of thing going to -- I mean is it going to be able to be faster? Some of the small agencies don't have, you know, the expertise to handle all these things, and I'm just wondering if we're going to end up -- we're absorbing some small communities. Are we going to end up being absorbed by another water system? I don't know how that's going to work out.

We've raised rates on our community probably 200 percent in the last ten years. We're just going to have a lot of people coming back, you know, very, very upset. I don't -- how do we know that we're not going to get -- it's not going to cause us to be part of another water community down -- taking away the local control?

MR. GROBER: Well, this is -- again, we've described the overall -- you know, the overarching area-wide effects, and part of the solutions and part of the issues that you're raising are your current water quality problems and problems with overdraft. And it's related to SGMA, but this will be -- a lot will be falling on the local areas. But I think the big comment that I'm hearing is that there's concerns about how to pay for these things and the need for, you know, some help.

So I think communicating that -- communicating that to us is good. When I keep saying refer to the board, I'm not trying to say or suggest that we're not hearing it here in the moment, by the way, but it's just

important -- this isn't part of the hearing. So it will be important to make those written and oral comments before the board at the hearing.

MR. FEATHERS: Well, you know, there's really no doubt that we'll -- we will do that because we see it as a hugely important issue for us, but, you know -- you know, what about the past infrastructure we've put in? What about our own capital planning that's been going on? What about the individuals in a disadvantaged community that will reach a point where basically they can't afford the rates impacts? I mean it's dev -- it would be devastating to a community.

You know, where do they go from there, you know? The uncertainty involved with it, you know, it's -- you know, I think that's an area that should be examined within the context of this report too. And, you know, how -- what kind of rate increases are we going to be looking at? I mean are we -- you know, is -- will it reach a point where, as Michael said, that we'll have to be out there looking at consolidation options? You know, is that our only viable solution?

And then at what point would -- would any entity want to combine with a smaller jurisdiction? You know, you see a lot of consolidations in the fire district area, but you don't see a lot in the water area. So it presents us with a huge level of uncertainties to deal with in terms of where we go and how we approach this issue to our boards and to our -- to our customers.

MS. RIESS: If I may, I'd like to circle back a little bit to the topic that Mike was talking about in regards to contaminants and resolution of that. In your presentation today, you stated that there's really not been data that suggested that there's been an increase in contamination due to the drought and, therefore, these -- increase in pumping to offset surface water supplies really shouldn't have any effect on water quality and, therefore, drinking water standards. And then I would like to reiterate Mr. Cooke's concerns in regards to that because I don't think that that is supported in the public -- the small public water system data.

We have been seeing an increase in contaminants, and a number of compliance orders have been issued within the last year, specifically for contamination resulting uranium, arsenic, nitrates. And, of course, the new regulations for the chromium hexavalent. And I think that those things need to be examined. Yes, there are funds for small water systems, but these projects that you have highlighted in your presentation today have been long, long in the waiting and still have not come full fruition for the water systems.

In Stanislaus County I worked on a number of projects for consolidation through several prop fundings, and of those, the six remain, you know, in -- on the track, and they're not in the foreseeable future coming to a close. That's a significant concern when we have clearly documented in this SED that there are potential

problems and they're significant and, you know, not really something that will be mitigated and it will be the local agency's responsibility for resolving. But that means money. And if the Water Board's is not capable of getting that money out to the necessary parties, that is of great concern and should be examined.

MR. GROBER: Okay. Again, making those comments will be a good idea before the board. You know, just -- I -- another just overarching, you know, response to all this. We've used, you know, the best available information and, again, at a programmatic level. I'm hearing what you're saying, but if you think that there's information that we've missed that should be -- inform the decision, please provide that to us.

MS. RIESS: Certainly will do that.

MR. ODOM: And, Walt, I got one more.

MR. WARD: Yeah.

MR. ODOM: The other question is how can the State Board knowingly be the main cause of our basin, in particular being out of SGMA regulations for our GSP? So if we do go out of what the Department of Water Resources allows our GSP regulations to be to avoid the six undesirable results, how can the state be -- knowingly be the major cause of our basin going into probationary status and then ultimately paying the fees for extracted water to the state?

MR. GROBER: That's an interesting way of posing the question because to circle back again, the board

proposal, the action is for an increase in flows in the San Joaquin River to protect fish and wildlife. In our analysis we analyze what would be a likely response to reduced surface water supplies, which would be additional groundwater pumping. So the additional groundwater pumping is not the action. That's not -- the board is not doing the additional groundwater pumping. That's our assessment of what would be the response to reduce surface water supplies.

It's an important distinction because it's -- so the short answer to the question, it's like the board is not causing the groundwater, you know. It's not a -- it's not a factor in the SGMA beyond what we've described here, what we think is a likely result and response to reduce surface water supplies. So the challenge for local committee or -- local community even before the SED, before the flow proposal is how to sustainably manage the groundwater resource. And now we have an added stressor of reduced surface water availability for February through June in certain years.

MR. WARD: That's the wildest thing I've ever heard you say because what you're saying there is that -- you're not recognizing the conjunctive use programs in this area that have been successful for decades and decades and decades isn't in part because of surface water. So now you're saying you take away the surface water, that's not causing increased groundwater because that's the local's response to not having surface water?

Just --

MR. GROBER: It's the way the question was phrased where --

MR. WARD: Well, I know.

MR. GROBER: -- it suggested that this is where causing us stressor something to --

MR. WARD: Well, no. What he was getting at was the disconnect between your proposal and the other side of the state through the legislature directing us to be in compliance with SGMA. It's back to the SGMA cart and horse. Is this driving SGMA? Is the surface -- is the SED behind SGMA? I need to figure that out.

MR. FEATHERS: Yeah, I don't know how you can deny that there's a causal link between the two things, you know. Because absent one, everything continues like normal. So there is an absolute link between the two.

MR. WARD: Yeah. Well, let's take a break for lunch.

MR. GROBER: It's the link that we've identified. We have current overdraft we believe as we've described, and we think it likely that this would increase the level of overdraft because of increased reliance on groundwater pumping.

MR. WARD: Probably so. I -- we're right on schedule. So let's take a -- stay on schedule. Let's take lunch. Everybody be back here at 1:00 o'clock. Those of you who have all served on the panels, only you, please join me in the back here. We'll give you some

lunch.

We'll all get back here at 1:00 o'clock, and we've got from 1:00 o'clock to 3:30 to do the economic session this afternoon. I know I saw Dr. Smith and Jason Bass, and they'll be leading that discussion.

(Luncheon recess.)

MR. WARD: All right. Thank you for your promptness in being back right at 1:00 o'clock. It's always a good thing to start meetings at the prescribed time because then those that are late know they're late; right? Never wait for them.

DR. SMITH: Exactly.

MR. WARD: That's my motto. So this is the last -- well, the afternoon session. It's going to be broken into two pieces, both on the economic impacts, which is -- when you kind of roll all this together, it sort of becomes that question.

And so immediately to my right is Dr. Rod Smith with Stratecon. Dr. Smith is a -- an economist.

DR. SMITH: Yes.

MR. WARD: Right?

DR. SMITH: Economist.

MR. WARD: That's what you call yourself?

DR. SMITH: University of Chicago.

MR. WARD: University of Chicago.

DR. SMITH: Yeah.

MR. WARD: And then to his right is his compatriot at Stratecon, Jason Bass. And then farther

over is Mark Hendrickson with the CEO's office, Merced County.

Is that correct?

MR. HENDRICKSON: Close enough. I'm the director of community and economic development for the County of Merced.

MR. WARD: All right. For Merced County. And are we expecting Don White from -- Dave White, excuse me, (unintelligible) business (unintelligible)? All right. We're going to get started. And with that, I'll just -- I don't have any other comments to open other than welcome back.

And, Dr. Smith --

DR. SMITH: Well, I believe -- what, they got 20 minutes or -- the agenda?

MR. WARD: That's exactly right.

DR. SMITH: Well, why don't --

MR. WARD: So you guys have an open 20 minutes --

DR. SMITH: You can save time.

MR. WARD: You have an open 20 minutes to make --

DR. SMITH: Right.

MR. WARD: -- a presentation.

DR. SMITH: And hopefully we don't have to put you on a timer.

MR. WARD: Thank you.

DR. SMITH: You're on the clock.

MR. WEGGE: Good afternoon. My name is Tom Wegge. I'm a resource economist for the consultant team

for the State Water Board and was responsible for coordinating the various economic analyses that comprise Chapter 1A, economic analysis.

As a lead-in for our panel discussion, I wanted to first --

UNIDENTIFIED SPEAKER: Could you please use the microphone?

MR. WEGGE: Sorry. Testing. Better? Sorry. Did you hear the first part?

UNIDENTIFIED SPEAKER: Yeah.

MR. WEGGE: Okay. Well, like I say, as a lead-in for our panel discussion, we wanted to first provide you with an overview of the analytical process for the economic analysis, and then we're going to dive into in more detail the analysis of potential effects on agricultural production and the associated economics. This first slide provides a roadmap of the topics to be covered in our presentation this afternoon.

As indicated, I will first briefly address the regulatory requirements for the economic analysis. Then I will identify the purposes and goals for the economic analysis and describe the key resources that were evaluated. After that I will briefly explain the study areas that were used with a focus on the characteristics that we considered in developing the different study areas. And, lastly, I will identify the types of evaluations that we conducted with an example of the different components evaluated.

At that point I will turn things over to Tim Nelson of the State Water Board to walk through the specifics of the ag economic evaluation, a topic that we anticipated would be of primary interest today.

This next slide summarizes the regulatory requirements for the economic analysis. These requirements include both CEQA and the Porter-Cologne Act. Under CEQA, as many of you know, economic analysis of effects is not required except in certain situations where economic and physical effects are closely linked. An example of this would be a highway realignment project in which a downtown area -- downtown business area may not be directly affected by the highway project but could lead to reduced economic activity in the downtown area which then could result in some subsequent physical deterioration of the area. So this would be a situation where CEQA would expect there to be an economic analysis.

Also under CEQA, the lead agency for the environmental compliance document can decide to expand the scope of the economic analysis. In California, the Porter-Cologne Act has codified -- has been codified into the California Water Code, and there are two provisions of the water code that specifically address the need for economic analysis.

The first is Section 13141 which states that estimates of the total cost of a program and sources of funding need to be considered when developing new water quality objectives. The second relevant provision in the

water code is Section 13241 which states that economic considerations need to be addressed when developing new water quality objectives. In practice what this typically means is identifying and estimating costs to affected parties and looking at potential effects on local and regional economies.

The next slide identifies key underpinnings of the analysis. First, the purpose of the analysis is to compare potential economic effects on a particular resource across the project alternatives. As shown in bullet 2 on this slide, the primary goal or reason for doing the economic analysis is to inform the State Water Board in its consideration of potential changes to the 2006 Bay-Delta plan.

The next slide identifies the different resources that the economic analysis focuses on. As shown, the first one hydrologic conditions which provides the driver for analyzing a range of other resources that include agriculture, hydropower, M & I, water supply, fisheries, and recreation.

As far as identifying study areas for the economic analysis, we determined that having unique -- one unique study area for all evaluations was not appropriate, this being because our main objective was to compare resource effects of the different alternatives and not to add up costs and benefits. So we ended up having individual study areas for different topics.

To identify each of the appropriate study areas,

we considered important temporal and geographic characteristics of each resource and then the geographic extent that they affected the local economy. So while in some cases the study area was generally the same as the plan area, in other cases the study area extended beyond the boundaries of the plan area. An example of this certainly would be the commercial and recreational fishery analysis, which trends well out of the plan area.

My last slide addresses the types of valuations conducted, more specifically whether the analyses were quantitative or qualitative based. As shown on the slide, we considered both direct and indirect effects at the local and regional level. For evaluating the quantitative topics or the quantitative base methods, we employed different analytical tools to address individual components of the analysis. And the example that's up on this slide runs through a series of four components for the agricultural economic analysis that now I'll turn over to Tim to brief you on that.

MR. NELSON: All right. So what's the logic behind our economic analysis? So we begin with given the proposed unimpaired flow objectives, there will likely be more frequent agricultural water shortages. As a result, crop production could be lower in certain years, particularly during the dryer periods. This could lead to increased fallowing of crops which would reduce the gross economic revenue for the farmers. Some changes in pricing and adjustment to cropping patterns could reduce the

losses that they receive.

Because of the reduced revenue, it could affect employment as well in the agricultural industry. If there's not as many crops grown, farmers may not need as much help during the harvesting or planting seasons. And then because all sectors of the economy are so interconnected, that any revenue impacts to the agricultural industry could ripple out to many other industries causing revenue or employment impacts in those.

So for this analysis, there was a suite of models used. So it begins with the Water Supply Effects Model. From that we -- that models our potential unimpaired flow requirements, and from that we determine our surface water availability. The surface water availability is in post-process to determine the applied surface water for the irrigation districts that we modeled, which is used in a groundwater analysis to determine how much extra groundwater pumping that the districts can perform or need to perform.

The total applied surface and groundwater is then used as the primary input to the Statewide Agricultural Production model, which outputs the agricultural revenues and cropping patterns. The revenue output from SWAP is then used with IMPLAN multipliers to estimate the relative effect on other sectors of the economy in terms of employment and total output.

So what is this SWAP model? So SWAP is an agricultural economic optimization model that assumes

farmers operate to maximize their net economic returns. It was developed in the 1990s at UC Davis and is still being updated today. It covers about 93 percent of the state's agricultural area and represents all of the crop types grown in the state.

Its inputs are a base cropping pattern for whatever you're modeling, water use intensities, a total land area, and the water use. The outputs are agricultural production acreage, the crop revenue, and the optimized cropping patterns. So it has been used in many other studies in the USA, in Central and Southern America, and the Middle East to explore water scare -- the effects of water scarcity and salinity on agricultural production.

So how do we set up our model? So this analysis covers six areas representing the seven irrigation districts that receive surface water or that account for most of the surface water diversions on the east side tributaries. So Merced Irrigation District, Turlock Irrigation District, Modesto, Oakdale, South San Joaquin Irrigation Districts, and then the two CEP contracting districts, Stockton East Water District and Central San Joaquin Water Conservation District, which are combined for the analysis.

It has 19 crop categories following DWR classification for land and water use, and base land and applied water are calibrated at 2010 levels using DWR, DAU crop survey data from 2010. So the primary input for SWAP is the total applied water that is estimated based on

(unintelligible) results and results of the groundwater use analysis. So applied water is whatever water is used to irrigate the crops. Some portion will be consumptively used in evapotranspiration and some portion will see (unintelligible) zone and into the subbasin.

So here we have a table of average annual applied water demand and then applied water deficits, so unmet demand under baseline and some of the unimpaired flow or potential unimpaired flow objectives. So under baseline conditions, there's about 45,000 acre-feet of unmet demand, although it is misleading as most of that unmet demand occurs in the 20 percent of years that are critically dry. Under the 40 percent unimpaired flow objective, this unmet demand increases by about 140,000 acre-feet on average for all years, with most of the increase coming in critically dry years.

So this -- after inputting this information into SWAP, it outputs the relative -- the acres grown for each of the irrigation districts. So here we have annual average irrigated acres over all the districts for all -- averaged for all years and for just critically dry years. So the X axises are alternatives, and under baseline, we have on average for all years about 512 acres grown. And under the 40 percent alternative, this decreases by about 23,000 acres. For critical years, the decrease is more significant. There's about -- there's a loss of 80,000 acres on average.

And how does this translate into revenue? So

under -- so this is the annual average revenue from crop production over all of the irrigation districts as output by SWAP, average for all years and critically dry years. So under baseline there's about a billion and a half dollars in economic output, and under 40 percent scenario, this decreases by about 40 million. For critical years, the decrease is about three times bigger, 120 million. So that was the direct economic impacts for the crop produc -- irrigation districts themselves.

Now, how does that affect the economy around them? So one model that looks at this is IMPLAN, which is an input/output model that provides a snapshot of the region's economy. So for our regional economic analysis, we used marginable multipliers derived from the IMPLAN model that relate to the direct change in crop revenue output from SWAP to the changing revenue and employment for other industries. We used IMPLAN data from 2010 to derive these multipliers, and they were extracted to cover a larger area around them for the three-county system of Merced and Stanislaus and San Joaquin counties. And the crop groups from SWAP were aggregated into eight IMPLAN crop groups.

So what do these IMPLAN (unintelligible)? So in SWAP, the revenue output represents the direct revenue impacts associated with the reduced crop production. IMPLAN (unintelligible) multipliers to estimate indirect and induced impacts throughout the regional economy. So indirect impacts could result in industries that provide

inputs to the agricultural industry. So if farmers don't grow as many crops, they won't need as much fertilizer, as many pesticides, and there could be impacts in those industries.

Induced impacts could result because of changes in spending throughout the economy as labor income has changed. So farmers aren't growing as much. They don't need as much help, especially during the harvesting and the growing seasons. And then is that -- those workers may need to relocate or change their spending habits.

So some results, the direct effect produced by SWAP was the direct economic impact, the baseline (unintelligible) impact -- or economic output was about one and a half billion dollars. And with the multipliers, the induced effect is about another billion -- another billion dollars. So in total, there's $2.6 billion output related to the economic activity in the districts. Under the 40 percent unimpaired flow objective, this decreases by about 64 million, about 2 and a half percent of that baseline value.

And then jobs. So the direct employment for the agricultural areas is about 8,000 jobs with another 10,000 jobs just related to that. And under the 40 percent unimpaired flow scenario, there's decrease of 433 jobs, about 2.3 percent. And so all of this information is contained in Chapters 11, 20, and Appendix G, which this -- these along with the agricultural economic analysis spreadsheet can be found at -- on the SED

website. Thank you.

MR. WARD: Okay. Right on time. Thank you.

MR. NELSON: Thank you.

MR. WARD: May I make a request that we receive copies of these Power Points? Is that something that you can provide?

You're going to leave it on that system? Okay. Great. Because then I can make it available, put it on our website.

Dr. Smith?

DR. SMITH: Okay.

MR. WARD: I wanted to make sure Milton (unintelligible).

DR. SMITH: (Unintelligible).

MR. WARD: Milton O'Haire is the Stanislaus County Ag Commissioner.

MR. O'HAIRE: Sorry for being late. I really messed up.

MR. WARD: And Dave White --

MR. O'HAIRE: We read the schedule wrong.

MR. WARD: -- Dave White to my left with the Business Alliance. Is that what it's called?

MR. GROBER: And may I make a request also? Is this -- this is being -- is this being webcast or --

MR. WARD: No.

MR. GROBER: But it's being recorded?

MR. WARD: Yes.

MR. GROBER: Can we get a recording of the

meeting as well?

MR. BOGGS: It will be on the county's website on Monday.

MR. GROBER: Thank you.

MR. WARD: I'll get you the address.

Go ahead.

DR. SMITH: Okay. Again, my name's Rod Smith. I'm president of Stratecon, Inc., and my colleague is Jason Bass. We have been retained by the three counties to provide an economic study of the economic consequences of the proposed flow regime on the local economy.

Jason and I were actually involved in the IID/San Diego proceedings for the State Board. I was the main economic witness for IID and Jason providing a lot of the economic input analysis at the programmatic level that looked at bookends of a deal based on fully land (unintelligible) as well as efficiency conservation. So I just want to give you all a sense. You probably don't know who I am. I just thought I'd, you know, share a little. Okay?

What I'm going to try to do in our two sessions of this final panel is just have a dialogue with you on your thought process, our thought process, what you thought about, how did you think about it, what type of evidence did you turn to. And certainly there's a lot of unknowns here, and so how do we bracket our unknowns? In terms of themes, we'll have discussions about some applied reliability, sustainability, volatility, all this for

the -- what it says about investment incentives.

We're also going to have a discussion on the fact that there's a vertical structure to the economy which -- and I do appreciate the presentation, where what you saw is you started at the farm level, you look at outputs and you look sort of below there, you know, fertilizers, employment, things of that sort. But there's also -- as you'll hear from our panel today, there's also a -- we go down the supply chain. Outputs have impacts on dairies, has impacts on feed lots. There's processing that goes on here. Some of it goes to the (unintelligible) processing that's located here.

And full disclosure. My stepdaughter is a regional vice president of Frito-Lay, so some of the stuff goes to Frito-Lay too. So -- so we're going to have a discussion about broadening our scope of understanding of this local economy and think through what will be the implications for how to assess as best we can best available information, best analytical techniques.

So I'm going to start with some questions. I'm going to move it around here to my panel. I will swear under oath we have not over-prepared here, so if we have some rough transitions, I hope you hang with us. The last question: Should I just be asking you as a three and then let whoever decide who wants to talk, or should I start addressing individuals? How would you like to proceed?

MR. GROBER: I think you can just ask the general question and we'll --

DR. SMITH: I think that's the most efficient way.

MR. GROBER: We're also not very rehearsed here.

DR. SMITH: There you go. Well, I'm going to start with some really simple questions. Whenever Stratecon looks at any water resource situation, as we all know, supply reliability's a key concept about what a water resource is. We know reliable water supplies aren't worth as much as -- unreliable water supplies aren't worth as much as reliable water supplies. Certainly, as we'll hear later, industrial recruitment depends on supply reliability. So I'm going to start with what I think is a softball question, but I could be wrong.

What is the reliability of this area's surface water supplies under the baseline?

MR. GROBER: You'll have to expand on what you mean in terms of "reliability." We've shown -- and we have the time series showing how the water supply varies over time.

DR. SMITH: Correct.

MR. GROBER: In fact, that was one of the charts that we show.

DR. SMITH: Right.

MR. GROBER: We show during periods of drought, multi-year drought in particular, then there is less water available, and that's when there's been additional groundwater pumping.

DR. SMITH: Yeah. Well, for example, as you

know, State Water -- the Department of Water Resources puts out biannually an assessment of the delivery of the state water project. Did you gentlemen look at their definition of supply reliability, or was that just something you didn't look at?

MR. GROBER: What's the purpose of the question?

DR. SMITH: Purpose of the question is what's the reliability of the surface water rights under baseline conditions?

MR. GROBER: The reliability of the surface water --

DR. SMITH: Rights.

MR. GROBER: Rights. So now you --

DR. SMITH: Of the -- of the irrigation districts.

MR. GROBER: I'm not understanding the question.

DR. SMITH: Okay. Well, then why don't we move on. Sure. You don't understand the relevance of supply reliability.

MR. GROBER: We showed -- we showed what the water availability has been over -- based on a model over an 82-year --

DR. SMITH: Yeah. And a very simple, straightforward calculation would be -- in fact, you used -- one could use your data to say what's the reliability of that surface water. And I guess what I'm hearing you say is you didn't do that; that's all. I just wanted to know. Because I couldn't find it and so I

didn't overlook it. Okay.

Okay. Next question then, it's sort of related to your chart. You see a lot of volatility there, and certainly you've produced a chart where you show what's the average of the baseline versus the 40 percent by, you know, hydrologic conditions. And you made a really good comment this morning when you said there's volatility beyond those averages, and that gets you back to your 82-year chart. How did the volatility of that available water get considered in your analysis?

MR. GROBER: And I don't recall using the "volatility" term, but I -- we show that there's a variability, and that variability is built into all of the numbers that we generate based on averages and year types.

DR. SMITH: Yeah. So, in other words, you averaged. You didn't think about what the implications would be of that volatility. Is that what -- I think that's what I'm hearing you say.

MR. GROBER: I don't think I said that. I think we presented the information in terms of both averages and also in terms of year types, but I guess you're looking for something more.

DR. SMITH: Okay. So you did nothing more. Got it. Okay. That's good. I think that's the purpose. We're trying to understand what you did and your thought process. So thus far, mission accomplished.

I want to pick up now -- and I know some of our panelists can't stay here for the full time. As I said

earlier, there's a vertical structure to this economy. It's at the farm level and it goes down to who they, you know, purchase from, but there's also a flow up into the dairies, into the feed lots, into the food processing.

If I may call on the ag commissioner maybe to opine on the relevant importance of this element of the ag economy.

MR. O'HAIRE: Oh, yeah, sure. As we know, there's a basic farm-gate value, you know, for all these counties here, and there's a huge supply chain that affects that. There's a multiplying factor. For instance, in our county, eight out of the ten top manufacturers are ag based. 38 percent of the jobs in our county are either direct ag or ag related, and those are studies that have been done by the UC -- we've sort of done our own little anecdotal little studies here and actually confirmed that. So there's -- I mean there's a multitude of jobs that are tied to that. And that doesn't even affect -- that doesn't even count for, for instance, those that directly work in the ag field, when they go down to the local Wal-Mart or Macy's or the car wash and spend money. That doesn't even account for that money.

So, you know, how much -- how much is that taken into effect as far as economic impact? And I guess that's the -- that's just part of it. I guess I've got some other questions on top of that, but --

DR. SMITH: Yeah, I think, if I may, I think what it is, I think, if I heard you correctly, what you're

saying is like the tomato processors, Frito-Lay, things that are downstream from the focus --

MR. O'HAIRE: Yeah, Foster Farms.

DR. SMITH: -- of their study are ultimately linked back to what is produced at the farm field. Is that what you're saying?

MR. O'HAIRE: For sure, yeah. There's many, many components: manufacturing, equipment, you know, services, advisory services. You know, it just is a multitude of other entities that are directly tied to agriculture. And I know I said like 38 percent of the jobs are in all three -- it's like 37, actually, all three counties, are tied to agriculture. So, you know, any -- it's going to be a huge ripple effect through the -- every job, you know.

So one of the things I wanted to -- maybe this will give you a little -- maybe just give you an idea of what I'm thinking about. When you look at the amount of acres that we produce, just in Stanislaus County, if you take our harvested acres and you look at the number of jobs that are directly or indirectly tied to agriculture, every ten acres -- roughly every ten acres supports a job.

Now, may -- that, you know, depends on what ten acres you're taking out, you know, whether it's almonds or peaches or apricots or whatever. But basically every ten acres represents a job, so -- and this one page, you -- this one page in there talks about 23 acres -- 23,000 acres going -- being fallowed and only affecting I think

it's 400 and -- you have it right here, 433 jobs. And that doesn't really add up to me. As I'm looking at that going, wow, how would it only be 433 jobs? And you're going to, you know, possibly fallow 23,000 acres and just rough statistics is every ten acres equals a job. Doesn't even come close, so --

DR. SMITH: Maybe one way of thinking about it is it's, again, as I said -- as I said up in (unintelligible) go back (unintelligible), they said -- and this is the logic. You start -- and this is not a critic. You do have to start with the impacts on the farm. There's no doubt about that.

MR. O'HAIRE: Sure.

DR. SMITH: And by looking at what goes down below the farm in terms of the employers, the farm services, the farm advisors, and that's what IMPLAN is taking care of. But we also have to understand that within this community, impacts on the farm have flow of inputs up -- or downstream, if you will, the vertical structure and -- so it's possible that one way to reconcile the difference between your understanding of how your economy works and their estimates may be that they didn't trace the downstream impacts.

MR. O'HAIRE: Yeah, that's the question.

DR. SMITH: Right, yeah. It's just a question, and we can't answer -- I think we're here today to talk about questions anyway, if you have a response.

MR. WEGGE: Sure. Let me address that. First of

all, to the commissioner's point about the averages, you know, I think you said ten acres support one job, or eight acres, something to that effect.

MR. O'HAIRE: Around ten. It's just a calculation I pulled up just looking at online data and from UC studies and looking at our crop report.

MR. WEGGE: Well, as you pointed out, that is an average, and clearly if we're talking about almonds as opposed to alfalfa, there's a big difference there. And, you know, what -- what we found in our analysis based on optimizing farmer operation is what -- what would go out first as far as out of production would be the lower value crops. So, you know, the relationship between the 400 jobs and the number of acres wouldn't, you know, hold true if you're looking at, you know, just the lower value crops. So I just wanted to point -- point that out.

MR. BASS: Might I jump in? Did you consider, though, the impacts of the loss of production of those lower value crops, though, on downstream activities? Dairies, for example, use a lot of hay, corn silage, et cetera, which are fundamental parts of the local economy. Was there any consideration for those downstream effects?

MR. WEGGE: Absolutely there was. I think that's a different question, the forward linkages, downstream effects from what the commissioner was mentioning. But we did look at the effects on down -- forward linkages, effects on dairies and on cattle growers, on other

processors. It was our feeling that -- and I think you would concur with this -- IMPLAN is, as most input/output models, is not designed to look at forward linkages.

Now, it can be used for that and data from IMPLAN can be used for that, but it's not a model designed to look at forward linkages. So with that limitation, we tried to work with the information that we had. And, absolutely, we looked at effects both on dairies and other processors.

DR. SMITH: Where is that information discussed in the documents? I'm talking specifically on the forward linkage issue.

MR. WEGGE: It is described in both Chapter 20 and in Appendix G. And I think Chapter 11. Yes.

DR. SMITH: Now you confused me, even though I'm very familiar with forward linkages and IMPLAN.

MR. WEGGE: Okay.

DR. SMITH: You pointed out that the off-the-shelf IMPLAN model does not do forward linkages, and then you said that you addressed forward linkages.

MR. WEGGE: Yes.

DR. SMITH: So you, therefore, must have taken the off-the-shelf IMPLAN model and adapted it. And where in the document do you discuss how that was done?

MR. WEGGE: We didn't do that.

DR. SMITH: Okay. That's what I --

MR. WEGGE: We took information from IMPLAN, as well as information from other sources, and looked at the

relationship between production of alfalfa and other grains to the dairies and other processors.

DR. SMITH: And all that information is in the documents you cited?

MR. WEGGE: Yes.

DR. SMITH: Okay. We'll double-check. That's fine. Just want to be sure we don't have to look elsewhere, that's all. Appreciate --

MR. GROBER: And I just want to point out we should continue this conversation as well when we have the other workshops on the 5th and the 12th. The other economist that we had working on this and working with IMPLAN was unavailable today, is out of the country. So that will be helpful to have that.

DR. SMITH: Yeah.

MR. GROBER: Continue the conversation.

DR. SMITH: Yeah, that would be.

MR. GROBER: And in the meantime, also, if you have any -- any other comments and observations, to bring those forward.

DR. SMITH: You'll be getting them. Today. We're starting. As you say, it's start of a dialogue, and I think it's a productive dialogue. And I forgot to say what I wanted to say. I appreciate this forum. This is a great opportunity, rather than just people reading documents and writing studies, you know. It's sort of good to have some dialogue, just as I found in my career it's good to get out of your office and get out on the

ground and on the road too. So that's also good. So it's great that we're out of our offices today.

Let's see. I'm going to go to Mark because I know you have to move because you are doing economic development in Merced. And I would like you -- I want to pick up on what -- the implications of volatility in terms of the availability of be it silage, tomatoes, corn, or whatnot does to the food processors and other -- other downstream business use you have already recruited and what would happen if instead of a relative -- as was testified earlier today, this area has done a great job of managing and developing resources so they have a relatively stable supply situation. Yeah, they get critical years; they backstop with groundwater. You have a relatively stable situation. What happens if -- if on annual basis things start jumping around a lot?

MR. HENDRICKSON: Well, first of all, thank you for the question and thank you for each of you being here today. I think generally speaking -- and Dave can certainly speak to this as well as I can from a Stanislaus County perspective -- one of the greatest challenges we have here in the State of California is obviously trying to recruit people this direction.

Unfortunately, California, due to either urban legend or myth has got a pretty bad rap. As being a place that creates jobs just happens to be the states of Arizona, Nevada, Texas, and everywhere else. The reality is is, you know, the volatility that you spoke to in terms

of the fluctuations, in terms of availability is absolutely going to discourage, you know, companies from which are either here and wish to grow or trying to attract new industry this direction.

You know, any time that we in the economic development world are trying to recruit somebody to this region, to our respective counties, it's really imperative that we are able to share with them, you know, a clear picture as to what they should expect. And so I think to really address the -- to address the question from just one single perspective, I think it's vitally important that we figure out some creative way here as a part of this to give some certainty to businesses that we've brought here and who were expecting to have a certain amount of available water to meet their needs.

But then, you know, also as a part of what we're trying to do when we've got, you know, regional economies that have, you know, double-digit unemployment most times of the year, what can we do to provide some comfort to those that we're trying to recruit as well at a time when, you know, obviously, you know, the San Joaquin Valley's economic recovery is quite a bit slower than most of the economies around the state?

So I guess if there was, you know, a question that I would pose is to what degree can you provide some comment as to what comfort can we provide folks that are either here that are, you know, looking to grow or expand their business or what can -- what can you help us with in

terms of information that we could provide, you know, people outside the state looking to grow a business here? What would you encourage us to tell them?

MR. GROBER: It doesn't sound like a technical question --

MR. HENDRICKSON: Not at all.

MR. GROBER: -- to how we've done our analysis, so I think that's best a policy question or comment to make before the board. But the answer we'll provide, and I think this kind of speaks to perhaps the theme of some of what you're discussing here, is if you're suggesting -- and tell me if I'm inferring too much. You're suggesting that when you see that choppy water supply now because you have times when you can't meet the demand because the supply is constrained by the more variable hydrology more often, another way of looking at that -- we didn't look at that. Another way of looking at that would be, well, just have -- actually have cuts that occur that are in all years so you don't have the same level of agricultural development in all years, I guess would be another way of looking at it. And perhaps that's going to be the nature of some of your comments that you make.

So that would be another way of saying, well, you can have -- if you're going to try to keep the reservoirs fuller to maintain a certain reliability of water, that's different from that patchiness that's seen there. I think that would be an excellent comment to make and also an excellent comment to make and say how that would change

the economics of the situation. Because we've looked at it one way, but there's, you know, maybe other ways to look at it.

DR. SMITH: Yeah, I appreciate that.

But go ahead.

MR. BASS: Yeah, I'd like to interject on that because it seems like built into your answer with that is this presumption that we can go from here and impose sort of an artificial lower level to keep stability and to avoid this sort of dramatic up-and-down curve that we're looking at.

But fundamentally what you're saying is you're going to shift the water supply situation lower. That's what's going to happen. And the analysis you've done is to look at everything on a year-by-year basis. To say, okay, in year 2 -- in 1937 here's what the hydrologic year was. Let's impose all these assumptions on that year in terms of what would have happened in terms of surface water supply availability, what would have therefore happened in terms of groundwater response, what would happen in terms of fallowing in that year. And you do that year by year and show, yes, a sort of up-and-down curve of impacts, and then you take some averages and present that, 2 and a half unemployment as a result on average. We can dig into the document and find that there's at some point 7, 8 percent loss of jobs in peak critical dry years.

From my perspective, the problem with that and/or

the oversight, and I want to know if you look on this -- this is my question. Did you take on the issue of that sort of lack of reliability, as we call it, or variability in your water supply that you would expect going forward as a result of SED implementation? The long-term effects of regional perception of the economic stability in this region, the long-term water supply situation, it changes drastically.

And what you have now is you have an economy which relies significantly on dairies, on food processors who have investigated hundreds of millions of dollars in infrastructure. You also have thousands -- tens of thousands of acres of tree crops which are permanent crops, significant investment in those assets. So you have an economy which is built on a significant amount of infrastructure and farm development infrastructure and development investment, yet now you're taking away the very reason that those investments occurred. You're saying, well, you used to have this water supply situation, a reliable surface supply that even in bad years we still got most of that water. And that was the world. That was the --

DR. SMITH: Baseline.

MR. BASS: -- the baseline, the context in which all of this development occurred.

You have population growth. You have job creation, et cetera. Now what you're saying is we're going to take away that reliable water supply, a big chunk

of it. Yes, we can do things to try to smooth it by holding water back and trying to manage it, and we're going to replace it as best we can with what is really an unreliable groundwater supply that's faced with significant issues already declining, declining water quality, all of the issues that have been brought up today.

So how are you going to try to reconcile that longer-term or bigger-picture question? We can talk all day long with IMPLAN and each year, oh, okay, ten more jobs, ten less jobs, et cetera, but the bigger picture of what this does to the structure of the regional economy, I don't see anywhere that that's considered. And I want to know, are you going to consider it? Did you consider it? You know, because everything I'm hearing in talking to people in the community, listening to these gentlemen is about our economy is built on this water supply. And now you're taking it away. What are we going to do?

And you're saying, well, we'll just pump more groundwater. Well, groundwater is not the solution necessarily because of reliability, quality issues, et cetera. And even there we have SGMA coming, which it doesn't sound like that was necessarily addressed. So what is really the analysis that you can do to sort of give some comfort maybe to what -- all these values?

I mean people have invested a lot of money in this economy and relied on this for many years, and now you're saying: We're going to take it away.

DR. SMITH: (Unintelligible) let's defer any discussion of groundwater, not because we're not going to get to it, but we get to that later. So (unintelligible) take the remaining part of Jason's question for now.

MR. GROBER: Sure. Well, I mean, we're presenting -- and this is great to have this conversation and look forward to getting more comments. We presented one way of looking at this. You know, he's not in the room, but I always hear in my head, you know, working with Dr. Jay Lund says, "All models are wrong; some are useful." This -- you know, you look at water -- you know, the initial water supply. Then you run it through groundwater, and then you're running it through economics. There's -- you know, it's the dismal science. There's a lot of things, a lot of assumptions that one needs to make. I hear your point now about, you know, reliability and, you know, what's the -- is there a new equilibrium or perhaps something, if you will. Well, this is just imposing this -- this new constraint in terms of limited surface water availability and looking at it one way, what would be the economic effect.

I'm hearing that a lot of work has gone into why you think the answer might not be wrong -- might not be correct and --

DR. SMITH: Yeah.

MR. GROBER: -- you will have alternatives, and I think you should provide that because there is probably other ways that you can look at it. But one here is we've

just kind of tracked the variability that already occurs and how the system responds to it, and now we're imposing greater variability --

DR. SMITH: Right.

MR. GROBER: -- and how that -- the system may respond to it. And I think I'm hearing in your comments --

DR. SMITH: Right.

MR. GROBER: -- that it would do something else then again, and that's -- please --

DR. SMITH: And I want you to take this because I'm going to finish to the end of our session with your fundamental question you posed this morning: What could you do differently and better? We'll have some ideas to share at that time. But I do appreciate you understanding now why we raised the reliability question.

And maybe to put the tie on the bow on this part of the subject matter, you're looking -- your analysis looks as into -- year by year independently and averaging by water year type or whatever, but says that that is, you know, the way you're looking at it and that is the way you looked at it. The whole issue we want you to think about at -- from a purpose of analysis is think about what the reliability and volatility implications are from an investment perspective. I think that's -- I think that's --

MR. BASS: And a value perspective.

DR. SMITH: And from a valuation of economic

impact. I would think that is -- would be possibly the take-away. I know the commissioner wants to add something.

MR. O'HAIRE: Yeah, I just wanted to -- that you guys are hitting on it, but, you know, it's the -- it's the reliability of water for the growers, you know. When they go into -- they go in and they're going to invest and they're going to get loans for this property to farm, that's going to be -- that's going to be very important that they have a reliable source of water. And what you're doing to the system is making it less reliable.

So have you studied what that is going to do all the way down to the grower level when they get ready to go in and try to get money to expand or to purchase property or to farm and now they have a -- maybe a not-so-much reliable water source? Has that been evaluated?

MR. GROBER: And your question is in terms of long term --

MR. O'HAIRE: Long term, right. They make long-term investments. They don't make, you know, a one-year investment. They're looking at it for, you know, generations. So what is that -- what's the economic impact there?

MR. GROBER: Any -- any responses? Thoughts?

MR. WEGGE: I can take a crack at that. We didn't look at that issue of how this would affect investment over a long period of time. I think, you know, there -- it's a very difficult question to answer in that

it requires a lot of assumptions about how resilient the economy is.

And so I think in order to address that issue, probably the first place to start would be to look at what's happened during the drought and how -- because that's -- the drought has incurred reductions in water and how -- how has the community, the economy been able to adapt to that. And, you know, that's sort of looking at the past history to help inform the -- what could happen in the future. But I think, you know, it's being able to specifically say how increasing reliability of water supplies might affect the community -- the business community's ability to borrow, to invest, is really a difficult task to do.

MR. O'HAIRE: And I would agree with that and -- 100 percent. It's a very difficult task to do. But when you're talking about taking away a -- something that this community totally relies upon, this economy we have here, I think it's upon the Water Board to not, you know -- no stone should not be overturned. You should be able to drill down to every situation that we're bringing up or that we're not. This is a huge impact on us. It's not like, you know, just something that's going to happen very easily.

So you guys have the resources; you have the staff. We're asking the questions. But, you know, I think it's really -- the onus is on you all to really drill down to everything. And that's what I think we

would expect, we would want. We want to see all the details, all the numbers, everything looked at because we're -- you know, this is our livelihood, you know. So it's not, you know -- I think that's what needs to be done.

MR. GROBER: Well, and this is why -- this is part of the process. So you have that information; please provide it. And don't have to wait until the end of the comment period. We have opportunity on the 5th and the 12th of December and anytime in between.

MR. WHITE: I have a question. I'm Dave White from the Stanislaus Business Alliance, Opportunity Stanislaus. And our organization has conducted hundreds of interviews of employers here in this county, and we know our economy really well as a result of that. We know what the issues are, what the challenges are because we've -- not only have we interviewed, but we've used a scientific tool to help us understand our economy. So I have a couple of questions for you.

Now, I see -- you know, I've seen your presentation. I also am worried about the downstream effect because I don't know if you've seen the California League of Food Processors Study, 2015. Our county -- Stanislaus County per capita is the No. 1 food production county in the State of California. In pure volume we're only second to Los Angeles County, and that's a county of 7 million people. So it's critically important to us. It's our lifeblood.

I used to live in Colorado. Our lifeblood there was aerospace, and when the Defense Department shut down programs, it had a crippling effect on our economy. You turn off the lifeblood, you turn off the economy. So my question is how well do you know our economy? Have you conducted interviews with employers? Have you conducted interviews with farmers? Or are you just using statistics that the State of California produces to make your analysis?

Because I think -- I agree with the commissioner. This is a really important issue. You need to dig down deep. You need to really understand our economy. What's -- can I ask, do you know what our unemployment rate is today in Stanislaus County? Any of you guys? Do you know what it is? You don't? Any? Do you know what it is? Okay. Well, then you don't know our economy. Our unemployment rate is 8 percent as of today.

And how many -- are you from the Bay Area? Raise of hands? Okay. What county are you from, sir?

UNIDENTIFIED SPEAKER: Contra Costa.

MR. WHITE: Okay. You know then 4 percent unemployment in Contra Costa County.

And what county are you from?

UNIDENTIFIED SPEAKER: Sonoma.

MR. WHITE: Sonoma. Okay. That's about 4.2 percent. If you're from Santa Clara County, it's about 3.3 percent.

So I hope that you will dig deep, that you will

take -- that you won't hurry through this process; that you'll interview the employers, you'll interview the farmers, you'll really learn our economy. Because this is our livelihood. And like Mark said, we can't -- you know, it's hard to attract business into California because our regulatory environment here is not like the regulatory environment in Arizona or Texas.

And so what we have to rely on, companies to expand, 80 percent of all the new jobs here. If we want to cut that unemployment rate down, we've got to have local companies expand. And that's -- that's the lifeblood of -- it's not like we're going to get Silicon Valley to move out to Modesto. So we have to rely on our excellent, exceptional companies here to expand. And you guys don't know our economy. If you did, you'd know what the unemployment rate is today. Who's our -- do you know what our -- who are No. 1 employer is?

MR. GROBER: If I may say, I just want to provide --

MR. WHITE: I'm not -- yeah.

MR. GROBER: -- context. Well, this is -- this is -- I'm hearing a number of good questions, but I don't know that the pop quiz on the statistics is that helpful to inform. But I would --

MR. WHITE: Well, my point is, sir -- my point is --

MR. GROBER: This is a programmatic analysis, and we're -- and we are considering economics. And we've done

an economic analysis that -- to inform this decision. And not to diminish how important this is for the area, but again, we've done more than really we're required in terms of doing programmatic analysis and for consideration of economics. That being said, we've done more because this is terribly important for the board, and the board recognizes how hard this is and how important it is and how they want to inform that balancing decision.

MR. WHITE: Well, all I'm asking is --

MR. GROBER: That being said, so --

MR. WHITE: -- I'm asking you to get to know our economy.

MR. GROBER: And I've acknowledged a number of times already that if there's pertinent information that we should be considering, then please get it to us as soon as possible, even before the end of the comment period. Because the more we know, the better our document can be to inform the board in making this hard decision.

MR. WHITE: I'd be happy to do that.

DR. SMITH: Mark, is -- you want to --

UNIDENTIFIED SPEAKER: Who's the No. 1 employer? Gallo?

MR. WHITE: Gallo, yeah, sure.

DR. SMITH: Yeah, Gallo, yeah.

Since we're on the economic incentive investment environment structure, is there anything you want to add? I think we're on a roll, so let's go.

MR. HENDRICKSON: I think we are on a bit of a

roll, and I do appreciate Dave's comments because I think that the comments absolutely -- are absolutely reflective of what we hear in the three counties, you know, we face. You know, I think -- you know, I spoke a little bit ago, and I think as just referenced, obviously, the regulatory climate here in California is not good. I think everybody can acknowledge that. It makes doing business in this region very, very difficult. But I'm very hopeful that, you know, as you continue to advance, you know, your plan -- and, you know, we do hope that you are, you know, listening -- that you do keep in mind that we have, you know, people making very big decisions as to where they go and how they expand.

Just last evening I was at a dinner with a few hundred farmers in Merced. And what was so impressive to me as a non-farmer, these are people who wake up every single day with the intention of putting food on your table. And these are folks that work incredibly hard to ensure that not only are we all fed but, you know, most of the world.

So I'm very hopeful that as a part of this process, as you continue to, as was suggested, drill a little bit deeper into what's taking place as a part of the development of your plan and the studies that you are basing it from, that you will think about, you know, obviously those -- maybe those unintended consequences of the impacts of our farmers who -- and ranchers and growers who wake up every single day, again, with the intention of

doing good for you.

You know, I would say kind of as an aside, you know, some of the other challenges that have certainly been expressed to us from an economic development standpoint are related to land value. Okay? And so certainly as we talk about obviously impacts related to having less, you know, water availability, if you will, and obviously you factor in the impacts of SGMA along -- along with it, can you maybe discuss to any extent that you studied how this will -- to what degree have you studied, you know, land value reductions?

Because clearly we've got a lot of folks out there that are concerned about, you know, what this means for them and their bottom line. So, you know, this will absolutely go into, you know, where companies will grow and expand, et cetera, et cetera. So was there any consideration given as a part of any of your economic modeling that, you know, relates to, you know, the impacts of this plan as relates to overall planned values and how that may prospectively impact, you know, business decisions here in the region?

MR. GROBER: Not specifically, not a topic that we -- no. But we looked at conversion. We had come up with some estimates of conversion of prime farmland, but not -- not changes in land value.

MR. HENDRICKSON: When you say "conversion," you mean conversion to permanent crops?

MR. GROBER: Just -- just loss of prime farmland.

MR. HENDRICKSON: Oh, loss of land. Okay. Okay.

DR. SMITH: Yeah, if I just may add, though, just wanted this point. The impacts of land value is very important because it gets back to the commissioner's things about how the real world works in terms of finance; right? If you take a 30 percent haircut on your land value, your ability to finance your existing operation sort of gets a little tenuous; right?

So I just want to be sure because sometimes economists think land value is just a wealth effect; it has no consequence. And, no, they're the financing mechanism. There is a feedback from a land value of impact to economic consequences of whatever you're studying. So I just wanted to just be sure I shared that perspective (unintelligible).

MR. O'HAIRE: Yeah, I just want to check something. I haven't read through the entire, whatever, 4,000 pages, but -- so am I correct then you're saying that there's going to be -- I think it's in the economic analysis, page 20.4 -- there's going to be between the three regions, 23,421 acres lost or fallowed, or is that converted? I can't remember exactly what it was. Versus going back -- back in, I saw numbers. And then public meetings back, I think, 2012, '13, there was some talk about 210,000 acres possibly being fallowed and why is that number different. I'm -- am I looking at -- those are two drastically different numbers.

MR. GROBER: Generally different numbers. I

think, as we mentioned earlier, when we did the last round, we looked at two ways: no replacement water supply, no ground -- additional groundwater pumping or full groundwater pumping. So if you don't do any additional groundwater pumping, then it would lead to great -- even larger water supply losses and, therefore, even higher fallowing.

MR. O'HAIRE: So was that -- so was that what -- the 200-so thousand acres, was that what that was from?

MR. GROBER: That was associated with -- yeah.

MR. O'HAIRE: Okay. No backfill. Okay. Another question I have, too, is just to make sure on the data, on Appendix G-67, I'm looking at -- here it appears that you're using -- I want to make sure I'm right. Appears that you're using 2008 crop production numbers on G -- it talks about its average annual total economic output related to agricultural production in irrigation districts, and it looks -- so this is 2008 values, looks like. I just want to make sure that's -- if that is, why aren't we using more up-to-date? Because, I mean, our value is much, much larger than it was in 2008.

UNIDENTIFIED SPEAKER: (Unintelligible) 67?

UNIDENTIFIED SPEAKER: It's G -- yeah, G-67.

MR. NELSON: So that's this -- well, okay.

UNIDENTIFIED SPEAKER: It's a graph -- nice, little, colorful graph there on the page.

MR. NELSON: Yeah. So that's just in 2008 dollars. So (unintelligible) like the value of the dollar

(unintelligible).

MR. WEGGE: If I could just add something to this. We attempted to keep dollars constant across the various topics, so that -- not for purposes of adding up but, rather, so you could get a sense of the relative importance of different topics if you want to look at monetary values in different sections. So, you know, this analysis was originally done in 2011. We were working with a lot of values from 2008 and 2009, and then when we redid it, we could have updated it by using an inflation factor, but we decided just leave it in 2008 dollars, and it's consistent across the various topics that are addressed in Chapter 20.

MR. O'HAIRE: Okay. Well, I would suggest that just -- I don't know about the entire document, but at some point, I think, we would love to see current numbers, even if it's some kind of summary or -- so we can see -- I mean that was, you know, eight years ago. It's almost a decade ago, so we've all moved on since that time and things have -- lot -- things have changed. We'd like to see some, you know, up-to-date real impact numbers in today's --

DR. SMITH: Yeah. And, by the way, it's (unintelligible) I -- first of all, I agree. We've got to have a constant dollar. We have to decide which -- you know, what's our base year. I agree with you. So you and I are in total 100 percent agreement. The difference, though, between 2008 and 2016 is not only the inflation

but any changes in the relative value; right? And if we go back to 2008, relative to today, Commissioner --

MR. O'HAIRE: That's a recession year.

DR. SMITH: But --

MR. WEGGE: Let me clarify something here.

DR. SMITH: Okay. Good.

MR. WEGGE: Because the way you're characterizing it makes it sound like we were just -- we just used information up to 2008. That was not the case. We may have used information from 2013 or 2014 --

DR. SMITH: Oh, then brought it back.

MR. WEGGE: -- and then brought it back to keep things consistent in --

DR. SMITH: That wasn't as clear in your written document as your spoken word, but I appreciate that.

MR. WEGGE: And the other thing I'd like to point out in response to your question about the land values, we did not specifically look at land values, but we did look at the fiscal effects of the changes in agriculture. Land values wasn't specifically pulled out, and I don't recall whether it was part of a composite type of multiplier. But the fact that we looked at fiscal effects on the three counties and jurisdictions within those counties is something to note.

MR. BASS: Were the physical effects done part of the IMPLAN tied to the lost crop production revenues?

MR. WEGGE: Yes.

MR. BASS: Okay. But not to a specific -- so it

didn't really flow through a valuation exercise, the land itself, tied to the production and reliable water supply?

MR. WEGGE: No, no.

DR. SMITH: Well, first of all, I agree with Professor Lund; models have use and, you know, no -- none is perfect. But sometimes it's good to look at what's happening to the world sometimes as natural experiments, like just think outside of this area.

During the 1991 drought, San Diego was -- took -- being at the end of the metropolitan water system, took the hugest cutbacks in '91 I think of anyone statewide. And the semiconductor industry, right before they went to Austin, went to Susan Golding's office, who happened to be the mayor at the time, and they said: You get a reliable supply or, you know, the vans are going. It took IID and San Diego, what, 15, 17 years to put together the deal. So those guys were long gone to Austin.

So we need to think through what are some of the other types of actual experiences we've had in the state. Maybe not necessarily in these three counties, but elsewhere that have seen something of an impact already. And I'd be interested in your reaction. The one thing we know is -- and I'll try to use a (unintelligible) sense of humor here. The Central Valley Project Improvement Act gave us a natural experiment to observe.

Because as we do know, if you're familiar with the CVP allocations to south-of-Delta ag users, there's a major transformation in the data that you download from

the, you know, the bureau. Pretty much until the CVPIA, they were getting 100 percent allocations, but for 1977 and thereafter, they've had a very vol -- I'm sorry I use this word, sir -- a very volatile history of what their annual allocations are from year to year.

Have you -- have you considered at looking what was the impact of that experience, for example, on groundwater pumping in Westlands or well elevations or fallowing patterns as sort of a way to look at what is happened elsewhere as a way of calibrating, you know, how your model's looking at the world? Because I didn't -- it wasn't discussed, as far as I could tell, and I guess I'm a -- I was paid to read all your stuff so I did. I don't remember any discussion of looking elsewhere of what, in fact, has happened to help inform how you look at what's being proposed.

MR. GROBER: No, but I look forward to seeing your comments and how we should be looking at that and using it.

DR. SMITH: Okay; good. After the break you'll get a few when we return to groundwater. Because I've got some great resources here, and I know I'm losing one. This one's graciously staying.

Commissioner, I don't know if you're staying for the whole --

MR. O'HAIRE: Oh, yeah. They'll be a power drain with just -- me just here. Losing all these brains. These guys know a lot more than me. I do have a --

DR. SMITH: Oh, that's not true.

MR. O'HAIRE: I do have a --

DR. SMITH: You know a lot more than what we do.

MR. O'HAIRE: I wouldn't say that, but I do have one -- I just -- question again. What was the total number that was com -- I probably missed it; it's probably in here. I just want to know. What is the total economic impact that you came up with for the total amount and sort of what was all in that? I know you --

MR. GROBER: What is the number you're saying?

MR. O'HAIRE: Yeah. You were here a couple -- or a month or so ago here at the board -- I think you said something about 65 -- 65, 64 million.

MR. GROBER: The slide is still up. It's the $64 million total sector output under the 40 percent flow.

MR. O'HAIRE: So under 40 percent -- make sure I understand this -- 40 percent, this region is only going to lose -- is it $64 million impact to the entire region? Wow.

UNIDENTIFIED SPEAKER: (Unintelligible).

MR. O'HAIRE: What's that?

UNIDENTIFIED SPEAKER: The three-county area: Stanislaus, Merced --

MR. O'HAIRE: Right. Which makes it even more dramatic because you're talking about three counties. So --

MR. GROBER: Average annual.

MR. O'HAIRE: Average. Again, I'm not an

economist. Like I said, when I was down here the other day -- but, for instance, I'm going to -- I'm a resident just like a lot of people here. I've seen what the drought has done. I go around the county, my neighborhood; I see lawns dried up, mediums lost, you know, browning lawns. It's affected just visually which I know -- I know enough about, you know, land value that that's going to drop the value of your home. So just looking at that, just no numbers -- I can't crunch any numbers for you, but Modesto has about 75,000 units. If you put -- if you say each house dropped down just $1,000 in value because of the drought, I think that's a reasonable assumption. $1,000 is, you know, not -- is not very much. This is going to make it worse, I think. $1,000 times 75 units is -- that's $75 million just on that one item. So I don't see how you can come up with only 64 million when we're talking about all these other drastic impacts. This -- so maybe I'm missing something.

MR. GROBER: Well, since you bring up the drought, I'm curious. Do you have numbers for what was the effect on the ag economy and over the drought years?

MR. O'HAIRE: Well, yeah. Well, part of it, you can look -- you can look at our crop reports. Now, we just showed the changes in the crop report from year to year. Of course, all of that is not drought related. Some of it's -- some of it's, you know, the unit -- it's supply and demand and so forth. But this last year, our crop value dropped down 500 and -- $508 million. Some of

that was because of the drought. We had additional fallowing. I think like two years we fallowed something like 20,000 acres and then another 13,000. So it's -- and the $64,000 is nowhere near, in my estimate -- again, I'm no economist, but just practically looking at the numbers, it's just -- it's just not even close.

MR. GROBER: It's 64 million.

MR. O'HAIRE: I'm sorry, 64 million. Well, it's sort of like 64,000, I guess, to us. Not very much.

MR. WHITE: You have the replacement of people that have to put in new lawns or, I mean, it's just -- it's astronomic --

MR. O'HAIRE: Just in my -- just in my neighborhood, I've got three driveways that have dropped because of the -- because of the drought. So I can imagine, you know, it's just -- I mean there's a lot to consider.

DR. SMITH: I think a way of tying these things together before we -- and I know Jason's going to build on this point -- is there's life beyond models. I think Mr. -- if Professor Lund would be here, he'd probably agree with that. But we also do look at models, but there's also experience. And this is just my universal Chicago training. You always sort of look at where the evidence is relative to models. And then, you know, how you concoct it into the goulash, that's a different point. But we're not here today about concocting. We're just trying to say what are the elements you may want to

consider. And Jason --

MR. BASS: And, yeah, I just wanted to add (unintelligible) because I know the drought obviously is a very important source of information. It's very instructive what's been happening in the last few years with respect to ag, with respect to municipal water use, development, et cetera. But the drought is a short-run phenomenon. We have just a couple of years, and the response is a reflection of a short-run response. In other words, people are dealing with the immediate and very difficult and challenging situation of a lack of water supply, so water -- lawns are going brown, et cetera.

But when we start talking about the SED, this is a long run, permanent, in theory, transition to a lower water supply. So I think we have to be careful not to focus too much on the short run, you know, information or demonstration of response just in the drought. It's very instructive because clearly it's created significant hardships, significant problems.

But I wanted to go into from -- we focused a lot on ag so far, and obviously it's fundamental because that's where the surface supply impacts are going to really flow through, but we haven't really talked much and saw a lot, we believe, in the documentation with respect to the community impacts. And I heard earlier discussions about how water bills have been going up very quickly in the region because well depths have been challenging,

water quality issues have been challenging, et cetera, and I wanted to know to what extent you folks have really examined in particular water rates for community members, for households, household water rates.

And I've done a lot of work in this arena looking at ratios of things like the average water billed to household income. And in this region, and I'll use Merced County as an example, I think it's upward of 80 percent of the households are within areas that are designated as disadvantaged communities, economically disadvantaged, by the State of California by the Department of Water Resources. I go to the DAC, Disadvantaged Community Mapping Tool, online and it lights up in these counties because a lot of households are, again, in communities where incomes are relatively low, yet you see water rates going up and up and up.

Dr. Smith brought up the issue of groundwater depths, and we know that if increased pumping occurs, all else being equal, we're probably going to see increases in groundwater depths. Already an issue that's occurred in the drought. Lot of cost. Talking to the City of Modesto, they're investing new wells. Planada, the community, they had to put in some new wells. This is a region-wide issue already.

When groundwater pumping goes up in response to the SED, we're going to probably need more infrastructure investment, et cetera. Costs go up. I mean someone's got to pay for it. A lot of these communities don't have a

lot of financial resources. They're going to pass it through to the ratepayers who are already seeing, in many instances, double-digit growth in their water bills.

Have you addressed that impact and, also, even in the IMPLAN modeling addressed how that flows through then to the community expenditure profile where you start to see then people having less money to go out to eat because they're spending twice as much on their water bill? So that's -- I wanted to pose that question.

MR. WARD: That's -- before you and your team respond, I'll give you a chance to think about that. I think this is a good time to take a break, that this looks like a transition now from the ag econ impacts to urban and drinking water. So why don't we take a ten-minute break. Everybody back here around 2:30; we'll wrap it up.

MR. GROBER: Great. Thank you.

(Recess.)

MR. WARD: All right. We're going to get started again, if you'll all sit down.

DR. SMITH: I don't have any kind of questions for you. I want you to talk on the issues that we're talking about that you can say something to talk about.

MR. BASS: Okay. If I can think of a smart question, I'll ask it.

DR. SMITH: Yeah, yeah.

MR. WARD: Okay. We're into the final session of the afternoon, and looks like we've lost Milt and Mark; right? Okay. So Dr. Smith, it's yours.

DR. SMITH: Okay. I think in fairness to our good friends from Sacramento, Jason, why don't you just state the question again.

MR. BASS: Yeah, I will. I know we were talking and focusing on agriculture and irrigation, but we want to shift over now to urban water, to the communities in the region that rely on -- mostly on groundwater. Well, a large portion on groundwater. They're obviously communities as well, typically the City of Modesto, that rely on surface supplies.

But an important question really gets to the characteristics of the household in the region. We have a region where, as has been discussed, we have high unemployment. We have high rates of poverty. We have -- relative to the State of California. And we also have a lot of communities, proportionately much larger amount of communities as compared to the state, that are designated as economically disadvantaged. And what we've seen in a lot of these communities over the years, particularly most recently with the drought, has been a need for a lot of investment in new water infrastructure, rising costs of water, a deteriorating water quality, particularly groundwater quality and, therefore, associated costs and water bills that have been rising very quickly as relative to incomes.

And so the question really is, is to what extent have you addressed this issue and how the SED implementation, say at the 40 percent level, how that

would flow through to additional costs and ultimately affect water bills and whether that's even tenable in the long run is my question.

MR. GROBER: I'm not sure what you mean which part is "tenable," but we -- I mean one of the things for cities, cities of course can, you know, afford -- I hear in terms of the disadvantaged communities, but maybe I'll pose it back to your question with a question. Because we look at, you know, the ability to purchase water, you know, and I think we look at figures of $1,000 an acre-foot or $2,000 an acre-foot. So with those costs, what -- what -- how much additional cost would that impart to the cities, if there are any?

So there basically is no shortage to cities because cities -- you know, it's high value. It's the disadvantaged communities.

MR. BASS: Sure.

MR. GROBER: So is -- that's -- I think that's part of the perspective that we had is that the -- for the relatively smaller quantities of water for cities, that there would be some purchase possibilities.

MR. BASS: Sure. No, there's certainly -- I mean we're not as focused, per se, on water supply issues. Obviously there will be water supply challenges for some of the communities relying particularly on surface water because of the SED, but with groundwater, we're talking about increased depths to groundwater, influences of increased pumping by irrigators affecting groundwater

depths. Water quality often gets influenced by greater depths to groundwater.

But really the issue just is the issue of cost. We know that if we're out purchasing water as opposed to producing it locally and supply/demand dynamics, that we're probably going to see escalation of cost of water. You're taking away a big chunk of the region's water supply. It would be expected that there would be a cost effect as a result, whether it's because of higher cost to purchase water, whether it's higher cost to pump water because it's deeper, et cetera. Those costs have to be borne by someone, and you have a region, again, that has a significant amount of economic challenges, high rates of unemployment, poverty, and a lot of communities that are designated disadvantaged.

You're going to have job losses associated with this, so you're putting additional strain on the economy, some of the bigger picture issues we talked about in terms of in generating new investment regionally in terms of the impacts on existing investment because of the loss of reliable water supplies. So you have a myriad of things that are putting a lot of pressure on the regional economy, and then you're saying, and in addition, now these communities, some of them very small -- we heard from some members of those communities who face -- don't even have any of the financial resources they need to respond to increased costs of water, yet now they're going to be faced with additional costs on top of everything

else.

How do we expect them to support those additional costs when they're -- the households are already paying water bills that are at percentages of their income that are higher than EPA standards, that are higher than a lot of the -- sort of the standard thresholds that are used to evaluate water supply availability? How do you -- how do you address that? Are you going to address that? And also the implications of increased water bills on regional economic impacts and flow thrust.

MR. GROBER: So I'm curious because you went -- now you phrased it in terms of addressing that. We disclose a lot of information, and to make this a productive, you know, panel discussion, technical discussion, again, I think I would like to pose it again as a question, but only after making very clear a point that has to do with both the total quantity of water and then the effects as well.

I'm seeing a tendency to look at, well, there's this bad effect and then there's this bad effect and this bad effect, and they're all kind of added up and that they're happening everywhere. We've disclosed a limited quantity of water that would be unavailable for public interest use, if you will, so combined agricultural and water supply, and it's shifting of that quantity of water to public trust use for reasonable protection of fish and wildlife.

So that's a -- that's a -- if there's one thing

that's certain in the modeling, though we didn't discuss today the Water Supply Effects Model and how that all works, but let's just assume for a moment that that's the correct number. It's a -- that's a defined quantity of water, and it can only have so many effects either here or there because -- so the reason I bring this up here in the context of the cities, it's not going to be both in effect here and then the full effect on ag. It's that limited quantity of water. And that's both a fact in terms of the limited quantity of water, so it can't be both in effect to the cities and effect to ag except barring -- I'm hearing what you've said about, you know, how the connectedness of the economy and all of these other things.

And, again, I look forward -- we look forward to hearing your comments and your analyses on that because -- I digress a bit, but I hear it both disparaged and yet it's useful. We have 3200 pages -- I always forget the number of pages. We have a lot of pages of document there because we've done, I think, a very good job at doing a programmatic analysis for a very big topic. That being said, the reason we're here and the reason the board wants us to be here is that there's a lot more information that could be added to it, which will add great value.

But getting back to that limited quantity of water, you can't have all of the effect. It's either going to effect the water supply of the cities or ag or a little bit of both, but it's not the total amount. And

there's --

UNIDENTIFIED SPEAKER: And I'm not --

MR. GROBER: -- (unintelligible) --

DR. SMITH: You try to put the --

MR. GROBER: I'm almost done, so just let me --

DR. SMITH: Yeah, we don't double count, yeah.

MR. GROBER: Okay. Okay. But I just want to make sure --

DR. SMITH: Right. We don't double count.

MR. GROBER: -- because when you're talking for ag -- because if there's a water supply effect to the cities because -- and then here's part of where -- and you as economists would know part of the magic is that it's very easy to show impacts. It's very easy to show that this is going to lead to all sorts of negative effects, but the reality is markets respond to new conditions. And one of the responses here, while money will change hands in terms of water will get to the cities that will provide money for infrastructure to ag that is then maybe taken the hit, but that can improve infrastructure. That infrastructure can lead to greater efficiencies. That infrastructure can lead to increased groundwater recharge taking advantage of wet years.

So there's an exhaustive analysis which we also did not do which is how you can actually achieve many, ultimately, benefits from the entire system because this gets at the crux of what I hear. I always hear it in my head, Felicia Marcus, the chair of the Water Board. How

do you maximize the beneficial use of water? And there are tremendous opportunities here. And I understand what you're asking, what you're doing is that there's also a cost. There's also all these things that we should be looking at and we acknowledge we need to look at, but let's not lose sight of how much better we can use the quantities of water we already have.

MR. BASS: Let me make two points related to that. First of all, I'm not talking about water supply. I'm not trying to double count. I'm not talking about a reduction in water supply to communities. I'm talking about the added cost to communities of mining the groundwater they need, of dealing with decreased water quality from the groundwater as a result of the pumping response that you've modeled with the irrigation districts. So I'm not saying that they're going to get hit by the water supply situation the same as the districts are and double counting. So that's one -- seems like you misinterpreted that.

The second thing is just the issue of the overall economic consequences of this. I think we don't want to lose sight of the fact that this is a regional economy that has a lot of these inner ties. And I think we don't want to separate too much irrigation from the communities. They have their own water supply situations, their own water supply needs. But at the end of the day, the jobs that are being generated by the ag economy are the jobs that are supporting these communities, and these

communities are reliant on those jobs. And so you're taking away jobs as a result of these impacts potentially, some -- 2 and a half percent by your estimates on an average, but on certain years, significant job losses by our estimation.

And then on the other side of the equation, you're saying we're also going to do things as a result of the farmer response, which we expect -- again, we can't just put it back on the farmers to deal with it, but ultimately the result of a reduction in their surface water supplies, how that flows through then to the cost to the cities of pumping. And Rod can talk more about that pumping tradeoff, that groundwater depth tradeoff.

DR. SMITH: Yeah, I'm not sure they answered your question, so let's move on.

MR. BASS: Yeah, okay.

DR. SMITH: And, first of all, I -- let me reassure you again, we are not a -- not in favor of double counting, so -- deal? Okay. So we're there.

What is interesting, though, is that if we get -- I think what Jason was getting at in part was that as you pump more groundwater, well elevations, you know, change. And as well elevations change, especially as you heard from the panels this morning, on even the large but especially the small systems, intensifies their problems. You heard today that their -- some of these communities are on a trajectory towards hitting their max -- you know, their MCLs.

So further changes -- the question would be -- and a research question. Okay? A research question would be given the trajectory currently of the communities' trajectories towards reaching their MCLs, how much more groundwater pumping and their impacts on elevations, what happens to that trajectory? Just because you hadn't hit the limit yet doesn't mean you're not going to hit the limit in the future.

It's getting back to some of these fundamental things we did at the first session where you can't look at this as an independent year-by-year thing. You have to look at more in the context of the trends and the resource. And we just didn't see any analysis -- to be fair to you, it was news to us today about this data about, you know, moving to the MCLs. We hadn't heard about that one yet. So I think that's a way of putting in that increased pumping will further lower elevations.

Now, as far as I can tell reading your material a few times -- I didn't have glasses before this engagement -- is that you didn't have any information available to you on how to tackle it, what could be the possible impact of increased pumping on well elevations. Is that correct?

MR. GROBER: I think what we're saying is we don't have detailed information to do this in a very detailed fashion throughout the project area, which is why, again, we did the programmatic assessment. I'm hearing -- I think we heard this morning that there could

be hot spots or something there was suggested where there might be some variations. And, again, if there's information that can be provided, then do please provide it.

DR. SMITH: Yeah. Again, a natural experiment that's been occurring actually in San Joaquin County -- and the only reason why I know this, I represent Central San Joaquin Water Conservation District as an expert in the federal litigation against the breach of contract on the New Melones, so I learned a little bit about that area. And from just a study point of view, the bureau did a great job of creating volatility in availability of surface water. And the San Joaquin Flood Control District puts out annual reports on continuous data of well elevations of certain key wells they have, and four of those wells happen to be in the -- happen to be in the Central San Joaquin Water Conservation District. So that would be an -- that could be some evidence you may want to look to.

Because we've looked at it and, indeed, well elevations were on secular decline for only 40 or 50 years. Once Central San Joaquin got access to surface water, that trend slowed. And then when the bureau started seesawing available surface water deliveries, the well elevations were just sort of there doing a tango. And from that case study or that natural experiment, you can identify what's the impact of a change in surface water on well elevations.

So, again, there is information out there. We are -- we, we, us, are in an adventure of being detectives. We have certain information but not as much as we'd like to have. So what we've got to do is piece together -- right? -- based on the information we do have and take advantage of some of these experiences, you know, of actual circumstances. And so the two that Jason and I have turned to thus far, I've told you. One is the Westlands experience, and the other is -- I'm just identifying the Central San Joaquin because it does provide some insight to what is the impact of the changes in surface water availability.

And, by the way, there is a diversity and then a sense of wells that you can't study, you know. Some wells have a greater impact than others. And if you knew more about the subbasins and talked to your hydrologist, you can understand all that. So there is information out on well elevations. Similarly, the districts have at least provided us information, what, on their trends; right? In elevations?

MR. BASS: Elevation trends and pumping and how pumping affects the elevations.

DR. SMITH: Right. So we're trying to solve a mystery here -- right? -- with pieces of information. We're trying to be Sherlock Holmes; right? Try to divine from pieces. But there's information out there, and everything that we've run into, these impacts are material. And so I would invite you to take a look

when -- as we finish our work, we'll certainly share -- I think we're retained to share work with you, I suspect, but you have to talk to Keith about that. But -- so there is things we can do better, okay, on that. And I'd just like you to keep an open mind and start thinking about revisiting what can you say about well elevations. Our -- sure. Go ahead.

MS. HUBER: Consideration of well elevations in Chapter 13. I was just trying to find the table.

DR. SMITH: The quantification of impact though?

MS. HUBER: It's more an evaluation of current well elevations relative to groundwater depth. There is more concern for those wells that are close to the top of the aquifer, and we point out a few small districts where there would be potentially the need to make new wells. And impact SP1 talks about impacts associated with drilling new wells or deepening existing wells.

DR. SMITH: Yeah, I'm familiar with that table, and that's a snapshot of what -- what the current well depths are. I instead was talking about what was the trend of and actual data we have on well elevation and how has it evolved over time and, indeed, how that evolving trend is impacted by the availability of surface water. So I (unintelligible). When I read that table, that was sort of what's your view of the head room was, of how much could well elevations change without someone having to deepen a well, your well depth table.

MS. HUBER: Right. So clearly well --

groundwater elevations vary up and down through time, and if the groundwater deficit increases, then there would be more of a trend downwards and there's more concern for wells being adequately deep, which is why we considered the impact of making new wells within Chapter 13. And I think there's also a financial consideration in Chapter 20, but I agree that it's not -- you know, we cannot say how many wells will need to be deepened.

DR. SMITH: Yeah, but actually I -- thank you for that comment because it gives me an opportunity to make something of (unintelligible). A lot of these questions are difficult; right? We can agree on that. A lot of these questions we don't have as much information as we'd like, if we're doing a Ph.D. thesis, to try to get our Ph.D. signed off by our advisor. But because it's hard doesn't mean there's no impact.

MS. HUBER: Yeah, I think --

DR. SMITH: I'm sorry. Just because it's hard to do, doesn't mean it's zero impact. I think the proper thing is to say it's an unknown impact until we start trying to improve our understanding.

MS. HUBER: Yeah, well, we agree. And for like impact SP1, we say there is potential significant impact associated with construction of new wells, for example, but there are a lot of other things that potentially could be required work as well.

DR. SMITH: Did I cut you off? I'm sorry.

MR. WEGGE: Well, again, I guess I'd just like to

return to a couple of issues, one of Jason's and one of yours just to follow up on what Les said. You know, as far as Jason was mentioning ratepayer effects and, you know, did we look at that. Yes, we did look at that, and we concluded that there would be effects on ratepayers because it's likely that costs would get passed on to those ratepayers. But without knowing the extent of the costs and without knowing specifically how the individual districts would be impacted and given that it was a programmatic analysis, we tried to lay out what we knew. And what we didn't know, we acknowledged that.

So in answer to your question where I think you were going about ratepayer effects, we did analyze that, and it's in Chapter 20.

MR. BASS: Okay.

MR. WEGGE: And just to follow up on the issue of --

MR. BASS: Could I actually just respond a little --

MR. WEGGE: Sure.

MR. BASS: -- just to interject one thing before you get -- go back to something Rod said. One of the things that was just raised a minute ago was that there's an expectation or a vision that there will be investment in infrastructure and activities to improve efficiencies; that it's not all bad, that there are ways to mitigate effectively is what I heard, whether it's groundwater recharge in wet years as one example. Well, again, that

takes a lot of money, and so I wanted to ask -- and that's the crux of my question before.

And I know, Tom, you met -- you responded somewhat is who pays for that cost? And if that cost ultimately flows through the businesses and the farming interests and households in this region, their cost of water went up, they're in the same situation they were before but their cost of water is higher. And when you have an economy that is often struggling -- we've heard about, you know, unemployment rates. We've heard about poverty. We've heard about a lot of things, the challenges in this region for continued economic growth where population continues to go up more rapidly than the state. How do you support the water supply (unintelligible) that population and also support the level of cost necessary to meet those water supply obligations?

DR. SMITH: Yeah. It's really a cost (unintelligible) analysis; right?

MR. GROBER: And this is what becomes very interesting about these questions. And I really appreciate the questions, and I'm sure the audience does as well, but it's very hard when you look at any single piece of this proposal without considering other pieces. And here I want to harken back to, you know, again, how many times have I said this is hard and you're living proof. No, this is hard to do this, and there's many different ways of looking at it. There's many different

pieces, parts to this puzzle, but the -- my introductory remarks about it being hard, we also encourage settlement, which is important. Parts of settlement can involve also money changing hands, you know. It's not the subject here today. It will be the subject in the future in terms of the City and County of San Francisco and potential shortages depending on how contracts, water rights are interpreted, things like that. Those are opportunities for money to change hands to build infrastructure.

And, again, without speaking in the same thing as you -- I'm sure you're all aware, currently there are water transfers that occur from districts in the area for sales, and that brings in money. You know, water I think we would all agree is -- it's a very valuable substance. It isn't as even highly valued as it should be in many cases. This is going to create some new stressors and opportunities, but through those, that can help to build that infrastructure in this area.

I'd also like to link this -- and there is a connection here because here we're kind of looking at what are the effects on, you know, drinking water, water levels, hearing about economic concerns. It's important to note that when we went out with this proposal in 2012, one of the top criticisms -- in fact, I just -- I just turned to it. And, you know, for those of you -- I'm sure you've all looked at it -- it's a 3,000-page document, but we have about a 100-page executive summary.

One of the things that was pointed out was

concern that we needed to explain and improve our reservoir operation assumptions and surface groundwater supply and quality effects. That's because in the first round, as we've already discussed a bit here today, we made the assumption of either no reliance on groundwater or full reliance on groundwater. We also didn't do -- we didn't look at reoperating the reservoirs. We basically said, well, let's just keep it the same. Criticism we heard is it wouldn't be the same. If we had less water, we're going to hit those reservoirs harder. That's basically what created that, as you refer to it, that volatility.

So there's -- there's different perspectives, different interests, different stressors, and many different ways to look at it. We've looked at one way that presents, we think, a full picture, but I can't emphasize enough how important it is to provide these different perspectives. And then in the end just to manage everyone's expectations, then you'll have to -- everyone will have to look at that once again in the context of the overall picture, which I'm hearing that is of great interest to all of you as well.

DR. SMITH: Yeah. Okay. I appreciate the sentiment. Let me just pick up on one thing because this is a question. Stratecon is probably in -- one of the things we do is we actually do water transactions, so we've closed some deals over the years. And from that perspective, I didn't see where you looked at what was the

market value of the surface water lost in this area relative to the market value of the water the exporters will receive.

And now what I'm -- because I remember way deep in one of your tables, your estimate on average I think was 77,000 acre-feet a year was going to go to the exporters. So the dealmaker (unintelligible) sort of looks at it this way. Again, you want a different way to look at the world? Here it comes, my friend. You're asking these people to say, well, you know, you divert water here or here or there. You can't -- you got to send some of the water downstream.

Now we got water down at this diversion point. What's now available for consumptive use? One thing you can do is assign that water to them and say you got some of your water here; take your restrictions. Water that's available down, you know, at another point, you know. Why isn't it their water or not? So I asked myself a question. There's a market value there. So did you do any market valuation of what -- of the water lost versus the water gained? I didn't see it. But, again, with 3,000 pages, you know, you miss something.

MR. GROBER: The short answer is no.

DR. SMITH: Okay.

MR. GROBER: But it's good that you mention it because that really is something that helps inform some of the settlement discussions to talk about clarification just to make it important. And, again, it's hard when we

do this in a disjointed fashion because we haven't talked about, you know, many elements of the analysis and the fish benefits and what we're doing in this phase as opposed to the next phase.

But an important point to make is that we're looking in this phase just what would happen with the increased San Joaquin River flows, and then you mentioned that additional amount of pumping that would occur. That's based on current rules, the current regulations in terms of export limits, inflow export ratios, things like that. All of that is going to be addressed in Phase 2 because the intent of this proposal is to protect migrating salmon on the San Joaquin River tributaries. Part of that migration includes through the Delta. So there will be new regulations as part of the Phase 2 update.

DR. SMITH: Okay. Okay. Let's go to groundwater and SGMA just because -- well, we've got 20 minutes. Certainly Jason and I have no clue what is going to be the explanation to SGMA here. So up front, disclosure, okay, whatever it is, would you agree that probably there will be less groundwater pumping allowed than today? We don't know what that difference may be, but whenever SGMA gets implemented, you can't pump as much as you can today. Would you agree with that as just a general premise?

MR. GROBER: Sorry to disappoint you, but this is why this gets into the realm of all being rather speculative because it's about sustainability. It's as

much about how much water you're getting in the ground as how much you're taking out. So it depends on in response to this what the local area does in terms of additional recharge, active recharge as opposed to the passive recharge that's generally occurring.

DR. SMITH: I would agree with that answer, but let me pick off the pieces. The reason why I would agree with the answer is before those recharge programs come in, I would believe that pumping under SGMA will be less than today. I agree with what you then added is that because -- they could pump 100 acre-feet histor -- or they pumped 100 acre-feet historically. SGMA, before they do anything of a recharge project, they only do 50. Now they can do a recharge project. Maybe they do a great recharge project. Now they can do 150. Well, as Jason has already pointed out, that didn't come for me. So there's a cost to move, you know, in my example from the 50 to 150.

So let me fine-tune my question a little better, is prior to any of those adjustments, it's got -- the amount of pumping that will be allowed prior to any other investment will have to be less than today. Would you agree with that?

MR. GROBER: You're saying with the qualification that you might do some additional recharge?

DR. SMITH: Yeah, yeah. In other words, before you do additional recharge.

MR. GROBER: Some hypothetical in the future, and --

DR. SMITH: No, no, no. Not in the future. You implement SGMA tomorrow.

MR. GROBER: Well, there's the rub. These are, and we discussed this morning, separate processes. This area, as we've disclosed in this, already has areas that are -- appear to be in overdraft. So that would be suggestive of having to go in the other direction, reducing overdraft. And this project imposed on it, we've done the analysis that there would be at least initially and for some time additional groundwater pumping.

DR. SMITH: Right.

MR. GROBER: The question is how long will it take for things to happen.

DR. SMITH: Right.

MR. GROBER: How will all this come together? How much additional groundwater recharge will there be?

DR. SMITH: Right.

MR. GROBER: A lot of changing conditions, changing circumstance. So we've presented one -- one thing that could be occurring. And likely, based on the most recent drought when SGMA's already in place and groundwater increased, a scenario that will unfold. Will it unfold exactly like that? That's back to all models and assumptions are wrong. It will be something else.

And it's important for you to provide that something else in that broad context, both of what and when and how they would be different. And you referred to volatility and reliability. If there's an alternate model

that you suggest that should be assessed, then please provide.

DR. SMITH: Okay. This is right now our current thinking. Certainly before SGMA is implemented, there will be what we'll call for -- picking up on your formulation for unknown period of time, there will be some -- in response to less surface water supply, increase in groundwater pumping. The way I characterize your approach is you assume 100 percent offset. What I mean by an offset, for each acre-foot of surface water that's looked -- no longer available, you're going to increase groundwater pumping by an acre-foot. Continue that 100 percent offset until you hit a maximum. Maximum defined either by the 2009 or 2014 threshold. That's your model; correct?

MR. GROBER: I didn't know that was a question. We didn't come up with any date certain of --

DR. SMITH: No, no, no, no. I said until. Whenever it was, you have a full offset, one-for-one offset, of the increased pumping until total pumping hits a capacity constraint. That's what's creating the --

MR. GROBER: Oh, you mean in the moment --

DR. SMITH: Yeah, in the moment.

MR. GROBER: -- (unintelligible) maximum pumping?

MR. BASS: Up until SGMA comes into place.

DR. SMITH: Yeah, yeah.

MR. Bass: Basically said we're doing analysis (unintelligible) SGMA.

MR. GROBER: Well, I think you're saying two different things.

DR. SMITH: Okay. That's fine.

MR. GROBER: The maximum pumping that we --

DR. SMITH: Oh, no. What I mean is you can't pump indefinitely up to offset everything, the peak reduction. The -- you're going to hit a maximum, groundwater pumping maximum.

MR. GROBER: Well, I -- maybe we're using different terms.

DR. SMITH: Yeah.

MR. GROBER: The maximum pumping is -- we just used a level, a maximum pumping based on 2009 information.

DR. SMITH: Yeah, no. That's what I'm saying. You defined a maximum.

MR. GROBER: The way we've -- we viewed it is that we didn't change that maximum pumping rate. That's just what --

DR. SMITH: No, I understand. That's what I mean. It's a maximum. So you have 100 percent offset until you hit a capacity constraint as defined. Okay?

What's interesting about the Westlands study is that if you look at the data -- and once we finish ours, I guess we'll be able to share it to you -- you get a 50 percent offset. That's been the experience based on about, what, 22 years. And what's interesting from a scientist or an economic researcher's point of view is we know Westlands had great variability in available surface

water year to year, so it's not like we're trying to extract from small variations. It's really remarkable. It's like a 50 percent offset. And some of the discussions we've done -- because we do believe in getting -- not only looking at data but talking to real people.

When we talked to the Westlands people about that offset, they hadn't looked at the data in that way, and so they were sort of interested in it. But, you know, there's a lot of good reasons why you don't have that full one-to-one offset. And that probably gets us into too much of ag economics, so let me just say that's not unreasonable.

So what's interesting is if you use that approach, that's 50 percent offset until you hit your maximum pumping, what that's going to do, it's going to reduce a bit your stressor, to use your concept. I agree about increased groundwater pumping is going to be a stressor in this area. It reduces the pressure there, but it's really going to increase the land fallowing by a lot.

So in terms of your point, you know, there's two models, let's say. It's 100 percent offset until maximums hit. A 50-50 offset, 50 percent offset until the same maximums hit. One's going to have a little less stressor than the other, but one's going to have a lot more impact on the local economy. And so what we're doing, again, is trying to look at experiences anywhere we can find them and how to see what happened, to help us inform. And, you

know, as you can imagine, that's -- those differences are going to have -- you know, where does reality fit within those is going to, you know, be really -- those are different futures.

MR. GROBER: So you've been -- I guess it's never seems to be a friendly phrase, but you were putting not words in my mouth, but you were saying things that I was saying. Let me say something back.

DR. SMITH: Good. No, no, no. I was letting you know how I characterize your approach; that's all. That's all. Just being honest.

MR. GROBER: So an analysis that, say, looked at no additional groundwater pumping, your suggestive that would be a better reflection --

DR. SMITH: No.

MR. GROBER: No?

DR. SMITH: Before SGMA's --

MR. GROBER: Or it would be -- it would be a glide slope down to --

DR. SMITH: Yeah.

MR. GROBER: -- to (unintelligible).

DR. SMITH: Another one, okay, real simple. A hypothetical. And you say math is good. I agree with you. Math is good. As a former math major, math is great.

I got a situation where I had 100 acre-feet of surface water. I lose 50. I had a 25 -- 100 -- 25 foot -- 25 acre-feet of groundwater pumping for a loss.

Rather than, you know, increasing to 75, it only increased, you know, by half of the loss. And as you got more lost groundwater, you could increase your pumping until you hit that maximum. Because what you guys do is you have the full offset until the maximum's reached.

MR. GROBER: And you're saying there should be some glide slope?

DR. SMITH: Yeah, glide slope. And I guess the -- our argument's based on looking at over 20 years of experience of what's happening in Westlands, as opposed to just, oh, isn't this a cool assumption, you know. And that will have very different impacts. It would be less stress on the groundwater base, but there's still a lot of stress relative to today.

MR. GROBER: Yeah, but you're saying it would adjust over time.

DR. SMITH: It should adjust over time. Now, when we get to SGMA, I don't see -- until you start adding recharge projects or something else, until SGMA, you cannot increase your groundwater pumping. I would not blame the reduction in groundwater pumping fully on the, you know -- you know, the flow restriction. You have an implementation of SGMA, whenever it's going to occur, 10 years, 15 years, whenever that shift point's going to be. But once we get into that SGMA world, the idea that we can increase ground pumping -- groundwater pumping at all to offset the loss of surface water is just problematic. It's just an opinion.

MR. GROBER: No, no. I -- that's -- this is what's great about panel discussions.

DR. SMITH: Right.

MR. GROBER: So I look forward to seeing what assumptions you would be --

DR. SMITH: Right.

MR. GROBER: -- suggesting and then also how you would suggest dealing with what I characterize as uncertainty because there's the recharge part of the equation. Because there's a lot of big unknowns, and I think all of this useful discussion --

DR. SMITH: Yeah.

MR. GROBER: -- shows what a big case somebody already thinks. It's not what (unintelligible) is.

DR. SMITH: (Unintelligible) follow up. Okay? So, therefore, I think we, in our opinion, we think the baseline of analysis -- again, we don't -- we think the short-term, just looking, averaging with the short-term model is not the right -- you got to look at it more of a, you know, a longer-term perspective. Within that longer-term perspective, we're going to hit out of the box increased groundwater pumping either by your 100 percent offset model or 50 percent offset model, whatever it is, until you get to SGMA.

And once you get into SGMA, you're going to transition to a new world where there's no offset of groundwater pumping in response to the flow objectives -- and here's where we get some common ground, I hope --

until we do new investment. Would you agree with that sort of definition of a baseline?

MR. GROBER: When you say, "new investment," meaning --

MR. BASS: Recharge.

DR. SMITH: Recharge.

MR. GROBER: Oh, yeah. Uh-huh.

MR. BASS: Or other actions, right.

DR. SMITH: Or other actions.

MR. GROBER: Yes. I think it's important to note -- again, I'm -- you know, of course I'm both defending and disclosing our analysis, but some of this discussion really gets at the crux of, say, why we didn't use the 2014 levels of groundwater pumping. Because rather than that glide slope approach, which you're referring to, it's rather looking at, well, how about a lower level that is, perhaps, underestimating what the current capacity is just because that's, as we characterize it, more sustainable than 2014 levels.

DR. SMITH: Right.

MR. GROBER: I don't think we're disagreeing about, you know, big concepts.

DR. SMITH: Yeah. Well, that's -- that's why it's good to start the first discussion. We see how we've looked at the world, same or differently. Yeah, because I agree with you too. To think you could put the (unintelligible) indefinitely from 2014 would be irresponsible analysis, because if we think of the Supreme

Court's decisions in groundwater adjudications, a concept of safe yield is really sort of average recharge plus the concept of temporary surplus. And the concept of temporary surpluses in light of the fact you don't always pump, you know, the average annual recharge, your demands are low or (unintelligible) or whatever. So you have, like, something in storage so you can peak above safe yield for a few years. And then all the groundwater adjudications in California, that's what watermasters are, you know, always trying to keep track of.

And so I do agree that to look at peak stressing in response to a drought and have a model that thinks, well, we can just go up there indefinitely is just -- that's bad resource economics anyway. I --

MR. WARD: While we're all enjoying this two-way conversation immensely, believe me, we've got about 15 minutes left.

DR. SMITH: Yeah.

MR. WARD: So, Dave, did you have -- I sense you --

MR. WHITE: I do. And I still don't understand this regional -- and maybe it's just me. I'm a little dense. But this regional economic impacts, you did not take into consideration the processors?

DR. SMITH: Yes, they did not.

MR. WHITE: That you did not? It was just agricultural output; correct?

MR. WEGGE: The processors were evaluated but not

as part of the regional economic analysis using IMPLAN.

MR. WHITE: Okay. Well, to me, that's a very significant flaw in your study because here, at least in our county, we have a lot of very significant processors. And I can tell you anecdotally that when fields go fallow and tomatoes are not grown, the processors react to that. They lay people off. They don't produce as much.

UNIDENTIFIED SPEAKER: They move.

MR. WHITE: Or they leave because they can't expand. So to me, that's a major flaw in your analysis.

MR. WEGGE: Let me -- let me clarify something. All I was saying was that we didn't use this particular model to look at the effects on processors. We looked at the effects on processors, but we did not feel that IMPLAN was the right tool to look at those effects.

MR. WARD: Where was that in your --

DR. SMITH: Which tool did you use then?

MR. WEGGE: We didn't use a tool. We --

DR. SMITH: That's right. So, therefore, it wasn't -- see, when you say you didn't use a tool, like his presentation, we can go back to the slides, it was all down. You didn't go forward and then you say this is the IMPLAN results.

MR. WEGGE: Right.

DR. SMITH: It didn't look forward. So these results are without looking at the processors, and now I hear you say: But we did something else.

MR. WEGGE: Yes.

DR. SMITH: And as Walt said, where is that in the document?

MR. WEGGE: Well, we talked about this earlier. It's in Chapter 20, Chapter 11, and Appendix G.

MR. WHITE: Well, I guess what I would like to see --

MR. GROBER: I just wanted to -- we'll have more information on this on December 5th or 12th. I don't know when we're discussing the economics, but our economic expert is not here today. And I think in conversations we've had with him, and I can't refer you to where in the document it is, but some of the variability or the ranges that were considered in terms of how the processors would be considered, that would be absorbed by the pros -- crops from out of area and shipping and things like that. But I will -- we'll have more of the details of that on the 5th or the 12th.

MR. WHITE: I can tell you anecdotally that many of our processors have local supply, and it is because many of them are farm fresh, want to be quick to market. And, for example, one tomato processor here, their whole mantra is that they can get their tomatoes in the can in six hours. So it does have an effect. And I would like to see a chart -- this regional economic impacts chart, I would see -- I would like to see the processors included in that, because I think it's going to be significant.

MR. GROBER: Well, we -- we recognize, I think, that it is important. We just felt that the tool that we

used to do the analysis of crop production was not the right analytical tool to evaluate the effects on processors and dairies.

DR. SMITH: So, Walt, is what I'm hearing -- let me see if I can -- because I know my client will ask me: What the heck does all this mean? I think when Tim did the presentation, it was step by step. It was good. It was appreciated as the IMPLAN results. These are the IMPLAN results. So, therefore, the answer to your question is this does not include the processor (unintelligible) issue.

Now, you're saying it was addressed elsewhere, and we'll reiterate again, because we missed it the first time, but it's -- you know, you read stuff; you miss it. But then I'm puzzled. If you had that elsewhere, why wasn't that included in your full -- we get IMPLAN plus the other work to get to the full result?

MR. WEGGE: Well, because, one, we did not estimate -- we described what we thought the effects would be in terms of whether processors -- as you pointed out, some of them get a large share of their product locally; some of them don't. Those are issues that from a modeling standpoint you need to be able to figure out. And the IMPLAN model doesn't allow for that, so it's beyond the capability of the IMPLAN model to accurately capture that. So --

MR. WHITE: I get that. But, again, if you're going to be presenting to the public an argument of this

is what the impact is going to -- and at least this is what's being presented to you. And I -- maybe my assumption's wrong, but if this is the same chart that you're intending to show the Water Board of what the impacts are going to be and you're not articulating strongly enough what the impacts are going to be to the whole economy, not just to ag but to processors, to the community, and et cetera, then I don't think they're going to get the whole picture. Despite the fact that it might be buried somewhere in the report, it needs to be shown very clearly.

MR. GROBER: And your point is well taken which is why, I believe -- and we'll be -- we'll have to talk to the other expert that was involved in this. And my thought is that it's covered implicitly, but your point is well taken; show us where is it. So hold that thought.

DR. SMITH: (Unintelligible) the math.

MR. WEGGE: And the other point I'd like to make about the other person who couldn't be here today who is at UC Davis, works at UC Davis, he would have been the one to make contact with the processors, contact with the growers. We collectively don't know exactly all the contacts he made. So I know that he did, but I can't sit here and tell you what they are. But --

DR. SMITH: Yeah.

MR. WEGGE: -- so he would be the best person to explain that. I know he didn't just, you know, sit in his office at UC Davis and run the model and say, okay, here

are the results. It was --

DR. SMITH: Well, that's fair.

MR. WARD: Who is that specifically?

DR. SMITH: I think Lund, Lund. Lund, isn't it?

MR. WEGGE: Josué --

UNIDENTIFIED SPEAKER: (Unintelligible).

MR. WEGGE: Azuara.

UNIDENTIFIED SPEAKER: I'm getting (unintelligible).

DR. SMITH: It's someone. It's someone, yeah.

MR. GROBER: Josué Medellín-Azuara.

DR. SMITH: Oh, okay.

MR. WHITE: May I ask another question? And actually, Jason and I were talking about this. Okay. For example, let's suppose the water -- you know, the water flows are increased to the Delta, farmers lose a certain percentage of water, and we talk about fields going fallow. Now, some fields, the loss -- there's not a huge impact pertaining to the investment they made in those fields because they could be row crops. But what about the loss of investment if a farmer has to -- if a farmer has to destroy his acreage of almonds or something that really required a huge investment? Is that figured -- is that -- have you determined that at all in this model?

MR. GROBER: That's available in our appendices that show that with -- well, that's what the SWAP model does is that it does not hit the permanent crops. Does not hit the high value crops. It's just having an effect

on the lower value crops.

MR. WEGGE: What he means by "hit," I mean it's considered in the model, but the extent to which the reduction in water affects different crop types, it works sort of from the bottom, lower value, net value crops, and it works its way up. So if you're just eliminating or reducing a small amount of water, it's going to only affect the lower value crops.

DR. SMITH: Under the model.

MR. GROBER: So it's -- yeah, so it's in the model, but it doesn't -- the effect on almonds doesn't get triggered because there's not the level of reduction of water in order to have that effect.

DR. SMITH: Commissioner?

MR. O'HAIRE: Well, yeah, I was going to say in reality probably -- I don't know how accurate that is. You go up and down the Valley and you see orchards being pulled out, ripped out. So I'd say it will affect some of the permanent crops eventually, sure.

I did have a question, sort of -- a couple actually, real quick. I was just wondering -- really a big-picture question for me. I know we've got a lot of detail here. We're talking about all these impacts, numbers, and so forth. But, you know, when you're putting budgets together, when it's your household or your company and -- you know, I always, as a manager, I want to see the worst-case scenario.

And, you know, we're talking -- I had mentioned

earlier about this. We talked about the 210,000 acres fallowed, and we've talked about all these different downstream effects. And to me, that's what I would -- I mean, I'm just speaking for myself personally. That's what I would want to see. I would want to see, okay, what's the worst-case scenario here? What are we looking at? You know, give me all -- everything that's tied to this. I want the big number. That may not be what happens, but I want to see it. And I think the public should see it, because it could actually happen. And I think we need to be aware of that.

And what I've found out in life is, you know, especially with government, a lot of times they underestimate, you know. I'm not saying anything particular about you. Just in general, federal government, whatever. They say, oh, it's going to cost $3 billion, and by the time it's done, it's, you know, $9 billion. It's three times that.

So I'm not saying that's the situation here, but I think we need to see the big number. That's what I want to see. I want to see the full -- give me the -- you know, I want to see the whole nine yards as to what the potential impact to this -- to this area could be. And it should be down to the detail where we can see it.

MR. GROBER: And --

MR. WHITE: And we can understand it.

MR. GROBER: And we appreciate that sentiment, but it's -- the problem is that cuts both ways, especially

when you're doing like a CEQA analysis, CEQA document. Because we don't want to just overstate every impact and then just sort of, well, everything's bad and everything's expensive and then it doesn't really provide resolution on what -- really what we're trying to do here. Which is why the comments are good. We're trying to present what we think are the real effects and also the real costs. Everything we're hearing here, if you think there's something different we should have, then we will need --

MR. O'HAIRE: But in reality, it's a range. I mean life's -- we're never going to hit it -- we know that. You can't hit it exact.

MR. GROBER: Sure.

MR. O'HAIRE: You're not God.

MR. GROBER: And there's some --

MR. O'HAIRE: It's nice to have that range and say we -- gee, this is at -- where at one end we think we can be and here's the other end, and it's probably going to be somewhere in between there, you know.

The other thing I just quickly would say -- maybe it's still on our topic here -- it's back -- it's sort of back to the residential areas. Did you work with -- I'm just -- because I get down in (unintelligible). Maybe it's small stuff, but did you -- did you talk with the -- or did you work with the water districts to see what type of impact this would mean to the residents as far as like watering? Like I -- again, I'm going back to my own situation. I live in town. We're down to the wintertime

one watering a week, summertime two waterings a week. And I'm sitting here thinking, gee, are we going to be down to one watering a week during the summertime? I don't know. I don't know if that is going to mean that's going to happen.

They're already cutting out a lot of trees in Modesto because of the drought and because of the lack of watering. There's a -- there's other impacts, as we mentioned a little bit earlier, but, you know, there's other impacts besides -- you know, there's property value. There's -- trees are going to be going. There's -- rotting and dying and infestation, beetle infestations.

There's a whole lot of other things, I think, that would happen. That's very important to the residents to know that, you know, possibly your yard trees could be dying, your yard is going to be going brown and -- you know, and what's the impact of that? I don't -- you know, I don't -- was that studied? Is that included in here anywhere?

MR. GROBER: Not at that granular level that you're describing.

MR. O'HAIRE: Okay.

DR. SMITH: Well, I promised you one thing is that I -- we'd take you up on your great plea that you started with this morning. What from our perspective could you consider doing differently or better? Okay. In no particular order, and just to just show you, no particular order, lot of scribbling, I'm going to try to

capture the essence of these two panels.

I think you need to define your time horizon. And where does the interface with SGMA implementation happen within that time horizon? I know everything's going to be tough, so I don't -- I won't go each into these, how tough. But at least consider doing that.

I think you've also heard that averages are good, but you've got to realize that economically they can be misleading, so open your mind up to think about volatility.

Similarly, consider reliability. I think we have to be sure how we think about how we're addressing sustainability. I think to ground truth models and assumptions to the extent you can is a real good idea. I mean, I share with you we're looking at a couple things of what's happened in Westlands and Central San Joaquin. There may be other things, so be mindful.

In terms of the issue about orchards coming out, Commissioner, I do know that if you take the 5 to the 46 to the 101, you can see how that The Wonderful Company, aka, Paramount, have ripped off -- have taken down hundreds of acres. So ground truth your models.

I think in terms of other things and challenges, know the structure of the local economy. I think you heard today that there's significant issues related to impacts downstream from ag as it relates to processing, dairies, feed lots. Sorry Frito-Lay, you know, my stepdaughter. You know, you have to think about that

because what we're hearing from the economic development officials of the states -- from the counties who have been on this panel today, that is a material issue.

And I think what my other punch list would include, that -- and I think this gets your point, Commissioner. We have to think in terms of risk analysis; right? What is our risk? These are hard things to do. I mean, we do it. You know, it's hard but, you know, to not do risk analysis at all is, you know, is troubling, at least to some of us.

And then I think the last thing is to say let's keep the discussion going. Thank you.

MR. GROBER: Thank you.

MR. WARD: And that's it. We ended it right on time.

MR. GROBER: You're a great timekeeper.

MR. WARD: You'll be seeing -- you'll be seeing more of us, hearing more from us. We're not going away. And --

MR. GROBER: We -- even if we might not always look like it, we appreciate the opportunity. Hopefully we do look like it.

MR. WARD: All right. We do. Thank you all very much, and everybody who stayed all day long.

As Keith Boggs said, we'll have this out on our website. So whatever that's worth to the people, that's where you'll be able to go back and review it. Thank you.

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STATE OF CALIFORNIA,)
)
COUNTY OF STANISLAUS.)

I, LISA S. COELHO, a Certified Shorthand Reporter in and for the County of Stanislaus, State of California, do hereby certify:

That in December 2016 and January 2017 thereof, I transcribed the text/electronic/audiotaped recording of the proceedings; that the foregoing transcript constitutes a full, true, and correct transcription of all proceedings had and given.

IN WITNESS HEREOF, I have hereunto set my hand and affixed my Official Seal on January 9, 2017.

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LISA S. COELHO, CSR #9487

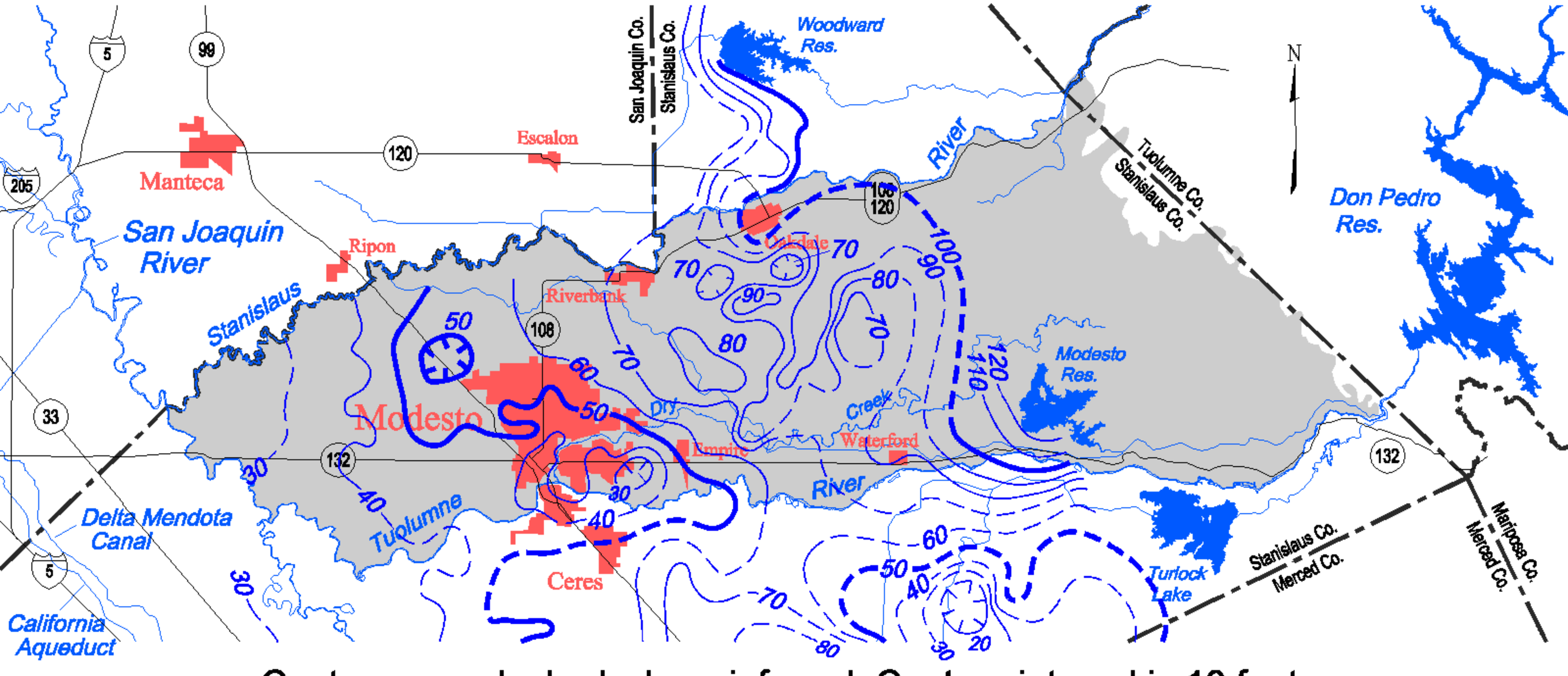
Certified Shorthand Reporter

Modesto Groundwater Basin

Spring 2010, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer

Scale of Miles

2 0 2 4 6 8 10



Contours are dashed where inferred. Contour interval is 10 feet.

A Report Prepared for the California League of Food Processors

The Economic Impact of Food and Beverage Processing in California and Its Cities and Counties

January 2015

Report Prepared by:

Richard J. Sexton, Josué Medellín-Azuara, and Tina L. Saitone

Richard J. Sexton is Professor and Chair of the Department of Agricultural and Resource Economics at the University of California, Davis. Josué Medellín-Azuara is a research scientist in the Civil and Environmental Engineering Department at the University of California, Davis. Tina L. Saitone is a project economist in the Department of Agricultural and Resource Economics. Brief Bios for all three researchers are included as Section 6 to this report. Funding for this study was provided by the California League of Food Processors.

Executive Summary

California's food and beverage processing sector is responsible for acquiring the bounty of agricultural produces grown on California's farms and ranches and converting it to the food and beverage products demanded by consumers worldwide. This study represents a comprehensive evaluation of the economic impact of the food and beverage processing industries on the California economy and the economies of key counties and metropolitan areas in State.

Food and beverage processing is California's third largest manufacturing sector, following computers and electronics and chemicals, and thus represents a key engine driving the California economy and an indispensible complement to California's agricultural production sector. Key economic impacts for California's food and beverage processors for 2012 are as follows:

- **$25.2 billion in *direct* value-added**
- **$56.7 billion in *additional* value-added through indirect and induced impacts**
- **$82 billion of *total* value added**

- **198,000 *direct* full- and part-time jobs**
- **562,000 jobs through indirect and induced activity**
- **760,000 *total* jobs**

- **$220 billion in total value output**

- **$10.5 billion in Federal tax revenue**
- **$8.2 billion in State/local tax revenue**

Food and beverage processing in California accounts directly for $25.2 billion in value added and 198,000 jobs. The remainder of its impact is comprised of multiplier effects created as the economic activity generated by California's food and beverage processors reverberates through the local and regional economies, building additional income and employment for the businesses that supply them inputs, and for commercial enterprises generally, as income earned is spent on a multitude of products and services in the local or regional economy.

We estimated these impacts using the highly regarded Impact Analysis for Planning (IMPLAN) model. On average, across all food and beverage processing sectors and statewide, we estimate that each dollar of value added in food and beverage processing generates $3.25 dollars in additional economic activity, once multiplier impacts are included. Each additional job in food and beverage processing generates 3.84 jobs in total. Food and beverage processing is also a key contributor to funding state and local governments in California. We estimate that each million dollars in output created directly or indirectly by the sector generates nearly $100,000 in additional Federal taxes and nearly $78,000 in additional state and local taxes.

Milk production is California's largest agricultural industry and also its leading food processing industry. Dairy processing accounted directly for $3.37 billion in value added in 2012. Once the multiplier impacts are included, the total economic impact of dairy processing in California is $15.6 billion. Over 139,000 California jobs can be traced directly or indirectly to the dairy-processing sector. Wineries represent California's second-leading food and beverage processing sector, accounting for

$3.65 billion in direct value added and an additional $7.4 billion in value added through multiplier impacts in 2012. California wineries were directly or indirectly responsible for just over 100,000 jobs in 2012.

Rounding out the top five California food and beverage processing industries for 2012 in terms of value-added were baking (comprised of bread and bakery product manufacturing; cookie, cracker, and pasta manufacturing; and tortilla manufacturing); fruit and vegetable canning, pickling, and drying; and soft drink and ice manufacturing. These sectors were responsible for $2.64 billion, $2.22 billion, and $1.72 billion in direct valued-added activity, respectively, in 2012. The baking sector accounted directly or indirectly for more than 89,000 jobs, the fruit and vegetable canning, pickling, and drying sector was responsible for another 73,000 jobs, and total employment due to the soft drink and ice-manufacturing sector was about 58,000 jobs.

Food and beverage processing is a key driver of county and metropolitan area economies in many parts of California, most notably its Central Valley, where the sector contributes nearly $20 billion in value added to the regional economy and nearly 205,000 jobs. The largest relative impact of food and beverage processing is in Colusa County, where the sector is responsibly for nearly half (48%) of all jobs. Food and beverage processing is responsible for 20% or more of all jobs in Kings, Merced, and Stanislaus Counties. The comparable story can be told for many metropolitan areas in California, where food and beverage processing is directly or indirectly responsible for a third or more of total employment in cities such as Williams, Corning, and Turlock. Food and beverage processing accounts for 28% of total employment in Tulare, and, even in the large and diversified city of Fresno, food and beverage processing is responsible for 14% of total employment—nearly 27,000 jobs.

The results from this study can be valuable input into understanding the impacts of legislation, regulations, and other policies that impact the food and beverage industries in California and for assessing the benefits derived from new economic activity in the sector. Estimates of primary impacts on value added of such actions can be readily extended to capture overall impacts on employment, value added, output, and tax revenues using the multipliers reported in the study.

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1 Introduction

Many Californians are aware that our state is the nation's leading producer of agricultural products. In 2012 California's farms and ranches accounted for $42.6 billion in output. California produced 15% of the nation's total value of crop production and 7.1% of the value of livestock and livestock products. Milk production is the State's largest agricultural industry, with production valued at $6.90 billion in 2012, followed by grapes at $4.45 billion, and almonds at $4.35 billion. Nursery plants with $3.54 billion in value and cattle and calves at $3.30 billion rounded out the top five.[1]

Californians, however, are probably less familiar with the state's vitally important food and beverage processing sector, which is responsible for acquiring the bounty produced on California's farms and ranches and converting it to the food, beverage, and fiber products demanded by consumers worldwide. Our study quantifies the economic impact of this integral component of California's economy. Food and beverage processing is California's third largest manufacturing sector, following computers and electronics and chemicals, and California's total of 3,421 food manufacturing establishments is the largest in the nation.[2] We find that for 2012 California's food and beverage processors accounted for $82 billion of value added and 760,000 full- and part-time jobs. We estimate the total value of output generated directly or indirectly by the food and beverage processors in 2012 at $220 billion.[3]

2 Methodology

The study seeks to isolate the economic value added by the food and beverage processing sectors in California. We derived value added as the value of the products produced by the food and beverage sector, less the cost of inputs used in producing those products. By deducting input costs, we avoid double counting the economic impact of agricultural production and are able to focus solely on the processing sector.

2.1 Multiplier Impacts

A key part of any impact study is estimating the secondary or multiplier impacts from economic activity. These impacts occur as the value added from the primary economic activity, food and beverage processing in our case, reverberates through the local and regional economies, creating additional income and employment for the businesses that supply inputs to the primary activity, and for commercial enterprises generally, as income earned is spent on a multitude of products and services in the local or regional economy.

We estimated secondary impacts derived from the primary activities of the food processing industry using regional and interregional input-output models.

[1] California Department of Food and Agriculture. 2012. "California Agricultural Production Statistics." Available at: http://www.cdfa.ca.gov/statistics/, accessed 12/20/14.

[2] United States Census Bureau. 2012. County Business Patterns, Industry Code Comparison 311, Food Manufacturing. Available at: http://www.census.gov/econ/cbp/index.html, accessed 11/15/14.

[3] The impacts reported in this study exclude the production of foods for animals.

The validity of this approach is well established, with a history dating back to the Nobel Prize winning work of Leontief.[4] Input-output models provide a snapshot of a state or regional economy by tracing relationships among commercial sectors, as well as government, households, and the rest of the world.

Input-output models provide measures of the multiplier or spillover effects attributable to a primary economic activity. These spillover impacts are broken down into two main categories: indirect and induced effects. Indirect effects are changes in local inter-industry spending transmitted through economic linkages among the different sectors of the economy. For example, a food processor who contracts with local businesses to provide containers and packing materials or to ship farm products to the plant and finished products to markets creates income and value added for those enterprises.

Induced effects are the result of spending household incomes generated from the sectors directly and indirectly affected by the primary economic activity. Thus businesses, such as retail shops and service providers, that may seem quite disconnected to food and beverage processing, benefit from the presence of these enterprises in the local economy through the income they generate that is then spent in their establishments.

The magnitudes of both indirect and induced impacts are determined by the degree to which income "leaks" from the local economy by being spent outside its boundary. Naturally, the larger and more economically developed the area of consideration, the smaller is the rate at which economic activity leaks beyond its boundary. Thus, multiplier impacts will be greater when we are considering California as a whole, than when we are examining individual counties or metropolitan regions within a county.

We utilized the Impact Analysis for Planning (IMPLAN) model to estimate the multiplier impacts generated by the food and beverage processing industry in California. The IMPLAN model is one of the most widely used and respected models for regional economic analysis, and it is utilized extensively in economics, planning, and engineering studies to estimate the full economic impacts of injections or withdrawals of economic activity from regions of interest. Several Federal agencies utilize the IMPLAN model including the Army Corps of Engineers, Forest Service, and Department of Transportation. The IMPLAN model has also been utilized by key California state agencies including the Department of Water Resources and the Water Resources Control Board.

2.2 Scope of Analysis

We estimated direct, indirect, and induced impacts of the food and beverage processing sector for (i) the entire state of California, (ii) California's Central Valley and Southern California regions, (iii) key food and beverage processing counties within the State, and (iv) selected metropolitan areas (MAs) within California. Table 1 details the regions, MAs, and counties included in the study. Figure 1 provides a map delineating the cities and MAs analyzed in this study. All measures of impact reported in this study are annual estimates for 2012 (the most recent year for which full information is available), with all impact measures reported in nominal U.S. dollars and all

[4] Leontief, W. 1941. *The Structure of the American Economy, 1919-1939.* Oxford University Press: Oxford, UK.

employment estimates reported as annual jobs (number of people employed). [5]

3 Economic Impact of Food and Beverage Processing in CA

Tables 2, 3, and 4 summarize the economic impacts of the food and beverage processing by industry sector in California in 2012.[6] Table 2 reports direct, indirect, induced, and total value added from food and beverage processing activities in the State. Table 3 provides the same information for employment by sector, and Table 4 delineates, by sector, the total value of sales or output for the food and beverage processing sector in California. Figures 2, 3, and 4 depict total value added, employment, and output in graphical form for the top 10 sectors in each category.

With milk production being California's largest agricultural industry, it is no surprise that dairy is the State's leading food processing industry. Across the four dairy products sectors contained in the table (fluid milk and butter; cheese; dry, condensed, and evaporated products; and ice cream and frozen desserts), dairy processing directly accounted for $3.37 billion in value added. Once the multiplier impacts from the sector's activities are included, the total economic impact of dairy processing in California is $15.6 billion. As to jobs, we estimate that the dairy sector directly accounts for 18,000 jobs, and that another nearly 122,000 jobs are generated from the indirect and induced impacts, resulting in over 139,000 California jobs that can be traced directly or indirectly to the dairy-processing sector. Finally, the total value of output generated directly and indirectly in the dairy sector is $46.5 billion, roughly 20 percent, of total food and beverage processing sector output.

California's grape production, the State's second largest agricultural industry, goes into producing wine and other grape beverages, table grapes, and raisins. Wineries represent California's second-leading food and beverage processing sector. Wineries accounted for $3.65 billion in direct value added in 2012. The multiplier for wineries is estimated to be 3.05, meaning indirect and induced impacts accounted for an additional $7.4 billion in value added in 2012. California wineries were directly or indirectly responsible for just over 100,000 jobs in 2012 and generated nearly $26 billion in sector output in the State.

Rounding out the top five California food and beverage processing sectors for 2012 in terms of value-added were baking (comprised of bread and bakery product manufacturing; cookie, cracker, and pasta manufacturing; and tortilla manufacturing); fruit and vegetable canning, pickling, and drying; and soft drink and ice manufacturing. These sectors were responsible for $2.64 billion, $2.22 billion, and $1.72 billion in direct valued-added activity, respectively. In terms of employment, the baking sector accounted directly or indirectly for more than 89,000 jobs, the fruit and vegetable canning, pickling, and drying sector was responsible for another 73,000 jobs, and total employment due to the soft drink and ice-manufacturing sector was about 58,000 jobs.

[5] Employment estimates thus include full-time, part-time, and seasonal jobs.

[6] The food and beverage processing sectors included in these tables are from IMPLAN. The sectors utilized by IMPLAN are in turn closely related to the definition of industry sectors utilized by the U.S. Census Bureau.

An interesting omission from the list of California's leading food and beverage processing sectors is animal processing, excluding poultry. As noted, production of cattle and calves is California's fifth leading agricultural industry, but the state has little processing capacity. Thus, most of the cattle and calves raised in California leave the state for feedlots and processing plants located elsewhere, depriving the State of that economic activity. Processing activity in California for all animals except poultry directly accounted for only $535 million in value added in 2012 and 13,000 jobs.

Total impacts of food and beverage processing for California are obtained by summing values across the economic sectors and are contained at the bottom of Tables 2 - 4. In 2012, the food and beverage processing sector directly accounted for nearly $25.2 billion in value-added activity and a total value added of $82 billion once indirect and induced impacts are included. The food and beverage processing sector was responsible for over 760,000 jobs in 2012, over 198,000 of them being directly in food and beverage processing and another nearly 563,000 through indirect and induced employment impacts. Finally, the total value of output generated in the State by the food and beverage processing industries was nearly $105 billion, with indirect and induced impacts totaling over $116 billion, for a grand total value of output due to food and beverage processing of $221.4 billion in California in 2012.

Based upon its direct value-added contribution, the food and beverage processing sector is the third largest manufacturing sector in California. Figure 5 depicts the leading manufacturing sectors in the State. Food and beverage processing's 9.2% share of manufacturing value added trails only electronic and computer equipment (34.5%) and chemical manufacturing (15.8%). Based upon total employee compensation food and beverage processing's 9.6% share ranks second in the state, behind only electronic and computer equipment.

3.1 Economic Impact by Select CA Counties

Tables 5, 6, and 7 report economic impacts from food and beverage processing for 30 individual counties in California, the Central Valley, and Southern California regions, and the state as a whole.[7] The Statewide total is not the aggregation of the 30 counties delineated in the table, but rather, the total food and beverage processing sector impact for all 58 counties in the State.[8] The individual counties represented in the tables were chosen based upon the importance of food and beverage processing in these local economies and the presence of CLFP members in them. Figures 6, 7, and 9 summarize direct and multiplier impacts for valued added, employment, and sector output, respectively, for the top 10 counties among those included in Tables 5 - 7.

The direct value-added due to food and beverage processing in these 30 counties accounts for 72% ($34.4 billion) of the

[7] Table 1 indicates the counties included in each of these regions.

[8] The total statewide impacts obtained from totaling the sector analysis differ slightly from the statewide impact calculated in the county analysis. This is due to the different multiplier impacts associated with revenues flowing across food and beverage processing sectors (in the sector analysis) and revenues flowing across county lines (in the county analysis). The relative closeness of the total impacts arrived through the two different approaches provides a useful check on the veracity of our methodology.

Statewide total, with Los Angeles County individually accounting for 24% of the State's direct value added. These 30 counties are responsible for 86% of direct food and beverage processing sector jobs in the State.[9]

Among the 30 counties included in Tables 5 - 7, Stanislaus County is second in terms of total value-added activity, employment, and sector output. Stanislaus accounted for nearly $1.3 billion in direct value-added economic activity in 2012. Its multiplier was estimated to be 1.87, meaning indirect and induced impacts accounted for another more than $1 billion in value added output. Food and beverage processing in Stanislaus County was responsible for nearly 25,000 total jobs in 2012 and generated more than $8.6 billion in sector output.

Rounding out the top five food and beverage processing counties included in the study in terms of direct value-added economic activity are Orange ($1.13 billion), Sonoma ($1.05 billion), and Fresno ($967 million). Food and beverage processing in Fresno County was directly and indirectly responsible for over 24,500 jobs; the comparable number for Sonoma County is 21,700 jobs. Alameda County, responsible for about 20,700 jobs, replaces Orange County in the top five based on the employment metric.

Column 6 in Table 6 contains the total number of jobs in each county as reported by the U.S. Census Bureau in its *County Business Patterns* publication. Column 7 reports the percentage of jobs due directly or indirectly to the food and beverage processing sector. Here we see vividly the importance of food and beverage processing to the economies of many California counties, particularly those that are most rural and which were hit hardest by the prolonged economic downturn and have also been impacted most by California's drought.

The largest relative impact of food and beverage processing is in Colusa County, where the sector is responsibly for nearly half (48%) of all jobs in the County. Food and beverage processing is responsible for 20% or more of all jobs in Kings, Merced, and Stanislaus Counties. Figure 8 provides a color-coded map based upon the percentage of total employment in the county that is directly or indirectly due to the food and beverage processing sector. The greatest impacts on a percentage basis are in rural counties and counties in the Central Valley. The importance of food and beverage processing to the Central Valley is also affirmed in the regional aggregation of impacts provided in Tables 6, 7, and 9. The processing sector contributes nearly $20 billion in value added to the Central Valley economy and nearly 205,000 jobs. The impacts of food and beverage processing on the Southern California economy are rather comparable—nearly $28 billion in total value added and 267,000 jobs.

3.2 Economic Impact in Selected Metropolitan Areas

We also analyzed the impact of food and beverage processing in 20 metropolitan areas. IMPLAN does not provide models of city economies. However, some information is provided at the zip-code level of aggregation. Thus, we defined the metropolitan area (MA) for each city included in the study as the geographic

[9] Because most of the counties included in our analysis are relatively rural, their multiplier impacts are less than those for more urban counties. Thus, the share of total impacts, including indirect and induced effects, for this group of counties is somewhat lower.

area encompassed by zip codes either wholly or partially included within a city's legal boundary. This approach has the advantage of enabling us to capture impacts of many food and beverage processing facilities that may be located just outside a city's boundary, but that, nonetheless, contribute importantly to the city's economy.[10]

Tables 8, 9, and 10 contain results of the MA analysis for value added, employment, and total output, respectively. Comparisons across the MAs included in the study makes little sense because the analysis was done for relatively large cities, such as Fresno (pop. 494, 465), and much smaller cities and towns, such as Corning (pop. 7,663) and Huron (pop. 6,754).

A more helpful comparison is employment generated directly or indirectly by the food and beverage processing sector relative to total employment in the MA. Column 6 in Table 9 contains 2012 annual average employment for each MA as reported by the California Employment Development Department, and column 7 provides the percentage of employment due to food and beverage processing.[11] From this comparison, we see the importance of the food and beverage processing sector to many California communities. The sector is directly or indirectly responsible for a third or more of total employment in Williams, Corning, and Turlock. Food and beverage processing accounts for 28% of total employment in Tulare, and, even in the large and rather diversified city of Fresno, food and beverage processing is responsible for 14% of total employment—nearly 27,000 jobs.

3.3 Contribution of Food and Beverage Processing to Tax Revenues

California's food and beverage processing sector is also an important contributor to tax revenues at all levels of government. Table 11 provides estimates of tax revenues generated by food and beverage processors in each of the 30 counties included in the study and for the entire state.[12] The results are presented as total tax revenues generated per million dollars of direct output in the food and beverage processing sector. The tax revenues in the table account for the taxes generated from direct, indirect, and induced impacts.[13] This presentation is convenient for policy analysis because any policies that will impact sales in the food and beverage processing sector, either positively or negatively, can be readily converted into impacts on tax revenues.[14]

[10] We caution that this analysis at the MA level is less precise than the analysis done for the entire State and for the counties due to the less detail being provided by IMPLAN at the zip-code level. In addition food and beverage processing activities that are near a city's boundary but are located in zip codes not included within the boundary will be excluded, even though they may represent a major source of jobs and income for residents of the city.

[11] Note that the employment numbers reported by the California Employment Development Department pertain to the city per se based upon its official boundary, whereas the employment numbers for food and beverage processing follow the zip code definition noted in the text.

[12] We are unable to estimate tax revenues from food and beverage processing at the metropolitan area level of aggregation.

[13] Federal taxes include social insurance taxes, corporate profits tax, personal income tax, and excise taxes and duties. State and local taxes include personal income taxes, corporate profits tax, motor vehicle taxes, revenue from licenses and fees, property taxes, sales and excise taxes, and social insurance taxes.

[14] In this regard the tax impacts contained in Table 11 are conservative because they represent averages. Marginal impacts are certain to be larger due to the progressive nature of both the Federal and State income taxes.

We see that Statewide each million dollars in output by the sector generates nearly $100,000 in additional Federal taxes and nearly $78,000 in additional state and local taxes. Applying these numbers to the value of output contained in table 7, column 2, we see that Statewide the sector is responsible, directly or indirectly, for $10.5 in Federal tax revenues and 8.2 billion in State and local tax revenues.

Results vary for the individual counties based upon a number of factors, including types of food and beverage processors located in the county, structure of taxation at the local level, and income distribution within the population base. The greatest impact on Federal tax revenues per million dollars in output is in Sonoma County, with nearly $136,000 in tax revenues generated. The greatest impacts on State and local tax revenues occur in San Luis Obispo and Santa Barbara Counties, where a million dollars in output generates nearly $100,000 in State and local tax revenues.

4 Conclusion

This study represents a comprehensive evaluation of the economic impact of the food and beverage processing industries on the California economy and the economies of key counties and metropolitan areas in California. The study demonstrates the value of the food and beverage processing sector as a key engine of the California economy and as an indispensible complement to California's agricultural production sector. In 2012 California's food and beverage processors contributed directly or indirectly, through multiplier impacts, $82 billion of value added and 760,000 jobs to the California economy. Food and beverage processing is a key driver of many county and metropolitan-area economies, in several instances accounting for a quarter of more of total employment in these jurisdictions.

This study can be a valuable asset for evaluating the impacts of legislation, regulations, and other policies that impact the food and beverage industries in California and for assessing the benefits derived from new economic activity in the sector. Estimates of primary impacts on value added of such actions can be readily extended to capture overall impacts on employment, value added, and output using the multipliers reported here.

At the time of this writing, December 2014, the study is as up-to-date as possible, given the unavoidable lags in reporting data. If food and beverage production and demand growth trends continue, as we expect they will, the impacts of the sector on value added, output, and employment reported here will soon understate the sector's true impacts. However, the multiplier values included in this report reflect the underlying fundamentals of the state and local economies analyzed in the study and should be relatively stable over time. Thus, it will be possible for future analysts to update this work by applying the multipliers to current information on the value of production in the different jurisdictions and industrial sectors included in this study.

5 Figures and Tables

Figure 1. Geographic Areas Analyzed

Figure 2. Top 10 Food and Beverage Processing Sectors by Value Added

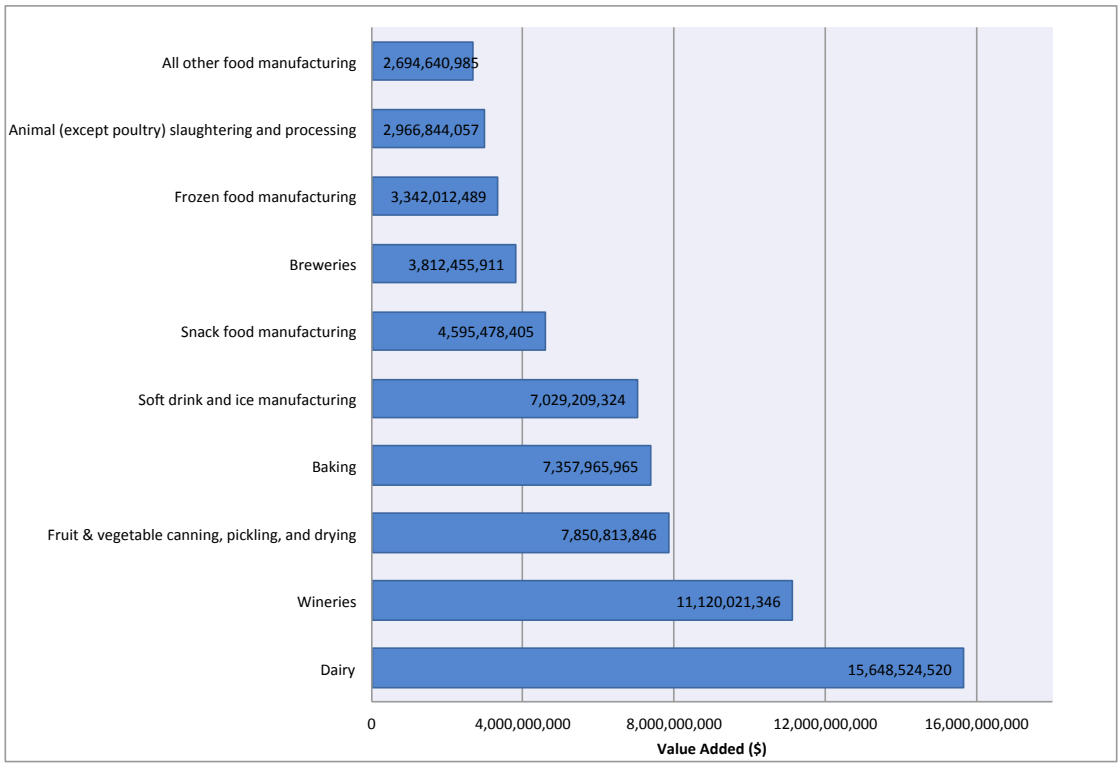


Figure 3. Top 10 Food and Beverage Processing Sectors by Employment

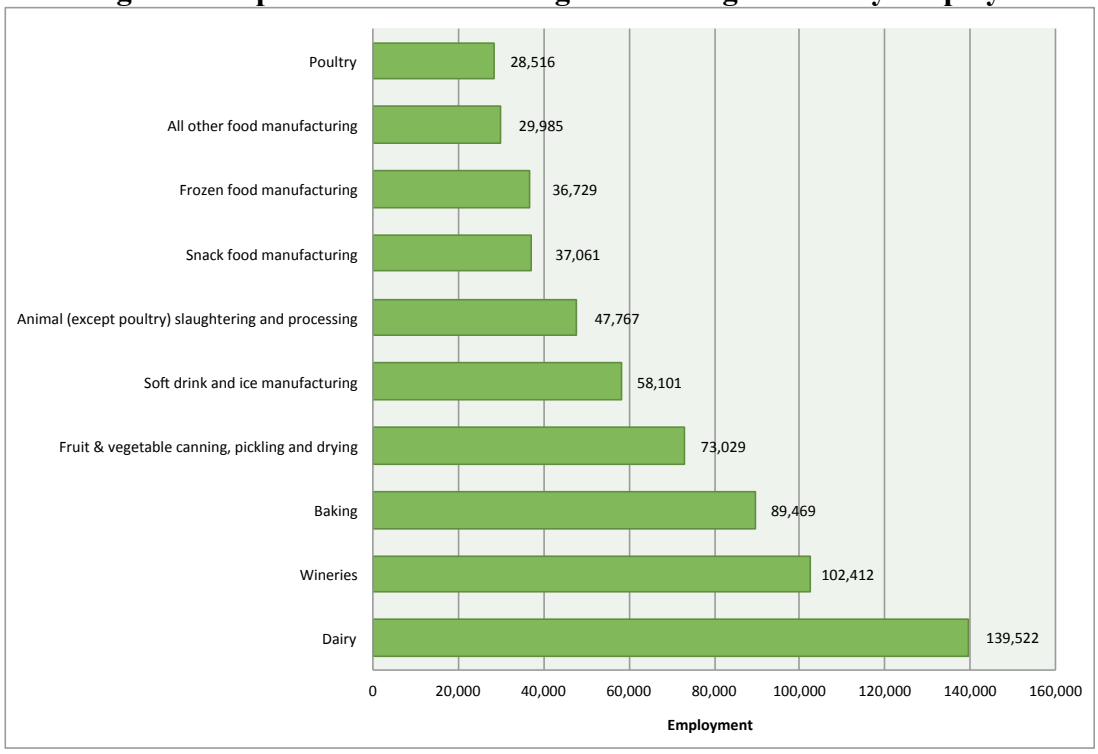


Figure 4. Top 10 Food and Beverage Processing Sectors by Sector Output

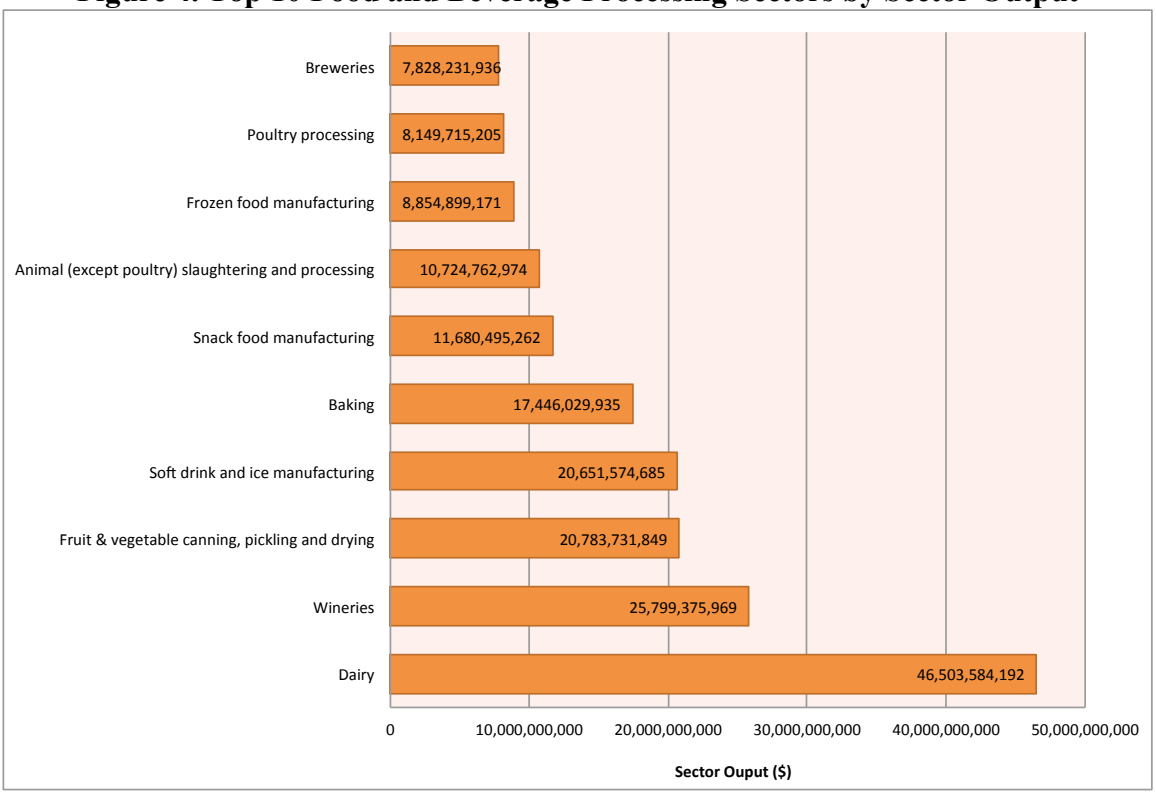


Figure 5. Top Processing/Manufacturing Industries in California

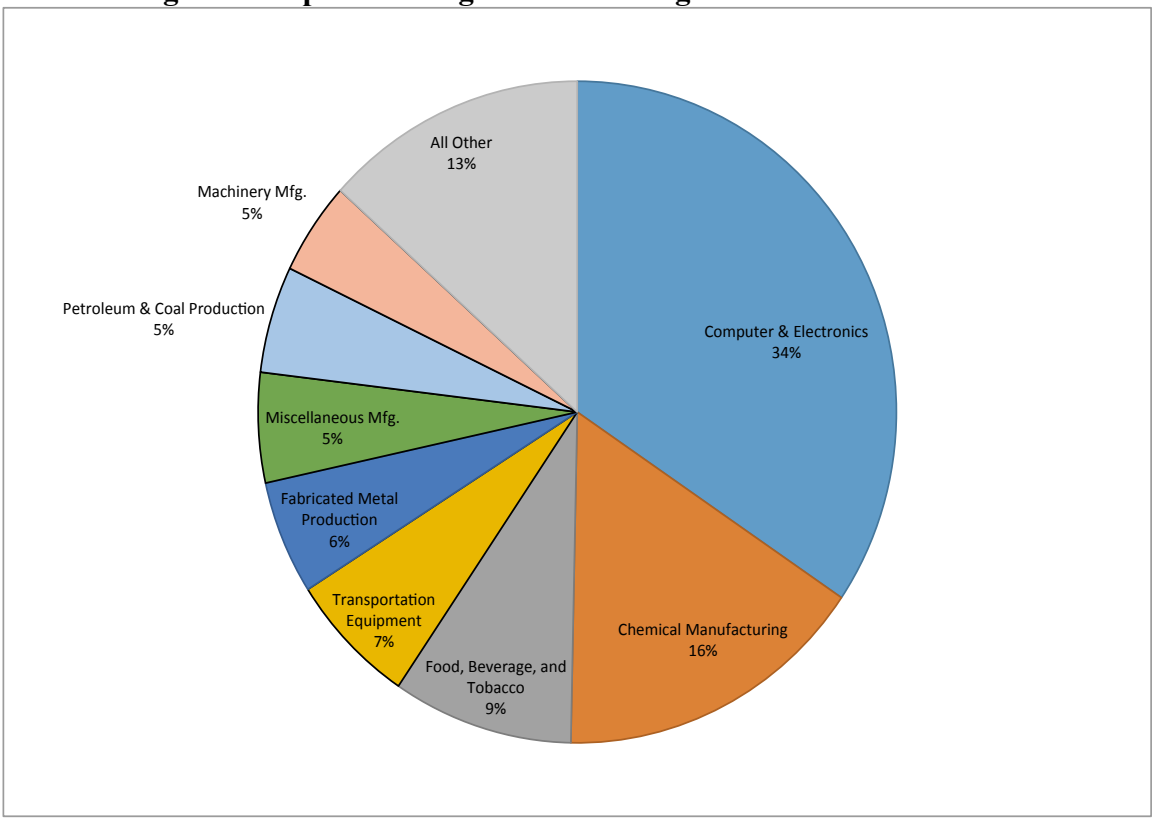


Figure 6. Top 10 Food and Beverage Processing Counties by Value Added

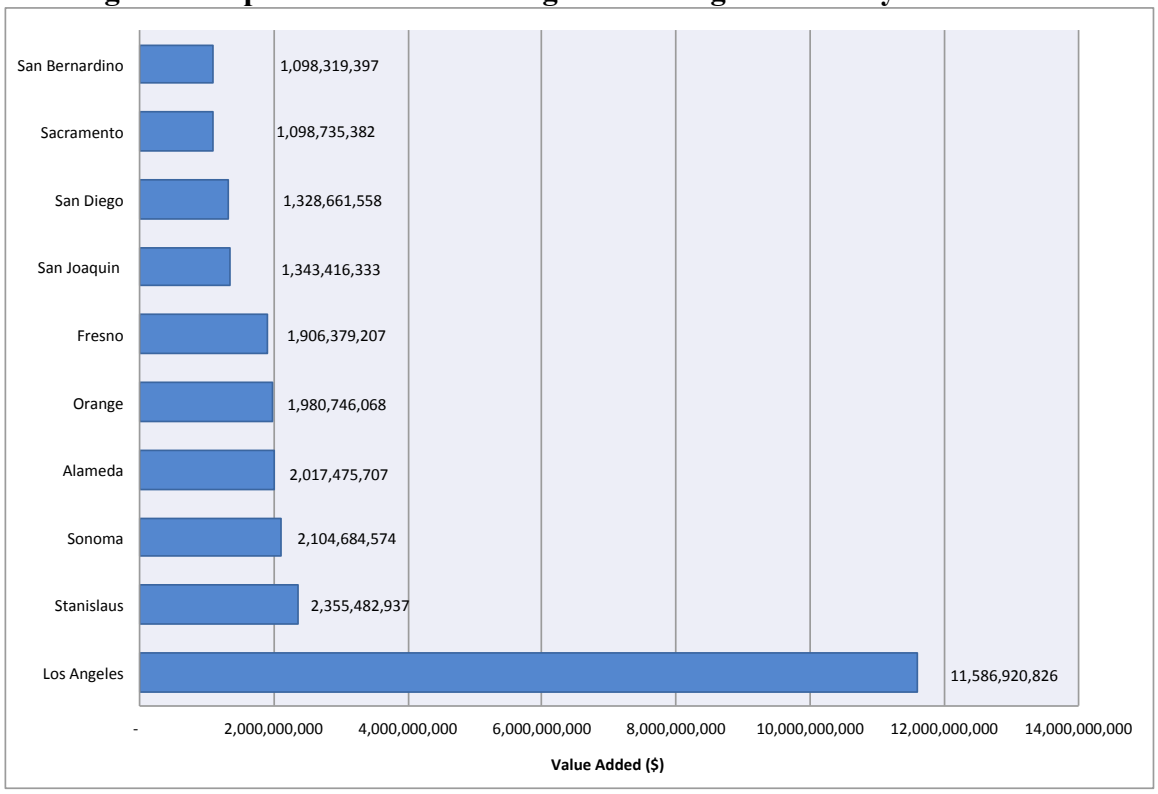


Figure 7. Top 10 Food and Beverage Processing Counties by Employment

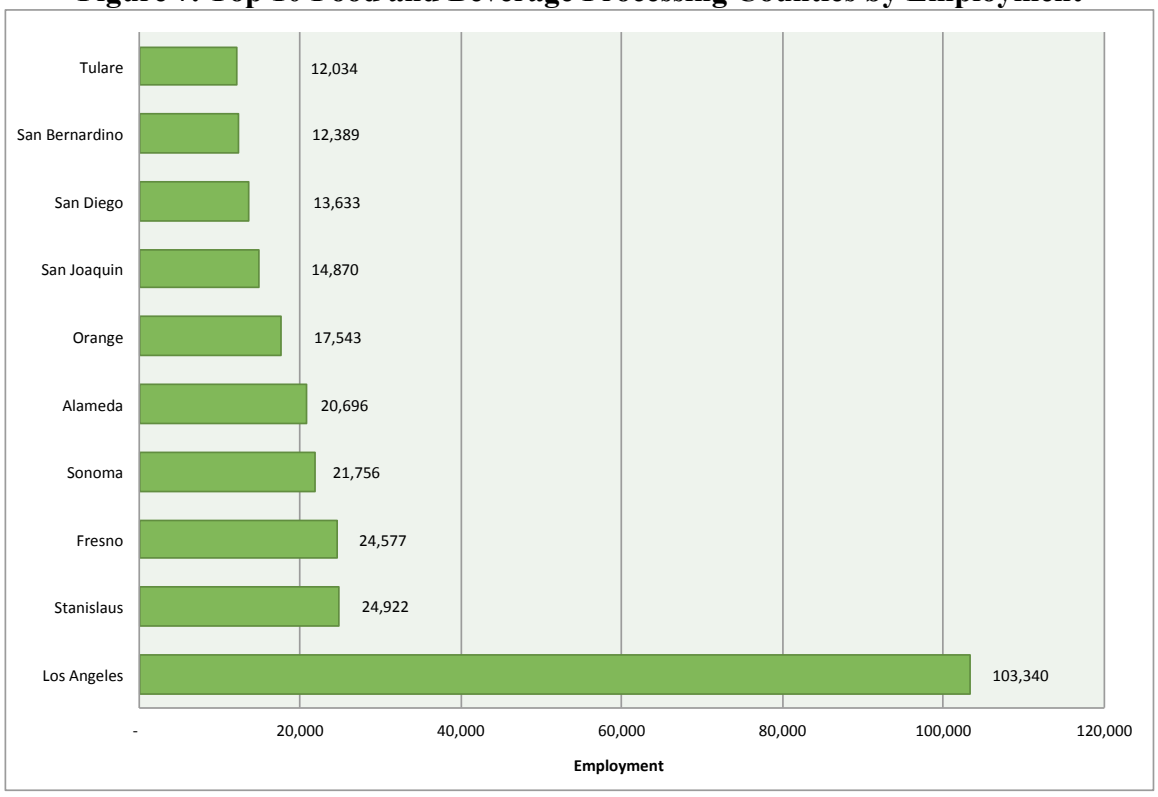


Figure 8. Fraction of Employment in Food and Beverage Processing by County

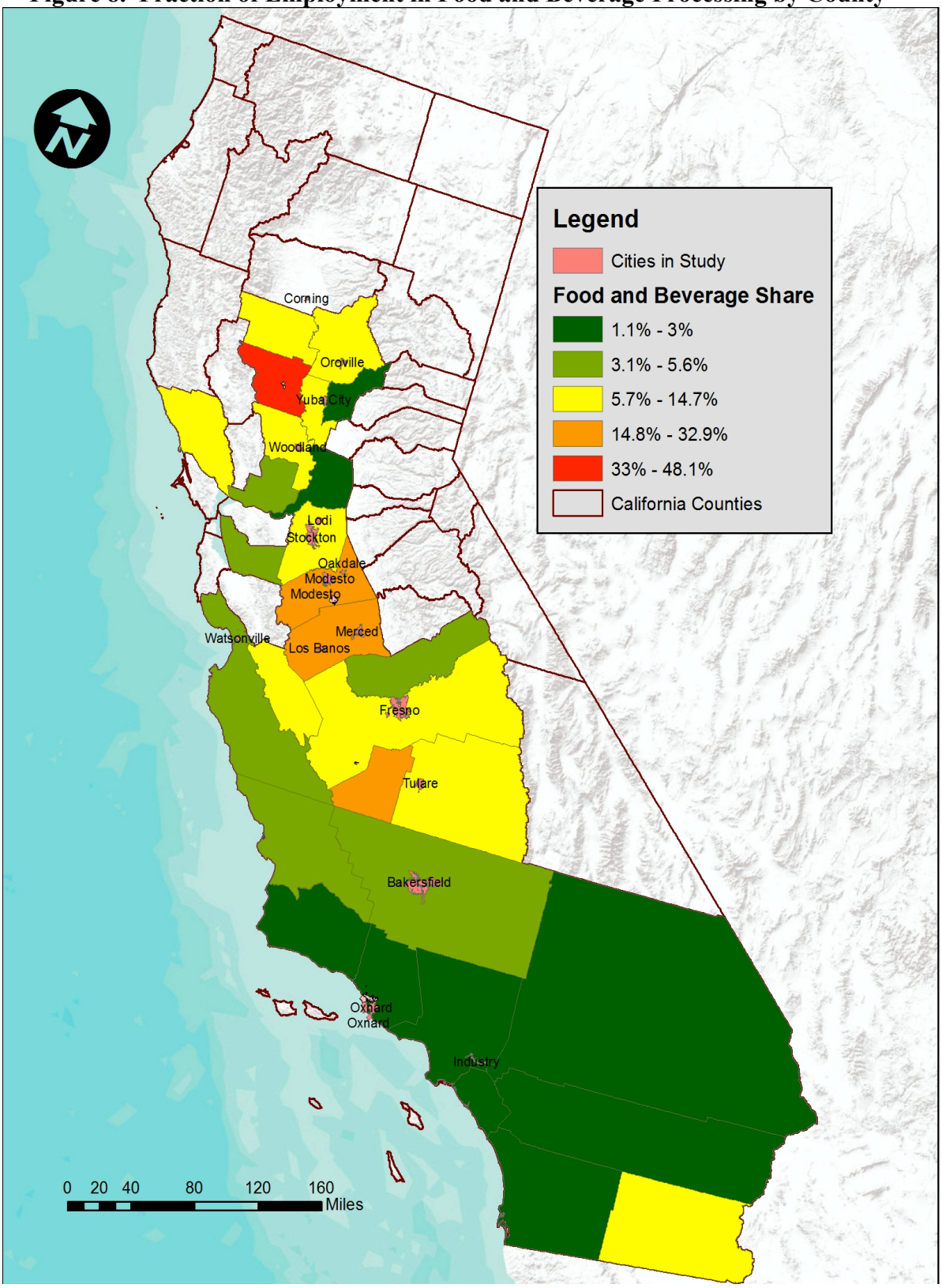


Figure 9. Top 10 Food and Beverage Processing Counties by Sector Output

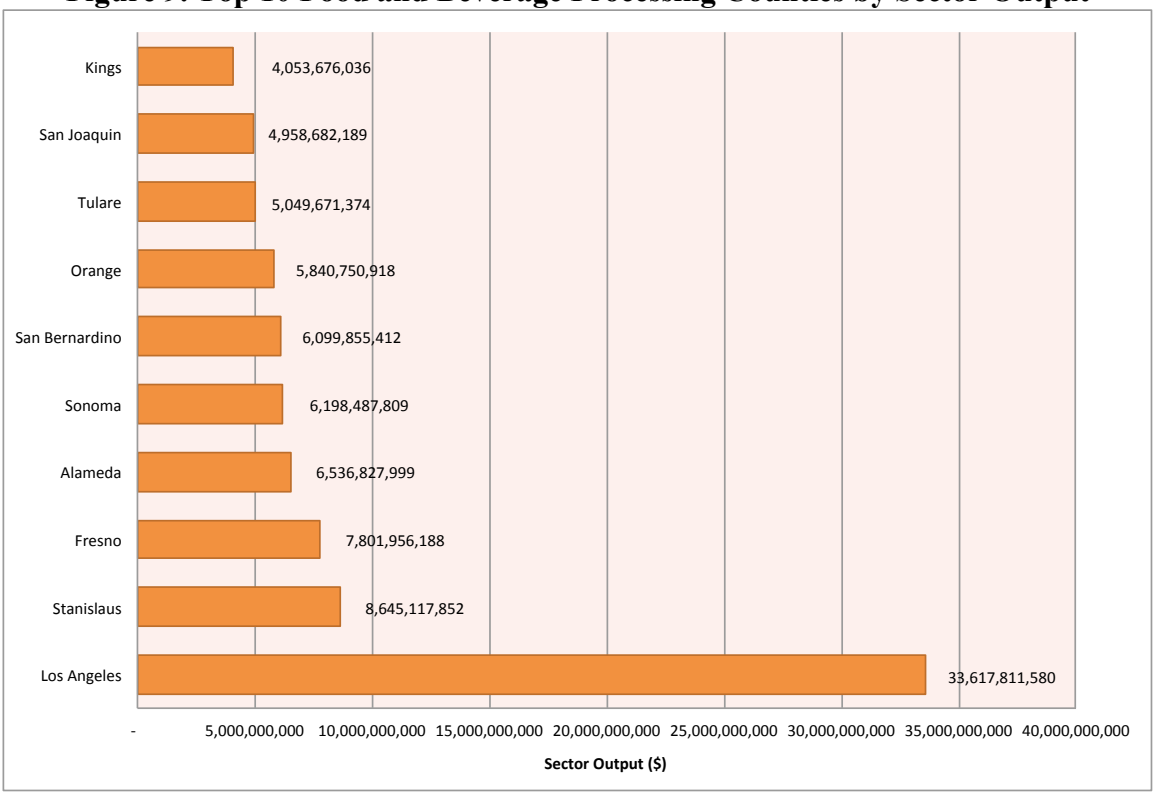


Table 1. Geographic Coverage of Each Impact Analysis Performed

Analysis for:	Geographic Coverage	Method
Statewide	58 California Counties	Aggregation of all counties
Counties (30)	Alameda, Butte, Colusa, Fresno, Glenn, Imperial, Kern, Kings, Los Angeles, Madera, Merced, Monterey, Orange, Riverside, Sacramento, San Benito, San Bernardino, San Diego, San Joaquin , San Luis Obispo, Santa Barbara, Santa Cruz, Solano, Sonoma, Stanislaus, Sutter, Tulare, Ventura, Yolo, and Yuba	Individual counties
Regions (2)	**Central Valley:** Butte, Colusa, Fresno, Glenn, Kern, Kings, Madera, Merced, Sacramento, San Benito, San Joaquin, Stanislaus, Sutter, Tulare, Yolo, and Yuba **Southern California:** Imperial, Los Angeles, Orange, Riverside, San Bernardino, San Diego, Santa Barbara, and Ventura	Aggregation of specific counties
Metropolitan Areas (MAs) (20)	Bakersfield, City of Industry, Corning, Fresno, Huron, Lodi, Los Banos, Merced, Modesto, Oakdale, Oroville, Oxnard, Stockton, Tulare, Turlock, Ventura, Watsonville, Williams, Woodland, and Yuba City	A MA is comprised of all zip codes wholly or partially included in the city boundary

Table 2. Food & Beverage Processing Value Added by Sector (*thousands of dollars*)

Sector	*Direct*	*Indirect*	*Induced*	*Total*	*Multiplier*
Flour milling and malt manufacturing	297,430	790,768	338,535	1,426,734	4.80
Wet corn milling	58,968	169,337	71,345	299,650	5.08
Soybean and other oilseed processing	58,121	166,822	81,246	306,189	5.27
Fats and oils refining and blending	334,200	707,620	250,526	1,292,347	3.87
Breakfast cereal manufacturing	200,621	118,198	72,900	391,719	1.95
Sugar cane mills and refining	111,925	268,198	136,286	516,408	4.61
Beet sugar manufacturing	15,264	34,938	17,218	67,420	4.42
Chocolate and confectionery manufacturing from cacao beans	160,162	323,458	163,604	647,223	4.04
Confectionery manufacturing from purchased chocolate	284,590	272,714	164,177	721,481	2.54
Nonchocolate confectionery manufacturing	176,333	256,766	138,859	571,959	3.24
Frozen food manufacturing	972,450	1,460,846	908,717	3,342,012	3.44
Fruit and vegetable canning, pickling, and drying	2,220,905	3,726,972	1,902,937	7,850,814	3.53
Fluid milk and butter manufacturing	2,312,040	4,935,992	1,833,058	9,081,090	3.93
Cheese manufacturing	648,127	3,124,760	1,116,586	4,889,473	7.54
Dry, condensed, and evaporated dairy product manufacturing	148,346	447,044	178,915	774,305	5.22
Ice cream and frozen dessert manufacturing	257,093	418,428	228,136	903,656	3.51
Animal (except poultry) slaughtering, rendering, and processing	535,129	1,589,124	842,591	2,966,844	5.54
Poultry processing	717,824	1,267,400	676,910	2,662,135	3.71
Seafood product preparation and packaging	68,791	121,188	73,163	263,143	3.83
Bread and bakery product manufacturing	1,673,560	1,645,785	1,274,654	4,594,000	2.75
Cookie, cracker, and pasta manufacturing	455,112	679,739	359,042	1,493,893	3.28
Tortilla manufacturing	511,661	431,368	327,044	1,270,073	2.48
Snack food manufacturing	1,701,458	1,916,252	977,768	4,595,478	2.70
Coffee and tea manufacturing	271,383	672,465	322,333	1,266,180	4.67
Flavoring syrup and concentrate manufacturing	1,415,387	598,554	228,639	2,242,581	1.58
Seasoning and dressing manufacturing	442,154	921,740	475,253	1,839,147	4.16
All other food manufacturing	778,410	1,216,618	699,613	2,694,641	3.46
Soft drink and ice manufacturing	1,720,053	3,570,442	1,738,715	7,029,209	4.09
Breweries	2,123,427	1,108,675	580,353	3,812,456	1.80
Wineries	3,648,947	4,446,960	3,024,114	11,120,021	3.05
Distilleries	912,396	81,042	43,453	1,036,892	1.14
Total	**25,232,267**	**37,490,214**	**19,246,691**	**81,969,173**	**3.25**

Table 3. Food & Beverage Processing Employment by Sector (*number of full- and part-time jobs)*

Sector	*Direct*	*Indirect*	*Induced*	*Total*	*Multiplier*
Flour milling and malt manufacturing	2,008	8,302	3,849	14,159	7.05
Wet corn milling	254	1,853	811	2,918	11.50
Soybean and other oilseed processing	572	1,616	924	3,112	5.44
Fats and oils refining and blending	710	5,958	2,848	9,517	13.40
Breakfast cereal manufacturing	631	1,105	829	2,564	4.07
Sugar cane mills and refining	808	3,191	1,550	5,548	6.87
Beet sugar manufacturing	151	508	196	855	5.67
Chocolate and confectionery manufacturing from cacao beans	1,101	2,944	1,861	5,905	5.36
Confectionery manufacturing from purchased chocolate	2,395	2,370	1,866	6,632	2.77
Nonchocolate confectionery manufacturing	1,839	2,213	1,579	5,630	3.06
Frozen food manufacturing	12,324	14,071	10,334	36,729	2.98
Fruit and vegetable canning, pickling, and drying	19,702	31,685	21,641	73,029	3.71
Fluid milk and butter manufacturing	8,072	45,864	20,850	74,785	9.27
Cheese manufacturing	6,183	29,928	12,700	48,811	7.89
Dry, condensed, and evaporated dairy product manufacturing	1,036	4,058	2,035	7,128	6.88
Ice cream and frozen dessert manufacturing	2,605	3,599	2,594	8,797	3.38
Animal (except poultry) slaughtering, rendering, and processing	13,079	25,107	9,582	47,767	3.65
Poultry processing	8,976	11,841	7,699	28,516	3.18
Seafood product preparation and packaging	1,237	1,277	832	3,346	2.71
Bread and bakery product manufacturing	28,635	16,622	14,489	59,746	2.09
Cookie, cracker, and pasta manufacturing	5,032	6,059	4,082	15,173	3.02
Tortilla manufacturing	6,689	4,144	3,717	14,550	2.18
Snack food manufacturing	8,518	17,422	11,121	37,061	4.35
Coffee and tea manufacturing	1,800	6,145	3,669	11,614	6.45
Flavoring syrup and concentrate manufacturing	1,154	4,423	2,601	8,178	7.09
Seasoning and dressing manufacturing	4,165	7,896	5,404	17,465	4.19
All other food manufacturing	10,468	11,559	7,957	29,985	2.86
Soft drink and ice manufacturing	13,557	24,766	19,778	58,101	4.29
Breweries	3,827	8,882	6,601	19,310	5.05
Wineries	30,441	37,576	34,396	102,412	3.36
Distilleries	358	637	494	1,488	4.16
Total	**198,326**	**343,619**	**218,888**	**760,833**	**3.84**

Table 4. Food & Beverage Processing Output by Sector (*thousands of dollars*)

Sector	*Direct*	*Indirect*	*Induced*	*Total*	*Multiplier*
Flour milling and malt manufacturing	2,575,887	1,447,061	552,034	4,574,982	1.78
Wet corn milling	594,906	319,688	116,341	1,030,935	1.73
Soybean and other oilseed processing	1,151,090	342,611	132,486	1,626,187	1.41
Fats and oils refining and blending	3,133,327	2,329,581	408,520	5,871,428	1.87
Breakfast cereal manufacturing	495,323	258,442	118,872	872,638	1.76
Sugar cane mills and refining	819,790	623,627	222,235	1,665,652	2.03
Beet sugar manufacturing	105,668	68,971	28,077	202,717	1.92
Chocolate and confectionery manufacturing from cacao beans	932,762	730,932	266,785	1,930,479	2.07
Confectionery manufacturing from purchased chocolate	877,914	607,144	267,710	1,752,769	2.00
Nonchocolate confectionery manufacturing	757,201	546,006	226,427	1,529,635	2.02
Frozen food manufacturing	4,114,893	3,258,188	1,481,818	8,854,899	2.15
Fruit and vegetable canning, pickling, and drying	9,730,820	7,949,838	3,103,074	20,783,732	2.14
Fluid milk and butter manufacturing	10,380,922	11,890,428	2,989,154	25,260,505	2.43
Cheese manufacturing	6,036,492	8,662,836	1,820,808	16,520,137	2.74
Dry, condensed, and evaporated dairy product manufacturing	961,623	1,105,973	291,752	2,359,348	2.45
Ice cream and frozen dessert manufacturing	1,012,279	979,309	372,006	2,363,594	2.33
Animal (except poultry) slaughtering, rendering, and processing	4,244,186	5,106,589	1,373,988	10,724,763	2.53
Poultry processing	3,830,357	3,215,534	1,103,824	8,149,715	2.13
Seafood product preparation and packaging	439,764	208,062	119,304	767,130	1.74
Bread and bakery product manufacturing	5,000,682	3,297,094	2,078,473	10,376,249	2.07
Cookie, cracker, and pasta manufacturing	2,002,897	1,550,179	585,466	4,138,542	2.07
Tortilla manufacturing	1,490,277	907,680	533,282	2,931,239	1.97
Snack food manufacturing	5,926,102	4,159,956	1,594,438	11,680,495	1.97
Coffee and tea manufacturing	1,501,674	1,214,148	525,657	3,241,479	2.16
Flavoring syrup and concentrate manufacturing	2,887,081	1,240,734	372,842	4,500,656	1.56
Seasoning and dressing manufacturing	2,449,512	2,088,578	774,974	5,313,063	2.17
All other food manufacturing	3,258,407	2,400,601	1,140,852	6,799,860	2.09
Soft drink and ice manufacturing	10,359,595	7,456,667	2,835,313	20,651,575	1.99
Breweries	4,532,918	2,348,941	946,373	7,828,232	1.73
Wineries	12,201,193	8,666,803	4,931,380	25,799,376	2.11
Distilleries	1,107,479	139,679	70,858	1,318,016	1.19
Total	**104,913,022**	**85,121,881**	**31,385,124**	**221,420,027**	**2.11**

Table 5. Food & Beverage Processing Value Added by County and Region (*thousands of dollars*)

County	*Direct*	*Indirect*	*Induced*	*Total*	*Multiplier*
Alameda	877,097	700,900	439,479	2,017,476	2.30
Butte*	188,632	130,934	61,888	381,454	2.02
Colusa*	67,035	63,700	15,395	146,130	2.18
Fresno*	967,685	536,945	401,749	1,906,379	1.97
Glenn*	13,071	14,394	3,209	30,675	2.35
Imperial~	82,817	56,052	22,424	161,293	1.95
Kern*	483,405	242,100	140,648	866,153	1.79
Kings*	347,577	251,439	90,796	689,812	1.98
Los Angeles~	6,085,688	3,313,278	2,187,955	11,586,921	1.90
Madera*	48,460	13,523	9,401	71,384	1.47
Merced*	403,797	214,762	111,888	730,447	1.81
Monterey	290,951	121,159	90,233	502,343	1.73
Orange County~	1,125,840	504,086	350,820	1,980,746	1.76
Riverside~	354,527	131,205	101,590	587,322	1.66
Sacramento*	592,753	321,597	184,386	1,098,735	1.85
San Benito*	67,995	14,222	9,134	91,351	1.34
San Bernardino~	693,931	220,551	183,838	1,098,319	1.58
San Diego~	619,630	436,790	272,242	1,328,662	2.14
San Joaquin*	682,654	402,501	258,261	1,343,416	1.97
San Luis Obispo	202,673	98,897	62,510	364,080	1.80
Santa Barbara~	237,736	88,242	67,603	393,582	1.66
Santa Cruz	116,566	84,512	44,336	245,415	2.11
Solano	266,296	105,301	70,435	442,032	1.66
Sonoma	1,048,163	648,488	408,033	2,104,685	2.01
Stanislaus*	1,259,509	622,451	473,523	2,355,483	1.87
Sutter*	71,316	51,359	27,840	150,516	2.11
Tulare*	528,591	354,948	138,656	1,022,194	1.93
Ventura~	161,235	69,185	55,441	285,861	1.77
Yolo*	173,228	176,598	62,925	412,751	2.38
Yuba*	4,663	2,964	1,055	8,682	1.86
Central Valley (*)	***7,746,123***	***8,495,301***	***3,483,906***	***19,725,330***	***2.55***
Southern California (~)	***10,387,169***	***11,687,242***	***6,749,446***	***28,823,856***	***2.77***
Statewide	***25,232,267***	***35,789,514***	***18,927,011***	***79,948,792***	***3.17***

Table 6. Food & Beverage Processing Employment by County and Region (*number of full- and part-time jobs)*

County	*Direct*	*Indirect*	*Induced*	*Total*	*Total Employment*[a]	*% F&B*	*Multiplier*
Alameda	9,971	5,992	4,733	20,696	587,140	4%	2.08
Butte*	1,345	2,016	839	4,201	53,701	8%	3.12
Colusa*	850	839	188	1,878	3,906	48%	2.21
Fresno*	13,798	5,907	4,873	24,577	234,997	10%	1.78
Glenn*	193	196	39	427	4,571	9%	2.22
Imperial~	1,847	666	305	2,818	30,146	9%	1.53
Kern*	5,926	2,615	1,730	10,271	189,978	5%	1.73
Kings*	4,051	2,479	1,127	7,657	23,303	33%	1.89
Los Angeles~	46,587	30,678	26,075	103,340	3,661,816	3%	2.22
Madera*	611	170	111	892	24,789	4%	1.46
Merced*	5,241	2,428	1,385	9,054	40,720	22%	1.73
Monterey	3,214	1,308	1,047	5,569	99,143	6%	1.73
Orange County~	8,904	4,582	4,058	17,543	1,349,188	1%	1.97
Riverside~	3,288	1,620	1,289	6,197	477,065	1%	1.88
Sacramento*	4,491	3,501	2,227	10,219	406,240	3%	2.28
San Benito*	887	202	108	1,197	9,476	13%	1.35
San Bernardino~	7,015	3,030	2,344	12,389	520,686	2%	1.77
San Diego~	6,418	4,072	3,143	13,633	1,157,453	1%	2.12
San Joaquin*	7,329	4,438	3,104	14,870	162,644	9%	2.03
San Luis Obispo	2,052	1,111	758	3,921	83,834	5%	1.91
Santa Barbara~	2,020	1,106	870	3,997	134,241	3%	1.98
Santa Cruz	1,401	1,031	558	2,989	68,500	4%	2.13
Solano	2,111	1,162	836	4,109	99,866	4%	1.95
Sonoma	9,477	7,351	4,928	21,756	147,777	15%	2.30
Stanislaus*	11,918	7,190	5,814	24,922	125,773	20%	2.09
Sutter*	846	798	372	2,016	19,153	11%	2.38
Tulare*	6,022	4,161	1,852	12,034	87,055	14%	2.00
Ventura~	1,383	695	653	2,731	240,958	1%	1.98
Yolo*	1,656	2,380	734	4,770	59,880	8%	2.88
Yuba*	57	48	11	117	8,706	1%	2.04
Central Valley (*)	***66,138***	***93,666***	***44,825***	***204,628***			***3.09***
Southern California (~)	***77,763***	***109,847***	***79,433***	***267,043***			***3.43***
Statewide	***198,326***	***337,687***	***215,163***	***751,176***	***12,952,818***	6%	***3.79***

[a] United States Census Bureau, County Business Patterns, Total Employment by County, available at: http://www.census.gov/econ/cbp/.

Table 7. Food & Beverage Processing Sector Output by County and Region (*thousands of dollars*)

County	*Direct*	*Indirect*	*Induced*	*Total*	*Multiplier*
Alameda	4,715,321	1,187,293	634,214	6,536,828	1.39
Butte*	1,054,802	272,643	94,141	1,421,585	1.35
Colusa*	742,847	144,320	23,716	910,883	1.23
Fresno*	6,251,231	965,144	585,582	7,801,956	1.25
Glenn*	138,150	37,246	4,875	180,272	1.30
Imperial~	730,875	156,965	33,804	921,644	1.26
Kern*	2,980,705	412,364	206,821	3,599,890	1.21
Kings*	3,196,974	714,677	142,025	4,053,676	1.27
Los Angeles~	24,151,071	6,038,579	3,428,161	33,617,812	1.39
Madera*	325,149	25,404	13,808	364,362	1.12
Merced*	2,883,481	440,030	165,726	3,489,237	1.21
Monterey	1,316,992	211,663	128,544	1,657,199	1.26
Orange County~	4,505,764	807,743	527,244	5,840,751	1.30
Riverside~	1,826,474	229,875	149,057	2,205,406	1.21
Sacramento*	2,455,909	578,222	280,759	3,314,890	1.35
San Benito*	394,163	32,695	19,340	446,197	1.13
San Bernardino~	5,388,502	446,963	264,390	6,099,855	1.13
San Diego~	2,885,049	743,564	404,837	4,033,450	1.40
San Joaquin*	3,855,105	723,963	379,614	4,958,682	1.29
San Luis Obispo	864,109	190,500	93,509	1,148,118	1.33
Santa Barbara~	831,713	156,477	102,362	1,090,551	1.31
Santa Cruz	656,145	152,020	65,901	874,066	1.33
Solano	1,307,019	200,451	104,551	1,612,021	1.23
Sonoma	4,257,947	1,333,841	606,700	6,198,488	1.46
Stanislaus*	6,716,159	1,235,240	693,719	8,645,118	1.29
Sutter*	446,447	98,636	41,524	586,606	1.31
Tulare*	3,978,654	863,130	207,888	5,049,671	1.27
Ventura~	780,022	110,179	80,346	970,546	1.24
Yolo*	1,324,426	331,965	92,744	1,749,135	1.32
Yuba*	31,152	6,019	1,568	38,739	1.24
Central Valley (*)	***37,001,639***	***21,198,062***	***5,605,444***	***63,805,145***	***1.72***
Southern California (~)	***41,601,348***	***25,105,847***	***10,959,433***	***77,666,628***	***1.87***
Statewide	***104,913,022***	***80,706,322***	***30,822,041***	***216,441,385***	***2.06***

Table 8. Food & Beverage Processing Value Added by Metropolitan Area
(*thousands of dollars*)

City/MA	*Direct*	*Indirect*	*Induced*	*Total*	*Multiplier*
Bakersfield	232,507	348,514	154,137	735,158	3.16
City of Industry	893,331	867,606	397,771	2,158,709	2.42
Corning	28,743	22,603	5,050	56,395	1.96
Fresno	593,137	1,041,460	487,990	2,122,587	3.58
Huron	4,043	2,065	550	6,659	1.65
Lodi	221,069	129,997	78,715	429,781	1.94
Los Banos	80,999	30,163	13,717	124,880	1.54
Merced	15,642	23,868	9,943	49,453	3.16
Modesto	679,548	381,639	228,678	1,289,865	1.90
Oakdale	43,546	38,742	14,885	97,172	2.23
Oroville	9,032	6,564	2,465	18,062	2.00
Oxnard	127,735	86,787	57,903	272,425	2.13
Stockton	307,879	329,208	145,467	782,555	2.54
Tulare	220,563	302,100	77,716	600,379	2.72
Turlock	322,173	315,980	136,469	774,622	2.40
Ventura	66,466	32,416	27,062	125,945	1.89
Watsonville	65,211	57,712	25,644	148,567	2.28
Williams	25,031	11,526	3,348	39,905	1.59
Woodland	95,144	80,217	25,700	201,061	2.11
Yuba City	72,704	61,272	32,660	166,635	2.29

Table 9. Food & Beverage Processing Employment by Metropolitan Area (*number of full- and part-time jobs)*

City/MA	*Direct*	*Indirect*	*Induced*	*Total*	*Employment*[a]	*% F&B*	*Multiplier*
Bakersfield	3,557	3,869	1,870	9,296	150,900	6%	2.61
City of Industry	6,586	7,419	4,159	18,164	NA	NA	2.76
Corning	373	445	59	877	2,450	36%	2.35
Fresno	9,365	11,630	5,990	26,985	199,000	14%	2.88
Huron	53	26	4	83	2,400	3%	1.57
Lodi	2,028	1,494	976	4,498	28,100	16%	2.22
Los Banos	639	361	174	1,174	11,400	10%	1.84
Merced	278	105	51	434	27,400	2%	1.56
Modesto	5,198	4,579	3,096	12,873	89,400	14%	2.48
Oakdale	503	465	159	1,127	7,700	15%	2.24
Oroville	127	85	30	243	4,500	5%	1.91
Oxnard	1,134	886	665	2,684	80,900	3%	2.37
Stockton	2,957	3,611	1,729	8,297	102,900	8%	2.81
Tulare	1,770	3,049	989	5,808	20,700	28%	3.28
Turlock	3,314	3,521	1,645	8,479	25,700	33%	2.56
Ventura	471	380	315	1,166	57,400	2%	2.47
Watsonville	826	734	286	1,846	18,200	10%	2.24
Williams	419	121	42	582	1,420	41%	1.39
Woodland	763	893	313	1,970	25,100	8%	2.58
Yuba City	856	776	422	2,054	16,100	13%	2.40

[a] Data from the California Employment Development Department, Labor Force and Unemployment Rates for Cities and Census Designated Areas, 2012 Annual Average, available at: http://www.labormarketinfo.edd.ca.gov/CES/Labor_Force_Unemployment_Data_for_Cities_and_Census_Areas.html#CCD

Table 10. Food & Beverage Processing Sector Output by Metropolitan Area
(*thousands of dollars*)

City/MA	*Direct*	*Indirect*	*Induced*	*Total*	*Multiplier*
Bakersfield	1,413,313	798,441	243,977	2,455,731	1.74
City of Industry	4,549,074	1,957,843	615,982	7,122,899	1.57
Corning	275,016	57,636	7,745	340,397	1.24
Fresno	4,163,985	2,579,576	772,195	7,515,755	1.80
Huron	26,472	5,364	758	32,593	1.23
Lodi	922,592	282,256	120,007	1,324,856	1.44
Los Banos	372,934	83,941	21,123	477,999	1.28
Merced	108,683	60,054	15,362	184,099	1.69
Modesto	2,597,247	852,308	355,782	3,805,337	1.47
Oakdale	259,827	93,894	22,203	375,923	1.45
Oroville	60,632	15,937	3,751	80,320	1.32
Oxnard	611,501	153,063	87,123	851,687	1.39
Stockton	1,899,300	671,768	220,157	2,791,225	1.47
Tulare	1,845,011	961,626	127,587	2,934,224	1.59
Turlock	1,860,880	908,763	216,012	2,985,655	1.60
Ventura	284,830	54,934	40,370	380,135	1.33
Watsonville	383,991	104,844	37,680	526,515	1.37
Williams	218,580	24,285	5,029	247,893	1.13
Woodland	622,296	149,244	39,597	811,138	1.30
Yuba City	450,528	117,839	49,204	617,570	1.37

Table 11. County and State Tax Impacts
(*per million dollars of direct Sector Output*)

County	*Federal*	*State and Local*
Alameda	60,993	43,800
Butte	47,124	83,433
Colusa	26,804	22,209
Fresno	42,258	29,554
Glenn	28,079	16,474
Imperial	31,027	21,427
Kern	40,046	22,465
Kings	26,406	17,293
Los Angeles	62,350	51,651
Madera	29,066	36,085
Merced	34,764	21,881
Monterey	52,968	52,691
Orange	58,444	35,270
Riverside	42,570	56,557
Sacramento	53,299	38,556
San Benito	30,936	29,270
San Bernadino	27,378	15,118
San Diego	61,185	71,277
San Joaquin	48,915	42,467
San Louis Obispo	60,355	98,561
Santa Barbara	60,268	98,554
Santa Cruz	51,209	40,033
Solano	45,049	59,359
Sonoma	135,550	51,071
Stanislaus	49,068	40,846
Sutter	47,205	27,194
Tulare	33,580	20,404
Ventura	52,663	34,713
Yolo	38,055	32,342
Yuba	30,912	29,353
California Total[a]	99,783	77,940

[a] California total is the statewide impact, therefore the sum of the counties in the table does not equal the state total.

6 Investigator Bios

Richard J. Sexton is a Professor and Chair in the Department of Agricultural and Resource Economics at the University of California, Davis. Sexton previously served as President of the Agricultural and Applied Economics Association (AAEA), Department chair at Davis from 1994-1998, Director of the Giannini Foundation of Agricultural Economics from 2000-03, and co-editor of the *American Journal of Agricultural Economics* (*AJAE*) from 1998-2000. Professor Sexton teaches and conducts research on a wide range of issues pertaining to marketing of agricultural products. He is an expert on production and marketing of California agricultural products, with particular focus on produce commodities and tree fruit and nut crops. His research has been published in a broad range of journals including *Agricultural Economics, American Journal of Agricultural Economics, American Economic Review, European Economic Review, Journal of Agricultural and Resource Economics, Journal of Environmental Economics and Management, Journal of Industrial Economics, Journal of Regulatory Economics, Land Economics, Rand Journal of Economics,* and *Review of Industrial Organization.* Sexton's research has been recognized with awards from the AAEA, European Economics Association, and Western Agricultural Economics Association. He is a 2004 Fellow of the AAEA.

Josué Medellin-Azuara is a Research Fellow in the Department of Civil and Environmental Engineering at the University of California, Davis. He holds a M.S. degree in Agricultural & Resource Economics and a Ph.D. degree in Ecology, both from UC Davis. He works currently in the Delta Solutions Program of the Center for Watershed Sciences at UC Davis. Dr. Medellin-Azuara is an expert in modeling agricultural production and water use in California and in the application of the SWAP and IMPLAN models. His research has been published in several scientific journals including *Climate Change*, *Water Resources Research, Journal of Hydrology,* and *Journal of Environmental Management.*

Tina L. Saitone is a Project Economist in the Department of Agricultural and Resource Economics at the University of California, Davis. Dr. Saitone conducts research on a broad range of topics in agricultural economics including food quality and safety, industrial organization, agricultural marketing, and antitrust. Tina has published papers in academic journals including the *American Journal of Agricultural Economics*, *Canadian Journal of Agricultural Economics*, *Journal of Agricultural and Resource Economics, Annual Review of Resource Economics, Journal of Industrial Organization Education,* and *Journal of Rural Cooperation*. Dr. Saitone has taught courses at the University of California, Davis and Sonoma State University in business and antitrust regulation, microeconomics, and environmental economics.

The Economic Consequences of the Proposed Flow Objective for the Lower San Joaquin River in Merced, San Joaquin and Stanislaus Counties

Rodney T. Smith, Ph.D.
Jason Bass, CPA, CFA

SWRCB Hearing on Draft Substitute Environmental Document

Modesto, CA

December 20, 2016

Stratecon versus SWRCB Methods

- Groundwater pumping and lost surface water supplies
- Volatility of impacts
- Impacts on well elevations
- Downstream Linkages from the farm sector

Groundwater pumping and lost surface water supplies

- SWRCB: groundwater pumping increases to fully offset lost surface water supplies until groundwater pumping capacity exhausted with no consideration of implementation of the Sustainable Groundwater Management Act ("SMGA")

- Stratecon: groundwater pumping increases to offset half of lost surface water supplies until groundwater capacity exhausted before SGMA implementation

  - Reflects almost quarter of century of evidence from Westlands Water District's response to the variability in reduced surface water supplies

  - Increased groundwater pumping not sustainable after SMGA implementation

Volatility of Impacts

- Study area faces variable hydrologic conditions
- SWRCB: examines each water year separately and focuses on the average over all hydrologic conditions
- Stratecon: volatility of impacts has consequences
  - Reliability of surface water supplies
  - Sustainability of groundwater pumping before and after SMGA implementation

Impacts on Well Elevations

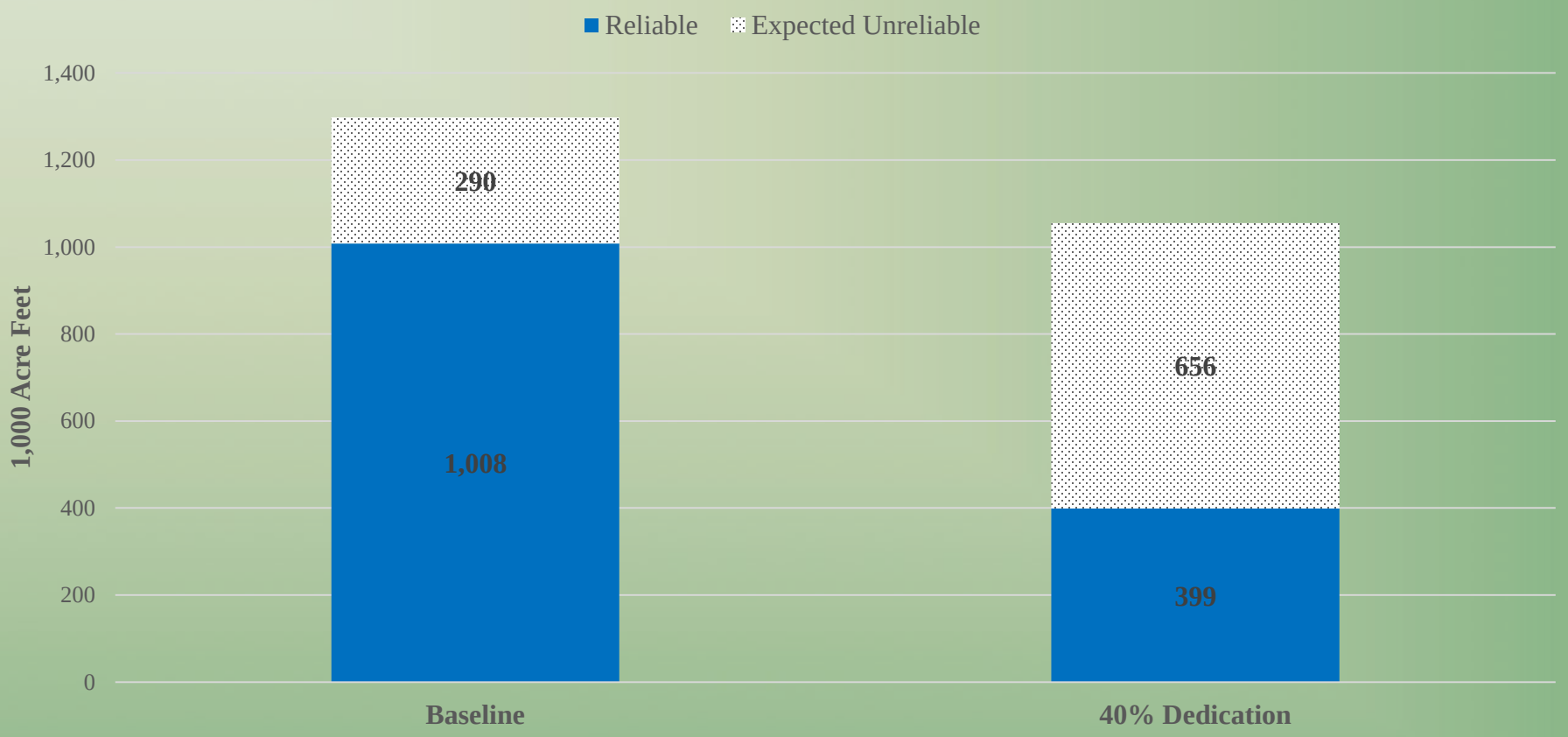
- SWRCB acknowledges that proposed flow objective will have significant and unavoidable adverse impacts on groundwater resources
- SWRCB: no quantification of impacts
- Stratecon: quantifies impact on groundwater elevations based on evidence from the impact of variability in surface water supplies available to Central San Joaquin Water Conservation District on groundwater elevations in San Joaquin County
  - Lower well elevations increase pumping costs for all water users

Downstream Linkeages from farm sector

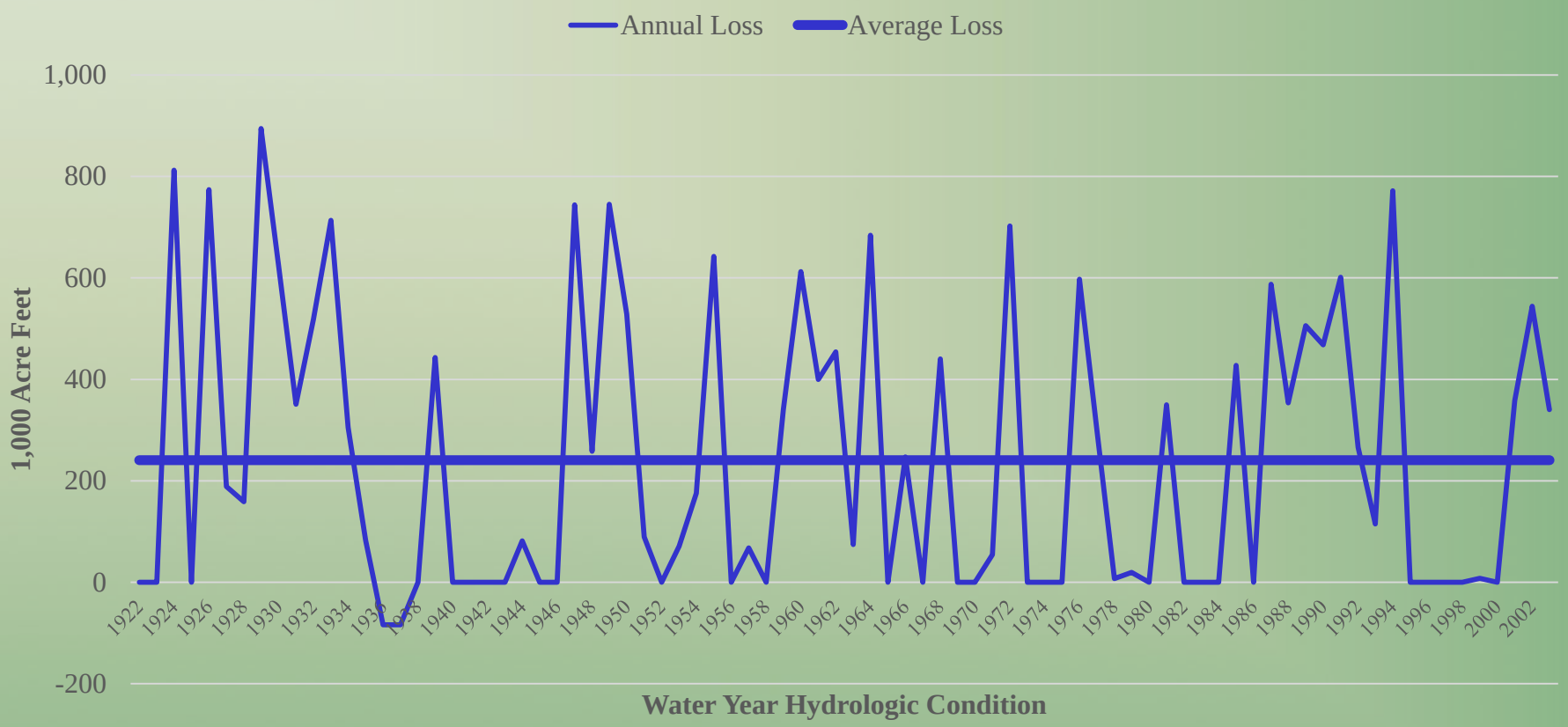
- Significant economic activity in dairy, livestock, food processing
- SWRCB: not considered
- Stratecon: considered

Surface Water Supply Reliability

Annual Reliable and (Expected) Unreliable Surface Water



Annual Loss of Surface Water Supplies Are Volatile

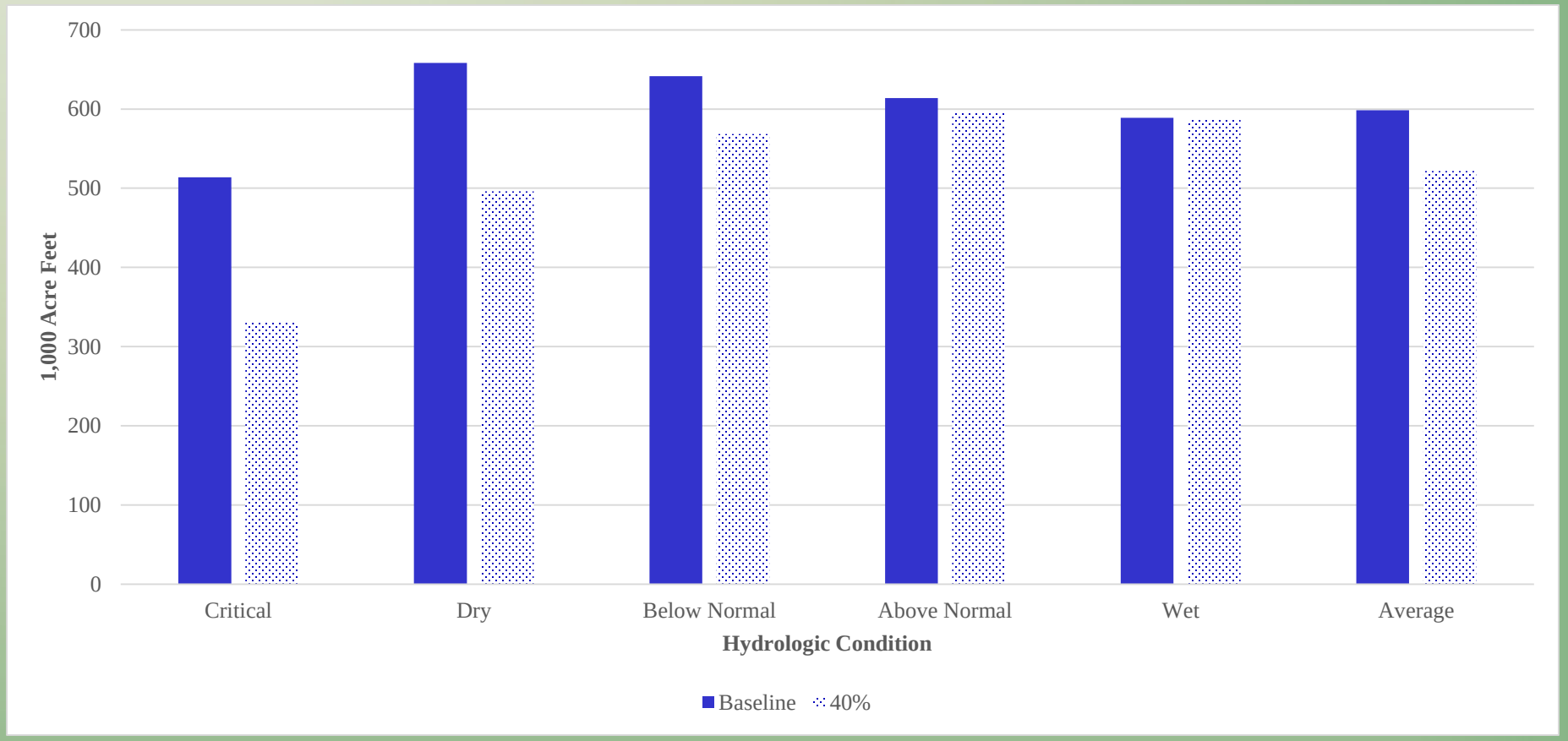


Groundwater Sustainability

All Sub-basins experiencing declining well elevations and are over drafted

Sub basin	Well Level Decline (inches/year)	Well Level Decline (inches/year)	Overdraft (TAF/year)
Eastern San Joaquin	20.0	5.3	88
Modesto	6.0	17.0	11 to 15
Turlock	2.8	20.0	9 to 85
Merced	12.0	27.0	22 to 44
Time Period	1970-2000	2005-2010	

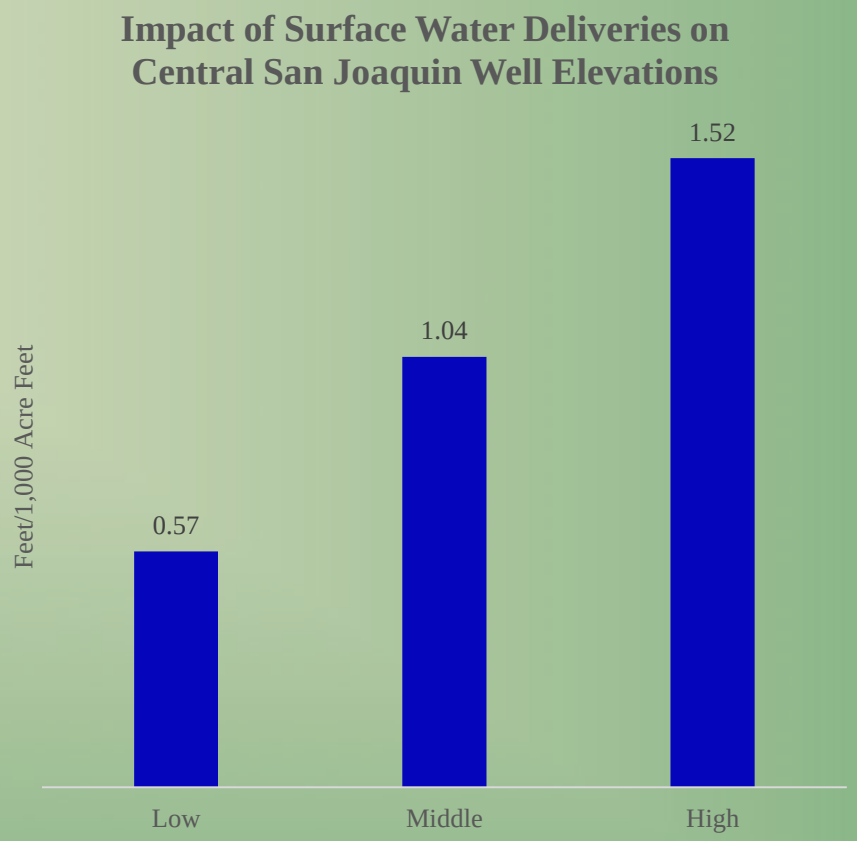
Annual Recharge from Distribution Losses and Deep Percolation in Study Area



Proposed Flow Objective and Well Elevations

Lessons from New Melones Litigation

- Natural experiment for assessing impact of surface water deliveries on well elevations
- Declining trend in well elevations in Central San Joaquin bottomed out with initiation of surface water deliveries
- Large variability in surface water deliveries explains annual variability in well elevations (see chart)



Reduced Well Elevations from Proposed Flow Objective

District	*Critical*	*Dry*	*Below Normal*	*Above Normal*	*Wet*
Central San Joaquin	10 to 20	20 to 45	5 to 10	0 to -2	0 to -4
Stockton East	2 to 5	12-38	-2 to -9	-2 to -5	-1 to -4
S. San Joaquin ID	30 to 80	10 to 30	8 to 18	8 to 15	1 to 3
Oakdale ID	45 to 118	19 to 42	10 to 22	10 to 22	1 to 3
Modesto ID	38 to 92	35 to 90	20 to 45	3 to -10	0 to 1
Turlock ID	32 to 82	30 to 80	15 to 40	3 to 9	none
Merced ID	35 to 80	60 to 140	22 to 60	1 to 3	none

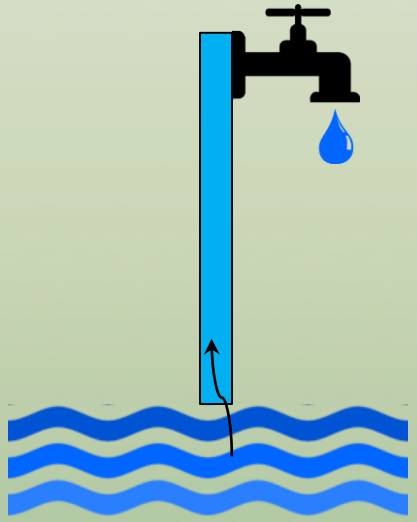
Economic Impact Analysis

ECONOMIC OUTPUT AND EMPLOYMENT

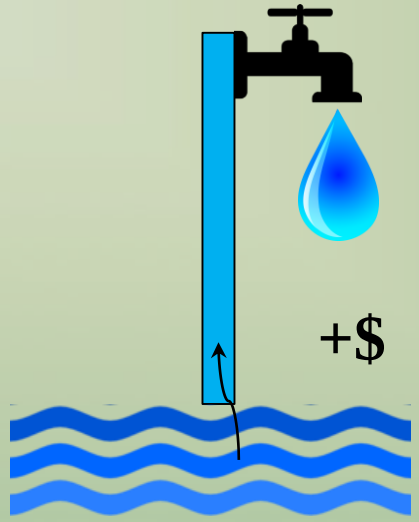
SWRCB QUANTIFIED	+	SWRCB DID NOT QUANTIFY
Increased Groundwater Pumping (Cost) Just Irrigation Districts with Surface Supplies	→	Increased Groundwater Depths (Cost) Irrigation Districts and All Other Regional Water Users
Crop Sector Losses Just Irrigation District growers	→	Other Sector Losses (Forward Linkages) Dairies, Dairy Product Manufacturers, Livestock Producers, etc.)
Groundwater Pumping Limited Only by Capacity	→	Sustainable Groundwater Management Act ("SGMA")

Increased Groundwater Depths

CURRENT

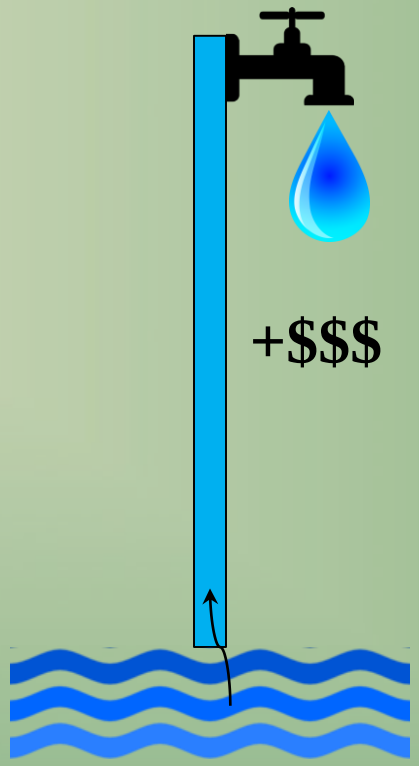


SWRCB



Just Those Reliant on Surface Water

ACTUAL



All Regional Water Users

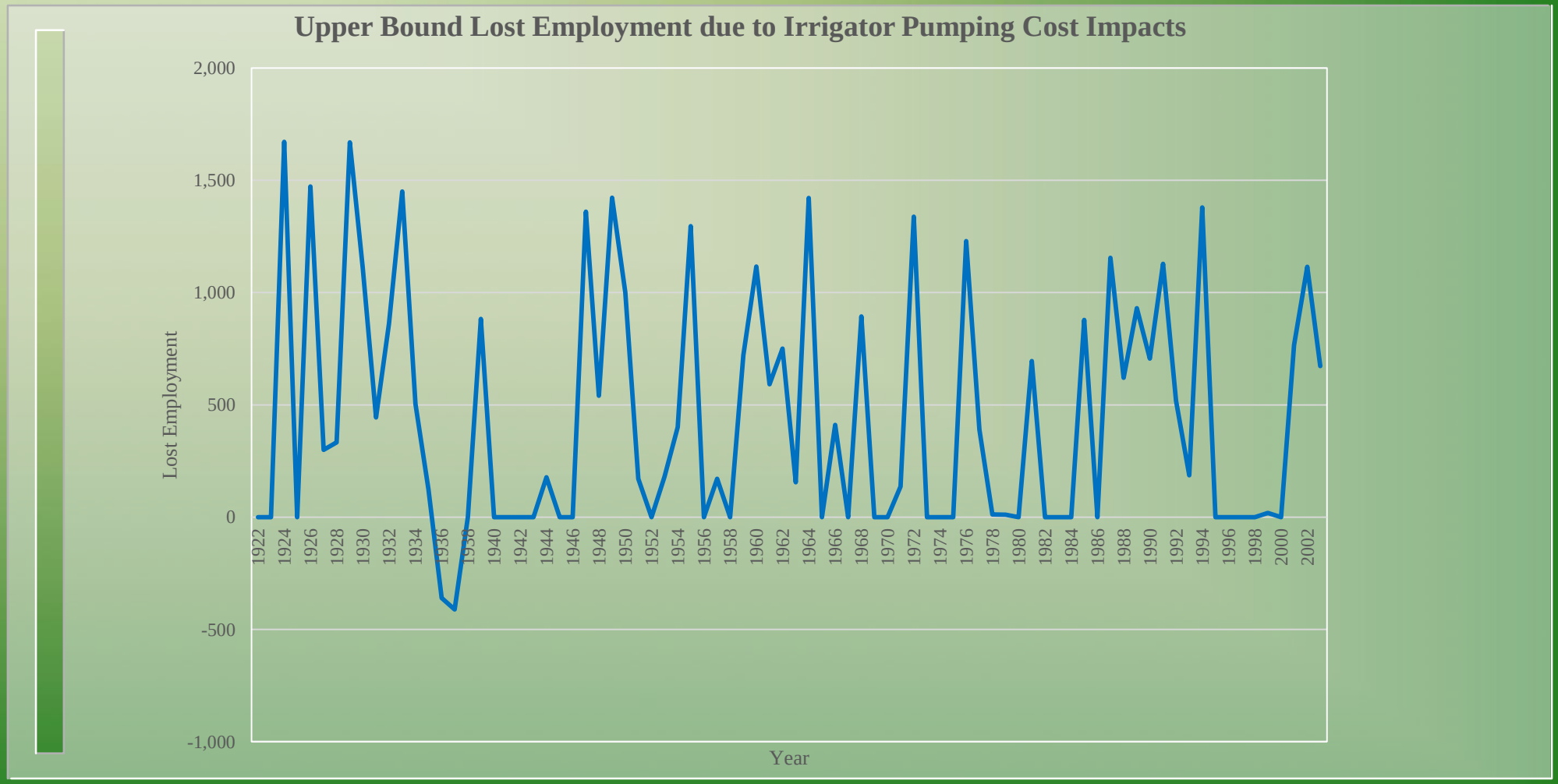
Increased Groundwater Depths

Irrigator Impacts

Increased Groundwater Depths - Farmers

User	Baseline Groundwater Pumping (000's of Acre-Feet)	Irrigated Acres (Acres)
Irrigation Districts	258	512,229
Outside of Irrigation Districts	1,466	531,431

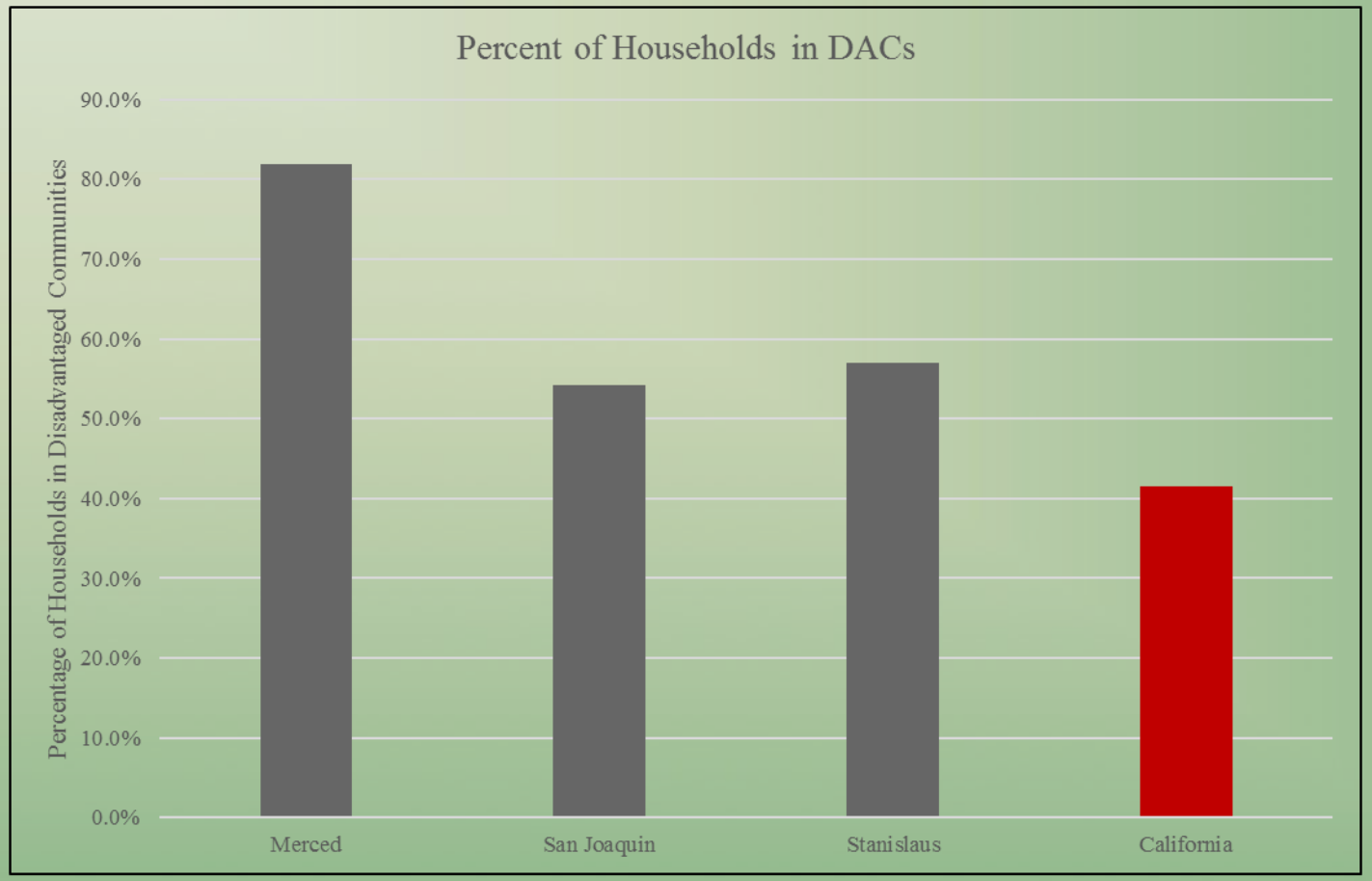
Increased Groundwater Depths - Irrigation



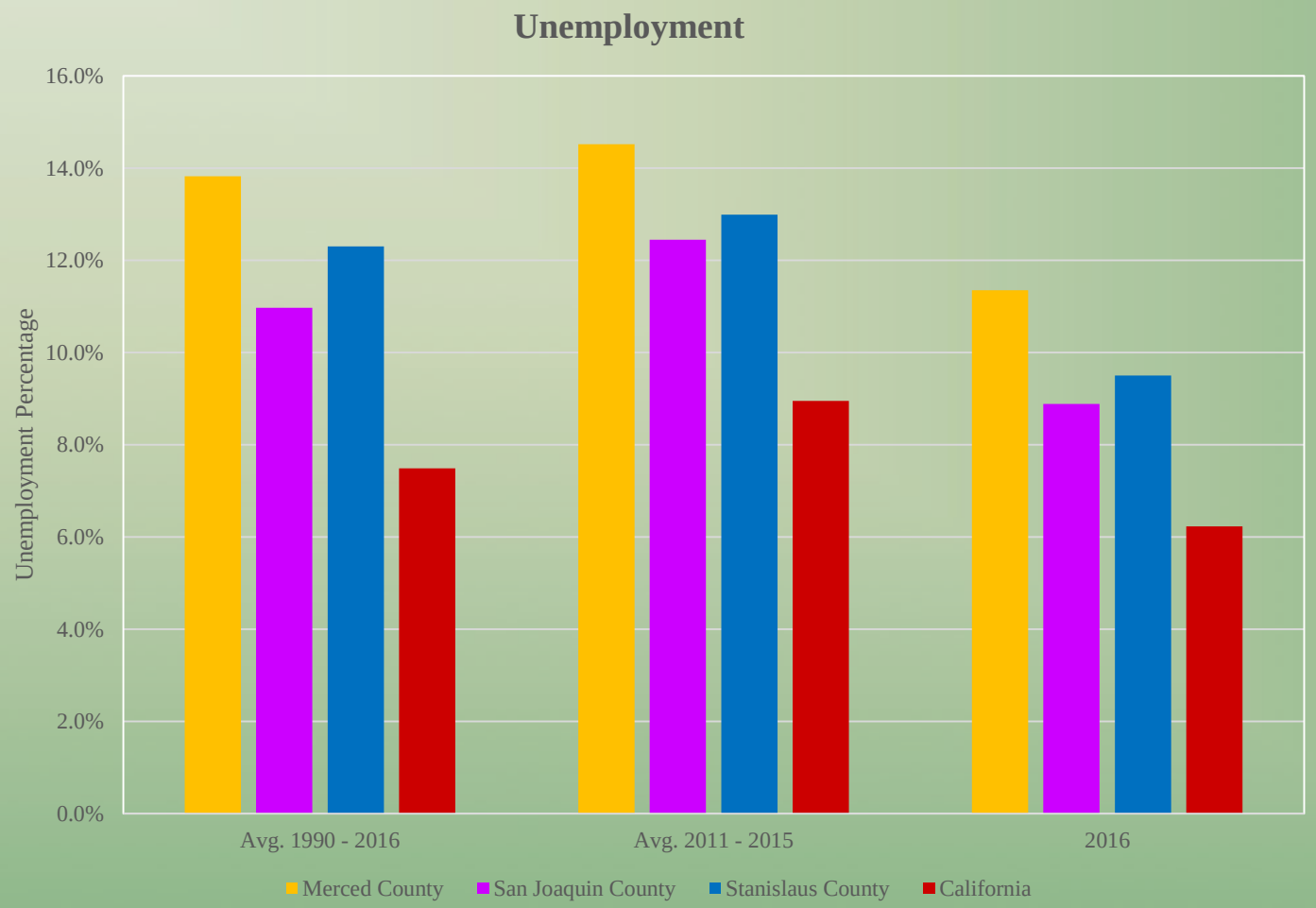
Increased Groundwater Depths

Community Impacts

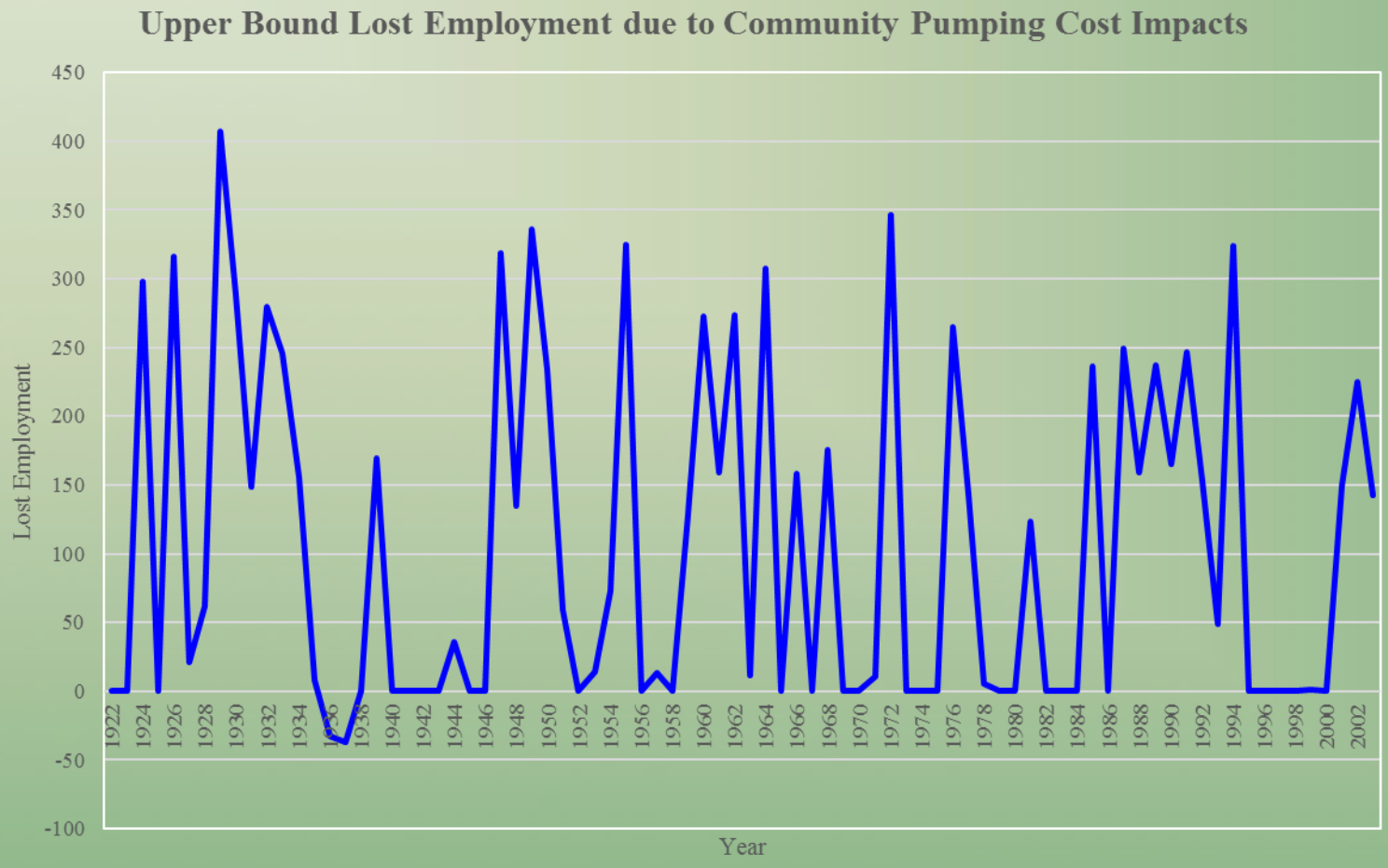
Increased Groundwater Depths - Communities



Increased Groundwater Depths - Communities



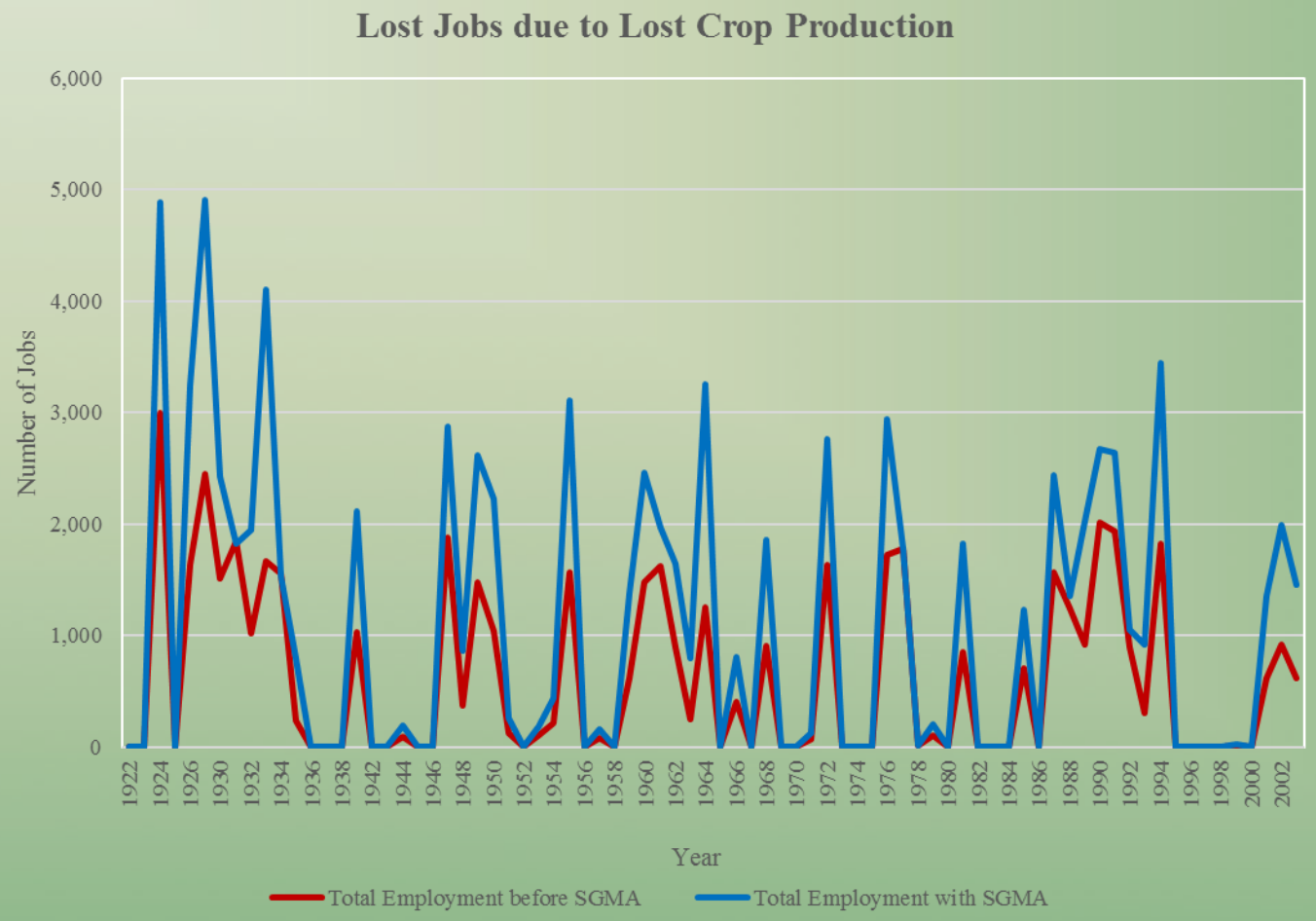
Increased Groundwater Depths - Communities



Forward Linkages

Crop Production Impacts

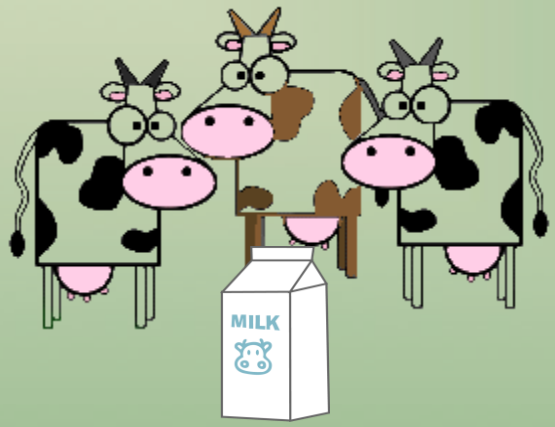
Crop Production Impacts



Forward Linkages

Forward Linkage Impacts

Forward Linkages



Forward Linkages

Merced County	
Company	**Business Activity**
Foster Farms	Poultry Production and Processing
Hilmar Cheese	Cheese Production
Live Oak Farms	Merchant Wholesale of Fresh Fruits and Vegetables
Gallo Cattle	Cheese Production
Liberty Packing Company	Packing and Transport of Farm Products

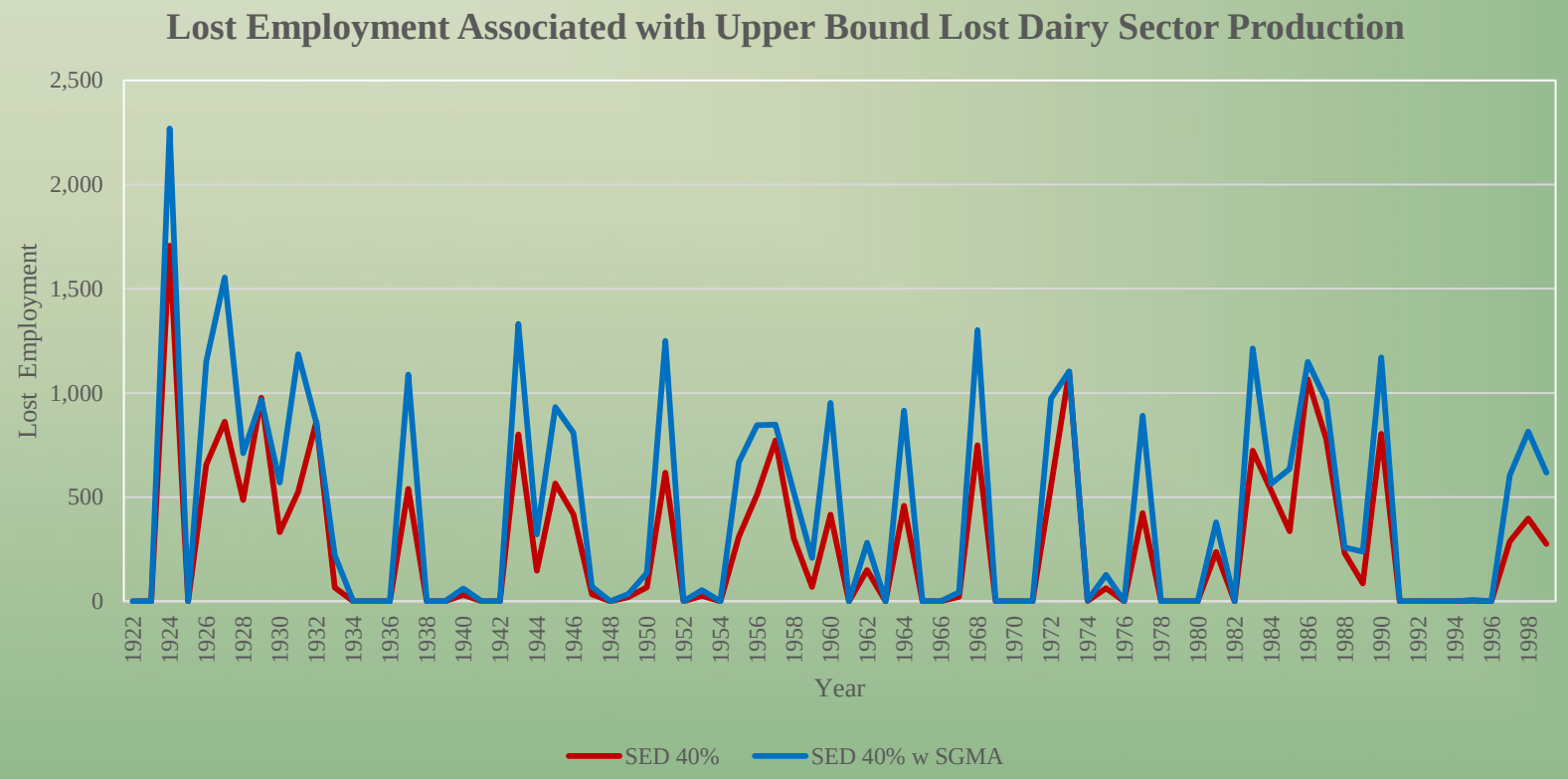
San Joaquin County	
Company	**Business Activity**
Leprino Foods Company	Cheese Production
Morada Produce Company	Merchant Wholesale of Fresh Fruits and Vegetables
O - G Packing & Cold Storage	Merchant Wholesale of Fresh Fruits and Vegetables
Pacific Coast Producers	Canning and Food Processing

Stanislaus County	
Company	**Business Activity**
Del Monte Foods	Canning and Food Processing
Con Agra Foods	Canning and Food Processing
Ecco Domani	Wine Production
Foster Farms	Poultry Production and Processing
Frito-Lay	Merchant Wholesale of Nuts, Potato Chips, etc.

Forward Linkages

Dairy Sector

- Relies on locally produced feed (corn silage, hay, etc.)



IMPACT SUMMARY

Average During Study Period	Before SGMA			With SGMA		
Impact Category	Lost Revenues/ Increased Cost (2015$)	Total Lost Output (2015$)	Total Lost Jobs	Lost Revenues/ Increased Cost (2015$)	Total Lost Output (2015$)	Total Lost Jobs
Reduced Crop Production Irrigation Districts	$ 58,110,593	$ 102,223,488	619	$ 101,279,043	$ 178,019,040	1,082
Reduced Dairy & Livestock Sector Production (Upper Bound)	$ 55,214,118	$ 99,520,600	341	$ 83,424,211	$ 133,263,208	656
Increased Irrigation District Costs (Upper Bound)	$ 25,310,496	$ 20,248,397	115	N/A	N/A	N/A
Increased Other Irrigation Costs (Upper Bound)	$ 73,065,124	$ 58,452,099	333	N/A	N/A	N/A
Increased Urban Water Costs (Upper Bound)	$ 23,025,416	$ 18,420,333	105	N/A	N/A	N/A
Total[1]	**$ 234,725,748**	**$ 298,864,917**	**1,513**	**$ 184,703,254**	**$ 311,282,247**	**1,738**

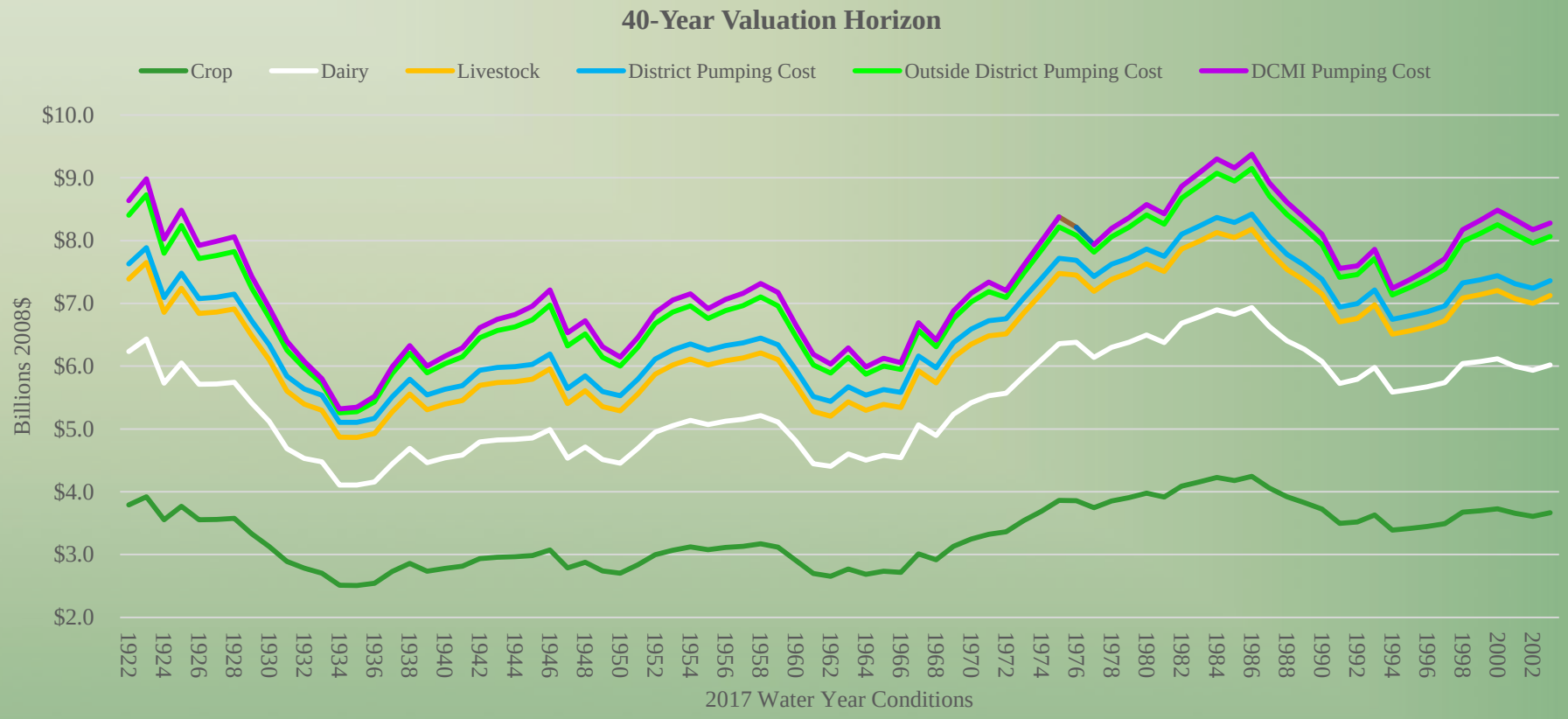
Peak Year of Impacts	Before SGMA			With SGMA		
Impact Category	Lost Revenues/ Increased Cost (2015$)	Total Lost Output (2015$)	Total Lost Jobs	Lost Revenues/ Increased Cost (2015$)	Total Lost Output (2015$)	Total Lost Jobs
Reduced Crop Production Irrigation Districts	$ 263,306,378	$ 463,359,118	2,997	$ 455,275,842	$ 798,140,076	4,909
Reduced Dairy & Livestock Sector Production (Upper Bound)	$ 312,704,416	$ 553,587,317	1,555	$ 405,980,251	$ 716,178,153	3,117
Increased Irrigation District Costs (Upper Bound)	$ 101,513,377	$ 81,210,701	462	N/A	N/A	N/A
Increased Other Irrigation Costs (Upper Bound)	$ 270,177,684	$ 216,142,147	1,230	N/A	N/A	N/A
Increased Urban Water Costs (Upper Bound)	$ 89,462,327	$ 71,569,861	407	N/A	N/A	N/A
Total[1]	**$ 997,813,713**	**$ 1,427,478,702**	**6,652**	**$ 827,217,094**	**$ 1,451,218,110**	**7,817**

Future Economic Impacts

Drivers of Future Economic Impacts

- Timing of SED Implementation (2018)
- Timing of SGMA Implementation
  - Start: 2020 (all sub basins high priority)
  - Implementation Period: 2020-2039 (20 years)
- Future Hydrologic Conditions (Monte Carlo study using Sequential Index Method)

Present Value of Lost Economic Output by 2017 Water Condition

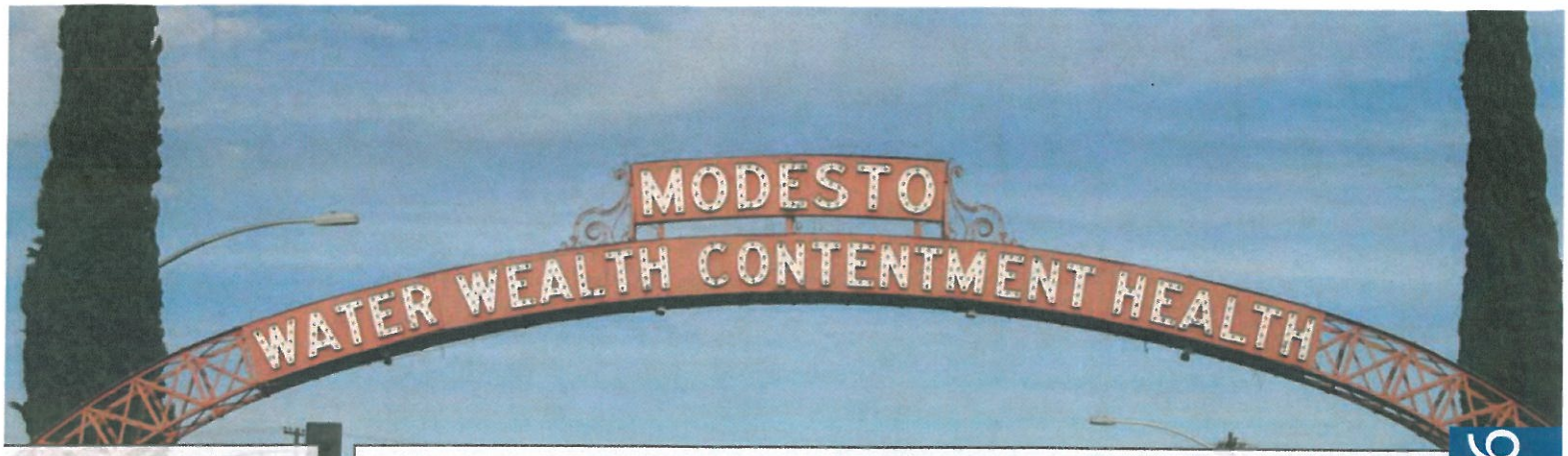


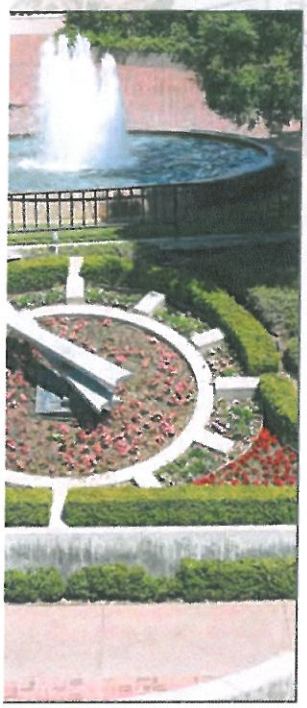
Composition of Expected Present Value of Lost Economic Output

Component	*Billions*	*Share*
Crop Output	$3.31	44.0%
Dairy	$2.12	28.9%
Livestock	$0.98	13.4%
Increased Pumping Costs		
Inside Irrigation Districts	$0.24	3.2%
Outside Irrigation Districts	$0.53	7.2%
DCMI	$0.17	2.3%
Total	$7.34	100.0%

Conclusion

- Reliable water supplies is a critical foundation for a community's economic sustainability and growth
- SWRCB's assessment is narrow in scope and completely fails to account for the supply reliability, sustainability and volatility challenges that will confront the counties
- SED implementation will transform the local investment environment from one of relative historical stability to extreme swings in annual conditions
- The deterioration in the economic incentives for investment and employment will herald a retrenchment in local economies
- The consequences of this deterioration are not quantified in the Stratecon study





FINAL - JUNE 2016

CITY OF MODESTO

2015 Urban Water Management Plan

WEST YOST ASSOCIATES

MODESTO CALIFORNIA

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Final
2015 Urban Water Management Plan

Prepared for

City of Modesto

June 2016

WEST YOST ASSOCIATES
Consulting Engineers

418-12-15-42

Elizabeth Drayer — 6-28-16

Project Manager
Elizabeth T. Drayer, PE — Date

James P Connell — 6-28-16

QA/QC Review
James P. Connell, PE — Date

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Chapter 7. Water Supply Reliability Assessment

Chapter 10. Plan Adoption, Submittal, and Implementation

List of Tables

List of Figures

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List of Acronyms and Abbreviations

AB	Assembly Bill
AB 797	Assembly Bill 797
Act	Urban Water Management Act
AF	Acre-Feet
AFA	Acre-Feet Annually
ag	Agriculture
AMI	Area Median Income
AMR	Automatic Meter Reading
ARTDA	Amended and Restated Treatment and Delivery Agreement

ASR	Aquifer Storage and Recovery
AWMP	Agricultural Water Management Plan
AWWA	American Water Works Association
Baseline GPCD	Baseline Daily Per Capita Water Use
BMP	Best Management Practice
CASGEM	California Statewide Groundwater Elevation Monitoring Program
cfs	Cubic Feet Per Second
CII	Commercial Industrial and Institutional
CIMIS	California Irrigation Management Information System
City	City of Modesto
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CWC	California Water Code
CWP	California Water Plan
DBCP	Dibromochloropropane
DDW	Department of Drinking Water
DMC	Delta-Mendota Canal
DMMs	Demand Management Measures
DOF	Department of Finance
DPWD	Del Puerto Water District
DSS	Digital Support System
DWR	Department of Water Resources
DWR Guidebook	2015 Urban Water Management Plans Guidebook for Urban Water Suppliers
EOC	Emergency Operations Center
ESIRWM	East Stanislaus Integrated Regional Water Management
ESRWMP	East Stanislaus Regional Water Management Partnership
ET_o	Reference Evapotranspiration
EWMPs	Efficient Water Management Practices
FERC	Federal Energy Regulatory Commission
ft msl	Feet Above Mean Sea Level
GHGs	Greenhouse Gases
GIS	Geographical Information System
GPCD	Gallons Per Capita Per Day
GPS	Global Positioning System
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
HECW	High Efficiency Clothes Washer
M&I	Municipal and Industrial
MAF	Million Acre-Feet
MCL	Maximum Contaminant Level
MG	Million Gallons

mg/L	Milligrams Per Liter
MGD	Million Gallons Per Day
MID	Modesto Irrigation District
MOU	Memorandum of Understanding
MRWTP	Modesto Regional Water Treatment Plant
MSL	Mean Sea Level
MWELO	Model Water Efficient Landscape Ordinance
NAICS	North American Industry Classification System
NPDES	National Pollutant Discharge Elimination System
NVRRWP	North Valley Regional Recycled Water Program
PCE	Perchloroethylene
RMSs	Resource Management Strategies
RO	Reverse Osmosis
RUWMP	Regional Urban Water Management Plan
RWQCF	Regional Water Quality Control Facility
SB	Senate Bill
SB X7-7	Senate Bill Seven of the Senate's Seventh Extraordinary Session of 2009
SCADA	Supervisory Control and Data Acquisition
SGMA	Sustainable Groundwater Management Act
SJRNWR	San Joaquin River National Wildlife Refuge
SOI	Sphere of Influence
sq mi	Square Mile
SSJID	South San Joaquin Irrigation District
TCE	Trichloroethylene
TDA	Treatment and Delivery Agreement
TDS	Total Dissolved Solids
TID	Turlock Irrigation District
TRPS	Treated Water Pump Station
USBR	United States Bureau of Reclamation
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
UV	Ultraviolet
UWMP	Urban Water Management Plan
WBIC	Weather Based Irrigation Controllers
West Yost	West Yost Associates
WSCP	Water Shortage Contingency Plan
WSS	WaterSense Specification

EXECUTIVE SUMMARY

ES.1 INTRODUCTION

Over the last several years, Urban Water Management Plans (UWMPs) have assumed a very important role in water supply planning and management for communities in California. UWMPs have become the foundational documents which cities and water agencies use to develop water supply assessments and other key water supply reliability documents in support of providing water service to existing customers and future development in accordance with adopted General Plans and established Spheres of Influence.

With the current unprecedented water supply conditions in California, development of the 2015 UWMPs comes at a pivotal time. Current drought conditions have resulted in unprecedented State mandates for water conservation and have led to the passage of the Sustainable Groundwater Management Act of 2014. These actions will impact all water suppliers and all water users in the State. With the improving economy statewide, the need for reliable water supplies to serve existing customers, as well as new development, is more critical than ever. Also, 2015 is the first compliance year for the interim water use targets required by the Water Conservation Act of 2009 (SB X7-7).

The City of Modesto (City) has prepared a 2015 UWMP to provide a planning tool for the City for developing and delivering municipal water supplies to the City's water service area. As described in this 2015 UWMP, the City's residents and businesses have responded positively to the call for water conservation and the City continues to be committed to the implementation of good water management practices to ensure that adequate, reliable water supplies are available to meet existing and projected demands. The City has met its interim 2015 per capita water use target and is well positioned to meet the final 2020 water use target per capita water demand.

ES.2 WATER CODE REQUIREMENTS

The Urban Water Management Planning Act (UWMP Act) requires water suppliers that provide over 3,000 acre-feet per year or have over 3,000 connections to prepare and submit to the State Department of Water Resources (DWR) an Urban Water Management Plan every 5 years.

The UWMP Act has been modified over the years in response to the State's water shortages, droughts and other factors. A significant amendment was made in 2009, after the 2007 to 2009 drought, and as a result of the Governor's call for a statewide 20 percent reduction in urban water use by the year 2020. This was the Water Conservation Act of 2009, also known as SB X7-7. This act required agencies to establish water use targets for 2015 and 2020 that would result in statewide water savings of 20 percent by 2020.

The primary objective of the UWMP Act is to direct "urban water suppliers" to develop an UWMP which provides a framework for long-term water supply planning and documents how urban water suppliers are carrying out their long-term resource planning responsibilities to ensure adequate water supplies are available to meet existing and future water demands.

In 2015, the City supplied approximately 47,459 acre-feet (AF) of water to approximately 74,686 residential and non-residential connections located within its water service area. The City is therefore considered an urban water supplier and is required to submit an UWMP. The City receives potable surface water from its wholesale water supplier, the Modesto Irrigation District (MID). Although MID does not have any direct urban customers, the City has an exclusive dependence on MID's wholesale supplies. This is because MID delivers treated water exclusively to the City, and the City currently receives surface water supplies only from MID. This 2015 UWMP describes the City's and MID's potable water systems, historical and projected water use, water supply sources, and a comparison of projected water supply to water demands during normal, single-dry, and multiple-dry years in five-year increments from 2020 to 2040. As required by SB X7-7, this 2015 UWMP also confirms the City's 2015 and 2020 water use targets, verifies the City's compliance with the interim 2015 water use target, and describes the City's implementation plan for meeting the City's final 2020 water use target.

The City's 2015 UWMP (or Plan) has been prepared in accordance with the UWMP Act, as defined by the California Water Code, Division 6, Part 2.6, Sections 10610 through 10656 (Urban Water Management Planning), and the Water Conservation Act of 2009 (WC Act, also known as SB X7-7), as defined by California Water Code, Division 6, Part 2.55, Section 10608 (Sustainable Water Use and Demand Reduction). A copy of the relevant sections of the Water Code are included in Appendix A of this document.

A brief summary of this 2015 UWMP's contents and the public review and adoption process is provided below, following a discussion of the legislative changes that have been enacted since the 2010 UWMP was prepared and adopted.

ES.3 LEGISLATIVE CHANGES FROM 2010 UWMP

The legislative changes to the UWMP Act are described in Chapter 1. Some highlighted changes include:

- Demand Management Measures: Address the nature and extent of each water demand management measure implemented over the past 5 years in narrative form.
- 2015 UWMP Submittal Date to DWR: Changed from December 31, 2015 to July 1, 2016.
- Water Loss: Requires water suppliers to quantify and report on distribution system water loss using the AWWA Water Audit methodology.
- Voluntary Reporting of Passive Savings due to new water codes and requirements.
- Voluntary Reporting of Energy Intensity: Describe the water/energy nexus.
- Defining Water Features: Water Shortage Contingency Plans must distinguish between water features that are artificially supplied with water (including ponds, lakes, waterfalls, and fountains) and swimming pools and spas.

ES.4 PLAN ORGANIZATION

This 2015 UWMP contains the appropriate sections and tables required per California Water Code Division 6, Part 2.6 (Urban Water Management Planning Act), included in Appendix A of this 2015 UWMP, and has been prepared based on guidance provided by the California Department of Water Resources (DWR) in their January 2016 "2015 Urban Water Management Plans, Guidebook for Urban Water Suppliers" (DWR Guidebook).

DWR's Urban Water Management Plan Checklist, as provided in the DWR Guidebook, has been completed to demonstrate the Plan's compliance with applicable requirements. A copy of the completed checklist is included in Appendix C.

This 2015 UWMP is organized into the following chapters:

- Chapter 1: Introduction and Overview
- Chapter 2: Plan Preparation
- Chapter 3: System Description
- Chapter 4: System Water Use
- Chapter 5: SB X7-7 Baselines and Targets
- Chapter 6: System Supplies
- Chapter 7: Water Supply Reliability Assessment
- Chapter 8: Water Shortage Contingency Planning
- Chapter 9: Demand Management Measures
- Chapter 10: Plan Adoption, Submittal and Implementation

Appendices (listed in Chapter 1) provide relevant supporting documents, including the 2015 UWMP tables and SB X7-7 Verification Form.

ES.5 PLAN OVERVIEW

ES.5.1 Service Area

The City's service area consists of one large "contiguous" service area and several "outlying" non-contiguous service areas. The central contiguous service area is primarily defined by the City's current sphere of influence (SOI) and includes Modesto, Salida, portions of North Ceres, and several unincorporated Stanislaus County "islands" located within the City's SOI. These County islands include Empire, Bret Harte, Shackelford, and West Modesto, among several others. The outlying service areas are not contiguous to the central service area and include Grayson, Del Rio, Ceres (Walnut Manor), and portions of Turlock.[1]

[1] Effective July 1, 2015, the City no longer provides water service to the communities of Hickman and Waterford. The water supplies for Waterford and Hickman are now managed by the City of Waterford. The City of Waterford also owns and operates these two water systems.

Although MID provides treated surface water to the City for urban delivery, MID is primarily an agricultural water supplier and does not directly serve any retail (municipal) water customers. The common City and MID water service area excludes those areas served by the City of Modesto with groundwater and/or which lie outside the MID water service boundary (these excluded areas generally include the communities of Del Rio, Grayson, parts of Ceres and Turlock, and parts of the City's service area located south of the Tuolumne River).

ES.5.2 Water Supply

The City currently uses a conjunctive water use strategy with two primary water sources to meet potable water demands within the City's service area. These include:

- Surface water from the Tuolumne River via Modesto Reservoir and treated at MID's Modesto Regional Water Treatment Plant, which is purchased on a wholesale basis from MID; and
- Local groundwater pumped from City wells located throughout the City's service area.

City residents within the contiguous service area north of the Tuolumne River (including North Modesto, Salida, and Empire) generally rely on treated surface water supply from MID year-round, supplemented with groundwater as needed. Water demands for the contiguous service area located south of the Tuolumne River (South Modesto) and the City's outlying service areas (Del Rio, Grayson, and parts of Ceres and Turlock) are met entirely with groundwater supply year-round.

ES.5.3 SB X7-7 Baselines and Targets

As part of the City's compliance with SB X7-7, the City has established its baseline per capita water use, interim (2015) per capita water use target, and final (2020) per capita water use target. The development of the City's baseline and per capita water use are described in Chapter 5 and Appendix F and are summarized as follows:

- Base Daily Per Capita Water Use (10-year): 285 gallons per capita per day (GPCD);
- 2015 Interim Per Capita Water Use Target: 257 GPCD, and
- 2020 Final Per Capita Water Use Target: 228 GPCD.

The City has calculated its actual 2015 water use for the 2015 calendar year as 163 GPCD, which is well below the 2015 interim water use target of 257 GPCD. Therefore, the City has met its interim 2015 water use target.

ES.5.4 Water Supply Availability and Reliability

The City relies on two primary water sources: Tuolumne River surface water deliveries (purchased wholesale from MID) and groundwater. The future water supply for the City will continue to be a mix of groundwater and surface water supply.

The City's Normal Year demands have been projected based on remaining vacant land assumed to be developed by buildout (estimated at 2050) in the City's service area (additional details are in the City's Water Master Plan (2016)). MID's wholesale water demand is projected to match the available supply as the City plans to maximize the use of treated surface water supply.

As described in Chapter 7, based on the anticipated availability and reliability of the City and MID water supplies during normal, single dry, and multiple dry years, the City anticipates that with water conservation in dry years it has adequate water supplies to meet projected water demands during all hydrologic conditions through 2040. The need for future water conservation during dry periods is consistent with the City's response to recent drought conditions, where the City's water customers have significantly reduced their water use in accordance with the City's Drought Contingency Plan.

ES.5.5 Drought Contingency Plan

In response to the recent State mandates for water conservation, the City adopted a revised Drought Contingency Plan (to include an additional Stage IIA drought condition) and to also declare a more severe Stage II drought condition. The City's revised Drought Contingency Plan was approved, and the City entered into a Stage II drought condition on May 1, 2015. On November 24, 2015, City Council approved enacting a Stage IIA drought condition, effective December 1, 2015. On April 26, 2016, City Council approved reinstating Drought Stage II requirements, effective May 1, 2016 through October 31, 2016.

The City's 2015 Drought Contingency Plan delineates four stages of action, prohibitions and other water consumption reduction methods, and associated penalties and charges for violating the established water use restrictions. The four stages of action specify reduction objectives ranging from 10 to 50 percent of normal water demand, depending on the water shortage stage declared. The City's Drought Contingency Plan is further described in Chapter 8 of this 2015 UWMP.

ES.5.6 Demand Management

The City's compliance with the established SB X7-7 targets will be achieved through the implementation of the City's Water Conservation Plan. As described in Chapter 9, the City has implemented, or plans to implement, all of the Best Management Practices (BMPs), as defined in the California Urban Water Conservation Council (CUWCC) Memorandum of Understanding (MOU). MID has also instituted a water conservation program which includes limiting water losses through the water conveyance systems, agricultural conservation programs and public information, etc. as described in its 2015 Agricultural Water Management Plan (AWMP).

ES.6 PLAN REVIEW AND ADOPTION

The UWMP Act requires the water supplier to coordinate the preparation of its Plan with other appropriate agencies, including other water suppliers that share a common source, water management agencies, and relevant public agencies. These agencies, as well as the public, participated in the coordination and preparation of this 2015 UWMP. The coordination and outreach are described in Chapter 2.

A public hearing to discuss the 2015 Draft UWMP was held by the City of Modesto on June 28, 2016. The public hearing provided an opportunity for City water users and the general public to become familiar with the Plan and to ask questions about water supply and continuing plans for providing a reliable, safe, high-quality water supply. The adoption, implementation and economic impact of revised per capita water use targets (described in Chapter 5) was also discussed. A copy of the Draft Plan was made available for public inspection at the City's Utilities Department, with an electronic version placed on the City's website.

Water Code Section 10621(b) requires agencies to notify the cities and counties to which they serve water that the Plan is being updated and reviewed. This notification must be sent out at least 60 days in advance of the public hearing. In early 2016, a notice of preparation was sent to the cities and counties, and other stakeholders, to inform them of the UWMP update process and schedule and to solicit input for the Plan update. The notifications to cities and counties, the public hearing notifications, and the public hearing and adoption are discussed in Chapter 10 and provided in Appendix D.

This Plan was adopted by the Modesto City Council on June 28, 2016. A copy of the City's adoption resolution is provided in Appendix K.

Within 30 days of Plan adoption, a copy of the Plan was submitted to DWR, the California State Library and the cities and counties to which the urban water supplier provides water.

Within 30 days of submitting the adopted Plan to DWR, a copy of this Plan will be made available during normal business hours at the following location:

- City of Modesto, Utilities Department, 1010 Tenth Street, 4th Floor, Modesto

A copy of the adopted 2015 UWMP will also be available on the City's website:

- City of Modesto Utilities Department Website (http://www.modestogov.com/uppd/reports/)

Should this Plan be amended or changed, copies of amendments or changes to the Plan shall be submitted to DWR, the California State Library, and any city or county within which the City provides water supplies within 30 days after adoption of the amendment(s).

CHAPTER 1
Introduction and Overview

This chapter provides an introduction and overview of the City of Modesto (City) 2015 Urban Water Management Plan (UWMP). This 2015 UWMP has been prepared by City staff and West Yost Associates (West Yost).

1.1 INTRODUCTION

The Urban Water Management Planning Act (Act) was originally established by Assembly Bill 797 (AB 797) on September 21, 1983. Passage of the Act was recognition by state legislators that water is a limited resource and a declaration that efficient water use and conservation would be actively pursued throughout the State. The primary objective of the Act is to direct "urban water suppliers" to develop an UWMP which provides a framework for long-term water supply planning and documents how urban water suppliers are carrying out their long-term water resource planning responsibilities to ensure adequate water supplies are available to meet existing and future water demands. A copy of the current version of the Act, as incorporated in Sections 10610 through 10656 of the California Water Code (CWC), is provided in Appendix A of this report.

1.2 IMPORTANCE AND EXTENT OF THE CITY'S WATER MANAGEMENT PLANNING EFFORTS

The purpose of the UWMP is to provide a planning tool to assist the City with developing, managing, and delivering municipal water supplies to the City's water service area. The City has had a long history of providing a clean and reliable water supply to their customers. To continue to meet the water needs of the community, the City carefully manages their available water resources. This 2015 UWMP is a comprehensive guide to assist the City in effectively utilizing available supplies to maximize existing and available resources.

1.3 CHANGES FROM 2010 UWMP

The Urban Water Management Planning Act has been modified over the years in response to the State's water shortages, droughts and other factors. A significant amendment was made in 2009, after the 2007 to 2009 drought, as a result of the Governor's call for a statewide 20 percent reduction in urban water use by the year 2020. This was the Water Conservation Act of 2009, also known as Senate Bill Seven of the Senate's Seventh Extraordinary Session of 2009 (SB X7-7). This act required agencies to establish water use targets for 2015 and 2020 that would result in statewide water savings of 20 percent by 2020.

There have been several additions and changes to the California Water Code since the 2010 UWMP was prepared. These are summarized below:

- AB 2067 (Weber 2014)
  - — CWC Section 10631(f)(1) and (2): Demand Management Measures
    - Requires water suppliers to provide narratives describing their water demand management measures, as provided.

- Requires retail water suppliers to address the nature and extent of each water demand management measure implemented over the past 5 years and describe the water demand management measures that the supplier plans to implement to achieve its water use targets.
- See Chapter 9 of this 2015 UWMP for a description of the City's Demand Management Measures.

— CWC Section 20621(d): Submittal Date

- Requires each urban water supplier to submit its 2015 UWMP to the California Department of Water Resources (DWR) by July 1, 2016.

- Senate Bill (SB) 1420 (Wolk 2014)

— CWC Section 10644(a)(2): Submittal Format

- Requires the plan, or amendments to the plan, to be submitted electronically to DWR.

— CWC Section 10644(a)(2): Standardized Forms

- Requires the plan, or amendments to the plan, to include any standardized forms, tables, or displays specified by DWR.

— CWC 10631(e)(1)(J) and (e)(3)(A) and (B): Water Loss

- Requires a plan to quantify and report on distribution system water loss.
- See Chapter 4 of this 2015 UWMP for a description of the City's distribution system water losses.

— CWC 10631(e)(4): Voluntary Reporting of Passive Savings

- Provides for water use projections to display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans, when that information is available and applicable to an urban water supplier.
- The City has opted not to report on passive water savings in this 2015 UWMP.

- SB 1036 (Pavley 2014)

— CWC 10631.2(a) and (b): Voluntary Reporting of Energy Intensity

- Provides for an urban water supplier to include certain energy-related information, including, but not limited to, an estimate of the amount of the energy used to extract or divert water supplies.
- The City has opted not to report on energy intensity in this 2015 UWMP.

- CWC 10632: Defining Water Features

— Commencing with the UWMP update due July 1, 2016, for purposes of developing the water shortage contingency analysis, requires urban water suppliers to analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.

— See Chapter 8 of this 2015 UWMP for a discussion of the City's water shortage contingency planning.

1.4 PLAN ORGANIZATION

This 2015 UWMP contains the appropriate sections and tables required per CWC Division 6, Part 2.6 (Urban Water Management Planning Act), included in Appendix A of this 2015 UWMP, and has been prepared based on guidance provided by DWR in their "2015 Urban Water Management Plans Guidebook for Urban Water Suppliers" (DWR Guidebook).

As described in this UWMP, the City currently receives treated surface water supplies from MID, and MID delivers treated surface water supplies exclusively to the City. Therefore, where applicable, separate descriptions have been included for the City and MID water systems. These sections reference each other extensively. Because this relationship is currently exclusive, much of the retail-wholesale information is interchangeable between these agencies. In addition, because MID does not have any direct urban customers, the City oversees demand management measures and other public outreach activities.

It should be noted that the primary basis for the general information and specific data reported in this 2015 UWMP is from the City's Water Master Plan, which is currently being updated (the City's Water Master Plan is expected to be completed by the end of 2016).

This 2015 UWMP is organized into the following chapters:

- Chapter 1: Introduction and Overview
- Chapter 2: Plan Preparation
- Chapter 3: System Description
- Chapter 4: System Water Use
- Chapter 5: SB X7-7 Baselines and Targets
- Chapter 6: System Supplies
- Chapter 7: Water Supply Reliability Assessment
- Chapter 8: Water Shortage Contingency Planning
- Chapter 9: Demand Management Measures
- Chapter 10: Plan Adoption, Submittal and Implementation

This 2015 UWMP also contains the following appendices of supplemental information and data:

- Appendix A: Legislative Requirements
- Appendix B: DWR 2015 UWMP Tables
- Appendix C: DWR 2015 UWMP Checklist
- Appendix D: Required Notices
- Appendix E: Water Audit
- Appendix F: SB X7-7 Verification Forms

- Appendix G: Amended and Restated Treatment and Delivery Agreement between Modesto Irrigation District and City of Modesto
- Appendix H: Groundwater Information
- Appendix I: Water Shortage Contingency Plan
- Appendix J: Water Conservation Program Information
- Appendix K: UWMP Adoption Resolution

Furthermore, this 2015 UWMP contains all of the tables recommended in the DWR Guidebook, both embedded into the UWMP chapters where appropriate and included in Appendix B. Because of the close relationship between the City and MID, both the retail and wholesale tables are included in this UWMP.

DWR's Urban Water Management Plan Checklist, as provided in the DWR Guidebook, has been completed by West Yost to demonstrate this plan's compliance with applicable requirements. A copy of the completed checklist is included in Appendix C.

CHAPTER 2
Plan Preparation

This chapter describes the preparation of the City's 2015 UWMP, including the basis for the preparation of the plan, individual or regional planning, fiscal or calendar year reporting, units of measure, and plan coordination and outreach.

2.1 BASIS FOR PREPARING A PLAN

The Urban Water Management Planning Act requires every "urban water supplier" to prepare and adopt an UWMP, to periodically review its UWMP at least once every five years and make any amendments or changes which are identified by the review. An "urban water supplier" is defined as a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet (AF) of water annually.

As shown in Table 2-1, in 2015, the City provided water supplies to 74,686 customers (connections), and supplied 47,459 AF of water. Therefore, the City is required to prepare an UWMP. The City's last UWMP, the City of Modesto/MID Joint 2010 UWMP, was adopted by both the Modesto City Council and MID Board of Directors in May 2011.

Table 2-1. Retail: Public Water Systems[a,b] (DWR Table 2-1 Retail)

Public Water System Number	Public Water System Name	Number of Municipal Connections 2015	Volume of Water Supplied 2015
CA5010010[c]	City of Modesto	69,152	45,544
CA5010005[d]	Salida	4,399	909
CA5010031	Ceres (Walnut Manor)	53	44
CA5010033	Grayson	274	162
CA5010029	Del Rio (Hillcrest)	389	577
CA5010034	North Turlock	52	31
CA5010023	South Turlock	332	192
CA5010035[e]	Central Turlock	35	0
	TOTAL	74,686	47,459

NOTES:
(a) Represents available services (includes billed and unbilled accounts).
(b) Represents water production (AF).
(c) Includes Empire and North Ceres services that are contiguous to the City of Modesto water system (interconnected).
(d) Salida is contiguous to the City of Modesto water system (interconnected).
(e) No SCADA available for production because City of Turlock provides groundwater to this system via an interconnection with Turlock.

As of July 1, 2015, water utility customers in Waterford and Hickman are no longer being served by the City of Modesto.[1] To accurately project water demands for the City's water service area, the historical water use and populations from the Waterford and Hickman service areas are not included in this 2015 UWMP.

2.2 REGIONAL PLANNING

As described in Section 2.3 below, the City has prepared this 2015 UWMP on an individual reporting basis, not part of a regional planning process. As described below in Section 2.5, the City has notified and coordinated with appropriate regional agencies and constituents.

The City and MID coordinate routinely with each other to ensure that a safe and reliable water supply is delivered to existing customers and that plans for serving future customers are implemented as efficiently as possible.

2.3 INDIVIDUAL OR REGIONAL PLANNING AND COMPLIANCE

This 2015 UWMP has been prepared on an Individual Reporting basis, covering only the City's municipal water service area (see Table 2-2).

Table 2-2. Plan Identification (DWR Table 2-2)

Select Only One	Type of Plan	Name of RUWMP or Regional Alliance *if applicable*
☑	Individual UWMP	
☐	Regional Urban Water Management Plan (RUWMP)	

2.4 FISCAL OR CALENDAR YEAR AND UNITS OF MEASURE

The City is a water retailer.

This 2015 UWMP has been prepared on a calendar year basis. Water use and planning data for the entire calendar year of 2015 has been included.

The City's reporting of water volume in this 2015 UWMP is in AF.

Table 2-3 summarizes the City's reporting methods for this 2015 UWMP.

[1] The water supplies for Waterford and Hickman are now managed by the City of Waterford. The City of Waterford also owns and operates these two water systems.

Table 2-3. Agency Identification (DWR Table 2-3)

Type of Agency (select one or both)	
☐	Agency is a wholesaler
☑	Agency is a retailer
Fiscal or Calendar Year (select one)	
☑	UWMP Tables Are in Calendar Years
☐	UWMP Tables Are in Fiscal Years
Units of Measure Used in UWMP (select from Drop down)	
Unit	AF
NOTES:	

2.5 COORDINATION AND OUTREACH

This section includes a discussion of the City's coordination with the general public. The Urban Water Management Planning Act requires the City to coordinate the preparation of their Plan with other appropriate agencies and all departments within the City, including other water suppliers that share a common source, water management agencies, and relevant public agencies. Neighboring water agencies, as well as the public, participated in the coordination and preparation of this 2015 UWMP, and are summarized below.

2.5.1 Wholesale and Retail Coordination

Water Code §10631

(j) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

The City is the primary domestic water purveyor in Stanislaus County, serving not only the City of Modesto but also the communities of Del Rio, Empire, Salida, Grayson, and parts of Ceres and Turlock. As discussed above, as of July 1, 2015, the City no longer provides water service to the communities of Waterford and Hickman.

In accordance with CWC 10631, the City and MID have coordinated with each other regarding the projected water use for the period from 2020 to 2040, as summarized in Tables 2-4 and 2-5.

Table 2-4. Retail: Water Supplier Information Exchange (DWR Table 2-4 Retail)

The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.
Wholesale Water Supplier Name
Modesto Irrigation District (MID)

Table 2-5. Wholesale: Water Supplier Information Exchange (DWR Table 2-4 Wholesale)

☑	Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with CWC 10631. **Complete the table below.**
Water Supplier Name	
City of Modesto	

2.5.2 Coordination with Other Agencies and the Community

The City coordinated the preparation of this 2015 UWMP with other local agencies and the community.

2.5.2.1 Coordination with Other Agencies

Water Code §10620 (d)(2)

(d)(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

The City coordinated the preparation of this 2015 UWMP with other agencies as discussed further in Chapter 10.

2.5.2.2 Coordination with the Community

Water Code §10642

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

The City has actively encouraged community participation in water management activities and specific water-related projects, such as preparation of the recurring UWMPs, Groundwater Management Plans, and Urban Area General Plan, as well as implementation of water conservation programs. Public participation has also been encouraged for specific regional water supply projects including the Modesto Regional Water Treatment Plant (MRWTP) Phase Two project.

The City's public participation program includes both active and passive means of obtaining input from the community, such as mailings, public meetings, and web-based communication. The City's website describes major multi-year water projects for extending water lines and installing wells and updating and rebuilding existing facilities. The website also posts announcements of planned rate increases to fund these water projects. MID provides educational videos on water to classrooms within the District free of charge. MID's website solicits public comment on water projects, as well as providing public information.

As part of development of this 2015 UWMP, the City allowed a public review period, following noticing and prior to adoption, to allow ample time for public comments to be developed and received. Public noticing, pursuant to Section 6066 of the Government Code, was conducted prior to commencement of the public comment period. Public hearing notices are included in Appendix D of this document. During the public comment period, the Draft UWMP update was made available at the City's Utilities Department, as well as on the City's website.

2.5.3 Notice to Cities and Counties

Water Code §10621(b)

Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

Water Code Section 10621(b) requires agencies to notify the cities and counties to which they serve water at least 60 days in advance of the public hearing that the plan is being updated and reviewed. In early 2016, a notice of preparation was sent to the cities and counties served by the City, and other stakeholders, to inform them of the UWMP update process and schedule and to solicit input for the Plan update. The notifications to cities and counties, the public hearing notifications, and the public hearing and adoption are discussed in Chapter 10.

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CHAPTER 3
System Description

This chapter provides a description of the City and MID's water service area. This includes a description of the water system facilities, climate, and population associated with municipal water use.

3.1 GENERAL DESCRIPTION

The City is located in the heart of the San Joaquin Valley, approximately 90 miles southeast of the San Francisco Bay Area and 77 miles south of the City of Sacramento as shown on Figure 3-1. The City and MID's service area is located in Stanislaus County. The City of Modesto is the largest incorporated city in Stanislaus County and accounts for approximately 40 percent of the County's population.

3.2 SERVICE AREA DESCRIPTION

The following sections provide brief descriptions of the geographical service area boundaries, water supplies and water system facilities for the City and MID water systems.

3.2.1 Geographical Boundaries

The City and MID's jurisdictional boundaries are shown on Figures 3-2 and 3-3, respectively.

3.2.1.1 City Service Area

The City's service area consists of one large "contiguous" service area and several "outlying" non-contiguous service areas. The central contiguous service area is primarily defined by the City's current sphere of influence (SOI) and includes Modesto, Salida, portions of North Ceres, and several unincorporated Stanislaus County "islands" located within the City's SOI. These County islands include Empire, Bret Harte, Shackelford, and West Modesto, among several others. The outlying service areas are not contiguous to the central service area and include Grayson, Del Rio, Ceres (Walnut Manor), and portions of Turlock.[1]

3.2.1.2 MID Service Area

MID is primarily an agricultural water supplier. Although treated water is provided to the City for urban delivery, MID does not directly serve any retail (municipal) water customers. The place of use for MID treated water is defined by the overlap of the MID water service area boundary with the City's service area north of the Tuolumne River. The common City and MID water service area excludes those areas served by the City of Modesto with groundwater and/or which lie outside the MID water service boundary; these excluded areas generally include the communities of Del Rio, Grayson, parts of Ceres and Turlock, and parts of the City's service area located south of the Tuolumne River.

[1] Effective July 1, 2015, the City no longer provides water service to the communities of Hickman and Waterford. The water supplies for Hickman and Waterford are now managed by the City of Waterford. The City of Waterford also owns and operates these two water systems.

3.2.2 Water Supply Overview

The City has been providing potable water service to its urban area since 1895 through the purchase and acquisition of several private water companies. Until 1995, the sole source of water supply to the City was groundwater pumped from the San Joaquin Valley Groundwater Basin. In the early 1990s, the City, MID and the former Del Este Water Company formed a partnership to use a portion of MID's surface water supplies for municipal water use. This shift to surface water supply has allowed the City to stabilize groundwater pumping rates to allow for groundwater aquifer recovery.

MID was formed as the second irrigation district in California in 1887. Since that time, MID has developed numerous water rights and facilities to provide agricultural irrigation water from the Tuolumne River. MID has also developed groundwater supplies for agricultural uses. For the current and projected planning timeframe in this 2015 UWMP, it is assumed that MID would only provide wholesale treated surface water to the City for municipal use.

3.2.3 Water System Facilities

This section describes water facilities to supply and deliver urban water supplies to the City's service area. As described above, MID is primarily an agricultural water supplier and operates extensive facilities to deliver agricultural water supplies. These facilities, although not described below, include a complex network of canals, pipelines, pumps, drainage features, and control structures.

3.2.3.1 Surface Water Supply

The City, MID, and the former Del Este Water Company formed the Modesto Domestic Water Partnership in the early 1990s (in 1995, the City acquired the Del Este Water Company) to use a portion of MID's surface water rights for municipal uses, and entered into a Treatment and Delivery Agreement (TDA) to cover the design, construction, commercial operation (i.e., governing delivery of treated surface water from MID to the City), and financing for the Initial Phase (Phase One) of the MRWTP. This new surface water treatment plant, along with associated storage and delivery facilities, became operational in 1995, and the City has purchased wholesale treated surface water from MID since.

The MRWTP is owned and operated by MID and per the original TDA, delivers an annual average supply of 30 million gallons per day (MGD) (33,600 acre-feet per year (AFA)) to the City with a functional hydraulic peaking capacity up to 42.5 MGD. This treated surface water supply from MID, coupled with the available groundwater supply (together termed a "conjunctive supply") is used to meet the City's water supply needs for municipal customers in the contiguous service area located north of the Tuolumne River (this is the southern boundary of the MID service area).

The MRWTP Phase Two Expansion project was essentially completed in May 2016, and will provide the City with up to an additional 30 MGD of treated surface water supply for a total annual average supply of up to 60 MGD (67,200 AFA). The peaking capacity for the Phase Two Expansion will be determined after start-up operations and testing protocols are completed. It should be noted that the total 60 MGD capacity is based on a normal and wet year annual average. The delivery of Phase Two treated surface water is governed by the October 2005 Amended and

Restated TDA (ARTDA), and the ARTDA includes formulas to determine supply reductions during dry years.

3.2.3.2 Groundwater Supply

The City's groundwater supply wells are located throughout the contiguous and outlying service areas, and these wells are located within the San Joaquin Valley Groundwater Basin (Modesto, Turlock and Delta-Mendota subbasins). The residents within the contiguous service area north of the Tuolumne River (North Modesto, Salida, and Empire) generally rely on treated surface water supply from MID year-round, and are supplemented with groundwater to meet increased water demands (primarily in the summer months). Water demands from the contiguous service area located south of the Tuolumne River (South Modesto) and the outlying service areas are met with groundwater supply year-round. The City currently has approximately 86 active groundwater wells to serve both the contiguous and outlying service areas.

3.2.3.3 Distribution System

The major water distribution system facilities in the City's contiguous and outlying service areas are shown on Figure 3-4.

The City's contiguous service area consists of approximately 900 miles of transmission and distribution pipelines. A portion of the transmission mains traversing the City is owned and operated by MID, and these transmission mains provide treated surface water through a series of turnouts that have the ability to control water supply into the City's water distribution system. The contiguous system currently has 77 active groundwater wells. The contiguous water system also has eight at-grade storage tanks with a combined total storage capacity of 12.1 million gallons (MG). Each storage tank has a booster pump station to pump water from the tank into the distribution system. There are also two 5.0 MG MRWTP reservoirs (10.0 MG total) that are owned and operated by MID.

The City's outlying service areas are served by groundwater wells located in each of the outlying service areas. Only the Grayson service area has an at-grade storage tank and booster pump station. The other outlying service areas are served exclusively from the existing groundwater wells.

3.3 SERVICE AREA CLIMATE

The climate of the City and MID's service area is best described as Mediterranean, characterized by hot, dry summers and cool winters. Precipitation in the area averages about 12.2 inches per year.

Water use within the service area is dependent on various climate factors such as temperature, precipitation, and evapotranspiration (ET_o). Climate data, including temperature and precipitation estimates, were obtained for Modesto, California. The period of record was March 1, 1906 to January 20, 2015. ET_o describes water lost through evaporation from the soil and surface-water bodies combined with plant transpiration. In general, the reference ET_o is given for turf grass, and then corrected for a specific crop type. Local ET_o data was obtained from California Irrigation Management Information System (CIMIS) monitoring station in West Modesto (Station #71).

The historical climate characteristics affecting water management in the City and MID's service area are shown in Table 3-1.

Table 3-1. Monthly Average Climate Data Summary

Month	Standard Monthly Average ETo, inches[a]	Average Total Rainfall, inches[b]	Average Temperature, degrees Fahrenheit[b]	
			Maximum	Minimum
January	1.10	2.44	53.8	37.6
February	1.88	2.07	60.9	40.8
March	3.57	1.93	66.9	43.5
April	5.23	1.03	73.3	46.8
May	6.98	0.46	81.2	51.8
June	7.87	0.13	88.3	56.6
July	7.95	0.02	94.3	60.0
August	6.89	0.04	92.3	58.8
September	5.10	0.17	87.7	56.0
October	3.40	0.63	77.9	49.6
November	1.70	1.24	64.6	41.7
December	1.05	2.05	54.4	37.7
Total	52.7	12.2	74.6	48.4

[a] Source: California Irrigation Management Information System (CIMIS) data for Station #71: Modesto (downloaded January 28, 2016).
[b] Source: Western Regional Climate Center data for DWR for Modesto, California (period of record: March 1, 1906 to January 20, 2015).

3.4 SERVICE AREA POPULATION AND DEMOGRAPHICS

3.4.1 City of Modesto Population

The City has historically been among the fastest growing areas in California. The City's population grew steadily from 1996 through 2004 (at an average rate of 1.8 percent per year). However, since 2005, growth within the City's service area has slowed significantly as a result of the national and statewide economic downturn. Growth from 2010 to 2015 has remained relatively stable and was equal to only 3.2 percent for the five-year period, or about 0.6 percent per year.[2]

Historical population estimates for the City's water service area are based on Census data from California Department of Finance (DOF) Report E-4, with the 2010 Census Benchmark, where available. Where DOF data are not available (e.g., Turlock and Ceres (Walnut Manor) areas), the population has been estimated based on a count of existing dwelling units served by the City

[2] Excludes population from the communities of Hickman and Waterford.

(from aerial photographs), and an estimated housing density (people per dwelling unit) based on Census data for the surrounding communities.

Based on data from the City's Community and Economic Development Department, it is assumed that future growth in a significant portion of the contiguous service area will be at an annual rate of approximately 1.3 percent (based on the San Joaquin Valley Demographic Forecast 2010 to 2050). The projected population for the City's contiguous and outlying service areas at buildout (estimated to be at 2050) is anticipated to be roughly 393,600 people and represents about a 50 percent increase from the current (2015) population. The growth assumptions used to project the population for each portion of the City's water service area are summarized below:

- City of Modesto: Assume a 1.3 percent annual growth rate from 2015 through 2050
- Salida: Assume a 1.3 percent annual growth rate from 2015 through 2050
- Communities of Empire, North Ceres (Bystrom), Bret Harte, Shackelford, and West Modesto: Fully developed; no additional growth anticipated
- Del Rio: Estimated based on projected demand and historical per capita water use; equates to a 2.6 percent average annual growth rate
- Grayson: Estimated based on projected demand and historical per capita water use; equates to a 0.7 percent average annual growth rate
- Turlock: Fully developed; no additional growth anticipated
- Ceres (Walnut Manor): Fully developed; no additional growth anticipated

Table 3-2 summarizes the current and projected population for the City's contiguous and outlying service areas.

Table 3-2. Retail: Population – Current and Projected
(DWR Table 3-1 Retail)

Population Served	2015	2020	2025	2030	2035	2040*(opt)*
	259,187	274,920	291,686	309,555	328,599	348,896
NOTES: 2015 population from California Department of Finance where available and projected populations are based on the City of Modesto Water Master Plan (refer to Table 3-1 in the Water Master Plan). Does not include population from Hickman and Waterford.						

3.4.2 MID Population

As stated previously, MID does not directly serve any municipal water customers, and does not plan to do so in the future, as summarized in Table 3-3.

Table 3-3. Wholesale: Population – Current and Projected (DWR Table 3-1 Wholesale)

Population Served	2015	2020	2025	2030	2035	2040*(opt)*
	0	0	0	0	0	0
NOTES: MID does not directly serve any urban water customers. The population served by MID wholesale water is included the City's total service area population (see DWR Table 3-1 Retail).						

3.4.3 Other Demographic Factors

No other demographic factors affecting water use in the City and MID's service area have been identified at this time. If additional demographic factors are identified, these will be addressed in subsequent updates to this 2015 UWMP.

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LEGEND

- Modesto
- Stanislaus County
- California Counties

MODESTO CALIFORNIA

N

0 50 100

Scale in Miles

FIGURE 3-1

City of Modesto 2015 UWMP

MODESTO VICINITY MAP

WEST YOST ASSOCIATES

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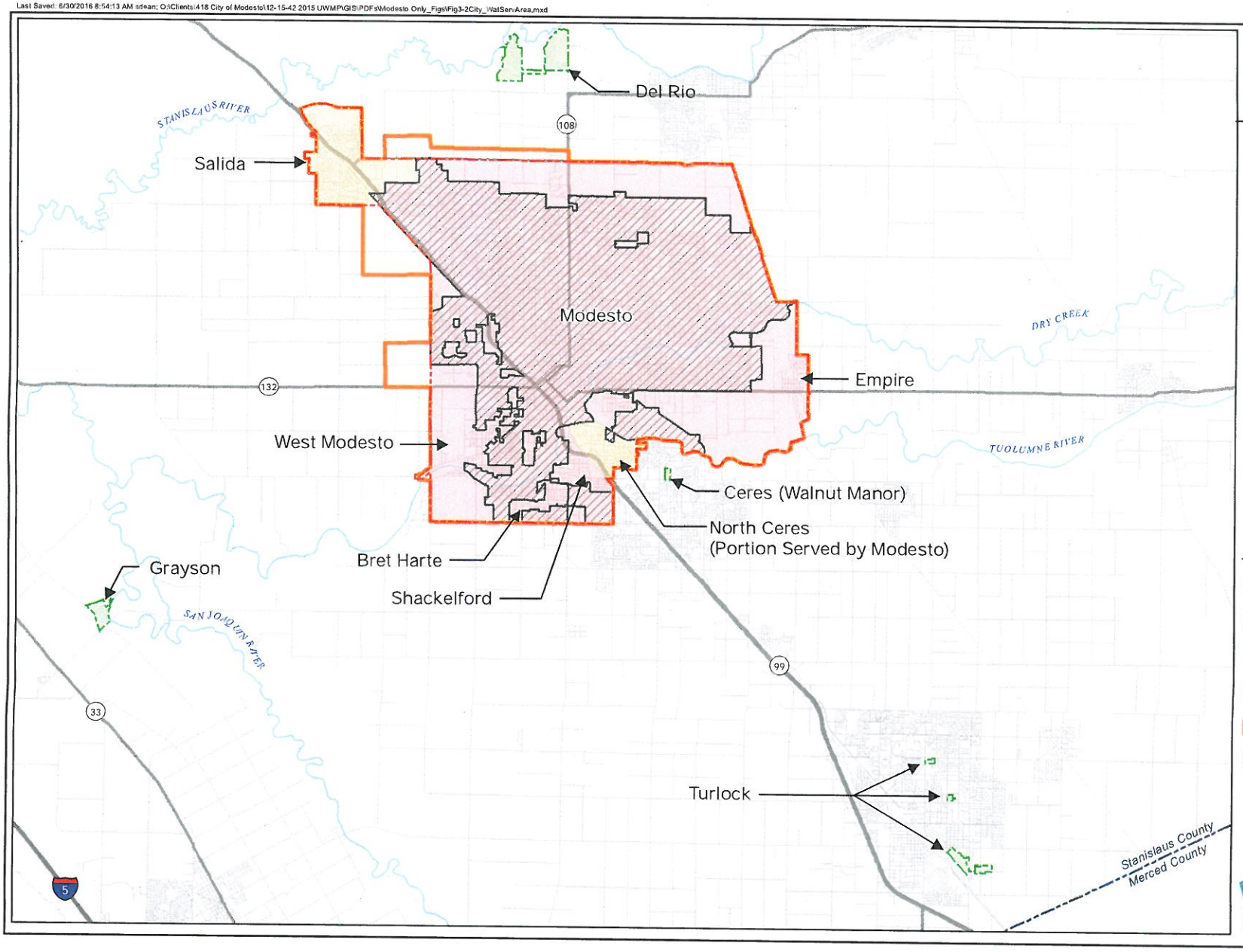

FIGURE 3-2

City of Modesto
2015 UWMP

CITY OF MODESTO WATER SERVICE AREAS

N

0 1 2

Scale in Miles

Notes
1. Sphere of influence boundary obtained from the City on 11/6/2014.
2. The City's contiguous service area is co-terminus with the City's SOI boundary except for the Salida and North Ceres areas.
3. Effective July 1, 2015, the City no longer provides water service to the communities of Hickman and Waterford.
4. The City's study area boundary represents the maximum area. The actual boundary will be determined by future Council action.

LEGEND

- Existing Sphere of Influence (SOI)
- Contiguous Service Area
- Contiguous Area Outside of SOI
- Outlying Service Area
- Water System Study Area (see Note 4)
- City Limits

MODESTO CALIFORNIA

WEST YOST ASSOCIATES

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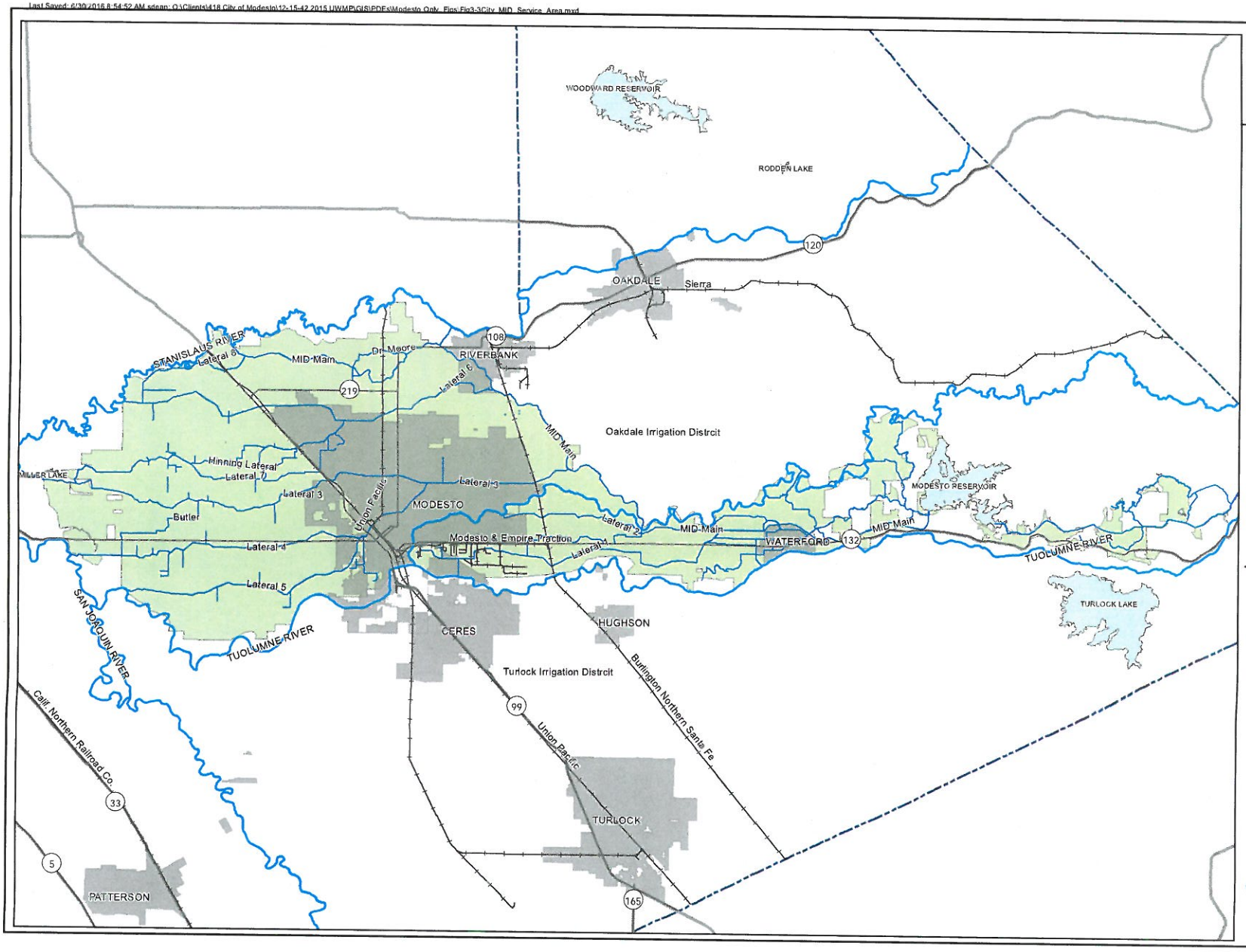

FIGURE 3-3

City of Modesto
2015 UWMP

MID WATER
SERVICE AREA

N

0 1.5 3
Scale in Miles

Notes
1. Source: Modesto Irrigation District.

LEGEND

- MID Service Boundary
- Cities
- Lake
- River
- Pipeline/Lateral/Crossing
- Railroad

MODESTO CALIFORNIA

WEST YOST ASSOCIATES

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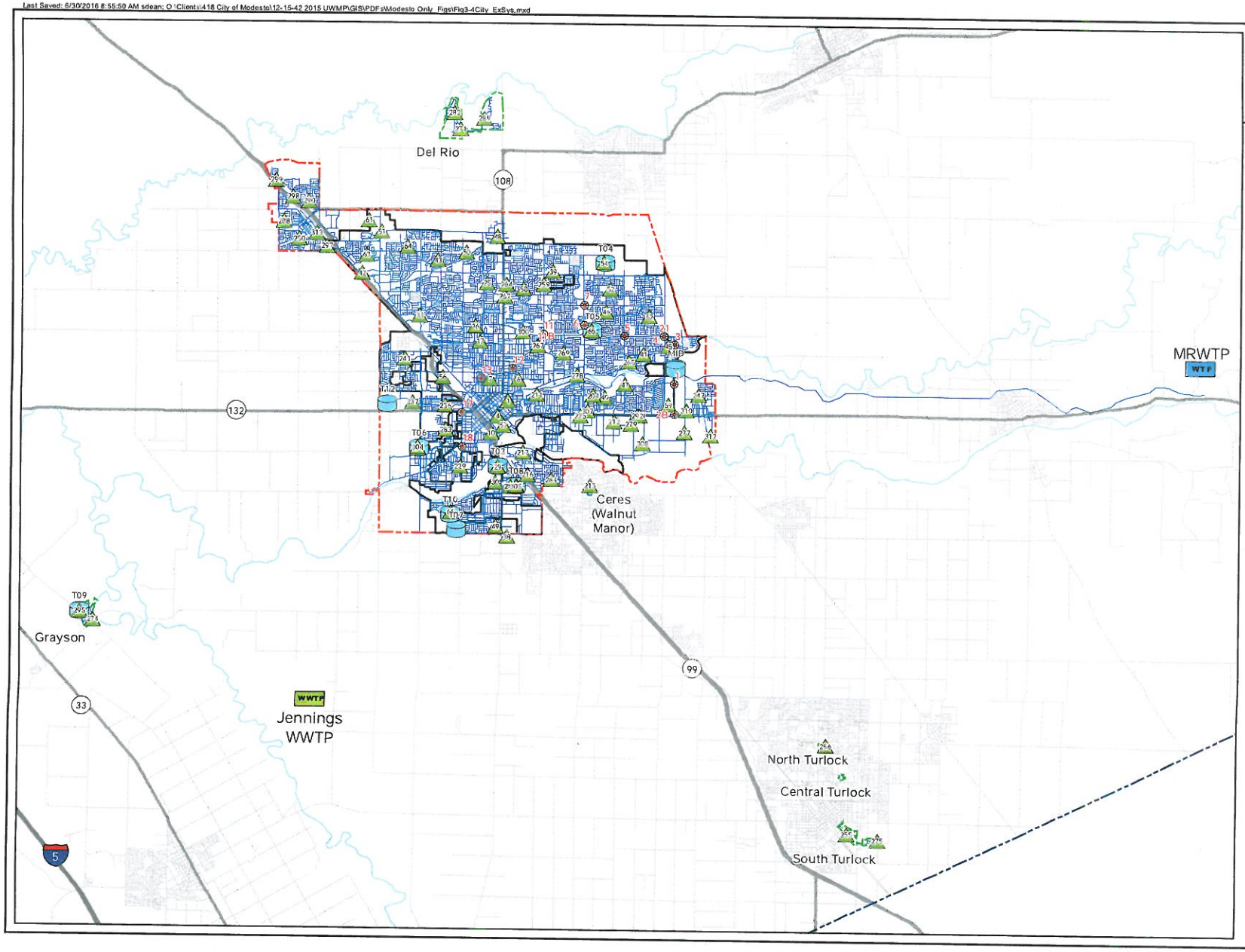

FIGURE 3-4

City of Modesto
2015 UWMP

CITY OF MODESTO EXISTING WATER SYSTEM FACILITIES

Notes
1. Pipeline diameters are based on City's current GIS provided by the City on 10/23/2014.
2. Effective July 1, 2015, the City no longer provides water service to the communities of Hickman and Waterford.

LEGEND

- Modesto Regional Water Treament Plant (MRWTP)
- Jennings Wastewater Treatment Plant
- Active Well
- Tank and Booster Pump Station
- MID Turnout
- Existing Pipeline
- Contiguous Service
- Outlying Service
- City Limits

MODESTO CALIFORNIA

WEST YOST ASSOCIATES

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CHAPTER 4
System Water Use

This chapter describes and quantifies the City and MID's past, current, and projected water use. Water demand projections are based on the projected growth within the City's service area. Accurately tracking and reporting current water demands allows the City to properly analyze the use of their water resources and conduct good resource planning for the future.

4.1 RECYCLED VERSUS POTABLE AND RAW WATER DEMAND

The City purchases potable water from MID and also treats pumped groundwater to potable water use standards. Potable water is water that is safe to drink and which typically has had various levels of treatment and disinfection.

Recycled water is municipal wastewater that has been treated to a specified quality to enable it to be used again. The City currently uses secondary-treated recycled water for agricultural irrigation of roughly 2,500 acres of fodder and feed crops on City-owned land. Due to geographical and financial constraints to supply tertiary recycled water inside the City's water service area, the City is currently moving forward with a project to supply tertiary treated recycled water to the neighboring Del Puerto Water District, as well as other potential users in western Stanislaus County. The City does not currently use recycled water to offset potable water use in its water service area nor does it anticipate to do so in the future.

Raw water is untreated water that is used in its natural state or with minimal treatment. The City does not deliver raw water to any customers in its water service area.

4.2 WATER USES BY SECTOR

This section describes the City's and MID's past, current and projected water use by sector through the year 2040 in five-year increments. This section identifies water usage among different water use sectors including single-family residential, multi-family residential, commercial, industrial, institutional/governmental, landscape irrigation, and others. These classifications were used to analyze current consumption patterns among various types of customers. The City and MID use the same definitions for each sector as outlined in the DWR Guidebook:

- **Single-family residential:** A single-family dwelling unit. A lot with a free-standing building containing one dwelling unit that may include a detached secondary dwelling.
- **Multi-family residential:** Multiple dwelling units contained within one building or several buildings within one complex.
- **Commercial:** A water user that provides or distributes a product or service (CWC 10608.12(d)).
- **Industrial:** A water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System (NAICS) code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development (CWC 10608.12(h)).

- **Institutional (and governmental):** A water user dedicated to public service. This type of user includes, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions (CWC 10608.12(i)).
- **Landscape:** Water connections supplying water solely for landscape irrigation. Such landscapes may be associated with multi-family, commercial, industrial, or institutional/governmental sites, but are considered a separate water use sector if the connection is solely for landscape irrigation.
- **Sales to other agencies:** Water sales made to another agency. Projected sales may be based on projected water demand provided by the receiving agency. There is inherent uncertainty in future demand projections, therefore, any projected sales reported in the UWMP are for planning purposes only and are not considered a commitment on the part of the seller.
- **Other:** Any other water demand that is not adequately described by the water sectors defined above. Unlike previous UWMPs, system water losses are not to be reported in the "Other" category.
- **Losses:** System losses are the difference between the actual volume of water treated and delivered into the distribution system and the actual metered consumption.

The City and MID's past urban water use is categorized by water use sectors in Table 4-1. These historical volumes are different from the totals presented in the 2010 UWMP because: (1) water production from the Hickman and Waterford service areas are excluded; and (2) more recent updates to the City's metered water use database have been made to provide more accurate totals.

Table 4-1. Historical Water Use by Sector, AFA

Water Use Type	2010 Actual Volume[a,b]	
	City	MID[c]
Single-Family	16,596	0
Multi-Family	5,389	0
Commercial	8,050	0
Industrial	3,209	0
Institutional/Governmental	2,013	0
Landscape	2,567	0
Sales to Other Agencies	0	30,645
Other – Unmetered	18,737	0
Losses (10 percent)	6,285	0
Total	62,846	30,645

(a) Volumes do not include production from Hickman and Waterford service areas, which are no longer served by the City.
(b) Based on data from the City's Water Master Plan.
(c) MID does not directly serve municipal water users and the total volume reflects actual deliveries to the City.

The current and projected water use for the City and MID are discussed below in separate sections.

4.2.1 City Water Use

The City's actual potable water demands for the calendar year 2015 are reported in Table 4-2. There are no existing or projected uses for saline barriers, groundwater recharge, conjunctive use, or raw water within the City's service area.

Table 4-2. Retail: Demands for Potable and Raw Water – Actual (DWR Table 4-1 Retail)

Use Type	2015 Actual		
	Additional Description *(as needed)*	Level of Treatment When Delivered	Volume
Single Family		Drinking Water	20,203
Multi-Family		Drinking Water	4,710
Commercial		Drinking Water	7,537
Industrial		Drinking Water	2,728
Institutional/Governmental		Drinking Water	1,486
Landscape		Drinking Water	1,744
Other	Unmetered water uses	Drinking Water	4,305
Losses		Drinking Water	4,746
		TOTAL	47,459
NOTES: Volumes are in AF; volumes do not include demands from Hickman and Waterford.			

Water demand projections in this 2015 UWMP are based on potable water demand projections developed for the City's Water Master Plan (2016) and were developed based on remaining vacant land assumed to be developed by buildout (estimated at 2050) in the City's service area. Table 4-3 reports the City's projected potable water demands through the year 2040.

Table 4-3. Retail: Demands for Potable and Raw Water – Projected (DWR Table 4-2 Retail)

Use Type	Additional Description *(as needed)*	Projected Water Use				
		2020	2025	2030	2035	2040-opt
Single Family		35,872	38,680	41,488	44,296	47,105
Multi-Family		6,894	7,434	7,974	8,513	9,053
Commercial		11,031	11,895	12,758	13,622	14,486
Industrial		3,993	4,305	4,618	4,931	5,243
Institutional/Governmental		2,175	2,345	2,515	2,685	2,855
Landscape		2,553	2,753	2,953	3,153	3,352
Other	Unmetered water uses	0	0	0	0	0
Losses		6,946	7,490	8,034	8,578	9,122
TOTAL		69,464	74,902	80,340	85,778	91,216
NOTES: Volumes are in AF. Projected water use is based on the City of Modesto Water Master Plan.						

Table 4-4 summarizes the City's actual and projected water demands reported in Tables 4-2 and 4-3, and the recycled water demands reported in Chapter 6.

Table 4-4. Retail: Total Water Demands (DWR Table 4-3 Retail)

	2015	2020	2025	2030	2035	2040 *(opt)*
Potable and Raw Water	47,459	69,464	74,902	80,340	85,778	91,216
Recycled Water Demand	0	0	0	0	0	0
TOTAL WATER DEMAND	47,459	69,464	74,902	80,340	85,778	91,216
NOTES: Volumes are in AF.						

4.2.2 MID Water Use

MID has not delivered potable, raw, or recycled water directly to urban customers in the past and present and does not plan to do so in the future.

MID's actual volume of water sold to the City for the calendar year 2015 is reported in Table 4-5.

Table 4-5. Wholesale: Demands for Potable and Raw Water – Actual (DWR Table 4-1 Wholesale)

Use Type	2015 Actual		
	Additional Description *(as needed)*	Level of Treatment When Delivered	Volume
Sales to other agencies	City of Modesto	Drinking Water	15,401
Losses		Drinking Water	31
		TOTAL	15,432
NOTES: Volumes are in AF.			

MID's projected urban water demands (sales to the City) through the year 2040 are reported in Table 4-6.

Table 4-6. Wholesale: Demands for Potable and Raw Water – Projected (DWR Table 4-2 Wholesale)

Use Type	Additional Description *(as needed)*	Projected Water Use				
		2020	2025	2030	2035	2040 *(opt)*
Sales to other agencies	City of Modesto	44,800	48,533	52,267	56,000	59,733
	TOTAL	44,800	48,533	52,267	56,000	59,733
NOTES: Volumes are in AF. Based on the City of Modesto Water Master Plan (refer to Figure 5-1 in the Water Master Plan).						

Table 4-7 summarizes the actual and projected water demands reported in Tables 4-5 and 4-6, and the recycled water demands reported in Chapter 6.

Table 4-7. Wholesale: Total Water Demands (DWR Table 4-3 Wholesale)

	2015	2020	2025	2030	2035	2040*(opt)*
Potable and Raw Water	15,432	44,800	48,533	52,267	56,000	59,733
Recycled Water Demand	0	0	0	0	0	0
TOTAL WATER DEMAND	15,432	44,800	48,533	52,267	56,000	59,733
NOTES: Volumes are in AF.						

4.3 DISTRIBUTION SYSTEM WATER LOSSES

System losses are the difference between the actual volume of water treated and delivered into the distribution system and the actual metered consumption. Such apparent losses are always present in a water system due to pipe leaks, unauthorized connections or use; faulty meters; unmetered services such as fire protection and training, and system and street flushing.

The estimated annual system losses for the City's service area (i.e., the difference between the annual production and annual sales) for the most recent 12-month period available (beginning on January 1, 2015) are summarized in Table 4-8. Actual water losses within the City's water system cannot be confirmed until the City has completed its current efforts to implement metering citywide. The completion of the City's meter retrofit program is expected to be in 2020. Therefore, unaccounted-for water and system losses are currently assumed to be approximately 10 percent of the City's total water production.

Table 4-8. Retail: 12-Month Water Loss Audit Reporting (DWR Table 4-4 Retail)

Reporting Period Start Date	Volume of Water Loss*
01/2015	4,746
** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*	
NOTES: Volumes are in AF. A copy of the City of Modesto's 2015 Water Audit is provided in Appendix E.	

MID does not directly serve any municipal water customers, and therefore has no water distribution system losses. However, MID does have some losses within its transmission system which are reflected in their most recent 12-month water loss audit reporting, as reported in Table 4-9.

Table 4-9. Wholesale: 12-Month Water Loss Audit Reporting (DWR Table 4-4 Wholesale)

Reporting Period Start Date	Volume of Water Loss*
01/2015	31
** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*	
NOTES: Volumes are in AF. A copy of MID's 2015 Water Audit is provided in Appendix E.	

Copies of the City's and MID's 2015 Water Audit worksheets are provided in Appendix E.

4.4 ESTIMATING FUTURE WATER SAVINGS

The water use projections presented in Table 4-4 are based on land use projections within the City's water service area and are described further in the City's Water Master Plan (2016). Additional water savings from codes, standards, ordinances, or transportation and land use plans, also known as passive savings, can decrease the water use for new and future customers. However, as shown in Table 4-10 below, these potential passive savings have not been included in the City's water demand projections.

Table 4-10. Retail Only: Inclusion in Water Use Projections (DWR Table 4-5 Retail)

Are Future Water Savings Included in Projections?	No
Are Lower Income Residential Demands Included In Projections?	Yes

4.5 WATER USE FOR LOWER INCOME HOUSEHOLDS

SB 1087 (2006) requires that water providers develop written policies that give priority to development that includes affordable housing to low-income households (Government Code Section 65589.7). The City passed Resolution 2006-508 on August 8, 2006, adopting written procedures to uphold this legislation.

The projected water demands shown in Table 4-3 include water use for single-family and multi-family residential housing needed for low-income households, as identified in the City's Housing Element. A lower income household is defined as a household that has an income below 80 percent of the Area Median Income (AMI), adjusted for family size. According to the City's

Housing Element (2015-2023), the percent of City of Modesto households with incomes below 80 percent of the AMI was approximately 38 percent in 2013[1].

Therefore, based on the 2013 housing data for the City of Modesto, it is estimated that approximately 38 percent of the City's water demands are attributed to low income households. Table 4-11 presents the projected water demands for low income single-family and multi-family residential households.

Table 4-11. Projected Water Demands for Lower Income Households

Water Use Sector	Water Demands for Low Income Households[(a)], AFA				
	2020	2025	2030	2035	2040
Single-Family	13,632	14,699	15,766	16,833	17,900
Multi-Family	2,620	2,825	3,030	3,235	3,440
Total	16,252	17,524	18,796	20,068	21,340

(a) Based on data from the City's Housing Element indicating that approximately 38 percent of households in the City's service area are classified as low income.

As shown in Table 4-10, water demands for the lower income households are included in the City's water demand projections.

4.6 CLIMATE CHANGE

The City's water demand and use patterns may be impacted by climate change. Increased irrigation demand is anticipated to occur due to temperature rise, increased evaporative losses from warmer temperatures, and a longer growing season. In addition, wildfire frequency may increase as a result of climate change which would increase the fire industry's water demands. A general discussion regarding the potential impacts of climate change on the City and MID's water supplies are described in *Chapter 6 System Supplies*.

[1] Chapter 2 Housing Needs Assessment, Table 2-5: 2013 Household Incomes: California, San Joaquin Valley, and Modesto, City of Modesto Draft Housing Element (2015-2023), January 2016.

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CHAPTER 5
SB X7-7 Baselines and Targets

In November 2009, SB X7-7, the Water Conservation Act of 2009, was signed into law by Governor Arnold Schwarzenegger as part of a comprehensive water legislation package. The Water Conservation Act addresses both urban and agricultural water conservation. The legislation sets a goal of achieving a 20 percent statewide reduction in urban per capita water use by the year 2020 (i.e., "20 by 2020"), and directs urban retail water suppliers to establish an "interim" per capita water use target to be met by 2015 and a "final" per capita water use target to be met by 2020.

It should be noted that wholesale water suppliers are not required to establish and meet baselines and targets for daily per capita water use, nor are wholesalers required to complete the SB X7-7 Verification Forms. However, wholesale agencies are required to provide an assessment of present and proposed programs and policies that will help the retail water supplier achieve their SB X7-7 water use reduction targets. A discussion of MID's programs and policies for water conservation is provided in *Chapter 9 Demand Management Measures*. Therefore, the remainder of this chapter focuses on SB X7-7 baselines and targets for only the City's water service area.

The City's compliance with SB X7-7 was first addressed in the 2010 UWMP. The City's baseline per capita water use was determined, and urban water use targets for 2015 and 2020 were established and adopted. SB X7-7 included a provision that an urban water supplier may update its 2020 urban water use target in its 2015 UWMP, and may use a different target method than was used in 2010. Also, the SB X7-7 methodologies developed by DWR in 2011 noted that water suppliers may revise population estimates for baseline years when the 2010 U.S. Census information became available (as described below, the 2010 U.S. Census data was not finalized until 2012).

The DWR Guidebook indicates that there were significant discrepancies between the DOF estimated 2010 population (based on 2000 U.S. Census data) and the actual 2010 population (based on 2010 U.S. Census data). Therefore, if a water supplier did not use 2010 U.S. Census data for their baseline population calculations in the 2010 UWMP, DWR has determined that these water suppliers must recalculate their baseline population for the 2015 UWMP using 2000 and 2010 U.S. Census data, and baseline, and 2015 and 2020 urban water use targets must be modified accordingly.

This chapter provides a review and update of the City's baseline per capita water use, 2015 interim per capita water use target, and 2020 final per capita water use target in accordance with the requirements described in the DWR Guidebook and based on the 2010 U.S. Census population data. The City calculated baselines and targets on an individual reporting basis in accordance with SB X7-7 legislation requirements and *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use* (DWR, 2016). The City has achieved compliance with its 2015 interim target, as discussed below, and is positioned to achieve its 2020 final target. Regional Alliance baselines and targets are discussed in Section 5.8.

Additional information on the City's baselines, targets, and compliance is provided in the SB X7-7 Verification Forms which are referenced throughout this chapter and included in Appendix F.

5.1 UPDATING CALCULATIONS FROM 2010 UWMP

CWC 10608.20(g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).

Methodologies DWR 2016, Methodology 2 Service Area Population Page 25 - Water suppliers may revise population estimates for baseline years between 2000 and 2010 when 2010 census information becomes available. DWR will examine discrepancy between the actual population estimate and DOF's projections for 2010; if significant discrepancies are discovered, DWR may require some or all suppliers to update their baseline population estimates.

DWR Guidebook, Required Use of 2010 U.S. Census Data page 5-5 – if an agency did not use 2010 Census data for their baseline population calculations in the 2010 UWMP...DWR has determined that these agencies must recalculate their baseline populations for the 2015 UWMPs using 2000 and 2010 Census data. This may affect the baseline and target GPCD values calculated in the 2010 UWMP, which must be modified accordingly in the 2015 UWMP.

Population data from the 2010 U.S. Census were not made available until 2012, after the City submitted its 2010 UWMP. Therefore, the City updated population, baselines, and targets for this 2015 UWMP to reflect 2010 U.S. Census data. The following sections describe these updates.

5.2 BASELINE PERIODS

SB X7-7 requires each urban water retailer to determine their baseline daily per capita water use, measured in gallons per capita per day (Baseline GPCD), over a 10-year or 15-year baseline period. The 10-year baseline period is defined as a continuous 10-year period ending no earlier than December 31, 2004 and no later than December 31, 2010. SB X7-7 also defines that for those urban water retailers that met at least 10 percent of their 2008 water demand using recycled water, the urban water retailer can extend the Baseline GPCD calculation for a maximum of a continuous 15-year baseline period, ending no earlier than December 31, 2004 and no later than December 31, 2010. SB X7-7 also requires each urban water retailer to determine a 5-year baseline per capita water demand, which DWR calls the Target Confirmation, calculated over a continuous 5-year period ending no earlier than December 31, 2007 and no later than December 31, 2010.

Based on these requirements, the City has selected the following baseline periods:

- 10-year Baseline Period: 1999 to 2008
- 5-year Baseline Period: 2003 to 2007

These baseline periods are listed in SB X7-7 Table 1 of Appendix F. It should be noted that these 10-year and 5-year periods are the same as reported in the 2010 UWMP.

5.3 SERVICE AREA POPULATION

DWR Guidebook, Required Use of 2010 U.S. Census Data page 5-5 – if an agency did not use 2010 Census data for their baseline population calculations in the 2010 UWMP...DWR has determined that these agencies must recalculate their baseline populations for the 2015 UWMPs using 2000 and 2010 Census data. This may affect the baseline and target GPCD values calculated in the 2010 UWMP, which must be modified accordingly in the 2015 UWMP.

This section includes a discussion of the City's service area population including 2000 and 2010 U.S. Census data. Population reported in the 2010 UWMP did not include 2010 U.S. Census data because the full Census data set was not available until 2012. Therefore, the City updated the current and historical service area population for this 2015 UWMP to reflect 2010 U.S. Census data.

As described in Chapter 3, the City's service area consists of one large "contiguous" service area and several "outlying" non-contiguous service areas. The central contiguous service includes Modesto, Salida, portions of North Ceres, and several unincorporated Stanislaus County "islands" (Empire, Bret Harte, Shackelford, and West Modesto, among several others). The outlying service areas are not contiguous to the central service area and include Grayson, Del Rio, Ceres (Walnut Manor), and portions of Turlock. As mentioned previously, as of July 1, 2015, the City no longer provides water service to the communities of Hickman and Waterford, and therefore their current and historical service area populations have been removed from the City's SB X7-7 analysis.

DOF population data was used to determine the City's service area population, where available. The DOF uses U.S. Census data, combined with changes to the housing stock, estimated occupancy of housing units, and the number of persons per household to estimate annual population within jurisdictional boundaries. Where DOF data are not available (e.g., Turlock and Ceres (Walnut Manor) areas), the population has been estimated based on a count of existing dwelling units served by the City (from aerial photographs) and an estimated housing density (people per dwelling unit) based on Census data for the surrounding communities.

Historical service area population during the 10- and 5-year baseline periods are shown in SB X7-7 Table 3 of Appendix F.

5.4 GROSS WATER USE

Annual gross water use is the water that enters the City's distribution system over a 12-month period (calendar year) with certain exclusions. This section discusses the City's annual gross water use for each year in the baseline periods, as well as 2015, in accordance with Methodology 1 of DWR's *Methodologies* document.

> *CWC 10608.12(g) "Gross Water Use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:*
>
> *(1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.*
>
> *(2) The net volume of water that the urban retail water supplier places into long term storage.*
>
> *(3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.*
>
> *(4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.*
>
> *California Code of Regulations Title 23 Division 2 Chapter 5.1 Article Section 596 (a) An urban retail water supplier that has a substantial percentage of industrial water use in its service area is eligible to exclude the process water use of existing industrial water customers from the calculation of its gross water use to avoid a disproportionate burden on another customer sector.*

The City's gross water use is based on the metered quantity of water purchased from MID and the groundwater produced by the City's municipal wells. Annual gross water use for the baseline periods and 2015 are summarized by source in SB X7-7 Table 4-A of Appendix F. It should be noted that the historical volumes presented are different from the totals presented in the 2010 UWMP because water production from the Hickman and Waterford service areas are excluded.

5.5 BASELINE DAILY PER CAPITA WATER USE

As indicated above, daily per capita water use is reported in gallons per capita per day (GPCD). Annual gross water use is divided by annual service area population to calculate the annual per capita water use for each year in the baseline periods. As discussed above, the City has used updated service area population data for this 2015 UWMP. The City's baseline daily per capita was use has been calculated as follows:

- 10-year Base Daily Per Capita Water Use
  - 285 GPCD (for the period from 1999 to 2008)
  - This value is the same value calculated in the 2010 UWMP (285 GPCD)
- 5-year Base Daily Per Capita Water Use
  - 279 GPCD (for the period from 2003 to 2007)
  - This value is 1 GPCD more than the value calculated in the 2010 UWMP (278 GPCD)

These values are shown in SB X7-7 Table 5 of Appendix F.

5.6 2015 AND 2020 TARGETS

SB X7-7 requires a state-wide average 20 percent reduction of urban per capita water use by the year 2020. Therefore, the City must set an interim (2015) water use target and a final (2020) water use target using one of four methods defined by SB X7-7 and DWR. Three of these methods are defined in Water Code Section 10608.20(a)(1), and the fourth method was developed by DWR. The 2020 water use target is calculated using one of the following four methods:

- Method 1: 80 percent of the City's base daily per capita water use;
- Method 2: Per capita daily water use estimated using the sum of performance standards applied to indoor residential use; landscaped area water use; and commercial, industrial, and institutional uses;
- Method 3: 95 percent of the applicable State hydrologic region target as stated in the State's 2010 20x2020 Water Conservation Plan; or
- Method 4: An approach that considers the water conservation potential from (1) indoor residential savings, (2) metering savings, (3) commercial, industrial and institutional savings, and (4) landscape and water loss savings.

Analysis using Methods 1 and 3 are included in Appendix F (SB X7-7 Tables 7A and 7E). The calculated 2020 target using Method 1 is 228 GPCD. The calculated 2020 target using Method 3 is 165 GPCD. Methods 2 and 4 require specific data which were not available, so those two methods were not considered. Target Method 1 results in the highest allowable SB X7-7 final (2020) target (228 GPCD by 2020), and would be the most favorable for the City.

The 2015 interim targets for each of the target methods are calculated based on the midpoint of the City's 10-year Base Daily Per Capita Water Use and the 2020 targets calculated for each of the respective target methods. The 2015 interim 2015 target is the midpoint between the City's 10-Year Base Daily Per Capita Water Use (285 GPCD) and the final 2020 target (228 GPCD). Therefore, the City's interim 2015 target is 257 GPCD (SB X7-7 Table 8).

Urban water suppliers must verify that their 2020 final water use target is at least a 5 percent reduction from the 5-year baseline GPCD. As shown in SB X7-7 Table 7F of Appendix F, the City's maximum 2020 target is 265 GPCD (95 percent of the City's 5-year base daily per capita water use of 279 GPCD). The City's Method 1 2020 target of 228 GPCD complies with the minimum reduction.

The City's interim and final targets are summarized in Table 5-1.

Table 5-1. Baselines and Targets Summary (DWR Table 5-1)

Baseline Period	Start Year	End Year	Average Baseline GPCD*	2015 Interim Target *	Confirmed 2020 Target*
10-15 year	1999	2008	285	257	228
5 Year	2003	2007	279		
*All values are in Gallons per Capita per Day (GPCD)					
NOTES: Historical per capita use from Hickman and Waterford are not included in calculations.					

For this 2015 UWMP, the City has selected Target Method 1, as was used in the 2010 UWMP. The recalculated interim 2015 target of 257 GPCD is 1 GPCD higher than the interim 2015 target reported in the 2010 UWMP (256 GPCD). The recalculated final 2020 target of 228 GPCD is the same final 2020 target reported in the 2010 UWMP (228 GPCD). The City understands that the target method and resulting targets may not be changed in any amendments to the 2015 UWMP or in the 2020 UWMP.

5.7 2015 COMPLIANCE DAILY PER CAPITA WATER USE

The City has calculated its actual 2015 water use for the 2015 calendar year in accordance with Methodology 4 of DWR's *Methodologies* document. As shown in Table 5-2, urban per capita water use in 2015 was 163 GPCD, which is well below the 2015 interim water use target of 257 GPCD. Therefore, the City has met its interim 2015 water use target. The complete set of SB X7-7 verification tables used to document this compliance is included in Appendix F.

Table 5-2. 2015 Compliance (DWR Table 5-2)

Actual 2015 GPCD*	2015 Interim Target GPCD*	Optional Adjustments to 2015 GPCD *From Methodology 8*					2015 GPCD* *(Adjusted if applicable)*	Did Supplier Achieve Targeted Reduction for 2015? Y/N
		Extraordinary Events*	Economic Adjustment*	Weather Normalization*	TOTAL Adjustments*	Adjusted 2015 GPCD*		
163	257	0	0	0	0	163	163	Yes
**All values are in Gallons per Capita per Day (GPCD)*								
NOTES: Historical per capita use from Hickman and Waterford are not included in calculations.								

As detailed in DWR's *Methodologies* document, there are allowable adjustments that can be made to an agency's gross water use in 2015 for unusual weather, land use changes, or extraordinary institutional water use. The City has elected not to make the adjustments allowed by Water Code Section 10608.24 because these exceptions are not needed to demonstrate compliance with SB X7-7 for 2015. Water use in 2015 in the City's service area was significantly reduced as compared to recent years as a result of increased water conservation efforts by the City and its customers (both voluntary and mandatory water use restrictions) in response to the severe drought conditions statewide.

5.8 REGIONAL ALLIANCE

The City has chosen to comply with the requirements of SB X7-7 on an individual basis, and did not participate in a regional alliance. Because the City was able to achieve compliance with SB X7-7 on an individual basis, the Regional Alliance compliance per capita water demand was not calculated.

CHAPTER 6
System Supplies

This chapter describes and reviews the sources of water that may be available to the City and MID. Supply sources such as surface water, supplies from other agencies, groundwater, stormwater, wastewater and recycled water, desalinated water, and exchanges or transfers are discussed below. The origin of the water supply, water quality, and quantity issues, as well as the anticipated actions to meet future demands for each water source are discussed.

The City currently uses a conjunctive water use strategy with two primary water sources to meet potable water demands within the City's service area. These include:

- Surface water from the Tuolumne River via Modesto Reservoir and treated at MID's MRWTP, which is purchased on a wholesale basis from MID; and
- Local groundwater pumped from City wells located throughout the City's service area.

City residents within the contiguous service area north of the Tuolumne River (including North Modesto, Salida, and Empire) generally rely on treated surface water supply from MID year-round, supplemented with groundwater as needed. Water demands for the contiguous service area located south of the Tuolumne River (South Modesto) and the City's outlying service areas are met entirely with groundwater supply year-round.

6.1 OVERVIEW

Prior to 1995, all municipal and industrial (M&I) water demands in the City were met from groundwater pumping. Beginning in the 1940s, increased water demands resulting from growth, along with periodic drought conditions, contributed to a reduction in groundwater levels and created a cone of depression under the City. This cone of depression, combined with increasingly stringent federal and state water quality requirements, prompted a 1983 study of the City's groundwater supply. This study recommended a conjunctive water use program that would supplement the City's M&I groundwater supply with treated surface water from the Tuolumne River. Following the recommendations from the study, the City, MID and the former Del Este Water Company[1] formed a partnership to use a portion of MID's surface water supplies for municipal water use. In 1995, treated surface water deliveries to the City began from the Phase One MRWTP, which has an annual average treatment capacity of 30 MGD.

The following sections provide a detailed discussion regarding the surface water supply for MID and the purchased water and groundwater supply for the City.

[1] In 1995, the City acquired the Del Este Water Company.

6.2 SURFACE WATER

This section describes the treatment and delivery of MID's surface water supply to the City. The City does not have a separate surface water supply and currently relies on treated surface water purchased from MID on a wholesale basis. A discussion of the wholesale water supply to the City, including the agreements governing the treated surface water deliveries from MID, is provided in Section 6.3.

6.2.1 Surface Water Supply for MID

MID is primarily an agricultural water supplier that provides irrigation water to approximately 3,400 irrigation accounts. MID serves a gross irrigation service area of approximately 103,733 acres; however, MID's irrigated acreage may vary in any given year. In 2012, approximately 63,313 acres (66,451 acres, less 3,138 idle acres) were irrigated with surface water, MID groundwater, and private groundwater.[2] In addition to its irrigation accounts, MID also provides treated surface water to the City's contiguous service area north of the Tuolumne River (North Modesto, Salida and Empire).

Together with the Turlock Irrigation District (TID), MID holds senior rights to water from the Tuolumne River. The 1,880-square mile (sq mi) Tuolumne River watershed extends to the high Sierra Nevada Mountains, and the river flows to its confluence with the San Joaquin River approximately ten miles west of Modesto. Most of the water in the Tuolumne River comes from snowmelt, with peak runoff flows occurring from April through July during which time over 60 percent of the annual flow takes place. Within the lower Tuolumne River watershed, MID and TID operate the New Don Pedro Reservoir with a maximum storage capacity of 2,030,000 AF. MID's median annual diversion from the Tuolumne River was approximately 294,000 AF of water (average from 2003 to 2012). Of that amount, approximately 32,900 AF (average from 2003 to 2012) was delivered to the MRWTP for treatment and delivery to the City.

Snowmelt from the central Sierra Nevada is of excellent quality. Surface water diverted from the Tuolumne River at La Grange has a Total Dissolved Solids (TDS) concentration of only about 36 milligrams per liter (mg/L). Other water quality constituents that impact agricultural and domestic water use are also very low or negligible. Also, the quality of the river water is fairly consistent from year to year. As runoff from agricultural and developed land is introduced into the lower part of the river, the overall water quality degrades somewhat, but still remains good.

6.2.2 Modesto Regional Water Treatment Plant

The original Phase One MRWTP is a 30 MGD (33,600 AFA) conventional treatment facility owned and operated by MID, which provides flocculation, sedimentation, and filtration, along with ozonation for primary disinfection. Treated surface water from the MRWTP is delivered to the City via MID's terminal reservoir facilities (a booster pump station and two 5 MG storage tanks located on the east side of the City) through a series of turnouts that have the ability to control

[2] Source: Modesto Irrigation District, 2015 Agricultural Water Management Plan Update, prepared by Provost & Pritchard, December 2015.

water supply from the MID transmission mains at various points within the City's water distribution system. Phase One of the MRWTP has a maximum functional capacity of 42.5 MGD that helps meet the maximum day and peak hour demands, but has been permitted by the State to produce up to 45 MGD.

In October 2005, MID and the City approved the ARTDA, which set forth the MRWTP Phase Two Expansion project that would allow MID to deliver an annual average supply of up to 60 MGD (67,200 AFA) of treated water to the City for municipal use. The MRWTP Phase Two Expansion project involves the construction of a new parallel treatment process consisting of low-pressure membranes, ozone disinfection system, a dissolved air flotation thickener and a new Supervisory Control and Data Acquisition (SCADA) system. Substantial completion of the MRWTP Phase Two Expansion project was reached in October 2015, and the project was accepted as complete by the MID Board of Directors in May 2016. The additional supply available to meet City demands from the MRWTP Phase Two Expansion project is projected to be 10 MGD (11,200 AFA) by 2020 (not accounting for supply reductions due to drought). The supply available from the MRWTP Phase Two Expansion project to meet City demands is projected to increase as additional development occurs within the City's contiguous service area and within MID's treated water 'place of use' up to an additional total treatment capacity of 30 MGD (33,600 AFA).

The combined capacity available at the completion of the MRWTP Phase Two Expansion project (60 MGD or 67,200 AFA) is an annual average, and both the original and expanded facilities will have peaking capacities greater than the annual averages. Peaking capacity for the Phase Two Expansion will be determined after start-up operations and testing protocols are completed.

6.3 PURCHASED OR IMPORTED WATER

The treated surface water supply that the City purchases from MID is described below. MID does not purchase wholesale water supplies, and a discussion of MID's water supply was provided in Section 6.2 above. Historically, annual treated surface water deliveries to the City have been relatively consistent, with groundwater pumping varying as need to meet water demands. However, in more recent years due to the on-going drought, MID has reduced surface water deliveries to both its agricultural customers and to the City.

Section 6.1 of the ARTDA provides in part that "In designing, constructing, operating and maintaining the First Expansion Facilities, [MID] also shall comply with applicable provisions of the [Subsequent Environmental Impact Report on the First Expansion Facilities], the related mitigation monitoring plan, and Urban Water Management Plan." The ARTDA also defines the UWMP to be "as the same may be adopted by the parties from time to time." Notwithstanding any statement directly or arguably to the contrary in this Plan, the 67,204.2 AF of water to be provided to the City by MID pursuant to the ARTDA is not altered, reduced or limited by the provisions of this Plan.

6.3.1 Wholesale Supplies for the City

The TDA, enacted in 1992, established the delivery of treated surface water to the City's contiguous service area north of the Tuolumne River. It obligated MID to deliver 33,600 AF (30 MGD) of treated surface water to the City, commencing on May 1 and ending the following April 30 during normal years. In 1995, the City purchased the Del Este Water Company and, along with it, their proportional share of treated surface water as defined in the TDA[3].

As discussed above, in October 2005, MID and the City approved the ARTDA. This agreement supersedes the original TDA and sets forth, among other things, the terms and conditions for the delivery of up to 67,200 AF (60 MGD) of treated water to the City from the expanded MRWTP. The increased water treatment capacity provided by the MRWTP Phase Two Expansion project could allow the City to serve more surface water, thereby reducing its long-term dependence on groundwater.

The ARTDA includes a formula to reduce deliveries in drier than average years based on the number of inches allocated to MID's agricultural customers. The ARTDA specifies a maximum delivery of 42 inches of water, or the amount calculated as (**y**/42) times 33,602.1 AFA[4], whichever is less (where **y** is the actual number of inches of water allocated by MID to agricultural water users for the irrigation season[5]). The allocation formula is as follows:

$$\frac{y}{42} \times 33{,}602.1 = x$$

where,

y is the number of inches of water allocated to MID's agricultural customers, and

x is the calculated amount of water to be delivered to the City in that particular year in AF.

Although the ARTDA specifies a formula for water allocations during shortages, the reduction in supply is not determined until the time of the shortage (ARTDA, Section 17.2 Formula for Water Allocation). A copy of the ARTDA is provided in Appendix G.

[3] In 1995, the City purchased the Del Este Water Company water systems in Empire, Salida, Waterford, Hickman, Grayson, Del Rio, and portions of Ceres and Turlock. In 2015, the City subsequently sold the Waterford and Hickman water systems to the City of Waterford.

[4] As described in the ARTDA, upon completion of MRWTP Phase Two Expansion, the treated water quantity shall be changed from 33,602.1 AFA to 67,204.2 AFA. These are the exact contractual supply volumes and are rounded to 33,600 AFA and 67,200 AFA, respectively, throughout this UWMP.

[5] The irrigation season is defined in the ARTDA to be May 1 through April 30 (*e.g.*, the 2015/2016 irrigation season extends from May 1, 2015 through April 30, 2016).

The ARTDA also provides the opportunity for the City to purchase additional water from MID (at a higher rate) or to exchange groundwater meeting the requirements of the ARTDA for agricultural use for treated surface water during drought years if such supplemental water supplies are available. Additional discussion regarding the availability and reliability of treated surface water supply from MID in dry years is provided in *Chapter 7 Water Supply Reliability*.

6.4 GROUNDWATER

The City relied exclusively on groundwater to meet water demands until the introduction of treated surface water in 1995. The City currently has approximately 86 active groundwater wells in both the contiguous and outlying service areas. MID currently pumps groundwater only to supplement water supplies to agricultural customers and does not pump and deliver groundwater supply to urban suppliers. The City and MID's groundwater supplies are discussed separately below.

6.4.1 Groundwater Supply for the City

The City has historically relied on groundwater pumped from the San Joaquin Valley Groundwater Basin as a major source of supply. The City's service area spans three subbasins: the Modesto Subbasin north of the Tuolumne River, the Turlock Subbasin south of the Tuolumne River, and the Delta-Mendota Subbasin west of the San Joaquin River that provides groundwater to the Grayson water system. Figure 6-1 illustrates the location of the City's water service areas in relation to the boundaries of the three underlying groundwater subbasins.

The residents within the City's contiguous service area north of the Tuolumne River generally rely on treated surface water supply from MID year-round, and are supplemented with groundwater to meet increased water demands primarily in the summer months. Water demands from the City's contiguous service area located south of the Tuolumne River (South Modesto) and the outlying service areas are met with groundwater supply year-round.

The following sections further describe the City's groundwater resource, including a description of the groundwater basin and subbasins, estimated groundwater operational yield, groundwater management activities, and historical groundwater use.

6.4.1.1 Groundwater Basin Description

The City's service area relies on groundwater pumped from three of the nine subbasins within the San Joaquin Valley Groundwater Basin. Key characteristics of these groundwater subbasins are summarized in Table 6-1. Subbasin descriptions provided below are taken from DWR Bulletin 118 Groundwater Basin Descriptions, which are provided in Appendix H.

Table 6-1. Groundwater Subbasin Characteristics and Service Areas[a]

Subbasin Name	DWR Subbasin No.	General Location	Surface Area	City Water Service Areas[b]
Modesto	5-22.02	North of Tuolumne River	247,000 acres (385 sq mi)	North Modesto South Modesto[c] Salida Empire Del Rio
Turlock	5-22.03	South of Tuolumne River	347,000 acres (542 sq mi)	South Modesto Turlock North Ceres Ceres (Walnut Manor)
Delta-Mendota	5-22.07	West of the San Joaquin River	747,000 acres (1,170 sq mi)	Grayson

[a] Based on information published in DWR Bulletin 118 Groundwater Subbasin Descriptions:
- Modesto Subbasin (last updated February 27, 2004)
- Turlock Subbasin (last updated January 20, 2006)
- Delta-Mendota Subbasin (last updated January 20, 2006)

[b] See Figure 6-1 for locations of the City water service areas in relation to the groundwater subbasin boundaries.

[c] The City's water distribution system in the contiguous service area is interconnected between North and South Modesto areas; groundwater produced in the Modesto Subbasin (North Modesto) can be delivered to South Modesto.

sq mi = square miles

Groundwater in the Modesto Subbasin occurs under unconfined, semi-confined, and confined conditions. The unconfined water body occurs in the unconsolidated deposits above and east of the Corcoran Clay, which underlies the southwestern portion of the subbasin at depths ranging from 150 to 250 feet. Where clay lenses restrict the downward flow of groundwater, semi-confined conditions occur. The confined water body occurs in the unconsolidated deposits below the Corcoran Clay and extends downward to the base of fresh water. The estimated average specific yield of this subbasin is 8.8 percent.

There are three groundwater bodies in the Turlock Subbasin: the unconfined water body; the semi-confined and confined water body in the consolidated rock fractures; and the confined water body beneath the E-clay in the western subbasin. The estimated average specific yield of the subbasin is 10.1 percent.

Groundwater in the Delta-Mendota Subbasin occurs in three water-bearing zones. These include the lower zone, which contains confined fresh water in the lower section of the Tulare Formation, an upper zone which contains confined, semi-confined, and unconfined water in the upper section of the Tulare Formation and younger deposits, and a shallow zone which contains unconfined water within about 25 feet of the land surface. The estimated specific yield of this subbasin is 11.8 percent. Land subsidence up to about 16 feet has occurred in the southern portion of the basin due to artesian head decline and consolidation of fine grained materials.

The primary sources of groundwater recharge in all three subbasins are from deep percolation of applied irrigation water and from canals and stream/river seepage. Lesser groundwater recharge occurs from percolation from small streams and direct percolation of precipitation. Table 6-2 provides a summary of estimated natural and applied water recharge and groundwater extraction in each of the three subbasins under the City's service area.

Table 6-2. Groundwater Subbasin Recharge and Extraction Estimates[a]

Subbasin Name	Natural Recharge, AFA	Applied Water Recharge, AFA	Groundwater Extraction, AFA
Modesto	86,000	92,000	81,000 (urban) 145,000 (ag)
Turlock	33,000	313,000	65,000 (urban) 387,000 (ag)
Delta-Mendota	8,000	74,000	17,000 (urban) 491,000 (ag)

[a] Based on information published in DWR Bulletin 118 Groundwater Subbasin Descriptions:
- Modesto Subbasin (last updated February 27, 2004)
- Turlock Subbasin (last updated January 20, 2006)
- Delta-Mendota Subbasin (last updated January 20, 2006)

ag = agriculture

6.4.1.1.1 Groundwater Level Trends

Groundwater levels in the Modesto Subbasin declined on average nearly 15 feet between 1970 and 2000. However, since augmenting the City's groundwater supply with treated surface water from the MRWTP beginning in 1995, the City has observed that groundwater levels have started to rise, particularly in the Modesto Subbasin, as a result of reduced groundwater pumping. From 1996 to 2000, groundwater levels in the Modesto Subbasin rose approximately 5 feet. Water levels in the Turlock Subbasin, similarly, rebounded about 8 feet from 1994 to 2000, bringing them to approximately 7 feet below the 1970 levels. Water levels in the Delta-Mendota Subbasin increased by an average of 2.2 feet from 1970 through 2000. The rising water levels suggest that the current level of pumping in each subbasin is less than the previously assumed "safe yields".

6.4.1.1.2 Groundwater Quality

The City has historically experienced some issues related to groundwater quality. Concentration levels of arsenic, uranium, perchloroethylene (PCE), trichloroethylene (TCE), dibromochloropropane (DBCP) or nitrate in excess of drinking water regulatory maximum contaminant levels (MCLs) have resulted in sixteen of the City's production wells to be taken out of service (thirteen wells in the North Modesto service area, two wells in the South Modesto service area, and one well in the Turlock service area). These well outages have reduced the City's groundwater pumping capacity.

In general, the quality of groundwater from the Turlock Subbasin, from which the South Modesto wells draw their water, is of relatively poor quality. In the South Modesto area, the City has a total of twelve wells. Of these twelve wells:

- Five wells are active wells that pump directly into the distribution system;
- Five wells are blending wells that produce water of potable quality, but do not meet all secondary MCL criteria for aesthetics (water pumped from these blending wells is pumped into storage tanks and blended with water of better water quality so that the water quality of these blended supplies meets all applicable California Department of Drinking Water (DDW) primary and secondary MCL requirements); and
- Two wells are inactive due to high nitrate concentrations.

To minimize the City's vulnerability to groundwater quality issues, the City has developed strategies to maintain and enhance its groundwater extraction capacity through a combination of well monitoring for early detection, well rehabilitation, wellhead treatment and blending. Through the well monitoring and capital improvement programs, the City expects to maintain sufficient well capacity to meet future water demands. Potential wellhead treatment options to address contaminants in the City's wells are discussed in Section 6.9.

6.4.1.2 Preliminary Operational Yield Estimate

In 2007, the City estimated that their preliminary operational yield from the three groundwater subbasins underlying the City's service area is approximately 53,500 AFA. This preliminary operational yield was estimated based on historical groundwater pumpage by the City from the Modesto, Turlock, and Delta-Mendota subbasins, and was developed by City staff to maintain a minimum average groundwater elevation of 40 feet above mean sea level (ft msl). A copy of the City's 2007 Technical Memorandum titled "Discussion on Operational Yield for the 2005 Urban Water Management Plan" documenting this preliminary operational yield is provided in Appendix H.

The general conclusion of the City's evaluation was that if the total, long-term average, groundwater pumpage quantity is held at or below 53,500 AFA, then stable groundwater levels will result at around 40 ft msl within and near the City's contiguous service area. If groundwater pumpage is significantly less than 53,500 AFA, groundwater levels will probably rise; thereby, increasing the quantity of available groundwater stored within the basin for later use in dry periods and/or to meet future demands, via "in-lieu" groundwater banking. Alternatively, if more than 53,500 AFA is extracted (e.g., during dry years), groundwater levels will probably decline. Actual annual groundwater pumpage is expected to be less during normal or wet years and higher during dry years. Table 6-3 summarizes the long-term preliminary operational yield assumed for each subbasin.

Table 6-3. Preliminary Operational Yield Assumed for Each Subbasin[a]

Groundwater Subbasin	Allocation, AFA
Modesto	48,286
Turlock	4,900
Delta-Mendota	314
Total	53,500

[a] As documented in the City's Technical Memorandum titled "Discussion on Operational Yield for the 2005 Urban Water Management Plan" (see Appendix H).

6.4.1.3 Groundwater Management

Groundwater Management Plans have been prepared for the Modesto, Turlock, and Delta-Mendota subbasins. Links to these groundwater management plans are provided in Appendix H.

The City and MID participated in groundwater management studies initiated by the 1992 California State Assembly Bill 3030 (AB 3030). The goal of this bill, also referred to as the Groundwater Management Act, is to maximize the total groundwater supply while protecting the quality of the groundwater basin. The Stanislaus and Tuolumne Rivers' Groundwater Basin Association completed the Integrated Regional Groundwater Management Plan for the Modesto Subbasin in 2005 in compliance with the Groundwater Management Planning Act of 2002 (SB 1938) and the Integrated Regional Water Management Planning Act of 2002 (SB 1672). The Stanislaus and Tuolumne Rivers' Groundwater Basin Association is made up of the following agencies: City of Modesto, MID, City of Oakdale, Oakdale Irrigation District, City of Riverbank, City of Waterford[6], and Stanislaus County.

The City also participated in the preparation of the Turlock Groundwater Basin Management Plan, which was prepared by the Turlock Groundwater Basin Association and was completed in 2008. The agencies involved in this association include the City of Modesto, City of Turlock, TID, City of Ceres, City of Hughson, Merced Irrigation District, Eastside Water District, Delhi County Water District, Ballico Community Services District, Ballico-Cortez Water District, Hillmar Water District, Denair Community Services District, the Keyes Community Water District, Stanislaus County, and Merced County.

The City did not participate in the preparation of the *Groundwater Management Plan for the Northern Agencies in the Delta-Mendota Canal Service Area*, which was prepared by the San Luis & Delta-Mendota Water Authority and was completed in 2011 and discusses the Tracy and Delta-Mendota subbasins.

[6] In 2015, the Memorandum of Understanding was revised to include the City of Waterford.

The Modesto, Turlock and Delta-Mendota subbasins are not adjudicated. This means that there is no court-appointed "watermaster" to resolve groundwater pumping issues, and there are no current specific limits on the amount of groundwater that individuals and agencies may extract from the basins. However, on September 16, 2014, Governor Jerry Brown signed into law a three-bill legislative package, composed of AB 1739 (Dickinson), SB 1168 (Pavley), and SB 1319 (Pavley), collectively known as the Sustainable Groundwater Management Act of 2014 (SGMA). The SGMA empowers local agencies to manage groundwater basins in a sustainable manner over a long-term horizon. Further discussion on the SGMA and its implications for future management of the groundwater subbasins underlying the City's service areas is provided below.

6.4.1.4 Groundwater Sustainability

As discussed above, the SGMA legislation provides a framework for sustainable management of groundwater supplies by local authorities, with a limited role for state intervention when necessary to protect the resource. The legislation lays out a process and a timeline for local authorities to achieve sustainable management of their groundwater basins. For local agencies involved in implementation of the SGMA, the requirements are significant and can be expected to take years to accomplish. The State Water Resources Control Board may intervene if local agencies do not form a Groundwater Sustainability Agency (GSA) and/or fail to adopt and implement a Groundwater Sustainability Plan (GSP). The SGMA implementation steps and deadlines are summarized in Table 6-4.

Table 6-4. Sustainable Groundwater Management Act Implementation Steps and Deadlines

Implementation Step	Implementation Measure	Deadlines
Step One	Local agencies must form local Groundwater Sustainability Agencies (GSAs) within two years	• June 30, 2017
Step Two	Agencies in basins deemed high- or medium-priority must adopt Groundwater Sustainability Plans (GSPs) within five to seven years, depending on whether a basin is in critical overdraft	• January 31, 2020 for critically overdrafted basins • January 31, 2022 for high- and medium-priority basins not currently in overdraft
Step Three	Once plans are in place, local agencies have 20 years to fully implement them and achieve the sustainability goal	• January 31, 2040 for critically overdrafted basins • January 31, 2042 for high- and medium-priority basins not currently in overdraft

The SGMA applies to basins or subbasins designated by the DWR as high- or medium-priority basins based on a statewide ranking that uses criteria including population and extent of irrigated agriculture dependent on groundwater. The final Basin Prioritization findings indicate that 127 of California's 515 groundwater basins and subbasins are high- and medium-priority basins. These high- and medium-priority basins account for 96 percent of California's annual groundwater pumping and supply 88 percent of the population which resides over the groundwater basins. The

rankings of the groundwater subbasins underlying the City's service areas are shown in Table 6-5. As shown, all three of the City's underlying groundwater subbasins have been designated as high-priority basins, and the Delta-Mendota subbasin has also been identified to be a critically overdrafted basin.

Table 6-5. Groundwater Basin Prioritization for Sustainable Groundwater Management Act[a]

Rank	Basin Number	Subbasin Name	Overall Basin Ranking Score	Overall Basin Priority
13	5-22.02	Modesto	23.5	High
26	5-22.07	Delta-Mendota	22.3	High; Critically Overdrafted Basin
38	5-22.03	Turlock	21.5	High

[a] CASGEM Groundwater Basin Prioritization Results, run version May 26, 2014.

The Stanislaus and Tuolumne Rivers' Groundwater Basin Association are currently discussing their strategy for complying with SGMA and strategizing on forming GSAs and developing GSPs as guidelines are developed. Several of the activities required by the SGMA are not expected to be finalized until June 2016; therefore, new requirements for groundwater management under the SGMA do not apply to this 2015 UWMP, but will be addressed in the 2020 UWMP.

6.4.1.5 Overdraft Conditions

A groundwater basin's sustainable, or "safe" yield is defined as the average annual amount of groundwater that can be extracted from the groundwater basins, while maintaining a non-overdraft condition. The Modesto and Turlock subbasins have not been identified by DWR as being critically overdrafted basins; however, the Delta-Mendota Subbasin has recently been identified as being a critically overdrafted basin. The Delta-Mendota Subbasin was not previously identified as being critically overdrafted in DWR Bulletin 118; however, per the requirements of the SGMA (described above), DWR was directed to review and evaluate groundwater conditions from 1989 to 2009 to develop a revised list of critically overdraft basins (conditions from 2011 to 2015 were not considered as the SGMA legislation requires the current drought period to be excluded from the evaluation). Based on this recent evaluation, the Delta-Mendota Subbasin was added to the list of critically overdrafted basins.

The City currently maximizes the use of its treated surface water supply from MID in normal and wetter years. The use of this treated surface water supply gives the City flexibility to preserve its groundwater supplies through in-lieu banking. Additional treated surface water supplies provided from the MRWTP Phase Two Expansion project will allow the City to further utilize available surface water to meet water demands in lieu of using groundwater in the Modesto Subbasin.

The City will address overdraft conditions in accordance with the SGMA through the development of GSPs for the groundwater subbasins underlying the City's water service area. The GSPs will identify the activities required for the City to monitor and manage groundwater levels, water quality, groundwater quality degradation, and inelastic land surface subsidence.

6.4.1.6 Historical Groundwater Pumping

The City's historical groundwater pumpage from 2011 through 2015, is summarized in Table 6-6. Average annual groundwater pumpage over the past five years has been approximately 32,904 AFA, which is below the City's established groundwater operational yield of 53,500 AFA. The City's historical groundwater supply was of sufficient quality and quantity to meet the City's water demands.

The general decrease in overall water use and groundwater pumpage in recent years is a direct result of water conservation by the City's water customers in response to the recent drought conditions, in addition to the City's installation of water meters, reduced leakage losses and after effects of the economic downturn. However, in 2014, groundwater pumpage increased over 2013 quantities to supplement reduced treated surface water deliveries from MID. In 2015, treated surface water supplies were again reduced, and groundwater pumpage was used to supply approximately two-thirds of the City's annual water supply.

Table 6-6. Retail: Groundwater Volume Pumped (DWR Table 6-1 Retail)

Groundwater Type	Location or Basin Name	2011	2012	2013	2014	2015
Alluvial Basin	San Joaquin Valley Groundwater Basin	34,897	31,380	29,773	36,415	32,058
	TOTAL	34,897	31,380	29,773	36,415	32,058
NOTES: Volumes are in AF. Historical groundwater volumes do not include production from Hickman and Waterford.						

6.4.2 Groundwater Supply for MID

MID maintains approximately 93 groundwater wells that are used to supplement the surface water supply during dry years for use by MID's agricultural customers. MID does not currently pump and deliver groundwater supply to urban suppliers as shown in Table 6-7, nor does it have plans to do so in future years.

Table 6-7. Wholesale: Groundwater Volume Pumped (DWR Table 6-1 Wholesale)

☑	Supplier does not pump groundwater. The supplier will not complete the table below.					
Groundwater Type	Location or Basin Name	2011	2012	2013	2014	2015
	TOTAL	0	0	0	0	0

6.5 STORMWATER

In 1989, Congress passed amendments to the Clean Water Act requiring states to address the increasing problem of stormwater pollution entering storm drains. California requires a National Pollutant Discharge Elimination System (NPDES) permit to regulate stormwater discharges.

The City's storm drain system has approximately 77 miles of storm drain lines and 20 pump stations. Stormwater discharges from the City drain to detention/retention basins, approximately 18 major outfalls to receiving waters (Tuolumne River or Dry Creek), MID laterals/drains, or rock wells (approximately 11,000). Approximately 40 percent of stormwater discharges to detention/retention basins, 20 percent to receiving waters (Tuolumne River or Dry Creek), 10 percent to MID laterals/drains, and 30 percent to rock wells.

Stormwater can be beneficially reused as a water supply source to meet local water demands. Beneficial reuses include blending with other water supplies for groundwater recharge, redirecting it into constructed wetlands or landscaping, and diverting it to a treatment facility for subsequent reuse. The City currently recharges some of its stormwater via rock wells, infiltration basins, and newly developed underground storage and recharge facilities with plans to further develop more of these passive recharge opportunities. The City has also teamed up with the County to develop a Storm Water Resources Plan that will evaluate beneficial stormwater uses, and specifically, those that can augment groundwater supplies.

6.6 WASTEWATER AND RECYCLED WATER

6.6.1 Recycled Water Coordination

6.6.1.1 Recycled Water Planning for the City

The cities of Modesto, Turlock and Ceres have historically worked together to identify regional opportunities for wastewater treatment and recycled water production. An example of a recent cooperative project is the North Valley Regional Recycled Water Program (NVRRWP), an effort to regionalize recycled water use in Stanislaus County. As envisioned, the NVRRWP could produce and deliver up to 16,800 AFA (15 MGD) of disinfected tertiary treated recycled water to western Stanislaus County by May 2018.[7] By 2045, NVRRWP could deliver up to 59,900 AFA of tertiary treated recycled water. The source of recycled water includes treated wastewater from the cities of Modesto, Turlock and Ceres. As part of the project, the City of Turlock would install an additional 5.7 miles of conveyance pipeline to convey water directly from its Regional Water Quality Control Facility's tertiary treatment plant to NVRRWP transmission pipe facilities, which would discharge to the Delta-Mendota Canal (DMC). The DMC would be used to convey the blended canal-recycled water to users in the west side of Stanislaus County.

[7] The City of Turlock is anticipated to increase the delivery by 8,000 AFA (7 MGD) after 2019.

A feasibility study was completed in 2005 to analyze opportunities for recycled water use in the region (Northern San Joaquin Valley Water Reclamation Project Feasibility Study (RMC, 2005))[8]. This feasibility study assessed recycled water markets, reviewed regulatory requirements, and developed and evaluated alternatives for regional wastewater treatment and recycled water use. As part of the study, stakeholder workshops were conducted to discuss and gain input on recycled water opportunities. Seventeen local communities and agencies were invited to participate in the workshops and nine cities and agencies participated.

This work has been further refined with completion of additional feasibility, alignment, and other studies in 2013 and 2015, and the City is currently moving forward with a project to supply tertiary treated recycled water to the Del Puerto Water District (DPWD), as well as other potential users[9] in western Stanislaus County, with the implementation of the NVRRWP. DPWD is located along the west side of the San Joaquin Valley and extends from Vernalis to Santa Nella. Currently, DPWD's only source of water is through a contract with USBR for Central Valley Project (CVP) supply. Since the 1990s, DPWD has experienced reduction in CVP deliveries due to drought conditions and regulatory restrictions imposed on CVP operations. The geographic proximity of DPWD to the City's wastewater treatment facilities provides an opportunity for recycled water to supplement DPWD's existing water supply and improve water reliability. Although the NVRRWP would not provide a potable water offset directly to the City's service area, the treated wastewater would be used beneficially and would provide water supply reliability, public safety, enhanced property values, and increased educational opportunities. The City currently has a State Revolving Fund loan to construct the proposed NVRRWP pipelines, pump stations, etc. from the City's Jennings Road Treatment Plant to the DMC, north of the City of Patterson.

6.6.1.2 Recycled Water Planning for MID

MID is not directly involved with the treatment of wastewater or the distribution of recycled water and does not have plans to do so in the future.

6.6.2 Wastewater Collection, Treatment, and Disposal

The City's wastewater service area is smaller than the City's water service area. The City of Modesto's wastewater treatment facilities serve the City's wastewater service area and a small northern portion of the City of Ceres (including Ceres (Walnut Manor)). The following sections discuss the wastewater collected and treated within the City's water service area either by the City or by other agencies.

6.6.2.1 Wastewater Collected and Treated by the City

Influent to the City's wastewater treatment facilities consists primarily of domestic, commercial, industrial, food processing, and winery waste. Treatment of the City's raw wastewater occurs at two locations: Sutter Avenue Primary Treatment Plant (located within the City's water service area) and Jennings Road Treatment Plant (located outside the City's water service area). The Sutter

[8] Source: https://www.modestogov.com/pwd/docs/reports/water/water_feasibilityi.pdf

[9] Wildlife refuges downstream of the DMC have been identified as potential users.

Avenue Primary Treatment Plant provides pumping, screening, grit removal, flow measurement, primary clarification and sludge digestion. The primary effluent is then pumped approximately seven miles to the secondary treatment plant (the Jennings Road Treatment Plant) where it is treated further.

The Jennings Road Treatment Plant includes both secondary and tertiary treatment facilities. Secondary treatment includes biological treatment with fixed film reactors, recirculation, aerated recirculation, and oxidation ponds. The City currently disposes of the secondary treated effluent in two ways: (1) through irrigation of approximately 2,500 acres of ranch lands that the City owns, and (2) through seasonal discharge to the San Joaquin River, both of which are pursuant to NPDES Permit No. CA0079103. However, when physical or regulatory constraints prevent land application or discharge of secondary effluent, the effluent is stored on-site. Discharge of secondary effluent and cannery waste[10] to City-owned ranch lands is limited by organic loading limitations of the NPDES permit, allowable pasture irrigation rates (5 AFA per acre), and available acreage. Discharge of secondary effluent to the San Joaquin River between October 1 and May 31 is limited by a dilution requirement of 20 parts river water to one-part secondary effluent.

In 2010, the Jennings Road Treatment Plant phased in tertiary treatment with the completion of Phase 1A of its Tertiary Treatment Project, providing up to 2.3 MGD of tertiary treated water. The tertiary treatment process includes oxidation, de-nitrification, membrane filtration and ultraviolet disinfection facilities. Phase 2 of the Tertiary Treatment Project was completed in late 2015 and added another 12.6 MGD of tertiary treatment capacity, allowing for compliance with the City's NPDES Permit and permitting year-round discharge to the San Joaquin River. As discussed above, the City has plans to supply tertiary treated recycled water to the DPWD, as well as other potential users in western Stanislaus County.

6.6.2.2 Wastewater Collected and Treated by Other Agencies

The City's water service areas that do not receive wastewater services from the City of Modesto include Salida, Grayson, Del Rio, and portions of Turlock. The wastewater collected and treated by other wastewater agencies are described below.

The Salida Sanitary District provides wastewater collection, treatment, and disposal for the unincorporated community of Salida and various customers located outside its boundaries including BMC West Lumber Company, the former Modesto Tobacco and Candy, Vella Middle School, Flory Industries, the former Shell Lab site, and Gregori High School. The Salida Sanitary District's operates its wastewater treatment plant on the northern edge of Stanislaus County, just south of the Stanislaus River (6200 Pirrone Road, Salida). The Salida Sanitary District's Wastewater Treatment Plant currently processes approximately 1.2 MGD, which represents half of the plant's total capacity of 2.4 MGD.

[10] Historically, about 20 MGD of cannery wastewater with high concentrations of organic vegetable solids were sent to the primary treatment plant, causing the treatment plant to operate inefficiently. To address this problem, in the late 1990s, the Cannery Segregation Project was implemented such that now, up to 40 MGD of wastewater from seasonal canneries is segregated and bypasses treatment. These cannery discharges are applied directly to City-owned ranch lands as a soil supplement.

The Grayson Community Services District provides street lighting and wastewater (sewer) services to the community of Grayson. The Grayson Community Services District's wastewater collection and treatment system has a designed flow capacity of 100,000 gallons per day. Any growth in the area would require significant upgrades to the system to increase the treatment capacity.

Wastewater collection and treatment in Del Rio is provided by both private septic systems and small packaged wastewater treatment plants. Generally, the newer areas on the east and northwest as well as the Country Club and nearby condominiums are likely to be served by packaged plants and the older larger homes are served by private septic systems.

The Turlock Regional Water Quality Control Facility (RWQCF) receives wastewater from the City of Turlock, the Community Service Districts of Keyes and Denair and up to 2 MGD of primary treated wastewater from the City of Ceres. The RWQCF is designed to treat an average of 20 MGD and is currently treating an average influent flow of 10.3 MGD. The raw wastewater received at the Turlock RWQCF is a combination of domestic and industrial wastewater flows. The RWQCF produces disinfected tertiary treated water that meets Title 22 standards for unrestricted use. Final effluent from the RWQCF that is not recycled is discharged to the San Joaquin River. Effluent flows by pipeline to a pump station for pumping via the Harding Drain Bypass Pipeline, with subsequent discharge through a 36-inch diameter outfall directly into the San Joaquin River.

Table 6-8 summarizes the information on the collection of wastewater generated within the City's water service area in 2015.

Table 6-8. Retail: Wastewater Collected Within Service Area in 2015 (DWR Table 6-2 Retail)

Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected from UWMP Service Area 2015	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party? *(optional)*
City of Modesto	Metered	24,152	City of Modesto	Sutter Avenue Primary Treatment Plant	Yes	
City of Modesto	Metered	2,995	City of Modesto	Jennings Road Treatment Plant	No	
Salida Sanitary Sewer District	Metered	1,283	Salida Sanitary Sewer District	Salida Sanitary Treament Plant	No	
Grayson Community Services District	Estimated	86	Grayson Community Services District	Grayson WWTP	No	
Del Rio	Estimated	92	Septic systems and Packaged plants	N/A	No	
City of Turlock	Estimated	101	City of Turlock	Turlock Regional Water Quality Control Facility	No	
Total Wastewater Collected from Service Area in 2015:		28,709				

NOTES: Volumes are in AF.

Table 6-9 identifies the wastewater treated and disposed of within the City's water service area in 2015. As discussed above, the City's Sutter Avenue Primary Treatment Plant is located within the City's water service area and provides primary treatment only. The primary effluent from the Sutter Avenue Primary Treatment Plant is pumped approximately to the Jennings Road Treatment Plant, which is located outside the City's water service area. Wastewater in Del Rio is also treated and disposed of within the City's water service area.

Table 6-9. Retail: Wastewater Treatment and Discharge Within Service Area in 2015 (DWR Table 6-3 Retail)

Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2015 volumes			
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
City of Modesto Sutter Avenue Primary Treatment Plant	N/A	N/A		Other	No	Secondary, Undisinfected	24,152	0	0	0
Del Rio Septic systems and Packaged plants	N/A	N/A		Other	No	Secondary, Undisinfected	92			
						Total	24,244	0	0	0

NOTES: Volumes are in AF. The Sutter Avenue Primary Treatment Plant provides primary treatment only.

6.6.2.3 Wastewater in MID

MID is not directly involved with the treatment and discharge of wastewater and is therefore not required to complete DWR Table 6-3 (Wholesale).

6.6.3 Recycled Water System

As discussed above, the City does not currently operate a recycled water system as secondary treated effluent is generally used to directly irrigate City-owned ranch lands or discharged to the San Joaquin River. MID also does not deliver recycled water supply. As discussed above, the City plans to deliver tertiary treated recycled water to DPWD's service area and to other potential users in western Stanislaus County as part of the NVRRWP. However, the City and MID do not have plans to develop recycled water systems within their respective water service boundaries in the future.

6.6.4 Recycled Water Beneficial Uses

Recycled water is recognized as a beneficial water supply due to its many advantages including:

- Providing a reliable water source that is consistently available regardless of droughts or climate change;
- Offsetting potable water for other uses; and
- Diversifying agencies' and cities' water supply portfolios.

As discussed above, the City currently uses recycled water for agricultural irrigation on City-owned ranch lands located outside of its water service area. Therefore, there is no existing or planned beneficial use of recycled water within the City's water service area as shown in Table 6-10. MID is not directly involved with the distribution of recycled water and also does not plan to do so in the future, and is therefore not required to complete DWR Table 6-4 (Wholesale).

Table 6-10. Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area (DWR Table 6-4 Retail)

☑	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.							
Name of Agency Producing (Treating) the Recycled Water:								
Name of Agency Operating the Recycled Water Distribution System:								
Supplemental Water Added in 2015								
Source of 2015 Supplemental Water								
Beneficial Use Type	General Description of 2015 Uses	Level of Treatment	2015	2020	2025	2030	2035	2040 (opt)
		Total:	0	0	0	0	0	0

The 2015 projected estimates of recycled water use from the 2010 UWMP is compared to the actual 2015 recycled water use in Table 6-11. The 2010 UWMP accounted for the projected recycled water use on City-owned ranch lands located outside the City's water service area. The City has continued to provide recycled water to these ranch lands. However, because no recycled water was actually used within the City's water service area, Table 6-11 indicates zero recycled water use in 2015.

MID is not directly involved with the distribution of recycled water as shown in Table 6-12.

Table 6-11. Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual (DWR Table 6-5 Retail)

Use Type	2010 Projection for 2015	2015 Actual Use
Agricultural irrigation	9,100	0
Total	9,100	0
NOTES: Volumes are in AF. There was no recycled water use within the City's water service area in 2015.		

Table 6-12. Wholesale: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual (DWR Table 6-5 Wholesale)

☑	Recycled water was not used or distributed by the supplier in 2010, nor projected for use or distribution in 2015. The wholesale supplier will not complete the table below.	
Name of Receiving Supplier or Direct Use by Wholesaler	2010 Projection for 2015	2015 actual use
None	0	0
Total	0	0

Other potential beneficial uses of recycled water in the City's water service area include the following:

- Water sale to agricultural users,
- Environmental use; and
- Groundwater recharge.

These beneficial uses were not identified previously in Table 6-10 because they either currently have significant implementation constraints or would not provide beneficial use directly to the City's water service area.

6.6.4.1 Water Sale to Agricultural Users

The City does not expect to expand recycled water use for agricultural irrigation within its water service area primarily due to the availability, reliability, and low cost of irrigation water available to water users from both MID and TID. As discussed above, the City is currently moving forward with a project to supply tertiary treated recycled water to the DPWD, as well as other potential users in western Stanislaus County, with the implementation of the NVRRWP. Although this project would not provide a potable water offset directly to the City's water service area, the treated wastewater would be used beneficially.

6.6.4.2 Environmental Use

Potential opportunities for environmental uses include stream flow augmentation, wildlife habitat restoration, wetland enhancement and other related environmental purposes. One potential environmental use identified in the 2005 recycled water feasibility study is augmentation of summer flow in the San Joaquin River with disinfected tertiary treated recycled water. This could enhance habitat in the San Joaquin River and the Delta during the summer months. Environmental uses of recycled water would require evaluation in future studies to assess the potential impacts to local groundwater supplies, agricultural lands, and other environmental habitats.

Another potential opportunity identified for environmental enhancement is potential delivery of recycled water to the San Joaquin River National Wildlife Refuge (SJRNWR) for wetlands enhancement. The U.S. Fish and Wildlife Service (USFWS) has a program to restore historic wetlands that are located adjacent to the San Joaquin River as land is acquired. The SJRNWR is

located approximately 10 miles west of the City of Modesto and is part of the Pacific Flyway that supports migratory waterfowl. Additional coordination with the USFWS would be necessary to identify opportunities for recycled water use in the SJRNWR.

Recycled water could also be used to develop constructed wetlands to provide habitat for endangered species and other wildlife. Constructing/developing wetlands in the Modesto area would probably require conversion of agricultural land or modification of other land uses.

Recycled water quality is a significant consideration for environmental use since pharmaceuticals, trace elements, pesticides, and other constituents could potentially result in adverse impacts to aquatic and other wetland species. The quality of recycled water required for environmental use is dependent on the specific uses of the water (i.e., treatment wetlands have different needs than stream flow augmentation projects). Treatment requirements and water quality goals should be evaluated in the future as specific environmental projects are identified.

6.6.4.3 Groundwater Recharge

Using municipal recycled water as a recharge source for groundwater subbasins used for M&I water supply purposes is an approved practice in California. Water Factory 21 in Orange County and the Montebello Forebay project operated by the Los Angeles County Sanitation District have been in operation since the late 1970's, recharging over 50,000 AFA to the local groundwater subbasins. However, advanced treatment technologies (reverse osmosis (RO), ultraviolet (UV) disinfection, etc.) are necessary to remove pathogens, organics, trace elements, and other impurities prior to recharge. These technologies are expensive to construct and operate, and typically reduce the project yield by as much as 25 percent (due to residuals and brine byproduct). Brine byproduct disposal would be an additional challenge for a groundwater recharge project. It is unlikely that the brine byproduct would be an allowable discharge to any inland surface water. Evaporation/crystallization process, blending and use for irrigation, or some other disposal process would need to be implemented in conjunction with the RO facilities.

Groundwater recharge using recycled water can be accomplished by percolation or direct injection. Recharge could be practiced year round or seasonally, and could be implemented with other potential recycled water uses. With recharge, recycled water would commingle with groundwater and be transported via the aquifer system to existing wells. Percolation basins would be located in areas with high recharge potential. Injection wells could also be constructed, but would need to be spaced to reduce groundwater mounding and would require a distribution header system.

Groundwater is a major potable water supply component for the City and surrounding communities. While the combined operational yield of the Modesto and Turlock subbasins is currently unknown, a groundwater recharge project could supplement and increase the annual groundwater basin operational yield. Water quality constituents of concern in any domestic groundwater supply include salinity, nitrates, certain trace elements, hardness, iron, and manganese. Such groundwater contaminants would need to be considered with any Aquifer Storage and Recovery Program in terms of how the source water would impact groundwater chemistry.

Regulatory requirements governing groundwater recharge differ based on factors such as method of recharge, effluent quality, groundwater depth, soil percolation capacity, and groundwater basin volume. All of these variables would need to be defined before a recharge project could be implemented. The coliform concentration of the City's secondary treated recycled water exceeds the maximum concentration allowed to recharge through settling basins. Tertiary treated recycled water would be necessary for direct groundwater injection.

6.6.5 Actions to Encourage and Optimize Future Recycled Water Use

The 2005 recycled water feasibility study identified a multi-phased implementation strategy for recycled water, with sale to agricultural users outside of the MID and TID service areas as the most cost-effective recycled water use opportunity, which the City has been pursuing as a near-term recycled water strategy. Since completion of the 2005 study, further feasibility analysis has been performed, and the concept has been refined to focus on delivery options to DPWD and other potential users in western Stanislaus County. The City is currently in the process of constructing the proposed NVRRWP pipelines, pump stations, etc. from the City's Jennings Road Treatment Plant to the DMC, north of the City of Patterson.

Although public education of the benefits of recycled water use and beautification of areas using recycled water supplies are important components to develop positive public perception surrounding recycled water and encourage widespread recycled water usage, due to the qualitative nature of these measures, it is not possible to project the quantity of recycled water usage that will result from implementation of these measures.

On a long-term basis, the City will continue to explore regional wastewater treatment and recycled water use opportunities. However, the City's currently identified actions to pursue delivery of recycled water to DPWD and other potential users in western Stanislaus County does not provide a potable water offset in the City's water service area and is therefore not included in Table 6-13.

Table 6-13. Retail: Methods to Expand Future Recycled Water Use (DWR Table 6-6 Retail)

☑	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
Page 6-21	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
		Total	0
NOTES:			

6.7 DESALINATED WATER OPPORTUNITIES

Due to the significant infrastructure investment required to convey seawater for desalination, the lack of proximate brackish supply sources and the depth to saline groundwater, desalination is not currently a viable water supply option for the City or MID.

6.8 EXCHANGES OR TRANSFERS

This section describes the City and MID's opportunities for exchanges or transfers of water on a short-term or long-term basis. Water exchanges are typically water delivered by one water user to another water user, with the receiving water user providing water in return at a specified time or when the conditions of the parties' agreements are met. The CWC defines water transfers as a temporary or long-term change in the point of diversion, place of use, or purpose of use due to transfer, sale, lease, or exchange of water or water rights. Temporary water transfers have a duration of one year or less, and long-term water transfers have a duration of more than one year.

6.8.1 Exchange or Transfer Opportunities for the City

During supply shortage years, MID's treated surface water supply deliveries to the City may be reduced in equal proportion to deliveries for agricultural customers. Although never utilized, the City has the option of delivering groundwater to MID's irrigation canal system in exchange for an equal amount of raw surface water to be treated at the MRWTP during dry years. The City's exchange or transfer opportunities are shown in Table 6-14.

Table 6-14. Exchange or Transfer Opportunities for the City

Transfer Agency	Transfer or Exchange	Short-term	Proposed Quantities	Long-term	Proposed Quantities
MID	Transfer or Exchange	Yes	TBD	Yes	TBD
Total			TBD		TBD

6.8.2 Exchange or Transfer Opportunities for MID

During supply shortage years, MID surface water supplies may be reduced. MID may execute exchange agreements with the City, which would allow the City to deliver groundwater to MID's irrigation canal system in exchange for an equal amount of raw surface water to be treated at the MRWTP during dry years. In general, MID has not sought exchange or transfer opportunities. MID's exchange or transfer opportunities are summarized in Table 6-15.

Table 6-15. Exchange or Transfer Opportunities for MID

Transfer Agency	Transfer or Exchange	Short-term	Proposed Quantities	Long-term	Proposed Quantities
City of Modesto	Exchange	Yes	TBD	No	TBD
Total			TBD		TBD

6.9 FUTURE WATER PROJECTS

The City's treated surface water supply from MID and the City's groundwater supply are the key components of the City's water supply portfolio. This section describes potential future water supply projects that the City and MID may implement to increase water supply for average, single-dry, and multiple dry years. Because the City is projected to have sufficient supplies to meet future water demands as documented in the City's Water Master Plan (2016), the need for and timing of potential water supply projects have not been determined. Therefore, these potential future water supply projects are not currently included in the City and MID's future water supply portfolio, and DWR Table 6-7 (Retail) and Table 6-7 (Wholesale) have not been completed as shown below in Tables 6-16 and 6-17.

Table 6-16. Retail: Expected Future Water Supply Projects or Programs (DWR Table 6-7 Retail)

☑	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.

Table 6-17. Wholesale: Expected Future Water Supply Projects or Programs (DWR Table 6-7 Wholesale)

☑	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.

6.9.1 Potential Additional Surface Water Supply Options

Treated surface water purchased from MID is a key component of the City's existing water supply portfolio. A MRWTP Phase Three Expansion Project may be possible in the future if an available surface water supply is identified in the future. However, at this time, this project is speculative, and the need for and timing of this project has not yet been determined.

6.9.2 Future Groundwater Supply Considerations

Groundwater is a key component of the City's existing water supply portfolio. The following sections describe key future groundwater supply options, including:

- Wellhead treatment systems; and
- Aquifer Storage and Recovery (ASR) Program consisting of injecting, storing, and recovering treated surface water from the groundwater aquifer beneath the City.

6.9.2.1 Wellhead Treatment Evaluation

To help address the City's vulnerability to groundwater quality issues, a wellhead treatment evaluation was performed as part of the City's Water Master Plan project to: (1) evaluate the range of wellhead treatment options available for removal of several specific contaminants of concern (hexavalent chromium, nitrate, manganese, strontium and uranium); and (2) recommend which processes would best suit wellhead treatment applications at the City's wells. The best technology for wellhead treatment depends upon both the target contaminant and the ambient water quality of

the well water. A series of recommended treatment approaches were developed and are summarized in Table 6-18.

Table 6-18. Summary of Wellhead Treatment Recommendations by Contaminant Type[a]

Contaminant	Recommended Process(es)	Rationale	Additional Notes
Hexavalent Chromium (with low nitrate)	Strong-base anion (SBA) exchange	Advances in brine minimization have greatly reduced waste management costs for at least one technology	If SBA or biological treatment cannot be used alone, biofiltration followed by SBA may be warranted to minimize expensive ion exchange brine disposal requirements.
Hexavalent Chromium (with high nitrate)	Biological treatment (if proven), anion exchange if not	Biological treatment is proven at bench-scale, pilot testing in progress	
Manganese	Greensand filtration	Simple to operate, low-cost alternative	Permanganate is a more effective oxidant but use of free chlorine may be simpler as it can also serve as a disinfectant residual post-treatment.
Nitrate	Biological filtration	Lowest-cost, simple operation, eco-friendly	A comparatively new technology but conditionally approved by DDW and does not produce a brine waste.
Uranium	Anion exchange with off-site regeneration	Long operating life if the nitrate concentration is low, no technically enhanced naturally occurring radioactive material waste production on-site	If nitrate is relatively high (so violation of the MCL is likely at breakthrough), pretreatment with biofiltration should be considered.
Strontium	Cation exchange and/or lime softening	Both proven efficacious	Dataset is limited. Cations like calcium can be a big problem for strontium removal with ion exchange so pretreatment may be warranted.

[a] Source: Chapter 5, City of Modesto Water Master Plan (2016), West Yost Associates.

As the City moves forward with treatment at one or more of its groundwater wells, site-specific details like water quality, available footprint, and access to waste disposal options may shift the preferred technology choice. Also, as technologies develop, new (and/or better proven) options may become available that warrant further consideration.

6.9.2.2 ASR Program

The City's Water Master Plan project also included a conceptual-level evaluation for ASR within the groundwater basin underlying the City's contiguous water service area. The focus of this evaluation was to review existing data on the City's wells and groundwater basin hydrogeologic and geochemical characteristics to determine the conceptual feasibility of injecting, storing, and recovering treated surface water within the groundwater aquifer beneath the City.

ASR is a form of managed aquifer recharge that involves the seasonal banking of water in an aquifer during times when excess water is available (typically winter and spring), and subsequent recovery of the water from the aquifer when needed (typically fall and summer, and/or during drought periods). ASR utilizes dual-purpose injection/recovery wells for the injection of treated, potable water for storage, and the subsequent recovery of this previously stored water by pumping. The advantage of ASR technology is that it allows recharge to be applied in those geographic areas or aquifer zones with the most need, or where available groundwater storage space is the greatest. In addition, ASR sites require minimal land use area, so they can be more easily located than spreading basins or other recharge facilities.

Conceptually, treated surface water purchased on a wholesale basis from MID could be used when seasonally available surplus supply is available to develop an ASR program for the City. The ASR program, if determined to be feasible, could provide the City with the following benefits: system peaking, enhanced groundwater operational yield, and improved groundwater quality.

The overall conclusion based on what has been analyzed to date is that an ASR Program could be viable in the groundwater basin underlying the City. It is recommended that the City move forward with additional necessary ASR related studies to empirically verify the conclusions of the initial study and to develop site-specific data regarding the effectiveness, impacts, and economics of ASR. These test program data would then serve as the basis for evaluating, planning, and permitting a full-scale ASR Program within the City.

6.10 SUMMARY OF EXISTING AND PLANNED SOURCES OF WATER

6.10.1 Existing and Planned Sources of Water for the City

Total annual water production has generally decreased since the mid-2000s, a direct result of decreased water demands resulting from the recent economic downturn, water conservation in response to recent drought conditions, the City's installation of water meters, and reduced leakage losses. Water production in both 2014 and 2015 was particularly low in response to increased water conservation due to severe drought conditions. Overall, annual surface water deliveries to the City have been relatively consistent, with groundwater pumpage varying as needed to meet demands. However, in 2014 and 2015, there were significant reductions in treated surface water deliveries from MID, and the City used its groundwater supply to meet water demands.

The City's annual treated surface water purchases from MID and groundwater pumpage in 2015 to serve the City's contiguous and outlying service areas are summarized in Table 6-19.

Table 6-19. Retail: Water Supplies – Actual (DWR Table 6-8 Retail)

Water Supply	Additional Detail on Water Supply	2015		
		Actual Volume	Water Quality	Total Right or Safe Yield *(optional)*
Purchased or Imported Water	Purchases from MID	15,401	Drinking Water	
Groundwater		32,058	Drinking Water	
Total		47,459		0
NOTES: Volumes are in AF. Does not include supplies for Hickman and Waterford.				

Table 6-20 summarizes the future projected water supplies for the City. The City plans to maximize the use of available treated surface water supplies purchased from MID including the MRWTP Phase Two Expansion and supplement with its available groundwater supply to meet projected water demands.

Table 6-20. Retail: Water Supplies – Projected (DWR Table 6-9 Retail)

Water Supply	Additional Detail on Water Supply	Projected Water Supply *Report To the Extent Practicable*									
		2020		2025		2030		2035		2040 *(opt)*	
		Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*
Purchased or Imported Water	Purchases from MID	44,800		48,533		52,267		56,000		59,733	
Groundwater		24,664	53,500	26,369	53,500	28,073	53,500	29,778	53,500	31,483	53,500
Total		69,464	53,500	74,902	53,500	80,340	53,500	85,778	53,500	91,216	53,500
NOTES: Volumes are in AF. Based on the City of Modesto Water Master Plan (refer to Figure 5-1 in the Water Master Plan).											

6.10.2 Existing and Planned Sources of Water for MID

MID's annual treated surface water supplies delivered to the City in 2015 are summarized in Table 6-21.

Table 6-21. Wholesale: Water Supplies – Actual (DWR Table 6-8 Wholesale)

Water Supply	Additional Detail on Water Supply	2015		
		Actual Volume	Water Quality	Total Right or Safe Yield *(optional)*
Surface water	Tuolumne River	15,432	Drinking Water	
Total		15,432		0
NOTES: Volumes are in AF.				

Table 6-22 summarizes the future projected water supplies for MID. As discussed above, the MRWTP Phase Two Expansion project was completed in May 2016, and will provide up to an additional 30 MGD of treated surface water supply for a total annual average supply of up to 60 MGD (67,200 AFA).

Table 6-22. Wholesale: Water Supplies – Projected (DWR Table 6-9 Wholesale)

Water Supply	Additional Detail on Water Supply	Projected Water Supply *Report To the Extent Practicable*									
		2020		2025		2030		2035		2040 *(opt)*	
		Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*
Surface water		44,800		48,533		52,267		56,000		59,733	
Total		44,800	0	48,533	0	52,267	0	56,000	0	59,733	0

NOTES: Volumes are in AF. Based on the City of Modesto Water Master Plan (refer to Figure 5-1 in the Water Master Plan).

6.11 CLIMATE CHANGE IMPACTS TO SUPPLY

An extensive evaluation of the impacts of climate change is included the East Stanislaus Integrated Regional Water Management (ESIRWM) Plan (December 2013). The City of Modesto is included in the East Stanislaus Regional Water Management Partnership (ESRWMP), the official Regional Water Management Group for the region, along with the cities of Hughson, Ceres and Turlock. Key findings from the climate change evaluation are summarized below.

There is mounting scientific evidence that global climate conditions are changing and will continue to change as a result of the continued build-up of greenhouse gases (GHGs) in the Earth's atmosphere and other issues. Changes in climate can affect municipal water supplies through modifications in the timing, amount, and form of precipitation, as well as water demands and the quality of surface runoff. These changes can affect all elements of water supply systems, from watersheds to reservoirs, conveyance systems, and treatment plants. Planning for and adapting to the anticipated changes in climate will be essential to ensure water supply reliability for all users and to protect sensitive infrastructure against potentially more frequent and extreme precipitation and wildfire events.

The ESIRWM planning region lies within the San Joaquin River Hydrologic Region and contains the Stanislaus, Tuolumne, Merced and San Joaquin Rivers, and Dry Creek. The Stanislaus, Tuolumne and Merced Rivers are all tributaries to the San Joaquin River, with the Tuolumne River having the largest watershed in the San Joaquin River system. At present, all major tributaries to the San Joaquin River are being studied with respect to anticipated impacts from climate change. Studies currently underway include:

- Changes in snow cover patterns in the Sierra Nevada (University of Washington);
- The role of atmospheric rivers in extreme events in the Sierra Nevada (USGS);
- Impacts of climate changes on soil properties and habitats in the Sierra Nevada (UC-Merced and USGS); and
- Study of the effects of climate change on hydrology and stream temperatures in the Merced and Tuolumne River watersheds (Santa Clara University).

In general, these studies are multi-year endeavors and are either in progress or have yielded data that are currently being evaluated. While preliminary study results appear to support other climate change impact observations and modeling simulations, the final published conclusions of these studies are, for the most part, not currently available.

Climate change is adding new uncertainties to already existing challenges in water resources planning within the ESIRWM planning region because the water supply portfolio in the region is not widely-diversified. Water supplies are derived from multiple subbasins of the San Joaquin Valley Groundwater Basin and primarily from the Tuolumne River. Climate change will impact groundwater and surface water differently, but the region's vulnerabilities are the same regardless of the source:

- Reduced surface water availability;
- Reduced water supply reliability as a result of reduced groundwater recharge and runoff;
- Potential increase in groundwater overdraft;
- Declining water quality;
- Loss of riparian habitat, wetlands and other sensitive natural communities; and
- Reduced hydroelectric generation capacity.

Considering the amount of uncertainty associated with climate change projections, a prudent approach to addressing climate change incorporates a combination of adaptation and mitigation strategies. Climate adaptation includes strategies (policies, programs or other actions) that bolster community resilience in the face of unavoidable climate impacts, where mitigation strategies include best management practices (BMPs) or other measures that are taken to reduce GHG emissions.

The Proposition 84 IRWM Guidelines require consideration of the California Water Plan (CWP) resource management strategies (RMSs) in identifying projects and water management approaches for the region. RMSs are being considered in the ESIRWM planning process to meet the region's objectives. Application of various RMSs diversifies water management approaches, and many of the RMSs apply to climate change adaptation and mitigation. Categories of applicable RMSs include:

- Reduce Water Demand
- Improve Operational Efficiency and Transfers
- Increase Water Supply
- Improve Water Quality
- Urban Runoff Management
- Practice Resource Stewardship
- Improve Flood Management
- Other Strategies

For the City, the implementation of its overall water conservation program, particularly the completion of the residential metering program, will help to reduce water demands, and also conserve energy as a result of decreased water treatment, conveyance and pumping requirements. The City's compliance with SB X7-7 and its interim and final per capita water use targets will also ensure continued water conservation and energy conservation in the future. The City's increased use of surface water supplies from MRWTP Phase Two Expansion will help to further diversify the City's water supplies and enhance the City's water supply reliability to "adapt" to the changing hydrologic conditions associated with climate change.

As described in MID's 2015 Agricultural Water Management Plan Update, MID is committed to (1) monitoring key indicators of climate change that affect the hydrology of the Tuolumne River watershed and the growing conditions in MID's irrigation service area and (2) adapting its water management practices to respond to changes as they become evident. In addition to adaptive management, implementation of the water conservation initiatives currently underway at MID will help MID and its agricultural water users prepare for the potential impacts of climate change by improving operational control. Improving operational control will enable MID to exercise adaptive management measures should they become necessary.

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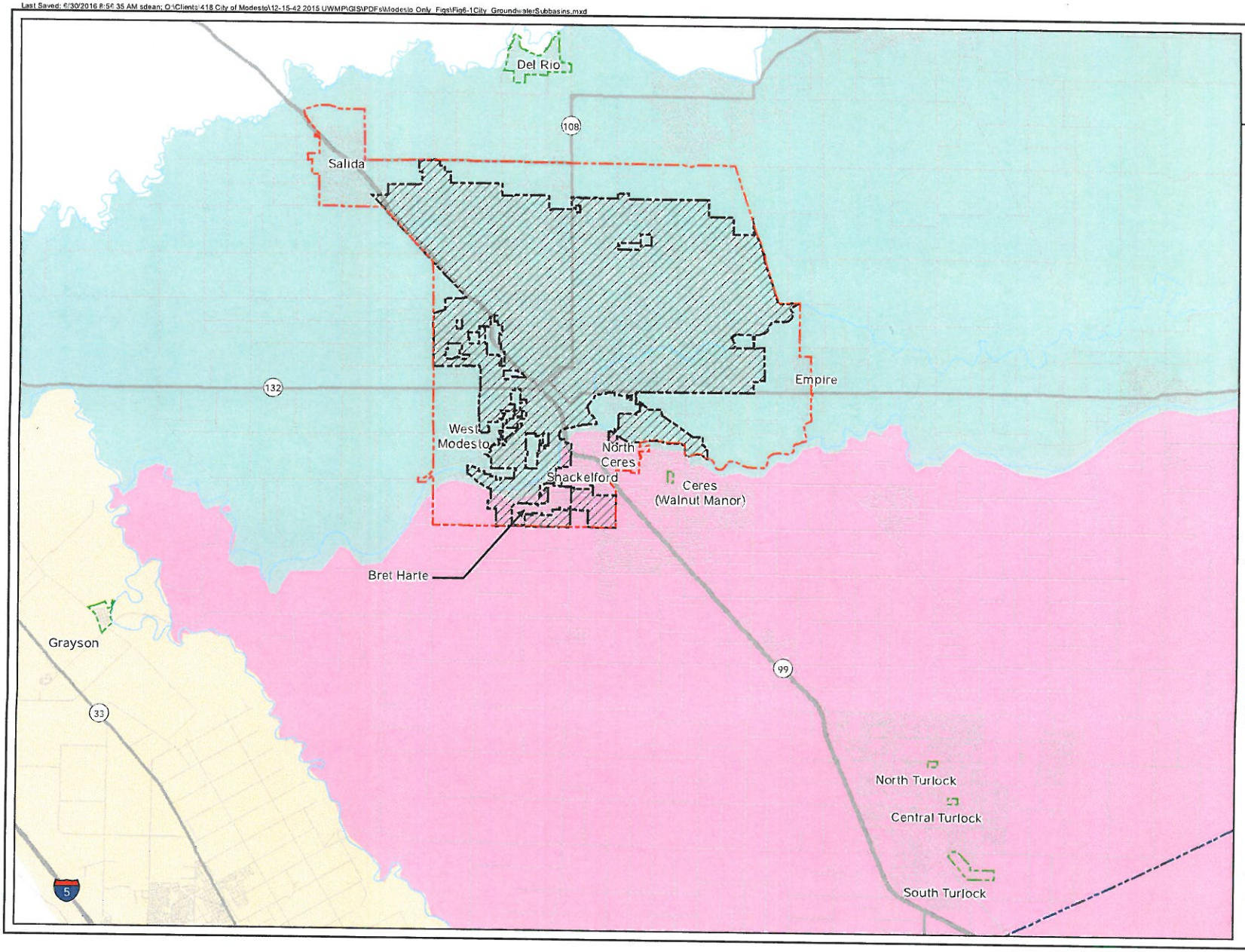

FIGURE 6-1

City of Modesto
2015 UWMP

GROUNDWATER SUBBASINS

N

0 1 2
Scale in Miles

Notes
1. Sphere of influence boundary obtained from the City on 11/6/2014.
2. The City's contiguous service area is co-terminus with the City's SOI boundary except for the Salida and North Ceres areas.
3. Effective July 1, 2015, the City no longer provides water service to the communities of Hickman and Waterford.

LEGEND

Groundwater Subbasins
- Delta-Mendota Subbasin
- Modesto Subbasin
- Turlock Subbasin
- Contiguous Service Area
- Outlying Service Area
- City Limits

MODESTO CALIFORNIA

WEST YOST ASSOCIATES

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CHAPTER 7
Water Supply Reliability Assessment

This chapter describes the long-term reliability and vulnerability of the City and MID's water supplies. The City and MID's current and proposed water management tools to address the reliability of water supplies are also addressed.

7.1 CONSTRAINTS ON WATER SOURCES

As described in *Chapter 6 System Supplies*, the City relies on two primary sources of water supplies: wholesale treated Tuolumne River surface water deliveries from MID and local groundwater pumping. The following is a general discussion regarding the constraints on the City and MID's water supplies and the associated management strategies that have been employed to address these constraints.

In general, the City and MID's water supplies are most vulnerable to climatic variability and chemical contamination (due to natural and/or man-made constituents).

Drought conditions can significantly reduce available surface water supplies because the reliability of surface water supply is dependent on hydrologic variations and the ability to store and extract water from available storage reservoirs. Precipitation, river flows and the incidental recharge of applied irrigation water are the primary sources of groundwater recharge to the groundwater basin. While drought conditions can reduce available groundwater supplies by reducing available recharge, this effect is less pronounced for groundwater than for surface water supplies, and is not expected to result in a reduction in groundwater pumping during dry years. The City's conjunctive use water supply strategy allows for flexibility in their water supply planning to address existing and future water supply constraints.

By using treated surface water in-lieu of groundwater in normal years, the City will bank groundwater supplies for use in meeting dry year and peak period water demands. The City's future water supply planning incorporates sufficient surface water supplies to allow the City to meet demands primarily through the use of surface water, allowing the in-lieu banking of groundwater for future use, thereby protecting the groundwater basin from overdraft and water quality degradation. For the City's service area south of the Tuolumne River, groundwater will continue to serve as the only source of supply.

In contrast to surface supply reliability, reliability of local groundwater supplies is threatened by poor water quality. In the past, contamination from arsenic, uranium, PCE, TCE, DBCP, and nitrate has resulted in the need for wellhead treatment to keep wells from being taken out of service. The City has developed a strategy to keep existing wells on-line and bring selected out-of-service wells back on-line through a combination of wellhead treatment, blending, and aggressive monitoring. As a result, the City does not anticipate groundwater quality to threaten the City's ability to pump and deliver groundwater supplies as needed to supplement its treated surface water supply and meet current and future water demands.

Legal issues, including place of use and water rights issues, are not anticipated to limit supply reliability for the City and MID's water supplies in future years. In certain situations, environmental factors can sometimes limit the reliability of surface water supplies, such as during a drought when dry year supply cutbacks are necessary to maintain the health of aquatic species and the environment in general. This issue is of particular concern for Delta water users, where

dry year supplies can be greatly reduced to maintain adequate water supplies for environmental purposes. Although environmental issues to date have not been a limiting factor in available water supplies to the City and MID, the regulatory process under Federal Energy Regulatory Commission (FERC) relicensing introduces potential uncertainties. Additionally, backup power and transmission/distribution system redundancies add reliability to the extraction, treatment and distribution of groundwater supplies to existing and future customers.

The vulnerability of MID's wholesale supplies and the City's local groundwater supplies to the previously mentioned constraints and the management strategies for addressing these vulnerabilities are discussed in the sections below.

7.2 RELIABILITY BY TYPE OF YEAR

The quantity of supply available from different water supply sources can vary from one year to the next depending on hydrologic conditions. Historical data, where available, were used to develop a projected yield for each water supply source under three conditions: (1) normal water year, (2) single dry water year, and (3) multiple dry water years. In accordance with the DWR Guidebook, each condition is defined as follows:

- **Normal Water Year:** The year in the historical sequence most closely representing average runoff or allocation levels and patterns.
- **Single-Dry Water Year:** The year with the lowest annual runoff or allocation in the historical sequence.
- **Multiple-Dry Water Years:** The lowest average runoff or allocation for a consecutive 3-year[1] period in the historical sequence.

7.2.1 Supply Reliability for the City

Under normal/wet water year supply conditions, it is assumed that the City will receive its full allotment of their MID treated surface water delivery. As discussed in Chapter 6, the ARTDA between MID and the City includes a formula to reduce deliveries in drier than average years based on the number of inches allocated to MID's agricultural customers. In 2014 and 2015, the available supply from MID was reduced significantly due to drought conditions. Surface water supply reductions in 2014 and 2015 were as follows:

- In 2014, the available supply was 24 inches of the total 42-inch allocation (equivalent to a 43 percent reduction), resulting in a treated water supply delivery to the City of approximately 19,200 AF (approximately 17 MGD) for the 2014/2015 water year (May 1, 2014 through April 30, 2015); and

[1] A minimum of three consecutive years must be used, but a longer period is allowed.

- In 2015, the available supply was 16 inches of the total 42-inch allocation (equivalent to a 62 percent reduction), resulting in a treated water supply delivery to the City of approximately 12,800 AF (approximately 11 MGD) for the 2015/16 water year (May 1, 2015 through April 30, 2016).

The ARTDA does provide the opportunity for the City to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water during drought years if such supplemental supplies are available. However, the City did not purchase additional treated surface water supplies in 2014 or 2015. Instead, the City chose to increase groundwater production and implement an aggressive water conservation program to help reduce water demands to match available supplies.

In 2014 and 2015, the City's water demands were significantly reduced as a result of water conservation. Water conservation measures included both voluntary actions implemented by the City's water customers and mandatory measures implemented by the City in response to the drought conditions and as mandated by the Governor's Executive Order calling for a statewide reduction in urban water use of 25 percent (as compared to 2013). Each urban water supplier in California was assigned a conservation standard (a percent reduction as compared to 2013 water use) to achieve the statewide water conservation goal. The City's conservation standard was a reduction of 36 percent (as compared to 2013 water use)[2]. From June 2015 to October 2015, the City achieved a cumulative savings of 29.1 percent (as compared to the same months in 2013). This is less than the 36 percent conservation standard set for the City, but is still a very significant reduction in water demand. The success of these recent water conservation measures has shown that the City has the ability to reduce water demands if needed to respond to water supply shortages.

The City's increase in groundwater production in response to the recent shortage in treated surface water supplies is within the operational yield estimates for the Modesto and Turlock Subbasins, and is not anticipated to have any adverse effects on the underlying groundwater subbasins or resources. In the future, if the City were to implement an ASR Program, the City may be able to inject surplus treated surface water supplies available in normal or wet years into the underlying groundwater subbasins and bank it for later extraction during dry years and/or use during seasonal demand peaking. Such a program would provide the City with added supply reliability during dry years.

For the purpose of estimating supply reductions during droughts, estimated MID delivery cutbacks were based on the recent 2015 water supply condition. It was assumed that 2015 was the fifth year of a five-year drought with equally proportioned shortages for the five years (or a 26-inch reduction/5 years for a 5.2-inch effective reduction per year). Therefore, for planning purposes, the MID delivery cutbacks experienced in each successive drought year are assumed as follows:

- First year cutback: 5.2/42 inches (12.4 percent)
- Second year cutback: 10.4/42 inches (24.8 percent)

[2] Effective March 1, 2016, the Urban Water Supplier Water Conservation Standard for the City of Modesto was reduced to 33 percent.

- Third year cutback: 15.6/42 inches (37.1 percent)
- Fourth year cutback: 20.8/42 inches (49.5 percent)
- Fifth year cutback: 26.0/42 inches (61.9 percent)

It was assumed that, for a single dry water year, MID delivery cutbacks would be equal to those experienced in 2015 (26/42 inches, or 61.9 percent). In dry years, the City plans to supplement reduced surface water supplies with banked groundwater supplies, as necessary, to meet water demands. When available, the City also has the ability to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water during drought years.

Table 7-1 lists the years that the City identifies as their average, single driest year, and driest multi-year period. These years are also known as the "base years".

Table 7-1. Basis for City and MID Water Year Data

Water Year Type	Base Year(s)	Assumed Water Supply Availability		
		MID Deliveries	Groundwater Pumping	Total Supply
Average/Normal Water Year	1984[a]	Current MID supply of 33,600 AFA as described in the ARTDA. MID supply will increase with completion of MRWTP Phase Two to 67,200 AFA.	Assumed to be equal to total demand minus MID deliveries north of the Tuolumne River	Assumed to be equal to MID deliveries plus groundwater pumping
Single-Dry Water Year	2015	Assumes 61.9 percent reduction in surface water supplies (equal to last year of a multi-year drought).	Assumed to be equal to total demand minus MID deliveries north of the Tuolumne River	Assumed to be equal to MID deliveries plus groundwater pumping
Multiple-Dry Water Years	2011-2015	Assumes an additional 12.4 percent reduction in surface water supplies per year (based on the 2015 MID cutback of 26 inches spread equally over 5 years).	Assumed to be equal to total demand minus MID deliveries north of the Tuolumne River	Assumed to be equal to MID deliveries plus groundwater pumping

[a] 1984 is representative of normal conditions for the area, based on the characterization of the year as an above normal year using the San Joaquin Valley Water Year Type Index. The index characterizes water year type based on the unimpaired flow at the following four locations: Stanislaus River below Goodwin Reservoir, Tuolumne River below La Grange, Merced River below Merced Falls, and San Joaquin River inflow to Millerton Lake. The unimpaired runoff for 1984 was 3.69 million AF (MAF). Above normal flow is characterized as flows greater than 3.1 MAF and less than 3.8 MAF.

Table 7-2 shows the historical supply reliability for the City's water supplies during the base years shown in Table 7-1. The available supplies column specifies the volume and percentage of the City's total water supply expected if there were to be a repeat of the hydrology from that type of year. It should be noted that the City was not purchasing water supplies from MID in the base average/normal water year shown (deliveries from MID to the City began in 1995 with the completion of the MRWTP); therefore, the quantity shown is based on what the available supply would have been during the given hydrologic condition.

Table 7-2. Retail: Basis of Water Year Data (DWR Table 7-1 Retail)

Year Type	Base Year *If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000*	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available	% of Average Supply
Average Year	1984	87,100	100%
Single-Dry Year	2015	66,300	76%
Multiple-Dry Years 1st Year	2011	82,900	95%
Multiple-Dry Years 2nd Year	2012	78,800	90%
Multiple-Dry Years 3rd Year	2013	74,600	86%
Multiple-Dry Years 4th Year *Optional*	2014	70,500	81%
Multiple-Dry Years 5th Year *Optional*	2015	66,300	76%

NOTES: Volumes are in AF; totals rounded to nearest hundred. Includes both purchased water from MID and groundwater supplies. Volume of MID supply for the fifth multiple dry year based on the supply reduction that actually occurred in 2015. 2011 through 2014 MID supply volumes are estimated based on the actual 2015 MID cutback spread equally over five years (2011 to 2015). Assumes groundwater supply will not be reduced in dry years. During dry years, the City may have the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID.

Table 7-3 provides additional detail regarding the individual volumes from each of the City's different water supply sources during the base years.

Table 7-3. City of Modesto Base Year Water Supply Reliability, AFA

Supply	Average/ Normal Water Year	Single-Dry Water Year	Multiple-Dry Water Years[a]				
			Year 1	Year 2	Year 3	Year 4	Year 5
	1984	2015	2011	2012	2013	2014	2015
MID Supply—Total Urban Supply[b]	33,600	33,600	33,600	33,600	33,600	33,600	33,600
MID Supply—Base Urban Supply[c]	33,600	12,800	29,400	25,300	21,100	17,000	12,800
Groundwater[d]	53,500	53,500	53,500	53,500	53,500	53,500	53,500
Percent of Average/Normal Year with Base Urban MID Supply		76%	95%	90%	86%	81%	76%
Percent of Average/Normal Year with Total Urban MID Supply		100%	100%	100%	100%	100%	100%

(a) 2015 MID Base Urban Supply based on the actual supply reduction from MID in 2015 (26-inches). 2011 through 2014 MID Base Urban Supply totals are estimated based on the actual 2015 MID cutback spread equally over five years (2011 to 2015).

(b) Hypothetical supply available to the City if the MRWTP had been available. Phase One of the MRWTP was completed in 1995. Historical totals assume only Phase One of the MRWTP was available.

(c) Includes the following cutbacks during dry years:

- Single-Dry Water Year: 61.9 percent
- Multiple-Dry Water Years: Estimated based on the actual 2015 MID cutback spread equally over five years (2011 to 2015)

(d) Based on the estimated "operational yield" of the groundwater basin underlying the City's service area.

7.2.2 Supply Reliability for MID

As described above, MID surface water supplies are subject to cutbacks based on climatic variability. Table 7-4 shows the historical supply reliability for MID's wholesale treated surface water deliveries to the City during the base years shown in Table 7-1. As discussed above, MID was not delivering treated surface water supply to the City in the base average/normal water year shown; therefore, the quantity shown is based on what the available supply would have been during the given hydrologic condition.

Table 7-4. Wholesale: Basis of Water Year Data (DWR Table 7-1 Wholesale)

Year Type	Base Year *If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000*	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available	% of Average Supply
Average Year	1984	33,600	100%
Single-Dry Year	2015	12,800	38%
Multiple-Dry Years 1st Year	2011	29,400	88%
Multiple-Dry Years 2nd Year	2012	25,300	75%
Multiple-Dry Years 3rd Year	2013	21,100	63%
Multiple-Dry Years 4th Year *Optional*	2014	17,000	50%
Multiple-Dry Years 5th Year *Optional*	2015	12,800	38%

NOTES: Volumes are in AF; totals rounded to nearest hundred. Volume for the fifth multiple dry year based on the supply reduction that actually occurred in 2015. 2011 through 2014 volumes are estimated based on the actual 2015 MID cutback spread equally over five years (2011 to 2015). During dry years, the City may have the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID.

7.3 SUPPLY AND DEMAND ASSESSMENT

In order to make the best determination of the reliability of the City and MID's water supplies, the supply and demand for various types of water years are quantified and discussed below.

7.3.1 Normal Water Year

7.3.1.1 City of Modesto

The City's Normal Water Year supplies are anticipated to be as follows:

- MRWTP Phase One supply of 33,600 AFA;
- The additional supply available to meet expected City demands from the MRWTP Phase Two Expansion project is assumed to be 11,200 AFA by 2020 and will increase as additional development occurs within the City's contiguous service area up to an additional total treatment capacity of 33,600 AFA; and
- Groundwater pumping from City's local groundwater basins (up to 53,500 AFA) is assumed to provide 100 percent of the City's remaining water demand.

As described in Chapter 4, the City's Normal Water Year demands have been projected based on remaining vacant land assumed to be developed by buildout (estimated at 2050) in the City's service area (additional details are in the City's Water Master Plan (2016)).

As shown in Table 7-5, the City's Normal Water Year supplies are adequate to meet projected Normal Water Year demands.

Table 7-5. Retail: Normal Year Supply and Demand Comparison (DWR Table 7-2 Retail)

	2020	2025	2030	2035	2040 *(Opt)*
Supply totals	69,464	74,902	80,340	85,778	91,216
Demand totals	69,464	74,902	80,340	85,778	91,216
Difference	0	0	0	0	0
NOTES: Volumes are in AF.					

7.3.1.2 MID

MID's total urban supply to meet expected City demands is assumed to be approximately 44,800 AFA in 2020 and is planned to increase based on the City's future water demands within the City's contiguous service area (up to 67,200 AFA). MID's wholesale water demand is projected to match the available supply as the City plans to maximize the use of treated surface water supply. As shown in Table 7-6, MID's Normal Water Year supply is adequate to meet projected Normal Water Year demands.

Table 7-6. Wholesale: Normal Year Supply and Demand Comparison (DWR Table 7-2 Wholesale)

	2020	2025	2030	2035	2040 *(Opt)*
Supply totals	44,800	48,533	52,267	56,000	59,733
Demand totals	44,800	48,533	52,267	56,000	59,733
Difference	0	0	0	0	0
NOTES: Volumes are in AF.					

7.3.2 Single-Dry Water Year

7.3.2.1 City of Modesto

The City's Single Dry Year supplies are anticipated to be as follows:

- Projected base purchased surface water supplies from MRWTP Phase One and the MRWTP Phase Two Expansion (with a 61.9 percent reduction from Normal Year MID supplies)[3]; and
- Groundwater pumping from City's local groundwater basins (up to 53,500 AFA).

When required, the City's Single Dry Year demands are assumed to be reduced through water conservation to match available supplies. As discussed above, the City has been successful at significantly reducing water demands during 2014 and 2015 and, if needed, will be able to implement existing and proposed water conservation measures to respond to future water supply shortages.

As shown in Table 7-7, the City's Single Dry Year supplies are adequate to meet projected Single Dry Year demands with water conservation.

Table 7-7. Retail: Single Dry Year Supply and Demand Comparison (DWR Table 7-3 Retail)

	2020	2025	2030	2035	2040 (Opt)
Supply totals	69,464	71,991	73,414	74,836	76,258
Demand totals	69,464	71,991	73,414	74,836	76,258
Difference	0	0	0	0	0

NOTES: Volumes are in AF. For planning purposes, a conservative supply condition assuming a 61.9 percent reduction in MID treated water supply during a single dry year is used here. Available groundwater supply assumed to be 53,500 AFA. The following demand reductions were required to match available supplies during a single dry year condition:

2020 - 0%
2025 - 4%
2030 - 9%
2035 - 13%
2040 - 16%

[3] If available, the City has the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID. For planning purposes, it is conservatively assumed that supplemental treated surface water supply is not available during a single dry year.

7.3.2.2 MID

In single dry years, the MID base urban supply is projected to be reduced by approximately 61.9 percent (as a result of reduced surface water deliveries). If available, the difference between dry year base supply and normal year supply will be available as an allocation on an optional basis at additional cost to the retail supplier. However, for planning purposes, a conservative supply condition assuming a 61.9 percent reduction in treated water supply is used.

As shown in Table 7-8, MID's Single Dry year supply is adequate to meet projected Single Dry Year demands. MID's wholesale water demand is projected to match the available supply as the City plans to maximize the use of treated surface water supply.

Table 7-8. Wholesale: Single Dry Year Supply and Demand Comparison (DWR Table 7-3 Wholesale)

	2020	2025	2030	2035	2040 (Opt)
Supply totals	17,069	18,491	19,914	21,336	22,758
Demand totals	17,069	18,491	19,914	21,336	22,758
Difference	0	0	0	0	0

NOTES: Volumes are in AF. During dry years, the City may have the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID. However, for planning purposes, a conservative supply condition assuming a 61.9 percent reduction in treated water supply during a single dry year is used here.

7.3.3 Multiple-Dry Water Years

7.3.3.1 City of Modesto

The City's Multiple Dry Year supplies are anticipated to be as follows:

- Projected base purchased surface water supplies from MRWTP Phase One and the MRWTP Phase Two Expansion (with a 12.4 percent reduction from Normal Year MID supplies during the first dry year and an additional 12.4 percent reduction in each successive dry year)[4]; and
- Groundwater pumping from City's local groundwater basins (up to 53,500 AFA).

[4] If available, the City has the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID. For planning purposes, it is conservatively assumed that supplemental treated surface water supply is not available during multiple dry years.

As shown in Table 7-9, the City's Multiple Dry Year supplies are adequate to meet projected Multiple Dry Year demands with water conservation. When required, the City's Multiple Dry Year demands are assumed to be reduced through water conservation to match available supplies. As discussed above, the City has been successful at significantly reducing water demands during 2014 and 2015 and, if needed, will be able to implement existing and proposed water conservation measures to respond to future water supply shortages.

Table 7-9. Retail: Multiple Dry Years Supply and Demand Comparison (DWR Table 7-4 Retail)

		2020	2025	2030	2035	2040 (Opt)
First year	Supply totals	69,464	74,902	80,340	85,778	91,216
	Demand totals	69,464	74,902	80,340	85,778	91,216
	Difference	0	0	0	0	0
Second year	Supply totals	70,551	75,989	81,427	81,427	92,304
	Demand totals	70,551	75,989	81,427	81,427	92,304
	Difference	0	0	0	0	0
Third year	Supply totals	71,639	77,077	82,515	87,953	92,012
	Demand totals	71,639	77,077	82,515	87,953	92,012
	Difference	0	0	0	0	0
Fourth year *(optional)*	Supply totals	72,727	78,165	81,026	82,911	84,796
	Demand totals	72,727	78,165	81,026	82,911	84,796
	Difference	0	0	0	0	0
Fifth year *(optional)*	Supply totals	71,707	73,129	74,551	75,974	77,396
	Demand totals	71,707	73,129	74,551	75,974	77,396
	Difference	0	0	0	0	0

NOTES: Volumes are in AF. Projected demand based on the City of Modesto Water Master Plan. For planning purposes, a conservative supply condition assuming a 12.4, 24.8, 37.1, 49.5, and 61.9 percent reduction in MID treated water supply during consecutive dry years is used here. Available groundwater supply assumed to be 53,500 AFA. Demand reductions between 1 to 20 percent were required to match available supplies during the third, fourth, and fifth years.

7.3.3.2 MID

In multiple dry years, the MID base urban supply is projected to be reduced by approximately 12.4 percent during the first year with an additional 12.4 percent reduction in successive years during an extended drought. If available, the difference between dry year base supply and normal year supply will be available as an allocation on an optional basis at additional cost to the retail supplier. However, for planning purposes, a conservative supply condition assuming reductions in treated water supply is used.

As shown in Table 7-10, MID's Multiple Dry Year supply is adequate to meet projected Multiple Dry Year demands. MID's wholesale water demand is projected to match the available supply as the City plans to maximize the use of treated surface water supply.

Table 7-10. Wholesale: Multiple Dry Years Supply and Demand Comparison (DWR Table 7-4 Wholesale)

		2020	2025	2030	2035	2040 (Opt)
First year	Supply totals	39,245	42,515	45,786	49,056	52,326
	Demand totals	39,245	42,515	45,786	49,056	52,326
	Difference	0	0	0	0	0
Second year	Supply totals	34,251	37,059	39,866	42,674	45,481
	Demand totals	34,251	37,059	39,866	42,674	45,481
	Difference	0	0	0	0	0
Third year	Supply totals	29,118	31,467	33,815	36,163	38,512
	Demand totals	29,118	31,467	33,815	36,163	38,512
	Difference	0	0	0	0	0
Fourth year *(optional)*	Supply totals	23,755	25,640	27,526	29,411	31,296
	Demand totals	23,755	25,640	27,526	29,411	31,296
	Difference	0	0	0	0	0
Fifth year *(optional)*	Supply totals	18,207	19,629	21,051	22,474	23,896
	Demand totals	18,207	19,629	21,051	22,474	23,896
	Difference	0	0	0	0	0

NOTES: Volumes are in AF. Based on the City of Modesto Water Master Plan (refer to Figure 5-1 in the Water Master Plan). During dry years, the City may have the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID. However, for planning purposes, a conservative supply condition assuming multiple dry year reductions is used here (Year 1 = 12.4%, Year 2 = 24.8%, Year 3 = 37.1%, Year 4 = 49.5%, and Year 5 = 61.9%).

7.4 REGIONAL SUPPLY RELIABILITY

The City and MID's water management tools and options that would maximize the use of local water resources and minimize the need to import water from other regions are discussed below.

7.4.1 Management Tools and Options for the City

The City's current water supply portfolio of local Tuolumne River water from MID and groundwater provides considerable flexibility in maximizing local resources. Supply from MID is treated at the MRWTP. The operating permit for the MRWTP does not allow treatment of supply other than from the Tuolumne River. Design of specific treatment methods at the plant are also based on the water chemistry of that local source.

The City currently maximizes the use of its surface water supply from MID in normal and wetter years. The use of this surface water supply provides the City with the flexibility to preserve its available groundwater supplies, through in-lieu banking.

To minimize the City's vulnerability to groundwater quality issues, the City has also developed strategies to maintain and enhance its groundwater extraction capacity through a combination of well monitoring for early detection, well rehabilitation, wellhead treatment and blending.

With these available management tools, the City does not currently foresee a need to import water from other regions.

7.4.2 Management Tools and Options for MID

MID is primarily an agricultural water supplier. MID has the ability to reduce deliveries in drought years when surface water supplies are reduced. MID also has approximately 93 groundwater wells that it owns and maintains that are used to supplement surface water supplies during drought conditions when surface water supplies are limited. These groundwater wells are used for agricultural supply only and are not used for drinking water purposes. MID does not currently foresee a need to import water from other regions.

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CHAPTER 8
Water Shortage Contingency Planning

This chapter describes the City's strategic planning process to prepare for and respond to water shortages. This includes the estimated three-year minimum water supply and a summary of the stages and actions described in the City's Drought Contingency Plan that will be implemented in the event of a water supply shortage. The purpose of the Drought Contingency Plan, also known as a Water Shortage Contingency Plan (WSCP), is to help the City maintain reliable water supplies and reduce the impacts of water supply shortfalls.

In 2015, the State Water Resources Control Board mandated a 36 percent reduction in residential water use for the City[1]. In order to meet this goal, the City's Utilities Department recommended the City Council to adopt a revised Drought Contingency Plan (to include an additional Stage IIA drought condition) and to also declare a more severe Stage II drought condition. The City's revised Drought Contingency Plan was approved, and the City entered into a Stage II drought condition on May 1, 2015. A copy of the City's current Drought Contingency Plan is provided in Appendix I. On November 24, 2015, City Council approved enacting a Stage IIA drought condition, effective December 1, 2015. On April 26, 2016, City Council approved reinstatement of Stage II drought requirements, effective May 1, 2016 through October 31, 2016.

Because MID is a wholesale water supplier and does not directly serve any urban customers, MID does not have a separate Water Shortage Contingency Plan which applies to urban customers. Therefore, the majority of the sections below only focus on water shortage contingency planning for the City's water service area. MID does have a Drought Management Plan, developed in September 2015, which defines three 'Levels of Surface Water Shortage' and a variety of innovative strategies for agricultural water uses to cope with drought for each level. MID's Drought Management Plan is included in Appendix E of MID's 2015 Agricultural Water Management Plan Update[2].

8.1 STAGES OF ACTION

8.1.1 City of Modesto

The City's Water Shortage Contingency Plan stages will be triggered based on the City's evaluation of available supplies from MID and the City's groundwater supplies. The stages of action in the City's Drought Contingency Plan specify reduction objectives ranging from 10 to 50 percent of normal water demand, depending on the water shortage stage declared. All four stages prohibit certain water uses at specific times, with prohibitions becoming stricter as supplies continue to decrease. The water supply conditions associated with each of the City's stages of action are identified in Table 8-1. As of May 1, 2016, the City is in Stage II of its Drought Contingency Plan.

[1] Effective March 1, 2016, the Urban Water Supplier Water Conservation Standard for the City of Modesto was reduced to 33 percent.

[2] Modesto Irrigation District, 2015 Agricultural Water Management Plan Update, prepared by Provost & Pritchard, December 2015.

Table 8-1. Retail: Stages of Water Shortage Contingency Plan (DWR Table 8-1 Retail)

Stage	Percent Supply Reduction[1]	Water Supply Condition
I	10-20%	Minor Shortage Potential
II	20-35%	Moderate Shortage Potential
IIA	30-40%	Medium Shortage Potential
III	35-50%	Critical Shortage Potential
[1] *One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.*		
NOTES: Based on the City's December 1, 2015 Drought Contingency Plan.		

The City's Director of Utilities is responsible for declaring a particular water shortage stage and reduction percentage. This declaration is based on his/her judgment as to the degree of the immediate or future supply deficiency.

8.1.2 MID

As discussed above, MID does not directly serve any urban customers and does not have a separate Water Shortage Contingency Plan as shown in Table 8-2. However, as described in Chapters 6 and 7, water shortage provisions are included in the ARTDA between MID and the City. Those provisions will be implemented by MID as needed if a shortage of MID's water supplies were to occur; however, the actual reduction in supply is not determined until the time of the shortage (ARTDA, Section 17.2 Formula for Water Allocation). A draft resolution citing and implementing these provisions is provided in Appendix I.

Table 8-2. Wholesale: Stages of Water Shortage Contingency Plan (DWR Table 8-1 Wholesale)

Stage	Supply Reduction[1]	Water Supply Condition
N/A	N/A	N/A
[1] *One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.*		
NOTES: MID does not have a Water Shortage Contingency Plan.		

8.2 PROHIBITIONS ON END USES

California Water Code Section 10632(a)(4) requires mandatory prohibitions against specific water use practices that may be considered excessive during water shortages.

Once the City's Director of Utilities declares a particular water shortage stage, a series of requested consumer actions is announced to the community. The prohibitions that the City places on end uses in each stage are summarized in Table 8-3. If a measure is declared mandatory for a lower level stage, it is also mandatory for all higher level stages.

Table 8-3. Retail Only: Restrictions and Prohibitions on End Uses (DWR Table 8-2 Retail)

Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
I	Landscape - Limit landscape irrigation to specific times	Prohibit outdoor water use from noon - 7 PM, however, may be extended to 9 AM - 7 PM at Council discretion	Yes
II	Landscape - Limit landscape irrigation to specific times	Prohibit outdoor water use from 9 AM - 7 PM	Yes
I	Landscape - Limit landscape irrigation to specific days	Limit to no more than 3 days per week; odd-numbered addresses water W, F, Su and even-numbered addresses water Tu, Th, Sa	Yes
II	Landscape - Limit landscape irrigation to specific days	Limit to no more than 2 days per week; odd-numbered addresses water W & Su and even-numbered addresses water Tu & Sa	Yes
IIA	Landscape - Limit landscape irrigation to specific days	Limit to no more than 1 day per week; odd-numbered addresses water Su and even-numbered addresses water Sa	Yes
III	Landscape - Prohibit certain types of landscape irrigation	No outdoor water use except for trees or shrubs by hand and vegetation maintained through drip irrigation	Yes
III	Landscape - Prohibit all landscape irrigation	Moratorium on all new landscaping	Yes
I	Landscape - Other landscape restriction or prohibition	New landscaping must comply with existing and future landscape ordinances	Yes
II	Landscape - Other landscape restriction or prohibition	No irrigating turf or ornamental landscapes during or and 48 hours following measurable rainfall	Yes
II	CII - Lodging establishment must offer opt out of linen service		Yes
I	CII - Restaurants may only serve water upon request	Encouraged only	No
II	CII - Restaurants may only serve water upon request		Yes
III	CII - Other CII restriction or prohibition	Moratorium on all new connections	Yes
II	Water Features - Restrict water use for decorative water features, such as fountains	No use of outdoor fountains except for maintenance purposes	Yes
III	Other water feature or swimming pool restriction	Moratorium on all new swimming pools	Yes
I	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Water leaks, once identified by home owner, must be repaired within 24 hours	Yes
I	Other - Require automatic shut of hoses		Yes
I	Other - Prohibit use of potable water for washing hard surfaces	Hosing concrete areas, building exteriors, etc., is prohibited except for health and safety concerns	Yes
III	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	Permitted at car wash facilities only	Yes
I	Other	Car washing limited to specific times and days (same as irrigation use)	Yes
I	Other	Require water meter installation on all new single family homes	Yes
II	Other	Mandatory retrofit of low flow showerheads in homes when building/remodeling occurs	Yes
III	Other	Mandatory retrofit of low flow toilets in homes when building/remodeling occurs	Yes

NOTES: Based on the City's December 1, 2015 Drought Contingency Plan.

8.3 PENALTIES, CHARGES, OTHER ENFORCEMENT OF PROHIBITIONS

California Water Code Section 10632(a)(6) requires a water supplier to penalize or charge for excessive water use, where applicable.

During a declared water shortage stage, penalties for excess water use exist in the form of administrative fees or fines. These fines are assessed based on the number of violations a particular customer accumulates during a particular stage. The penalty for the first violation for all three stages consists of a warning only, requiring no fine. However, a fine is issued for a second violation, and increasingly expensive fines are issued for any subsequent violations thereafter (all penalties are assessed for violations occurring within 12 months of first violation). The City's administrative fines for excessive water use are summarized in Table 8-4.

Table 8-4. City of Modesto Penalties and Charges for Excessive Water Use

Stage	Penalties and Charges
I	$50 Administrative fee assessed upon second violation $200 Administrative fee assessed upon third violation (includes meter installation) $500 Administrative fee assessed for each subsequent violation
II and IIA	$150 Administrative fee assessed upon second violation $250 Administrative fee assessed upon third violation (includes meter installation) $500 Administrative fee assessed for each subsequent violation
III	$200 Administrative fee assessed upon second violation $300 Administrative fee assessed upon third violation (includes meter installation) $500 Administrative fee assessed for each subsequent violation

8.4 CONSUMPTION REDUCTION METHODS

8.4.1 City of Modesto

In accordance with California Water Code Section 10632(a)(5), the City may implement consumption reduction methods during water emergency stages.

Consumption reduction methods are actions that reduce water demand within the City's service area, whereas prohibitions, as described in Section 8.2, limit specific uses of water. The City will use the consumption reduction methods listed in Table 8-5. The consumption reduction methods associated with an "All" water shortage stage are part of the City's on-going Demand Management Measures (DMMs) (see *Chapter 9 Demand Management Measures*).

Table 8-5. Retail: Stages of Water Shortage Contingency Plan – Consumption Reduction Methods (DWR Table 8-3 Retail)

Stage	Consumption Reduction Methods by Water Supplier	Additional Explanation or Reference *(optional)*
All	Expand Public Information Campaign	
All	Improve Customer Billing	Residential metering program
All	Offer Water Use Surveys	Residential water surveys and landscape water surveys
All	Provide Rebates on Plumbing Fixtures and Devices	
All	Provide Rebates for Landscape Irrigation Efficiency	
All	Decrease Line Flushing	
All	Increase Water Waste Patrols	
I	Reduce System Water Loss	Repair water leaks
III	Moratorium or Net Zero Demand Increase on New Connections	Moratorium on all new landscaping and connections
All	Other	
NOTES: Consumption reduction methods associated with an "All" stage are on-going DMMs (see Chapter 9 for additional discussion).		

8.4.2 MID

MID is primarily an agricultural water supplier. MID has the ability to reduce agricultural deliveries in drought years when surface water supplies are reduced. As stated in the ARTDA, MID also has the ability to reduce deliveries to the City in drier than average years based on the proportional number of inches allocated to MID's agricultural customers. MID also has approximately 93 groundwater wells that it owns and maintains that are used to supplement surface water supplies during drought conditions when surface water supplies are limited. However, these groundwater wells are used for agricultural supply only and are not used for drinking water purposes.

8.5 DETERMINING WATER SHORTAGE REDUCTIONS

California Water Code Section 10632(a)(9) requires the water supplier to develop a mechanism for determining actual reductions in water use in the course of carrying out the urban water supply shortage contingency analysis.

As described in Chapter 6, the City is supplied with treated surface water from MID and municipal groundwater wells. MID's MRWTP and the City's wells have flow monitoring devices that record the amount of water entering the City's distribution system. The flow devices are connected to the City's SCADA system, allowing past and real-time flow trends to be analyzed at the City's Control Center and actual water use reductions to be determined. Further, the City is in the process of converting all customers to meters, and the meter retrofit program is anticipated to be completed

by 2020. Once the conversion to metered water use is complete, the City will be able to determine reductions in demand based on metered usage. The City's water use monitoring mechanisms are summarized in Table 8-6.

Table 8-6. City of Modesto Water Use Monitoring Mechanisms

Mechanism for Determining Actual Reductions	Type of Data Expected
MRWTP and Groundwater Monitoring	Production Volume
Water Meters	Demand

8.6 REVENUE AND EXPENDITURE IMPACTS

California Water Code Section 10632(a)(7) requires an analysis of the impacts of each of the actions taken for conservation and water restriction on the revenues and expenditures of the water supplier.

8.6.1 City of Modesto

The City's water operations are organized as an Enterprise Fund in which the costs of providing goods or services to the general public on a continuing basis are financed or recovered primarily through user charges. The water funds have historically brought in sufficient revenue to allow inter-fund transfers for repayment of contributed capital or to fund capital improvement projects and information and technology projects.

Implementation of the Drought Contingency Plan results in reduced water usage, and accordingly, reduced operating revenues. However, operating expenses would also be reduced due to the lower customer water demands that result in a need to purchase less surface water and/or pump less groundwater.

Implementation of Stage II, IIA, and III drought restrictions are expected to have the following impacts on operating revenues:

- Water sales based on metered rates are expected to decrease up to 35 percent under Stage II;
- Water sales based on metered rates are expected to decrease up to 40 percent under Stage IIA; and
- Water sales based on metered rates are expected to decrease up to 50 percent under Stage III.

Currently, revenue from flat rate water sales provides a level of financial stability for the City, even when water use is reduced. However, in the future, as the City converts all of its flat rate accounts to metered accounts, it will become more vulnerable to revenue impacts as a result of water use reductions.

Expenditure impacts resulting from implementation of the Drought Contingency Plan may include additional costs to provide increased outreach to customers about water conservation, purchases of more expensive water supplies, and possibly, developing and/or implementing a drought rate structure. A drought rate structure is an option the City is evaluating in its current on-going water rate study.

If needed, funding for water shortages will come through a temporary rate increase and/or fund reserves. Other potential funding sources and/or water shortage management options include close monitoring, managing the short-term water reduction plan, initiating a water contingency fund and/or temporary deferral of capital improvement projects. There may be additional outside funding sources made available to water agencies under a water emergency situation (Stage III). The City's proposed measures for overcoming revenue and expenditure impacts are summarized below:

- Rate adjustment;
- Water shortage contingency fund;
- Temporary deferral of capital improvement projects; and
- Additional outside funding sources.

8.6.2 MID

Per the ARTDA, the City pays all expenses for the operation of the MRWTP whether it is producing water or not, so there is no revenue shortfall to MID if the production of treated surface water is reduced.

8.7 RESOLUTION OR ORDINANCE

8.7.1 City of Modesto

As a requirement of the UWMPs, the City is required to develop a water shortage contingency resolution or ordinance for submittal with the UWMP. On November 24, 2015, City Council adopted Resolution 2015-455 implementing Stage IIA of the City's Drought Contingency Plan effective December 1, 2015, and on April 26, 2016, City Council adopted Resolution 2016-178 reinstating Stage II of the City's Drought Contingency Plan. Copies of Resolutions 2015-455 and 2016-178 are included in Appendix I. If the City needs to implement another stage of the Drought Contingency Plan in the future, a similar resolution would be drafted for City Council consideration and approval.

8.7.2 MID

MID does not have a specific Water Shortage Contingency Plan; however, water shortage provisions are included in the ARTDA between MID and the City. Those provisions will be implemented by MID as needed if a shortage of MID's supplies were to occur.

8.8 CATASTROPHIC SUPPLY INTERRUPTION

California Water Code Section 10632(a)(3) requires actions to be undertaken by the water supplier to prepare for and implement during a catastrophic interruption of water supplies.

8.8.1 City of Modesto

The City has prepared an *Emergency Operations Manual* which presents specific actions and procedures to follow during a catastrophic event interrupting either the City's supplies or MID's urban water supplies. These procedures include the immediate establishment of an Emergency Operations Center (EOC), which can direct actions to maintain an emergency water supply and announce water reduction orders.

8.8.2 MID

MID does not directly serve any urban customers, and therefore, is not required to prepare an Emergency Response Plan. However, during a catastrophic interruption of water supplies, MID expects to coordinate with the City and other local agencies on emergency response actions to help restore water service as quickly as possible.

8.9 MINIMUM SUPPLY NEXT THREE YEARS

As an UWMP requirement, all water agencies are required to provide an estimate of the minimum water supply available during each of the next three water years.

8.9.1 City of Modesto

The City's minimum supply estimate reflects the combined availability of all water supply sources and assumes the current water supply conditions for 2016, and the same hydrology that was noted in the historical multiple-dry year period (Chapter 7, Section 7.3) for 2017 and 2018. In Table 8-7, the City's minimum potable water supply available during 2017 and 2018 is estimated based on the driest multiple year historic sequence for the City's water supply. Table 8-7 conservatively assumes that the base purchased surface water supply from MID will be reduced[3], but the City will be able to meet their remaining water demands through available groundwater supply and/or water conservation. However, the City may have the opportunity to purchase or exchange for supplemental purchased surface water supply from MID if available.

[3] For 2016, assumes a 14.3 percent surface water supply reduction (36-inches available) based on current conditions. For 2017 and 2018, assumes Years 4 and 5 surface water reductions during a multiple year drought (49.5 percent and 61.9 percent reductions, respectively).

Table 8-7. Retail: Minimum Supply Next Three Years (DWR Table 8-4 Retail)

	2016	2017	2018
Available Water Supply	82,300	76,100	70,600

NOTES: Volumes are in AF; totals rounded to nearest hundred. 2016 based on current conditions (14.3 percent reduction in MID supply). 2017 and 2018 are estimated based on the driest multiple year historic sequence for the City's water supply (Years 4 and 5: assumes 49.5 percent and 61.9 percent reductions in available MID supply, respectively). Available groundwater supply assumed to be 53,500 AFA.

8.9.2 MID

As shown in Table 8-8, base purchased surface water supply available from MID in 2016 is based on current conditions (36-inches or 28,800 AFA); base purchased surface water supplies available from MID in 2017 and 2018 assume the same hydrology that was noted in the driest historical multiple-dry year period (Chapter 7, Section 7.3).

Table 8-8. Wholesale: Minimum Supply Next Three Years (DWR Table 8-4 Wholesale)

	2016	2017	2018
Available Water Supply	28,800	22,600	17,100

NOTES: Volumes are in AF; totals rounded to nearest hundred. For 2016, assumes a 14.3 percent surface water supply reduction (36-inches available) based on current conditions. For 2017 and 2018, assumes Years 4 and 5 surface water reductions during a multiple year drought (49.5 percent and 61.9 percent reductions, respectively) as well as an initial MRWTP Phase Two Expansion supply of 10 MGD (11,200 AFA) to meet projected water demands. During dry years, the City may have the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID. However, for planning purposes, a conservative supply condition assuming multiple dry year reductions is used here.

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CHAPTER 9
Demand Management Measures

This chapter describes the City and MID's historical and existing water conservation program, status of implementation of DMMs, and projected future conservation implementation. The California Water Commission requires that UWMPs include a comprehensive description of historical, current, and projected water conservation programs.

> *CWC 10631 (f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:*
>
> *(1) (A) ... a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measure that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.*
>
> *(B)The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:*
>
> *(i) Water waste prevention ordinances.*
>
> *(ii) Metering.*
>
> *(iii) Conservation pricing.*
>
> *(iv) Public education and outreach.*
>
> *(v) Programs to assess and manage distribution system real loss.*
>
> *(vi) Water conservation program coordination and staffing support.*
>
> *(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.*
>
> *(2) For an urban wholesale water supplier, as defined in Section 10608.12, (provide) a narrative description of the items in clauses (ii), (iv), (vi), and (vii) of subparagraph (B) of paragraph (1), and a narrative description of its distribution system asset management and wholesale supplier assistance programs.*

In previous UWMPs, a substantial amount of data was required to document a water supplier's progress in implementing fourteen specific DMMs. In 2014, Assembly Bill 2067 simplified, clarified, and updated reporting requirements for DMMs. Starting with this 2015 UWMP, focus has turned away from detailed descriptions of each of the fourteen DMMs and has turned to key water conservation measures that are being implemented to achieve compliance with SB X7-7. For retail agencies, the number of DMMs has been reduced from fourteen to six (plus an "other" category). For wholesalers, the number of DMMs was reduced to three specific measures (plus an "other" category), as well as a requirement for a narrative description of asset management and wholesale supplier assistance programs. A narrative description of the status of the DMMs and how the DMMs will help the water supplier achieve its SB X7-7 water use targets is required. Detailed data are not required.

Members of the California Urban Water Conservation Council (CUWCC) may include their reporting in the UWMP, but a narrative is also required.

The City has acknowledged the importance of water conservation and management, and has implemented significant water conservation efforts during the drought years of 1976-1977 and 1987-1992 in addition to maintaining ongoing conservation programs. In March 1990, the City Council approved a Water Conservation Program (Section 11-1.14 of Title XI of the Modesto Municipal Code) which combined a strong education program with watering restrictions and prohibition of water waste.

In 2011, the City developed a Water Conservation Plan, building upon the demand management measures and conservation strategies identified and documented in the 2010 UWMP. The City is currently in the process of developing an updated Conservation Plan, with the intent to better define the City's Conservation Program and to plan for conservation program implementation in the future. The City's goals are to conserve water through public relations, education, customer service, and enforcement. The City strives to meet this challenge by working in a friendly, respectful and positive manner with homeowners, businesses and property managers. In preparation of this Water Conservation Plan, the City developed the following policy statement, reflecting its belief in water conservation:

> *To protect, conserve, and manage all water resources for the current and future needs of the community and the environment.*

The overall goal is to develop a system-wide water conservation plan containing acceptable water efficiency measures and an implementation plan which will decrease water use and water loss while using the most cost-effective methods.

A copy of the City's current Water Conservation Plan is provided in Appendix J.

9.1 CITY OF MODESTO DEMAND MANAGEMENT MEASURES

The six retail agency DMMs required to be discussed in the 2015 UWMP include the following:

- Water waste prevention ordinances;
- Metering;
- Conservation pricing;
- Public education and outreach;
- Programs to assess and manage distribution system real loss; and
- Water conservation program coordination and staffing support.

For each DMM, the current program is described, followed by a description of how the DMM was implemented over the previous five years and the planned implementation to achieve the water use targets required by SB X7-7 (see *Chapter 5 SB X7-7 Baselines and Targets*).

9.1.1 Water Waste Prevention Ordinances

Since 2002, the City has implemented the water waste prevention measures defined in Stage I of the City's Drought Contingency Plan (see Appendix I). Therefore, there have always been basic water conservation measures and varying degrees of water waste prevention enforced by the City. In April 2015, the City adopted Resolution 2015-134 revising the Water Shortage Contingency Plan and implementing Stage II of the Plan.

In November 2015, the City adopted Resolution 2015-455 implementing Stage IIA of the City's Drought Contingency Plan. Any violations of the rules and regulations established as part of Stage IIA of the Drought Contingency Plan are considered water waste. The rules and regulations for Stage IIA are as follows:

1. Outdoor water use prohibited Saturday and Sunday from 9:00 AM to 7:00 PM.
2. Odd-numbered addresses shall water outdoors only on Sundays.
3. Even-numbered addresses shall water outdoors only on Saturdays.
4. No outdoor water use is permitted on Monday through Friday.
5. City residents shall not wash cars without the use of a quick-acting positive shut-off nozzle or permit others to do so on their behalf. In addition, car washing must be done in compliance with the schedule for outdoor water use. There shall be no washing of building exteriors, mobile home exteriors, recreational vehicle exteriors, sidewalks, patios, driveways, gutters, or other exterior surfaces.
6. City residents shall not have leaky faucets or plumbing fixtures on their premises for more than 24 hours after the leak has been identified or notice has been received from the City, whichever comes first.
7. Eating establishments are required to serve water only at the customer's request.
8. New landscaping installations must comply with all applicable landscape ordinances.
9. The following penalties may be added to the utility service customer's account upon violation of the above regulations:
    a) A penalty in the sum of $150 upon the second violation within one year after having received a Notice of Violation.
    b) A penalty of $250 upon the third violation within said one-year period.
        i) Upon the third violation within one year of having received a Notice of Violation, the resident shall also have a water meter installed if one is not present and metered billing shall commence.
    c) A penalty of $500 upon the fourth and any subsequent violations within said one-year period.
    d) The customer shall be advised of these charges through a Notice of Intention to Impose a Penalty.

However, on April 26, 2016, the City decided to reinstate the Stage II requirements effective May 1, 2016 through October 31, 2016. Stage II allows for outdoor watering two days per week, but all other regulations listed above remain in effect under Stage II. Copies of the November 2015 and April 2016 Resolutions are included in Appendix I.

The City will continue to enforce its water waste ordinance by having the Utilities Department perform site visits. The effectiveness of this program will be evaluated based on the number of violations observed, as well as the overall demand reduction associated with invoking drought restrictions. Presently, the City's Utilities Department employs four part-time water patrols. They patrol during the summer hours enforcing outdoor water restrictions.

Implementation of this DMM is on-going and expected to help the City achieve its water use targets by minimizing the nonessential uses of water so that water is available to be used for human, consumption, sanitation, and fire protection.

9.1.2 Metering

The City's water system is not yet fully metered. The City has been installing meters on new homes since the City Council enacted the Modesto Municipal Code 11-1 on May 14, 1991[1], and in 2005 the City changed its water rate structure to include a volumetric rate charge. As of 2015, approximately 80 to 85 percent of the residential metering program is complete. All but one of the City's non-residential services are metered, and all new development in the City since 1991 has had meters installed.

In 2004, the California Legislature passed AB 2572, requiring all water suppliers to install water meters on all customer connections by January 1, 2025. The City is on track to convert all of the City's water system to metered accounts by 2020, and therefore satisfy the 2025 deadline.

Effectiveness of the metering program will be monitored by tracking the number of retrofits installed per year. By implementing the on-going meter installation and replacement program, the City is developing a more focused and direct monitoring tool allowing them to detect high water usages.

9.1.3 Conservation Pricing

The City's current water rate structure is shown in Table 9-1. This rate structure encourages conserving behavior by incorporating a uniform volume charge in addition to the fixed meter charge for those customers who are metered. Consequently, water usage reductions directly reduce cost to the metered customer, while excessive water use results in increased costs. As described above, not all of the City's residential customers are currently metered. Unmetered residential

[1] Though the City did start installing meters in 1991, these meters were not read for volumetric billing purposes and these homes remained on a flat rate billing method until 2005 when, as a result of AB 2572 mandating all homes to be metered by 2025, the City started installing meters on existing homes and changed its rate structure to bill metered homes on a volumetric basis.

customers are billed based on a flat rate based on lot size. As customers become metered, they are converted from the flat rate charge to the metered charge.

Table 9-1. City of Modesto Current Water Rates and Charges

Customer Class	Rate[a]
Flat Rate Residential – Monthly Service Charges[b]	
0 –5,000 sq. ft. lot	$43.26
5,011 – 7,000 sq. ft. lot	$49.16
7,001 – 11,000 sq. ft. lot	$58.34
11,001 – 17,000 sq. ft. lot	$61.94
Over 17,000 sq. ft. lot	$72.81
Metered Charges (Residential & Commercial)	
Uniform Volume Charge ($/hcf)	$1.40
Fixed Meter Charges	
5/8" – 3/4"	$15.03
1"	$21.33
1 ½"	$36.90
2"	$55.68
3"	$105.80
4"	$162.13
6"	$318.47
8"	$506.20
10"	$725.56
12"	$1,350.92

[a] City of Modesto Current Water Rate (as of July 1, 2013) from City of Modesto website.
[b] Flat rates shown include tax.

The City is currently performing a water rate study to evaluate the potential effectiveness of different rate structures. Based on preliminary results of this study, the City has decided to not implement tiered rates at this time, but instead to implement a uniform surcharge to cover costs associated with a statewide mandate for water conservation. This surcharge would then end when the statewide water conservation mandate ends.

As required, the City will evaluate the need to readjust rates and/or rate structures in order to ensure continued compliance for this DMM. The City will evaluate the effectiveness of conservation rates by tracking changes in unit water use resulting from rate increases.

9.1.4 Public Education and Outreach

To promote water conservation, the City seeks to foster sustainable changes in behavior, not just temporary responses to drought. The purpose of the City's water conservation program is to promote indoor and outdoor water conservation, as well as landscape ideas incorporating the use

of drought tolerant landscaping and irrigation systems. Water conservation information is distributed to the public through a variety of methods including personal contact, brochures, radio and television public service announcements, a dedicated conservation website, bill inserts, exhibits at community events, school presentations and videos. A water conservation telephone line is available to provide residents with any additional information they might request regarding water conservation.

The City has also coordinated with the media to better inform the public. Media coverage of the City's water conservation program is provided through public service announcements on television and radio in both English and Spanish, live interviews and taped cable television. Videotapes on water conservation and efficient landscaping practices are available from the Utilities Department, Water Services Division for use by the public. Copies of these tapes have also been donated to the Stanislaus County Library and several landscape nurseries in the City. In addition, the City's local newspaper, the *Modesto Bee*, also provides frequent and extensive coverage of current water conditions within the Modesto area.

The City has attended and promoted water conservation at the Stanislaus County Home and Garden show, Modesto Home Improvement Show, and Earth Day in the Park. At these events, the City provides conservation kits for both children and adults. There are three conservation kits the City distributes for different purposes. These include:

- Childs Water Conservation Kit
  - — A Water Wise bag
  - — BE WATER WISE coloring book with crayons and stickers
  - — A NIAGARA water conservation "showering Coach" timer
  - — Water conservation website links for parents
- Use Water Wisely Kit
  - — Five Tips to Save Water bag
  - — A Use Water Wise Wheel
  - — Our World of Water activity book
  - — 6" Use Water Wisely Ruler
  - — Water Conservation website links
- Water Conservation Adult Kit
  - — 15 Ways to Use Water Wisely bag
  - — Leak detection dye tablets
  - — Water Conservation slide guide
  - — Use Water Wisely note pad.
  - — Water Conservation Brochures
  - — Water conservation website links

On May 18, 2016, the Cities of Modesto, Ceres, Turlock, Manteca, and the UC Davis California Center of Urban Agriculture organized a landscape workshop in Modesto on how to maintain landscapes and reduce water waste through water management and system efficiency. At the workshop, attendees received indoor presentations and outdoor demonstrations on the following topics:

- Understanding precipitation rates to mitigate water and pesticide runoff;
- Improving sprinkler distribution uniformity to reduce water use;
- Improving controller programs to reduce and manage water use;
- Determining application rates and precipitation rates of drop/micro irrigation; and
- Understanding and reading water meters to improve irrigation efficiency.

In addition, City staff give school presentations to students at elementary schools in Modesto's service area each year. During these presentations, elementary school students are taught about the water cycle and water conservation, and receive Water Conservation Kits. The Water Conservation Coordinator has also met with school district principals to encourage participation in the program as it focuses on water conservation while incorporating state content standards. Two American Water Works Association (AWWA) publications, "Splash" and the "Story of Water," as well as the video "Water Follies," are used in conjunction with school programs and other community events. Elementary school students are particularly receptive to the conservation message and they share that message with their parents. Though fifth graders are targeted with the school presentations, similar presentations are given to junior and high school students upon request.

The City and MID will continue to implement the public education and outreach strategies as described above. Implementation of this DMM is expected to help the City achieve its water use targets by educating water users about the importance of improving water use efficiency and avoiding water waste.

9.1.5 Programs to Assess and Manage Distribution System Real Loss

A water audit is a process of accounting for water use throughout a water system in order to quantify the unaccounted-for water. Unaccounted-for water is the difference between metered production and metered consumption on a system-wide basis. A leak detection program typically consists of both visual inspection as well as audible inspection. Visual inspection includes the inspection of distribution system appurtenances (e.g., fire hydrants, valves, meters, etc.) to identify obvious signs of leakage. To perform audible leak detection, specialized electronic listening equipment is used to detect the sounds associated with distribution system leakage. This process allows the agency to pinpoint the location of suspected leaks.

Repair and maintenance of the water distribution systems are priorities for the City. The City has Capital Improvement Projects that provide for maintenance programs that maximize efficiency of water distribution system operations and minimize water losses. These programs include using SCADA systems to monitor groundwater and surface water production, quick responses to water main leak detection and repair, recalibration of each well meter every four years, annual pump efficiency testing, and water quality efforts including main flushing and water quality testing.

Daily water production from the City's wells and the MRWTP is recorded and used to monitor water use. Additionally, the City maintains records of main breaks which are used to identify mains to be replaced and estimate system water loss. Water Line workers (four servicemen and one supervisor) are responsible for identifying excessive water waste, standing water and system leaks. At the customer's request, City staff will investigate and, where appropriate, repair leaks within the City's right-of-way. In addition, staff conducts repairs of water line leaks and replaces or repairs meters. A repair crew will repair leaks in areas where leak detection equipment has pinpointed hidden leaks.

Each year, 25 percent of well sites are serviced and meters are recalibrated as routine maintenance. Pump efficiency tests are completed annually. Repairs are promptly made on pumps showing decreased efficiency, and well meters found to be inaccurate or exhibiting signs of wear are promptly replaced. Well efficiency is consistently tracked through the City's SCADA System.

A Maintenance Avoidance Program was implemented in 1995 to analyze motor well vibration using a probe and recorder. This program allows the City to schedule maintenance on motors and pumps based on predictive trends calculated by the vibration analysis instruments. As a result, motors and pumps can be repaired or parts replaced before their complete failure, extending their useful life.

The City's Water Services Division uses Geographical Information Systems (GIS) and Global Positioning Systems (GPS) to record fire hydrant locations, valves, water meters, and map water lines of all water distribution systems. The GIS data is organized in a database of the water system. In conjunction with the data assembled through SCADA, the database aids in hydraulic modeling of the water system. The City uses CassWorks, a maintenance management system, to improve the efficiency of completing work orders, managing imported records and scheduling maintenance. In addition, the City's metered customers are able to use automatic meter reading (AMR) technology to help them detect leaks themselves. Leak reports and repairs are also logged in GIS to document and track the frequency of issues by location and to aid in identifying, planning, and prioritizing which areas need to be budgeted for water main and service line replacements. These programs are effective tools for providing customers with an efficiently operated and dependable water distribution system.

The City's Annual Pipe Replacement Program has City Engineering staff working with City Operations crews to identify old pipelines that are leaking, and provide follow-up in replacing those lines. The City's work on its Annual Pipe Replacement Program has allowed them to identify areas within its service area that are problematic with high percentages of leaking and repair frequency. A schedule and budget have been developed to systematically replace the pipes in these identified areas. The implementation of the Annual Pipe Replacement Program has resulted in the replacement of approximately 14 miles of water mains over the last five years.

Concurrent with completion of the City's metering plan, implementation of this DMM is expected to help the City achieve its water use targets by identifying sources of water loss quickly so repairs can be made and losses minimized.

9.1.6 Water Conservation Program Coordination and Staffing Support

A full-time water conservation coordinator position was authorized by the City Council and was filled in 2001. This position, also known as the "Water Conservation Specialist," works in the City's Water Quality Division. The Water Conservation Coordinator's role is to develop, implement and manage the City's water conservation program and to coordinate with on-going conservation programs in other departments and other agencies. Specifically, the Water Conservation Coordinator performs the following tasks:

- Runs school education outreach programs;
- Trains and directs activities of other staff assigned to water conservation functions;
- Provides conservation information to residents and commercial businesses, coordinates the development of uniform conservation policies and enforcement;
- Develops, recommends and maintains various media sources for providing conservation information to both internal and external customers;
- Plans, coordinates and administers various day-to-day activities pertaining to the City's Water Conservation Program;
- Promotes the efficient use of the City's water supply by residential, irrigation, industrial, commercial public agencies and other customers to ensure sufficient pressure throughout the system for fire protection and other essential City services; and
- Investigates and identifies compliance issues; and communicates with regulatory agencies as required.

The Conservation Coordinator also has an administrative office assistant and four to six temporary (seasonal) employees to help with the water conservation program. The administrative office assistant helps with phone calls, answers questions, and assists with the work flow of the temporary-seasonal employees. The seasonal employees help with water waste enforcement and public education. In addition, there are other staff members of the City's Water Quality Division that help with conservation program tasks. However, these staff members are not specifically designated to the water conservation program.

The City will continue to keep the position of the Conservation Coordinator filled. The effectiveness of this program will be evaluated through the development of effective working relationships between conservation programs.

Implementation of this DMM is on-going and expected to help the City achieve its water use targets by making water conservation and implementation of the City's water conservation program a priority among City employees.

9.2 OTHER CITY OF MODESTO DEMAND MANAGEMENT MEASURES

In addition to the six DMMs described above, the City implements the following programs:

- Residential conservation programs;
- Commercial, industrial, institutional customer conservation programs; and
- Large landscape irrigation conservation programs.

These programs are described below.

9.2.1 Residential Conservation Programs

Water surveys for residential users help raise awareness of water conservation in the home and help conserve water during everyday use. Program staff members are available to set sprinkler timers upon request, adjust sprinkler heads, and provide minor advice on sprinkler systems. Staff members agree that the small amount of extra time spent assisting customers creates goodwill, ultimately reducing the likelihood of enforcement staff having to return in the future. In the past, the City has offered these free services upon request

The City will identify the high water users in its service and focus on those areas; service technicians and/or City interns will visit the residential users to provide leak detection assistance by performing surveys that include both indoor and outdoor investigations and offer suggestions for both single-family and multi-family residences to improve water use efficiency. Surveys are offered via mailers, bill inserts and/or the City's website.

The City requires water efficient equipment to be installed in all new construction and remodels. In addition, Water Conservation Kits are distributed by the City through its Water Conservation Program. Conservation kits are also distributed after each water conservation presentation to both adults and children. Each kit contains one toilet displacement bag, dye tablets to detect toilet leaks, general conservation information, and installation instructions. When using the displacement bag in a standard toilet, approximately one gallon of water is saved with each flush. It is estimated that 20 percent of all toilets leak, and that the average leak wastes nearly 47 gallons a day. Using the dye tablet will help citizens detect those leaks. The water savings from using lawn watering guides is estimated to be 20 percent per household with automatic sprinklers and 10 percent for manual systems.

The City has implemented a formal rebate program to provide financial incentive for customers to meet the WaterSense Specification (WSS) Toilets. The City offers up to $100 in rebates for customers that replace a less efficient (using more than 1.6 gallons per flush) with the purchase of a qualified high efficiency toilets (1.28 gallons per flush).

The City will also provide $100 rebates to users towards the purchase of High Efficiency Clothes Washers (HECW) meeting the average WSS water factor value of 5.0 or better. As part of the implementation of this program, the City will develop and maintain a list of qualifying HECWs for residents to use.

In addition to high efficiency toilets and clothes washer rebates, the City also provides rebates up to $2,000 for residential turf replacement. Up to $2 per square foot of removed and replaced turf can be rebated per eligible household.

The effectiveness of the residential water survey programs will be measured by monitoring the number of completed assistance requests. The effectiveness of the residential plumbing retrofit programs will be measured by monitoring the number of new residential establishments constructed with high efficiency equipment as well as the number of establishments remodeled with efficient equipment. In addition, the number of water conservation kits distributed will be tracked. The effectiveness of the high-efficiency washer program will be evaluated by tracking the number of requested and reimbursed rebates.

9.2.2 Commercial, Industrial, Institutional Customers Conservation Programs

The City has provided water use audits to any Commercial Industrial and Institutional (CII) customer upon request as an informal service. The City implements two different strategies, one for new CII accounts and one for existing CII accounts. For new users, the City works to inform the user of potential wastewater saving measures by having them conduct a self-audit of their operations and equipment. This effort can save the user wastewater connection charges in addition to reducing their water consumption per square foot of operation. The City plans to develop tools and information sources to inform new CII customers of these potential savings. For existing CII users, a similar effort can be developed to display the economic savings through self-audits. It is estimated the savings on both the water and wastewater side will offset the cost of the self-audit in a short time. In the future, the City may have staff attend training that would increase their knowledge of such water saving measures. Currently, the City's Environmental Compliance Division, who handles wastewater discharge permits among other regulatory tasks, is instrumental in assisting larger CII users with water savings measures to reduce wastewater discharge impacts.

Under this program, the City will develop a formal survey program for CII accounts that will consist of free water use surveys (performed upon request) and evaluations of water using apparatus and processes, as well as recommended efficiency measures. Rebates will be provided for some water saving devices such as those included in the Table 9-2. In addition, CII accounts are able to take advantage of the City's turf replacement rebates discussed in Section 9.2.1 (Residential Conservation Programs). The City has also adopted the Commercial Green Building Code which requires higher water use efficiency standards (i.e., 20 percent reduction).

Table 9-2. City of Modesto CII Rebate Programs

Device	Incentive Amount
High Efficiency (HE) Toilets	$200
HE Urinals	$200
Ultra Low Volume Urinals	$200
Zero Consumption Urinals	$200
Commercial HE Single Load Clothes Washers	$200
Cooling Tower Conductivity Controllers	$400
Cooling Tower pH Controllers	$400
Connectionless Food Steamers	$400
Medical Equipment Steam Sterilizers	$400
Water-Efficient Ice Machines	$250
Pressurized Water Brooms	$125
Dry Vacuum Pumps	$125

The effectiveness of the commercial application of the rebate programs will be evaluated by tracking the number of requested and reimbursed rebates.

9.2.3 Large Landscape Irrigation Conservation Programs

The City Utilities Department, Water Services Division has implemented an efficient ET_o-based irrigation system at eleven City parks. The ET_o-based irrigation systems involve irrigating parks using field computers connected by modem to a weather station. The weather station relays weather forecasts and evapotranspiration data to the field computers and the irrigation is adjusted according to incoming weather forecasts. Recently, the system has expanded to include more parks and public land. The City's three certified landscape auditors oversee landscaping maintenance of the City's parks and golf courses.

The City also strives to match water quality with use. For example, the shallower aquifers in the area are generally not tapped for potable water uses due to the presence of contaminants that require treatment. The City plans to convert older, shallower wells or develop new shallow wells to be used exclusively for park and school landscaping irrigation instead of using the treated surface and groundwater sources for these demands. This strategy serves as both a cost savings to the Parks Department and as a means by which available potable water supply sources can be conserved for potable uses. Irrigation conservation measures are still utilized at the parks, regardless of water source; but using the shallower water-bearing aquifer zones puts a supply to use that would otherwise go unused in highly urban areas.

In addition to the actions the City is already taking, the City has begun to formally offer surveys to large landscape accounts. Under this program, the City will visit customers who irrigate and recommend an efficient irrigation schedule and improvements. The City will provide each dedicated irrigation account with an ET_o-based water use budget equal to no more than an average of 70 percent of ET_o of annual average local ET_o per square foot of landscape area. The recreational

areas, such as parks, may require additional water than allotted in the budget, but their use still may not exceed 100 percent of ET_o on an annual basis.

To aid the customer in tracking their water use, the City will provide notices each billing cycle to the accounts with water use budgets showing the relationship between the budget and actual water consumption. The City will offer technical assistance to customers that are 20 percent over budget. In addition, the City will implement a weather-based irrigation controller (WBIC) rebate program, offering a $50 rebate per WBIC purchased.

In December 2015, the City adopted the State of California's Model Water Efficient Landscape Ordinance (MWELO). The City plans to use MWELO until the City has time to revise its ordinance which is planned for summer 2016. The revisions will be minor changes that aim at simplifying the process for smaller landscape projects.

The effectiveness of this program will be evaluated by comparing water use at parks equipped with efficient, ET_o–based irrigation systems with water use at parks not equipped with irrigation systems. In addition, the City will track the increasing number of parks equipped with efficient irrigation systems and track the number of surveys and rebates for other large landscape customers.

9.3 MID DEMAND MANAGEMENT MEASURES

The four wholesale agency DMMs required to be discussed in the 2015 UWMP include the following:

- Metering;
- Public education and outreach;
- Water conservation program coordination and staffing support; and
- Other demand management measures.

In addition, a narrative of asset management and wholesale supplier assistance programs is required. For each DMM, the current program is described, followed by a description of how the DMM was implemented over the previous five years.

It should be noted that MID is primarily an agricultural water supplier and has prepared a 2015 AWMP Update (December 2015) which describes Efficient Water Management Practices (EWMPs) being implemented by MID in conjunction with its agricultural water system. As described further below, although MID is not directly involved in the City's implementation of urban water conservation measures, MID does support the City's water conservation efforts.

9.3.1 Metering

Treated water supplies provided to the City by MID are metered by MID at the Terminal Reservoir Pump Station when in flow through mode and at the Treated Water Pump Station (TRPS) when in bypass mode. The meters are calibrated annually.

9.3.2 Public Education and Outreach

Although MID does not directly provide public education and outreach for urban water use and conservation, MID provides the City with funding for the Save Our Water campaign advertising, and plans to assist the City in school educational programs described in Section 9.1.4 above.

9.3.3 Water Conservation Program Coordination and Staff Support

MID is primarily an agricultural water supplier and has developed a Conservation Program to encourage landowners, through financial incentives, to invest in physical improvements and management practices that conserve water and improve water management. The long-term goal of the Conservation Program is the improve water management within MID. As described in MID's 2015 AWMP, MID has designated their Irrigation Operations Manager as their Water Conservation Coordinator.

However, MID's Water Conservation Coordinator does not focus on urban water conservation, as the City is responsible for implementing and managing the urban water conservation programs. However, MID staff coordinate regularly with City staff in support of the City's urban water conservation programs and the MID website (www.mid.org) provides a link to the City's water conservation webpage.

9.3.4 Other Demand Management Measures

MID does not implement any additional approaches to demand management for its urban customers.

9.3.5 Asset Management

MID uses a Maintenance Management Program to help manage and coordinate maintenance activities at its facilities. Routine preventive maintenance work, non-routine service, and work orders are tracked such that MID's Maintenance Supervisor can identify equipment issues that are starting to be problematic and proactively plan for replacement. MID generally does not replace equipment based on a manufacturer or industry recommended schedule as they have found that through an aggressive preventive maintenance program, the service life of most equipment can be significantly extended.

9.3.6 Wholesale Supplier Assistance Programs

Although MID is not directly involved with urban water demand reduction, MID strongly supports the City's efforts through on-going and continuous coordination between MID and the City, support of water conservation and public outreach activities through MID's website and water use provisions contained in the October 2005 ARTDA between the City and MID.

There are two advisory committees that were formed to assist the Project Manager with the implementation of the Domestic Water Project. The Technical Committee, which meets monthly, is comprised of MID and City staff. The Policy Committee, which meets at least twice annually, is comprised two elected officials each from the MID Board and the City Council.

9.4 PLANNED IMPLEMENTATION TO ACHIEVE WATER USE TARGETS

Water conservation measures are a vital part of the City's overall plan to achieve, reliable, high quality, and cost-effective water supply for its customers. Because MID does not have any direct urban customers, the City oversees the majority of the demand management measures and other public outreach activities. As described above, the City has implemented a number of water conservation measures that include, but are not limited to the following: public information outreach, water conservation kits, device incentive rebate programs, and water conservation partnerships. Additional information regarding the City's conservation activities in provided in Appendix J.

9.5 MEMBERS OF THE CALIFORNIA URBAN WATER CONSERVATION COUNCIL

In 1991 (amended September 16, 1999), a Memorandum of Understanding (MOU) regarding urban water conservation in California was made that formalizes an agreement between DWR, water utilities, environmental organizations, and other interested groups to implement BMPs and make a cooperative effort to reduce the consumption of California's water resources. This MOU is administered by the CUWCC.

The Urban Water Management Planning Act (Water Code Section 10631(j)) allows for an urban retail water agency that is a signatory (member) of the CUWCC to meet the DMM requirements by documenting that the CUWCC has determined the urban water agency is complying (coverage) with all of the provisions of the MOU. However, neither the City of Modesto nor MID are signatories to the CUWCC MOU.

However, the City has implemented, or plans to implement, all of the BMPs, as defined in the CUWCC MOU. MID has also instituted a water conservation program which includes limiting water losses through the water conveyance systems, agricultural conservation programs and public information, etc. as reported in its 2015 AWMP. As described above, where feasible, the City and MID have participated in joint conservation programs.

These existing and proposed water conservation programs will assist the City in meeting the per capita water use targets required by SB X7-7 as discussed in *Chapter 5 SB X7-7 Baselines and Targets*.

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CHAPTER 10
Plan Adoption, Submittal, and Implementation

This chapter provides information regarding the notification, public hearings and adoption of the Plan.

10.1 INCLUSION OF ALL 2015 DATA

Because 2015 is the first compliance year for SB X7-7, the 2015 UWMPs must contain data through the end of 2015. If a water supplier bases its accounting on a fiscal year (July through June) the data must be presented through the end of the 2015 fiscal year (June 2015). If the water supplier bases its accounting on a calendar year, the data must be presented through the end of the 2015 calendar year (December 2015).

As indicated in Chapter 2, the City uses a calendar year for water supply and demand accounting, and therefore this 2015 UWMP includes data through December 2015.

10.2 NOTICE OF PUBLIC HEARINGS

The City provided 60-day notice of the preparation of its 2015 UWMP, and notice of the 2015 UWMP Public Hearing, to the cities and counties listed in Tables 10-1 and 10-2.

Table 10-1. Retail: Notification to Cities and Counties (DWR Table 10-1 Retail)

City Name	60 Day Notice	Notice of Public Hearing
City of Turlock	☑	☑
City of Ceres	☑	☑
City of Modesto	☑	☑
County Name	**60 Day Notice**	**Notice of Public Hearing**
Stanislaus County	☑	☑

Table 10-2. Wholesale: Notification to Cities and Counties (DWR Table 10-1 Wholesale)

☑	Supplier has notified 10 or fewer cities or counties. **Complete the table below.**	
City Name	60 Day Notice	Notice of Public Hearing
City of Turlock	☑	☑
City of Ceres	☑	☑
City of Modesto	☑	☑
County Name	60 Day Notice	Notice of Public Hearing
Stanislaus County	☑	☑

In addition, the City also notified other adjacent agencies, cities, and stakeholders including the following:

- Modesto Irrigation District
- Turlock Irrigation District
- Oakdale Irrigation District
- City of Waterford
- City of Riverbank
- City of Oakdale
- City of Patterson
- City of Newman

The City held a public hearing for the 2015 UWMP on June 28, 2016. The public hearing notifications for adoption of the 2015 UWMP were published in the City's local newspaper and on the City's website. Copies of the public hearing notices are included in Appendix D.

10.3 PUBLIC HEARINGS AND ADOPTION

The City has actively encouraged community and public interest involvement in the 2015 UWMP update through the use of mailings, public meetings, and web-based communication. Copies of the City's outreach efforts are included in Appendix D.

The public hearing provided an opportunity for City water customers and the general public to become familiar with the 2015 UWMP and ask questions about their existing water supply, in addition to the City's continuing plans for providing a reliable, safe, high-quality water supply. The adoption, implementation and economic impact of the revised per capita water use targets (described in Chapter 5) were also discussed at the public hearings. Copies of the Draft 2015

UWMP were made available for public review at the City's Utilities Department, with an electronic version placed on the City's website.

The 2015 UWMP was adopted by the Modesto City Council on June 28, 2016. A copy of the City's adoption resolution is provided in Appendix K.

10.4 PLAN SUBMITTAL

A copy of this 2015 UWMP will be submitted to DWR within 30 days of adoption and by July 1, 2016. The adopted 2015 UWMP will be submitted electronically to DWR using the WUEdata submittal tool. A CD or hardcopy of the adopted 2015 UWMP will also be submitted to the California State Library.

No later than 30 days after adoption, a copy of the adopted 2015 UWMP, including the Water Shortage Contingency Plan, will be provided to the cities and counties to which the City provides water.

10.5 PUBLIC AVAILABILITY

No later than 30 days after submittal to DWR, copies of the adopted 2015 UWMP will be made available to the public during normal business hours at the following location:

- City of Modesto, Utilities Department, 1010 Tenth Street, 4th Floor, Modesto

An electronic copy of the adopted 2015 UWMP will also be available on the City's website:

- City of Modesto Utilities Department Website (http://www.modestogov.com/uppd/reports/)

10.6 PLAN IMPLEMENTATION

Following adoption, this 2015 UWMP will be the source document for any SB 610 Water Supply Assessments or SB 221 Water Supply Verifications required for any proposed projects in the City's water service area between 2016 and 2020 that are subject to the California Environmental Quality Act and would demand an amount of water equivalent to or greater than the amount of water required by a 500 dwelling unit project. Lastly, this Plan will provide guidance and direction on development of new local water supplies and implementation of water conservation programs to meet the requirements of SB X7-7.

10.7 AMENDING AN ADOPTED UWMP

If the City amends its 2015 UWMP, copies of amendments or changes to the plans will be submitted to DWR, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

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APPENDIX A

Legislative Requirements

- California Water Code – Urban Water Management Planning
- California Water Code – Sustainable Water Use and Demand Reduction

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California Water Code
Urban Water Management Planning

California Water Code Division 6, Part 2.6.

Chapter 1. General Declaration and Policy §10610-10610.4
Chapter 2. Definitions §10611-10617
Chapter 3. Urban Water Management Plans
Article 1. General Provisions §10620-10621
Article 2. Contents of Plans §10630-10634
Article 2.5. Water Service Reliability §10635
Article 3. Adoption And Implementation of Plans §10640-10645
Chapter 4. Miscellaneous Provisions §10650-10656

Chapter 1. General Declaration and Policy

SECTION 10610-10610.4

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

10610.4. The Legislature finds and declares that it is the policy of the state as follows:

(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.

(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.

(c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

Chapter 2. Definitions

SECTION 10611-10617

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.5. "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses,

reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

Chapter 3. Urban Water Management Plans

Article 1. General Provisions

SECTION 10620-10621

10620. (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d) (1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that

share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10621. (a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero, except as provided in subdivision (d).

(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

(d) Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.

Article 2. Contents of Plan

SECTION 10630-10634

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

10631. A plan shall be adopted in accordance with this chapter that shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of

water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) (1) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(A) An average water year.

(B) A single-dry water year.

(C) Multiple-dry water years.

(2) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(J) Distribution system water loss.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(3) (A) For the 2015 urban water management plan update, the distribution system water loss shall be quantified for the most recent 12-month period available. For all subsequent updates, the distribution system water loss shall be quantified for each of the five years preceding the plan update.

(B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.

(4) (A) If available and applicable to an urban water supplier, water use projections may display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.

(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:

(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.

(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:

(i) Water waste prevention ordinances.

(ii) Metering.

(iii) Conservation pricing.

(iv) Public education and outreach.

(v) Programs to assess and manage distribution system real loss.

(vi) Water conservation program coordination and staffing support.

(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.

(2) For an urban wholesale water supplier, as defined in Section 10608.12, a narrative description of the items in clauses (ii), (iv), (vi), and (vii) of subparagraph (B) of paragraph (1), and a narrative description of its distribution system asset management and wholesale supplier assistance programs.

(g) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water

use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(h) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

(i) For purposes of this part, urban water suppliers that are members of the California Urban Water Conservation Council shall be deemed in compliance with the requirements of subdivision (f) by complying with all the provisions of the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated December 10, 2008, as it may be amended, and by submitting the annual reports required by Section 6.2 of that memorandum.

(j) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

10631.1. (a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirement under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

10631.2. (a) In addition to the requirements of Section 10631, an urban water management plan may, but is not required to, include any of the following information:

(1) An estimate of the amount of energy used to extract or divert water supplies.

(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.

(3) An estimate of the amount of energy used to treat water supplies.

(4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.

(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.

(6) An estimate of the amount of energy used to place water into or withdraw from storage.

(7) Any other energy-related information the urban water supplier deems appropriate.

(b) The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.

10631.5. (a) (1) Beginning January 1, 2009, the terms of, and eligibility for, a water management grant or loan made to an urban water supplier and awarded or administered by the department, state board, or California Bay-Delta Authority or its successor agency shall be conditioned on the implementation of the water demand management measures described in Section 10631, as determined by the department pursuant to subdivision (b).

(2) For the purposes of this section, water management grants and loans include funding for programs and projects for surface water or groundwater storage, recycling, desalination, water conservation, water supply reliability, and water supply augmentation. This section does not apply to water management projects funded by the federal American Recovery and Reinvestment Act of 2009 (Public Law 111-5).

(3) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if the urban water supplier has

submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the water demand management measures. The supplier may request grant or loan funds to implement the water demand management measures to the extent the request is consistent with the eligibility requirements applicable to the water management funds.

(4) (A) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if an urban water supplier submits to the department for approval documentation demonstrating that a water demand management measure is not locally cost effective. If the department determines that the documentation submitted by the urban water supplier fails to demonstrate that a water demand management measure is not locally cost effective, the department shall notify the urban water supplier and the agency administering the grant or loan program within 120 days that the documentation does not satisfy the requirements for an exemption, and include in that notification a detailed statement to support the determination.

(B) For purposes of this paragraph, "not locally cost effective" means that the present value of the local benefits of implementing a water demand management measure is less than the present value of the local costs of implementing that measure.

(b) (1) The department, in consultation with the state board and the California Bay-Delta Authority or its successor agency, and after soliciting public comment regarding eligibility requirements, shall develop eligibility requirements to implement the requirement of paragraph (1) of subdivision (a). In establishing these eligibility requirements, the department shall do both of the following:

(A) Consider the conservation measures described in the Memorandum of Understanding Regarding Urban Water Conservation in California, and alternative conservation approaches that provide equal or greater water savings.

(B) Recognize the different legal, technical, fiscal, and practical roles and responsibilities of wholesale water suppliers and retail water suppliers.

(2) (A) For the purposes of this section, the department shall determine whether an urban water supplier is implementing all of the water demand management measures described in Section 10631 based on either, or a combination, of the following:

(i) Compliance on an individual basis.

(ii) Compliance on a regional basis. Regional compliance shall require participation in a regional conservation program consisting of two or more urban water suppliers that achieves the level of conservation or water efficiency savings equivalent to the amount of conservation or savings achieved if each of the participating urban water suppliers implemented the water demand management measures. The urban water supplier administering the regional program shall provide participating urban water suppliers and the department with data to demonstrate that the regional program is consistent with this clause. The department shall review the data to determine whether the urban water suppliers in the regional program are meeting the eligibility requirements.

(B) The department may require additional information for any determination pursuant to this section.

(3) The department shall not deny eligibility to an urban water supplier in compliance with the requirements of this section that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan is not implementing all of the water demand management measures described in Section 10631.

(c) In establishing guidelines pursuant to the specific funding authorization for any water management grant or loan program subject to this section, the agency administering the grant or loan program shall include in the guidelines the eligibility requirements developed by the department pursuant to subdivision (b).

(d) Upon receipt of a water management grant or loan application by an agency administering a grant and loan program subject to this section, the agency shall request an eligibility determination from the department with respect to the requirements of this section. The department shall respond to the request within 60 days of the request.

(e) The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities. In addition, for urban water suppliers that are signatories to the Memorandum of Understanding Regarding Urban Water Conservation in California and submit biennial reports to the California Urban Water Conservation Council in accordance with the memorandum, the department may use these reports to assist in tracking the implementation of water demand management measures.

(f) This section shall remain in effect only until July 1, 2016, and as of that date is repealed, unless a later enacted statute, that is enacted before July 1, 2016, deletes or extends that date.

10631.7. The department, in consultation with the California Urban Water Conservation Council, shall convene an independent technical panel to provide information and recommendations to the department and the Legislature on new demand management measures, technologies, and approaches. The panel shall consist of no more than seven members, who shall be selected by the department to reflect a balanced representation of experts. The panel shall have at least one, but no more than two, representatives from each of the following: retail water suppliers, environmental organizations, the business community, wholesale water suppliers, and academia. The panel shall be convened by January 1, 2009, and shall report to the Legislature no later than January 1, 2010, and every five years thereafter. The department shall review the panel report and include in the final report to the Legislature the department's recommendations and comments regarding the panel process and the panel's recommendations.

10632. (a) The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier:

(1) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions that are applicable to each stage.

(2) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

(3) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

(4) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(5) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are

appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(6) Penalties or charges for excessive use, where applicable.

(7) An analysis of the impacts of each of the actions and conditions described in paragraphs (1) to (6), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

(8) A draft water shortage contingency resolution or ordinance.

(9) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

(b) Commencing with the urban water management plan update due July 1, 2016, for purposes of developing the water shortage contingency analysis pursuant to subdivision (a), the urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Article 2.5. Water Service Reliability

SECTION 10635

10635. (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

Article 3. Adoption and Implementation of Plans

SECTION 10640-10645

10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area.

After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644. (a) (1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1) shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

(b) (1) Notwithstanding Section 10231.5 of the Government Code, the department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part.

The report prepared by the department shall identify the exemplary elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan to the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

(2) A report to be submitted pursuant to paragraph (1) shall be submitted in compliance with Section 9795 of the Government Code.

(c) (1) For the purpose of identifying the exemplary elements of the individual plans, the department shall identify in the report water demand management measures adopted and implemented by specific urban water suppliers, and identified pursuant to Section 10631, that achieve water savings significantly above the levels established by the department to meet the requirements of Section 10631.5.

(2) The department shall distribute to the panel convened pursuant to Section 10631.7 the results achieved by the implementation of those water demand management measures described in paragraph (1).

(3) The department shall make available to the public the standard the department will use to identify exemplary water demand management measures.

10645. Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

Chapter 4. Miscellaneous Provisions

SECTION 10650-10656

10650. Any actions or proceedings to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the "Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26

(commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

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California Water Code
Sustainable Water Use and Demand Reduction

California Water Code Division 6, Part 2.55.

Chapter 1. General Declarations and Policy

SECTION 10608-10608.8

10608. The Legislature finds and declares all of the following:

(a) Water is a public resource that the California Constitution protects against waste and unreasonable use.

(b) Growing population, climate change, and the need to protect and grow California's economy while protecting and restoring our fish and wildlife habitats make it essential that the state manage its water resources as efficiently as possible.

(c) Diverse regional water supply portfolios will increase water supply reliability and reduce dependence on the Delta.

(d) Reduced water use through conservation provides significant energy and environmental benefits, and can help protect water quality, improve streamflows, and reduce greenhouse gas emissions.

(e) The success of state and local water conservation programs to increase efficiency of water use is best determined on the basis of measurable outcomes related to water use or efficiency.

(f) Improvements in technology and management practices offer the potential for increasing water efficiency in California over time, providing an essential water management tool to meet the need for water for urban, agricultural, and environmental uses.

(g) The Governor has called for a 20 percent per capita reduction in urban water use statewide by 2020.

(h) The factors used to formulate water use efficiency targets can vary significantly from location to location based on factors including weather, patterns of urban and suburban development, and past efforts to enhance water use efficiency.

(i) Per capita water use is a valid measure of a water provider's efforts to reduce urban water use within its service area. However, per capita water use is less useful for measuring relative water use efficiency between different water providers. Differences in weather, historical patterns of urban and suburban development, and density of housing in a particular location need to be considered when assessing per capita water use as a measure of efficiency.

10608.4. It is the intent of the Legislature, by the enactment of this part, to do all of the following:

(a) Require all water suppliers to increase the efficiency of use of this essential resource.

(b) Establish a framework to meet the state targets for urban water conservation identified in this part and called for by the Governor.

(c) Measure increased efficiency of urban water use on a per capita basis.

(d) Establish a method or methods for urban retail water suppliers to determine targets for achieving increased water use efficiency by the year 2020, in accordance with the Governor's goal of a 20-percent reduction.

(e) Establish consistent water use efficiency planning and implementation standards for urban water suppliers and agricultural water suppliers.

(f) Promote urban water conservation standards that are consistent with the California Urban Water Conservation Council's adopted best management practices and the requirements for demand management in Section 10631.

(g) Establish standards that recognize and provide credit to water suppliers that made substantial capital investments in urban water conservation since the drought of the early 1990s.

(h) Recognize and account for the investment of urban retail water suppliers in providing recycled water for beneficial uses.

(i) Require implementation of specified efficient water management practices for agricultural water suppliers.

(j) Support the economic productivity of California's agricultural, commercial, and industrial sectors.

(k) Advance regional water resources management.

10608.8. (a) (1) Water use efficiency measures adopted and implemented pursuant to this part or Part 2.8 (commencing with Section 10800) are water conservation measures subject to the protections provided under Section 1011.

(2) Because an urban agency is not required to meet its urban water use target until 2020 pursuant to subdivision (b) of Section 10608.24, an urban retail water supplier's failure to meet those targets shall not establish a violation of law for purposes of any state administrative or judicial proceeding prior to

January 1, 2021. Nothing in this paragraph limits the use of data reported to the department or the board in litigation or an administrative proceeding. This paragraph shall become inoperative on January 1, 2021.

(3) To the extent feasible, the department and the board shall provide for the use of water conservation reports required under this part to meet the requirements of Section 1011 for water conservation reporting.

(b) This part does not limit or otherwise affect the application of Chapter 3.5 (commencing with Section 11340), Chapter 4 (commencing with Section 11370), Chapter 4.5 (commencing with Section 11400), and Chapter 5 (commencing with Section 11500) of Part 1 of Division 3 of Title 2 of the Government Code.

(c) This part does not require a reduction in the total water used in the agricultural or urban sectors, because other factors, including, but not limited to, changes in agricultural economics or population growth may have greater effects on water use. This part does not limit the economic productivity of California's agricultural, commercial, or industrial sectors.

(d) The requirements of this part do not apply to an agricultural water supplier that is a party to the Quantification Settlement Agreement, as defined in subdivision (a) of Section 1 of Chapter 617 of the Statutes of 2002, during the period within which the Quantification Settlement Agreement remains in effect. After the expiration of the Quantification Settlement Agreement, to the extent conservation water projects implemented as part of the Quantification Settlement Agreement remain in effect, the conserved water created as part of those projects shall be credited against the obligations of the agricultural water supplier pursuant to this part.

Chapter 2 Definitions

SECTION 10608.12

10608.12. Unless the context otherwise requires, the following definitions govern the construction of this part:

(a) "Agricultural water supplier" means a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding recycled water. "Agricultural water supplier" includes a supplier or contractor for water, regardless of the basis of right, that distributes or sells water for ultimate resale to customers. "Agricultural water supplier" does not include the department.

(b) "Base daily per capita water use" means any of the following:

(1) The urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

(2) For an urban retail water supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier, the urban retail water supplier may extend the calculation described in paragraph (1) up to an additional five years to a maximum of a continuous 15-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

(3) For the purposes of Section 10608.22, the urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous five-year period ending no earlier than December 31, 2007, and no later than December 31, 2010.

(c) "Baseline commercial, industrial, and institutional water use" means an urban retail water supplier's base daily per capita water use for commercial, industrial, and institutional users.

(d) "Commercial water user" means a water user that provides or distributes a product or service.

(e) "Compliance daily per capita water use" means the gross water use during the final year of the reporting period, reported in gallons per capita per day.

(f) "Disadvantaged community" means a community with an annual median household income that is less than 80 percent of the statewide annual median household income.

(g) "Gross water use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:

(1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.

(2) The net volume of water that the urban retail water supplier places into long-term storage.

(3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.

(4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.

(h) "Industrial water user" means a water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development.

(i) "Institutional water user" means a water user dedicated to public service. This type of user includes, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.

(j) "Interim urban water use target" means the midpoint between the urban retail water supplier's base daily per capita water use and the urban retail water supplier's urban water use target for 2020.

(k) "Locally cost effective" means that the present value of the local benefits of implementing an agricultural efficiency water management practice is greater than or equal to the present value of the local cost of implementing that measure.

(l) "Process water" means water used for producing a product or product content or water used for research and development, including, but not limited to, continuous manufacturing processes, water used for testing and maintaining equipment used in producing a product or product content, and water used in combined heat and power facilities used in producing a product or product content. Process water does not mean incidental water uses not related to the production of a product or product content, including, but not limited to, water used for restrooms, landscaping, air conditioning, heating, kitchens, and laundry.

(m) "Recycled water" means recycled water, as defined in subdivision (n) of Section 13050, that is used to offset potable demand, including recycled water supplied for direct use and indirect potable reuse, that meets the following requirements, where applicable:

(1) For groundwater recharge, including recharge through spreading basins, water supplies that are all of the following:

(A) Metered.

(B) Developed through planned investment by the urban water supplier or a wastewater treatment agency.

(C) Treated to a minimum tertiary level.

(D) Delivered within the service area of an urban retail water supplier or its urban wholesale water supplier that helps an urban retail water supplier meet its urban water use target.

(2) For reservoir augmentation, water supplies that meet the criteria of paragraph (1) and are conveyed through a distribution system constructed specifically for recycled water.

(n) "Regional water resources management" means sources of supply resulting from watershed-based planning for sustainable local water reliability or any of the following alternative sources of water:

(1) The capture and reuse of stormwater or rainwater.

(2) The use of recycled water.

(3) The desalination of brackish groundwater.

(4) The conjunctive use of surface water and groundwater in a manner that is consistent with the safe yield of the groundwater basin.

(o) "Reporting period" means the years for which an urban retail water supplier reports compliance with the urban water use targets.

(p) "Urban retail water supplier" means a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes.

(q) "Urban water use target" means the urban retail water supplier's targeted future daily per capita water use.

(r) "Urban wholesale water supplier," means a water supplier, either publicly or privately owned, that provides more than 3,000 acre-feet of water annually at wholesale for potable municipal purposes.

Chapter 3 Urban Retail Water Suppliers

SECTION 10608.16-10608.44

10608.16.(a) The state shall achieve a 20-percent reduction in urban per capita water use in California on or before December 31, 2020.

(b) The state shall make incremental progress towards the state target specified in subdivision (a) by reducing urban per capita water use by at least 10 percent on or before December 31, 2015.

10608.20.(a) (1) Each urban retail water supplier shall develop urban water use targets and an interim urban water use target by July 1, 2011. Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28, and may determine the targets on a fiscal year or calendar year basis.

(2) It is the intent of the Legislature that the urban water use targets described in paragraph (1) cumulatively result in a 20-percent reduction from the baseline daily per capita water use by December 31, 2020.

(b) An urban retail water supplier shall adopt one of the following methods for determining its urban water use target pursuant to subdivision (a):

(1) Eighty percent of the urban retail water supplier's baseline per capita daily water use.

(2) The per capita daily water use that is estimated using the sum of the following performance standards:

(A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the department's 2016 report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.

(B) For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.

(C) For commercial, industrial, and institutional uses, a 10-percent reduction in water use from the baseline commercial, industrial, and institutional water use by 2020.

(3) Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). If the service area of an urban water supplier includes more than one hydrologic region, the supplier shall apportion its service area to each region based on population or area.

(4) A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31, 2020. In developing urban daily per capita water use targets, the department shall do all of the following:

(A) Consider climatic differences within the state.

(B) Consider population density differences within the state.

(C) Provide flexibility to communities and regions in meeting the targets.

(D) Consider different levels of per capita water use according to plant water needs in different regions.

(E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.

(F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.

(c) If the department adopts a regulation pursuant to paragraph (4) of subdivision (b) that results in a requirement that an urban retail water supplier achieve a reduction in daily per capita water use that is greater than 20 percent by December 31, 2020, an urban retail water supplier that adopted the method

described in paragraph (4) of subdivision (b) may limit its urban water use target to a reduction of not more than 20 percent by December 31, 2020, by adopting the method described in paragraph (1) of subdivision (b).

(d) The department shall update the method described in paragraph (4) of subdivision (b) and report to the Legislature by December 31, 2014. An urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may adopt a new urban daily per capita water use target pursuant to this updated method.

(e) An urban retail water supplier shall include in its urban water management plan due in 2010 pursuant to Part 2.6 (commencing with Section 10610) the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.

(f) When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.

(g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).

(h) (1) The department, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part, including, but not limited to, both of the following:

(A) Methodologies for calculating base daily per capita water use, baseline commercial, industrial, and institutional water use, compliance daily per capita water use, gross water use, service area population, indoor residential water use, and landscaped area water use.

(B) Criteria for adjustments pursuant to subdivisions (d) and (e) of Section 10608.24.

(2) The department shall post the methodologies and criteria developed pursuant to this subdivision on its Internet Web site, and make written copies available, by October 1, 2010. An urban retail water supplier shall use the methods developed by the department in compliance with this part.

(i) (1) The department shall adopt regulations for implementation of the provisions relating to process water in accordance with subdivision (l) of Section 10608.12, subdivision (e) of Section 10608.24, and subdivision (d) of Section 10608.26.

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the

Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

(j) (1) An urban retail water supplier is granted an extension to July 1, 2011, for adoption of an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) due in 2010 to allow the use of technical methodologies developed by the department pursuant to paragraph (4) of subdivision (b) and subdivision (h). An urban retail water supplier that adopts an urban water management plan due in 2010 that does not use the methodologies developed by the department pursuant to subdivision (h) shall amend the plan by July 1, 2011, to comply with this part.

(2) An urban wholesale water supplier whose urban water management plan prepared pursuant to Part 2.6 (commencing with Section 10610) was due and not submitted in 2010 is granted an extension to July 1, 2011, to permit coordination between an urban wholesale water supplier and urban retail water suppliers.

10608.22. Notwithstanding the method adopted by an urban retail water supplier pursuant to Section 10608.20, an urban retail water supplier's per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use as defined in paragraph(3) of subdivision (b) of Section 10608.12. This section does not apply to an urban retail water supplier with a base daily per capita water use at or below 100 gallons per capita per day.

10608.24.(a) Each urban retail water supplier shall meet its interim urban water use target by December 31, 2015.

(b) Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

(c) An urban retail water supplier's compliance daily per capita water use shall be the measure of progress toward achievement of its urban water use target.

(d) (1) When determining compliance daily per capita water use, an urban retail water supplier may consider the following factors:

(A) Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.
(B) Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.

(C) Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.

(2) If the urban retail water supplier elects to adjust its estimate of compliance daily per capita water use due to one or more of the factors described in

paragraph (1), it shall provide the basis for, and data supporting, the adjustment in the report required by Section 10608.40.

(e) When developing the urban water use target pursuant to Section 10608.20, an urban retail water supplier that has a substantial percentage of industrial water use in its service area may exclude process water from the calculation of gross water use to avoid a disproportionate burden on another customer sector.

(f) (1) An urban retail water supplier that includes agricultural water use in an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) may include the agricultural water use in determining gross water use. An urban retail water supplier that includes agricultural water use in determining gross water use and develops its urban water use target pursuant to paragraph (2) of subdivision (b) of Section 10608.20 shall use a water efficient standard for agricultural irrigation of 100 percent of reference evapotranspiration multiplied by the crop coefficient for irrigated acres.

(2) An urban retail water supplier, that is also an agricultural water supplier, is not subject to the requirements of Chapter 4 (commencing with Section 10608.48), if the agricultural water use is incorporated into its urban water use target pursuant to paragraph (1).

10608.26.(a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:

(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.

(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.

(3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.

(b) In complying with this part, an urban retail water supplier may meet its urban water use target through efficiency improvements in any combination among its customer sectors. An urban retail water supplier shall avoid placing a disproportionate burden on any customer sector.

(c) For an urban retail water supplier that supplies water to a United States Department of Defense military installation, the urban retail water supplier's implementation plan for complying with this part shall consider the conservation of that military installation under federal Executive Order 13514.

(d) (1) Any ordinance or resolution adopted by an urban retail water supplier after the effective date of this section shall not require existing customers as of the effective date of this section, to undertake changes in product formulation, operations, or equipment that would reduce process water use, but may provide technical assistance and financial incentives to those customers to implement efficiency measures for process water. This section shall not limit

an ordinance or resolution adopted pursuant to a declaration of drought emergency by an urban retail water supplier.

(2) This part shall not be construed or enforced so as to interfere with the requirements of Chapter 4 (commencing with Section 113980) to Chapter 13 (commencing with Section 114380), inclusive, of Part 7 of Division 104 of the Health and Safety Code, or any requirement or standard for the protection of public health, public safety, or worker safety established by federal, state, or local government or recommended by recognized standard setting organizations or trade associations.

10608.28.(a) An urban retail water supplier may meet its urban water use target within its retail service area, or through mutual agreement, by any of the following:

(1) Through an urban wholesale water supplier.

(2) Through a regional agency authorized to plan and implement water conservation, including, but not limited to, an agency established under the Bay Area Water Supply and Conservation Agency Act (Division 31 (commencing with Section 81300)).

(3) Through a regional water management group as defined in Section 10537.

(4) By an integrated regional water management funding area.

(5) By hydrologic region.

(6) Through other appropriate geographic scales for which computation methods have been developed by the department.

(b) A regional water management group, with the written consent of its member agencies, may undertake any or all planning, reporting, and implementation functions under this chapter for the member agencies that consent to those activities. Any data or reports shall provide information both for the regional water management group and separately for each consenting urban retail water supplier and urban wholesale water supplier.

10608.32. All costs incurred pursuant to this part by a water utility regulated by the Public Utilities Commission may be recoverable in rates subject to review and approval by the Public Utilities Commission, and may be recorded in a memorandum account and reviewed for reasonableness by the Public Utilities Commission.

10608.36. Urban wholesale water suppliers shall include in the urban water management plans required pursuant to Part 2.6 (commencing with Section 10610) an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part.

10608.40. Urban water retail suppliers shall report to the department on their progress in meeting their urban water use targets as part of their urban water management plans

submitted pursuant to Section 10631. The data shall be reported using a standardized form developed pursuant to Section 10608.52.

10608.42.(a) The department shall review the 2015 urban water management plans and report to the Legislature by July 1, 2017, on progress towards achieving a 20-percent reduction in urban water use by December 31, 2020. The report shall include recommendations on changes to water efficiency standards or urban water use targets to achieve the 20-percent reduction and to reflect updated efficiency information and technology changes.

(b) A report to be submitted pursuant to subdivision (a) shall be submitted in compliance with Section 9795 of the Government Code.

10608.43. The department, in conjunction with the California Urban Water Conservation Council, by April 1, 2010, shall convene a representative task force consisting of academic experts, urban retail water suppliers, environmental organizations, commercial water users, industrial water users, and institutional water users to develop alternative best management practices for commercial, industrial, and institutional users and an assessment of the potential statewide water use efficiency improvement in the commercial, industrial, and institutional sectors that would result from implementation of these best management practices. The taskforce, in conjunction with the department, shall submit a report to the Legislature by April 1, 2012, that shall include a review of multiple sectors within commercial, industrial, and institutional users and that shall recommend water use efficiency standards for commercial, industrial, and institutional users among various sectors of water use. The report shall include, but not be limited to, the following:

(a) Appropriate metrics for evaluating commercial, industrial, and institutional water use.

(b) Evaluation of water demands for manufacturing processes, goods, and cooling.

(c) Evaluation of public infrastructure necessary for delivery of recycled water to the commercial, industrial, and institutional sectors.

(d) Evaluation of institutional and economic barriers to increased recycled water use within the commercial, industrial, and institutional sectors.

(e) Identification of technical feasibility and cost of the best management practices to achieve more efficient water use statewide in the commercial, industrial, and institutional sectors that is consistent with the public interest and reflects past investments in water use efficiency.

10608.44. Each state agency shall reduce water use at facilities it operates to support urban retail water suppliers in meeting the target identified in Section 10608.16.

Chapter 4 Agricultural Water Suppliers

SECTION 10608.48

10608.48.(a) On or before July 31, 2012, an agricultural water supplier shall implement efficient water management practices pursuant to subdivisions (b) and (c).

(b) Agricultural water suppliers shall implement all of the following critical efficient management practices:

(1) Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph (2).

(2) Adopt a pricing structure for water customers based at least in part on quantity delivered.

(c) Agricultural water suppliers shall implement additional efficient management practices, including, but not limited to, practices to accomplish all of the following, if the measures are locally cost effective and technically feasible:

(1) Facilitate alternative land use for lands with exceptionally high water duties or whose irrigation contributes to significant problems, including drainage.

(2) Facilitate use of available recycled water that otherwise would not be used beneficially, meets all health and safety criteria, and does not harm crops or soils.

(3) Facilitate the financing of capital improvements for on-farm irrigation systems.

(4) Implement an incentive pricing structure that promotes one or more of the following goals:

(A) More efficient water use at the farm level.

(B) Conjunctive use of groundwater.

(C) Appropriate increase of groundwater recharge.

(D) Reduction in problem drainage.

(E) Improved management of environmental resources.

(F) Effective management of all water sources throughout the year by adjusting seasonal pricing structures based on current conditions.

(5) Expand line or pipe distribution systems, and construct regulatory reservoirs to increase distribution system flexibility and capacity, decrease maintenance, and reduce seepage.

(6) Increase flexibility in water ordering by, and delivery to, water customers within operational limits.

(7) Construct and operate supplier spill and tailwater recovery systems.

(8) Increase planned conjunctive use of surface water and groundwater within the supplier service area.

(9) Automate canal control structures.

(10) Facilitate or promote customer pump testing and evaluation.

(11) Designate a water conservation coordinator who will develop and implement the water management plan and prepare progress reports.

(12) Provide for the availability of water management services to water users. These services may include, but are not limited to, all of the following:

(A) On-farm irrigation and drainage system evaluations.

(B) Normal year and real-time irrigation scheduling and crop evapotranspiration information.

(C) Surface water, groundwater, and drainage water quantity and quality data.

(D) Agricultural water management educational programs and materials for farmers, staff, and the public.

(13) Evaluate the policies of agencies that provide the supplier with water to identify the potential for institutional changes to allow more flexible water deliveries and storage.

(14) Evaluate and improve the efficiencies of the supplier's pumps.

(d) Agricultural water suppliers shall include in the agricultural water management plans required pursuant to Part 2.8 (commencing with Section 10800) a report on which efficient water management practices have been implemented and are planned to be implemented, an estimate of the water use efficiency improvements that have occurred since the last report, and an estimate of the water use efficiency improvements estimated to occur five and 10 years in the future. If an agricultural water supplier determines that an efficient water management practice is not locally cost effective or technically feasible, the supplier shall submit information documenting that determination.

(e) The data shall be reported using a standardized form developed pursuant to Section 10608.52.

(f) An agricultural water supplier may meet the requirements of subdivisions (d) and (e) by submitting to the department a water conservation plan submitted to the United States Bureau of Reclamation that meets the requirements described in Section 10828.

(g) On or before December 31, 2013, December 31, 2016, and December 31, 2021, the department, in consultation with the board, shall submit to the Legislature a report on the agricultural efficient water management practices that have been implemented and are planned to be implemented and an assessment of the manner in which the implementation of those efficient water management practices has affected and will affect agricultural operations, including estimated water use efficiency improvements, if any.

(h) The department may update the efficient water management practices required pursuant to subdivision (c), in consultation with the Agricultural Water Management Council, the United States Bureau of Reclamation, and the board. All efficient water management practices for agricultural water use pursuant to this chapter shall be adopted or revised by the department only after the department conducts public hearings to allow participation of the diverse geographical areas and interests of the state.

(i) (1) The department shall adopt regulations that provide for a range of options that agricultural water suppliers may use or implement to comply with the measurement requirement in paragraph (1) of subdivision (b).

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

Chapter 5 Sustainable Water Management

Section 10608.50

10608.50.(a) The department, in consultation with the board, shall promote implementation of regional water resources management practices through increased incentives and removal of barriers consistent with state and federal law. Potential changes may include, but are not limited to, all of the following:

(1) Revisions to the requirements for urban and agricultural water management plans.

(2) Revisions to the requirements for integrated regional water management plans.

(3) Revisions to the eligibility for state water management grants and loans.

(4) Revisions to state or local permitting requirements that increase water supply opportunities, but do not weaken water quality protection under state and federal law.

(5) Increased funding for research, feasibility studies, and project construction.

(6) Expanding technical and educational support for local land use and water management agencies.

(b) No later than January 1, 2011, and updated as part of the California Water Plan, the department, in consultation with the board, and with public input, shall propose new statewide targets, or review and update existing statewide targets, for regional water resources management practices, including, but not limited to, recycled water, brackish groundwater desalination, and infiltration and direct use of urban stormwater runoff.

Chapter 6 Standardized Data Collection

SECTION 10608.52

10608.52.(a) The department, in consultation with the board, the California Bay-Delta Authority or its successor agency, the State Department of Public Health, and the Public Utilities Commission, shall develop a single standardized water use reporting form to meet the water use information needs of each agency, including the needs of urban water suppliers that elect to determine and report progress toward achieving targets on a regional basis as provided in subdivision (a) of Section 10608.28.

(b) At a minimum, the form shall be developed to accommodate information sufficient to assess an urban water supplier's compliance with conservation targets pursuant to Section 10608.24 and an agricultural water supplier's compliance with implementation of efficient water management practices pursuant to subdivision (a) of Section 10608.48. The form shall accommodate reporting by urban water suppliers on an individual or regional basis as provided in subdivision (a) of Section 10608.28.

Chapter 7 Funding Provisions

Section 10608.56-10608.60

10608.56.(a) On and after July 1, 2016, an urban retail water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

(b) On and after July 1, 2013, an agricultural water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

(c) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for achieving the per capita reductions. The supplier may request grant or loan funds to achieve the per capita reductions to the extent the request is consistent with the eligibility requirements applicable to the water funds.

(d) Notwithstanding subdivision (b), the department shall determine that an agricultural water supplier is eligible for a water grant or loan even though the supplier is not implementing all of the efficient water management practices described in Section 10608.48, if the agricultural water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the efficient water management practices. The supplier may request grant or loan funds to implement the efficient water management practices to the extent the request is consistent with the eligibility requirements applicable to the water funds.

(e) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval documentation demonstrating that its entire service area qualifies as a disadvantaged community.

(f) The department shall not deny eligibility to an urban retail water supplier or agricultural water supplier in compliance with the requirements of this part and Part 2.8 (commencing with Section 10800), that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan is not implementing all of the requirements of this part or Part 2.8 (commencing with Section 10800).

10608.60.(a) It is the intent of the Legislature that funds made available by Section 75026 of the Public Resources Code should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for grants to implement this part. In the allocation of funding, it is the intent of the Legislature that the department give consideration to disadvantaged communities to assist in implementing the requirements of this part.

(b) It is the intent of the Legislature that funds made available by Section 75041 of the Public Resources Code, should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for direct expenditures to implement this part.

Chapter 8 Quantifying Agricultural Water Use Efficiency

SECTION 10608.64

10608.64. The department, in consultation with the Agricultural Water Management Council, academic experts, and other stakeholders, shall develop a methodology for quantifying the efficiency of agricultural water use. Alternatives to be assessed shall include, but not be limited to, determination of efficiency levels based on crop type or irrigation system distribution uniformity. On or before December 31, 2011, the department shall report to the Legislature on a proposed methodology and a plan for implementation. The plan shall include the estimated implementation costs and the types of data needed to support the methodology. Nothing in this section authorizes the department to implement a methodology established pursuant to this section.

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APPENDIX B

DWR 2015 Urban Water Management Plan Tables

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Table 2-1 Retail Only: Public Water Systems [a,b]			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2015	Volume of Water Supplied 2015
CA5010010[c]	City of Modesto	69,152	45,544
CA5010005[d]	Salida	4,399	909
CA5010031	Ceres (Walnut Manor)	53	44
CA5010033	Grayson	274	162
CA5010029	Del Rio (Hillcrest)	389	577
CA5010034	North Turlock	52	31
CA5010023	South Turlock	332	192
CA5010035[e]	Central Turlock	35	0
	TOTAL	74,686	47,459

NOTES:

(a) Represents available services (includes billed and unbilled accounts).

(b) Represents water production (AF).

(c) Includes Empire and North Ceres services that are contiguous to the City of Modesto water system (interconnected).

(d) Salida is contiguous to the City of Modesto water system (interconnected).

(e) No SCADA available for production because City of Turlock provides groundwater to this system via an interconnection with Turlock.

Table 2-2: Plan Identification		
Select Only One	**Type of Plan**	**Name of RUWMP or Regional Alliance** *if applicable*
☑	**Individual UWMP**	
☐	**Regional Urban Water Management Plan (RUWMP)**	
NOTES:		

Table 2-3: Agency Identification	
Type of Agency (select one or both)	
☐	Agency is a wholesaler
☑	Agency is a retailer
Fiscal or Calendar Year (select one)	
☑	UWMP Tables Are in Calendar Years
☐	UWMP Tables Are in Fiscal Years
Units of Measure Used in UWMP (select from Drop down)	
Unit	AF
NOTES:	

Table 2-4 Retail: Water Supplier Information Exchange
The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.
Wholesale Water Supplier Name
Modesto Irrigation District (MID)
NOTES:

Table 2-4 Wholesale: Water Supplier Information Exchange (select one)	
☐	Supplier has informed more than 10 other water suppliers of water supplies available in accordance with CWC 10631. Completion of the table below is optional. If not completed include a list of the water suppliers that were informed.
	Provide page number for location of the list.
☑	Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with CWC 10631. **Complete the table below.**

Water Supplier Name
City of Modesto
NOTES:

Table 3-1 Retail: Population - Current and Projected						
Population Served	2015	2020	2025	2030	2035	2040*(opt)*
	259,187	274,920	291,686	309,555	328,599	348,896
NOTES: 2015 population from California Department of Finance where available and projected populations are based on the City of Modesto Water Master Plan (refer to Table 3-1 in the Water Master Plan). Does not include population from Hickman and Waterford.						

Table 3-1 Wholesale: Population - Current and Projected						
Population Served	2015	2020	2025	2030	2035	2040*(opt)*
	0	0	0	0	0	0
NOTES: MID does not directly serve any urban water customers. The population served by MID wholesale water is included the City's total service area population (see DWR Table 3-1 Retail).						

Table 4-1 Retail: Demands for Potable and Raw Water - Actual			
Use Type	2015 Actual		
	Additional Description *(as needed)*	Level of Treatment When Delivered	Volume
Single Family		Drinking Water	20,203
Multi-Family		Drinking Water	4,710
Commercial		Drinking Water	7,537
Industrial		Drinking Water	2,728
Institutional/Governmental		Drinking Water	1,486
Landscape		Drinking Water	1,744
Other	Unmetered water uses	Drinking Water	4,305
Losses		Drinking Water	4,746
		TOTAL	47,459
NOTES: Volumes are in AF; volumes do not include demands from Hickman and Waterford.			

Table 4-1 Wholesale: Demands for Potable and Raw Water - Actual			
Use Type	2015 Actual		
	Additional Description *(as needed)*	Level of Treatment When Delivered	Volume
Sales to other agencies	City of Modesto	Drinking Water	15,401
Losses		Drinking Water	31
		TOTAL	15,432
NOTES: Volumes are in AF.			

Table 4-2 Retail: Demands for Potable and Raw Water - Projected						
Use Type	Additional Description *(as needed)*	Projected Water Use				
		2020	2025	2030	2035	2040-opt
Single Family		35,872	38,680	41,488	44,296	47,105
Multi-Family		6,894	7,434	7,974	8,513	9,053
Commercial		11,031	11,895	12,758	13,622	14,486
Industrial		3,993	4,305	4,618	4,931	5,243
Institutional/Governmental		2,175	2,345	2,515	2,685	2,855
Landscape		2,553	2,753	2,953	3,153	3,352
Other	Unmetered water uses	0	0	0	0	0
Losses		6,946	7,490	8,034	8,578	9,122
	TOTAL	69,464	74,902	80,340	85,778	91,216
NOTES: Volumes are in AF. Projected water use is based on the City of Modesto Water Master Plan.						

Table 4-2 Wholesale: Demands for Potable and Raw Water - Projected						
Use Type	Additional Description *(as needed)*	Projected Water Use				
		2020	2025	2030	2035	2040 *(opt)*
Sales to other agencies	City of Modesto	44,800	48,533	52,267	56,000	59,733
	TOTAL	44,800	48,533	52,267	56,000	59,733
NOTES: Volumes are in AF. Based on the City of Modesto Water Master Plan (refer to Figure 5-1 in the Water Master Plan).						

Table 4-3 Retail: Total Water Demands						
	2015	2020	2025	2030	2035	2040 *(opt)*
Potable and Raw Water	47,459	69,464	74,902	80,340	85,778	91,216
Recycled Water Demand	0	0	0	0	0	0
TOTAL WATER DEMAND	47,459	69,464	74,902	80,340	85,778	91,216
NOTES: Volumes are in AF.						

Table 4-3 Wholesale: Total Water Demands						
	2015	2020	2025	2030	2035	2040*(opt)*
Potable and Raw Water	15,432	44,800	48,533	52,267	56,000	59,733
Recycled Water Demand	0	0	0	0	0	0
TOTAL WATER DEMAND	15,432	44,800	48,533	52,267	56,000	59,733
NOTES: Volumes are in AF.						

Table 4-4 Retail: 12 Month Water Loss Audit Reporting	
Reporting Period Start Date	Volume of Water Loss*
01/2015	4,746
** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*	
NOTES: Volumes are in AF. A copy of the City of Modesto's 2015 Water Audit is provided in Appendix E.	

Table 4-4 Wholesale: 12 Month Water Loss Audit Reporting	
Reporting Period Start Date	Volume of Water Loss*
01/2015	31
** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*	
NOTES: Volumes are in AF. A copy of MID's 2015 Water Audit is provided in Appendix E.	

Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections?	No
Are Lower Income Residential Demands Included In Projections?	Yes
NOTES:	

Table 5-1 Baselines and Targets Summary
Retail Agency or Regional Alliance Only

Baseline Period	Start Year	End Year	Average Baseline GPCD*	2015 Interim Target *	Confirmed 2020 Target*
10-15 year	1999	2008	285	257	228
5 Year	2003	2007	279		

*All values are in Gallons per Capita per Day (GPCD)

NOTES: Historical per capita use from Hickman and Waterford are not included in calculations.

Table 5-2: 2015 Compliance

Retail Agency or Regional Alliance Only

Actual 2015 GPCD*	2015 Interim Target GPCD*	Optional Adjustments to 2015 GPCD *From Methodology 8*					2015 GPCD* *(Adjusted if applicable)*	Did Supplier Achieve Targeted Reduction for 2015? Y/N
		Extraordinary Events*	Economic Adjustment*	Weather Normalization*	TOTAL Adjustments*	Adjusted 2015 GPCD*		
163	257	0	0	0	0	163	163	Yes

**All values are in Gallons per Capita per Day (GPCD)*

NOTES: Historical per capita use from Hickman and Waterford are not included in calculations.

Table 6-1 Retail: Groundwater Volume Pumped						
☐	Supplier does not pump groundwater. The supplier will not complete the table below.					
Groundwater Type	Location or Basin Name	2011	2012	2013	2014	2015
Alluvial Basin	San Joaquin Valley Groundwater Basin	34,897	31,380	29,773	36,415	32,058
	TOTAL	34,897	31,380	29,773	36,415	32,058
NOTES: Volumes are in AF. Historical groundwater volumes do not include production from Hickman and Waterford.						

Table 6-1 Wholesale: Groundwater Volume Pumped						
☑	Supplier does not pump groundwater. The supplier will not complete the table below.					
Groundwater Type	Location or Basin Name	2011	2012	2013	2014	2015
	TOTAL	0	0	0	0	0
NOTES:						

Table 6-2 Retail: Wastewater Collected Within Service Area in 2015						
☐	There is no wastewater collection system. The supplier will not complete the table below.					
	Percentage of 2015 service area covered by wastewater collection system *(optional)*					
	Percentage of 2015 service area population covered by wastewater collection system *(optional)*					
Wastewater Collection			**Recipient of Collected Wastewater**			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected from UWMP Service Area 2015	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party? *(optional)*
City of Modesto	Metered	24,152	City of Modesto	Sutter Avenue Primary Treatment Plant	Yes	
City of Modesto	Metered	2,995	City of Modesto	Jennings Road Treatment Plant	No	
Salida Sanitary Sewer District	Metered	1,283	Salida Sanitary Sewer District	Salida Sanitary Treament Plant	No	
Grayson Community Services District	Estimated	86	Grayson Community Services District	Grayson WWTP	No	
Del Rio	Estimated	92	Septic systems and Packaged plants	N/A	No	
City of Turlock	Estimated	101	City of Turlock	Turlock Regional Water Quality Control Facility	No	
Total Wastewater Collected from Service Area in 2015:		28,709				
NOTES: Volumes are in AF.						

Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2015

☐	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.

Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2015 volumes			
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
City of Modesto Sutter Avenue Primary Treatment Plant	N/A	N/A		Other	No	Secondary, Undisinfected	24,152	0	0	0
Del Rio Septic systems and Packaged plants	N/A	N/A		Other	No	Secondary, Undisinfected	92	0	0	0
						Total	24,244	0	0	0

NOTES: Volumes are in AF. The Sutter Avenue Primary Treatment Plant provides primary treatment only.

Table 6-3 Wholesale: Wastewater Treatment and Discharge Within Service Area in 2015

☑	Wholesale supplier neither distributes nor provides supplemental treatment to recycled water. The supplier will not complete the table below.

Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2015 volumes			
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
						Total	0	0	0	0

NOTES:

Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area

☑	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.
Name of Agency Producing (Treating) the Recycled Water:	
Name of Agency Operating the Recycled Water Distribution System:	
Supplemental Water Added in 2015	
Source of 2015 Supplemental Water	

Beneficial Use Type	General Description of 2015 Uses	Level of Treatment	2015	2020	2025	2030	2035	2040 (opt)
		Total:	0	0	0	0	0	0

**IPR - Indirect Potable Reuse*

NOTES:

Table 6-4 Wholesale: Current and Projected Retailers Provided Recycled Water Within Service Area							
☑	Recycled water is not directly treated or distributed by the supplier. The supplier will not complete the table below.						
Name of Receiving Supplier or Direct Use by Wholesaler	Level of Treatment	2015	2020	2025	2030	2035	2040 *(opt)*
	Total	0	0	0	0	0	0
NOTES:							

Table 6-5 Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual			
☐	Recycled water was not used in 2010 nor projected for use in 2015. The supplier will not complete the table below.		
Use Type		**2010 Projection for 2015**	**2015 Actual Use**
Agricultural irrigation		9,100	0
Total		9,100	0
NOTES: Volumes are in AF. There was no recycled water use within the City's water service area in 2015.			

Table 6-5 Wholesale: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual		
☑	Recycled water was not used or distributed by the supplier in 2010, nor projected for use or distribution in 2015. The wholesale supplier will not complete the table below.	
Name of Receiving Supplier or Direct Use by Wholesaler	2010 Projection for 2015	2015 actual use
None	0	0
Total	0	0
NOTES:		

Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
☑	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
Page 6-21	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
		Total	0
NOTES:			

Table 6-7 Retail: Expected Future Water Supply Projects or Programs						
☑	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
☐	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other agencies?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Agency
NOTES:						

Table 6-7 Wholesale: Expected Future Water Supply Projects or Programs						
☑	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
☐	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other agencies?		Description *(if needed)*	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Agency
NOTES:						

Table 6-8 Retail: Water Supplies — Actual				
Water Supply	Additional Detail on Water Supply	2015		
		Actual Volume	Water Quality	Total Right or Safe Yield *(optional)*
Purchased or Imported Water	Purchases from MID	15,401	Drinking Water	
Groundwater		32,058	Drinking Water	
	Total	47,459		0
NOTES: Volumes are in AF. Does not include supplies for Hickman and Waterford.				

Table 6-8 Wholesale: Water Supplies — Actual				
Water Supply	Additional Detail on Water Supply	2015		
		Actual Volume	Water Quality	Total Right or Safe Yield *(optional)*
Surface water	Tuolumne River	15,432	Drinking Water	
	Total	15,432		0
NOTES: Volumes are in AF.				

Table 6-9 Retail: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Projected Water Supply *Report To the Extent Practicable*									
		2020		2025		2030		2035		2040 *(opt)*	
		Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*
Purchased or Imported Water	Purchases from MID	44,800		48,533		52,267		56,000		59,733	
Groundwater		24,664	53,500	26,369	53,500	28,073	53,500	29,778	53,500	31,483	53,500
Total		69,464	53,500	74,902	53,500	80,340	53,500	85,778	53,500	91,216	53,500

NOTES: Volumes are in AF. Based on the City of Modesto Water Master Plan (refer to Figure 5-1 in the Water Master Plan).

Table 6-9 Wholesale: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Projected Water Supply *Report To the Extent Practicable*									
		2020		2025		2030		2035		2040 *(opt)*	
		Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*
Surface water		44,800		48,533		52,267		56,000		59,733	
Total		44,800	0	48,533	0	52,267	0	56,000	0	59,733	0

NOTES: Volumes are in AF. Based on the City of Modesto Water Master Plan (refer to Figure 5-1 in the Water Master Plan).

Table 7-1 Retail: Basis of Water Year Data

Year Type	Base Year *If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000*	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available	**% of Average Supply**
Average Year	1984	87,100	100%
Single-Dry Year	2015	66,300	76%
Multiple-Dry Years 1st Year	2011	82,900	95%
Multiple-Dry Years 2nd Year	2012	78,800	90%
Multiple-Dry Years 3rd Year	2013	74,600	86%
Multiple-Dry Years 4th Year *Optional*	2014	70,500	81%
Multiple-Dry Years 5th Year *Optional*	2015	66,300	76%

NOTES: Volumes are in AF; totals rounded to nearest hundred. Includes both purchased water from MID and groundwater supplies. Volume of MID supply for the fifth multiple dry year based on the supply reduction that actually occurred in 2015. 2011 through 2014 MID supply volumes are estimated based on the actual 2015 MID cutback spread equally over five years (2011 to 2015). Assumes groundwater supply will not be reduced in dry years. During dry years, the City may have the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID.

Table 7-1 Wholesale: Basis of Water Year Data

Year Type	Base Year *If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000*	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available	**% of Average Supply**
Average Year	1984	33,600	100%
Single-Dry Year	2015	12,800	38%
Multiple-Dry Years 1st Year	2011	29,400	88%
Multiple-Dry Years 2nd Year	2012	25,300	75%
Multiple-Dry Years 3rd Year	2013	21,100	63%
Multiple-Dry Years 4th Year *Optional*	2014	17,000	50%
Multiple-Dry Years 5th Year *Optional*	2015	12,800	38%

NOTES: Volumes are in AF; totals rounded to nearest hundred. Volume for the fifth multiple dry year based on the supply reduction that actually occurred in 2015. 2011 through 2014 volumes are estimated based on the actual 2015 MID cutback spread equally over five years (2011 to 2015). During dry years, the City may have the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID.

Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040 *(Opt)*
Supply totals	69,464	74,902	80,340	85,778	91,216
Demand totals	69,464	74,902	80,340	85,778	91,216
Difference	0	0	0	0	0
NOTES: Volumes are in AF.					

Table 7-2 Wholesale: Normal Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040 *(Opt)*
Supply totals	44,800	48,533	52,267	56,000	59,733
Demand totals	44,800	48,533	52,267	56,000	59,733
Difference	0	0	0	0	0
NOTES: Volumes are in AF.					

Table 7-3 Retail: Single Dry Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040 (Opt)
Supply totals	69,464	71,991	73,414	74,836	76,258
Demand totals	69,464	71,991	73,414	74,836	76,258
Difference	0	0	0	0	0

NOTES: Volumes are in AF. For planning purposes, a conservative supply condition assuming a 61.9 percent reduction in MID treated water supply during a single dry year is used here. Available groundwater supply assumed to be 53,500 AFA. The following demand reductions were required to match available supplies during a single dry year condition:

2020 - 0%
2025 - 4%
2030 - 9%
2035 - 13%
2040 - 16%

Table 7-3 Wholesale: Single Dry Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040 (Opt)
Supply totals	17,069	18,491	19,914	21,336	22,758
Demand totals	17,069	18,491	19,914	21,336	22,758
Difference	0	0	0	0	0

NOTES: Volumes are in AF. During dry years, the City may have the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID. However, for planning purposes, a conservative supply condition assuming a 61.9 percent reduction in treated water supply during a single dry year is used here.

Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison						
		2020	2025	2030	2035	2040 (Opt)
First year	Supply totals	69,464	74,902	80,340	85,778	91,216
	Demand totals	69,464	74,902	80,340	85,778	91,216
	Difference	0	0	0	0	0
Second year	Supply totals	70,551	75,989	81,427	81,427	92,304
	Demand totals	70,551	75,989	81,427	81,427	92,304
	Difference	0	0	0	0	0
Third year	Supply totals	71,639	77,077	82,515	87,953	92,012
	Demand totals	71,639	77,077	82,515	87,953	92,012
	Difference	0	0	0	0	0
Fourth year *(optional)*	Supply totals	72,727	78,165	81,026	82,911	84,796
	Demand totals	72,727	78,165	81,026	82,911	84,796
	Difference	0	0	0	0	0
Fifth year *(optional)*	Supply totals	71,707	73,129	74,551	75,974	77,396
	Demand totals	71,707	73,129	74,551	75,974	77,396
	Difference	0	0	0	0	0

NOTES: Volumes are in AF. Projected demand based on the City of Modesto Water Master Plan. For planning purposes, a conservative supply condition assuming a 12.4, 24.8, 37.1, 49.5, and 61.9 percent reduction in MID treated water supply during consecutive dry years is used here. Available groundwater supply assumed to be 53,500 AFA. Demand reductions between 1 to 20 percent were required to match available supplies during the third, fourth, and fifth years.

Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison						
		2020	2025	2030	2035	2040 (Opt)
First year	Supply totals	39,245	42,515	45,786	49,056	52,326
	Demand totals	39,245	42,515	45,786	49,056	52,326
	Difference	0	0	0	0	0
Second year	Supply totals	34,251	37,059	39,866	42,674	45,481
	Demand totals	34,251	37,059	39,866	42,674	45,481
	Difference	0	0	0	0	0
Third year	Supply totals	29,118	31,467	33,815	36,163	38,512
	Demand totals	29,118	31,467	33,815	36,163	38,512
	Difference	0	0	0	0	0
Fourth year *(optional)*	Supply totals	23,755	25,640	27,526	29,411	31,296
	Demand totals	23,755	25,640	27,526	29,411	31,296
	Difference	0	0	0	0	0
Fifth year *(optional)*	Supply totals	18,207	19,629	21,051	22,474	23,896
	Demand totals	18,207	19,629	21,051	22,474	23,896
	Difference	0	0	0	0	0

NOTES: Volumes are in AF. Based on the City of Modesto Water Master Plan (refer to Figure 5-1 in the Water Master Plan). During dry years, the City may have the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID. However, for planning purposes, a conservative supply condition assuming multiple dry year reductions is used here (Year 1 = 12.4%, Year 2 = 24.8%, Year 3 = 37.1%, Year 4 = 49.5%, and Year 5 = 61.9%).

Table 8-1 Retail Stages of Water Shortage Contingency Plan		
Stage	Percent Supply Reduction[1]	Water Supply Condition
I	10-20%	Minor Shortage Potential
II	20-35%	Moderate Shortage Potential
IIA	30-40%	Medium Shortage Potential
III	35-50%	Critical Shortage Potential
[1] *One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.*		
NOTES: Based on the City's December 1, 2015 Drought Contingency Plan.		

Table 8-1 Wholesale Stages of Water Shortage Contingency Plan		
Stage	Supply Reduction[1]	Water Supply Condition
N/A	N/A	N/A
[1] *One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.*		
NOTES: MID does not have a Water Shortage Contingency Plan.		

Table 8-2 Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
I	Landscape - Limit landscape irrigation to specific times	Prohibit outdoor water use from noon - 7 PM, however, may be extended to 9 AM - 7 PM at Council discretion	Yes
II	Landscape - Limit landscape irrigation to specific times	Prohibit outdoor water use from 9 AM - 7 PM	Yes
I	Landscape - Limit landscape irrigation to specific days	Limit to no more than 3 days per week; odd-numbered addresses water W, F, Su and even-numbered addresses water Tu, Th, Sa	Yes
II	Landscape - Limit landscape irrigation to specific days	Limit to no more than 2 days per week; odd-numbered addresses water W & Su and even-numbered addresses water Tu & Sa	Yes
IIA	Landscape - Limit landscape irrigation to specific days	Limit to no more than 1 day per week; odd-numbered addresses water Su and even-numbered addresses water Sa	Yes
III	Landscape - Prohibit certain types of landscape irrigation	No outdoor water use except for trees or shrubs by hand and vegetation maintained through drip irrigation	Yes
III	Landscape - Prohibit all landscape irrigation	Moratorium on all new landscaping	Yes
I	Landscape - Other landscape restriction or prohibition	New landscaping must comply with existing and future landscape ordinances	Yes
II	Landscape - Other landscape restriction or prohibition	No irrigating turf or ornamental landscapes during or and 48 hours following measurable rainfall	Yes
II	CII - Lodging establishment must offer opt out of linen service		Yes
I	CII - Restaurants may only serve water upon request	Encouraged only	No
II	CII - Restaurants may only serve water upon request		Yes
III	CII - Other CII restriction or prohibition	Moratorium on all new connections	Yes
II	Water Features - Restrict water use for decorative water features, such as fountains	No use of outdoor fountains except for maintenance purposes	Yes
III	Other water feature or swimming pool restriction	Moratorium on all new swimming pools	Yes
I	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Water leaks, once identified by home owner, must be repaired within 24 hours	Yes
I	Other - Require automatic shut of hoses		Yes
I	Other - Prohibit use of potable water for washing hard surfaces	Hosing concrete areas, building exteriors, etc., is prohibited except for health and safety concerns	Yes
III	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	Permitted at car wash facilities only	Yes
I	Other	Car washing limited to specific times and days (same as irrigation use)	Yes
I	Other	Require water meter installation on all new single family homes	Yes
II	Other	Mandatory retrofit of low flow showerheads in homes when building/remodeling occurs	Yes
III	Other	Mandatory retrofit of low flow toilets in homes when building/remodeling occurs	Yes
NOTES: Based on the City's December 1, 2015 Drought Contingency Plan.			

Table 8-3 Retail Only: Stages of Water Shortage Contingency Plan - Consumption Reduction Methods		
Stage	Consumption Reduction Methods by Water Supplier	Additional Explanation or Reference *(optional)*
All	Expand Public Information Campaign	
All	Improve Customer Billing	Residential metering program
All	Offer Water Use Surveys	Residential water surveys and landscape water surveys
All	Provide Rebates on Plumbing Fixtures and Devices	
All	Provide Rebates for Landscape Irrigation Efficiency	
All	Decrease Line Flushing	
All	Increase Water Waste Patrols	
I	Reduce System Water Loss	Repair water leaks
III	Moratorium or Net Zero Demand Increase on New Connections	Moratorium on all new landscaping and connections
All	Other	
NOTES: Consumption reduction methods associated with an "All" stage are on-going DMMs (see Chapter 9 for additional discussion).		

Table 8-4 Retail: Minimum Supply Next Three Years			
	2016	2017	2018
Available Water Supply	82,300	76,100	70,600

NOTES: Volumes are in AF; totals rounded to nearest hundred. 2016 based on current conditions (14.3 percent reduction in MID supply). 2017 and 2018 are estimated based on the driest multiple year historic sequence for the City's water supply (Years 4 and 5: assumes 49.5 percent and 61.9 percent reductions in available MID supply, respectively). Available groundwater supply assumed to be 53,500 AFA.

Table 8-4 Wholesale: Minimum Supply Next Three Years			
	2016	2017	2018
Available Water Supply	28,800	22,600	17,100

NOTES: Volumes are in AF; totals rounded to nearest hundred. For 2016, assumes a 14.3 percent surface water supply reduction (36-inches available) based on current conditions. For 2017 and 2018, assumes Years 4 and 5 surface water reductions during a multiple year drought (49.5 percent and 61.9 percent reductions, respectively) as well as an initial MRWTP Phase Two Expansion supply of 10 MGD (11,200 AFA) to meet projected water demands. During dry years, the City may have the opportunity to purchase additional water from MID (at a higher rate) or to exchange groundwater for agricultural use for treated surface water from MID. However, for planning purposes, a conservative supply condition assuming multiple dry year reductions is used here.

Table 10-1 Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
City of Turlock	☑	☑
City of Ceres	☑	☑
City of Modesto	☑	☑
County Name	60 Day Notice	Notice of Public Hearing
Stanislaus County	☑	☑
	☐	☐

Table 10-1 Wholesale: Notification to Cities and Counties (select one)		
☐	Supplier has notified more than 10 cities or counties in accordance with CWC 10621 (b) and 10642. **Completion of the table below is not required. Provide a separate list of the cities and counties that were notified.**	
	Provide the page or location of this list in the UWMP.	
☑	Supplier has notified 10 or fewer cities or counties. **Complete the table below.**	
City Name	60 Day Notice	Notice of Public Hearing
City of Turlock	☑	☑
City of Ceres	☑	☑
City of Modesto	☑	☑
County Name	60 Day Notice	Notice of Public Hearing
Stanislaus County	☑	☑
NOTES:		

APPENDIX C

DWR 2015 Urban Water Management Plan Checklist

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Appendix C. Urban Water Management Plan Checklist
Checklist Arranged by Subject

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location
10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.1	**Section 2.1 (page 2-1)**
10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.5.2	**Section 2.5 (page 2-3)**
10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	Plan Preparation	Section 2.5.2	**Section 2.5.2.2 (page 2-4); Appendix D**
10631(a)	Describe the water supplier service area.	System Description	Section 3.1	**Section 3.2 (page 3-1)**
10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3	**Section 3.3 (page 3-3)**
10631(a)	Provide population projections for 2020, 2025, 2030, and 2035.	System Description	Section 3.4	**Section 3.4.1 (page 3-5)**
10631(a)	Describe other demographic factors affecting the supplier's water management planning.	System Description	Section 3.4	**Section 3.4.3 (page 3-6)**
10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.4 and 5.4	**Section 3.4.1 (page 3-5)**
10631(e)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2	**Section 4.2 (page 4-2)**
10631(e)(3)(A)	Report the distribution system water loss for the most recent 12-month period available.	System Water Use	Section 4.3	**Section 4.3 (page 4-6)**
10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.5	**Section 4.5 (page 4-7)**
10608.20(b)	Retail suppliers shall adopt a 2020 water use target using one of four methods.	Baselines and Targets	Section 5.7 and App E	**Section 5.6 (page 5-4); Appendix F**
10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Chapter 5 and App E	**Sections 5.5, 5.6, and 5.7 (page 5-4); Appendix F**
10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply is the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.7.2	**Section 5.6 (page 5-5); Appendix F**
10608.24(a)	Retail suppliers shall meet their interim target by December 31, 2015.	Baselines and Targets	Section 5.8 and App E	**Section 5.7 (page 5-5); Appendix F**
1608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Section 5.8.2	**Section 5.7 (page 5-6)**
10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Section 5.1	**N/A**
10608.40	Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form.	Baselines and Targets	Section 5.8 and App E	**Section 5.7 (page 5-5); Appendix F**
10631(b)	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, 2030, and 2035.	System Supplies	Chapter 6	**Section 6.10 (page 6-25)**
10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2	**Section 6.4 (page 6-5)**
10631(b)(1)	Indicate whether a groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.2.2	**Section 6.4.1.3 (page 6-9); Appendix H**
10631(b)(2)	Describe the groundwater basin.	System Supplies	Section 6.2.1	**Section 6.4.1.1 (page 6-5)**
10631(b)(2)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.2	**Section 6.4.1.3 (page 6-9)**
10631(b)(2)	For unadjudicated basins, indicate whether or not the department has identified the basin as overdrafted, or projected to become overdrafted. Describe efforts by the supplier to eliminate the long-term overdraft condition.	System Supplies	Section 6.2.3	**Section 6.4.1.5 (page 6-11)**

Appendix C. Urban Water Management Plan Checklist
Checklist Arranged by Subject

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location
10631(b)(3)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years.	System Supplies	Section 6.2.4	**Section 6.4.1.6 (page 6-12)**
10631(b)(4)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Sections 6.2 and 6.9	**Section 6.10 (page 6-25);**
10631(d)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System Supplies	Section 6.7	**Section 6.8 (page 6-22)**
10631(g)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years.	System Supplies	Section 6.8	**Section 6.9 (page 6-23)**
10631(i)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6	**Section 6.7 (page 6-21)**
10631(j)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) – if any - with water use projections from that source.	System Supplies	Section 2.5.1	**Section 2.5.1 (page 2-3)**
10631(j)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	Section 2.5.1	**N/A**
10633	For wastewater and recycled water, coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.1	**Section 6.6.1 (page 6-13)**
10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area. Include quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	System Supplies (Recycled Water)	Section 6.5.2	**Section 6.6.2 (page 6-14)**
10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.5.2.2	**Section 6.6.2 (page 6-14); Table 6-9**
10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.3 and 6.5.4	**Section 6.6.3 (page 6-17)**
10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.5.4	**Section 6.6.4 (page 6-18)**
10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.5.4	**Section 6.6.4 (page 6-18)**
10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.5.5	**Section 6.6.5 (page 6-21)**
10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.5	**Section 6.6.5 (page 6-21)**
10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.4	**Section 7.4 (page 7-13)**
10631(c)(1)	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage.	Water Supply Reliability Assessment	Section 7.1	**Section 7.1 (page 7-1)**
10631(c)(1)	Provide data for an average water year, a single dry water year, and multiple dry water years	Water Supply Reliability Assessment	Section 7.2	**Section 7.2 (page 7-2)**
10631(c)(2)	For any water source that may not be available at a consistent level of use, describe plans to supplement or replace that source.	Water Supply Reliability Assessment	Section 7.1	**Section 7.1 (page 7-1); Section 7.4 (page 7-13)**
10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Section 7.1	**Section 7.1 (page 7-1); Section 7.4 (page 7-13)**
10635(a)	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.3	**Section 7.3 (page 7-7)**
10632(a) and 10632(a)(1)	Provide an urban water shortage contingency analysis that specifies stages of action and an outline of specific water supply conditions at each stage.	Water Shortage Contingency Planning	Section 8.1	**Section 8.1 (page 8-1)**
10632(a)(2)	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency.	Water Shortage Contingency Planning	Section 8.9	**Section 8.9 (page 8-8)**
10632(a)(3)	Identify actions to be undertaken by the urban water supplier in case of a catastrophic interruption of water supplies.	Water Shortage Contingency Planning	Section 8.8	**Section 8.8 (page 8-8)**

Appendix C. Urban Water Management Plan Checklist
Checklist Arranged by Subject

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location
10632(a)(4)	Identify mandatory prohibitions against specific water use practices during water shortages.	Water Shortage Contingency Planning	Section 8.2	**Section 8.2 (page 8-2)**
10632(a)(5)	Specify consumption reduction methods in the most restrictive stages.	Water Shortage Contingency Planning	Section 8.4	**Section 8.4 (page 8-4)**
10632(a)(6)	Indicated penalties or charges for excessive use, where applicable.	Water Shortage Contingency Planning	Section 8.3	**Section 8.3 (page 8-4)**
10632(a)(7)	Provide an analysis of the impacts of each of the actions and conditions in the water shortage contingency analysis on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts.	Water Shortage Contingency Planning	Section 8.6	**Section 8.6 (page 8-6)**
10632(a)(8)	Provide a draft water shortage contingency resolution or ordinance.	Water Shortage Contingency Planning	Section 8.7	**Section 8.7 (page 8-7); Appendix I**
10632(a)(9)	Indicate a mechanism for determining actual reductions in water use pursuant to the water shortage contingency analysis.	Water Shortage Contingency Planning	Section 8.5	**Section 8.5 (page 8-5)**
10631(f)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Sections 9.2 and 9.3	**Sections 9.1 and 9.2 (page 9-2)**
10631(f)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Sections 9.1 and 9.3	**N/A**
10631(j)	CUWCC members may submit their 2013-2014 CUWCC BMP annual reports in lieu of, or in addition to, describing the DMM implementation in their UWMPs. This option is only allowable if the supplier has been found to be in full compliance with the CUWCC MOU.	Demand Management Measures	Section 9.5	**Section 9.5 (page 9-15)**
10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets.	Plan Adoption, Submittal, and Implementation	Section 10.3	**Section 10.3 (page 10-2)**
10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.	Plan Adoption, Submittal, and Implementation	Section 10.2.1	**Section 10.2 (page 10-1); Appendix D**
10621(d)	Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.	Plan Adoption, Submittal, and Implementation	Sections 10.3.1 and 10.4	**Section 10.4 (page 10-3)**
10635(b)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 60 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	**Section 10.4 (page 10-3)**
10642	Provide supporting documentation that the urban water supplier made the plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan.	Plan Adoption, Submittal, and Implementation	Sections 10.2.2, 10.3, and 10.5	**Section 10.3 (page 10-2); Appendix D**
10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Sections 10.2.1	**Section 10.2 (page 10-1): Appendix D**
10642	Provide supporting documentation that the plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.1	**Section 10.3 (page 10-2); Appendix K**
10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4.3	**Section 10.4 (page 10-3)**
10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	**Section 10.4 (page 10-3)**
10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Sections 10.4.1 and 10.4.2	**Section 10.4 and 10.7 (page 10-3)**
10645	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5	**Section 10.5 (page 10-3)**

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APPENDIX D

Required Notices

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City of Modesto Urban Water Management Plan Contact List

City of Turlock	Garner Reyonlds	Regulatory Affairs Manager	209-668-5599 x4407 Cell 541-7575	greynolds@turlock.ca.us	156 S Broadway, Ste 270, Turlock, CA 95380
Stanislaus County	Matt Machado	Stanislaus County Public Works Director	209-525-6550	machadom@stancounty.com	1716 Morgan Rd, Modesto CA 95358
Modesto Irrigation District	Patrick Ryan	Civil Engineering Manager	209-526-7564	patrick.ryan@mid.org	1231 Eleventh St. Modesto, CA 95354 or PO Box 4060, Modesto, CA 95352
Turlock Irrigation District (prime)	Debbie Liebersbach	Water Planning Department Manager	209-883-8428	dcliebersbach@tid.org	333 East Canal Dr. PO Box 949, Turlock, CA 95381-0949
City of Ceres	Mike Brinton	Public Works Director	209-538-5748	Michael.Brinton@ci.ceres.ca.us	2220 Hackett, Ceres, CA 95307
City of Waterford	Matt Erickson	Public Works Director (primary contact)	209-874-2328	merickson@cityofwaterford.org	312 E Street, Waterford, CA 95386
City of Riverbank	Michael Riddell	Deputy Development Services Director -Operations	209-869-7128	mriddell@riverbank.org	2901 High Street, Riverbank, CA 95367
City of Oakdale	Thom Clark	Public Services Director	209-845-3615	tclark@oakdale.ca.us	455 South Fifth Ave, Oakdale, CA 95361
Oakdale Irrigation District	Steve Knell	General Manager	209-847-0341 x207	srknell@oakdaleirrigation.com	1205 East F Street, Oakdale, CA 95361
City of Patterson	Mike Willett	Public Works Director	209-895-8065	MWillett@ci.patterson.ca.us	1 Plaza Circle, Patterson, CA 95363
City of Newman	Kim Koosun	Public Works Director	209-862-4448	kkim@cityofnewman.com	Fresno Street P.O. Box 787 Newman, CA 95360

NOTICE

CITY OF MODESTO AND MODESTO IRRIGATION DISTRICT 2015 JOINT URBAN WATER MANAGEMENT PLAN UPDATE

DATE: February 5, 2016

TO: All Interested Parties

FROM: Jim Alves, Associate Civil Engineer

SUBJECT: 2015 Joint Urban Water Management Plan Update

Water purveyors within the State of California are required to review and update their Urban Water Management Plans every five years. The City of Modesto and the Modesto Irrigation District are conducting a joint effort for the 2015 Urban Water Management Plan by submitting a single plan document for both water purveyors. As part of this process, the City of Modesto and the Modesto Irrigation District are required to notify Stanislaus County and agencies within the County of this planned update at least 60 days prior to the proposed public hearing (California Water Code §10621(b)).

By State law, the City of Modesto and the Modesto Irrigation District must adopt and submit the final plan to the California Department of Water Resources by July 1, 2016 (California Water Code §10621(d))

If you have any questions or comments regarding the update of the City of Modesto and Modesto Irrigation District 2015 Joint Urban Water Management Plan, please contact either:

Mr. Jim Alves
Associate Civil Engineer
City of Modesto
P.O. Box 462
Modesto, CA 95353
(209) 571-5557
jalves@modestogov.com

Mr. Patrick Ryan
Water Treatment Plant Manager
Modesto Irrigation District
P.O. Box 4060
Modesto, CA 95352
(209) 526-7656
patrickr@mid.org

Sincerely,

Mr. Jim Alves
City of Modesto

Mr. Patrick Ryan
Modesto Irrigation District

DATE: May 31, 2016

TO: All Interested Parties

FROM: Jim Alves, Associate Civil Engineer, City of Modesto
Patrick Ryan, Water Treatment Plant Manager, Modesto Irrigation District

SUBJECT: Review of Draft City of Modesto/Modesto Irrigation District Joint 2015 Urban Water Management Plan

In accordance with the Urban Water Management Planning Act (California Water Code Section 10610 et seq.), the City of Modesto and Modesto Irrigation District (MID) are required to update their Joint Urban Water Management Plan (UWMP) to meet the California Department of Water Resources (DWR) requirements for a 2015 UWMP. The last City of Modesto/MID Joint UWMP was adopted in May 2011.

The City of Modesto and MID have completed the Draft 2015 UWMP and have scheduled public hearings for the review of the updated UWMP on **TUESDAY, JUNE 14, 2016** at **9:00 A.M.** at the Modesto Irrigation District Board Room located at 1231 11th Street, Modesto and at **5:30 P.M.** at the City of Modesto Council Chambers, Basement Level, located at 1010 10th Street, Modesto. It is anticipated that the Draft 2015 UWMP will be formally adopted by both the Modesto City Council and the Modesto Irrigation District Board of Directors immediately following the respective public hearings.

At this time we invite your agency to review the Draft 2015 UWMP located on the City website at www.modestogov.com/uppd/reports/ and on the MID website at www.mid.org and available at the City of Modesto Utilities Department, 1010 10th Street, 4th Floor, Modesto and at the Modesto Irrigation District Board Secretary's Office at 1231 11th Street, Modesto.

Please forward your comments no later than 5:00 PM Monday, June 13, 2016 to either:

Mr. Jim Alves
Associate Civil Engineer
City of Modesto
P.O. Box 462
Modesto, CA 95353
(209) 571-5557
jalves@modestogov.com

Mr. Patrick Ryan
Water Treatment Plant Manager
Modesto Irrigation District
P.O. Box 4060
Modesto, CA 95352
(209) 526-7656
patrickr@mid.org

Sincerely,

Mr. Jim Alves
City of Modesto

Mr. Patrick Ryan
Modesto Irrigation District

DECLARATION OF PUBLICATION (C.C.P. S2015.5)

COUNTY OF STANISLAUS STATE OF CALIFORNIA

I am a citizen of the United States and a resident Of the County aforesaid; I am over the age of Eighteen years, and not a party to or interested In the above entitle matter. I am a printer and Principal clerk of the publisher of THE MODESTO BEE, printed in the City of MODESTO, County of STANISLAUS, State of California, daily, for which said newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of STANISLAUS, State of California, Under the date of February 25, 1951, Action No. 46453; that the notice of which the annexed is a printed copy, has been published in each issue there of on the following dates, to wit:

May 30, 2016, Jun 06, 2016

I certify (or declare) under penalty of perjury That the foregoing is true and correct and that This declaration was executed at

MODESTO, California on

June 6th, 2016

(By Electronic Facsimile Signature)

Cynthia A. Williams

PUBLIC NOTICE

Public notice is hereby given that public hearings will be held before the City Council of the City of Modesto and the Board of Directors of the Modesto Irrigation District for the purpose of considering the following:

Receive public comment on the Draft City of Modesto/Modesto Irrigation District Joint 2015 Urban Water Management Plan (UWMP), as required by the Urban Water Management Planning Act (California Water Code Section 10610 et seq.). Complete copies of the Draft UWMP are available for public review at the City of Modesto Public Works Department, 1010 10th Street, 4th Floor, Modesto and at the Modesto Irrigation District Board Secretary's Office at 1231 11th Street, Modesto, and on the City website at www.ci.modesto.ca.us and on the MID website at www.mid.org.

The hearings will be held on TUESDAY, JUNE 14, 2016 at 9:00 A.M. at the Modesto Irrigation District Board Room located at 1231 11th Street, Modesto and at 5:30 P.M. at the City of Modesto Council Chambers, Basement Level, located at 1010 10th Street, Modesto. It is anticipated that the Draft 2015 UWMP will be formally adopted that day as well by both the Modesto Irrigation District Board of Directors and Modesto City Council. All interested persons are invited to appear and be heard.

City of Modesto
Public Works Department
1010 10th Street, 4th Floor
Modesto, CA 95354

Modesto Irrigation District
1231 11th Street
Modesto, CA 95354

Pub Dates 5/30, 6/6

CASE NO. VATPP253466 key 84883

APPENDIX E

Water Audit

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AWWA Free Water Audit Software v5.0

This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format, and is not meant to take the place of a full-scale, comprehensive water audit format.

Auditors are strongly encouraged to refer to the most current edition of AWWA M36 Manual for Water Audits for detailed guidance on the water auditing process and targetting loss reduction levels

The spreadsheet contains several separate worksheets. Sheets can be accessed using the tabs towards the bottom of the screen, or by clicking the buttons below.

Please begin by providing the following information

Name of Contact Person:	Jim Alves
Email Address:	jalves@modestogov.com
Telephone (incl Ext.):	209-571-5557
Name of City / Utility:	City of Modesto
City/Town/Municipality:	Modesto
State / Province:	California (CA)
Country:	USA
Year:	2015
Start Date:	01/2015 Enter MM/YYYY numeric format
End Date:	12/2015 Enter MM/YYYY numeric format
Audit Preparation Date:	5/24/2016
Volume Reporting Units:	Acre-feet
PWSID / Other ID:	CA 5010010

The following guidance will help you complete the Audit

All audit data are entered on the *Reporting Worksheet*

- Value can be entered by user
- Value calculated based on input data
- These cells contain recommended default values

Use of Option (Radio) Buttons: Pcnt: 0.25% Value:

Select the default percentage by choosing the option button on the left

To enter a value, choose this button and enter a value in the cell to the right

The following worksheets are available by clicking the buttons below or selecting the tabs along the bottom of the page

Instructions
The current sheet. Enter contact information and basic audit details (year, units etc)

Reporting Worksheet
Enter the required data on this worksheet to calculate the water balance and data grading

Comments
Enter comments to explain how values were calculated or to document data sources

Performance Indicators
Review the performance indicators to evaluate the results of the audit

Water Balance
The values entered in the Reporting Worksheet are used to populate the Water Balance

Dashboard
A graphical summary of the water balance and Non-Revenue Water components

Grading Matrix
Presents the possible grading options for each input component of the audit

Service Connection Diagram
Diagrams depicting possible customer service connection line configurations

Definitions
Use this sheet to understand the terms used in the audit process

Loss Control Planning
Use this sheet to interpret the results of the audit validity score and performance indicators

Example Audits
Reporting Worksheet and Performance Indicators examples are shown for two validated audits

Acknowledgements
Acknowledgements for the AWWA Free Water Audit Software v5.0

If you have questions or comments regarding the software please contact us via email at: wlc@awwa.org

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Modesto (CA 5010010)
Reporting Year: 2015 1/2015 - 12/2015

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

<---------- Enter grading in column 'E' and 'J' ---------->

WATER SUPPLIED

				Master Meter and Supply Error Adjustments Pcnt:	Value:	
Volume from own sources:	8	32,058.000	acre-ft/yr			acre-ft/yr
Water imported:	8	15,401.000	acre-ft/yr			acre-ft/yr
Water exported:	10	0.000	acre-ft/yr			acre-ft/yr
WATER SUPPLIED:		**47,459.000**	acre-ft/yr			

Enter negative % or value for under-registration
Enter positive % or value for over-registration

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:	
Billed metered:	8	38,408.000	acre-ft/yr			
Billed unmetered:	5	3,712.000	acre-ft/yr			
Unbilled metered:	10	0.000	acre-ft/yr			
Unbilled unmetered:	5	593.238	acre-ft/yr	1.25%		acre-ft/yr

Default option selected for Unbilled unmetered - a grading of 5 is applied but not displayed

Use buttons to select percentage of water supplied OR value

AUTHORIZED CONSUMPTION: **42,713.238** acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption)

4,745.763 acre-ft/yr

Apparent Losses

				Pcnt:	Value:	
Unauthorized consumption:		118.648	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	5	984.821	acre-ft/yr	2.50%		acre-ft/yr
Systematic data handling errors:	5	96.020	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: **1,199.488** acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: **3,546.274** acre-ft/yr

WATER LOSSES: **4,745.763** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: **5,339.000** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	7	900.0	miles
Number of active AND inactive service connections:	8	74,686	
Service connection density:		83	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 7 60.0 psi

COST DATA

Total annual cost of operating water system:	7		$/Year
Customer retail unit cost (applied to Apparent Losses):	7		
Variable production cost (applied to Real Losses):	7		$/acre-ft

☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 70 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Billed unmetered
3: Customer metering inaccuracies

AWWA Free Water Audit Software v5.0

This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format, and is not meant to take the place of a full-scale, comprehensive water audit format.

Auditors are strongly encouraged to refer to the most current edition of AWWA M36 Manual for Water Audits for detailed guidance on the water auditing process and targetting loss reduction levels

The spreadsheet contains several separate worksheets. Sheets can be accessed using the tabs towards the bottom of the screen, or by clicking the buttons below.

Please begin by providing the following information

Name of Contact Person:	Patrick Ryan
Email Address:	Patrick.Ryan@mid.org
Telephone (incl Ext.):	209-526-7656
Name of City / Utility:	Modesto Irrigation District
City/Town/Municipality:	Modesto
State / Province:	California (CA)
Country:	USA
Year:	2015
Start Date:	01/2015 Enter MM/YYYY numeric format
End Date:	12/2015 Enter MM/YYYY numeric format
Audit Preparation Date:	5/24/2016
Volume Reporting Units:	Acre-feet
PWSID / Other ID:	

The following guidance will help you complete the Audit

All audit data are entered on the *Reporting Worksheet*

- Value can be entered by user
- Value calculated based on input data
- These cells contain recommended default values

Use of Option (Radio) Buttons: Pcnt: 0.25% Value:

Select the default percentage by choosing the option button on the left

To enter a value, choose this button and enter a value in the cell to the right

The following worksheets are available by clicking the buttons below or selecting the tabs along the bottom of the page

Instructions
The current sheet. Enter contact information and basic audit details (year, units etc)

Reporting Worksheet
Enter the required data on this worksheet to calculate the water balance and data grading

Comments
Enter comments to explain how values were calculated or to document data sources

Performance Indicators
Review the performance indicators to evaluate the results of the audit

Water Balance
The values entered in the Reporting Worksheet are used to populate the Water Balance

Dashboard
A graphical summary of the water balance and Non-Revenue Water components

Grading Matrix
Presents the possible grading options for each input component of the audit

Service Connection Diagram
Diagrams depicting possible customer service connection line configurations

Definitions
Use this sheet to understand the terms used in the audit process

Loss Control Planning
Use this sheet to interpret the results of the audit validity score and performance indicators

Example Audits
Reporting Worksheet and Performance Indicators examples are shown for two validated audits

Acknowledgements
Acknowledgements for the AWWA Free Water Audit Software v5.0

If you have questions or comments regarding the software please contact us via email at: wlc@awwa.org

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

Click to access definition
Click to add a comment

Water Audit Report for: Modesto Irrigation District
Reporting Year: 2015 1/2015 - 12/2015

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

				Master Meter and Supply Error Adjustments		
				Pcnt:	Value:	
Volume from own sources:	10	15,291.000	acre-ft/yr	10	0.000	acre-ft/yr
Water imported:	10	0.000	acre-ft/yr			acre-ft/yr
Water exported:	10	0.000	acre-ft/yr			acre-ft/yr
WATER SUPPLIED:		**15,291.000**	acre-ft/yr	Enter negative % or value for under-registration Enter positive % or value for over-registration		

AUTHORIZED CONSUMPTION

Click here: for help using option buttons below

				Pcnt:	Value:	
Billed metered:	10	15,260.000	acre-ft/yr			
Billed unmetered:	10	0.000	acre-ft/yr			
Unbilled metered:	10	0.000	acre-ft/yr			
Unbilled unmetered:	10	0.000	acre-ft/yr		0.000	acre-ft/yr
AUTHORIZED CONSUMPTION:		**15,260.000**	acre-ft/yr	Use buttons to select percentage of water supplied OR value		

WATER LOSSES (Water Supplied - Authorized Consumption)

31.000 acre-ft/yr

Apparent Losses

				Pcnt:	Value:	
Unauthorized consumption:	8	0.020	acre-ft/yr		0.020	acre-ft/yr
Customer metering inaccuracies:	8	0.000	acre-ft/yr			acre-ft/yr
Systematic data handling errors:	9	0.010	acre-ft/yr		0.010	acre-ft/yr
Apparent Losses:		**0.030**	acre-ft/yr			

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: **30.970** acre-ft/yr

WATER LOSSES: **31.000** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: **31.000** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	10	31.0	miles
Number of active AND inactive service connections:	10	41	
Service connection density:		1	conn./mile main
Are customer meters typically located at the curbstop or property line?		No	
Average length of customer service line:	10		ft

(length of service line, beyond the property boundary, that is the responsibility of the utility)

Average operating pressure:	5	60.0	psi

COST DATA

Total annual cost of operating water system:	10	$10,908,507	$/Year	
Customer retail unit cost (applied to Apparent Losses):	10	$2.19	$/1000 gallons (US)	
Variable production cost (applied to Real Losses):	7		$/acre-ft	☑ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 93 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Variable production cost (applied to Real Losses)
2: Customer metering inaccuracies
3: Unauthorized consumption

APPENDIX F

SB X7-7 Compliance and Verification Forms

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SB X7-7 Table 0: Units of Measure Used in UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent with Table 2-3*
NOTES:

SB X7-7 Table-1: Baseline Period Ranges

Baseline	Parameter	Value	Units
10- to 15-year baseline period	2008 total water deliveries	75,030	Acre Feet
	2008 total volume of delivered recycled water	0	Acre Feet
	2008 recycled water as a percent of total deliveries	0.00%	Percent
	Number of years in baseline period[1, 2]	10	Years
	Year beginning baseline period range	1999	
	Year ending baseline period range[3]	2008	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2003	
	Year ending baseline period range[4]	2007	

[1] *If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period.* [2] *The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.*

[3] *The ending year must be between December 31, 2004 and December 31, 2010.*

[4] *The ending year must be between December 31, 2007 and December 31, 2010.*

NOTES: Water production from Hickman and Waterford are not included.

SB X7-7 Table 2: Method for Population Estimates	
Method Used to Determine Population (may check more than one)	
☑	**1. Department of Finance** (DOF) DOF Table E-4 and 2010 Census Benchmark
☑	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☐	**4. Other** DWR recommends pre-review

NOTES: Where DOF data are not available (e.g., Turlock and Ceres (Walnut Manor)), the population has been estimated based on a count of existing dwelling units served by the City (from aerial photographs) and an estimated housing density (people per dwelling unit) (based on Census data for the surrounding communities).

SB X7-7 Table 3: Service Area Population		
Year		Population
10 to 15 Year Baseline Population		
Year 1	1999	224,237
Year 2	2000	228,723
Year 3	2001	234,915
Year 4	2002	241,035
Year 5	2003	245,809
Year 6	2004	249,188
Year 7	2005	249,692
Year 8	2006	249,918
Year 9	2007	250,877
Year 10	2008	251,639
Year 11		
Year 12		
Year 13		
Year 14		
Year 15		
5 Year Baseline Population		
Year 1	2003	245,809
Year 2	2004	249,188
Year 3	2005	249,692
Year 4	2006	249,918
Year 5	2007	250,877
2015 Compliance Year Population		
2015		259,187
NOTES: Population from Hickman and Waterford are not included.		

SB X7-7 Table 4: Annual Gross Water Use *

Baseline Year *Fm SB X7-7 Table 3*		Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.*	Deductions					Annual Gross Water Use
			Exported Water	Change in Dist. System Storage (+/-)	Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.*	Water Delivered for Agricultural Use	Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.*	
10 to 15 Year Baseline - Gross Water Use								
Year 1	1999	77,685			-		-	77,685
Year 2	2000	74,194			-		-	74,194
Year 3	2001	78,278			-		-	78,278
Year 4	2002	80,378			-		-	80,378
Year 5	2003	80,168			-		-	80,168
Year 6	2004	78,801			-		-	78,801
Year 7	2005	76,517			-		-	76,517
Year 8	2006	76,275			-		-	76,275
Year 9	2007	77,020			-		-	77,020
Year 10	2008	75,030			-		-	75,030
Year 11	0	-			-		-	-
Year 12	0	-			-		-	-
Year 13	0	-			-		-	-
Year 14	0	-			-		-	-
Year 15	0	-			-		-	-
10 - 15 year baseline average gross water use								**77,434**
5 Year Baseline - Gross Water Use								
Year 1	2003	80,168			-		-	80,168
Year 2	2004	78,801			-		-	78,801
Year 3	2005	76,517			-		-	76,517
Year 4	2006	76,275			-		-	76,275
Year 5	2007	77,020			-		-	77,020
5 year baseline average gross water use								**77,756**
2015 Compliance Year - Gross Water Use								
2015		47,459	-		-		-	**47,459**

* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3

NOTES: Volumes are in AF. Water production from Hickman and Waterford are not included. Potable water use only.

SB X7-7 Table 4-A: Volume Entering the Distribution				
Name of Source	Groundwater			
This water source is:				
☑	The supplier's own water source			
☐	A purchased or imported source			
Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1999	42,388		42,388
Year 2	2000	40,482		40,482
Year 3	2001	43,350		43,350
Year 4	2002	46,454		46,454
Year 5	2003	44,839		44,839
Year 6	2004	43,711		43,711
Year 7	2005	44,010		44,010
Year 8	2006	42,769		42,769
Year 9	2007	40,449		40,449
Year 10	2008	42,997		42,997
Year 11	-			0
Year 12	-			0
Year 13	-			0
Year 14	-			0
Year 15	-			0
5 Year Baseline - Water into Distribution System				
Year 1	2003	44,839		44,839
Year 2	2004	43,711		43,711
Year 3	2005	44,010		44,010
Year 4	2006	42,769		42,769
Year 5	2007	40,449		40,449
2015 Compliance Year - Water into Distribution System				
2015		32,058		32,058
** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*				
NOTES: Volumes are in AF. Water production from Hickman and Waterford are not included.				

SB X7-7 Table 4-B: Indirect Recycled Water Use Deduction *(For use only by agencies that are deducting indirect recycled water)*

Baseline Year *Fm SB X7-7 Table 3*		Surface Reservoir Augmentation					Groundwater Recharge			Total Deductible Volume of Indirect Recycled Water Entering the Distribution System
		Volume Discharged from Reservoir for Distribution System Delivery	Percent Recycled Water	Recycled Water Delivered to Treatment Plant	Transmission/ Treatment Loss	Recycled Volume Entering Distribution System from Surface Reservoir Augmentation	Recycled Water Pumped by Utility*	Transmission/ Treatment Losses	Recycled Volume Entering Distribution System from Groundwater Recharge	
10-15 Year Baseline - Indirect Recycled Water Use										
Year 1	1999			-		-			-	-
Year 2	2000			-		-			-	-
Year 3	2001			-		-			-	-
Year 4	2002			-		-			-	-
Year 5	2003			-		-			-	-
Year 6	2004			-		-			-	-
Year 7	2005			-		-			-	-
Year 8	2006			-		-			-	-
Year 9	2007			-		-			-	-
Year 10	2008			-		-			-	-
Year 11	0			-		-			-	-
Year 12	0			-		-			-	-
Year 13	0			-		-			-	-
Year 14	0			-		-			-	-
Year 15	0			-		-			-	-
5 Year Baseline - Indirect Recycled Water Use										
Year 1	2003			-		-			-	-
Year 2	2004			-		-			-	-
Year 3	2005			-		-			-	-
Year 4	2006			-		-			-	-
Year 5	2007			-		-			-	-
2015 Compliance - Indirect Recycled Water Use										
2015				-		-			-	-

**Suppliers will provide supplemental sheets to document the calculation for their input into "Recycled Water Pumped by Utility". The volume reported in this cell must be less than total groundwater pumped - See Methodology 1, Step 8, section 2.c.*

NOTES:

SB X7-7 Table 4-C: Process Water Deduction Eligibility *(For use only by agencies that are deducting process water) Choose Only One*	
☐	**Criteria 1**- Industrial water use is equal to or greater than 12% of gross water use. Complete SB X7-7 Table 4-C.1
☐	**Criteria 2** - Industrial water use is equal to or greater than 15 GPCD. Complete SB X7-7 Table 4-C.2
☐	**Criteria 3** - Non-industrial use is equal to or less than 120 GPCD. Complete SB X7-7 Table 4-C.3
☐	**Criteria 4** - Disadvantaged Community. Complete SB x7-7 Table 4-C.4
NOTES:	

SB X7-7 Table 4-C.1: Process Water Deduction Eligibility

Criteria 1

Industrial water use is equal to or greater than 12% of gross water use

Baseline Year *Fm SB X7-7 Table 3*		Gross Water Use Without Process Water Deduction	Industrial Water Use	Percent Industrial Water	**Eligible for Exclusion Y/N**
10 to 15 Year Baseline - Process Water Deduction Eligibility					
Year 1	1999	77,685		0%	NO
Year 2	2000	74,194		0%	NO
Year 3	2001	78,278		0%	NO
Year 4	2002	80,378		0%	NO
Year 5	2003	80,168		0%	NO
Year 6	2004	78,801		0%	NO
Year 7	2005	76,517		0%	NO
Year 8	2006	76,275		0%	NO
Year 9	2007	77,020		0%	NO
Year 10	2008	75,030		0%	NO
Year 11	0	-			NO
Year 12	0	-			NO
Year 13	0	-			NO
Year 14	0	-			NO
Year 15	0	-			NO
5 Year Baseline - Process Water Deduction Eligibility					
Year 1	2003	80,168		0%	NO
Year 2	2004	78,801		0%	NO
Year 3	2005	76,517		0%	NO
Year 4	2006	76,275		0%	NO
Year 5	2007	77,020		0%	NO
2015 Compliance Year - Process Water Deduction Eligiblity					
2015		47,459		0%	NO

NOTES:

SB X7-7 Table 4-C.2: Process Water Deduction Eligibility

Criteria 2

Industrial water use is equal to or greater than 15 GPCD

Baseline Year *Fm SB X7-7 Table 3*		Industrial Water Use	Population	Industrial GPCD	**Eligible for Exclusion Y/N**
10 to 15 Year Baseline - Process Water Deduction Eligibility					
Year 1	1999		224,237	-	NO
Year 2	2000		228,723	-	NO
Year 3	2001		234,915	-	NO
Year 4	2002		241,035	-	NO
Year 5	2003		245,809	-	NO
Year 6	2004		249,188	-	NO
Year 7	2005		249,692	-	NO
Year 8	2006		249,918	-	NO
Year 9	2007		250,877	-	NO
Year 10	2008		251,639	-	NO
Year 11	0		-		NO
Year 12	0		-		NO
Year 13	0		-		NO
Year 14	0		-		NO
Year 15	0		-		NO
5 Year Baseline - Process Water Deduction Eligibility					
Year 1	2003		245,809	-	NO
Year 2	2004		249,188	-	NO
Year 3	2005		249,692	-	NO
Year 4	2006		249,918	-	NO
Year 5	2007		250,877	-	NO
2015 Compliance Year - Process Water Deduction Eligibility					
2015			259,187	-	NO

NOTES:

SB X7-7 Table 4-C.3: Process Water Deduction Eligibility

Criteria 3

Non-industrial use is equal to or less than 120 GPCD

Baseline Year *Fm SB X7-7 Table 3*		Gross Water Use Without Process Water Deduction *Fm SB X7-7 Table 4*	Industrial Water Use	Non-industrial Water Use	Population *Fm SB X7-7 Table 3*	Non-Industrial GPCD	Eligible for Exclusion Y/N
10 to 15 Year Baseline - Process Water Deduction Eligibility							
Year 1	1999	77,685		77,685	224,237	309	NO
Year 2	2000	74,194		74,194	228,723	290	NO
Year 3	2001	78,278		78,278	234,915	297	NO
Year 4	2002	80,378		80,378	241,035	298	NO
Year 5	2003	80,168		80,168	245,809	291	NO
Year 6	2004	78,801		78,801	249,188	282	NO
Year 7	2005	76,517		76,517	249,692	274	NO
Year 8	2006	76,275		76,275	249,918	272	NO
Year 9	2007	77,020		77,020	250,877	274	NO
Year 10	2008	75,030		75,030	251,639	266	NO
Year 11	0	-		-	-		NO
Year 12	0	-		-	-		NO
Year 13	0	-		-	-		NO
Year 14	0	-		-	-		NO
Year 15	0	-		-	-		NO
5 Year Baseline - Process Water Deduction Eligibility							
Year 1	2003	80,168		80,168	245,809	291	NO
Year 2	2004	78,801		78,801	249,188	282	NO
Year 3	2005	76,517		76,517	249,692	274	NO
Year 4	2006	76,275		76,275	249,918	272	NO
Year 5	2007	77,020		77,020	250,877	274	NO
2015 Compliance Year - Process Water Deduction Eligiblity							
2015		47,459		47,459	259,187	163	NO

NOTES:

SB X7-7 Table 4-C.4: Process Water Deduction Eligibility

Criteria 4

Disadvantaged Community

Use IRWM DAC Mapping tool http://www.water.ca.gov/irwm/grants/resources_dac.cfm

California Median Household Income		Service Area Median Household Income	Percentage of Statewide Average	**Eligible for Exclusion? Y/N**
2015 Compliance Year - Process Water Deduction Eligibility				
2010	$53,046		0%	YES

A "Disadvantaged Community" is a community with a median household income less than 80 percent of the statewide average.

NOTES:

SB X7-7 Table 4-D: Process Water Deduction - Volume *Complete a separate table for each industrial customer with a process water exclusion*

Name of Industrial Customer		*Industrial Customer 1*				
Baseline Year *Fm SB X7-7 Table 3*		Industrial Customer's Total Water Use	Total Volume Supplied by Water Agency	% of Water Supplied by Water Agency	Customer's Total Process Water Use	Volume of Process Water Eligible for Exclusion for this Customer
10 to 15 Year Baseline - Process Water Deduction						
Year 1	1999					-
Year 2	2000					-
Year 3	2001					-
Year 4	2002					-
Year 5	2003					-
Year 6	2004					-
Year 7	2005					-
Year 8	2006					-
Year 9	2007					-
Year 10	2008					-
Year 11	0					-
Year 12	0					-
Year 13	0					-
Year 14	0					-
Year 15	0					-
5 Year Baseline - Process Water Deduction						
Year 1	2003					-
Year 2	2004					-
Year 3	2005					-
Year 4	2006					-
Year 5	2007					-
2015 Compliance Year - Process Water Deduction						
2015						-

NOTES:

SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Annual Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	1999	224,237	77,685	309
Year 2	2000	228,723	74,194	290
Year 3	2001	234,915	78,278	297
Year 4	2002	241,035	80,378	298
Year 5	2003	245,809	80,168	291
Year 6	2004	249,188	78,801	282
Year 7	2005	249,692	76,517	274
Year 8	2006	249,918	76,275	272
Year 9	2007	250,877	77,020	274
Year 10	2008	251,639	75,030	266
Year 11	0	-	-	
Year 12	0	-	-	
Year 13	0	-	-	
Year 14	0	-	-	
Year 15	0	-	-	
10-15 Year Average Baseline GPCD				**285**
5 Year Baseline GPCD				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use
Year 1	2003	245,809	80,168	291
Year 2	2004	249,188	78,801	282
Year 3	2005	249,692	76,517	274
Year 4	2006	249,918	76,275	272
Year 5	2007	250,877	77,020	274
5 Year Average Baseline GPCD				**279**
2015 Compliance Year GPCD				
2015		259,187	47,459	**163**

NOTES: Volumes are in AF. Population and water production from Hickman and Waterford are not included. Potable water use only.

SB X7-7 Table 6: Gallons per Capita per Day *Summary From Table SB X7-7 Table 5*	
10-15 Year Baseline GPCD	285
5 Year Baseline GPCD	279
2015 Compliance Year GPCD	163
NOTES:	

SB X7-7 Table 7: 2020 Target Method *Select Only One*		
Target Method		Supporting Documentation
☑	Method 1	SB X7-7 Table 7A
☐	Method 2	SB X7-7 Tables 7B, 7C, and 7D *Contact DWR for these tables*
☐	Method 3	SB X7-7 Table 7-E
☐	Method 4	Method 4 Calculator
NOTES:		

SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	**2020 Target GPCD**
285	**228**
NOTES:	

SB X7-7 Table 7-B: Target Method 2 Landscape Water Use	Target
Tables for Target Method 2 (SB X7-7 Tables 7-B, 7-C, and 7-D) are not included in the SB X7-7 Verification Form, but are still required for water suppliers using Target Method 2. These water suppliers should contact Gwen Huff at (916) 651-9672 or gwen.huff@water.ca.gov	

SB X7-7 Table 7-C: Target Method 2

Target CII Water Use

Tables for Target Method 2 (SB X7-7 Tables 7-B, 7-C, and 7-D) are not included in the SB X7-7 Verification Form, but are still required for water suppliers using Target Method 2. These water suppliers should contact Gwen Huff at (916) 651-9672 or gwen.huff@water.ca.gov

SB X7-7 Table 7-D: Target Method 2 Summary

Tables for Target Method 2 (SB X7-7 Tables 7-B, 7-C, and 7-D) are not included in the SB X7-7 Verification Form, but are still required for water suppliers using Target Method 2. These water suppliers should contact Gwen Huff at (916) 651-9672 or gwen.huff@water.ca.gov

SB X7-7 Table 7-E: Target Method 3				
Agency May Select More Than One as Applicable	Percentage of Service Area in This Hydrological Region	Hydrologic Region	"2020 Plan" Regional Targets	Method 3 Regional Targets (95%)
☐		North Coast	137	130
☐		North Lahontan	173	164
☐		Sacramento River	176	167
☐		San Francisco Bay	131	124
☑	100%	San Joaquin River	174	165
☐		Central Coast	123	117
☐		Tulare Lake	188	179
☐		South Lahontan	170	162
☐		South Coast	149	142
☐		Colorado River	211	200
Target *(If more than one region is selected, this value is calculated.)*				**165**
NOTES:				

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target			
5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target[1]	Calculated 2020 Target[2]	**Confirmed 2020 Target**
279	265	228	**228**

[1] Maximum 2020 Target is 95% of the 5 Year Baseline GPCD *[2] 2020 Target is calculated based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target.*

NOTES:

SB X7-7 Table 8: 2015 Interim Target GPCD		
Confirmed 2020 Target *Fm SB X7-7 Table 7-F*	10-15 year Baseline GPCD *Fm SB X7-7 Table 5*	**2015 Interim Target GPCD**
228	285	**257**
NOTES:		

SB X7-7 Table 9: 2015 Compliance

Actual 2015 GPCD	2015 Interim Target GPCD	Optional Adjustments *(in GPCD)* Enter "0" if Adjustment Not Used			TOTAL Adjustments	Adjusted 2015 GPCD	2015 GPCD *(Adjusted if applicable)*	**Did Supplier Achieve Targeted Reduction for 2015?**
		Extraordinary Events	Weather Normalization	Economic Adjustment				
163	257	-	-	-	-	163	163	**YES**

NOTES:

APPENDIX G

Amended and Restated Treatment and Delivery Agreement between
Modesto Irrigation District and City of Modesto

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Amended and Restated Treatment and Delivery Agreement

Between

Modesto Irrigation District and City of Modesto

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AMENDED AND RESTATED
TREATMENT AND DELIVERY AGREEMENT

AMONG

MODESTO IRRIGATION DISTRICT AND CITY OF MODESTO

1. PARTIES.

The Parties to this Amended and Restated Treatment and Delivery Agreement are Modesto Irrigation District, a California irrigation district, and City of Modesto, a California municipal corporation and charter city, who agree as follows:

2. RECITALS.

This Agreement is made with reference to the following facts and circumstances, among others:

2.1. District Formation and General Purposes. District was formed more than 100 years ago for the purpose of providing irrigation water to serve the needs of agriculture. To that end, District has perfected water rights sufficient to meet those needs. District's development of its water rights and its agricultural irrigation delivery system, and the careful attention to the needs of District's agricultural water users, have been prominent in making Stanislaus County one of the world's foremost agricultural areas. In recent years, population growth within District's boundaries has reduced the irrigated acreage while increasing the demand for municipal uses of water. The Parties desire to put to beneficial municipal use for the inhabitants of District certain amounts of surface water to which District has rights. In doing so, the Parties shall be mindful of the great importance of District's water rights, and the significant role of agriculture within District. The area to be served with water pursuant to this Agreement is within District's Irrigation District Boundary. The water to be supplied by District pursuant to this Agreement is not surplus water, but rather is water which has historically been put to beneficial agricultural use within District and is now necessary for municipal use within District.

2.2. [Not Used]

2.3. Water Management Study. District and City authorized, received, and accepted the Study, which was completed in 1984.

2.4. Problems of Reliance on Groundwater. The Study found, in part, that existing groundwater sources of City are limited and supplies are declining, and that a continued decline in the quantity of groundwater will result in a gradual degradation of the quality of the groundwater. This degradation of quality, combined with on-going Modifications to State and Federal drinking water standards, will make it increasingly difficult to meet domestic water supply demands solely through the use of groundwater.

2.5. Water Rights. District has certain water rights with respect to the waters of the Tuolumne River.

2.6. Study Recommendation. The Water Management Study recommended, in part, that City and DEW contract with District for treated surface water to supplement its groundwater supplies. This resulted in construction of the existing surface water treatment plant located at the Modesto Reservoir. The design, financing, construction, operation and maintenance of the water treatment plant was implemented pursuant to the Treatment and Delivery Agreement Among Modesto Irrigation District, City of Modesto, and Del Este Water Company that was approved in 1992.

2.7. Projection Expansion. Pursuant to the 1992 Agreement, District designed and constructed, and now owns, operates and maintains, the initial Project facilities, including the Modesto Regional Water Treatment Plant, which has a rated treatment capacity of 30 million gallons of treated water per day (mgd). The 1992 Agreement contemplates that the parties may agree at some time to expand the Project up to a capacity of 60 mgd.

2.8. Environmental Clearance. District, with the assistance of its environmental consultant, completed a final environmental impact report for the Initial Facilities and, on April 17, 1990, the Board of Directors of District adopted Resolution 90-50 which, among other things, certified the EIR and caused a Notice of Determination to proceed with the Project to be filed in accordance with the California Environmental Quality Act and the CEQA Guidelines. The parties prepared a Subsequent Environmental Impact Report on the First Expansion Facilities, and District and City cooperated as CEQA co-lead agencies of the preparation of the SEIR, which addresses the First Expansion Facilities and this Amended and Restated Agreement. The SEIR also studies other City water system improvements to be financed, designed,

constructed and operated by City outside of this Agreement. The parties have certified the SEIR and made appropriate CEQA findings. (See District Resolution No. 2005-92, pertaining to SEIR Certification; District Resolution No. 2005-158, pertaining to CEQA Findings; City Resolution No. 2005-378, pertaining to the SEIR Certification; City Resolution No. 2005-515, pertaining to the CEQA Findings.)

2.9 Use of Available Water to Carry Out Recommendations of the Urban Water Management Plan. It is in the best interests of the Parties and their respective water users to utilize District's available water to expand the present capacity of the MRWTP to provide treated water to City in an environmentally acceptable manner, which is not injurious to agricultural water users or any other interests of District.

2.10. Enterprise Fund. It is the intention of the Parties that, except as specifically provided otherwise herein, the Project shall be financially operated as an enterprise fund with costs borne by City, and with neither profits nor losses accruing to District as a result of the Project. All terms of this Agreement shall be construed in accordance with the intent of this Section 2.10.

2.11. Long Term Water Supply. By this Agreement, the Parties intend to provide for and increase the long-term source of domestic Treated Water supply for City.

2.12. Conservation. In entering into this Agreement, the Parties recognize that it is important to continue to encourage both urban and agricultural water users within District to utilize water conservation practices, which are effective, practical, and economical.

2.13. Groundwater. The Parties recognize the importance of an adequate supply of good quality groundwater. The Parties in the future, as they deem appropriate, shall cooperate in necessary ground water management efforts as may be required by future State or Federal legislation or regulations.

2.14. DEW Acquisition. In 1995, City acquired certain assets of DEW, including all of the Company's rights, interests and obligations in and to the Project and 1992 Agreement. The parties acknowledge and confirm that (a) District has consented to this transfer and assignment pursuant to the 1992 Agreement, (b) DEW is no longer a party to the 1992 Agreement, and (c) all DEW's rights, interests and obligations in and to the 1992 Agreement have been transferred to and accepted by City. Consequently, DEW no longer has any right or interest in the 1992 Agreement or the Project and therefore is not a party to this Agreement.

2.15. Purpose of Agreement. The Parties desire to amend the 1992 Agreement to (a) provide for expansion of the MRWTP to 60 mgd and construction of related facilities, (b) address City's acquisition of DEW's interests in the 1992 Agreement and Project, and (c) make certain other changes. In order to simplify and clarify the applicable contract terms and consolidate all current contract terms and conditions into a single document, the parties have incorporated the amendments into this amended and restated agreement, which includes the 1992 Agreement as amended.

3. AMENDMENT AND RESTATEMENT OF 1992 AGREEMENT.

The 1992 Agreement is hereby amended and restated in full with the amendments as set forth in this Amended and Restated Treatment and Delivery Agreement. The 1992 Agreement therefore is hereby terminated and superseded by this Agreement. Any right, debt, obligation or liability under or secured by the 1992 Agreement shall be deemed a right, debt, obligation or liability under or secured by this Agreement.

4. DEFINITIONS.

4.1. Advances. All costs advanced by District pursuant to Section 10.1 during the Design Phase, except Sunk Costs, together with an estimate made just prior to the Financing and agreed upon by the Parties with respect to all advances, which are to be made by District prior to the end of the Design Phase.

4.2. Advisory Committees. The committees created pursuant to Section 18.6.

4.3. Agreement. This Amended and Restated Treatment and Delivery Agreement between District and City.

4.4 1992 Agreement. The Treatment and Delivery Agreement Among Modesto Irrigation District, City of Modesto, and Del Este Water District that was approved in 1992.

4.5. Approvals. The licenses, permits, entitlements, and privileges necessary for the construction, operation, and maintenance of the Project.

4.6. Board. The Board of Directors of District.

4.7. Chief Executive Officers. The City Manager and the General Manager of District, or their respective designees.

4.8. City. City of Modesto.

4.9. City Gross Water Revenues. All gross income and revenue received or receivable by City from the ownership and operation of City Municipal Water System, which gross income

and revenue shall be calculated in accordance with generally accepted accounting principles, including all rates, fees, and charges received by City for water service and connection and hook-up fees and all other income and revenue however derived by City from the ownership and operation of or arising from City Municipal Water System, but excluding in all cases any proceeds of taxes and any refundable deposits made to establish credit, federal or state grants, or advances or contributions in aid of construction, or monetary recoveries in lawsuits on behalf of City's water rate payers for environmental and other torts and actions at law.

4.10. City Municipal Water System. The municipal water system of City existing on the effective date of this Agreement and all additions, betterments, extensions, and improvements thereto hereafter acquired or constructed.

4.11. Commercial Operation Date. The first day following the Test Period.

4.12. Commercial Operation Phase. The (a) ongoing operation and maintenance of the Initial Facilities, and (b) for the First Expansion Facilities, the Period beginning with the Commercial Operation Date and continuing thereafter.

4.13. Construction Phase. The Period during which the First Expansion Facilities are constructed, ending with the end of the Test Period.

4.14. Debt Service. The payments required to be made for principal, interest, and other charges, if any, to the holders of evidences of indebtedness or certificates of participation issued by District pursuant to this Agreement to finance the Project. If bond insurance is used in connection with Fixed Financing, Debt Service shall include bond insurance premiums.

4.15. Debt Service Reserve Fund. The fund established and maintained pursuant to Section 12.2 of this Agreement.

4.16. Design Phase. The Period of First Expansion Facilities environmental review and design ending with the start of construction of the Project.

4.17. DEW. Del Este Water Company.

4.18. District. Modesto Irrigation District.

4.19. District Interest Rate. For the Period for which interest is to be calculated, interest at the same average monthly yield as District earns on its general fund portfolio, provided, however, that if at any time District's average cost of borrowing money exceeds District's rate of return on its general fund portfolio, the interest on amounts advanced by District shall be District's cost of borrowed money. In no event shall the rate of interest determined pursuant to

this Section 4.18 as applied exceed the legal limit. Interest shall accrue monthly beginning at the time District actually expends the funds on which the interest is to accrue.

4.20. District's Electrical Service Area Boundary. The boundary of the electrical service area of District as shown on the official maps and records of District.

4.21. District's Irrigation District Boundary. The irrigation district boundary of District, as opposed to District's Electrical Service Area Boundary, as shown on the official maps and records of District.

4.22. Domestic Water Year. Each 12 month period commencing on May 1 and ending on the next succeeding April 30.

4.23. Finance Committee. A committee consisting of the Director of Finance of City and the chief financial officer of District, or their respective designees.

4.24. Financing. The actual putting into place of Variable Financing or Fixed Financing to the point of the disbursement of funds as needed to allow construction of the First Expansion Facilities to proceed.

4.25. First Expansion Facilities. The expansion of the MRWTP as described in the SEIR (but excluding those water system transmission and storage facilities to be financed, designed and constructed by City), or such other First Expansion Facilities description as may be approved by the parties in writing.

4.26. Fixed Costs. All costs other than Debt Service which must be borne by District in connection with the Project irrespective of whether the Project is producing Treated Water or not.

4.27. Fixed Financing. Long term Project Financing with fixed terms and rates extending for the length of the repayment period.

4.28. Initial Amount. The amount to be initially deposited to the Reserve and Contingency Fund pursuant to Section 12.1 and thereafter the amount currently required to be maintained in the Reserve and Contingency Fund pursuant to Section 12.1.3.

4.29. Initial Facilities. The diversion facilities, 30 million gallons per day water treatment facilities, pipelines, pumps, storage facilities, and other improvements as described in and completed during the original project pursuant to the 1992 Agreement to deliver Treated Water to City.

4.30. Maximum Annual Debt Service. The largest amount of Debt Service to be paid under Fixed Financing during any Year.

4.31. Modifications. Any improvements or alterations in the Project mandated by regulatory agencies, or required to meet the provisions of Section 9.4, or changes in the Project agreed upon as necessary by the Parties.

4.32. MRWTP. District's Modesto Regional Water Treatment Plant.

4.33. Next Turnout. The first point of diversion onto private land or into a smaller canal or pipeline below any point at which City discharges groundwater into an irrigation canal as provided in Section 9.8.1.

4.34. Other City Water. All groundwater and surface water supplies available to City for municipal and industrial purposes excluding Raw Water and Treated Water.

4.35. Parity Debt. Loans, bonds, notes, advances or indebtedness, or other obligations of City payable from and secured by a pledge of water rates, and charges of City on a parity with the obligations to be paid by City pursuant to this Agreement.

4.36. Parties. District and City.

4.37. Period. One or more Calendar Years or Domestic Water Years and/or any portion thereof.

4.38. Phases. The Design Phase, the Construction Phase, and the Commercial Operation Phase.

4.39. Policy Committee. The Committee created pursuant to Section 18.6.1 of this Agreement.

4.40. Prior Agreement. The Advance Funding and Reimbursement Agreement executed by the parties October 7, 2003, as amended, which identifies environmental review and preliminary design costs to be funded by District and later reimbursed by the First Expansion Facilities Financing.

4.41. Project. The Initial Facilities (as described in and constructed pursuant to the 1992 Agreement) plus the First Expansion Facilities. If the First Expansion Facilities are terminated pursuant to section 22.2 prior to completion, then "Project" shall mean and be limited to the Initial Facilities.

4.42. Project Manager. The person or entity as is appointed pursuant to Section 18.1.2 of this Agreement.

4.43. Project Observer. The observer or observers that may be appointed pursuant to Section 8.2.

4.44. Property Cost. As to an interest in real property either owned or acquired by City and then acquired by District for the Project pursuant to Section 7.1.2, (i) the fair market value of already owned property at the time it is conveyed to District, and (ii) the purchase price of newly acquired property, including, but not limited to, incidental costs such as legal fees, appraisal fees, and title fees.

4.45. [Not Used]

4.46. Raw Water. Water of District diverted to the Project.

4.47. Raw Water Charge. The cost of Raw Water for the year as set forth in Section 14.2.

4.48. Reserve and Contingency Fund. The reserve and contingency fund established and maintained pursuant to Section 12.1 of this Agreement.

4.49. SEIR. The Subsequent Environmental Impact Report for the MRWTP Phase Two Expansion Project dated June 2005.

4.50. Service Area. City municipal water system service areas as shown and described in the Urban Water Management Plan, as the same may be adopted by City from time to time.

4.51. Surface Water Service Area. The portion of the Service Area located within District's Irrigation District Boundary.

4.52. Study. The Water Management Study, prepared by James M. Montgomery Consulting Engineers, dated November 1984.

4.53. Sunk Costs. Those costs associated with the First Expansion Facilities incurred by the Parties and set forth in Exhibit A of this Agreement.

4.54. Technical Committee. The committee created pursuant to Section 18.6.2 of this Agreement.

4.55. Termination. A termination of the Agreement pursuant to section 22.1.

4.56. Test Period. The seven day Period immediately following the completion of the construction of the First Expansion Facilities during which those facilities are tested as to their ability to operate and produce Treated Water meeting the standards of Section 9.4 in the quantity specified in Section 9.2. If during the initial seven day Period the First Expansion Facilities fail to operate and produce Treated Water meeting the standards of Section 9.4 in the quantity

specified in Section 9.2, the Test Period shall be extended until the time when the First Expansion Facilities have in fact demonstrated their ability to operate and produce Treated Water meeting the standards of Section 9.4 in the quantity specified in Section 9.2.

4.57. TIC. "True Interest Cost" as the term is commonly applied in municipal finance.

4.58. Treated Water. All water meeting the standards of Section 9.4 delivered from the Project to City at point or points of delivery.

4.59. Trustee. The trustee or trustees, if any, appointed in the documents executed in connection with any Financing.

4.60. Urban Water Management Plan. The 2000 Urban Water Management Plan dated October 2001, which was adopted by District with District Resolution No. 2001-134 and by City with City Resolution No. 2001-480, as the same may be adopted by the parties from time to time.

4.61. Variable Financing. Project Financing with variable rates and terms during the First Expansion Facilities Construction Phase and until Fixed Financing is put in place.

4.62. Water Shortage Condition. Any Period in which pursuant to Section 17.2 the Treated Water available to City falls below 33,602.1 acre-feet during a full Domestic Water Year because of a reduction in District's water supply due to a cause beyond District's control, whether due to drought, new or amended federal or state statute or regulation, court order, federal or state government agency license, permit, order or ruling, or good faith settlement agreement in lieu of a court order or federal or state government agency order or ruling. Upon completion of the First Expansion Facilities (as evidenced by the Commercial Operation Date), this quantity shall be changed to 67,204.2 acre-feet per year.

4.63. Year. Each 12 month period commencing on January 1 and ending on the next succeeding December 31.

5. TERMINATION OF PRIOR AGREEMENT.

By execution of this Agreement the Parties intend to, and do, hereby terminate and cancel the Prior Agreement, provided, that to the extent provisions of this Agreement are the same or have the same meaning as provisions of the Prior Agreement, those provisions shall be deemed to have been continuously in effect since the date of the Prior Agreement.

6. PROJECT AND FIRST EXPANSION FACILITIES.

6.1. Obligations of District and Expansion. Pursuant to sections 4.41 and 6.1 of the 1992 Agreement, the parties agree to expand the Project to include the First Expansion Facilities.

District shall finance, design, acquire lands and rights-of-way for, acquire licenses and permits for, construct, own, operate and maintain the First Expansion Facilities pursuant to applicable provisions of this Agreement, including, but not necessarily limited to, sections 6 through 13, inclusive and 18. In designing, constructing, operating and maintaining the First Expansion Facilities, District also shall comply with applicable provisions of the SEIR, the related mitigation monitoring plan, and Urban Water Management Plan. The configuration, design, construction, and financing of the First Expansion Facilities shall be determined in accordance with this Agreement.

6.1.1. The parties acknowledge that City intends to concurrently finance, design, acquire lands and rights-of-way for, acquire permits for, construct, own, operate and maintain certain water system transmission, distribution and storage facilities that are described and analyzed in the SEIR but not part of the First Expansion Facilities for purposes of this Agreement.

6.1.2. The Project facilities owned, operated and maintained by District and the points of delivery to City water system are shown on the map attached as Exhibit B and incorporated herein. All municipal water system facilities downstream of such points of delivery are owned by and the responsibility of City. The meters at District-City points of delivery shall be owned and operated by District as part of the Project.

6.2. First Expansion Facilities Phases. Implementation and completion of the First Expansion Facilities shall be undertaken in three Phases consisting of the Design Phase, the Construction Phase, and the Commercial Operation Phase, as described in sections 4.38 and 6 through 9, inclusive.

6.3. Area to be Served by Project. The area to be served by the Project is the Surface Water Service Area. District acknowledges that City's entire Service Area extends beyond the Surface Water Service Area, that the portions of the Service Area located outside of the Surface Water Service Area are served by City with City groundwater and City water supplies other than the Treated Water, and that the Treated Water and Other City Water are commingled in a single water distribution system that serves the entire Service Area. City shall have the right to continue to commingle the Treated Water and Other City Water for use throughout the Service Area, provided that in no event shall water from the Project be transported outside the Surface Water Service Area that is not replaced with an equal or greater amount of Other City Water in

accordance with section 17.6 below. Subject to all other limitations in this Agreement, Treated Water may be used outside the Surface Water Service Area without replacement by Other City Water if the Parties have approved that use after any environmental processing required by law has taken place.

6.4. Ownership, Assignment, and Sale of Project Water to Others.

6.4.1. District Sole Owner. District shall be the sole owner of the Project, however City shall have rights in the Project as set forth in this Agreement.

6.4.2 Sale, Transfer, or Assignment. Except as to management and operation as expressly provided in section 6.4.3, District shall not sell, transfer, or assign any interest in the Project. This section 6.4.2 does not prohibit District from disposing of excess or surplus personal property or land, provided that the proceeds of the disposition shall be credited to the Project.

6.4.3. Assignment of Management and Operations. In the event that District contemplates the assignment or transfer of the management and operation of its interest in the Project to an entity other than City, then, prior to the assignment or transfer, the Parties shall meet and confer to determine whether it is practical to make the assignment or transfer to City. District shall not assign, transfer, contract out, or subcontract all or substantially all of District's operation and maintenance obligations under the Commercial Operation Phase without the prior written consent of City.

6.4.4. Interest of City. Upon completion of the Construction Phase and during the life of this Agreement throughout the Commercial Operation Phase, including after retirement of the Fixed Financing or other debt for the Project, City shall have and continue to have a permanent beneficial interest in the output of the Project in accordance with the terms of this Agreement.

6.4.5. Assignment By City. City shall not assign or transfer its right or interest in the Project, in whole or in part, without the prior written consent of District, which consent shall not be unreasonably withheld. Any assignment or transfer by City without consent of District shall be void. No assignee or transferee of City shall obtain any right or interest in this Agreement until it assumes by written instrument all obligations under this Agreement with respect to the right or interest transferred or assigned, and it becomes a Party to this Agreement by executing this Agreement or an amendment thereto also executed by the Parties.

6.4.6. Sale of Treated Water to Other Entities. District shall not sell, lease, transfer, or in any other manner direct or convey Treated Water from the Project to any person or entity other than City without the prior written consent of City, which consent shall not be unreasonably withheld. Prior to selling, leasing, transferring, or conveying Treated Water from the Project to any person or entity other than City, District shall first offer the water to City. City may take all or a portion of the Treated Water offered. Unless parties otherwise agree, the price of any Treated Water sold, leased, transferred, or conveyed by District to any person or entity other than City shall not be less than the full cost of producing the water including Sunk Costs and Raw Water, capital, treatment, operation, maintenance, and administrative costs, and in any event shall not be lower than the price to City. In the event the cost of furnishing water to any person or entity other than City is less than the charges to that person or entity, the excess revenue shall be applied to the operation of the Project. Subject to the provisions of Section 6.4.5, this Agreement shall inure to the benefit of and be binding upon the Parties and their respective successors and assignees.

6.5. Disposition of Plans. City, upon request, shall be entitled to obtain and keep copies of all reports, drawings, studies, plans, specifications, other engineering documents, and all other documents pertaining to the Project, provided that City has fully paid its share of all costs due up to the time of the request, as those costs are due and owing pursuant to this Agreement.

6.6. Cooperation in Proceeding with First Expansion Facilities. District shall, to the extent it has not already done so, utilize its best efforts to acquire and maintain ownership of all easements, water conveyance rights, water rights, and Approvals necessary for the construction, operation, and maintenance of the First Expansion Facilities. City shall utilize its best efforts to support the First Expansion Facilities and its Financing and assist District in regard to the matters set forth in this Section 6.6 in order to facilitate the Financing, construction, operation, and maintenance of the First Expansion Facilities.

7. DESIGN PHASE.

7.1. Design Phase Work. Under the Advance Funding and Reimbursement Agreement, Design Phase work on the First Expansion Facilities has been commenced and is currently under way. District has retained various engineers and consultants to perform the work. District may utilize different engineers and consultants on the First Expansion Facilities, subject

to City's approval of engineering services contracts pursuant to Agreement section 18.3.1. To the extent items are not already completed or under way, during the Design Phase each of the following shall occur:

7.1.1. District to Obtain Approvals. To the extent practical, District shall obtain all Approvals during the Design Phase. Approvals, which cannot be obtained during Design Phase, shall be obtained as soon thereafter as practical.

7.1.2. Property Interests. District shall acquire all land, easements, and rights of way required for the construction, operation, and maintenance of the First Expansion Facilities including real property interests owned by City where applicable. City shall assist with the identification and acquisition of all water storage sites within its respective Service Areas. If City either acquires real property for District's portion of the First Expansion Facilities, or agrees to the utilization of already owned property for District's portion of the Project, then District shall acquire the real property from City at the Property Cost.

7.1.3. Preliminary and Final Design. The First Expansion Facilities engineers shall prepare preliminary design development plans and specifications and a preliminary cost estimate, and, after approval by the Parties of the preliminary design and cost estimate as provided in Sections 18.3 and 18.4, the engineers shall prepare final and complete construction documents and a final cost estimate.

7.1.4. Preliminary Financing Work. The financial advisor, underwriter, bond counsel, and District shall perform preliminary work necessary for the Financing of the First Expansion Facilities and shall make a Financing proposal to City.

7.2. Costs for Design Phase to be Advanced. Costs for all work performed during the Design Phase shall be advanced in accordance with the provisions of Section 10.1.

7.3. Reimbursement of Advanced Design Phase Costs. Reimbursement of the costs advanced pursuant to Section 10.1 shall be made in accordance with Section 10.2. The SEIR and First Expansion Facilities environmental review costs shall be considered design costs to be advanced by District and reimbursed pursuant to sections 4.1, 7.2, 7.3, 10.1 and 10.2; provided, however, that SEIR, First Expansion Facilities environmental review and other costs paid or advanced by City pursuant to the Prior Agreement shall not be reimbursed to District, but shall be reimbursed to City through the First Expansion Facilities Financing.

8. CONSTRUCTION PHASE.

8.1. Finalization of Financing and Construction. The Construction Phase shall consist of finalization of the Financing and the construction of the First Expansion Facilities. Prior to the commencement of the Construction Phase all necessary agreements for the Financing and construction, purchase, and sale of water, and operation and maintenance of the First Expansion Facilities shall be executed.

8.2. First Expansion Facilities Observer. City may designate a First Expansion Facilities Observer to function during the Construction Phase. City shall pay all costs for the First Expansion Facilities Observer, including, but not limited to, salary and fringe benefits. A First Expansion Facilities Observer may: (i) be at the construction site of the First Expansion Facilities at any time he/she elects; (ii) observe on-going and completed construction; and (iii) have access to all of District's records, files, and documents related to the design and construction of the First Expansion Facilities. He/she shall not direct, comment to, correct, advise, or otherwise deal with personnel of any contractor or District except that the First Expansion Facilities Observer may bring to the attention of the Project Manager any concerns noted by him/her and may bring those concerns to City. The First Expansion Facilities Observer shall observe all applicable requirements of the Occupational and Health Safety Act and all other statutes, rules, and regulations applicable to employee safety on construction sites. The Project Manager may exclude from the construction site any First Expansion Facilities Observer who, after warning, fails to observe the limitations and requirements of this Section 8.2.

9. COMMERCIAL OPERATION PHASE.

9.1. Commercial Operation Phase. District shall continue the Commercial Operation Phase as to the Initial Facilities. The Commercial Operation Phase for the First Expansion Facilities shall commence immediately following the Test Period. Any water produced during the Test Period, which meets the standards of Section 9.4, shall be delivered to City.

9.2. Test Quantity. During the Test Period after completion of the First Expansion Facilities, Treated Water from the MRWTP shall be produced at a rate of 60 million gallons per day or at the highest rate below 60 million gallons per day which City system is able to accept. During the Test Period every reasonable effort shall be made to produce Treated Water at the rate of 60 million gallons per day. The Parties shall cooperate during the Test Period in an effort to maximize production of water and acceptance of water by City system.

9.3. District Obligations During Commercial Operation Phase. During the Commercial Operation Phase District shall: (i) operate and maintain the Project in as economic a manner as practical in accordance with generally accepted waterworks practices as evidenced by well designed and operated potable water treatment plants of a similar size in Northern California; and (ii) deliver Treated Water to City consistent with the terms of this Agreement. Until the Commercial Operation Date for the First Expansion Facilities, District's operation and maintenance responsibilities shall be limited to the Initial Facilities. After the Commercial Operation Date for the First Expansion Facilities, District's operation and maintenance responsibilities shall include the First Expansion Facilities.

9.4. Standards of Treated Water. Throughout the term of this Agreement, or any successor or substitute agreement, or extensions thereof, District shall deliver to City Treated Water which meets all state and federal drinking water quality standards applicable to the Project at the time of delivery to City system.

9.5. Obligation of City to Take Water. City at all times shall exercise its best efforts to take all Treated Water made available to City, up to the amount identified in Sections 14.8 and 17.3.

9.6. Cooperation in Operation. The Parties shall cooperate and remain in frequent telephonic or other communication so as to efficiently operate the domestic water system and fully put to use the Treated Water produced by the MRWTP.

9.7. Expansion of Groundwater Capacity and Commingling of Groundwater. Throughout the term of this Agreement, City shall maintain and, to the extent it deems necessary, expand, its well system so that the groundwater used in conjunction with the Treated Water will best enable City to be able to meet its customer demands. It is understood that District's obligations to deliver Treated Water are as otherwise set forth in this Agreement. Groundwater is to be delivered by City through its same water pipelines which will carry the Treated Water, resulting in a physical commingling of the groundwater and surface supplies.

9.8. Exchange of Groundwater for Treated Water. Subject to the absolute limitation of 67,204.2 acre feet per Domestic Water Year, and subject to approval of District as to time and place of delivery, which approval shall not be unreasonably withheld, City, at its option, may deliver groundwater to District irrigation canal system in exchange for an additional amount of

Treated Water from District equal to the quantity of groundwater delivered to District irrigation canal system, provided that each of the following conditions is met:

9.8.1. Delivery. Any groundwater delivered by City shall be delivered into one of the irrigation canals of District. After blending the groundwater discharged with the water then in the canal, the quality of the water, sampled at the Next Turnout, shall be of a quality suitable for agricultural use, including without limitation, use for crops, orchards or livestock.

In the event that water samples at the Next Turnout demonstrate, based upon the quality standards set forth above, that the groundwater after mixing is not suitable for agriculture, City shall immediately cease making those discharges which contribute to the unsuitability of the water at the point at which the sampling occurred

9.8.2. Costs. City shall bear all costs, including the cost of additional capital facilities, if any are necessary, associated with delivering exchange groundwater supply to District irrigation canal system.

9.8.3. Records. City shall maintain a record of the quantity of exchange groundwater delivered to District irrigation canal system and the quality of blended water in the canal at the Next Turnout below each point of introduction of groundwater.

9.8.4 Use of District Pumps. In order to facilitate the exchange of groundwater pursuant to this Section 9.8, City may enter into an agreement with District for the use of District owned or controlled pumps to accomplish the exchange. City shall reimburse District for all costs incurred, including electric rates normally charged for pumping and costs of operations, maintenance, repair, administration, and personnel. Agreements pursuant to this Section 9.8.4 shall be at the sole discretion of District.

9.9. Force Majeure. District shall be excused from its obligation to deliver Treated Water in the event that District is rendered unable, wholly or in part, by force majeure to carryout its obligations under this Agreement. Upon the occurrence of an event of force majeure, District shall give notice and full particulars of the force majeure in writing, or by telephone followed by a writing. District's performance shall be suspended during the continuance of the force majeure. The term "force majeure" as used herein shall mean acts of God, strikes, lock-outs, failure or refusal of any person or entity to comply with then existing agreements to obtain or ship materials or equipment, or industrial disturbances, acts of a public enemy, wars, blockades, insurrections, riots, epidemics, landslides, lightning, earthquakes, volcanic eruptions,

fires, flood, washouts, or other natural disasters, threat of physical harm or damage resulting in the evacuation or shutdown of facilities necessary for the supply, treatment, and distribution of water, arrests and restraints of governments and people, civil disturbances, insurrection, explosions, sabotage, restraint by court order or public authority, other than District, having jurisdiction over the Project, and action or non-action by, or failure to obtain authorizations or approvals from, any governmental agency or authority of competent jurisdiction, and any other causes, whether of the kind herein enumerated or otherwise, not within the control of the Party claiming force majeure and which, by the exercise of due diligence, the Party is unable to prevent or overcome. District shall use its best efforts to promptly bring to an end any condition falling within the definition of force majeure. District shall prepare, revise from time to time as appropriate, and implement when necessary an operational plan to deal with strikes and lockouts so as to minimize interruption of the delivery of Treated Water to City in the event of a strike or lockout. It is understood and agreed that the settlement of strikes or lockouts shall be entirely at the discretion of the Party having the difficulty. In the event of a strike or lockout, District's obligation to perform under this Agreement shall not be suspended for a Period of more than 60 days. If District gives notice of a force majeure event which impacts District's ability to deliver Treated Water, then the provisions of Section 13 shall be determinative as to whether City is excused from its obligation to pay Debt Service and Fixed Costs. Upon the occurrence of any event of force majeure which may render District wholly or in part unable to carry out its obligations under the Agreement, to the extent reasonably practical District shall use its best efforts to promptly implement a plan to ensure the continued operation of the Project and continued delivery of Treated Water to City.

10. ADVANCE OF PRE-CONSTRUCTION COSTS.

10.1. Advances by District, City, Sunk Costs, and Approval of Other Costs. City shall be liable for the payment of all costs and expenses of all Phases of the Project in accordance with this Agreement. To facilitate the planning and construction of the First Expansion Facilities, and pursuant to the Prior Agreement, District has already advanced certain First Expansion Facilities costs. Some costs have been advanced by City. District shall advance all costs reasonably necessary for completion of all engineering and design work, feasibility studies, permit, and licensing costs, and all other work required and conducted during the Design Phase of the First Expansion Facilities. The costs shall be reimbursed by City as set forth in Section 10.2; however,

in order for costs incurred by District to be reimbursed by City, the costs must be either included as Sunk Costs identified in Exhibit A or approved by City. Separate approval shall not be required as to costs approved as a part of a Project milestone as provided in Sections 18.3 and 18.4. Any cost not approved by City shall be subject to further review in the manner provided in Section 18.6. As also indicated on Exhibit A, City has also advanced a portion of Sunk Costs.

10.2. Reimbursement. Upon Termination, City shall reimburse District for all Sunk Costs and Advances not previously reimbursed or incorporated into a Financing, unless the Parties agree otherwise. In the event of a Termination of the First Expansion Facilities pursuant to Section 22.2, and the Parties abandon the First Expansion Facilities, City shall not be required to reimburse District pursuant to this Section 10.2. If the Project proceeds to Financing, reimbursement of Sunk Costs and Advances to District and reimbursement of Sunk Costs to City shall be included in the principal amount of the financed obligation. District and City shall be reimbursed for Sunk Costs and District shall be reimbursed for Advances from the proceeds of the Financing.

10.3. Interest on Advances. Amounts advanced by the Parties pursuant to Section 10.1 shall bear interest at District Interest Rate until repaid.

10.4. Costs of Studies and Negotiation Borne by Each Party. Costs of studies conducted by either Party for its own purposes and costs associated with the preparation and negotiation of this Agreement or subsequent or other agreements between the Parties shall be borne by the Party incurring the costs and shall not be advanced pursuant to Section 10.1, nor reimbursed pursuant to Section 10.2.

11. DRAINAGE.

11.1. Responsibility. District shall not be responsible for any drainage pumping or facilities necessary to maintain water tables so as to avoid damage to structures and crops within the Service Area of City. City shall not be responsible for any drainage pumping or facilities necessary to maintain water tables so as to avoid damage to structures and crops outside the Service Area of City.

11.2. Indemnification. Each Party shall indemnify, protect, defend, and hold harmless the other Party, and its respective officers, directors, officials, employees, agents, and volunteers, from and against any and all liabilities, claims, damages, losses, judgments, penalties, costs or expenses (including attorney fees) arising from rising groundwater tables within the service area

of the indemnifying Party. For the purposes of this Section 11.2, District's service area shall be that portion of District lying outside of the Service Area of City.

12. RESERVE FUNDS.

12.1. Reserve and Contingency Fund. District shall continue to maintain a Reserve and Contingency Fund. The Initial Amount shall be $500,000.

12.1.1. Additional Deposits to Reserve and Contingency Fund. If the balance in the Reserve and Contingency Fund shall fall below the Initial Amount as of the end of any Year, then the amount of the shortfall shall be added to the amount to be paid by City pursuant to Section 15 during the next ensuing Domestic Water Year.

12.1.2. Withdrawals From Reserve and Contingency Fund. The Reserve and Contingency Fund shall be subject to withdrawals by District for the following purposes:

12.1.2.A. Unbudgeted Items. The cost of (i) unbudgeted necessary repairs and replacements required to maintain the Project in good order in keeping with the standards evidenced by similar sized potable water treatment plants in Northern California and at all times able to produce Treated Water meeting the standards of Section 9.4; plus (ii) all unbudgeted Modifications.

12.1.2.B. Costs in Excess of Budget Amount. Costs, including, among other things, Fixed Costs and Debt Service, for the operation and maintenance of the Project, which exceed the funds available pursuant to Section 15 for any Period.

12.1.2.C. Budgeted Items. The cost of budgeted repairs, replacements, and Modifications if so agreed by all of the Parties.

12.1.3. Increase or Decrease in Reserve and Contingency Fund. From time to time, as a part of and subject to the budget process set forth in Section 18.7.2, District may, if experience reasonably indicates, increase or decrease the Initial Amount and in the event of an increase in the Initial Amount, provide for necessary additional payments by City during the next ensuing Domestic Water Year so as to increase the balance in the Reserve and Contingency Fund. In the event of a decrease in the Initial Amount, the excess balance in the Reserve and Contingency Fund shall be credited against payments due from City during the next Domestic Water Year.

12.1.4. Reserve and Contingency Fund Advances. If at any time because the Reserve and Contingency Fund is depleted or contains insufficient funds so that District must

advance funds which otherwise would be obtained from withdrawals from the Reserve and Contingency Fund under Section 12.1, then the aggregate amount of the advances during any Year and the amount necessary to replenish the Reserve and Contingency Fund to its established balance shall be added to the amount to be paid by City pursuant to Section 15 during the next ensuing Domestic Water Year. The amount of advances by District to the Reserve and Contingency Fund while outstanding shall bear interest at District Interest Rate. Funds received monthly by District by payments from City pursuant to this Section 12.1.4 shall be applied first to interest and then to the replenishment of the Reserve and Contingency Fund.

12.1.5. Interest on Reserve and Contingency Fund. Funds in the Reserve and Contingency Fund shall be invested by District and actual interest earned on the funds shall be credited to the Reserve and Contingency Fund.

12.1.6. Reports. District shall submit to the Technical Committee no less often than quarterly a report setting forth the current balance of the Reserve and Contingency Fund, income and expenditures from the Fund, and anticipated expenditures, if any during the remainder of the year.

12.2. Debt Service Reserve Fund. District shall establish and maintain a Debt Service Reserve Fund. There shall be deposited into the Debt Service Reserve Fund from the Fixed Financing, an amount equal to the Maximum Annual Debt Service. The Debt Service Reserve Fund shall be held by the Trustee. If the First Expansion Facilities proceed to Financing, then the amount of the Debt Service Reserve Fund under this section shall be increased by an amount equal to the Maximum Annual Debt Service for the Fixed Financing of the First Expansion Facilities. In the alternative, District may establish and maintain under this section a second, separate Debt Service Reserve Fund in this amount for the First Expansion Facilities.

12.2.1. Withdrawals From Debt Service Reserve Fund and Replenishment of Debt Service Reserve Fund. Withdrawals from the Debt Service Reserve Fund shall only be made for the purpose of making current payments of Debt Service obligations. If any such withdrawal is made from the Debt Service Reserve Fund, due at any time that funds available under the provisions of Section 15 and/or Section 12.1 are insufficient to meet current Debt Service Reserve Fund, City shall pay pursuant to Section 14.1 and Section 15.1 that amount necessary to replenish the amount on deposit in the Debt Service Reserve Fund to an amount

equal to the Maximum Annual Debt Service no later than one year following such withdrawal from the Debt Service Reserve Fund.

12.2.2. Interest On Debt Service Reserve Fund. Funds in the Debt Service Reserve Fund held by the Trustee shall be invested by District and actual interest earned on the funds shall be credited annually as a part of each Year's budget to sums otherwise due from City pursuant to Section 15 after deducting from interest earnings any amounts which must by law be paid to the United States. It is anticipated that the Debt Service Reserve Fund will be invested in an investment vehicle such as Guaranteed Investment Contingent Fund or a state and local government securities fund.

12.2.3. Final Disposition. The balance on hand in the Debt Service Reserve Fund shall be applied to the final payment or payments of Debt Service.

12.2.4. No Duplication. To the extent the Financing documents provide for a Debt Service Reserve Fund, the provisions of the Financing documents shall prevail. In the event that any reserve requirements set forth in any Financing documents duplicate or parallel the requirements of this Section 12.2, it is agreed that in no event shall contributions to the Debt Service Reserve Fund and any similar fund exceed an aggregate amount equal to the Maximum Annual Debt Service.

13. FINANCING AND TAKE OR PAY PROVISION.

13.1 District to Arrange Financing, Take or Pay Provision, Excuse from Take or Pay. District, subject to Section 18.5, shall use its best efforts to arrange Financing for the construction of the First Expansion Facilities using bonds or other evidences of indebtedness or certificates of participation, which shall be secured in part by the provisions of this Agreement.

City shall pay the Fixed Costs and Debt Service of the Project whether or not the Project or any part of it is operating or operable or its output or capability is suspended, interrupted, interfered with, reduced or curtailed, or terminated in whole or in part except as excused below. The payments of Fixed Costs and Debt Service shall not be subject to reduction whether by offset, counterclaim, recoupment, or otherwise and shall not be conditioned upon the performance or nonperformance by either Party to any agreement or for any other cause or reason whatsoever. The "take or pay" obligation of City with respect to Debt Service shall commence at the time that Debt Service payments actually commence under the applicable Financing. The "take or pay" obligation of City with respect to Fixed Costs shall commence at

the time of the commencement of the Commercial Operation Phase, which shall occur at the end of the Test Period. City shall not be required to pay Debt Service or Fixed Costs if any of the following specific conditions shall occur:

13.1.1. Excuse, 50 Percent of Contracted Water Not Delivered. District for any reason other than Drought shall fail to deliver at least 50% of the Treated Water that City is scheduled to receive for any Domestic Water Year (as determined pursuant to sections 17.1 and 17.2 of the Agreement) for a Period in excess of 18 consecutive months. For purposes of this provision, the particular Domestic Water Year shall be that year in effect at the beginning of the 18-month term.

13.1.2. Excuse, 50 Percent of Water Supply. 50 percent or more of District's total annual water supply, as adjusted as provided in Section 17.2 shall be lost or unavailable for physical reasons beyond District's best efforts to control, other than Drought, for a Period in excess of 24 consecutive months.

13.1.3. Excuse, 80 Percent of Water Treatment Plant Destroyed. 80 percent or more of the water treatment plant, which is a part of the Project, shall be destroyed or disabled for a period in excess of 24 consecutive months.

13.2. New Period of Excuse. A new 18 month, and if applicable, 24 month Period, shall not commence for the purpose of Section 13.1 until a consecutive 12 month Period, during which at least 75 percent of the Treated Water which City is to receive pursuant to Sections 17.1 and 17.2 of this Agreement has been delivered, has passed.

14. PAYMENT FOR WATER BY CITY.

In exchange for District agreeing to make available to City Treated Water in the manner set forth in this Agreement, City shall pay each Domestic Water Year in equal monthly installments the sum of the items set forth below. The sum shall be calculated and paid to District as set forth in Section 15 regardless of the amount of Treated Water actually delivered to City, or, subject to the exceptions found in Section 13.1, whether any Treated Water is delivered. The sum to be paid shall be comprised of the following:

14.1. Debt Service. Debt Service, so long as there is outstanding indebtedness incurred by District in connection with the Project, plus the amounts, if any, necessary to replenish the Debt Service Reserve Fund pursuant to Section 12.2.1.

14.2. Raw Water Charge. District shall charge City for Raw Water at the same rate as District charges for water furnished by District to its agricultural water users. The Raw Water Charge shall be charged only for water actually delivered to the Water Treatment Plant. In setting the rates for Raw Water, District shall be guided by the following principles:

(i) The economy of District is, to a great extent, dependent upon fair, reasonable, and economical irrigation water rates, and District, in setting such irrigation water rates shall be mindful of the impact that increases in water rates would have on agriculture and the economy of District.

(ii) District shall not derive a profit from its Raw Water diverted to the Project.

(iii) City shall be fully advised through the budget process set forth in Section 18.7 of the proposed water rates to be set by District.

(iv) The rates established for Raw Water and water furnished to District's agricultural water users shall be adopted by the Board only after a public hearing for which at least ten days' notice has been given in writing to City.

(v) Water rates shall be fair, reasonable, and economical as to both District's agricultural water users, and to City.

In order to observe the foregoing principles, it will be necessary to convert the agricultural water users supply to acre feet and the agricultural water users charge to a "per acre foot charge." The cost of Raw Water shall then be calculated as follows:

14.2.1. Agricultural Allocation in Acre Feet. District provides a water supply to its agricultural water users during each irrigation season. In some seasons, it is possible to allow irrigation water to each agricultural water user to the extent of demand. In other seasons it is found necessary by the Board to allocate, that is to reduce, the amount of water available to agricultural water users. When allocation is necessary it is the practice of the Board to announce, usually in March or April, the allocation for the season allowing a certain number of inches of water for the season for each agricultural acre to which agricultural water is provided. For the purposes of this Agreement, if no allocation of agricultural water is announced for any agricultural season, then the allocation for that season shall be presumed to be 42 inches. The

allocation for agricultural water for each irrigation season shall be converted to acre feet by taking the number of inches of water allocated and dividing by 12. In some Years the Board may provide for an allocation on an optional basis. For example, the Board may provide for a base supply of 33 inches of water for each agricultural acre at a charge of $7.50 per acre with an option of up to another 12 inches for $7.50 per acre with a limited option in certain cases for additional water at $15.00 per acre-foot. Under such an allocation, a maximum allocation of 42 inches would be assumed and the allocation of 42 inches would be divided by 12 to obtain acre-feet.

14.2.2. Acre Foot Charge. Presently, District charges for water furnished to agricultural water users on a per acre basis; Raw Water furnished pursuant to this Agreement shall be charged on a per acre foot basis. Accordingly, the per acre charge for agricultural water set for each irrigation season by District shall then be divided by the number of acre feet derived pursuant to Section 14.2.1 and the result shall be the charge for each acre foot of Raw Water supplied to the Project for that irrigation season. In the event of an allocation similar to the example, as described in Section 14.2.1, the first 33 inches would be divided by 12 and the quotient would be divided into $7.50. The remaining nine inches of the total of 42 inches would be divided by 12 and would be charged at the rate of $7.50 per acre-foot.

14.2.3. Irrigation Season not Concurrent with Year. Each irrigation season, depending upon need, commences at some time after the beginning of each Year. Thus, two Raw Water rates may be applicable for portions of each Year; the actual Raw Water charges for each Year shall be calculated accordingly.

14.2.4. Raw Water Charge not Applicable. Treated Water delivered in exchange for groundwater delivered to District irrigation canals pursuant to Section 9.8 shall be subject to the same costs as all other Treated Water except there shall be no charge for Raw Water provided for in this Section 14.2.

14.2.5. Change in Method for Charging for Agricultural Water. In the event that District adopts a new method of charging for, or allocating, agricultural water, the Parties shall agree upon a new method of calculating the Raw Water charge devised so that the Project shall bear the same cost per acre foot as is borne by the agricultural water users of District.

14.2.6. Measurement of Raw Water. Raw Water shall be measured at its point of entry into the MRWTP.

14.3. Operation and Maintenance Costs. The actual operation, maintenance, repair, replacement, and Modification costs directly attributable to the operation of the Project for the Year, less sums drawn against the Reserve and Contingency Fund pursuant to Section 12.1.2, except any sum drawn against the Reserve and Contingency Fund for Debt Service. It is agreed that no item for depreciation shall be included in the sums calculated and paid pursuant to this Section 14 and Section 15.

14.4. Administrative Services. An amount equal to the reasonable actual cost of administrative services fairly attributable to the operation of the Project and the administration of this Agreement including, but not limited to, legal, accounting, and consulting engineering services, and the actual cost of paying agents or other services which District requires in processing and making payments to the holders of indebtedness incurred by District in connection with the Project.

14.5. Insurance. The actual cost of all insurance required by this Agreement to be maintained by District.

14.6. Electric Energy. The cost of electric energy provided to the Project. Electric energy will be provided by District. District shall charge the Project, from time to time, consistent with District policy as to use and applicable rate structure and cost the same as would be charged to District itself.

14.7. Other Payments and Costs and Deductions From Payments and Costs. The amount of payments or costs and deductions from payments or costs specified by Sections 12.1.1, 12.1.3, 12.1.4, and 12.2.2, and 16.3.2.

14.8. Payments by City to District for Raw Water Only. To assist District in planning its budget, City will pay District on an annual Domestic Water Year basis in accordance with the following:

1. City shall estimate and provide its estimate to District no later than thirty (30) days prior to the commencement of each Domestic Water Year, its anticipated usage of Treated Water.
2. District shall multiply the raw water charge determined in accordance with Section 14.2, above, by City's estimate to obtain a total estimated annual Raw Water Charge to City for budget planning purposes.

3. At the end of each Domestic Water Year, District shall calculate City's actual total Raw Water Charge in accordance with Section 14.2 of this Agreement, based on actual Raw Water used and use this cost for calculation of City's payments pursuant to Sections 15.3 and 15.4.

14.9. First Expansion Facilities. Upon completion of the First Expansion Facilities (as evidenced by the Commercial Operation Date), the application of the billing and payment provisions in this section shall be modified to provide for billing and payment to include the operation and maintenance of the First Expansion Facilities.

15. TIME AND MANNER OF PAYMENT BY CITY TO DISTRICT.

15.1. Monthly Payments. Payment of the total sum due for each Year pursuant to Section 14 shall be as set forth in this Section 15. Each monthly payment to be made pursuant to this Section 15 shall be made on the first day of each month.

15.2. Proration. Any payment made pursuant to this Agreement which covers less than a full month or which covers less than a Year shall be prorated accordingly.

15.3. Calculation of Monthly Payments. Prior to December 31 of each Year, District shall prepare and adopt a budget for the forthcoming Year pursuant to section 18.7 of this Agreement. The budget shall include all of the items listed in section 14. The budget for a Year shall determine and set forth a monthly payment amount to be made by City which shall be the net amount of budgeted expenses for the Year, less any refunds or credits allowed to District in connection with the Project pursuant to the Agreement, divided by 12. Each Year, the new monthly payment calculated as provided in this section 15.3 shall take effect at the beginning of the next ensuing Domestic Water Year (i.e., the new monthly payment for a Year shall take effect on May 1 of that Year). Regarding the First Expansion Facilities, (a) the budget and City payments shall be increased to include Debt Service for the First Expansion Facilities Financing for the Year in which the Debt Service payments for such Financing become due, and (b) the budget and City payments shall be increased to include the other expense items for the First Expansion Facilities listed in section 14 after the Commercial Operation Date for the First Expansion Facilities.

At the conclusion of each Year, District shall prepare an accounting of the actual expenses for the Year as compared with the Year's budget and City payments for the Year, and determine whether City made overpayments or underpayments for the Year based on the actual

City payments compared to actual expenses. City shall pay the amount of any underpayment for a Year in a lump sum payment to District. District shall pay the amount of any overpayment for the Year in a lump sum payment to City. The amount of any such overpayment or underpayment shall be reflected in the first invoice for the Domestic Water Year immediately following the completion of the accounting, and shall be due and payable at the time payment of such invoice is due and payable.

15.4 Late Payments. Any amounts owed by one Party to the other Party under this Agreement that is not paid in full when due shall thereafter bear interest at the rate of 1% per month of the unpaid balance, or at the maximum lawful rate, whichever is less.

16. GENERAL PAYMENT PROVISIONS.

16.1. Percentages. [Not Used].

16.2. Records. District shall (i) keep and maintain and provide to City detailed cost accounting reports documenting the Project costs, (ii) keep and maintain separate accounting and bookkeeping records with a separate account and fund for the Project, and (iii) allow City and its employees, accountants, attorneys and agents to review, inspect, copy and audit the accounting and bookkeeping records of District, including all source documents. District shall have the right to review, inspect, copy, and audit all accounting and bookkeeping records of City, including all source documents, as may pertain to the receipt, delivery, and sale of water received from the Project.

16.3. Security for Payment, Rate Covenant by City. Prior to obtaining the Financing for the First Expansion Facilities as set forth in Section 13.1, District shall be entitled to the assurances it may reasonably deem necessary, and be entitled to the financial information as may be necessary, to ascertain that City is in the financial condition as will allow it to fulfill its financial commitments to the First Expansion Facilities.

16.3.1. [Not Used]

16.3.2. Security from City. City's security obligation pursuant to this Section 16.3 shall be satisfied by the following rate covenant and pledge of City Gross Water Revenues which shall be effective and binding upon City upon the execution of this Agreement by the Parties:

16.3.2.A. Rates and Charges. City shall fix, prescribe, and collect water rates and charges which shall be at least sufficient to yield City Gross Water Revenues during

each fiscal year of City in an amount equal to: (i) the payment obligations of City under this Agreement during the fiscal year other than Debt Service; (ii) City maintenance and operations costs to the extent not included in clause (i) above; plus (iii) one hundred twenty-five percent (125%) of the Debt Service to be paid during the fiscal year.

16.3.2.B. Pledge. All City Gross Water Revenue and all money on deposit in the funds established by this Agreement are hereby irrevocably pledged to the punctual payment of the interest on and principal of and redemption premiums if anyone the obligations evidencing the Financing and all obligations of City under any Parity Debt. This pledge shall constitute a lien on and security interest in City Gross Water Revenues and funds established by this Agreement and shall attach, be perfected, and be valid and binding from and after the consummation of the Financing or the issuance of Parity Debt, without any physical delivery thereof or further act. If City gives any additional collateral to secure the payment of the Financing, City agrees that such collateral shall also secure all obligations of City under any Parity Debt on a pari passu basis.

16.3.2.C. Similar Covenant. City hereby covenants and agrees that it shall require a covenant substantially similar to clauses (i), (ii), and (iii) of Section 16.3.2.A with respect to all Parity Debt.

16.3.2.D. Parity Debt. In addition to its obligations hereunder, City may issue or incur Parity Debt in such principal amount as shall be determined by City in accordance with Section 16.3.2.C.

16.3.2.E. Subordinated Debt. In addition to its obligations hereunder, City may issue or incur loans, bonds, notes, advances or indebtedness payable from City Gross Water Revenues on a junior and subordinated basis with its obligations hereunder in such principal amount as shall be determined by City.

16.3.2.F. Amendment To Obtain Financing. This Section 16.3.2 may be amended from time to time by the Parties to the extent necessary to obtain the Financing as set forth in Section 13.1 and, after the Financing is obtained and so long as it remains unpaid, may only be amended in accordance with the terms and conditions of the legal documents for the Financing.

16.3.2.G. Alternative Security. City may be relieved from its obligation to perform any of the covenants set forth in this Section 16.3.2 by providing to District for

deposit with Trustee a policy of municipal bond insurance, irrevocable letter of credit, surety bond or similar credit facility assuring payment of Debt Service due and payable by City pursuant to this Agreement, and which is acceptable to District and Trustee in accordance with the terms and conditions of the Financing.

17. DELIVERY OF WATER.

17.1. Water Supply to City. Subject to Sections 4.41 and 17.2, District shall make available to City an amount of Treated Water equal to 30 million gallons per day. District shall consult with City on a regular basis during the Commercial Operation Phase to determine the schedule of deliveries, and, consistent with the terms of this Agreement, District shall use its best efforts to meet the requirements of City. Notwithstanding any other provision of this Agreement, in a Drought situation the delivery of surface water by District for agricultural uses to its agricultural customers and for municipal uses to City shall be reduced in equal proportions in accordance with the formula in Section 17.2.

Upon completion of the First Expansion Facilities (as evidenced by the Commercial Operation Date), the Treated Water quantities as set forth in sections 17.1 to 17.7 shall be changed from 33,602.1 acre-feet per year and 30 million gallons per day to 67,204.2 acre-feet per year and 60 million gallons per day.

District promises and agrees to treat District's agricultural customers and City on a parity basis. If District is required to reduce deliveries, it will cut back its deliveries to its agricultural customers and to City in equal proportions. In keeping with the foregoing, District agrees that its commitments to its agricultural customers and to City shall be met before any subsequent water transfers for delivery of water outside District's boundaries. It must be understood, however, that "transfers" between District and Turlock Irrigation District made in the ordinary course of operations are not included in the foregoing, as District and Turlock Irrigation District regularly deliver water to each other in the interest of maximizing beneficial use of their water rights and facilities.

17.2. Formula for Water Allocation. During each Domestic Water Year, District shall make available to City 33,602.1 acre feet of Treated Water provided that the allocation of City shall be reduced in any Domestic Water Year that the following calculation results in a sum less than 33,602.1 acre feet:

$$(Y/42) \times 33,602.1 = X$$

"Y" shall be the actual number of inches of water allocated by the Board to agricultural water users for the subject irrigation season commencing immediately prior to each Domestic Water Year. In the event a portion of the water allocation is optional as in 1991 as described in Section 14.2.1 and the fixed and optional amounts equal or exceed 42 inches, then City shall be assumed to have exercised the available option up to a total of 42 inches for the purposes of the above calculation. If no allocation is made for any irrigation season, the allocation shall be presumed to be 42 inches. The actual maximum Treated Water allocation of City for the subject Domestic Water Year shall be 33,602.1 acre feet of Treated Water or the amount calculated as "X" in the above formula, whichever is less. It is anticipated that from time to time District may modify its current agricultural water allocation. When District makes changes in its agricultural water allocation that result in the above allocation formula no longer ensuring that reductions or increases in available water are in equal proportions as between District's agricultural customers and City, subject to the limitation of 33,602.1 acre feet of Treated Water, the Parties shall meet and confer and agree upon necessary changes in the above allocation formula so as to ensure that reductions and increases in available water are in equal proportions as between District's agricultural customers and City.

Except as provided in Section 17.3, in no event shall District be required to make available to City, more than 33,602.1 acre feet of Treated Water for First Expansion Facilities during any Domestic Water Year. If the applicable formula during any Domestic Water Year provides for an annual allocation of less than 33,602.1 acre feet, there shall be no suspension in the payment obligations of City, set forth in Section 14, regardless of the length of the Period during which deliveries of Treated Water shall be less than 33,602.1 acre feet for each Domestic Water Year. Nothing contained in this Section 17.2 shall be deemed to modify in any way District's right to suspend, curtail, or reduce water deliveries as provided in Section 9.9 and in this Section 17.2. Nothing in this Agreement shall be construed to require District to curtail deliveries of water during any Period.

17.3. Treated Water Delivery Schedule. The parties acknowledge that City's water needs vary throughout the Domestic Water Year with high peak day demands in summer and lower demands in winter. City shall have the right to specify, on a daily basis, its water delivery requirement for the following day (or longer period of time as agreed between the parties) and

District shall be obliged, subject to its engineering, operating, maintenance, regulatory, safety and other practical requirements, to make a good faith effort to meet the daily (or longer period) demands specified by City.

17.4. Adjustment of Curtailment. In the event that a severe and prolonged drought threatens the ability of City to deliver adequate drinking water to its customers despite its efforts to impose rationing and to utilize all water resources available to it, the Parties shall meet and confer to determine whether, and upon what terms, water allocations other than those provided for in this Agreement could be implemented which would alleviate hardships to the customers of City without unduly or disproportionately injuring agriculture. In the event that water deliveries during a Domestic Water Year must be curtailed pursuant to Section 17.2, for the reasons set forth in the preceding sentence or for any other reason, the Parties shall meet and confer for the purpose of reaching an agreement as to an alternative curtailment formula or water allocation basis which more equitably and more fairly meets the then current needs of the agricultural and municipal water users within District's boundaries. The Parties shall also endeavor to reach agreement upon other terms and conditions necessary to implement an agreement. The duration of an adjustment agreement shall be specified in the agreement. In the event that no agreement can be reached, the deliveries shall be curtailed in accordance with the formula set forth in Section 17.2 of this Agreement.

17.5. Exchange for Groundwater. During a Domestic Water Year in which City's allocation is reduced below 33,602.1 acre feet of Treated Water, City shall continue to have the option to deliver groundwater to the irrigation canal system in exchange for additional surface water as provided by Section 9.8.

17.6. Water to Remain in District's Irrigation District Boundary. No Treated Water delivered by District to City, not offset by City groundwater and City water supplies other than the Treated Water within District's Irrigation Boundary, shall be allowed to flow outside District's Irrigation District Boundary. In order to demonstrate and ensure compliance with this Section 17.6, City shall install and maintain meters to monitor flow and usage at appropriate locations on its water delivery systems to determine (i) the amount of all Other City Water delivered to the Service Area, and (ii) the amount of all water (whether Treated Water or Other City Water) transported outside District's Irrigation District Boundary. City shall monitor these records to ensure that the amount recorded under (i) is at all times greater than or equal to the

amount recorded under (ii). City shall maintain records as to the items set forth above in this Section 17.6 which records shall be open to reasonable inspection by District, and its officers, directors, officials, employees, agents, and volunteers. A monthly summary of the applicable records shall be provided to District by City .

17.7. Conjunctive Use. It is understood by the Parties that from time to time water allocations for a Domestic Water Year to City may be reduced below 33,602.1 acre feet by the application of the formula set forth in Section 17.2. Accordingly, City shall exert its best efforts to maintain, in its judgment, reasonable groundwater pumping capacity to meet the needs of its Service Area during times of reduced surface water allocations. City's obligation to maintain reasonable groundwater pumping capacity shall be subject to the constraints of the groundwater basin underlying City as described in the Urban Water Management Plan and other City records, and City's obligation shall be subject to what is feasible and cost-effective.

18. PROJECT MANAGEMENT.

18.1. District's Board of Directors.

18.1.1. Final Decisions. Subject to the Approvals set forth in Section 18.3 and Section 18.5 and subject to the review set forth in Section 18.5 and Section 18.6, the Board shall be the final decision making authority with regard to the Project. The Board shall consider the recommendations of the Project Manager. All Board decisions shall be made at duly noticed regular meetings or special meetings.

18.1.2. Project Manager. The Board shall appoint a Project Manager, who shall perform those duties set forth in Section 18.2.

18.2. Duties of Project Manager.

18.2.1. Implementation of this Agreement. The responsibility for implementing and administering this Agreement and for carrying out the tasks necessary for the successful completion of each of the Phases of the First Expansion Facilities shall be vested in the Project Manager.

18.2.2. Notice to Advisory Committees. The Project Manager, in the course of fulfilling his responsibilities, shall provide the Advisory Committees reasonable advance notice of impending major decisions as defined in Section 18.6.1.C.

18.2.3. Specific Duties. The Project Manager shall have the following powers, duties, and responsibilities:

18.2.3.A. Work Plans. Developing a work plan for each Phase of the Project.

18.2.3.B. Progress Reports. Submitting periodic progress reports to the Parties and to the Board.

18.2.3.C. Administering Contracts. Administering this Agreement and any contracts as are entered into pursuant to this Agreement.

18.2.3.D. Public Information. Serving as public information officer for the Project.

18.2.3.E. Recommending Consultants. Recommending the hiring or utilization of consultants, engineers, contractors, attorneys, underwriters, and other services necessary to carry out the Project.

18.2.3.F. Financial Report. Preparing an annual financial report within three months of the end of each Year of the operation of the Project for review by the Advisory Committees. The annual financial report shall include the amount of water delivered by District to its agricultural customers and to City during the preceding Year. To the extent permitted by data available at the time of preparation of the report, the report shall also include estimates of the amount of water which will be available during the current Year for delivery to the agricultural water users of District and to City. In the event that during the Year changed water conditions modify the projections of the availability of water to District's customers, the Project Manager shall promptly notify the Advisory Committees.

18.2.3.G. Emergency Plans. Developing emergency plans for dealing with reasonably anticipated events of force majeure so as to minimize, to the extent practical, the interruption or curtailment of the operation of the Project and, to the extent practical, ensure the continued delivery of Treated Water to City.

18.2.3.H. Other Duties. Other duties as are necessary and proper to carry out the Project.

18.3. City Approval of First Expansion Facilities Milestones. Since City will be paying virtually all costs associated with design, construction, operation, maintenance, repair, reconstruction, and Modifications of and to the First Expansion Facilities, the Parties agree and consent that City shall have the authority to approve or disapprove major First Expansion Facilities milestones as follows:

18.3.1. Engineering Services. Prior to District's approval of any engineering services contract concerning the design and engineering of the First Expansion Facilities, City shall review the contract or contracts and each shall provide District with written authorization to proceed.

18.3.2. Review of Preliminary Design. Prior to proceeding with the final Design Phase under an engineering services contract, City shall review the preliminary design plans and preliminary cost estimate and each shall provide District with its written authorization to proceed.

18.3.3. Acceptance of Final Design. Prior to accepting the final design work, including construction ready final plans and specifications and final cost estimate, City shall review the final design work and cost estimate and shall provide District with its written authorization to proceed.

18.3.4. Construction Contracts. Prior to District's approval of a construction contract or contracts for the construction of the First Expansion Facilities, City shall review the construction contract documents and shall provide District with its written authorization to proceed.

18.4. Processing Milestone Approvals. City shall act promptly in giving or refusing to give any of the written authorizations to proceed as set forth above. The written authorizations to proceed to be given by City shall not be unreasonably withheld. If City fails to provide its written authorization to proceed, or written refusal of authorization, within 45 days from the date of the written request for authorization from District, then City shall be deemed to have authorized District to proceed with the milestone in question. If City refuses to authorize any of the foregoing Project milestones, it shall set forth in writing its reason or reasons for the refusal and shall timely provide the writing to the other Party. Thereafter either (i) District shall work to address and resolve City's concerns and then re-request the written authorization to proceed for the particular Project milestone, or (ii) either Party may terminate the First Expansion Facilities pursuant to Section 22.2.

18.5. Project Financing Approvals. Prior to issuing bonds or other evidences of indebtedness or certificates of participation for the purpose of Financing the First Expansion Facilities, District shall give written notice to City that the time to commence Financing has arrived. Within 30 days of the notice, the Finance Committee shall meet and confer at least once

and within 60 days of the notice City shall advise District in writing as to whether Fixed Financing or Variable Financing shall be used. If City advises in writing that Fixed Financing is to be used or fail to give their written advice within 60 days of the notice, the Fixed Financing shall be used.

18.5.1. Fixed Financing. If Fixed Financing is to be used, District shall give written notice to City that Fixed Financing is to be used and shall request that City give to District a not-to-exceed TIC within 30 days of the notice and request. Within 15 days of the notice and request by District, the Finance Committee shall meet at least once. Upon receipt of a not-to-exceed TIC from City, District shall thereafter be responsible for marketing the Financing subject to the not-to-exceed TIC approved by City. The members of the Finance Committee shall be present at the time and place of marketing and they and their financial advisers shall consult with the persons responsible for the marketing for District and the terms and conditions of the Financing, but all final decisions shall be made by District, provided that the TIC of the issue is (i) the lowest then available, and (ii) at or below the not-to-exceed TIC approved by City. In the event City fails to approve a not-to-exceed TIC within 30 days of the notice from District that Fixed Financing is to be used, then the Parties shall seek to reach agreement as to a not-to-exceed TIC or either Party may terminate the First Expansion Facilities pursuant to Section 22.2. It is understood that bond insurance shall be used with Fixed Financing if, when the cost of bond insurance premiums is included in Debt Service, the result is the lowest Fixed Financing alternative available at the time of Fixed Financing.

18.5.2. Variable Financing. Variable Financing shall be used only during the Construction Phase, except as otherwise provided herein. If City agrees that Variable Financing should be undertaken, District shall issue Variable Financing for the duration of the Construction Phase. No later than 60 days after the Commercial Operation Date, the Variable Financing shall be replaced entirely by Fixed Financing unless the Parties unanimously agree to the contrary. It is understood that Variable Financing may require the use of a letter of credit and, if that is the case, the cost of the letter of credit shall be financed out of the Variable Financing.

18.5.2.A. Initial Financing. Variable Financing shall initially be issued in the maturities and at the interest rates as, in the judgment of District after consulting with the Finance Committee, provides the most cost-effective combination of maturities and interest rates.

Thereafter, as the securities mature, District shall be solely responsible for the remarketing of the securities until the Issuance of the Fixed Financing.

18.5.2.B. Conversion During Construction Phase. If Variable Financing is issued for the First Expansion Facilities, City may, during the Construction Phase, request that District convert the Variable Financing to Fixed Financing. The request may be conditioned upon the ability of District to secure the Fixed Financing at a TIC specified in City's request.

18.5.2.C. Conversion Upon Commercial Operation. If no request to convert Variable Financing to Fixed Financing has been made prior to the Commercial Operation Date, District shall convert the Variable Financing to Fixed Financing on the Commercial Operation Date, or within 60 days thereafter without regard to the provisions of Section 18.5.1, provided, however, that District shall consult with the Finance Committee during the time it is converting the Variable Financing to Fixed Financing unless the Parties unanimously agree to the contrary.

18.6. Advisory Committees. In order to assist District and the Project Manager with the implementation of the Project, the following committees are formed and shall have the following duties, responsibilities, and authority:

18.6.1. Policy Committee. A Policy Committee consisting of two City Council members and two members of the Board. The Policy Committee shall meet at least twice each Year, and at other times when a meeting is called by the Project Manager. Each member of the Policy Committee shall serve at the pleasure of the Party selecting that member. The Policy Committee shall function during all three Phases, and shall have the following responsibilities and authority:

18.6.1.A. First Expansion Facilities Milestones. To review and make recommendations to City concerning the request for authorization to proceed with First Expansion Facilities milestones pursuant to Section 18.3. District and the Project Manager shall not request written authorization to proceed with any of the First Expansion Facilities milestones until after the Policy Committee has reviewed the proposal and made a recommendation to City.

18.6.1.B. Budget Functions. To perform the functions with respect to District budget for the Project as set forth in Section 18.7. All expenditures of District concerning the Project shall be consistent with the approved budget.

18.6.1.C. Major Decisions and Design Changes (In Excess of $100,000). To review and advise District and the Project Manager concerning major decisions or changes in the Project or design of the First Expansion Facilities. A major decision shall be defined as any contract, change order, purchase, change in policy, or any other action with an estimated cost in excess of $100,000. A major change in the design of the First Expansion Facilities shall be defined as any change involving an estimated increase or decrease in the cost of the First Expansion Facilities in excess of $100,000. A major decision shall not include any budgeted expenditure in a budget that has been approved pursuant to Section 18.7.

18.6.2. Technical Committee. A Technical Committee, consisting of one staff person appointed by each Party, and one alternate member as each Party deems necessary. Each member of the Technical Committee shall serve at the pleasure of the Party selecting that member. The Technical Committee shall meet at least once each month, and at all other times as requested by the Project Manager. During the Construction Phase of the Project, the Technical Committee shall meet once a month. If additional meetings are required, any of the parties, with five days prior notice, may schedule a Technical Committee meeting. The Technical Committee shall function during all three Phases of the Project, and shall have the following responsibilities and authority:

18.6.2.A. Consultation With Project Manager. To advise and consult with the Project Manager and District, to exchange information, and to make any necessary recommendations relating to the Project design, construction, operation, and maintenance. The Project Manager shall, from time to time, inform the Technical Committee of any material event, incident, occurrence, or condition that the Project Manager anticipates may impair District's ability to perform its obligations under this Agreement, including, but not limited to, labor disputes and threatened or pending litigation.

18.6.2.B. Recommendations to Policy Committee. To review and make recommendations to the Policy Committee for all matters within the scope of authority and responsibility of the Policy Committee.

18.6.2.C. Advice Relative to Minor Decisions ($5,000 to $100,000). To review and advise the Project Manager concerning any minor decision affecting the Project. A minor decision shall be defined as any contract, change order, purchase, change in policy, or any other action with an estimated cost between $5,000 and $100,000, and any action involving

changes in Treated Water quality beyond the range of normal plant operation variability. A major decision shall not include any budgeted expenditure in a budget that has been approved pursuant to Section 18.7.

18.7. Budget.

18.7.1. Budget Principles. In preparing and reviewing budgets for the Project, the Parties shall be guided by the principle that the Project shall be operated in as economic a manner as practical in accordance with generally accepted waterworks practices as evidenced by well designed and operated similar sized potable water treatment plants in Northern California.

18.7.2. Budget Process.

18.7.2.A. Preparation. For each Year during the Commercial Operation Phase, District shall prepare a budget for the Project prior to December 31 for the next ensuing Year. All Project budgets shall include both operating and capital components and shall include a monthly payment to be paid during the next ensuing Domestic Water Year in accordance with Sections 14 and 15. Upon completion of the First Expansion Facilities (as evidenced by the Commercial Operation Date), the budget shall be expanded to include the First Expansion Facilities costs and the increased Treated Water allocation of 67,204.2 acre-feet per year.

18.7.2.B. Technical Committee Review and Recommendation. Prior to completion of the first administrative draft of each Year's budget by District, the Project Manager shall meet with the Technical Committee at least once to discuss and receive input from the Committee concerning development of the budget. Prior to submission of the budget to the Policy Committee, the Technical Committee may make a recommendation with respect to the budget to the Policy Committee. Upon completion of the first administrative draft of a Year's budget and not later than September 15 of each Year, the Project Manager shall forthwith furnish it to the members of the Technical Committee. Within 15 days of receipt of the draft budget, the Technical Committee members may individually or collectively submit to the Project Manager their recommendations and/or comments regarding draft budget. The documents shall not be mailed to City as provided in Section 18.7.2.C until after the expiration of this 15 day Period.

18.7.2.C. Information to City. At least 10 days before the mailing of the annual budget to City as provided in this Section 18.7.2.C, the Project Manager shall mail copies of the budget to the Technical Committee and during the 10 day Period the Project Manager shall arrange at least one meeting of the Technical Committee for review of the budget. After the

expiration of the above 10 day Period and at least 20 days before the submission of each annual budget to District Board, the Project Manager shall mail to City copies of the proposed budget for the ensuing Year and a detailed calculation of the proposed monthly payment obligations of City for the ensuing Domestic Water Year calculated pursuant to Section 15.3 of this Agreement. Commencing after the first Year of operation, the Project Manager shall also at the same time mail copies of the most recent update of the current Year's expenditures and revenues, and the balance sheet and income statement for the most recent Year, if available.

18.7.2.D. Policy Committee Review. Approximately 10 days before the submission of the budget to District Board, the Policy Committee shall meet to review and discuss the proposed budget for the ensuing Year. District staff at this meeting shall explain and justify the need for all of the various budget items and proposed expenditures. At this meeting, the Parties shall strive to agree upon a budget for the ensuing Year.

18.7.2.E. Consideration of Budget by Policy Committee. The budget shall be deemed approved by the Policy Committee unless, at the meeting, the Committee by an affirmative vote of at least two members of the Committee objects to one or more of the budget items. If the Policy Committee objects to one or more budget items, the Committee members objecting shall specify the item or items of the budget which are objectionable, and why the item or items are objectionable.

18.7.2.F. Revision of Budget, Alternate Budget and Report. If one or more budget items are objected to by the Policy Committee, District shall either (i) revise the budget at the Policy Committee meeting so that it is acceptable to at least three members of the Policy Committee, (ii) continue the Policy Committee meeting and thereafter consider the objections raised at the meeting and prepare a revised budget for consideration by the Policy Committee at a subsequent meeting, or (iii) District may determine to submit the budget to District Board over the objections of the Policy Committee. In the latter event, District shall give written notice to the Policy Committee, and the Policy Committee may, within 10 days after receipt of this notice, submit an alternative to the objectionable budget item or items to District Board to be considered along with the budget submitted by District. The alternative budget item or items shall be accompanied report as to the reasons the alternate budget should be adopted in place of the budget submitted by District.

18.7.3 Public Hearing. The annual budget for the Project shall be adopted by the Board only after a public hearing for which ten days' notice has been given by publication in a newspaper of general circulation published and circulated within District. The period of notice commences on the first day of publication and terminates on the 10th day following, including the day of publication.

18.7.4. Appearance at Hearing. The foregoing provisions on review concerning the budget are not intended to, and shall not, preclude City, and its officers, , officials, employees, agents, and volunteers, from appearing before District Board regarding the proposed budget.

18.7.5. Increase. If, during the course of any Year, District proposes to make any budget increase, then the provisions of Sections 18.7.1 through 18.7.2.F concerning review of budgets shall apply to the budget increase.

19. LIABILITY AND INSURANCE.

19.1. Insurance, General. During all Phases of the Project, District shall procure and maintain Project Insurance, including coverage for the construction, operation, and maintenance of the Project, and all operation and activities concerning all Phases of the Project. Such Project insurance coverage shall be primary insurance coverage for all claims related to this Project and City shall be named as an additional insured. Any insurance or self insurance maintained by City, District or their respective directors, officers, officials, employees, agents or volunteers shall be excess of the Project insurance and shall not contribute with it.

19.1.1. Project General Liability. Project General Liability insurance in an amount not less than $1,000,000 per occurrence, combined single limit for bodily injury and property damage, $3,000,000 aggregate.

19.1.2. Commercial Automobile Liability Insurance. Commercial Automobile Liability insurance including, as applicable, owned, non-owned and hired automobiles, in an amount not less than $1,000,000 per occurrence combined single limit for bodily injury and property damage.

19.1.3. Umbrella or Excess Liability Insurance. Umbrella or Excess Liability insurance in an amount not less than $10,000,000 over and above the underlying limits with the Umbrella or Excess Liability policy containing insuring agreements, exclusions and conditions of coverage substantially similar to the underlying policies.

19.1.4. Workers' Compensation Insurance. Workers' Compensation Insurance as required by the State of California, including employer's liability limits of not less than $1,000,000 per accident. All rights of subrogation against City, its officers, elected officials, officials, employees, and volunteers shall be waived by the insurer for losses arising from work performed by District. All costs for the waiver of subrogation shall be borne by the Project.

19.1.5 Property Insurance.

19.1.5.A. Course of Construction Insurance. District shall maintain this coverage in its insurance policy portfolio protecting the First Expansion Facilities.

19.1.5.B. Buildings and Equipment Insurance. Special form (all risks subject to approved exclusions) insurance for the Project shall be placed on a replacement cost basis, including the agreed amount or comparable endorsement, all buildings and structures comprising the Project and all fixtures, equipment, and facilities located in, on, or connected with the Project, excluding the pipeline and its associated equipment and fixtures. Such insurance shall include coverage for loss of use, loss of rents, or loss of financing payment. Loss payee under this policy mentioned in this Section 19.1.5.B shall be determined by the Financing documents.

19.1.6. Insurance Provisions. Each insurance policy required by this Agreement shall contain the following clauses:

19.1.6.A. Cancellation. This insurance shall not be cancelled, limited in scope or coverage or non-renewed until 30 days after prior written notice has been given to District and City. Upon receipt of a notice of cancellation of non-payment, District shall give City immediate notice of non-payment of any insurance policy premium required to maintain the insurance coverage required by this Agreement.

19.1.6.B. City to be Named. On all policies, City and its officers, elected officials, officials, employees, agents, and volunteers are to be covered as additional insureds as respects to claims or losses arising out of activities related to the Project. This additional insured requirement shall not apply to Workers' Compensation Insurance.

19.1.6.C. Special Limitations. No policy shall contain any special limitation as to the scope of protection afforded City or its officers, elected officials, officials, elected officials, employees, agents, and volunteers.

19.1.6.D. Approval by City. The policies of insurance required by this Agreement shall be issued by an insurer, or insurers, and shall be in a form approved by City, which approval shall not be unreasonably withheld. Any deductible, and/or self insured retention must be declared to City. District and City shall meet annually to review Project insurance and, if changes are necessary, make recommendations to the Technical Committee.

19.1.7. Insurance Provision in All Contracts. In any and all contracts entered into concerning the construction, operation, or maintenance of the Project, District shall include a provision requiring that the contractor and all of its subcontractors provide insurance protection in an amount agreed by City and District.

19.2. Indemnification and Hold Harmless.

19.2.1. Indemnification by District. Except as provided in Sections 19.3 through 19.6, District shall indemnify, defend, protect, and hold harmless City, and its officers, elected officials, officials, employees, agents, and volunteers from any and all liabilities, claims, damages, losses, judgments, penalties, costs, or expenses (including attorneys' fees) arising out of or relating to the performance of the Project caused in whole or in part by any negligent act or omission of District or contractors, any subcontractors, or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, except where caused by the active negligence, sole negligence, or willful misconduct of City, its officers, officials, elected officials, employees and volunteers.

19.2.2. Cost of Litigation. Subject to the other provisions of this Agreement, the reasonable cost of the prosecution and defense of litigation and the payment of settlements or judgments in connection with litigation necessary to perform, or arising from, the construction, financing, operation, or maintenance of the Project by District shall be a cost of the Project.

19.2.3. Notification. District shall advise City in writing promptly as to any litigation the cost of which, including settlements or judgments, District proposes be a cost of the Project.

19.2.4. Objections. If City raises any objection in writing within 10 days of notification pursuant to Section 19.2.3 as to the cost of litigation being a cost of the Project, then the matter shall be subject to review by the Parties. In the event that City takes the position that the cost of particular litigation should not be an expense to be passed on to the Project or that only a portion of the cost of particular litigation should be an expense to be passed on to the

Project, then City Attorney, and the General Counsel of District shall meet and endeavor to reach an agreement relative to the sharing of the costs related to the particular litigation. If the attorneys are unable to promptly come to an agreement, the issue shall be submitted to the Chief Executive Officers. If the Chief Executive Officers are unable to promptly come to an agreement, the Parties shall promptly agree upon an independent attorney or retired judge to determine the matter. If the Parties cannot, within thirty (30) days of the dispute first arising, agree upon a decision relative to the dispute or an independent attorney or retired judge to determine the matter, any Party may request the American Arbitration Association to appoint an independent attorney or retired judge. For purposes of calculating the foregoing 30 day period, the dispute shall be deemed to have arisen on the day City gave notice to District of an objection pursuant to this Section 19.2.4. Upon appointment, the independent attorney or retired judge shall promptly decide the dispute based upon whether the litigation involved is necessary to perform, or arises from, the construction, financing, operation, or maintenance of the Project by District.

19.3. Third Party Claims Not Covered by Insurance; Willful. With respect to claims and lawsuits against one or more of the Parties by third parties concerning injury, death, property damage, or construction claims resulting from the construction, operation or maintenance of the Project, which claims and lawsuits are not covered by insurance, including self insurance, maintained by District pursuant to Section 19.1, and which are the result of willful misconduct, intentional tort, or gross negligence of one of the Parties, the Party whose willful misconduct, intentional tort, or gross negligence resulted in the damage claimed by the third party shall indemnify, defend, protect, and hold harmless the other Party, and its respective officers, elected officials, officials, employees, agents, and volunteers from any and all liabilities, claims, damages, losses, judgments, penalties, costs, or expenses (including attorneys' fees) resulting from a claim or lawsuit by a third party. This Section 19.3 shall not apply if the lack of insurance coverage is because of a denial of coverage based on District's failure to comply with any claim reporting requirement of any applicable insurance.

19.4. Third Party Claims Not Covered by Insurance; Ordinary. With respect to claims and lawsuits against one or more of the Parties by third parties concerning injury, death, or property damage resulting from the construction, operation or maintenance of the Project, which claims and lawsuits are not covered by insurance, including self insurance, maintained by

District pursuant to Section 19.1, and which are not the result of willful misconduct, intentional tort, or gross negligence of one of the Parties, District shall defend the claim or lawsuit on behalf of either or both of the Parties to this Agreement which are named in the claim or lawsuit, and District shall pay any settlement entered into by District or judgment entered against District or City. City shall reimburse District for its defense costs (including attorneys' fees and litigation expenses), settlement and judgment amounts incurred pursuant to this provision, in accordance with their respective percentage obligations to reimburse all Project costs pursuant to this Agreement, provided, however, that City shall not be obligated to pay any settlement of any Project related claim unless City approves the settlement. This Section 19.4 shall not apply if the lack of insurance coverage is because of a denial of coverage based upon District's failure to comply with any claim reporting requirement of any applicable insurance.

19.5. Claims Between Parties. With respect to claims and lawsuits by one of the Parties against the other, the claims and lawsuits shall be processed and resolved in accordance with (i) the Tort Claims Act and/or (ii) breach of contract remedies provided by this Agreement, or applicable law. Nothing in this Agreement shall relieve either Party of any contractual liability or duty imposed by this Agreement.

19.6. Workers' Compensation Claims. Each Party shall bear the costs of discharging all liability imposed, including costs and expenses for attorneys' fees and other costs of defending, settling, or otherwise administering claims arising out of workers' compensation or employers liability claims brought by its employees.

19.7. Replacement of Pro Rata Right of Contribution. The insurance, indemnification, hold harmless, and reimbursement provisions set forth above in Sections 19.1 through 19.4 are intended to and shall replace, and be applicable instead of, the pro rata right of contribution provisions of Government Code Section 895.6, to the extent that Section is applicable.

19.8. Defense by Modesto City Attorney. For any claim or lawsuit against City (whether or not also against District) which falls under Section 19.4, City may defend its own interests through its City Attorney's office; provided, however, that if District is also named in the claim or lawsuit, defense of District by the Modesto City Attorney shall only be with the consent of District, which consent shall not be unreasonably withheld. City shall bear all costs and expenses in representing its own interests pursuant to this Section 19.8. If the Modesto City Attorney represents both parties, then its costs and expenses shall be divided equally among the

Parties to the claim or lawsuit. If City decides not to represent its own interests pursuant to this Section 19.8 , then District shall defend the claim or lawsuit on behalf of City pursuant to Section 19.4.

20. RELATIONSHIP OF PARTIES.

Except as provided in Section 19, the covenants, obligations, and liabilities of the Parties are intended to be several and not joint or collective, and nothing herein contained shall ever be construed to create an association, joint venture, trust, or partnership, or to impose a trust or partnership covenant, obligation, or liability on or with regard to one or both of the Parties. Each Party shall be individually responsible for its own covenants, obligations, and liabilities pursuant to this Agreement. No Party shall be under the control of or shall be deemed to control any other Party or the Parties as a group. No Party shall be the agent of or have a right or power to bind any other Party without its express prior written consent, except as expressly provided in this Agreement.

21. GENERAL PROVISIONS GOVERNING AGREEMENT.

21.1. Severance. In the event that any of the terms, covenants or conditions of this Agreement or the application of any term, covenant or condition shall be held invalid as to any Party or circumstance by any court having jurisdiction over the Parties or subject matter of this Agreement, all other terms, covenants or conditions of this Agreement and their application shall not be affected thereby, but shall remain in force and effect unless a court holds that the provisions are not separable from all other provisions of this Agreement.

21.2 Waiver. The waiver at any time by any Party of its rights with respect to a default or other matter arising in connection with this Agreement shall not be deemed a waiver with respect to any subsequent default or matter.

21.3. Counterparts. This Agreement may be executed in counterparts.

21.4. Supporting Resolutions. Each Party represents that it has legal authority to enter into this Agreement and to perform its obligations hereunder, and shall attach to this Agreement a duly authorized resolution evidencing the authority and authorizing the person executing this Agreement to do so.

21.5. No Rights in Other Parties. This Agreement is for the sole benefit of the Parties and shall not be construed as granting rights to any person other than the Parties or, except as

specifically set forth in this Agreement, imputing to any person the obligations imposed on a Party.

21.6. Amendment. This Agreement may be amended only by a written instrument duly executed by both of the Parties hereto.

21.7. Obligations Prior to Termination. The obligations of the Parties incurred pursuant to this Agreement prior to Termination of this Agreement shall survive the Termination.

21.8. Captions. The captions and the headings in this Agreement are inserted merely to facilitate reference and shall have no bearing upon the interpretation of any of the terms and provisions hereof.

21.9. Additional Documents. Each Party agrees to make, execute, and deliver any and all documents reasonably required to implement this Agreement.

21.10. Governing Law. This Agreement shall be interpreted, governed by, and construed under the laws of the State of California.

21.11. Shall and May. "Shall" is mandatory and "may" is permissive.

21.12. Non-Discrimination. In performing the obligations of this Agreement, there shall be no discrimination against any employee or applicant for employment because of race, color, religion, sex, or national origin.

22. TERM AND TERMINATION.

22.1. Execution by Both Parties. This Agreement shall not become effective until it has been executed by both Parties. Following execution by both Parties, this Agreement shall continue in effect until the earlier of the following:

22.1.1. Superseded by Other Agreement. This Agreement is superseded by another, or an amended, agreement which, by its terms, supersedes this Agreement.

22.1.2. Termination by Mutual Agreement. Termination by mutual agreement of the Parties.

22.2. Termination of Participation in First Expansion Facilities Prior to Financing. Notwithstanding any other provision in this Agreement to the contrary, either Party, prior to the time District issues either Variable Financing or Fixed Financing, whichever occurs first, for the purpose of Financing the First Expansion Facilities, upon not less than 30 days' written notice to the other Party, shall be entitled to terminate its participation in the First Expansion Facilities at any time (i) the Party determines that the First Expansion Facilities is not feasible because of

technical, engineering, or economic reasons, or if adequate insurance is not, or probably will not, be available at a commercially reasonable price, or for other reasons as would cause a reasonably prudent utility in the same or similar circumstances to terminate its participation in a First Expansion Facilities as is contemplated by this Agreement (failure of District to permanently secure a permit to divert sufficient water for urban purposes to meet its obligations under this agreement shall be such cause for termination), or (ii) City determines that District has failed to meet its Design Phase or, if Financing has not yet been obtained, its Construction Phase obligations, and has failed to pursue those obligations with due diligence. If the First Expansion Facilities is terminated pursuant to the provision, then this Agreement shall remain in effect as to the Initial Facilities.

23. UNDERTAKINGS. [Not Used]

24. WATER RIGHTS AND OWNERSHIP.

City shall not own or acquire any of District's water rights, but shall have an absolute right to the delivery of Treated Water in accordance with the terms of this Agreement. City shall not have any ownership rights in any of the facilities of the Project except as specified in this agreement. District shall use its best efforts to exercise and utilize all of its available water rights and supplies to ensure that it delivers the full allocation of Treated Water to City to the extent feasible. District, though, retains the discretion and flexibility to exercise its water rights in such a manner as to reasonably and prudently manage and plan for single and multiple-year Droughts. District also agrees to vigorously defend its water rights and oppose any litigation or regulatory proceeding that could adversely impact District's ability to provide the full allocation of Treated Water to City.

24.1. The parties contemplate that City may increase its reclamation of waste water from its primary or secondary wastewater treatment plants by additional advanced treatment/ technologies and/or methods for groundwater recharge, resale, or any other use whatsoever, inside or outside District's irrigation district boundary. District agrees that City has the right to utilize its reclaimed water in this manner, and shall not object to any such reclaimed water usage, transportation or sale to any, court, administrative agency or other body or tribunal with jurisdiction over any such use, or in the press.

24.2. Nothing in the agreement shall restrict, prohibit, or inhibit in any way, City's right to acquire from third parties and/or exercise water rights additional to or apart from those enumerated in this agreement.

25. NOTICES.

Any notice, demand, or request provided for in this Agreement shall be in writing, and shall be deemed properly served, given, or made if delivered in person or if sent by registered or certified mail, postage prepaid, to the persons specified below:

District: General Manager
Modesto Irrigation District
Post Office Box 4060
Modesto, CA 95352

City: City Manager
City of Modesto
Post Office Box 642
Modesto, CA 95353

MODESTO IRRIGATION DISTRICT

By: _____
President

_____
Vice President

Approved as to form:

_____
General Counsel

Attest:

_____
Secretary

CITY OF MODESTO

By: _____
Mayor

_____
City Manager

Approved as to form:

_____
City Attorney

Attest:

_____
City Clerk

EXHIBIT A – MID SUNK COSTS

(Through October 1, 2005)

Consultants = $982,773.00

Kind Labor = $501,580.46

Materials & Supplies = $18,558.08

Advertising = $9,271.65

Meals & Lodging = $2,701.07

Transportation = $2,666.26

Miscellaneous = $940.73

Meetings = $ 875

TOTAL = $1,519,366.25*

* Detailed accounts, reported by date and expenditure type, are included on the attached spreadsheets.

PHASE TWO DOMESTIC WATER EXPANSION PROJECT-COSTS FRONTED BY MID
EXPENDITURES THROUGH MAY 28, 2005

Line No.	Project	Task	Employee/Supplier	Expnd Type	Item Date	Quantity	UOM	Burdened Cost	Comment	Expnd Org
1	701620	1.0	COLBY, DAVID W (DAVE)	1	08-Jan-05	12	Hours	$640.00		8420-Civil Engineering
2	701620	1.0	COLBY, DAVID W (DAVE)	1	22-Jan-05	12	Hours	$640.00		8420-Civil Engineering
3	701620	1.0	COLBY, DAVID W (DAVE)	1	05-Feb-05	4	Hours	$213.33		8420-Civil Engineering
				Total Labor				**$1,493.33**		
4	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	22-Sep-01	20	Hours	$1,242.13		8420-Civil Engineering
5	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	06-Oct-01	48	Hours	$2,981.12		8420-Civil Engineering
6	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	20-Oct-01	48	Hours	$2,981.12		8420-Civil Engineering
7	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	17-Nov-01	50	Hours	$3,105.34		8420-Civil Engineering
8	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	01-Dec-01	24	Hours	$1,490.56		8420-Civil Engineering
9	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	15-Dec-01	40	Hours	$2,584.12		8420-Civil Engineering
10	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	29-Dec-01	44.5	Hours	$2,874.85		8420-Civil Engineering
11	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	12-Jan-02	60	Hours	$3,876.19		8420-Civil Engineering
12	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	26-Jan-02	45	Hours	$2,907.14		8420-Civil Engineering
13	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	09-Feb-02	46	Hours	$2,971.74		8420-Civil Engineering
14	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	23-Feb-02	51	Hours	$3,294.76		8420-Civil Engineering
15	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	09-Mar-02	58.25	Hours	$3,763.13		8420-Civil Engineering
16	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	09-Mar-02	6	Hours	$387.62		8420-Civil Engineering
17	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	23-Mar-02	25	Hours	$1,615.08		8420-Civil Engineering
18	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	06-Apr-02	25.5	Hours	$1,647.39		8420-Civil Engineering
19	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	20-Apr-02	45	Hours	$2,907.14		8420-Civil Engineering
20	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	04-May-02	44	Hours	$2,842.54		8420-Civil Engineering
21	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	18-May-02	40	Hours	$2,584.12		8420-Civil Engineering
22	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	01-Jun-02	38	Hours	$2,454.92		8420-Civil Engineering
23	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	15-Jun-02	44	Hours	$2,842.54		8420-Civil Engineering
24	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	29-Jun-02	43	Hours	$2,777.93		8420-Civil Engineering
25	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	13-Jul-02	39	Hours	$2,519.52		8420-Civil Engineering
26	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	11-Jan-03	16	Hours	$1,099.56		8420-Civil Engineering
27	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	25-Jan-03	10	Hours	$687.23		8420-Civil Engineering
28	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	08-Feb-03	24	Hours	$1,649.34		8420-Civil Engineering
29	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	22-Feb-03	20	Hours	$1,374.45		8420-Civil Engineering
30	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	08-Mar-03	15	Hours	$1,124.42		8420-Civil Engineering
31	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	22-Mar-03	20	Hours	$1,499.23		8420-Civil Engineering
32	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	05-Apr-03	21	Hours	$1,574.19		8420-Civil Engineering
33	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	19-Apr-03	30	Hours	$2,248.85		8420-Civil Engineering
34	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	03-May-03	25	Hours	$1,874.04		8420-Civil Engineering
35	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	17-May-03	26	Hours	$1,949.00		8420-Civil Engineering
36	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	31-May-03	20	Hours	$1,499.23		8420-Civil Engineering
37	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	14-Jun-03	48	Hours	$3,598.16		8420-Civil Engineering
38	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	28-Jun-03	12	Hours	$899.54		8420-Civil Engineering
39	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	12-Jul-03	22	Hours	$1,854.02		8420-Civil Engineering
40	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	26-Jul-03	2	Hours	$168.55		8420-Civil Engineering
41	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	09-Aug-03	12	Hours	$1,011.28		8420-Civil Engineering
42	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	06-Sep-03	22	Hours	$1,854.02		8420-Civil Engineering
43	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	20-Sep-03	18	Hours	$1,516.92		8420-Civil Engineering
44	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	04-Oct-03	25	Hours	$2,106.84		8420-Civil Engineering
45	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	18-Oct-03	32	Hours	$2,696.76		8420-Civil Engineering
46	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	01-Nov-03	33	Hours	$2,781.03		8420-Civil Engineering
47	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	15-Nov-03	40	Hours	$3,370.94		8420-Civil Engineering
48	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	29-Nov-03	17	Hours	$1,432.65		8420-Civil Engineering
49	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	13-Dec-03	20	Hours	$1,744.48		8420-Civil Engineering
50	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	27-Dec-03	19	Hours	$1,657.25		8420-Civil Engineering
51	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	10-Jan-04	38	Hours	$3,028.84		8420-Civil Engineering
52	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	24-Jan-04	43	Hours	$3,427.37		8420-Civil Engineering
53	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	07-Feb-04	61.5	Hours	$4,887.12		8420-Civil Engineering
54	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	21-Feb-04	50.5	Hours	$4,013.01		8420-Civil Engineering
55	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	06-Mar-04	60.5	Hours	$4,828.07		8420-Civil Engineering
56	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	20-Mar-04	58.5	Hours	$4,668.46		8420-Civil Engineering
57	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	03-Apr-04	55	Hours	$4,389.15		8420-Civil Engineering
58	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	17-Apr-04	32	Hours	$2,553.68		8420-Civil Engineering
59	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	15-May-04	59	Hours	$4,708.36		8420-Civil Engineering
60	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	29-May-04	38.5	Hours	$3,072.41		8420-Civil Engineering
61	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	12-Jun-04	44	Hours	$3,511.32		8420-Civil Engineering
62	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	26-Jun-04	20	Hours	$1,596.05		8420-Civil Engineering
63	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	10-Jul-04	24	Hours	$1,915.26		8420-Civil Engineering
64	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	24-Jul-04	28	Hours	$2,234.47		8420-Civil Engineering
65	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	07-Aug-04	40.5	Hours	$2,978.29		8420-Civil Engineering
66	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	21-Aug-04	12	Hours	$882.46		8420-Civil Engineering
67	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	04-Sep-04	38	Hours	$2,794.44		8420-Civil Engineering
68	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	18-Sep-04	38	Hours	$2,794.44		8420-Civil Engineering
69	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	02-Oct-04	34	Hours	$2,500.29		8420-Civil Engineering
70	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	16-Oct-04	42	Hours	$3,088.59		8420-Civil Engineering
71	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	30-Oct-04	52	Hours	$3,823.97		8420-Civil Engineering
72	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	13-Nov-04	54	Hours	$3,971.05		8420-Civil Engineering
73	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	27-Nov-04	36	Hours	$2,647.37		8420-Civil Engineering
74	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	11-Dec-04	30	Hours	$2,206.14		8420-Civil Engineering
75	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	25-Dec-04	41	Hours	$3,015.06		8420-Civil Engineering
76	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	08-Jan-05	8	Hours	$588.30		8420-Civil Engineering
77	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	08-Jan-05	25	Hours	$1,838.45		8420-Civil Engineering
78	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	22-Jan-05	56	Hours	$4,118.12		8420-Civil Engineering
79	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	05-Feb-05	58	Hours	$4,265.20		8420-Civil Engineering
80	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	19-Feb-05	43	Hours	$3,162.13		8420-Civil Engineering

Line No.	Project	Task	Employee/Supplier	Expnd Type	Item Date	Quantity	UOM	Burdened Cost	Comment	Expnd Org
81	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	05-Mar-05	41	Hours	$3,015.06		8420-Civil Engineering
82	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	19-Mar-05	47	Hours	$3,559.56		8420-Civil Engineering
83	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	02-Apr-05	52	Hours	$4,506.01		8420-Civil Engineering
84	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	16-Apr-05	62.5	Hours	$5,415.88		8420-Civil Engineering
85	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	30-Apr-05	62	Hours	$5,372.55		8420-Civil Engineering
86	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	14-May-05	52	Hours	$5,099.58		8420-Civil Engineering
87	701620	1.0	DIAS, GREGORY PAUL (GREG)	1	28-May-05	28	Hours			8420-Civil Engineering
				Total Labor				**$220,399.49**		
88	701620	1.0	DOMECQ, ALLEN ROSS (ALLEN)	1	27-Dec-03	5	Hours	$286.61		8220-Modesto Dom Water
				Total Labor				**$286.61**		
89	701620	1.0	DURRER, CHARLES L (CHUCK)	1	27-Dec-03	4	Hours	$162.25		8220-Modesto Dom Water
90	701620	1.0	DURRER, CHARLES L (CHUCK)	1	10-Jan-04	20	Hours	$741.32		8220-Modesto Dom Water
91	701620	1.0	DURRER, CHARLES L (CHUCK)	1	24-Jan-04	10	Hours	$370.66		8220-Modesto Dom Water
				Total Labor				**$1,274.23**		
92	701620	1.0	EDWARDS, KENNETH W (KEN)	1	27-Dec-03	8	Hours	$647.84		8220-Modesto Dom Water
93	701620	1.0	EDWARDS, KENNETH W (KEN)	1	10-Jan-04	30	Hours	$2,220.00		8220-Modesto Dom Water
94	701620	1.0	EDWARDS, KENNETH W (KEN)	1	24-Jan-04	14	Hours	$1,036.00		8220-Modesto Dom Water
95	701620	1.1	EDWARDS, KENNETH W (KEN)	1	07-Feb-04	10	Hours	$737.76		8220-Modesto Dom Water
96	701620	1.0	EDWARDS, KENNETH W (KEN)	1	07-Feb-04	10	Hours	$737.76		8220-Modesto Dom Water
97	701620	1.1	EDWARDS, KENNETH W (KEN)	1	21-Feb-04	5	Hours	$368.88		8220-Modesto Dom Water
98	701620	1.0	EDWARDS, KENNETH W (KEN)	1	21-Feb-04	2	Hours	$147.55		8220-Modesto Dom Water
99	701620	1.1	EDWARDS, KENNETH W (KEN)	1	06-Mar-04	10	Hours	$740.89		8220-Modesto Dom Water
100	701620	1.1	EDWARDS, KENNETH W (KEN)	1	20-Mar-04	5	Hours	$370.45		8220-Modesto Dom Water
101	701620	1.1	EDWARDS, KENNETH W (KEN)	1	01-May-04	6	Hours	$444.54		8220-Modesto Dom Water
102	701620	1.0	EDWARDS, KENNETH W (KEN)	1	01-May-04	8	Hours	$592.72		8220-Modesto Dom Water
103	701620	1.0	EDWARDS, KENNETH W (KEN)	1	29-May-04	10	Hours	$740.89		8220-Modesto Dom Water
104	701620	1.1	EDWARDS, KENNETH W (KEN)	1	16-Oct-04	8	Hours	$546.19		8220-Modesto Dom Water
105	701620	1.0	EDWARDS, KENNETH W (KEN)	1	30-Oct-04	20	Hours	$1,365.46		8220-Modesto Dom Water
106	701620	1.0	EDWARDS, KENNETH W (KEN)	1	13-Nov-04	10	Hours	$682.73		8220-Modesto Dom Water
				Total Labor				**$11,379.66**		
107	701620	1.0	GUMM, DALE E (DALE)	1	27-Dec-03	4	Hours	$170.50		8220-Modesto Dom Water
				Total Labor				**$170.50**		
108	701620	1.0	HARMON, KATE C (KATE)	1	27-Dec-03	4	Hours	$170.50		8220-Modesto Dom Water
				Total Labor				**$170.50**		
109	701620	1.0	HAUGH, JEFFREY CARL (JEFF)	1	27-Dec-03	4	Hours	$229.29		8220-Modesto Dom Water
				Total Labor				**$229.29**		
110	701620	1.0	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	01-May-04	10	Hours	$608.08		8220-Modesto Dom Water
111	701620	1.0	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	15-May-04	20	Hours	$1,216.17		8220-Modesto Dom Water
112	701620	1.0	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	29-May-04	20	Hours	$1,216.17		8220-Modesto Dom Water
113	701620	1.0	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	12-Jun-04	12	Hours	$729.70		8220-Modesto Dom Water
114	701620	1.0	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	26-Jun-04	8	Hours	$486.47		8220-Modesto Dom Water
115	701620	1.0	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	10-Jul-04	8	Hours	$486.47		8220-Modesto Dom Water
116	701620	1.0	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	07-Aug-04	10	Hours	$560.35		8220-Modesto Dom Water
117	701620	1.0	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	21-Aug-04	10	Hours	$588.73		8220-Modesto Dom Water
118	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	04-Sep-04	10	Hours	$588.73		8220-Modesto Dom Water
119	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	18-Sep-04	10	Hours	$588.73		8220-Modesto Dom Water
120	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	02-Oct-04	10	Hours	$588.73		8220-Modesto Dom Water
121	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	16-Oct-04	10	Hours	$588.73		8220-Modesto Dom Water
122	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	30-Oct-04	10	Hours	$588.73		8220-Modesto Dom Water
123	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	13-Nov-04	10	Hours	$588.73		8220-Modesto Dom Water
124	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	27-Nov-04	6	Hours	$353.24		8220-Modesto Dom Water
125	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	11-Dec-04	5	Hours	$294.37		8220-Modesto Dom Water
126	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	25-Dec-04	2	Hours	$117.75		8220-Modesto Dom Water
127	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	08-Jan-05	8	Hours	$470.98		8220-Modesto Dom Water
128	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	08-Jan-05	4	Hours	$235.49		8220-Modesto Dom Water
129	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	22-Jan-05	4	Hours	$235.49		8220-Modesto Dom Water
130	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	05-Feb-05	12	Hours	$706.48		8220-Modesto Dom Water
131	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	19-Feb-05	16	Hours	$941.97		8220-Modesto Dom Water
132	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	05-Mar-05	14	Hours	$824.22		8220-Modesto Dom Water
133	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	19-Mar-05	8	Hours	$485.15		8220-Modesto Dom Water
134	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	02-Apr-05	10	Hours	$693.86		8220-Modesto Dom Water
135	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	16-Apr-05	10	Hours	$693.86		8220-Modesto Dom Water
136	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	30-Apr-05	22	Hours	$1,526.49		8220-Modesto Dom Water
137	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	14-May-05	10	Hours	$785.26		8220-Modesto Dom Water
138	701620	1.1	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	1	28-May-05	10	Hours			8220-Modesto Dom Water
				Total Labor				**$17,789.13**		
139	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	22-Sep-01	8	Hours	$576.28		8420-Civil Engineering
140	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	06-Oct-01	6	Hours	$432.21		8420-Civil Engineering
141	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	20-Oct-01	8	Hours	$576.28		8420-Civil Engineering
142	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	03-Nov-01	4	Hours	$288.14		8420-Civil Engineering
143	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	17-Nov-01	4	Hours	$288.14		8420-Civil Engineering
144	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	01-Dec-01	4	Hours	$288.14		8420-Civil Engineering
145	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	12-Jan-02	10	Hours	$749.06		8420-Civil Engineering
146	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	26-Jan-02	20	Hours	$1,498.12		8420-Civil Engineering
147	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	09-Feb-02	14	Hours	$1,048.69		8420-Civil Engineering
148	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	23-Feb-02	24	Hours	$1,797.75		8420-Civil Engineering
149	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	09-Mar-02	4	Hours	$299.62		8420-Civil Engineering
150	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	19-Oct-02	1	Hours	$76.62		8420-Civil Engineering
151	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	25-Jan-03	2	Hours	$159.38		8420-Civil Engineering
152	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	08-Feb-03	2	Hours	$159.38		8420-Civil Engineering
153	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	05-Apr-03	2	Hours	$173.85		8420-Civil Engineering
154	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	14-Jun-03	8	Hours	$695.39		8420-Civil Engineering
155	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	12-Jul-03	1	Hours	$97.72		8420-Civil Engineering

Line No.	Project	Task	Employee/Supplier	Expnd Type	Item Date	Quantity	UOM	Burdened Cost	Comment	Expnd Org
156	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	09-Aug-03	2	Hours	$195.44		8420-Civil Engineering
157	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	18-Oct-03	4	Hours	$390.89		8420-Civil Engineering
158	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	01-Nov-03	4	Hours	$390.89		8420-Civil Engineering
159	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	15-Nov-03	4	Hours	$390.89		8420-Civil Engineering
160	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	29-Nov-03	4	Hours	$390.89		8420-Civil Engineering
161	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	15-May-04	6	Hours	$555.22		8420-Civil Engineering
162	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	29-May-04	2	Hours	$185.07		8420-Civil Engineering
163	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	26-Jun-04	6	Hours	$555.22		8420-Civil Engineering
164	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	10-Jul-04	4	Hours	$370.15		8420-Civil Engineering
165	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	07-Aug-04	4	Hours	$341.09		8420-Civil Engineering
166	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	21-Aug-04	6	Hours	$511.64		8420-Civil Engineering
167	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	04-Sep-04	4	Hours	$341.09		8420-Civil Engineering
168	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	18-Sep-04	6	Hours	$511.64		8420-Civil Engineering
169	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	02-Oct-04	12	Hours	$1,023.27		8420-Civil Engineering
170	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	16-Oct-04	8	Hours	$682.18		8420-Civil Engineering
171	701620	1.1	KETSCHER, WILLIAM M (BILL)	1	30-Oct-04	10	Hours	$852.73		8420-Civil Engineering
172	701620	1.1	KETSCHER, WILLIAM M (BILL)	1	13-Nov-04	10	Hours	$852.73		8420-Civil Engineering
173	701620	1.1	KETSCHER, WILLIAM M (BILL)	1	27-Nov-04	2	Hours	$170.55		8420-Civil Engineering
174	701620	1.1	KETSCHER, WILLIAM M (BILL)	1	11-Dec-04	6	Hours	$511.64		8420-Civil Engineering
175	701620	1.1	KETSCHER, WILLIAM M (BILL)	1	25-Dec-04	8	Hours	$682.18		8420-Civil Engineering
176	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	08-Jan-05	30	Hours	$2,558.19		8420-Civil Engineering
177	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	22-Jan-05	24	Hours	$2,046.55		8420-Civil Engineering
178	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	05-Feb-05	24	Hours	$2,046.55		8420-Civil Engineering
179	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	19-Feb-05	8	Hours	$682.18		8420-Civil Engineering
180	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	05-Mar-05	8	Hours	$682.18		8420-Civil Engineering
181	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	19-Mar-05	8	Hours	$702.69		8420-Civil Engineering
182	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	02-Apr-05	16	Hours	$1,608.00		8420-Civil Engineering
183	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	16-Apr-05	16	Hours	$1,608.00		8420-Civil Engineering
184	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	30-Apr-05	10	Hours	$1,005.00		8420-Civil Engineering
185	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	14-May-05	24	Hours	$2,729.73		8420-Civil Engineering
186	701620	1.0	KETSCHER, WILLIAM M (BILL)	1	28-May-05	10	Hours			8420-Civil Engineering
187	701620	1.0	LOSCHKE, CARRIE E (CARRIE)	1	27-Dec-03	5.3	Hours	$225.92		8220-Modesto Dom Water
				Total Labor				**$35,005.16**		
188	701620	1.0	MASON, JOSEPH EDWARD (JOE)	1	27-Dec-03	4	Hours	$183.61		8220-Modesto Dom Water
189	701620	1.0	MASON, JOSEPH EDWARD (JOE)	1	10-Jan-04	30	Hours	$1,258.36		8220-Modesto Dom Water
190	701620	1.0	MASON, JOSEPH EDWARD (JOE)	1	24-Jan-04	10	Hours	$419.45		8220-Modesto Dom Water
191	701620	1.0	MICAL, WILLIAM ANDREW (ANDY)	1	10-Jan-04	9	Hours	$471.44		8220-Modesto Dom Water
192	701620	1.0	MICAL, WILLIAM ANDREW (ANDY)	1	24-Jan-04	1	Hours	$52.38		8220-Modesto Dom Water
193	701620	1.0	MICAL, WILLIAM ANDREW (ANDY)	1	01-May-04	2	Hours	$104.89		8220-Modesto Dom Water
				Total Labor				**$2,490.13**		
194	701620	1.0	MILLER, JEFFERY LEE (JEFF)	1	10-Jan-04	5	Hours	$269.04		8220-Modesto Dom Water
195	701620	1.0	MILLER, JEFFERY LEE (JEFF)	1	24-Jan-04	60	Hours	$3,468.44		8220-Modesto Dom Water
196	701620	1.1	MILLER, JEFFERY LEE (JEFF)	1	07-Feb-04	34.5	Hours	$1,988.33		8220-Modesto Dom Water
197	701620	1.0	MILLER, JEFFERY LEE (JEFF)	1	07-Feb-04	5	Hours	$288.16		8220-Modesto Dom Water
198	701620	1.1	MILLER, JEFFERY LEE (JEFF)	1	06-Mar-04	10	Hours	$578.77		8220-Modesto Dom Water
199	701620	1.0	MILLER, JEFFERY LEE (JEFF)	1	29-May-04	10	Hours	$578.77		8220-Modesto Dom Water
200	701620	1.1	MILLER, JEFFERY LEE (JEFF)	1	13-Nov-04	4	Hours	$213.33		8220-Modesto Dom Water
201	701620	1.0	MILLER, JEFFERY LEE (JEFF)	P04 (overtime)	29-May-04	0	Hours	$72.35		8220-Modesto Dom Water
				Total Labor				**$7,477.19**		
202	701620	1.0	NIEMI, MICHAEL JOHN (MICHAEL)	1	08-Jan-05	13	Hours	$541.78		8410-Water Use, Planning & Conservation
203	701620	1.0	NIEMI, MICHAEL JOHN (MICHAEL)	1	22-Jan-05	20	Hours	$833.50		8410-Water Use, Planning & Conservation
204	701620	1.0	NIEMI, MICHAEL JOHN (MICHAEL)	1	05-Feb-05	12	Hours	$500.10		8410-Water Use, Planning & Conservation
205	701620	1.0	NIEMI, MICHAEL JOHN (MICHAEL)	1	19-Feb-05	3	Hours	$131.34		8410-Water Use, Planning & Conservation
206	701620	1.0	NIEMI, MICHAEL JOHN (MICHAEL)	1	19-Mar-05	39	Hours	$1,758.64		8410-Water Use, Planning & Conservation
207	701620	1.0	NIEMI, MICHAEL JOHN (MICHAEL)	1	02-Apr-05	8	Hours	$412.75		8410-Water Use, Planning & Conservation
208	701620	1.0	NIEMI, MICHAEL JOHN (MICHAEL)	1	16-Apr-05	20	Hours	$1,031.89		8410-Water Use, Planning & Conservation
209	701620	1.0	NIEMI, MICHAEL JOHN (MICHAEL)	1	30-Apr-05	30	Hours	$1,547.83		8410-Water Use, Planning & Conservation
210	701620	1.0	NIEMI, MICHAEL JOHN (MICHAEL)	1	14-May-05	3	Hours	$175.17		8410-Water Use, Planning & Conservation
211	701620	1.0	NIEMI, MICHAEL JOHN (MICHAEL)	P12 (overtime)	19-Mar-05	0	Hours	$45.09		8410-Water Use, Planning & Conservation
				Total Labor				**$6,978.09**		
212	701620	1.0	NOFFSINGER, GARY J (GARY)	1	27-Dec-03	4	Hours	$126.77		8220-Modesto Dom Water
				Total Labor				**$126.77**		
213	701620	1.0	RYAN, PATRICK J (PAT)	1	27-Dec-03	14.5	Hours	$1,296.25		8220-Modesto Dom Water
214	701620	1.0	RYAN, PATRICK J (PAT)	1	10-Jan-04	4	Hours	$326.76		8220-Modesto Dom Water
215	701620	1.0	RYAN, PATRICK J (PAT)	1	07-Feb-04	8	Hours	$651.55		8220-Modesto Dom Water
216	701620	1.0	RYAN, PATRICK J (PAT)	1	21-Feb-04	11	Hours	$895.89		8220-Modesto Dom Water
217	701620	1.0	RYAN, PATRICK J (PAT)	1	06-Mar-04	24	Hours	$1,962.96		8220-Modesto Dom Water
218	701620	1.0	RYAN, PATRICK J (PAT)	1	20-Mar-04	5	Hours	$408.95		8220-Modesto Dom Water
219	701620	1.0	RYAN, PATRICK J (PAT)	1	03-Apr-04	3	Hours	$245.37		8220-Modesto Dom Water
220	701620	1.0	RYAN, PATRICK J (PAT)	1	17-Apr-04	2	Hours	$163.58		8220-Modesto Dom Water
221	701620	1.0	RYAN, PATRICK J (PAT)	1	01-May-04	10	Hours	$817.90		8220-Modesto Dom Water
222	701620	1.0	RYAN, PATRICK J (PAT)	1	15-May-04	10	Hours	$817.90		8220-Modesto Dom Water
223	701620	1.0	RYAN, PATRICK J (PAT)	1	29-May-04	12	Hours	$1,031.16		8220-Modesto Dom Water

Line No.	Project	Task	Employee/Supplier	Expnd Type	Item Date	Quantity	UOM	Burdened Cost	Comment	Expnd Org
224	701620	1.0	RYAN, PATRICK J (PAT)	1	12-Jun-04	10	Hours	$859.30		8220-Modesto Dom Water
225	701620	1.0	RYAN, PATRICK J (PAT)	1	26-Jun-04	10	Hours	$859.30		8220-Modesto Dom Water
226	701620	1.0	RYAN, PATRICK J (PAT)	1	10-Jul-04	10	Hours	$859.30		8220-Modesto Dom Water
227	701620	1.0	RYAN, PATRICK J (PAT)	1	24-Jul-04	10	Hours	$859.30		8220-Modesto Dom Water
228	701620	1.0	RYAN, PATRICK J (PAT)	1	07-Aug-04	10	Hours	$791.84		8220-Modesto Dom Water
229	701620	1.0	RYAN, PATRICK J (PAT)	1	21-Aug-04	5	Hours	$395.92		8220-Modesto Dom Water
230	701620	1.0	RYAN, PATRICK J (PAT)	1	04-Sep-04	10	Hours	$791.84		8220-Modesto Dom Water
231	701620	1.0	RYAN, PATRICK J (PAT)	1	18-Sep-04	10	Hours	$791.84		8220-Modesto Dom Water
232	701620	1.0	RYAN, PATRICK J (PAT)	1	02-Oct-04	17	Hours	$1,346.13		8220-Modesto Dom Water
233	701620	1.0	RYAN, PATRICK J (PAT)	1	16-Oct-04	10	Hours	$791.84		8220-Modesto Dom Water
234	701620	1.0	RYAN, PATRICK J (PAT)	1	30-Oct-04	15	Hours	$1,187.76		8220-Modesto Dom Water
235	701620	1.0	RYAN, PATRICK J (PAT)	1	13-Nov-04	10	Hours	$791.84		8220-Modesto Dom Water
236	701620	1.0	RYAN, PATRICK J (PAT)	1	27-Nov-04	7.5	Hours	$593.89		8220-Modesto Dom Water
237	701620	1.0	RYAN, PATRICK J (PAT)	1	11-Dec-04	12	Hours	$950.21		8220-Modesto Dom Water
238	701620	1.0	RYAN, PATRICK J (PAT)	1	25-Dec-04	15	Hours	$1,187.76		8220-Modesto Dom Water
239	701620	1.0	RYAN, PATRICK J (PAT)	1	08-Jan-05	4	Hours	$316.74		8220-Modesto Dom Water
240	701620	1.0	RYAN, PATRICK J (PAT)	1	08-Jan-05	12	Hours	$950.21		8220-Modesto Dom Water
241	701620	1.0	RYAN, PATRICK J (PAT)	1	22-Jan-05	17	Hours	$1,346.13		8220-Modesto Dom Water
242	701620	1.0	RYAN, PATRICK J (PAT)	1	05-Feb-05	12	Hours	$950.21		8220-Modesto Dom Water
243	701620	1.0	RYAN, PATRICK J (PAT)	1	19-Feb-05	26	Hours	$2,058.79		8220-Modesto Dom Water
244	701620	1.0	RYAN, PATRICK J (PAT)	1	05-Mar-05	8	Hours	$633.47		8220-Modesto Dom Water
245	701620	1.0	RYAN, PATRICK J (PAT)	1	19-Mar-05	29	Hours	$2,365.38		8220-Modesto Dom Water
246	701620	1.0	RYAN, PATRICK J (PAT)	1	02-Apr-05	10	Hours	$933.24		8220-Modesto Dom Water
247	701620	1.0	RYAN, PATRICK J (PAT)	1	16-Apr-05	14	Hours	$1,306.53		8220-Modesto Dom Water
248	701620	1.0	RYAN, PATRICK J (PAT)	1	30-Apr-05	16	Hours	$1,493.18		8220-Modesto Dom Water
249	701620	1.0	RYAN, PATRICK J (PAT)	1	14-May-05	8	Hours	$844.94		8220-Modesto Dom Water
250	701620	1.0	RYAN, PATRICK J (PAT)	1	28-May-05	12	Hours			8220-Modesto Dom Water
				Total Labor				**$34,875.16**		
251	701620	1.0	SMALLING, MARCINE A (MARCINE)	1	27-Dec-03	5.5	Hours	$192.44		8220-Modesto Dom Water
				Total Labor				**$192.44**		
252	701620	1.0	ULM, AARON REYNOLDS (AARON)	1	04-Sep-04	2	Hours	$50.85		8420-Civil Engineering
253	701620	1.0	ULM, AARON REYNOLDS (AARON)	1	18-Sep-04	4	Hours	$101.69		8420-Civil Engineering
				Total Labor				**$152.54**		
254	701620	1.0	WARD, WALTER PAUL (WALT)	1	22-Sep-01	2.5	Hours	$199.28		8010-AGM-Water Operations
255	701620	1.0	WARD, WALTER PAUL (WALT)	1	06-Oct-01	3	Hours	$239.13		8010-AGM-Water Operations
256	701620	1.0	WARD, WALTER PAUL (WALT)	1	20-Oct-01	2	Hours	$159.42		8010-AGM-Water Operations
257	701620	1.0	WARD, WALTER PAUL (WALT)	1	03-Nov-01	2	Hours	$159.42		8010-AGM-Water Operations
258	701620	1.0	WARD, WALTER PAUL (WALT)	1	17-Nov-01	4	Hours	$318.85		8010-AGM-Water Operations
259	701620	1.0	WARD, WALTER PAUL (WALT)	1	01-Dec-01	4	Hours	$318.85		8010-AGM-Water Operations
260	701620	1.0	WARD, WALTER PAUL (WALT)	1	15-Dec-01	6	Hours	$497.40		8010-AGM-Water Operations
261	701620	1.0	WARD, WALTER PAUL (WALT)	1	29-Dec-01	10	Hours	$829.00		8010-AGM-Water Operations
262	701620	1.0	WARD, WALTER PAUL (WALT)	1	12-Jan-02	9	Hours	$746.10		8010-AGM-Water Operations
263	701620	1.0	WARD, WALTER PAUL (WALT)	1	26-Jan-02	6	Hours	$497.40		8010-AGM-Water Operations
264	701620	1.0	WARD, WALTER PAUL (WALT)	1	09-Feb-02	6	Hours	$497.40		8010-AGM-Water Operations
265	701620	1.0	WARD, WALTER PAUL (WALT)	1	23-Feb-02	12	Hours	$994.80		8010-AGM-Water Operations
266	701620	1.0	WARD, WALTER PAUL (WALT)	1	09-Mar-02	12	Hours	$994.80		8010-AGM-Water Operations
267	701620	1.0	WARD, WALTER PAUL (WALT)	1	23-Mar-02	6	Hours	$497.40		8010-AGM-Water Operations
268	701620	1.0	WARD, WALTER PAUL (WALT)	1	06-Apr-02	8	Hours	$663.20		8010-AGM-Water Operations
269	701620	1.0	WARD, WALTER PAUL (WALT)	1	20-Apr-02	1.5	Hours	$124.36		8010-AGM-Water Operations
270	701620	1.0	WARD, WALTER PAUL (WALT)	1	04-May-02	4	Hours	$331.60		8010-AGM-Water Operations
271	701620	1.0	WARD, WALTER PAUL (WALT)	1	18-May-02	4	Hours	$331.60		8010-AGM-Water Operations
272	701620	1.0	WARD, WALTER PAUL (WALT)	1	01-Jun-02	6	Hours	$497.40		8010-AGM-Water Operations
273	701620	1.0	WARD, WALTER PAUL (WALT)	1	15-Jun-02	10	Hours	$829.00		8010-AGM-Water Operations
274	701620	1.0	WARD, WALTER PAUL (WALT)	1	29-Jun-02	4	Hours	$331.60		8010-AGM-Water Operations
275	701620	1.0	WARD, WALTER PAUL (WALT)	1	13-Jul-02	2	Hours	$165.80		8010-AGM-Water Operations
276	701620	1.0	WARD, WALTER PAUL (WALT)	1	10-Aug-02	2	Hours	$169.59		8010-AGM-Water Operations
277	701620	1.0	WARD, WALTER PAUL (WALT)	1	24-Aug-02	4	Hours	$339.18		8010-AGM-Water Operations
278	701620	1.0	WARD, WALTER PAUL (WALT)	1	21-Sep-02	4	Hours	$339.18		8010-AGM-Water Operations
279	701620	1.0	WARD, WALTER PAUL (WALT)	1	16-Nov-02	4	Hours	$339.18		8010-AGM-Water Operations
280	701620	1.0	WARD, WALTER PAUL (WALT)	1	08-Feb-03	4	Hours	$352.76		8010-AGM-Water Operations
281	701620	1.0	WARD, WALTER PAUL (WALT)	1	22-Feb-03	4	Hours	$352.76		8010-AGM-Water Operations
282	701620	1.0	WARD, WALTER PAUL (WALT)	1	08-Mar-03	2	Hours	$192.40		8010-AGM-Water Operations
283	701620	1.0	WARD, WALTER PAUL (WALT)	1	22-Mar-03	4	Hours	$384.79		8010-AGM-Water Operations
284	701620	1.0	WARD, WALTER PAUL (WALT)	1	19-Apr-03	2	Hours	$192.40		8010-AGM-Water Operations
285	701620	1.0	WARD, WALTER PAUL (WALT)	1	03-May-03	3	Hours	$288.59		8010-AGM-Water Operations
286	701620	1.0	WARD, WALTER PAUL (WALT)	1	14-Jun-03	3.5	Hours	$336.70		8010-AGM-Water Operations
287	701620	1.0	WARD, WALTER PAUL (WALT)	1	28-Jun-03	4	Hours	$384.79		8010-AGM-Water Operations
288	701620	1.0	WARD, WALTER PAUL (WALT)	1	12-Jul-03	8	Hours	$865.18		8010-AGM-Water Operations
289	701620	1.0	WARD, WALTER PAUL (WALT)	1	26-Jul-03	4	Hours	$432.59		8010-AGM-Water Operations
290	701620	1.0	WARD, WALTER PAUL (WALT)	1	09-Aug-03	3.5	Hours	$378.53		8010-AGM-Water Operations
291	701620	1.0	WARD, WALTER PAUL (WALT)	1	23-Aug-03	4	Hours	$432.59		8010-AGM-Water Operations
292	701620	1.0	WARD, WALTER PAUL (WALT)	1	06-Sep-03	4	Hours	$432.59		8010-AGM-Water Operations
293	701620	1.0	WARD, WALTER PAUL (WALT)	1	20-Sep-03	6	Hours	$648.89		8010-AGM-Water Operations
294	701620	1.0	WARD, WALTER PAUL (WALT)	1	04-Oct-03	5	Hours	$540.74		8010-AGM-Water Operations
295	701620	1.0	WARD, WALTER PAUL (WALT)	1	18-Oct-03	5	Hours	$540.74		8010-AGM-Water Operations
296	701620	1.0	WARD, WALTER PAUL (WALT)	1	15-Nov-03	3	Hours	$324.44		8010-AGM-Water Operations
297	701620	1.0	WARD, WALTER PAUL (WALT)	1	29-Nov-03	6	Hours	$648.89		8010-AGM-Water Operations
298	701620	1.0	WARD, WALTER PAUL (WALT)	1	13-Dec-03	4	Hours	$447.72		8010-AGM-Water Operations
299	701620	1.0	WARD, WALTER PAUL (WALT)	1	27-Dec-03	10	Hours	$1,119.30		8010-AGM-Water Operations
300	701620	1.0	WARD, WALTER PAUL (WALT)	1	10-Jan-04	4	Hours	$409.13		8010-AGM-Water Operations
301	701620	1.0	WARD, WALTER PAUL (WALT)	1	24-Jan-04	6	Hours	$613.70		8010-AGM-Water Operations
302	701620	1.0	WARD, WALTER PAUL (WALT)	1	07-Feb-04	6	Hours	$611.84		8010-AGM-Water Operations
303	701620	1.0	WARD, WALTER PAUL (WALT)	1	21-Feb-04	12	Hours	$1,223.69		8010-AGM-Water Operations

Line No.	Project	Task	Employee/Supplier	Expnd Type	Item Date	Quantity	UOM	Burdened Cost	Comment	Expnd Org
304	701620	1.0	WARD, WALTER PAUL (WALT)	1	06-Mar-04	20	Hours	$2,048.14		8010-AGM-Water Operations
305	701620	1.0	WARD, WALTER PAUL (WALT)	1	20-Mar-04	6	Hours	$614.44		8010-AGM-Water Operations
306	701620	1.0	WARD, WALTER PAUL (WALT)	1	03-Apr-04	4	Hours	$409.63		8010-AGM-Water Operations
307	701620	1.0	WARD, WALTER PAUL (WALT)	1	17-Apr-04	8	Hours	$819.26		8010-AGM-Water Operations
308	701620	1.0	WARD, WALTER PAUL (WALT)	1	01-May-04	12	Hours	$1,228.88		8010-AGM-Water Operations
309	701620	1.0	WARD, WALTER PAUL (WALT)	1	15-May-04	8	Hours	$819.26		8010-AGM-Water Operations
310	701620	1.0	WARD, WALTER PAUL (WALT)	1	29-May-04	10	Hours	$1,024.07		8010-AGM-Water Operations
311	701620	1.0	WARD, WALTER PAUL (WALT)	1	12-Jun-04	15	Hours	$1,536.11		8010-AGM-Water Operations
312	701620	1.0	WARD, WALTER PAUL (WALT)	1	26-Jun-04	8	Hours	$819.26		8010-AGM-Water Operations
313	701620	1.0	WARD, WALTER PAUL (WALT)	1	10-Jul-04	8	Hours	$819.26		8010-AGM-Water Operations
314	701620	1.0	WARD, WALTER PAUL (WALT)	1	24-Jul-04	5	Hours	$512.04		8010-AGM-Water Operations
315	701620	1.0	WARD, WALTER PAUL (WALT)	1	07-Aug-04	18	Hours	$1,698.62		8010-AGM-Water Operations
316	701620	1.0	WARD, WALTER PAUL (WALT)	1	21-Aug-04	8.5	Hours	$802.13		8010-AGM-Water Operations
317	701620	1.0	WARD, WALTER PAUL (WALT)	1	04-Sep-04	20	Hours	$1,887.36		8010-AGM-Water Operations
318	701620	1.0	WARD, WALTER PAUL (WALT)	1	18-Sep-04	10	Hours	$943.68		8010-AGM-Water Operations
319	701620	1.0	WARD, WALTER PAUL (WALT)	1	02-Oct-04	11	Hours	$1,038.05		8010-AGM-Water Operations
320	701620	1.0	WARD, WALTER PAUL (WALT)	1	16-Oct-04	4	Hours	$377.47		8010-AGM-Water Operations
321	701620	1.0	WARD, WALTER PAUL (WALT)	1	30-Oct-04	2	Hours	$188.74		8010-AGM-Water Operations
322	701620	1.0	WARD, WALTER PAUL (WALT)	1	13-Nov-04	2	Hours	$188.74		8010-AGM-Water Operations
323	701620	1.0	WARD, WALTER PAUL (WALT)	1	27-Nov-04	4	Hours	$377.47		8010-AGM-Water Operations
324	701620	1.0	WARD, WALTER PAUL (WALT)	1	11-Dec-04	2	Hours	$188.74		8010-AGM-Water Operations
325	701620	1.0	WARD, WALTER PAUL (WALT)	1	11-Dec-04	5	Hours	$471.84		8010-AGM-Water Operations
326	701620	1.0	WARD, WALTER PAUL (WALT)	1	25-Dec-04	9	Hours	$849.31		8010-AGM-Water Operations
327	701620	1.0	WARD, WALTER PAUL (WALT)	1	22-Jan-05	1.5	Hours	$141.55		8010-AGM-Water Operations
328	701620	1.0	WARD, WALTER PAUL (WALT)	1	05-Feb-05	4	Hours	$377.47		8010-AGM-Water Operations
329	701620	1.0	WARD, WALTER PAUL (WALT)	1	19-Feb-05	3	Hours	$283.10		8010-AGM-Water Operations
330	701620	1.0	WARD, WALTER PAUL (WALT)	1	19-Mar-05	4	Hours	$388.82		8010-AGM-Water Operations
331	701620	1.0	WARD, WALTER PAUL (WALT)	1	02-Apr-05	4	Hours	$444.88		8010-AGM-Water Operations
332	701620	1.0	WARD, WALTER PAUL (WALT)	1	16-Apr-05	7	Hours	$778.54		8010-AGM-Water Operations
333	701620	1.0	WARD, WALTER PAUL (WALT)	1	30-Apr-05	5	Hours	$556.10		8010-AGM-Water Operations
334	701620	1.0	WARD, WALTER PAUL (WALT)	1	14-May-05	2	Hours	$251.74		8010-AGM-Water Operations
335	701620	1.0	WARD, WALTER PAUL (WALT)	1	28-May-05	3	Hours			8010-AGM-Water Operations
				Total Labor				**$46,451.39**		
336	701620	1.0	MILLER, JEFFERY LEE (JEFF)	4	29-May-04	2.5	Hours	$144.70		8220-Modesto Dom Water
337	701620	1.0	NIEMI, MICHAEL JOHN (MICHAEL)	12	19-Mar-05	2	Hours	$90.19		8410-Water Use, Planning & Conservation
338	701620	1.0	DIAS, GREGORY PAUL (GREG)	15	29-Dec-01	0	Hours	$0.00		8420-Civil Engineering
339	701620	1.0	DIAS, GREGORY PAUL (GREG)	15	04-Oct-03	0	Hours	$0.00		8420-Civil Engineering
340	701620	1.0	DIAS, GREGORY PAUL (GREG)	15	01-Nov-03	0	Hours	$0.00		8420-Civil Engineering
341	701620	1.0	WARD, WALTER PAUL (WALT)	15	29-May-04	0	Hours	$0.00		8010-AGM-Water Operations
342	701620	1.0	WARD, WALTER PAUL (WALT)	15	18-Sep-04	0	Hours	$0.00		8010-AGM-Water Operations
343	701620	1.0	DIAS, GREGORY PAUL (GREG)	16	09-Feb-02	0	Hours	$0.00		8420-Civil Engineering
344	701620	1.0	DIAS, GREGORY PAUL (GREG)	16	18-Oct-03	0	Hours	$0.00		8420-Civil Engineering
345	701620	1.0	DIAS, GREGORY PAUL (GREG)	16	01-Nov-03	0	Hours	$0.00		8420-Civil Engineering
				Total Misc. Labor				**$234.89**		
346	701620	1.0	ACCRUALS/ADJUSTMENTS	111-Labor Accrual/Reversal	31-Dec-04	905.04	Currency	$905.04	2004 LABOR ACCRUAL - PERIOD 12/26/04 - 12/31/04	0000-Balance Sheet
347	701620	1.1	ACCRUALS/ADJUSTMENTS	111-Labor Accrual/Reversal	31-Dec-04	470.98	Currency	$470.98	2004 LABOR ACCRUAL - PERIOD 12/26/04 - 12/31/04	0000-Balance Sheet
348	701620	1.0	ACCRUALS/ADJUSTMENTS	111-Labor Accrual/Reversal	01-Jan-05	-905.04	Currency	-$905.04	2004 LABOR ACCRUAL - PERIOD 12/26/04 - 12/31/04	0000-Balance Sheet
349	701620	1.1	ACCRUALS/ADJUSTMENTS	111-Labor Accrual/Reversal	01-Jan-05	-470.98	Currency	-$470.98	2004 LABOR ACCRUAL - PERIOD 12/26/04 - 12/31/04	0000-Balance Sheet
350	701620	1.0	ACCRUALS/ADJUSTMENTS	112-Labor Corrections	05-Mar-05	64	Currency	$64.00	ADJ FOR RETRO PAY ALLOCATION 12/1/04-3/5/05	8010-AGM-Water Operations
351	701620	1.0	ACCRUALS/ADJUSTMENTS	112-Labor Corrections	05-Mar-05	252	Currency	$252.00	ADJ FOR RETRO PAY ALLOCATION 12/1/04-3/5/05	8220-Modesto Dom Water
352	701620	1.0	ACCRUALS/ADJUSTMENTS	112-Labor Corrections	05-Mar-05	60	Currency	$60.00	ADJ FOR RETRO PAY ALLOCATION 12/1/04-3/5/05	8410-Water Use, Planning & Conservation
353	701620	1.0	ACCRUALS/ADJUSTMENTS	112-Labor Corrections	05-Mar-05	1012	Currency	$1,012.00	ADJ FOR RETRO PAY ALLOCATION 12/1/04-3/5/05	8420-Civil Engineering
354	701620	1.1	ACCRUALS/ADJUSTMENTS	112-Labor Corrections	05-Mar-05	115	Currency	$115.00	ADJ FOR RETRO PAY ALLOCATION 12/1/04-3/5/05	8220-Modesto Dom Water
355	701620	1.0	SMITH CLEARING	112-Labor Corrections	01-Oct-03	2981.12	Currency	$2,981.12	Sunk Cost 14-Jul-01 DIAS, GREGORY PAUL (GREG) 48.00 HOURS	0000-Balance Sheet
356	701620	1.0	SMITH CLEARING	112-Labor Corrections	01-Oct-03	576.28	Currency	$576.28	Sunk Cost 14-Jul-01 KETSCHER, WILLIAM M (BILL) 8.00 HOURS	0000-Balance Sheet
357	701620	1.0	SMITH CLEARING	112-Labor Corrections	01-Oct-03	2856.91	Currency	$2,856.91	Sunk Cost 28-Jul-01 DIAS, GREGORY PAUL (GREG) 46.00 HOURS	0000-Balance Sheet
358	701620	1.0	SMITH CLEARING	112-Labor Corrections	01-Oct-03	288.14	Currency	$288.14	Sunk Cost 28-Jul-01 KETSCHER, WILLIAM M (BILL) 4.00 HOURS	0000-Balance Sheet
359	701620	1.0	SMITH CLEARING	112-Labor Corrections	01-Oct-03	1863.2	Currency	$1,863.20	Sunk Cost 11-Aug-01 DIAS, GREGORY PAUL (GREG) 30.00 HOURS	0000-Balance Sheet
360	701620	1.0	SMITH CLEARING	112-Labor Corrections	01-Oct-03	993.71	Currency	$993.71	Sunk Cost 25-Aug-01 DIAS, GREGORY PAUL (GREG) 16.00 HOURS	0000-Balance Sheet
361	701620	1.0	SMITH CLEARING	112-Labor Corrections	01-Oct-03	1490.56	Currency	$1,490.56	Sunk Cost 8-Sep-01 DIAS, GREGORY PAUL (GREG) 24.00 HOURS	0000-Balance Sheet
362	701620	1.0	SMITH CLEARING	112-Labor Corrections	01-Oct-03	200.65	Currency	$200.65	Sunk Cost 14-Jul-01 LIMA, JOSEPH M. (JOE) 3.00 HOURS	0000-Balance Sheet
363	701620	1.0	SMITH CLEARING	112-Labor Corrections	01-Oct-03	267.53	Currency	$267.53	Sunk Cost 28-Jul-01 LIMA, JOSEPH M. (JOE) 4.00 HOURS	0000-Balance Sheet
364	701620	1.0	SMITH CLEARING	112-Labor Corrections	01-Oct-03	66.88	Currency	$66.88	Sunk Cost 11-Aug-01 LIMA, JOSEPH M (JOE) 1.00 HOUR	0000-Balance Sheet
365	701620	1.0	SMITH CLEARING	112-Labor Corrections	01-Oct-03	133.77	Currency	$133.77	Sunk Cost 22-Sep-01 LIMA, JOSEPH M (JOE) 2.00 HOURS	0000-Balance Sheet
366	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	1374.45	Currency	$1,374.45	Sunk Cost 28-Dec-02 DIAS, GREGORY PAUL (GREG) 20.00 HOURS	0000-Balance Sheet

Line No.	Project	Task	Employee/Supplier	Expnd Type	Item Date	Quantity	UOM	Burdened Cost	Comment	Expnd Org
367	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	2405.29	Currency	$2,405.29	Sunk Cost 14-Dec-02 DIAS, GREGORY PAUL (GREG) 35.00 HOURS	0000-Balance Sheet
368	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	726.89	Currency	$726.89	Sunk Cost 30-Nov-02 DIAS, GREGORY PAUL (GREG) 11.00 HOURS	0000-Balance Sheet
369	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	1354.66	Currency	$1,354.66	Sunk Cost 16-Nov-02 DIAS, GREGORY PAUL (GREG) 20.50 HOURS	0000-Balance Sheet
370	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	462.56	Currency	$462.56	Sunk Cost 02-Nov-02 DIAS, GREGORY PAUL (GREG) 7.00 HOURS	0000-Balance Sheet
371	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	1354.66	Currency	$1,354.66	Sunk Cost 19-Oct-02 DIAS, GREGORY PAUL (GREG) 20.50 HOURS	0000-Balance Sheet
372	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	2196.51	Currency	$2,196.51	Sunk Cost 27-Jul-02 DIAS, GREGORY PAUL (GREG) 34.00 HOURS	0000-Balance Sheet
373	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	299.62	Currency	$299.62	Sunk Cost 29-Jun-02 KETSCHER, WILLIAM M (BILL) 4.00 HOURS	0000-Balance Sheet
374	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	4493.48	Currency	$4,493.48	Sunk Cost 24-Aug-02 DIAS, GREGORY PAUL (GREG) 68.00 HOURS	0000-Balance Sheet
375	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	1817.22	Currency	$1,817.22	Sunk Cost 07-Sep-02 DIAS, GREGORY PAUL (GREG) 27.50 HOURS	0000-Balance Sheet
376	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	1585.93	Currency	$1,585.93	Sunk Cost 21-Sep-02 DIAS, GREGORY PAUL (GREG) 24.00 HOURS	0000-Balance Sheet
377	701620	1.0	SMITH CLEARING	112-Labor Corrections	02-Oct-03	2511.06	Currency	$2,511.06	Sunk Cost 05-Oct-02 DIAS, GREGORY PAUL (GREG) 38.00 HOURS	0000-Balance Sheet
				Total Labor Corrections				**$33,804.08**		
378										
379			**Total Labor**	**$420,980.58**						
380									**LINES 381-405 ARE MEMBRANE PILOT PLANT EXPENSES**	
381	701620	1.1	BANK ONE, NA	201-Materials	15-Jan-04	440.22	Currency	$440.22	MCMASTER-CARR SUPPLY 14-JAN-04	8220-Modesto Dom Water
382	701620	1.1	BANK ONE, NA	201-Materials	15-Jan-04	375.14	Currency	$375.14	HARRINGTON PLASTICS 14-JAN-04	8220-Modesto Dom Water
383	701620	1.1	BANK ONE, NA	201-Materials	16-Jan-04	174.88	Currency	$174.88	MCMASTER-CARR SUPPLY 15-JAN-04	8220-Modesto Dom Water
384	701620	1.1	BANK ONE, NA	201-Materials	22-Jan-04	-18	Currency	-$18.00	HARRINGTON PLASTICS 21-JAN-04	8220-Modesto Dom Water
385	701620	1.1	BANK ONE, NA	201-Materials	22-Jan-04	82.72	Currency	$82.72	ORCHARD SUPPLY #201 20-JAN-04	8220-Modesto Dom Water
386	701620	1.1	BANK ONE, NA	201-Materials	29-Jan-04	1275.12	Currency	$1,275.12	USA BLUE BOOK 27-JAN-04	8220-Modesto Dom Water
387	701620	1.1	BANK ONE, NA	201-Materials	31-Jan-04	185.09	Currency	$185.09	USA BLUE BOOK	0000-Balance Sheet
388	701620	1.1	BANK ONE, NA	201-Materials	14-Jan-05	716.04	Currency	$716.04	MCMASTER-CARR SUPPLY 13-JAN-05	8220-Modesto Dom Water
389	701620	1.1	BANK ONE, NA	201-Materials	17-Jan-05	324.57	Currency	$324.57	MCMASTER-CARR SUPPLY 14-JAN-05	8220-Modesto Dom Water
				Total Bank One Material Purchases				**$3,555.78**		
390	701620	1.0	CENTER STATE PIPE & SUPPLY	201-Materials	30-Dec-03	1100.71	Currency	$1,100.71	PO 44100	0000-Balance Sheet
391	701620	1.0	CENTER STATE PIPE & SUPPLY	201-Materials	07-Jan-04	92.3	Currency	$92.30	PO 44100	0000-Balance Sheet
392	701620	1.0	CENTER STATE PIPE & SUPPLY	201-Materials	07-Jan-04	36.61	Currency	$36.61	PO 44100	0000-Balance Sheet
393	701620	1.0	CENTER STATE PIPE & SUPPLY	201-Materials	14-Jan-04	6.12	Currency	$6.12	PO 44100	0000-Balance Sheet
394	701620	1.1	CENTER STATE PIPE & SUPPLY	201-Materials	26-Jan-04	150.49	Currency	$150.49	PO 44100	0000-Balance Sheet
395	701620	1.1	CENTER STATE PIPE & SUPPLY	201-Materials	01-Feb-04	4.08	Currency	$4.08	PO 44100	0000-Balance Sheet
396	701620	1.1	CENTER STATE PIPE & SUPPLY	201-Materials	01-Feb-04	14.18	Currency	$14.18	PO 44100	0000-Balance Sheet
				Total Center State Pipe Purchases				**$1,404.49**		
397	701620	1.1	SAFE-T-LITE	201-Materials	22-Oct-04	1407.2	Currency	$1,407.20	PO 42930	0000-Balance Sheet
				Total Safe-T-Light Material Purchases				**$1,407.20**		
398	701620	1.0	WARDEN'S OFFICE	201-Materials	04-Feb-04	47.68	Currency	$47.68	PO 44670 / WATER OPS	0000-Balance Sheet
				Total Warden's Office Material Purchases				**$47.68**		
399	701620	1.0	WATERFORD FARM SUPPLY	201-Materials	07-Jan-04	161.5	Currency	$161.50	PO 43010	0000-Balance Sheet
				Total Waterford Farm Supply Material Purchases				**$161.50**		
400	701620	1.0	WILLE ELECTRIC SUPPLY COMPANY, INC.	201-Materials	07-Jan-04	3.89	Currency	$3.89	PO 43410	0000-Balance Sheet
401	701620	1.1	WILLE ELECTRIC SUPPLY COMPANY, INC.	201-Materials	13-Jan-04	276.64	Currency	$276.64	PO 43410	0000-Balance Sheet
402	701620	1.1	WILLE ELECTRIC SUPPLY COMPANY, INC.	201-Materials	13-Jan-04	209.58	Currency	$209.58	PO 43410	0000-Balance Sheet
403	701620	1.1	WILLE ELECTRIC SUPPLY COMPANY, INC.	201-Materials	13-Jan-04	81.42	Currency	$81.42	PO 43410	0000-Balance Sheet
404	701620	1.1	WILLE ELECTRIC SUPPLY COMPANY, INC.	201-Materials	29-Jan-04	78	Currency	$78.00	PO 43410	0000-Balance Sheet
405	701620	1.1	WILLE ELECTRIC SUPPLY COMPANY, INC.	201-Materials	29-Jan-04	446.94	Currency	$446.94	PO 43410	0000-Balance Sheet
				Total Willie Electric Supply Purchases				**$1,096.47**		
406	701620	1.0	BANK ONE, NA	203-Stationary Supplies	15-Mar-04	481.35	Currency	$481.35	DITTOS 11-MAR-04	8220-Modesto Dom Water
				Total Bank One Stationary Supplies				**$481.35**	**COLOR COPIES FOR DSEIR**	
407	701620	1.0	OFFICE DEPOT BUSINESS SERVICES DIVISION - 1161	204-Office Supplies	01-Feb-04	12.54	Currency	$12.54	DOM WATER PHASE 2 / SUMMARY BILLING - 1/1/04 - 1/31/04	0000-Balance Sheet
				Total Office Depot Office Supplies				**$12.54**		
408	701620	1.0	FEDERAL EXPRESS CORPORATION	205-Postage/Express	21-Dec-01	10.74	Currency	$10.74	5634495300 / GREG DIAS	0000-Balance Sheet
409	701620	1.0	FEDERAL EXPRESS CORPORATION	205-Postage/Express	18-Oct-02	15.28	Currency	$15.28	000977240305 / INVOICE SUMMARY OCT 18 2002 / ACCT #0952-0270-5	0000-Balance Sheet
410	701620	1.0	FEDERAL EXPRESS CORPORATION	205-Postage/Express	18-Jul-03	11.83	Currency	$11.83	G. DIAS / ACCT #0952-0270-5 / SUMMARY THROUGH JULY 18, 2003	0000-Balance Sheet
411	701620	1.0	FEDERAL EXPRESS CORPORATION	205-Postage/Express	21-Nov-03	12.39	Currency	$12.39	G. DIAS / ACCT #0952-0270-5 / SUMMARY NOV 21, 2003	0000-Balance Sheet
412	701620	1.0	FEDERAL EXPRESS CORPORATION	205-Postage/Express	19-Dec-03	13.46	Currency	$13.46	ACCT #0952-0270-5 / SUMAMRY DEC 19, 2003	0000-Balance Sheet
413	701620	1.0	FEDERAL EXPRESS CORPORATION	205-Postage/Express	18-Feb-05	12.21	Currency	$12.21	G DIAS / ACCT 0952-0270-5 / SUMMARY 2/18/05	0000-Balance Sheet
414	701620	1.1	FEDERAL EXPRESS CORPORATION	205-Postage/Express	18-Feb-05	22.75	Currency	$22.75	C HIDAHL / ACCT 0952-0270-5 / SUMMARY 2/18/05	0000-Balance Sheet
415	701620	1.0	FEDERAL EXPRESS CORPORATION	205-Postage/Express	21-Mar-05	11.19	Currency	$11.19	G DIAS / ACCT 0952-0270-5 / SUMMARY 3/21/05	0000-Balance Sheet
416	701620	1.0	FEDERAL EXPRESS CORPORATION	205-Postage/Express	21-Mar-05	17.39	Currency	$17.39	W WARD / ACCT 0952-0270-5 / SUMMARY 3/21/05	0000-Balance Sheet
417	701620	1.0	FEDERAL EXPRESS CORPORATION	205-Postage/Express	21-Mar-05	25.66	Currency	$25.66	G DIAS / ACCT 0952-0270-5 / SUMMARY 3/21/05	0000-Balance Sheet
418	701620	1.1	FEDERAL EXPRESS CORPORATION	205-Postage/Express	21-Mar-05	18.07	Currency	$18.07	C HIDAHL / ACCT 0952-0270-5 / SUMMARY 3/21/05	0000-Balance Sheet
				Total Fed Ex Postage				**$170.97**		
419	701620	1.1	BANK ONE, NA	207-Freight	03-Feb-04	43.1	Currency	$43.10	**LINES 419-438 ARE MEMBRANE PILOT PLANT EXPENSES** FEDEX FREIGHT WEST INC 02-FEB-04	8220-Modesto Dom Water
				Total Bank One Freight				**$43.10**		
420	701620	1.0	BANK ONE, NA	214-Repair Parts	26-Dec-03	1014.78	Currency	$1,014.78	USA BLUE BOOK 23-DEC-03	8220-Modesto Dom Water

Line No.	Project	Task	Employee/Supplier	Expnd Type	Item Date	Quantity	UOM	Burdened Cost	Comment	Expnd Org
421	701620	1.1	BANK ONE, NA	214-Repair Parts	05-Feb-04	21.45	Currency	$21.45	ORCHARD SUPPLY #201 03-FEB-04	8220-Modesto Dom Water
422	701620	1.1	BANK ONE, NA	214-Repair Parts	06-Feb-04	29.46	Currency	$29.46	ORCHARD SUPPLY #201 04-FEB-04	8220-Modesto Dom Water
423	701620	1.1	BANK ONE, NA	214-Repair Parts	23-Feb-04	514.65	Currency	$514.65	USA BLUE BOOK 19-FEB-04	8220-Modesto Dom Water
				Total Bank One Repair Parts				**$1,580.34**		
424	701620	1.1	WATERFORD FARM SUPPLY	214-Repair Parts	09-Jul-04	16.83	Currency	$16.83	PO 43010 / REF 92030	0000-Balance Sheet
				Total Waterford Farm Supply Repair Parts				**$16.83**		
425	701620	1.1	BANK ONE, NA	217-Small Tools	04-Oct-04	162.15	Currency	$162.15	MCMASTER-CARR SUPPLY 01-OCT-04	8220-Modesto Dom Water
426	701620	1.1	BANK ONE, NA	217-Small Tools	20-Oct-04	1303.6	Currency	$1,303.60	TRANSCAT 18-OCT-04	8220-Modesto Dom Water
				Total Bank One Small Tool Purchases				**$1,465.75**		
427	701620	1.1	SAFE-T-LITE	248-Safety Equipment Cost	27-Apr-04	1299	Currency	$1,299.00	PO 42930	0000-Balance Sheet
				Total Safe-T-Lite Safety Equipment				**$1,299.00**		
428	701620	1.0	BANK ONE, NA	255-Material Sales Tax	31-Dec-03	67.45	Currency	$67.45	KENNETH EDWARDS 31-DEC-03	0000-Balance Sheet
429	701620	1.1	BANK ONE, NA	255-Material Sales Tax	31-Jan-04	84.81	Currency	$84.81	JEFF L MILLER 31-JAN-04	0000-Balance Sheet
430	701620	1.1	BANK ONE, NA	255-Material Sales Tax	31-Jan-04	6.49	Currency	$6.49	KENNETH EDWARDS 31-JAN-04	0000-Balance Sheet
431	701620	1.1	BANK ONE, NA	255-Material Sales Tax	29-Feb-04	35.21	Currency	$35.21	SALES TAX / USA BLUE BOOK 19-FEB-04	0000-Balance Sheet
432	701620	1.0	CENTER STATE PIPE & SUPPLY	255-Material Sales Tax	30-Dec-03	81.18	Currency	$81.18	PO 44100	0000-Balance Sheet
433	701620	1.0	CENTER STATE PIPE & SUPPLY	255-Material Sales Tax	07-Jan-04	6.81	Currency	$6.81	PO 44100	0000-Balance Sheet
434	701620	1.0	CENTER STATE PIPE & SUPPLY	255-Material Sales Tax	07-Jan-04	2.7	Currency	$2.70	PO 44100	0000-Balance Sheet
435	701620	1.0	CENTER STATE PIPE & SUPPLY	255-Material Sales Tax	14-Jan-04	0.45	Currency	$0.45	PO 44100	0000-Balance Sheet
436	701620	1.1	CENTER STATE PIPE & SUPPLY	255-Material Sales Tax	26-Jan-04	11.1	Currency	$11.10	PO 44100	0000-Balance Sheet
437	701620	1.1	CENTER STATE PIPE & SUPPLY	255-Material Sales Tax	01-Feb-04	0.3	Currency	$0.30	PO 44100	0000-Balance Sheet
438	701620	1.1	CENTER STATE PIPE & SUPPLY	255-Material Sales Tax	01-Feb-04	1.05	Currency	$1.05	PO 44100	0000-Balance Sheet
439	701620	1.0	OFFICE DEPOT BUSINESS SERVICES DIVISION - 1161	255-Material Sales Tax	01-Feb-04	0.92	Currency	$0.92	DOM WATER PHASE 2 / SUMMARY BILLING - 1/1/04 - 1/31/04	0000-Balance Sheet
440	701620	1.1	SAFE-T-LITE	255-Material Sales Tax	27-Apr-04	95.81	Currency	$95.81	PO 42930	0000-Balance Sheet
441	701620	1.1	SAFE-T-LITE	255-Material Sales Tax	22-Oct-04	103.78	Currency	$103.78	PO 42930	0000-Balance Sheet
442	701620	1.0	WARDEN'S OFFICE	255-Material Sales Tax	04-Feb-04	3.52	Currency	$3.52	PO 44670 / WATER OPS	0000-Balance Sheet
443	701620	1.0	WATERFORD FARM SUPPLY	255-Material Sales Tax	07-Jan-04	11.91	Currency	$11.91	PO 43010	0000-Balance Sheet
444	701620	1.1	WATERFORD FARM SUPPLY	255-Material Sales Tax	09-Jul-04	1.24	Currency	$1.24	PO 43010 / REF 92030	0000-Balance Sheet
445	701620	1.0	WILLE ELECTRIC SUPPLY COMPANY, INC.	255-Material Sales Tax	07-Jan-04	0.28	Currency	$0.28	PO 43410	0000-Balance Sheet
446	701620	1.1	WILLE ELECTRIC SUPPLY COMPANY, INC.	255-Material Sales Tax	13-Jan-04	20.4	Currency	$20.40	PO 43410	0000-Balance Sheet
447	701620	1.1	WILLE ELECTRIC SUPPLY COMPANY, INC.	255-Material Sales Tax	13-Jan-04	15.46	Currency	$15.46	PO 43410	0000-Balance Sheet
448	701620	1.1	WILLE ELECTRIC SUPPLY COMPANY, INC.	255-Material Sales Tax	13-Jan-04	6.01	Currency	$6.01	PO 43410	0000-Balance Sheet
449	701620	1.1	WILLE ELECTRIC SUPPLY COMPANY, INC.	255-Material Sales Tax	29-Jan-04	5.76	Currency	$5.76	PO 43410	0000-Balance Sheet
450	701620	1.1	WILLE ELECTRIC SUPPLY COMPANY, INC.	255-Material Sales Tax	29-Jan-04	32.96	Currency	$32.96	PO 43410	0000-Balance Sheet
451				**Total Sales Tax**				**$595.60**		
452			**Total Materials and Supplies**	**$13,338.60**						
453										
454	701620	1.0	BLACK & VEATCH	401-Consulting	05-Sep-03	3050	Currency	$3,050.00	REF 65518 / 8/1/03-8/29/03 / PROF SVCS / WTP PHASE 2	0000-Balance Sheet
455	701620	1.0	BLACK & VEATCH	401-Consulting	02-Oct-03	14761.86	Currency	$14,761.86	CLIENT REF 65518 / PROF SVCS 8/29/03-9/26/03 / WTP PHASE II	0000-Balance Sheet
456	701620	1.0	BLACK & VEATCH	401-Consulting	05-Nov-03	56476.2	Currency	$56,476.20	PROF SVCS / MRWTP PHASE 2 / 9/26/03-10/31/03	0000-Balance Sheet
457	701620	1.0	BLACK & VEATCH	401-Consulting	04-Dec-03	27361.5	Currency	$27,361.50	PROFESSIONAL SERVICES - NOV 03 BILLING / MRWTP PHASE TWO EXPANSION PROJECT	0000-Balance Sheet
458	701620	1.0	BLACK & VEATCH	401-Consulting	31-Dec-03	5570	Currency	$5,570.00	PROFESSIONAL SERVICES - MRWTP PHASE TWO EXPANISON PROJECT / DEC 03 BILLING	0000-Balance Sheet
459	701620	1.1	BLACK & VEATCH	401-Consulting	11-Feb-04	63533.2	Currency	$63,533.20	PROF SVCS 12/26/03-1/30/04 FOR PHASE 2 EXPANSION MRWTP	0000-Balance Sheet
460	701620	1.1	BLACK & VEATCH	401-Consulting	05-Mar-04	48858	Currency	$48,858.00	PROFESSIONAL SERVICES / FEB 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT	0000-Balance Sheet
461	701620	1.1	BLACK & VEATCH	401-Consulting	05-Apr-04	25788.81	Currency	$25,788.81	PROF SVCS 2/27/04-3/26/04 FOR MRWTP PHASE 2 EXPANSION	0000-Balance Sheet
462	701620	1.1	BLACK & VEATCH	401-Consulting	13-May-04	33628.68	Currency	$33,628.68	PROFESSIONAL SERVICES - APR 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT	0000-Balance Sheet
463	701620	1.1	BLACK & VEATCH	401-Consulting	03-Jun-04	38684.87	Currency	$38,684.87	PROFESSIONAL SERVICES - MAY 04 BILLING / MRWTP PHASE TWO	0000-Balance Sheet
464	701620	1.1	BLACK & VEATCH	401-Consulting	06-Jul-04	15218.67	Currency	$15,218.67	PROFESSIONAL SERVICES / JUN 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT	0000-Balance Sheet
465	701620	1.1	BLACK & VEATCH	401-Consulting	04-Aug-04	32358.65	Currency	$32,358.65	PROFESSIONAL SERVICES / JUL 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT	0000-Balance Sheet
466	701620	1.1	BLACK & VEATCH	401-Consulting	02-Sep-04	34883.74	Currency	$34,883.74	PROFESSIONAL SRVICES / MRWTP PHASE TWO EXPANISON PROJECT AUG 04 BILLING	0000-Balance Sheet
467	701620	1.1	BLACK & VEATCH	401-Consulting	30-Sep-04	59764.5	Currency	$59,764.50	PROFESSIONAL SERVICES / AUG 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT	0000-Balance Sheet
468	701620	1.1	BLACK & VEATCH	401-Consulting	08-Nov-04	61809.18	Currency	$61,809.18	PROF SVCS / 9/24/04-10/29/04 / MRWTP PHASE 2 EXPANSION PROJECT	0000-Balance Sheet
469	701620	1.1	BLACK & VEATCH	401-Consulting	01-Dec-04	25424.5	Currency	$25,424.50	PROFESSIONAL SERVICES / NOV 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT	0000-Balance Sheet
470	701620	1.1	BLACK & VEATCH	401-Consulting	31-Dec-04	18609.56	Currency	$18,609.56	PROF SVCS / MRWTP PHASE 2 EXP PROJ / 11/26/04-12/31/04	0000-Balance Sheet
471	701620	1.1	BLACK & VEATCH	401-Consulting	01-Apr-05	15532.81	Currency	$15,532.81	CLIENT 65518 / PROF SVCS / MRWTP PHASE 2 EXP PROJ / 1/1/05-2/4/05	0000-Balance Sheet
472	701620	1.1	BLACK & VEATCH	401-Consulting	01-Apr-05	35873.36	Currency	$35,873.36	CLIENT 65518 / PROF SVCS / MRWTP PHASE 2 EXP PROJ / 2/5/05-3/4/05	0000-Balance Sheet
				Total Black & Veatch Consulting				**$617,188.09**		
	701620	1.1	JOHNSTON, WILLIAM R. P.E. RESEARCH & CONSULTING	401-Consulting	31-Dec-04	10075.00	Currency	$10,075.00	77.5 hrs @ $130 per hr for Water Rights consulting	
			JOHNSTON, WILLIAM R. P.E. RESEARCH & CONSULTING	401-Consulting	03-May-05	4200.00	Currency	$4,200.00	30 hrs @ $140 per hr for Water Rights consulting	
				Total William Johnston Consulting				**$14,275.00**		
473	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	14-Jan-04	8411.6	Currency	$8,411.60	PROFESSIONAL SERVICES - MRWTP PHASE TWO EXPANISON PROJECT SEIR / NOV 24- DEC 28, 2003	0000-Balance Sheet

Line No.	Project	Task	Employee/Supplier	Expnd Type	Item Date	Quantity	UOM	Burdened Cost	Comment	Expnd Org
474	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	08-Feb-04	13196.85	Currency	$13,196.85	PROF SVCS - MRWTP PHASE 2 EXPANSION PROJECT SEIR / 12/29/03-1/25/04	0000-Balance Sheet
475	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	10-Mar-04	35368.47	Currency	$35,368.47	PROFESSIONAL SERVICES - FEB 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR	0000-Balance Sheet
476	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	08-Apr-04	13399.51	Currency	$13,399.51	PROFESSIONAL SERVICES - MAR 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR	0000-Balance Sheet
477	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	10-May-04	19462.78	Currency	$19,462.78	PROFESSIONAL SERVICES - APR 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR	0000-Balance Sheet
478	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	08-Jun-04	5366.49	Currency	$5,366.49	PROFESSIONAL SERVICES - MAY 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR	0000-Balance Sheet
479	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	13-Jul-04	7978.92	Currency	$7,978.92	JUN 04 BILLING / MRWTP PHASE TWO EXPANSIONS PROJECT SEIR	0000-Balance Sheet
480	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	10-Aug-04	4255.84	Currency	$4,255.84	PROFESSIONAL SERVICES / JUL 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR	0000-Balance Sheet
481	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	01-Sep-04	17635.27	Currency	$17,635.27	PROFESSIONAL SERVICES / AUG 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR	0000-Balance Sheet
482	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	13-Oct-04	22229.32	Currency	$22,229.32	PROFESSIONAL SERVICES - AUG 04 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR	0000-Balance Sheet
483	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	03-Nov-04	11132.79	Currency	$11,132.79	PROF SVCS - 9/27/04-10/24/04 / MRWTP PHASE 2 EXPANSION PROJECT SEIR	0000-Balance Sheet
484	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	01-Dec-04	4946.92	Currency	$4,946.92	PROFESSIONAL SERVICES / NOV 04 BILLNG / MRWTP - PHASE TWO EXPANSION PROJECT SEIR	0000-Balance Sheet
485	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	10-Jan-05	11080.32	Currency	$11,080.32	PROF SVCS - 11/22/04-12/26/04 / MRWTP PHASE 2 EXPANSION PROJECT SEIR	0000-Balance Sheet
486	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	04-Feb-05	3400.14	Currency	$3,400.14	PROF SVCS - 12/27/04-1/23/05 / MRWTP PHASE 2 EXPANSION PROJECT SEIR	0000-Balance Sheet
487	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	01-Mar-05	2906.1	Currency	$2,906.10	PROF SVCS - 1/24/05-2/20/05 / MRWTP PHASE 2 EXPANSION PROJECT SEIR	0000-Balance Sheet
488	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	12-Apr-05	1496.47	Currency	$1,496.47	PROJ 03564.03 / PROF SVCS - 2/21/05-3/2705 / MRWTP PHASE 2 EXPANSION PROJECT SEIR	0000-Balance Sheet
489	701620	1.1	JONES & STOKES ASSOCIATES	401-Consulting	03-May-05	705.18	Currency	$705.18	PROJ 03564.03 / PROF SVCS - 3/28/05-4/24/05 / MRWTP PHASE 2 EXPANSION PROJECT SEIR	0000-Balance Sheet
				Total Jones & Stokes Consulting				**$182,972.97**		
490	701620	1.1	KATZ & ASSOCIATES	401-Consulting	01-Apr-04	2145	Currency	$2,145.00	PROF SVCS OF CRAIG MOYLE THRU 2/29/04	0000-Balance Sheet
491	701620	1.1	KATZ & ASSOCIATES	401-Consulting	01-Apr-04	163.7	Currency	$163.70	PROFESSIONAL SERVICES - MAR 04 BILLING	0000-Balance Sheet
492	701620	1.1	KATZ & ASSOCIATES	401-Consulting	01-Jun-04	279.38	Currency	$279.38	PROFESSIONAL SERVICES / APR 04 BILLING / CLIENT #SC1123L	0000-Balance Sheet
				Total Katz & Associates Consulting				**$2,588.08**		
									LINE 493 IS COURT REPORTER	
493	701620	1.1	AL CALA & ASSOCIATES	425-Other Outside Services	31-Dec-04	230	Currency	$230.00	2 PUBLIC MTGS FOR MRWTP PHASE 2 EXPANSION	0000-Balance Sheet
				Total Al Cala & Associates Consulting				**$230.00**	**COURT REPORTER**	
494	701620	1.1	BANK ONE, NA	425-Other Outside Services	12-Apr-04	10.74	Currency	$10.74	AUDIO VIDEO HQ 09-APR-04	8220-Modesto Dom Water
495	701620	1.1	BANK ONE, NA	425-Other Outside Services	12-Apr-04	42.95	Currency	$42.95	AUDIO VIDEO HQ 08-APR-04	8220-Modesto Dom Water
				Total Bank One Outside Services				**$53.69**		
									LINES 496-520 ARE MEMBRANE PILOT PLANT COSTS FOR SIMULATED DISTRIBUTION STUDIES	
496	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	23-Aug-04	900	Currency	$900.00	PO 41760	0000-Balance Sheet
497	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	01-Feb-05	300	Currency	$300.00	PO 41760	0000-Balance Sheet
498	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	07-Feb-05	240	Currency	$240.00	PO 41760	0000-Balance Sheet
499	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	07-Feb-05	320	Currency	$320.00	PO 41760	0000-Balance Sheet
500	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	07-Feb-05	565	Currency	$565.00	PO 41760	0000-Balance Sheet
501	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	09-Feb-05	390	Currency	$390.00	PO 41760	0000-Balance Sheet
502	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	18-Feb-05	239	Currency	$239.00	PO 41760	0000-Balance Sheet
503	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	23-Feb-05	35	Currency	$35.00	PO 41760	0000-Balance Sheet
504	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	24-Feb-05	170	Currency	$170.00	PO 41760	0000-Balance Sheet
505	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	25-Feb-05	900	Currency	$900.00	PO 41760	0000-Balance Sheet
506	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	01-Mar-05	35	Currency	$35.00	PO 41760	0000-Balance Sheet
507	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	10-Mar-05	2265	Currency	$2,265.00	PO 41760	0000-Balance Sheet
508	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	17-Mar-05	207.5	Currency	$207.50	PO 41760	0000-Balance Sheet
509	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	21-Mar-05	60	Currency	$60.00	PO 41760 / SUBM #2005030799	0000-Balance Sheet
510	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	21-Mar-05	185	Currency	$185.00	PO 41760 / SUBM #2005030323	0000-Balance Sheet
511	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	22-Mar-05	317	Currency	$317.00	PO 41760 / SUBM #2005021298	0000-Balance Sheet
512	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	24-Mar-05	207.5	Currency	$207.50	PO 41760	0000-Balance Sheet
513	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	07-Apr-05	230	Currency	$230.00	PO 41760	0000-Balance Sheet
514	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	11-Apr-05	2250	Currency	$2,250.00	PO 41760	0000-Balance Sheet
515	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	14-Apr-05	155	Currency	$155.00	PO 41760	0000-Balance Sheet
516	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	25-Apr-05	185	Currency	$185.00	PO 41760	0000-Balance Sheet
517	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	06-May-05	339	Currency	$339.00	PO 41760	0000-Balance Sheet
518	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	11-May-05	445	Currency	$445.00	PO 41760	0000-Balance Sheet
519	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	24-May-05	495	Currency	$495.00	PO 41760	0000-Balance Sheet
520	701620	1.1	BSK ANALYTICAL LABORATORIES	425-Other Outside Services	24-May-05	3075	Currency	$3,075.00	PO 41760	0000-Balance Sheet
				Total BSK Analytical Lab Outside Services				**$14,510.00**		
521	701620	1.0	CALIFORNIA CAD SOLUTIONS	425-Other Outside Services	28-Dec-04	2815	Currency	$2,815.00	SCAN, PLACE & RUBBER SHEET 10 AERIAL PHOTOS	0000-Balance Sheet
				Total California CAD Solutions Outside Services				**$2,815.00**	**ACREAGE MAP FOR SWRCB**	
522	701620	1.0	MARTINO GRAPHIC DESIGN	425-Other Outside Services	08-Jun-04	1779.92	Currency	$1,779.92	PO 44563 / WTP NEWSLETTER	0000-Balance Sheet
				Total Martino Graphic Design Outside Services				**$1,779.92**		
523	701620	1.0	SMITH CLEARING	425-Other Outside Services	02-Oct-03	1715	Currency	$1,715.00	Sunk Cost 01-Jun-02 KATZ & ASSOCIATES	0000-Balance Sheet
524	701620	1.0	SMITH CLEARING	425-Other Outside Services	02-Oct-03	6701.25	Currency	$6,701.25	Sunk Cost 01-Jun-02 KATZ & ASSOCIATES	0000-Balance Sheet
525	701620	1.0	SMITH CLEARING	425-Other Outside Services	02-Oct-03	808.25	Currency	$808.25	Sunk Cost 01-Jun-02 KATZ & ASSOCIATES	0000-Balance Sheet
526	701620	1.0	SMITH CLEARING	425-Other Outside Services	02-Oct-03	2572.94	Currency	$2,572.94	Sunk Cost 01-Jun-02 KATZ & ASSOCIATES	0000-Balance Sheet
527	701620	1.0	SMITH CLEARING	425-Other Outside Services	02-Oct-03	5290.91	Currency	$5,290.91	Sunk Cost 21-Jun-02 KATZ & ASSOCIATES	0000-Balance Sheet

Line No.	Project	Task	Employee/Supplier	Expnd Type	Item Date	Quantity	UOM	Burdened Cost	Comment	Expnd Org
528	701620	1.0	SMITH CLEARING	425-Other Outside Services	02-Oct-03	-8544.17	Currency	-$8,544.17	Sunk Cost 10-Jul-02 ACCOUNTS RECEIVABLE	0000-Balance Sheet
				Total Financial Adjustments to Outside Services				**$8,544.18**		
529	701620	1.0	CALIFORNIA CAD SOLUTIONS	455-Outside Services Sales Tax	28-Dec-04	1.11	Currency	$1.11	SCAN, PLACE & RUBBER SHEET 10 AERIAL PHOTOS	0000-Balance Sheet
530	701620	1.0	MARTINO GRAPHIC DESIGN	455-Outside Services Sales Tax	08-Jun-04	131.27	Currency	$131.27	PO 44563 / WTP NEWSLETTER	0000-Balance Sheet
531				**Total Outside Services Sales Tax**				**$132.38**		
532			**Total Outside Services**	**$845,089.31**						
533									**LINES 534-538 Scottsdale Wtr Campus; Mesa CAP Plant**	
534	701620	1.1	AMERICAN EXPRESS	501-Transportation-Commercial	26-Feb-04	292.3	Currency	$292.30	G. DIAS / ACCT #3782-911358-11007 / FEB 04 BILLING	0000-Balance Sheet
535	701620	1.1	AMERICAN EXPRESS	501-Transportation-Commercial	26-Feb-04	20	Currency	$20.00	SERVICE FEE / ACCT #3782-911358-11007 / FEB 04 BILLING	0000-Balance Sheet
536	701620	1.1	AMERICAN EXPRESS	501-Transportation-Commercial	26-Feb-04	40	Currency	$40.00	SERVICE FEE / ACCT #3782-911358-11007 / FEB 04 BILLING	0000-Balance Sheet
537	701620	1.1	AMERICAN EXPRESS	501-Transportation-Commercial	26-Feb-04	255.3	Currency	$255.30	P. RYAN / ACCT #3782-911358-11007 / FEB 04 BILLING	0000-Balance Sheet
538	701620	1.1	AMERICAN EXPRESS	501-Transportation-Commercial	26-Feb-04	255.3	Currency	$255.30	W. WARD / ACCT #3782-911358-11007 / FEB 04 BILLING	0000-Balance Sheet
									LINES 539-545 OCWD WWTP - Submerged membranes	
539	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Jun-04	209.7	Currency	$209.70	W. WARD / ACCT #3782-911358-11007 / MAY 04 BILLING	0000-Balance Sheet
540	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Jun-04	209.7	Currency	$209.70	G. DIAS / ACCT #3782-911358-11007 / MAY 04 BILLING	0000-Balance Sheet
541	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Jun-04	209.7	Currency	$209.70	P. RYAN / ACCT #3782-911358-11007 / MAY 04 BILLING	0000-Balance Sheet
542	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Jun-04	-209.7	Currency	-$209.70	P. RYAN / ACCT #3782-911358-11007 / MAY 04 BILLING	0000-Balance Sheet
543	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Jun-04	209.7	Currency	$209.70	K. EDWARDS / ACCT #3782-911358-11007 / MAY 04 BILLING	0000-Balance Sheet
544	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Jun-04	209.7	Currency	$209.70	C. HIDAHL / ACCT #3782-911358-11007 / MAY 04 BILLING	0000-Balance Sheet
545	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Jun-04	100	Currency	$100.00	W. WARD / ACCT #3782-911358-11007 / MAY 04 BILLING	0000-Balance Sheet
546	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Mar-05	138.39	Currency	$138.39	P RYAN / ACCT #3782-911358-11007 / FEB 05 BILLING	0000-Balance Sheet
547	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Mar-05	20	Currency	$20.00	SERVICE CHARGE / ACCT #3782-911358-11007 / FEB 05 BILLING	0000-Balance Sheet
	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Mar-05	215.39	Currency	$215.39	P RYAN / ACCT #3782-911358-11007 / FEB 05 BILLING	
	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Mar-05	60	Currency	$60.00	3 SERVICE CHARGES	
	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Mar-05	215.39	Currency	$215.39	K. EDWARDS / ACCT #3782-911358-11007 / FEB 05 BILLING	
	701620	1.0	AMERICAN EXPRESS	501-Transportation-Commercial	01-Mar-05	215.39	Currency	$215.39	J. MILLER / ACCT #3782-911358-11007 / FEB 05 BILLING	
548										
549			**Total Transportation Costs**	**$2,666.26**						
550										
551	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	11-Jan-02	58.81	Currency	$58.81	THE FRUIT YARD 09-JAN-02- ENGR SEL PROCESS	5220-Accounting/Budgeting
552	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	17-Jan-02	19.68	Currency	$19.68	THE FRUIT YARD 15-JAN-02 - ENGR SEL PROCESS	5220-Accounting/Budgeting
553	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	12-May-03	34.94	Currency	$34.94	THE FRUIT YARD 08-MAY-03 - CEQA RFP	8420-Civil Engineering
554	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	09-Jun-03	29.39	Currency	$29.39	PICCADILLY DELI & SAND 06-JUN-03 - EIR INTERVIEWS	8420-Civil Engineering
555	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	24-Nov-03	63.27	Currency	$63.27	SMART & FINAL CO. SCL 21-NOV-03	8010-AGM-Water Operations
556	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	29-Jan-04	35.94	Currency	$35.94	PICCADILLY DELI 27-JAN-04	8220-Modesto Dom Water
557	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	04-Feb-04	72.73	Currency	$72.73	PICCADILLY DELI 02-FEB-04 EROOM TRAINING	8220-Modesto Dom Water
									LINES 558-561PHOENIX FIELD TRIP	
558	701620	1.1	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	27-Feb-04	36	Currency	$36.00	FIVE STAR PARK00100107 25-FEB-04	8220-Modesto Dom Water
559	701620	1.1	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	27-Feb-04	98.6	Currency	$98.60	AMERISUITES TEMPE 25-FEB-04	8220-Modesto Dom Water
560	701620	1.1	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	27-Feb-04	98.6	Currency	$98.60	AMERISUITES TEMPE 25-FEB-04	8220-Modesto Dom Water
561	701620	1.1	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	27-Feb-04	98.6	Currency	$98.60	AMERISUITES TEMPE 25-FEB-04	8220-Modesto Dom Water
562	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	01-Oct-04	104.47	Currency	$104.47	PICCADILLY DELI 29-SEP-04	8220-Modesto Dom Water
563	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	20-Oct-04	45.38	Currency	$45.38	PICCADILLY DELI 18-OCT-04	8220-Modesto Dom Water
564	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	16-Dec-04	23.01	Currency	$23.01	SMART & FINAL CO. SCL 14-DEC-04	8220-Modesto Dom Water
									LINES 565-570 SALT LAKE CITY FIELD TRIP	
565	701620	1.1	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	21-Feb-05	91.19	Currency	$91.19	LITTLE AMERICA SLC LOD 19-FEB-05	8220-Modesto Dom Water
566	701620	1.1	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	21-Feb-05	19.46	Currency	$19.46	HMSHOST-SMF-AIR #01 17-FEB-05	8220-Modesto Dom Water
567	701620	1.1	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	21-Feb-05	24	Currency	$24.00	SACRAMENTO CNTY ARPRT 18-FEB-05	8220-Modesto Dom Water
568	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	21-Feb-05	10.76	Currency	$10.76	LITTLE AMERICA SLC LOD 19-FEB-05	8220-Modesto Dom Water
569	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	21-Feb-05	20.27	Currency	$20.27	SQUATTERS AIRPORT PUB 18-FEB-05	8220-Modesto Dom Water
570	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	21-Feb-05	182.38	Currency	$182.38	LITTLE AMERICA SLC LOD 19-FEB-05	8220-Modesto Dom Water
571	701620	1.1	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	28-Feb-05	67.74	Currency	$67.74	HOUSE OF BEEF 24-FEB-05-SO CTY WTP TOUR	8220-Modesto Dom Water
									MEMBRANE CONFERENCE-PAT RYAN	
572	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	02-Mar-05	211.81	Currency	$211.81	WYNDHAM HOTELS PHOENIX 01-MAR-05	8220-Modesto Dom Water
573	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	11-Mar-05	11.53	Currency	$11.53	HRC-PHOENIX 10011435 09-MAR-05	8220-Modesto Dom Water
574	701620	1.0	BANK ONE, NA	503-Meals/Lodg/Park/RentCar	11-Mar-05	468.53	Currency	$468.53	WYNDHAM HOTELS PHOENIX 09-MAR-05	8220-Modesto Dom Water
				Total Bank One Meals/Lodg/Park/RentCar				**$1,927.09**		
575	701620	1.0	DIAS, GREGORY PAUL (GREG)	503-Meals/Lodg/Park/RentCar	16-Dec-04	20	Currency	$20.00	EXPENSES - PBLIC MTG PHASE TWO EXPANSION PROJECT PUBLIC MTG	0000-Balance Sheet
				Total Greg Dias Meals/Lodg/Park/RentCar				**$20.00**		

Line No.	Project	Task	Employee/Supplier	Expnd Type	Item Date	Quantity	UOM	Burdened Cost	Comment	Expnd Org
576	701620	1.0	JAKE SONKE, CONTROLLER	503-Meals/Lodg/Park/RentCar	20-Jun-03	7.55	Currency	$7.55	CASH AND CARRY / PURCHASES- W.E. 6/20/03 - REIMBURSE THE PETTY CASH ACCT FOR MONEY ISSUED	0000-Balance Sheet
577	701620	1.0	JAKE SONKE, CONTROLLER	503-Meals/Lodg/Park/RentCar	27-Jun-03	33.12	Currency	$33.12	CASH AND CARRY	0000-Balance Sheet
578	701620	1.0	JAKE SONKE, CONTROLLER	503-Meals/Lodg/Park/RentCar	22-Jul-03	11.2	Currency	$11.20	OLDE TYME PASTRY / PURCHASES THRU 7/21/03 - REIMBURSE THE PETTY CASH ACCT	0000-Balance Sheet
579	701620	1.0	JAKE SONKE, CONTROLLER	503-Meals/Lodg/Park/RentCar	11-Mar-04	11	Currency	$11.00	CITY OF SACRAMENTO -PARKING / PURCHASES W.E. 3/10/04 - MEETING WITH SWRCB	0000-Balance Sheet
580	701620	1.0	JAKE SONKE, CONTROLLER	503-Meals/Lodg/Park/RentCar	28-Sep-04	7.8	Currency	$7.80	CASH & CARRY / PURCHASES - W.E. 9/27/04 / REIMBURSE THE PETTY CASH FOR FUNDS ISSUED	0000-Balance Sheet
581	701620	1.0	JAKE SONKE, CONTROLLER	503-Meals/Lodg/Park/RentCar	19-Oct-04	6.49	Currency	$6.49	CASH & CARRY / PURCHASES / W.E. 10/19/04 / REIMBURSE THE PETTY CASH FOR FUNDS ISSUED	0000-Balance Sheet
582	701620	1.0	JAKE SONKE, CONTROLLER	503-Meals/Lodg/Park/RentCar	17-Dec-04	14.97	Currency	$14.97	SAVEMART / PURCHASES W.E. 12/16/04 / REPLENISH THE PETTY CASH ACCT FOR FUNDS ISSUED	0000-Balance Sheet
				Total Petty Cash Meals/Lodg/Park/RentCar				**$92.13**		
583	701620	1.0	RYAN, PATRICK J (PAT)	503-Meals/Lodg/Park/RentCar	18-Mar-05	49.5	Currency	$49.50	REIMB EXP / MEMBRANE TECH CONF IN PHOENIX, AZ 3/9/05	0000-Balance Sheet
				Total Pat Ryan Meals/Lodg/Park/RentCar				**$49.50**		
584	701620	1.0	WARD, WALTER PAUL (WALT)	503-Meals/Lodg/Park/RentCar	28-Feb-04	60	Currency	$60.00	MRWTP PHASE II PROJECT LUNCH MTG / FEB 18, 2004	0000-Balance Sheet
585	701620	1.0	WARD, WALTER PAUL (WALT)	503-Meals/Lodg/Park/RentCar	09-Mar-04	75	Currency	$75.00	3/2/04 SWRCB MTG	0000-Balance Sheet
586	701620	1.0	WARD, WALTER PAUL (WALT)	503-Meals/Lodg/Park/RentCar	12-May-04	52	Currency	$52.00	LUNCH STRATEGY MTG 5/3/04	0000-Balance Sheet
587	701620	1.0	WARD, WALTER PAUL (WALT)	503-Meals/Lodg/Park/RentCar	19-May-04	110	Currency	$110.00	OC WTP TOUR W/BLACK & VEATCH & US FILTER, 5/18/04	0000-Balance Sheet
588	701620	1.0	WARD, WALTER PAUL (WALT)	503-Meals/Lodg/Park/RentCar	17-Dec-04	90	Currency	$90.00	EXPENSES - PBLIC MTG PHASE TWO EXPANSION PROJECT MTG	0000-Balance Sheet
589				**Total Walter Ward Meals/Lodg/Park/RentCar**				**$387.00**		
590			**Total Meals/Lodge/Park/RentalCars**	**$2,475.72**						
591										
592	701620	1.1	BANK ONE, NA	504-Seminars/Training/Meetings	02-Feb-05	675	Currency	$675.00	AMERICAN WATER WORKS 27-JAN-05 (MEMBRANE CONF.)	8220-Modesto Dom Water
593										
594	701620	1.1	BANK ONE, NA	504-Seminars/Training/Meetings	17-Feb-05	200	Currency	$200.00	AMER WATER WORKS LB 15-FEB-05 (MEMBRANE CONF.)	8220-Modesto Dom Water
595										
596			**Total Seminars/Training/Meetings**	**$875.00**						
597										
598	701620	1.1	EL SOL	601-Advertising	01-Feb-04	172.5	Currency	$172.50	PO 44568 / JAN 03 BILLING	0000-Balance Sheet
599	701620	1.0	EL SOL	601-Advertising	01-Mar-04	172.5	Currency	$172.50	PO 44568 / FEB 04 ADS	0000-Balance Sheet
600	701620	1.0	EL SOL	601-Advertising	01-Dec-04	205.6	Currency	$205.60	PO 44568 / ACCT 90000005	0000-Balance Sheet
601	701620	1.0	EL SOL	601-Advertising	26-Dec-04	179.9	Currency	$179.90	PO 44568	0000-Balance Sheet
602	701620	1.0	MODESTO BEE	601-Advertising	01-Feb-04	1726.73	Currency	$1,726.73	ADVERTISING 1/31 & 2/1/04 / WATER FACILITIES	0000-Balance Sheet
603	701620	1.0	MODESTO BEE	601-Advertising	01-Mar-04	1547.04	Currency	$1,547.04	ACCT 40061705 / VARIOUS ADS 2/2/04-2/29/04	0000-Balance Sheet
604	701620	1.0	MODESTO BEE	601-Advertising	28-Nov-04	1843.2	Currency	$1,843.20	PO 44564 / 11/7-11/21/04 NOA-WATER	0000-Balance Sheet
605	701620	1.0	MODESTO BEE	601-Advertising	26-Dec-04	2281.38	Currency	$2,281.38	PO 44564 / ACCT 40061705 / 11/29/04-12/26/04	0000-Balance Sheet
606	701620	1.0	STANISLAUS FARM NEWS	601-Advertising	01-Feb-04	50	Currency	$50.00	PO 44558 / DISPLAY ADS	0000-Balance Sheet
607	701620	1.0	STANISLAUS FARM NEWS	601-Advertising	01-Mar-04	50	Currency	$50.00	PO 44558 / FEB 04 / WATER FAC PHASE 2	0000-Balance Sheet
608	701620	1.0	WATERFORD NEWS	601-Advertising	09-Feb-04	179.25	Currency	$179.25	AD 2/3/04 / WATER FACILITIES EXPANSION	0000-Balance Sheet
609	701620	1.1	WATERFORD NEWS	601-Advertising	10-Dec-04	358.5	Currency	$358.50	PO 44557 / W/E 12/10/04 ADS	0000-Balance Sheet
610	701620	1.0	WATERFORD NEWS	601-Advertising	17-Dec-04	358.5	Currency	$358.50	PO 44557 / W.E. 12/15/04 BILLING / PUBLIC MTGS	0000-Balance Sheet
611										
612			**Total Advertising**	**$9,125.10**						
613										
614	701620	1.0	STATE WATER RESOURCES CONTROL BOARD	612-Permits	31-Dec-03	900	Currency	$900.00	ADDT'L FILING FEE FOR LONG TERM WATER TRANSFER TO THE CITY OF MODESTO / RECENT ADOPTED FEE SCHEDULE WAS CHANGED	0000-Balance Sheet
615	701620	1.0	JAKE SONKE, CONTROLLER	621-Publications/Subscriptions	15-Jun-04	10.73	Currency	$10.73	PURCHASES W.E. 6/14/04 / REIMBURSE THE PETTY CASH FOR FUNDS ISSUED-Videos City Council Meeting	0000-Balance Sheet
			Total Misc. Expenses	**$910.73**						

Labor	$420,980.58	32.5%
Consultants/Outside Services	$845,089.31	65.2%
Meals/Lodging/Parking/RentCar	$2,475.72	0.2%
Transportation	$2,666.26	0.2%
Materials, Postage, Parts, Supplies	$13,338.60	1.0%
Seminars/Training/Meetings	$875.00	0.1%
Advertising	$9,125.10	0.7%
Misc. Expenses	$910.73	0.1%

check sum $1,295,461.30 100.0%
OK

$450,371.99

PHASE TWO DOMESTIC WATER EXPANSION PROJECT-COSTS FRONTED BY MID

EXPENDITURES- MAY 29, 2005 THROUGH OCTOBER 1, 2005

Project	Task	Expnd Type		Item Date	Employee/Supplier	Quantity	UOM	Project Burdened Comment	Expnd Org
Total From 6-1-05 Report (Expenditures through May 28 2005)								**$1,295,461.30**	
701620	01.0		1	11-Jun-05	DIAS, GREGORY PAUL (GREG)	46	Hours	$4,511.17	8420-Civil Engineering
701620	01.0		1	25-Jun-05	DIAS, GREGORY PAUL (GREG)	50	Hours	$4,903.44	8420-Civil Engineering
701620	01.0		1	9-Jul-05	DIAS, GREGORY PAUL (GREG)	51	Hours	$5,001.51	8420-Civil Engineering
701620	01.0		1	23-Jul-05	DIAS, GREGORY PAUL (GREG)	34	Hours	$3,334.34	8420-Civil Engineering
701620	01.0		1	6-Aug-05	DIAS, GREGORY PAUL (GREG)	36	Hours	$3,530.48	8420-Civil Engineering
701620	01.0		1	20-Aug-05	DIAS, GREGORY PAUL (GREG)	24	Hours	$2,353.65	8420-Civil Engineering
701620	01.0		1	3-Sep-05	DIAS, GREGORY PAUL (GREG)	58	Hours	$5,688.00	8420-Civil Engineering
					Total Greg Dias Labor			**$29,322.59**	
701620	01.1		1	20-Aug-05	DURRER, CHARLES L (CHUCK)	20	Hours	$912.12	8220-Modesto Dom Water
					Total Charles Durrer Labor			**$912.12**	
701620	01.1		1	9-Jul-05	EDWARDS, KENNETH W (KEN)	15	Hours	$1,366.11	
701620	01.1		1	23-Jul-05	EDWARDS, KENNETH W (KEN)	10	Hours	$910.74	8220-Modesto Dom Water
701620	01.1		1	6-Aug-05	EDWARDS, KENNETH W (KEN)	25	Hours	$2,276.85	8220-Modesto Dom Water
701620	01.1		1	20-Aug-05	EDWARDS, KENNETH W (KEN)	20	Hours	$1,821.48	8220-Modesto Dom Water
					Total Ken Edwards Labor			**$6,375.18**	8220-Modesto Dom Water
701620	01.1		1	23-Jul-05	EICHMAN, MARK A (MARK)	8	Hours	$412.90	
701620	01.1		1	6-Aug-05	EICHMAN, MARK A (MARK)	20	Hours	$1,032.26	8220-Modesto Dom Water
701620	01.1		1	20-Aug-05	EICHMAN, MARK A (MARK)	25	Hours	$1,290.33	8220-Modesto Dom Water
701620	01.1		1	3-Sep-05	EICHMAN, MARK A (MARK)	8	Hours	$412.90	8220-Modesto Dom Water
					Total Mark Eichman Labor			**$3,148.39**	8220-Modesto Dom Water
701620	01.1		1	11-Jun-05	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	3	Hours	$235.58	
701620	01.1		1	25-Jun-05	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	8	Hours	$628.21	8220-Modesto Dom Water
701620	01.1		1	9-Jul-05	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	8	Hours	$628.21	8220-Modesto Dom Water
701620	01.1		1	23-Jul-05	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	5	Hours	$392.63	8220-Modesto Dom Water
701620	01.1		1	6-Aug-05	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	12	Hours	$942.31	8220-Modesto Dom Water
701620	01.1		1	20-Aug-05	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	25	Hours	$2,062.45	8220-Modesto Dom Water
701620	01.1		1	3-Sep-05	HIDAHL, CLAUDIA LOUISE (CLAUDIA)	28	Hours	$2,309.94	8220-Modesto Dom Water
					Total Claudia Hidahl Labor			**$7,199.33**	8220-Modesto Dom Water
701620	01.0		1	11-Jun-05	KETSCHER, WILLIAM M (BILL)	4	Hours	$454.95	
701620	01.0		1	25-Jun-05	KETSCHER, WILLIAM M (BILL)	8	Hours	$909.91	8420-Civil Engineering
701620	01.0		1	9-Jul-05	KETSCHER, WILLIAM M (BILL)	10	Hours	$1,137.39	8420-Civil Engineering
701620	01.0		1	23-Jul-05	KETSCHER, WILLIAM M (BILL)	10	Hours	$1,137.39	8420-Civil Engineering
701620	01.0		1	6-Aug-05	KETSCHER, WILLIAM M (BILL)	12	Hours	$1,364.86	8420-Civil Engineering
701620	01.0		1	20-Aug-05	KETSCHER, WILLIAM M (BILL)	8	Hours	$909.91	8420-Civil Engineering
701620	01.0		1	3-Sep-05	KETSCHER, WILLIAM M (BILL)	6	Hours	$682.43	8420-Civil Engineering
					Total Bill Ketscher Labor			**$6,596.84**	8420-Civil Engineering
701620	01.1		1	9-Jul-05	MASON, JOSEPH EDWARD (JOE)	4	Hours	$206.45	
701620	01.0		1	23-Jul-05	MASON, JOSEPH EDWARD (JOE)	2	Hours	$103.23	8220-Modesto Dom Water
701620	01.1		1	6-Aug-05	MASON, JOSEPH EDWARD (JOE)	8	Hours	$412.90	8220-Modesto Dom Water
701620	01.1		1	20-Aug-05	MASON, JOSEPH EDWARD (JOE)	20	Hours	$1,032.26	8220-Modesto Dom Water
					Total Joe Mason Labor			**$1,754.84**	8220-Modesto Dom Water
701620	01.0		1	6-Aug-05	MAZARIEGOS, LEISSER PATRICIA (LEISSI	42	Hours	$1,424.14	
					Total Leisser Mazariegos Labor			**$1,424.14**	8420-Civil Engineering
701620	01.1		1	9-Jul-05	MILLER, JEFFERY LEE (JEFF)	50	Hours	$3,556.80	
701620	01.1		1	9-Jul-05	MILLER, JEFFERY LEE (JEFF)	-50	Hours	-$3,556.80	8220-Modesto Dom Water
701620	01.1		1	9-Jul-05	MILLER, JEFFERY LEE (JEFF)	42	Hours	$2,987.71	8220-Modesto Dom Water
701620	01.1	P12		9-Jul-05	MILLER, JEFFERY LEE (JEFF)	0	Hours	$106.70	8220-Modesto Dom Water
701620	01.1		12	9-Jul-05	MILLER, JEFFERY LEE (JEFF)	3	Hours	$213.41	8220-Modesto Dom Water
701620	01.1		1	23-Jul-05	MILLER, JEFFERY LEE (JEFF)	30	Hours	$2,134.08	8220-Modesto Dom Water
701620	01.1		1	20-Aug-05	MILLER, JEFFERY LEE (JEFF)	16	Hours	$1,138.18	8220-Modesto Dom Water
					Total Jeff Miller Labor			**$6,580.08**	8220-Modesto Dom Water
701620	01.0		1	6-Aug-05	RATTO, VALERIE I (VALERIE)	1	Hours	$33.91	
					Total Valerie Ratto Labor			**$33.91**	8420-Civil Engineering
701620	01.0		1	11-Jun-05	RYAN, PATRICK J (PAT)	8	Hours	$844.94	
701620	01.0		1	25-Jun-05	RYAN, PATRICK J (PAT)	19	Hours	$2,006.73	8220-Modesto Dom Water
									8220-Modesto Dom Water

701620	01.0	1	23-Jul-05	RYAN, PATRICK J (PAT)	17 Hours	$1,795.49		8220-Modesto Dom Water
701620	01.0	1	6-Aug-05	RYAN, PATRICK J (PAT)	15 Hours	$1,584.26		8220-Modesto Dom Water
701620	01.0	1	20-Aug-05	RYAN, PATRICK J (PAT)	15 Hours	$1,584.26		8220-Modesto Dom Water
701620	01.0	1	3-Sep-05	RYAN, PATRICK J (PAT)	53 Hours	$5,597.71		8220-Modesto Dom Water
				Total Pat Ryan Labor		**$13,413.39**		
701620	01.0	1	11-Jun-05	WARD, WALTER PAUL (WALT)	2.5 Hours	$314.68		8010-AGM-Water Operations
701620	01.0	1	25-Jun-05	WARD, WALTER PAUL (WALT)	6 Hours	$755.23		8010-AGM-Water Operations
701620	01.0	1	23-Jul-05	WARD, WALTER PAUL (WALT)	2 Hours	$251.74		8010-AGM-Water Operations
701620	01.0	1	6-Aug-05	WARD, WALTER PAUL (WALT)	4 Hours	$503.48		8010-AGM-Water Operations
701620	01.0	1	20-Aug-05	WARD, WALTER PAUL (WALT)	8 Hours	$1,006.97		8010-AGM-Water Operations
701620	01.0	1	3-Sep-05	WARD, WALTER PAUL (WALT)	8 Hours	$1,006.97		8010-AGM-Water Operations
				Total Walter Ward Labor		**$3,839.07**		
	Total Labor						**$80,599.88**	
701620	01.1 201-Materials		7-Jul-05	CENTER STATE PIPE & SUPPLY	59.99 Currency	$59.99	PO 44100	0000-Balance Sheet
701620	01.1 255-Material Sales Tax		7-Jul-05	CENTER STATE PIPE & SUPPLY	4.42 Currency	$4.42	PO 44100	0000-Balance Sheet
				Total Center State Pipe & Supply Materials		**$64.41**		
701620	01.1 201-Materials		1-Jul-05	DELTA RUBBER	835.61 Currency	$835.61	PO 42750	0000-Balance Sheet
701620	01.1 201-Materials		8-Jul-05	DELTA RUBBER	111.84 Currency	$111.84	PO 42750	0000-Balance Sheet
701620	01.1 201-Materials		1-Sep-05	DELTA RUBBER	285.94 Currency	$285.94	PO 42750	0000-Balance Sheet
701620	01.1 255-Material Sales Tax		1-Jul-05	DELTA RUBBER	61.67 Currency	$61.67	PO 42750	0000-Balance Sheet
701620	01.1 255-Material Sales Tax		8-Jul-05	DELTA RUBBER	8.25 Currency	$8.25	PO 42750	0000-Balance Sheet
701620	01.1 255-Material Sales Tax		1-Sep-05	DELTA RUBBER	21.1 Currency	$21.10	PO 42750	0000-Balance Sheet
				Total Delta Rubber Materials		**$1,324.41**		
701620	01.1 201-Materials		10-Aug-05	WATERFORD FARM SUPPLY	15.76 Currency	$15.76	PO 43010	0000-Balance Sheet
701620	01.1 255-Material Sales Tax		10-Aug-05	WATERFORD FARM SUPPLY	1.16 Currency	$1.16	PO 43010	0000-Balance Sheet
				Total Waterford Farm Supply Materials		**$16.92**		
701620	01.1 207-Freight		4-Jul-05	BANK ONE, NA	62.66 Currency	$62.66	FEDEX FREIGHT WEST INC 30-JUN-05	8220-Modesto Dom Water
				Total Bank One Freight		**$62.66**		
701620	01.1 214-Repair Parts		29-Jun-05	BANK ONE, NA	264.89 Currency	$264.89	MCMASTER-CARR 27-JUN-05	8220-Modesto Dom Water
701620	01.1 214-Repair Parts		29-Jun-05	BANK ONE, NA	388.38 Currency	$388.38	MCMASTER-CARR 27-JUN-05	8220-Modesto Dom Water
701620	01.1 214-Repair Parts		30-Jun-05	BANK ONE, NA	416.61 Currency	$416.61	MCMASTER-CARR 28-JUN-05	8220-Modesto Dom Water
701620	01.1 214-Repair Parts		1-Jul-05	BANK ONE, NA	43.8 Currency	$43.80	MCMASTER-CARR 29-JUN-05	8220-Modesto Dom Water
701620	01.1 214-Repair Parts		1-Jul-05	BANK ONE, NA	52.06 Currency	$52.06	MCMASTER-CARR 29-JUN-05	8220-Modesto Dom Water
701620	01.1 214-Repair Parts		1-Jul-05	BANK ONE, NA	483.51 Currency	$483.51	MCMASTER-CARR 29-JUN-05	8220-Modesto Dom Water
701620	01.1 214-Repair Parts		7-Jul-05	BANK ONE, NA	244.55 Currency	$244.55	MCMASTER-CARR 05-JUL-05	8220-Modesto Dom Water
701620	01.1 214-Repair Parts		18-Jul-05	BANK ONE, NA	100.38 Currency	$100.38	MCMASTER-CARR 13-JUL-05	8220-Modesto Dom Water
701620	01.1 214-Repair Parts		18-Jul-05	BANK ONE, NA	114.57 Currency	$114.57	MCMASTER-CARR 14-JUL-05	8220-Modesto Dom Water
701620	01.1 214-Repair Parts		18-Jul-05	BANK ONE, NA	1336.96 Currency	$1,336.96	MCMASTER-CARR 13-JUL-05	8220-Modesto Dom Water
701620	01.1 214-Repair Parts		28-Jul-05	BANK ONE, NA	74.53 Currency	$74.53	MCMASTER-CARR 26-JUL-05	8220-Modesto Dom Water
701620	01.1 214-Repair Parts		29-Jul-05	BANK ONE, NA	230.84 Currency	$230.84	MCMASTER-CARR 27-JUL-05	8220-Modesto Dom Water
				Total Bank One Repair Parts		**$3,751.08**		
	Total Materials and Supplies						**$5,219.48**	
701620	01.1 401-Consulting		1-Jun-05	BLACK & VEATCH	16841.86 Currency	$16,841.86	CLIENT 65518 / PROF SVCS / MRWTP PHASE 2 EXP PROJ / 3/5/05-4/1/05	0000-Balance Sheet
701620	01.1 401-Consulting		22-Jun-05	BLACK & VEATCH	34983.76 Currency	$34,983.76	CLIENT 65518 / PROF SVCS / MRWTP PHASE 2 EXP PROJ / 4/2/05-6/3/05	0000-Balance Sheet
701620	01.1 401-Consulting		15-Jul-05	BLACK & VEATCH	18137.81 Currency	$18,137.81	CLIENT 65518 / PROF SVCS / MRWTP PHASE 2 EXP PROJ / 6/4/05-6/30/05	0000-Balance Sheet
701620	01.1 401-Consulting		1-Sep-05	BLACK & VEATCH	47247.97 Currency	$47,247.97	PROFESSIONAL SERVICES - JUL 05 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR	0000-Balance Sheet
				Total Black & Veatch Consulting		**$117,211.40**		
701620	01.1 401-Consulting		6-Jun-05	JONES & STOKES ASSOCIATES	2100.15 Currency	$2,100.15	PROFESSIONAL SERVICES / MAY 05 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR	0000-Balance Sheet
701620	01.1 401-Consulting		7-Jul-05	JONES & STOKES ASSOCIATES	7475.79 Currency	$7,475.79	PROJ 03564.03 / PROF SVCS - 5/23/05-6/26/05 / MRWTP PHASE 2 EXPANSION PROJECT SEIR	0000-Balance Sheet
701620	01.1 401-Consulting		1-Aug-05	JONES & STOKES ASSOCIATES	4260.25 Currency	$4,260.25	PROFESSIONAL SERVICES - MRWTP PHASE TWO EXPANSION PROJECT SEIR / JUL 05 BILLING	0000-Balance Sheet
701620	01.1 401-Consulting		1-Sep-05	JONES & STOKES ASSOCIATES	786.1 Currency	$786.10	PROFESSIONAL SERVICES - JUL 05 BILLING / MRWTP PHASE TWO EXPANSION PROJECT SEIR	0000-Balance Sheet
				Total Jones & Stokes Consulting		**$14,622.29**		
701620	01.1 425-Other Outside Services		30-May-05	BSK ANALYTICAL LABORATORIES	1350 Currency	$1,350.00	PO 41760	0000-Balance Sheet
701620	01.1 425-Other Outside Services		2-Jun-05	BSK ANALYTICAL LABORATORIES	185 Currency	$185.00	PO 41760	0000-Balance Sheet
701620	01.1 425-Other Outside Services		8-Jun-05	BSK ANALYTICAL LABORATORIES	240 Currency	$240.00	PO 41760	0000-Balance Sheet
701620	01.1 425-Other Outside Services		15-Jun-05	BSK ANALYTICAL LABORATORIES	2025 Currency	$2,025.00	PO 41760	0000-Balance Sheet

701620	01.1 425-Other Outside Services	17-Jun-05	BSK ANALYTICAL LABORATORIES	365	Currency		$365.00	PO 41760	0000-Balance Sheet
701620	01.1 425-Other Outside Services	21-Jun-05	BSK ANALYTICAL LABORATORIES	495	Currency		$495.00	PO 41760	0000-Balance Sheet
701620	01.1 425-Other Outside Services	21-Jun-05	BSK ANALYTICAL LABORATORIES	150	Currency		$150.00	PO 41760	0000-Balance Sheet
701620	01.1 425-Other Outside Services	21-Jun-05	BSK ANALYTICAL LABORATORIES	185	Currency		$185.00	PO 41760	0000-Balance Sheet
701620	01.1 425-Other Outside Services	23-Jun-05	BSK ANALYTICAL LABORATORIES	150	Currency		$150.00	PO 41760	0000-Balance Sheet
701620	01.1 425-Other Outside Services	30-Jun-05	BSK ANALYTICAL LABORATORIES	150	Currency		$150.00	PO 41760	0000-Balance Sheet
701620	01.1 425-Other Outside Services	13-Jul-05	BSK ANALYTICAL LABORATORIES	150	Currency		$150.00	PO 41760	0000-Balance Sheet
701620	01.1 425-Other Outside Services	8-Aug-05	BSK ANALYTICAL LABORATORIES	30	Currency		$30.00	PO 41760	0000-Balance Sheet
701620	01.1 425-Other Outside Services	8-Aug-05	BSK ANALYTICAL LABORATORIES	375	Currency		$375.00	PO 41760	0000-Balance Sheet
			Total BSK Analytical Lab Outside Services				**$5,850.00**		
	Total Consulting & Outside Services					**$137,683.69**			
701620	01.1 503-Meals/Lodg/Park/RentCar	1-Aug-05	BANK ONE, NA	66.67	Currency		$66.67	DOUBLETREE MODESTO F & 28-JUL-05	8220-Modesto Dom Water
701620	01.0 503-Meals/Lodg/Park/RentCar	24-Jun-05	EDWARDS, KENNETH W (KEN)	43.56	Currency		$43.56	EXP REIMB / AWWA IN SF ON 6/15/05	0000-Balance Sheet
701620	01.0 503-Meals/Lodg/Park/RentCar	24-Jun-05	EICHMAN, MARK A (MARK)	26.12	Currency		$26.12	EXP REIMB / AWWA IN SF ON 6/14/05	0000-Balance Sheet
701620	01.0 503-Meals/Lodg/Park/RentCar	6-Sep-05	JAKE SONKE, CONTROLLER	4	Currency		$4.00	PURCHASES W.E. 9/6/05 / REIMBURSE PETTY CASH FOR FUNDS ISSUED	0000-Balance Sheet
701620	01.1 503-Meals/Lodg/Park/RentCar	26-Jul-05	WARD, WALTER PAUL (WALT)	85	Currency		$85.00	MRWTP PHASE TWO EXPANSION PROJECT MEMBRANE PRE-SELECTION REVIEW TEAM LUNCHOEN / MODESTO , CA / JUL 25, 2005	0000-Balance Sheet
			Total Meals/Lodg/Park/RentCar				**$225.35**		
701620	01.0 601-Advertising	31-Jul-05	MODESTO BEE	146.55	Currency		$146.55	PO 44564 / ACCT #10133800 / JUL 05 BILLING	0000-Balance Sheet
			Total Advertising				**$146.55**		
701620	01.0 642-Trash Removal/Dumping Fees	31-Aug-05	GILTON RESOURCE RECOVERY	30	Currency		$30.00	ACCT #00000386-00 / AUG 05 BILLING / PO 44573	0000-Balance Sheet
			Total Misc. Expenses				**$30.00**		

Task 01 Totals

Labor	$501,580.46	33.0%
Consultants/Outside Services	$982,773.00	64.7%
Meals/Lodging/Parking/RentCar	$2,701.07	0.2%
Transportation	$2,666.26	0.2%
Materials, Postage, Parts, Supplies	$18,558.08	1.2%
Seminars/Training/Meetings	$875.00	0.1%
Advertising	$9,271.65	0.6%
Misc. Expenses	$940.73	0.1%

Check sum for this report	$223,904.95	
Total from June 1 2005 report	$1,295,461.30	
Total for All 01 Task Charges	**$1,519,366.25**	100.0%

APPENDIX H

Groundwater Information

- Groundwater Basin Descriptions
- Discussion on Groundwater Operational Yield
- Groundwater Management Plans (Report Cover Sheets with Links)

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San Joaquin Valley Groundwater Basin
Modesto Subbasin

- Groundwater Subbasin Number: 5-22.02
- County: Stanislaus
- Surface Area: 247,000 acres (385 square miles)

Basin Boundaries and Hydrology

The San Joaquin Valley is surrounded on the west by the Coast Ranges, on the south by the San Emigdio and Tehachapi Mountains, on the east by the Sierra Nevada and on the north by the Sacramento-San Joaquin Delta and Sacramento Valley. The northern portion of the San Joaquin Valley drains toward the Delta by the San Joaquin River and its tributaries, the Fresno, Merced, Tuolumne, and Stanislaus Rivers. The southern portion of the valley is internally drained by the Kings, Kaweah, Tule, and Kern Rivers that flow into the Tulare drainage basin including the beds of the former Tulare, Buena Vista, and Kern Lakes.

The Modesto subbasin lies between the Stanislaus River to the north and Tuolumne River to the south and between the San Joaquin River on the west and crystalline basement rock of the Sierra Nevada foothills on the east. The northern, western, and southern boundaries are shared with the Eastern San Joaquin Valley, Delta-Mendota, and Turlock Groundwater Subbasins, respectively. The subbasin comprises land primarily in the Modesto Irrigation District (MID) and the southern two-thirds of the Oakdale Irrigation District (OID). The City of Modesto is in the southwestern portion of the subbasin. Average annual precipitation for this subbasin is 11 to 15 inches, increasing eastward.

Hydrogeologic Information

The San Joaquin Valley represents the southern portion of the Great Central Valley of California. The San Joaquin Valley is a structural trough up to 200 miles long and 70 miles wide. It is filled with up to 32,000 feet of marine and continental sediments deposited during periodic inundation by the Pacific Ocean and by erosion of the surrounding mountains, respectively. Continental deposits shed from the surrounding mountains form an alluvial wedge that thickens from the valley margins toward the axis of the structural trough. This depositional axis is below to slightly west of the series of rivers, lakes, sloughs, and marshes, which mark the current and historic axis of surface drainage in the San Joaquin Valley.

Water Bearing Formations

The primary hydrogeologic units in the Modesto Subbasin include both consolidated and unconsolidated sedimentary deposits. The consolidated deposits include the Ione Formation of Miocene age, the Valley Springs Formation of Eocene age, and the Mehrten Formation, which was deposited during the Miocene to Pliocene Epochs. The consolidated deposits lie in the eastern portion of the subbasin and generally yield small quantities of water to wells except for the Mehrten Formation, which is an important aquifer. In the Subbasin, the Mehrten Formation is composed of up to 300 feet of sandstone, breccia, conglomerate, tuff siltstone and claystone (Page 1973).

The unconsolidated deposits were laid down during the Pliocene to present and, from oldest to youngest, include continental deposits lacustrine and marsh deposits, older alluvium, younger alluvium, and flood-subbasin deposits. The continental deposits and older alluvium are the main water-yielding units in the unconsolidated deposits. The lacustrine and marsh deposits (which include the Corcoran, or "E-" Clay), and the flood-subbasin deposits yield little water to wells, and the younger alluvium in most places probably yields only moderate quantities of water to wells (Page 1973).

The continental deposits consist of poorly sorted gravel, sand, silt and clay varying in thickness from 0 to 450 feet occurring at the surface on the eastern side of the subbasin to over 400 feet deep in the western portion. These deposits are the equivalent of the North Merced Gravels and the lower Turlock Lake Formation (Davis and others 1959). The older alluvium consists of intercalated beds of gravel sand, silt and clay with some hardpan. This alluvium is up to 400 feet thick and is generally present near or at the surface of the western one-half of the subbasin. The older alluvium is largely equivalent to the Riverbank and Modesto Formations (Davis and others 1959).

Ground water occurs under unconfined, semi-confined, and confined conditions. The unconfined water body occurs in the unconsolidated deposits above and east of the Corcoran Clay, which underlies the southwestern portion of the subbasin at depths ranging from 150 to 250 feet (DWR 1981). Where clay lenses restrict the downward flow of ground water, semi-confined conditions occur. The confined water body occurs in the unconsolidated deposits below the Corcoran Clay and extends downward to the base of fresh water.

The estimated average specific yield of this subbasin is 8.8 percent (based on DWR San Joaquin District internal data and Davis and others 1959).

Restrictive Structures

Groundwater flow is primarily to the southwest, following the regional dip of basement rock and sedimentary units. The lower to middle reaches of the Stanislaus and Tuolomne Rivers in the Subbasin appear to be gaining streams with groundwater flow into both, especially the Tuolomne River (DWR 2000). No faults have been identified that affect the movement of fresh groundwater (Page and Balding 1973).

Recharge Areas

Groundwater recharge is primarily from deep percolation of applied irrigation water and canal seepage from MID and OID facilities. Seepage from Modesto Reservoir is also significant (STRGBA 1995). Lesser recharge occurs as a result of subsurface flows originating in the mountains and foothills along the east side of the subbasin, losses from minor streams, and from percolation of direct precipitation.

Groundwater Level Trends

Changes in groundwater levels are based on annual water level measurements by DWR and cooperators. Water level changes were

evaluated by quarter township and computed through a custom DWR computer program using geostatistics (kriging). On average, the subbasin water level has declined nearly 15 feet from 1970 through 2000. The period from 1970 through 1978 showed steep declines totaling about 12 feet. The six-year period from 1978 to 1984 saw stabilization and rebound of about 7 feet. 1984 through 1995 again showed steep declines, bottoming out in 1995 at nearly 20 feet below the 1970 level. Water levels then rose about 5 feet from 1996 to 2000. Water level declines have been more severe in the eastern portion of the subbasin, but have risen faster in the eastern subbasin between 1996 and 2000 than in any other portion of the subbasin.

Groundwater Storage

Estimations of the total storage capacity of the subbasin and the amount of water in storage as of 1995 were calculated using an estimated specific yield of 8.8 percent and water levels collected by DWR and cooperators. According to these calculations, the total storage capacity of this subbasin is estimated to be 6,500,000 af to a depth of 300 feet. According to published literature, the amount of stored groundwater in this subbasin as of 1961 is 14,000,000 af to a depth of $\leq$ 1000 feet (Williamson 1989).

Groundwater Budget (Type B)

Although a detailed budget was not available for this subbasin, an estimate of groundwater demand was calculated based on the 1990 normalized year and data on land and water use. A subsequent analysis was done by a DWR water budget spreadsheet to estimate overall applied water demands, agricultural groundwater pumpage, urban pumping demand and other extraction data.

Natural recharge into the subbasin is estimated to be 86,000 af. Artificial recharge and subsurface inflow values are not determined. There is approximately 92,000 af of applied water recharge. Annual urban and agricultural extractions are estimated to be 81,000 and 145,000 af, respectively. There are no other extractions, and values for subsurface outflow are not determined.

Groundwater Quality

Characterization. The groundwater in this basin is of a calcium bicarbonate type in the eastern subbasin to a calcium-magnesium bicarbonate or calcium-sodium bicarbonate type in the western portion. TDS values range from 60 to 8,300 mg/L, with a typical range of 200 to 500 mg/L. The Department of Health Services, which monitors Title 22 water quality standards, reports TDS values in 88 wells ranging from 60 to 860 mg/L, with an average value of 295 mg/L.

Impairments. There are areas of hard groundwater and localized areas of high chloride, boron, DBCP, nitrate, iron, and manganese. Some sodium chloride waters of high TDS values are found along the east side of the subbasin. There are also some areas of shallow groundwater in the subbasin that require dewatering wells.

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	110	3
Radiological	109	25
Nitrates	114	3
Pesticides	117	14
VOCs and SVOCs	117	8
Inorganics – Secondary	110	8

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.
[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: 350 – 4,500	Average: 1,000 - 2,000
	Total depths (ft)	
Domestic		
Municipal/Irrigation	Range: 50 - 500	

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
DWR (incl. Cooperators)	Groundwater levels	230 Semi-annually
Oakdale Irrigation District	Drinking water parameters	15 Monthly to every 3 years
Department of Health Services (including Cooperators)	Title 22 water quality	209 Varies

Basin Management

Groundwater management:	The Stanislaus and Tuolumne Rivers' Groundwater Subbasin Association has developed an AB3030 ground water management plan for the individual Association members (City of Modesto, Del Este Water Company, County of Stanislaus, Oakdale I.D., City of Oakdale, City of Riverbank, and Modesto I.D.) Conjunctive use programs, stormwater recharge subbasins, water conservation programs operated by Oakdale and Modesto I.Ds., Stanislaus County and other public entities.
Water agencies	
Public	Oakdale I.D., Modesto I.D.; Stanislaus and Tuolumne Rivers' Groundwater Subbasin Association; City of Oakdale; City of Riverbank
Private	

References Cited

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Page, RW, and Balding, GO. 1973. *Geology and Quality of Water in the Modesto-Merced Area, San Joaquin Valley, California, with a Brief Section of Hydrology.* USGS Water-Resources Investigations 6-73, 85p.

Stanislaus and Tuolumne Rivers' Groundwater Subbasin Association (STRGBA). 1995. *Development of a Groundwater Management Plan Phase I.* Technical Memorandum. Prepared by Black & Veatch, Provost & Pritchard, and Kenneth D. Schmidt & Associates Consulting Firms.

Williamson, Alex K, Prudic, David E, and Swain, Lindsay A. 1989. *Groundwater flow in the Central Valley, California.* US Geological Survey Professional Paper 1401-D. 127 p.

Additional References

Balding, GO, and Page, RW. 1971. Data for Wells in the Modesto-Merced Area San Joaquin Valley, California. US Geological Survey Open-File Report.

California Department of Water Resources (DWR). 1980. Bulletin 118-80, Ground Water Subbasins in California.

_____. 1994. Bulletin 160-93. California Water Plan Update, Vol. 1.

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Errata

Changes made to the basin description will be noted here.

San Joaquin Valley Groundwater Basin
Turlock Subbasin

- Groundwater Basin Number: 5-22.03
- County: Stanislaus, Merced
- Surface Area: 347,000 acres (542 square miles)

Basin Boundaries and Hydrology

The San Joaquin Valley is surrounded on the west by the Coast Ranges, on the south by the San Emigdio and Tehachapi Mountains, on the east by the Sierra Nevada and on the north by the Sacramento-San Joaquin Delta and Sacramento Valley. The northern portion of the San Joaquin Valley drains toward the Delta by the San Joaquin River and its tributaries, the Fresno, Merced, Tuolumne, and Stanislaus Rivers. The southern portion of the valley is internally drained by the Kings, Kaweah, Tule, and Kern Rivers that flow into the Tulare drainage basin including the beds of the former Tulare, Buena Vista, and Kern Lakes.

The Turlock Subbasin lies between the Tuolumne and Merced Rivers and is bounded on the west by the San Joaquin River and on the east by crystalline basement rock of the Sierra Nevada foothills. The northern, western, and southern boundaries are shared with the Modesto, Delta-Mendota, and Merced Groundwater Subbasins, respectively. The subbasin includes lands in the Turlock Irrigation District, the Ballico-Cortez Water District, the Eastside Water District, and a small portion of Merced I.D. Average annual precipitation is estimated as 11 to 13 inches, increasing eastward, with 15 inches in the Sierran foothills.

Hydrogeologic Information

The San Joaquin Valley represents the southern portion of the Great Central Valley of California. The San Joaquin Valley is a structural trough up to 200 miles long and 70 miles wide. It is filled with up to 32,000 feet of marine and continental sediments deposited during periodic inundation by the Pacific Ocean and by erosion of the surrounding mountains, respectively. Continental deposits shed from the surrounding mountains form an alluvial wedge that thickens from the valley margins toward the axis of the structural trough. This depositional axis is below to slightly west of the series of rivers, lakes, sloughs, and marshes that mark the current and historic axis of surface drainage in the San Joaquin Valley.

Water Bearing Formations

The primary hydrogeologic units in the Turlock Subbasin include both consolidated and unconsolidated sedimentary deposits. The consolidated deposits include the Ione Formation of Miocene age, the Valley Springs Formation of Eocene age, and the Mehrten Formation, which was deposited during the Miocene to Pliocene Epochs. The consolidated deposits lie in the eastern portion of the subbasin and generally yield small quantities of water to wells except for the Mehrten Formation, which is an important aquifer. The Mehrten Formation is composed of up to 800 feet of sandstone, breccia, conglomerate, tuff siltstone and claystone (Page 1973).

Unconsolidated deposits include continental deposits, older alluvium, younger alluvium, and flood-basin deposits. Lacustrine and marsh deposits, which constitute the Corcoran or E-clay aquitard, underlie the western half of the subbasin at depths ranging between about 50 and 200 feet (DWR 1981). The continental deposits and older alluvium are the main water-yielding units in the unconsolidated deposits. The lacustrine and marsh deposits and the flood-subbasin deposits yield little water to wells. The younger alluvium, in most places, probably yields only moderate quantities of water.

There are three ground water bodies in the Turlock Subbasin: the unconfined water body; the semi-confined and confined water body in the consolidated rocks; and the confined water body beneath the E-clay in the western Subbasin. The estimated average specific yield of the subbasin is 10.1 percent (based on DWR San Joaquin District internal data and Davis 1959).

Restrictive Structures

Groundwater flow is primarily to the southwest, following the regional dip of basement rock and sedimentary units. Based on recent groundwater measurements (DWR 2000), a paired groundwater mound and depression appear beneath the city of Turlock and to its east, respectively. The lower to middle reaches of the Tuolomne River and the reach of the San Joaquin River in the subbasin appear to be gaining streams during this period also. No faults have been identified that affect the movement of fresh groundwater (Page 1973).

Groundwater Level Trends

Changes in groundwater levels are based on annual water level measurements by DWR and cooperators. Water level changes were evaluated by quarter township and computed through a custom DWR computer program using geostatistics (kriging). On average the subbasin water level has declined nearly 7 feet from 1970 through 2000. The period from 1970 through 1992 showed a generally steep decline totaling about 15 feet. Between 1992 and 1994, water levels stayed near this low level. From 1994 to 2000, the water levels rebounded about 8 feet, bringing them to approximately 7 feet below the 1970 levels. Water level declines have been more severe in the eastern portion of the subbasin after 1982. From 1970 to 1982, water level declines were more severe in the western portion of the subbasin.

Groundwater Storage

Estimations of the total storage capacity of the subbasin and the amount of water in storage as of 1995 were calculated using an estimated specific yield of 10.1 percent and water levels collected by DWR and cooperators. According to these calculations, the total storage capacity of this subbasin is estimated to be 15,800,000 af to a depth of 300 feet and 30,000,000 af to the base of fresh groundwater. These same calculations give an estimate of 12,800,000 af of groundwater to a depth of 300 feet stored in this subbasin as of 1995 (DWR 1995). According to published literature, the amount of stored groundwater in this subbasin as of 1961 is 23,000,000 af to a depth of $\leq$ 1000 feet (Williamson 1989).

Groundwater Budget (Type B)

Although a detailed budget was not available for this subbasin, an estimate of groundwater demand was calculated based on the 1990 normalized year and data on land and water use. A subsequent analysis was done by a DWR water budget spreadsheet to estimate overall applied water demands, agricultural groundwater pumpage, urban pumping demand and other extraction data.

Natural recharge of the subbasin was estimated to be 33,000 af. Artificial recharge and subsurface inflow were not determined. Applied water recharge was calculated to be 313,000 af. Annual urban extraction and annual agricultural extraction were calculated at 65,000 and 387,000 af, respectively. Other extractions and subsurface inflow were not determined.

Groundwater Quality

Characterization. The groundwater in this subbasin is predominately of the sodium-calcium bicarbonate type, with sodium bicarbonate and sodium chloride types at the western margin and a small area in the north-central portion. TDS values range from 100 to 8,300 mg/L, with a typical range of 200 to 500 mg/L. The Department of Health Services, which monitors Title 22 water quality standards, reports TDS values in 71 wells ranging from 100 to 930 mg/L, with an average value of 335 mg/L. EC values range from 168 to 1,000 µmhos/cm, with a typical range of 244 to 707 µmhos/cm.

Impairments. There are localized areas of hard groundwater, nitrate, chloride, boron, and DBCP. Some sodium chloride type water of high TDS is found along the west side of the subbasin. Two wells in the city of Turlock have been closed, one for nitrate and one for carbon tetrachloride (Dan Wilde 2001).

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	84	0
Radiological	80	12
Nitrates	90	8
Pesticides	89	5
VOCs and SVOCs	86	3
Inorganics – Secondary	84	11

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.
[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: 200 – 4,500	Average: 1,000 - 2,000
	Total depths (ft)	
Domestic		
Municipal/Irrigation	Range: 50 - 350	

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
DWR (incl. Cooperators)	Groundwater levels	307 Semi-annually
Department of Health Services (including cooperators)	Title 22 water quality	163 Varies

Basin Management

Groundwater management:	Turlock District has an adopted AB 3030 ground water management plan. Eastside WD adopted its plan on September 25, 1997.
Water agencies	
Public	Eastside Water District, Turlock Irrigation District, Ballico-Cortez Water District (inactive), Merced I.D. (portion).
Private	

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Errata

Updated groundwater management information and added hotlinks where applicable. (1/20/06)

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San Joaquin Valley Groundwater Basin
Delta-Mendota Subbasin

- Groundwater Subbasin Number: 5-22.07
- County: Stanislaus, Merced, Madera, Fresno
- Surface Area: 747,000 acres (1,170 square miles)

Basin Boundaries and Hydrology

The San Joaquin Valley is surrounded on the west by the Coast Ranges, on the south by the San Emigdio and Tehachapi Mountains, on the east by the Sierra Nevada and on the north by the Sacramento-San Joaquin Delta and Sacramento Valley. The northern portion of the San Joaquin Valley drains toward the Delta by the San Joaquin River and its tributaries, the Fresno, Merced, Tuolumne, and Stanislaus Rivers. The southern portion of the valley is internally drained by the Kings, Kaweah, Tule, and Kern Rivers that flow into the Tulare drainage basin including the beds of the former Tulare, Buena Vista, and Kern Lakes.

The Delta-Mendota subbasin is bounded on the west by the Tertiary and older marine sediments of the Coast Ranges, and on the north by the Stanislaus/San Joaquin county line. The eastern boundary follows the San Joaquin River to Township 11 S, where it jogs eastward and follows the eastern boundary of Columbia Canal company to the San Joaquin River, then follows the Chowchilla Bypass and the eastern border of Farmer's Water District. It then trends southerly through Township 14S Range 15E on the eastern side of Fresno Slough, then follows the Tranquility ID boundary to its southern extremity. Heading northward, it follows the eastern, northern, and northwestern boundary of San Joaquin Valley – Westside Groundwater Subbasin (corresponding with Westlands Water District boundaries). Average annual precipitation is nine to 11 inches, increasing northwards.

Hydrogeologic Information

The San Joaquin Valley represents the southern portion of the Great Central Valley of California. The San Joaquin Valley is a structural trough up to 200 miles long and 70 miles wide filled with up to 32,000 feet of marine and continental sediments deposited during periodic inundation by the Pacific Ocean and by erosion of the surrounding mountains, respectively. Continental deposits shed from the surrounding mountains form an alluvial wedge that thickens from the valley margins toward the axis of the structural trough. This depositional axis is below to slightly west of the series of rivers, lakes, sloughs, and marshes, which mark the current and historic axis of surface drainage in the San Joaquin Valley.

Water Bearing Formations

The geologic units that comprise the ground water reservoir in the Delta-Mendota subbasin consist of the Tulare Formation, terrace deposits, alluvium, and flood-basin deposits. The Tulare Formation is composed of beds, lenses, and tongues of clay, sand, and gravel that have been alternately deposited in oxidizing and reducing environments (Hotchkiss 1971). The Corcoran Clay Member of the formation underlies the basin at depths ranging about 100 to 500 feet and acts as a confining bed (DWR 1981).

Terrace deposits of Pleistocene age lie up to several feet higher than present streambeds. They are composed of yellow, tan, and light-to-dark brown silt, sand, and gravel with a matrix that varies from sand to clay (Hotchkiss 1971). The water table generally lies below the bottom of the terrace deposits. However, the relatively large grain size of the terrace deposits suggests their value as possible recharge sites.

Alluvium is composed of interbedded, poorly to well-sorted clay, silt, sand, and gravel and is divided based on its degree of dissection and soil formation. The flood-basin deposits are generally composed of light-to-dark brown and gray clay, silt, sand, and organic materials with locally high concentrations of salts and alkali. Stream channel deposits of coarse sand and gravel are also included.

Groundwater in the Delta-Mendota subbasin occurs in three water-bearing zones. These include the lower zone, which contains confined fresh water in the lower section of the Tulare Formation, an upper zone which contains confined, semi-confined, and unconfined water in the upper section of the Tulare Formation and younger deposits, and a shallow zone which contains unconfined water within about 25 feet of the land surface (Davis 1959).

The estimated specific yield of this subbasin is 11.8 percent (based on DWR San Joaquin District internal data and Davis 1959). Land subsidence up to about 16 feet has occurred in the southern portion of the basin due to artesian head decline (Ireland 1964).

Restrictive Structures

Groundwater flow was historically northwestward parallel to the San Joaquin River (Hotchkiss 1971). Recent data (DWR 2000) show flow to the north and eastward, toward the San Joaquin River. Based on current and historical groundwater elevation maps, groundwater barriers do not appear to exist in the subbasin.

Groundwater Level Trends

Changes in groundwater levels are based on annual water level measurements by DWR and cooperators. Water level changes were evaluated by quarter township and computed through a custom DWR computer program using geostatistics (kriging). On average, the subbasin water level has increased by 2.2 feet from 1970 through 2000. The period from 1970 through 1985 showed a general increase, topping out in 1985 at 7.5 feet above the 1970 water level. The nine-year period from 1985 to 1994 saw general declines in groundwater levels, reaching back down to the 1970 groundwater level in 1994. Groundwater levels rose in 1995 to about 2.2 feet above the 1970 groundwater level. Water levels fluctuated around this value until 2000.

Groundwater Storage

Estimations of the total storage capacity of the subbasin and the amount of water in storage as of 1995 were calculated using an estimated specific yield of 11.8 percent and water levels collected by DWR and cooperators.

According to these calculations, the total storage capacity of this subbasin is estimated to be 30,400,000 af to a depth of 300 feet and 81,800,000 af to the base of fresh groundwater. These same calculations give an estimate of 26,600,000 af of groundwater to a depth of 300 feet stored in this subbasin as of 1995 (DWR 1995). According to published literature, the amount of stored groundwater in this subbasin as of 1961 is 51,000,000 af to a depth of $\leq$ 1,000 feet (Williamson 1989).

Groundwater Budget (Type B)

Although a detailed budget was not available for this subbasin, an estimate of groundwater demand was calculated based on the 1990 normalized year and data on land and water use. A subsequent analysis was done by a DWR water budget spreadsheet to estimate overall applied water demands, agricultural groundwater pumpage, urban pumping demand and other extraction data.

Natural recharge is estimated to be 8,000 af. Artificial recharge and subsurface inflow are not determined. Applied water recharge is approximately 74,000 af. Annual urban and agricultural extractions estimated to be 17,000 af and 491,000 af, respectively. Other extractions are approximately 3,000 af, and subsurface outflow is not determined.

Groundwater Quality

Characterization. The groundwater in this subbasin is characterized by mixed sulfate to bicarbonate types in the northern and central portion with areas of sodium chloride and sodium sulfate waters in the central and southern portion. TDS values range from 400 to 1,600 mg/L in the northern portion of the subbasin and from 730 to 6,000 mg/L in the southern portion of the subbasin (Hotchkiss 1971). The Department of Health Services (DHS), which monitors Title 22 water quality standards, reports TDS values in 44 public supply wells to range from 210 to 1,750 mg/L, with an average value of 770 mg/L. A typical range of water quality in wells is 700-1,000 mg/L.

Impairments. Shallow, saline groundwater occurs within about 10 feet of the ground surface over a large portion of the subbasin. There are also localized areas of high iron, fluoride, nitrate, and boron in the subbasin (Hotchkiss 1971).

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	47	2
Radiological	47	1
Nitrates	51	4
Pesticides	47	1
VOCs and SVOCs	45	0
Inorganics – Secondary	47	18

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.
[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: 20 – 5,000	Average: 800-2,000
	Total depths (ft)	
Domestic		
Municipal/Irrigation	Range: 50 - 800	Average: 400-600

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
DWR (incl. Cooperators)	Groundwater levels	816 Semi-annually
DWR (incl. Cooperators)	Mineral, nutrient, & minor element.	
Department of Health Services (incl. Cooperators)	Title 22 water quality	120 Varies

Basin Management

Groundwater management:	Panoche Water District is approximately 11 months into the AB3030 process and will be doing a joint plan with other districts and the county. San Luis and Delta-Mendota Water Authority North adopted an AB 3030 plan on December 5, 1997.
Water agencies	
Public	Merced County, Fresno County, Broadview WD, Centinella WD, Central California ID, Davis WD, Del Puerto WD, Eagle Field WD, El Solyo WD, Farmers WD, Firebaugh Canal WD, Foothill WD, Fresno Slough WD, Grasslands WD, Hospital WD, Kern Canon WD, Laguna WD, Mercy Springs WD, Mustang WD, Oak Flat WD, Orestimba WD, Oro Loma WD, Pacheco WD, Panoche WD, Patterson WD, Romero WD, Salado WD, San Luis Canal Company, San Luis WD, Santa Nella C.WD, Sunflower WD, Tranquility ID, West Stanislaus ID, Widren WD, Quinto WD
Private	None.

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Errata

Updated groundwater management information and added hotlinks to applicable websites. (1/20/06)

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APPENDIX 4A
GROUNDWATER OPERATIONAL YIELD MEMORANDUM

PREFACE

The attached memorandum entitled "Discussion on Operational Yield for the 2005 Urban Water Management Plan" was prepared by the City of Modesto and included in the Joint City of Modesto/MID 2005 and 2010 Urban Water Management Plans (UWMPs). The purpose of the memorandum was to describe the basis for estimating the "operational yield", or annual groundwater pumping quantity, that could be extracted from the aquifer underlying the City's water service area that includes the Modesto, Turlock and Delta-Mendota sub-basins. As described in the memorandum, the City's Operational Yield was estimated to be 53,500 acre-feet per year.

The memorandum describes that the City had increased its groundwater pumping from 1999 to 2002 to meet growing demands, but that the City's reliance on groundwater was anticipated to decrease when the Modesto Regional Water Treatment Plant (MRWTP) Phase Two is completed. Although the completion of MRWTP Phase Two has been delayed (currently anticipated to be completed in mid 2015), the findings and conclusions described in the memorandum have not changed.

It should be noted that the United States Geological Survey (USGS) is currently in the process of developing a simulation/optimization model of the Modesto Area Groundwater Basin for use in evaluating water resources management alternatives. It is not known when the USGS study will be completed. The findings of the USGS study may result in changes to the City's estimate of the Operational Yield. However, the City's current estimate of the Operational Yield of 53,500 af/yr will continue to be assumed pending the USGS study findings.

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City of Modesto

Memo

To: Nick Pinhey – Public Works Director
Rolly Stevens – Assistant City Attorney
Alison Barratt-Green – Senior Deputy City Attorney

From: William Wong – Associate Civil Engineer

CC: Rich Ulm, Jack Bond, Garner Reynolds, Jim Alves, Violet Jakab, Allen Lagarbo

Date:

Re: **FINAL** - Discussion on Operational Yield for the 2005 Urban Water Management Plan (UWMP)

This memorandum establishes an empirical basis for estimating the "operational yield" for the rate of groundwater pumping within the City's water service area that includes the Modesto, Turlock, and Delta-Mendota sub-basins. Information incorporated into this study includes water well pumping records, groundwater elevation data, and future demands based on land use densities at build-out.

For clarification, and as used in this report, the following terms are defined:

Operational Yield – is an amount (or rate in acre-feet per year) of localized groundwater withdrawn on an annual average basis by a given agency that does not exceed the long-term annual average recharge rate of the localized aquifer(s) from which the groundwater is being pumped.

Sustainable Yield – is similar to operational yield, but applies to an entire groundwater basin and all of the entities pumping from it as a whole, rather than just a localized area and a specific agency.

Safe Yield – is everything defined for sustainable yield, but also includes other considerations beyond just a quantity of water extracted or recharged, such as its quality and potential surface subsidence issues. Safe yield can be defined as the maximum amount of water that can be pumped without creating any long-term undesirable results. However, for the purposes of this report, safe yield is considered to be synonymous with sustainable yield.

Overdraft – is when the long-term annual average rate of extracted groundwater exceeds the annual average rate of recharge, as measured by groundwater levels (as measure of groundwater volume is difficult). Overdraft is also defined as the deficit between the water pumped from a groundwater basin and the long-term basin recharge.

The basis of previous estimates of the combined City's "safe yield" of 50,000 AFY repeated in various City documents is not clear through researching of available literature. Previous documents reference a historic water budget, using data that was not directly measured, but estimated. The uncertainty of this data and the

determination of the safe yield are currently considered questionable, and recent data suggests that this value may not be correct.

This memorandum attempts to use existing data from various sources to reconcile an estimate of the City's current groundwater operational yield, instead of "safe yield" for the entire City of Modesto's Water Service Area.

Establishing an Operational Yield:

It is envisioned that the City will undertake a more comprehensive, hydro-geological groundwater yield study in the upcoming fiscal year where more resources can be devoted to the task of quantifying the City's groundwater operational yield. Until then, it is believed that the rate of extraction established in this report accurately reflects the best data readily available to staff and will be incorporated into the 2005 Urban Water Management Plan.

Prior to 1995, the City's sole source of domestic water was from groundwater pumping. The effect of long-term groundwater extraction consequently resulted in a decline of groundwater elevation, which led to temporary overdraft conditions, primarily in the downtown Modesto area. However, once the City began to implement conjunctive use by supplementing its water supplies with 33,602 AFY of treated surface water from Phase 1 of the MID Modesto Regional Water Treatment Plant (MRWTP) in 1995, the City has been able to reduce its groundwater extraction. As a result, groundwater levels began to rise correcting the temporary overdraft conditions. **Figure 1** shows that recent groundwater levels have decreased slightly as groundwater pumping increased over the last six years (2000 – 2005); however, until additional hydrogeologic studies are completed, it appears that current groundwater extractions and water levels are, to some extent, in a steady state condition.

The current annual water demands for the entire City of Modesto water system, in the Modesto and Turlock sub-basins, are over 79,000 AFY. The City's current rate of groundwater extractions is about 70% of the historically high pumping levels of 1994, and is not causing an overdraft condition.

Table 1 – Current Annual Groundwater Extractions

Year	Annual GW Extractions from the Modesto Subbasin (AFY)[a]	Annual GW Extractions from the Turlock Subbasin (AFY)[a,b]	Average GW Extractions from the Delta-Mendota Subbasin (AFY)[a,c]	Totals
2000	37,495	4,958	261	42,714
2001	40,857	4,837	297	45,991
2002	43,535	5,445	324	49,304
2003	41,990	5,053	287	47,330
2004	41,681	4,194	261	46,136
2005	41,090	4,849	237	46,176
Average Annual Groundwater Extractions	**41,108**	**4,889**	**278**	**46,275**

a. Based on City of Modesto SCADA records
b. Includes South Modesto, Hickman, portions of North Ceres and Turlock.
c. The Community of Grayson is within the Delta-Mendota Subbasin

As shown in **Table 1**, current six-year average (between 2000 and 2005) of groundwater extractions for the entire City of Modesto water system is 46,275 AFY. These water demands also reflect some water conservation due to continuous implementation of Stage I restrictions from the City's Drought Contingency Plan in 2003.

The City maximizes its surface water allocation within the City's contiguous service area, and must rely on groundwater pumping to meet its maximum day and peak hour demands. To meet the demands of future development, the City will is currently working with the MID to double the capacity of the Modesto Regional Water Treatment Plant (MRWTP) to 67,204 AFY. However, the Phase 2 Expansion of the MRWTP is not anticipated to be on-line until mid- to late-2009, and therefore the City will need to increase its groundwater pumping to meet the demands for near-term development. This would be done by drilling new wells, rehabilitating currently out-of-service wells, or increasing the pumping from existing wells.

The movement of groundwater for both sub-basins is generally in a westward direction from the Sierra Nevada foothills. Recent analysis by the USGS and information from California's Groundwater Bulletin 118 has indicated that the geological characteristics of the Modesto and portions of Turlock sub-basins that are served by the City of Modesto appear to be similar. Although the Tuolumne River separates the Modesto and Turlock sub-basins, the USGS has determined that both groundwater and surface water systems are interconnected, and it can be reasonably assumed that groundwater flows between the two sub-basins. This has also been indirectly substantiated by analysis of the City's static well level data; the average groundwater elevations of the City's production wells between the Modesto and Turlock groundwater sub-basins are very comparable. Therefore, in this analysis, it is assumed that the cumulative groundwater extractions by the City apply to the entire City's water service area and no further distinctions are made between the two sub-basins (this does not apply to the Delta-Mendota sub-basin).

Based on California's Groundwater Bulletin 118 for the Modesto Sub-basin, as a result of long-term groundwater pumping, a cone of depression formed when the groundwater elevations reached around 30 feet above sea level (ASL) (see **Figure 2**). In order to extrapolate an operational yield using empirical data, a minimum groundwater elevation of 40 feet ASL was selected as the lowest elevation that the City will allow groundwater to reach. By establishing this minimum groundwater elevation allowable, the City can reasonably establish a conservative operational yield and be certain that the associated amount groundwater pumping should not result in an overdraft condition.

Based on a relative stabilization of groundwater elevations through the City's water service area, the City's current annual average groundwater pumping constitutes a non-overdraft condition, and therefore it can be assumed that the City is within its operational yield range. **Figure 3** plots the City's groundwater pumping and associated well levels between 1993 through 2006. It is apparent that there is not a linear relation between groundwater extractions to groundwater levels. Nevertheless, a linear factor rate was extrapolated from existing well information and can be considered a conservative representation of the effects of groundwater levels due to pumping. An empirical equation was extrapolated from these data points, which estimates that the groundwater levels will decline at a rate of approximately **0.685 feet/1,000 AFY** (or 1 foot per 1,430 AFY) of groundwater extracted over the entire water service area.

It is reasonable that, until hydrogeologic studies are complete, the City can use this estimated rate as the City's **"operational yield factor".** Using 40 ft ASL as the minimum allowable groundwater elevation, the associated **operational groundwater yield** is approximately **53,500 AFY**. This calculated operational yield is a projection of the City's water service area's groundwater pumping capacity (AFY) and is based on the following:

- Groundwater elevation data from 1993 to 2006 obtained from spring and fall field measurements by the City Water Department.
- Groundwater pumping data obtained from Water Department and from the City's SCADA from 2003 to current. Prior pumping records were obtained through Del Este and City of Modesto files.
- Assumes that Ag-to-Urban conversion accounted for in the calculated operational yield estimate.

The calculated operational yield does not account for:

- The City's ability to extract groundwater from the subbasins to meet demands.
- Seasonal peak water demands, and localized water distribution and pressure issues.

- Growth beyond the City's current water service area, either within the contiguous Modesto System or the outlying areas.
- Varying economic factors that could effect the projected growth assumptions.
- More stringent water quality standards would result in potential losses in well production from taking wells out-of-service due to contamination, such as from Arsenic, Nitrates and Uranium.

Additionally, once the City begins necessary groundwater studies to determine an actual operational yield (or specific yield) of the groundwater sub-basins, water budget and quality analyses for the groundwater sub-basins, the City would be able to develop procedures to optimize its groundwater extractions, and determine potential Aquifer Storage and Recovery (ASR) opportunities, where the City could potentially recharge the groundwater basins with surface water during seasonal low demand periods.

Conclusions:

Recent projections from MID anticipate that Phase 2 of the MRWTP expansion will be complete by mid- to late-2009. However, until the additional 33,602 AFY of surface water is available to meet demands, the City will need to increase its groundwater extractions to meet water demands until Phase 2 is on-line.

More extensive studies and modeling will be required to quantify the City's operational yield and water budget for both the Modesto and Turlock sub-basins. However, based on self-imposed groundwater level limits, the City's current Operational Yield is estimated at **53,500 AFY**.

Recent information has indicated that the City has gradually increased its groundwater pumping over the last few years to meet growth demands. It is not anticipated that the City will continue to increase its groundwater extractions for an extended period of time, since Phase 2 is expected to be online by mid- to late- 2009. It is not expected that this short term increase of pumping would cause an overdraft condition in the Modesto Subbasin, which is typically a result from a cumulative effect of long-term over-pumping.

Figure 1 - 1993-2006 Groundwater Elevation and Pumping Data

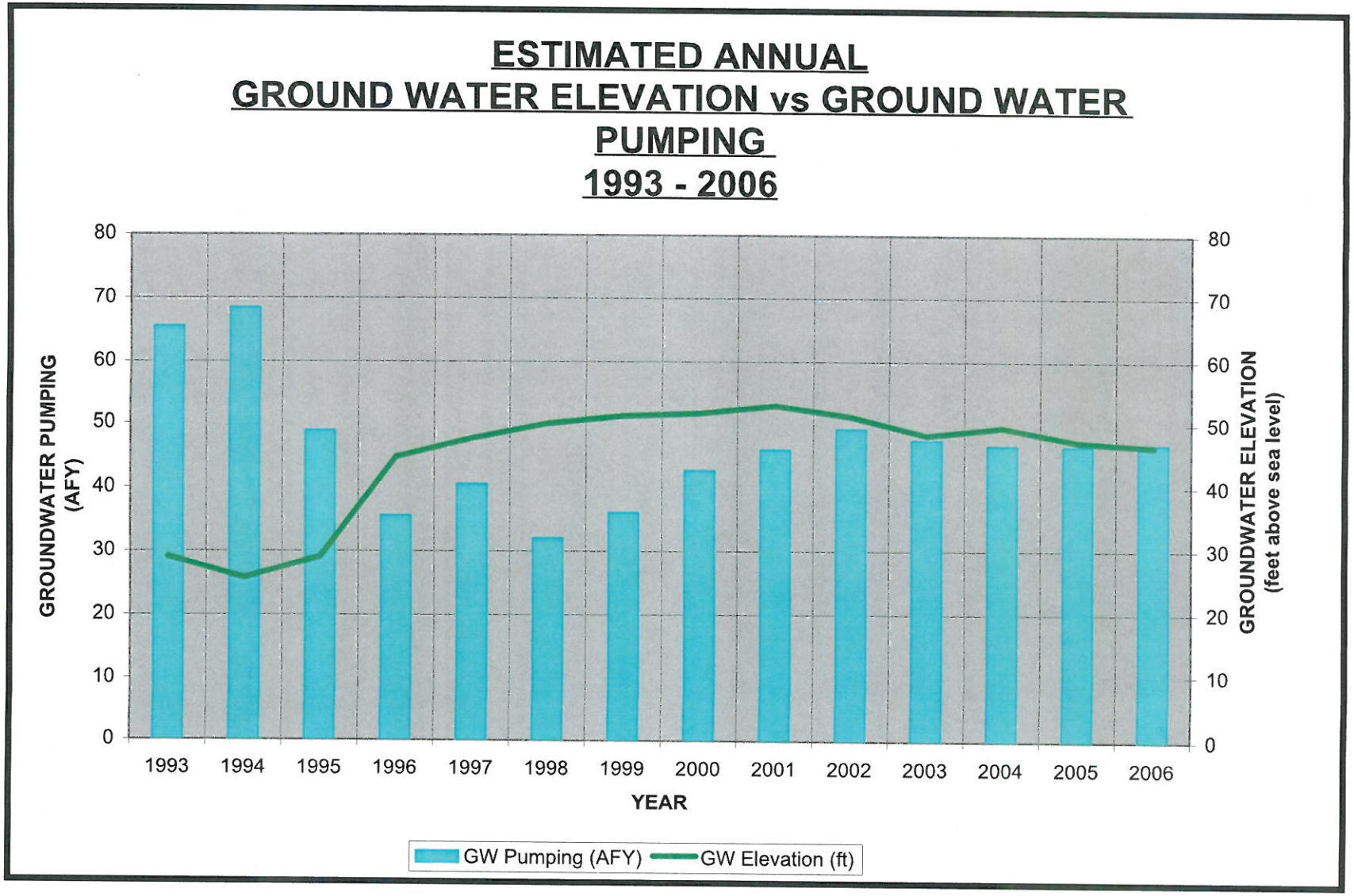
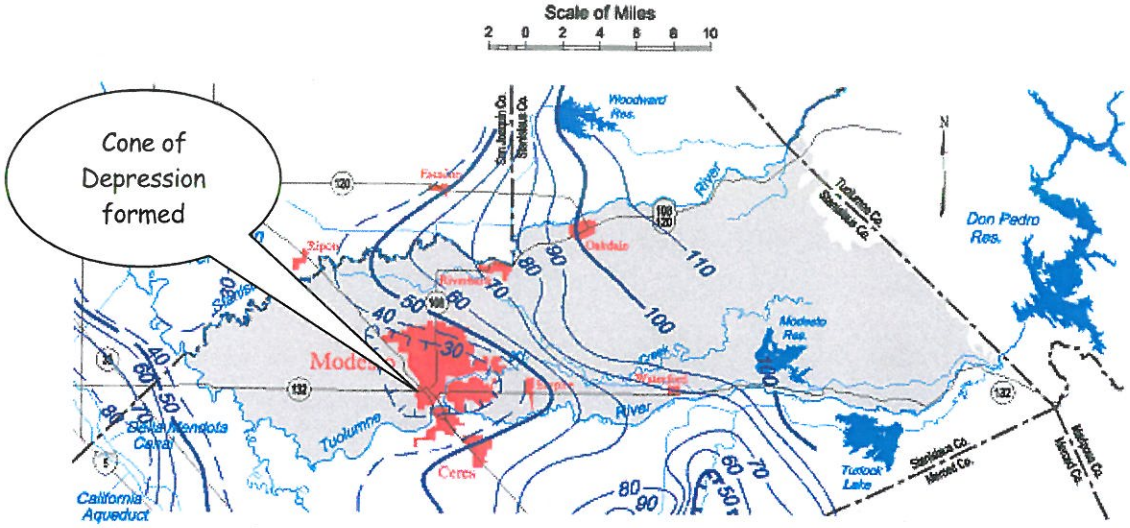


Figure 2 – 1993 and 1998 Groundwater Elevations (above sea level)

Source: Department of Water Resources (DWR) Website - http://www.sjd.water.ca.gov/groundwater/basin_maps/index.cfm

Modesto Groundwater Basin

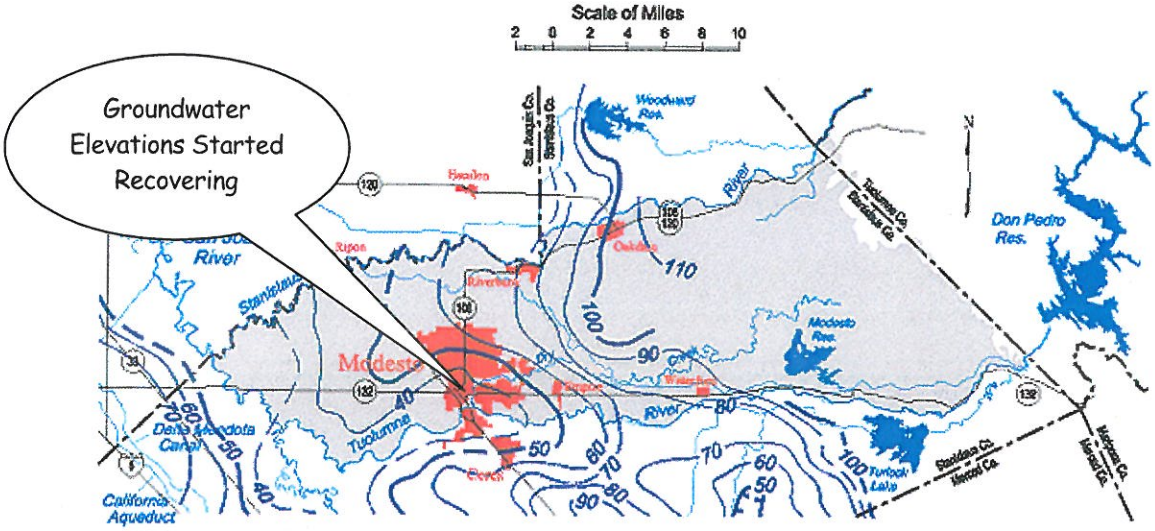
Spring 1993, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10 feet.

Modesto Groundwater Basin

Spring 1998, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10 feet.

Figure 3 - Annual Groundwater Pumping (AFY) vs. Groundwater Elevation (feet, above sea level)

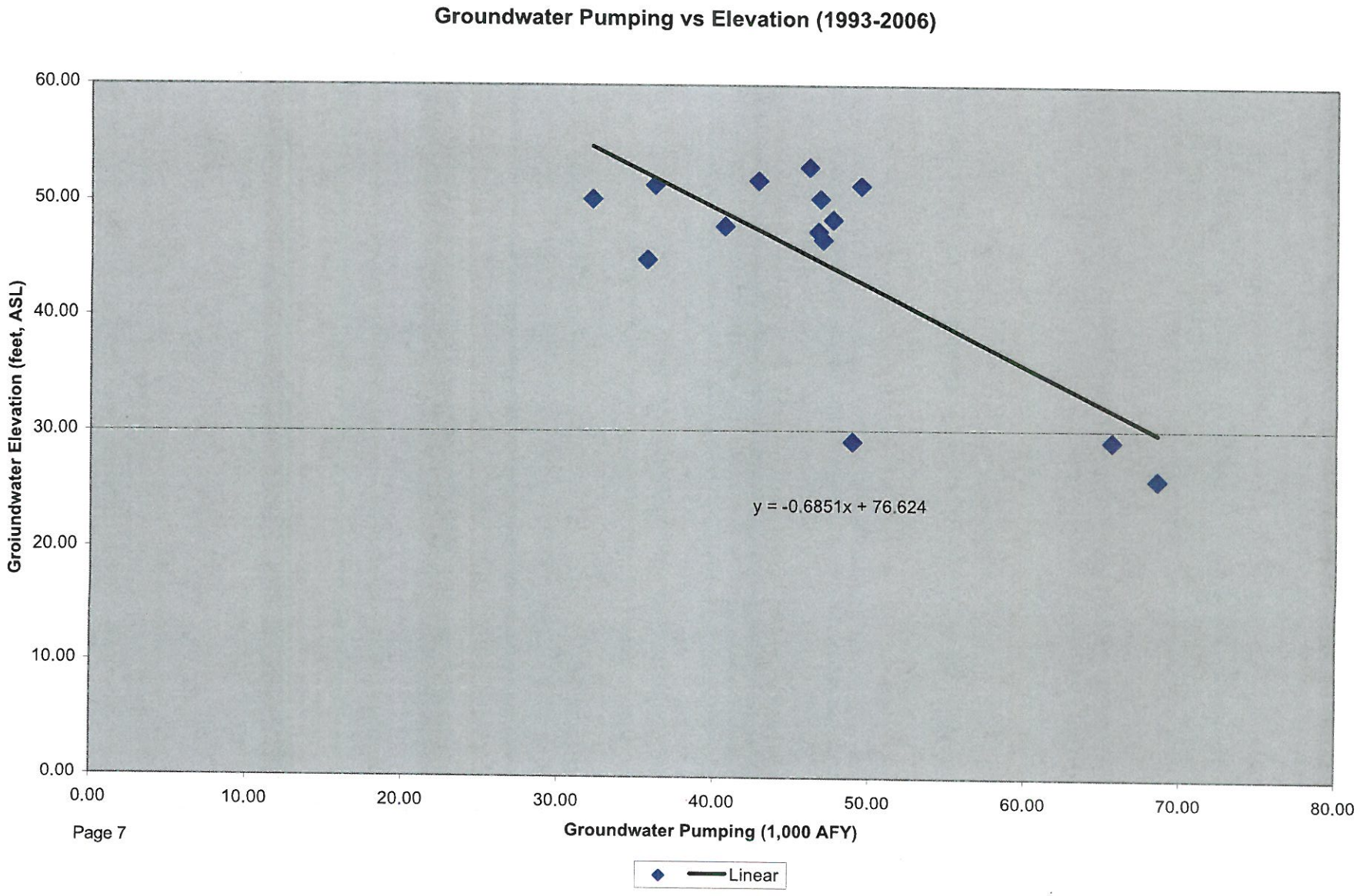
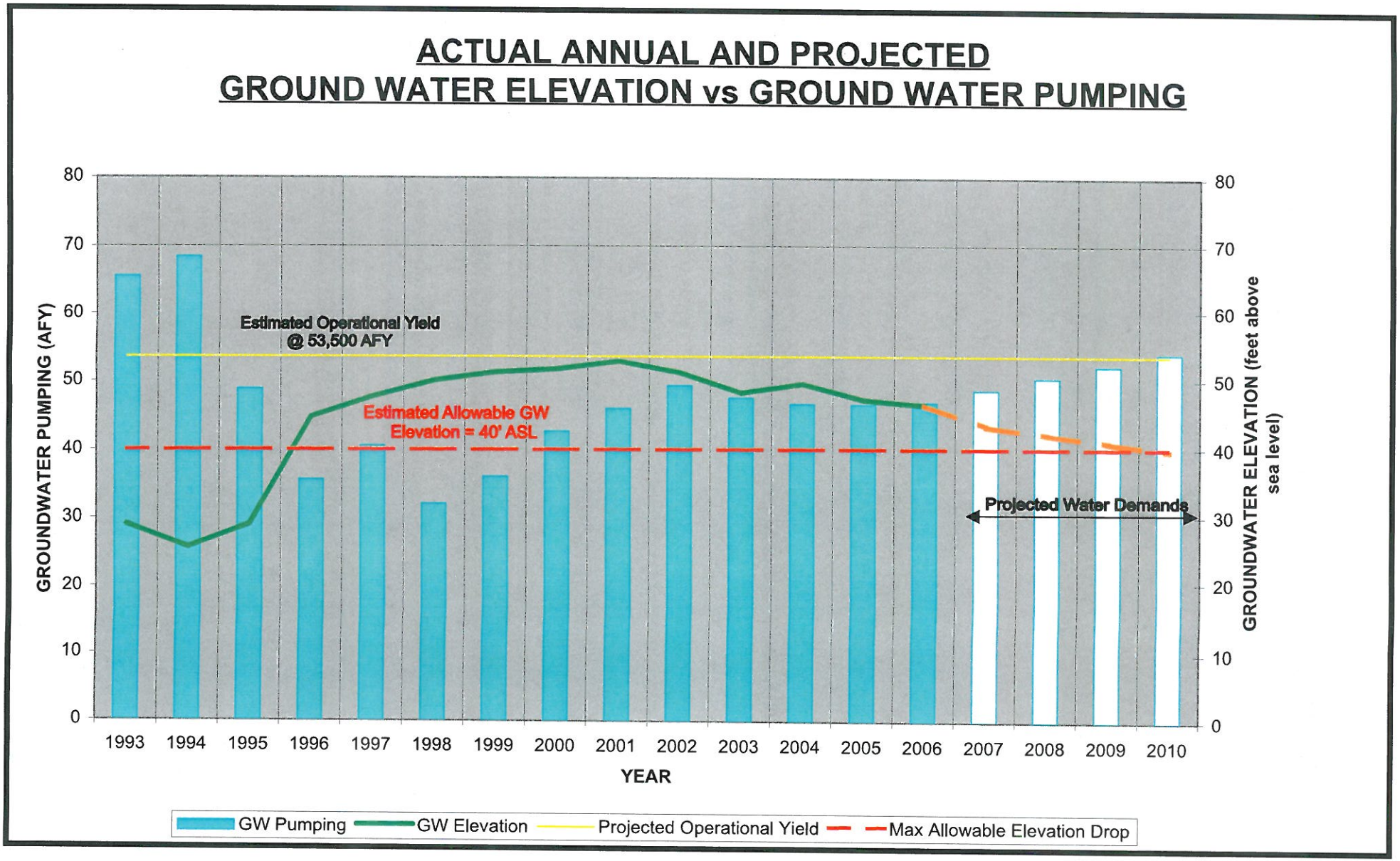


Figure 4 - Projected Near-Term Water Demands (to 2010)

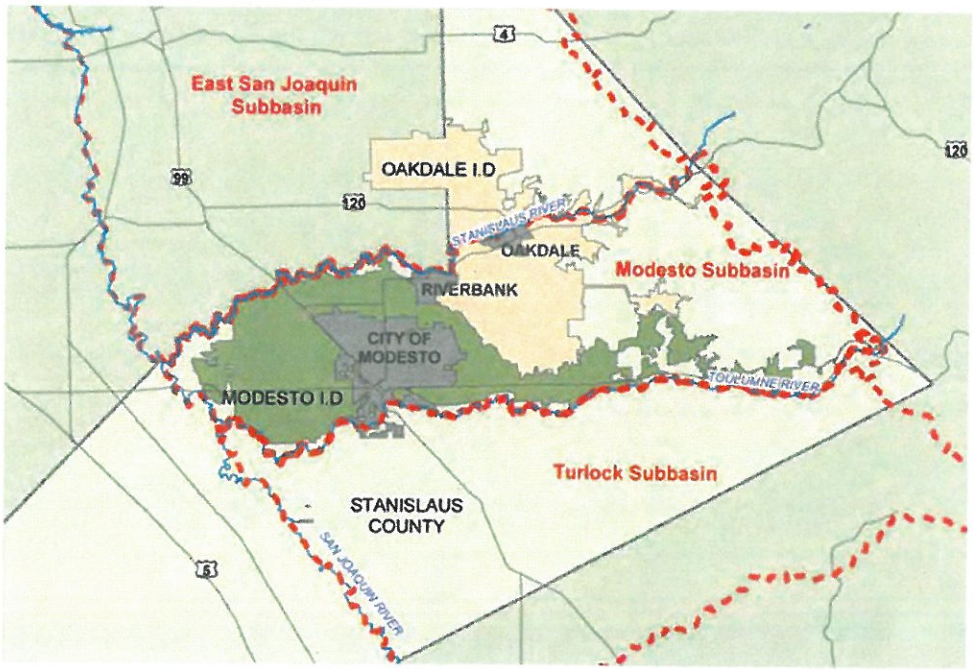


FINAL DRAFT

Integrated Regional Groundwater Management Plan

for the Modesto Subbasin

Stanislaus and Tuolumne Rivers Groundwater Basin Association



prepared by
Bookman-Edmonston
A Division of GEI Consultants

June 2005

http://www.mid.org/water/irgmp/default.html

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TURLOCK GROUNDWATER BASIN

Groundwater Management Plan

Prepared for:

Turlock Irrigation District
333 East Canal Drive/P.O. Box 949
Turlock, CA 95381

March 18, 2008

Prepared by:

Turlock Groundwater Basin Association

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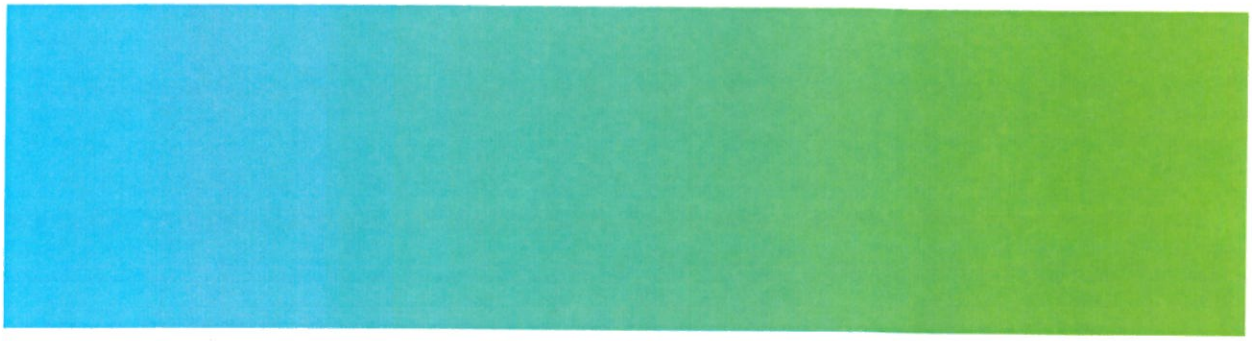
Groundwater Management Plan for the Northern Agencies in the Delta-Mendota Canal Service Area

Groundwater Management Plan Update



San Luis & Delta-Mendota Water Authority

July 2011

Revised November 7, 2011

http://www.sldmwa.org/OHTDocs/pdf_documents/Groundwater/GroundwaterManagementPlanNorthernApproved11_2011.pdf

AECOM 1120 West "I" Street, Suite C Los Banos, CA 93635

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APPENDIX I

Water Shortage Contingency

- City of Modesto Drought Contingency Plan
- Draft MID Resolution
- City of Modesto Resolution No. 2015-455
- City of Modesto Resolution No. 2016-178

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CITY OF MODESTO – DROUGHT CONTINGENCY PLAN (Revised December 1, 2015)

**(Applies to all COM water users including residential, commercial, industrial, institutional, and private wells)*

Drought Stage 1 – Minor Shortage Potential	Drought Stage II – Moderate Shortage Potential	Drought Stage IIA – Medium Storage Potential	Drought Stage III – Critical Shortage Potential
Phasing Criteria			
* Extended periods of drought, associated with a warm, dry season, and due to lower than average precipitation and runoff.	* Extended periods of drought, associated with a warm, dry season, and due to lower than average precipitation and runoff.	* Extended periods of drought, associated with a warm, dry season, and due to lower than average precipitation and runoff.	* Groundwater levels are dropping due to the increased use associated with a warm, dry season, and due to lower than average precipitation and runoff. * Production from wells is decreasing. *There is a possibility that customer demands and system pressure requirements cannot be met at all times.
Reduction Objectives			
10%-20% reduction in total water production from baseline.	20%-35% reduction in total water production from baseline.	30%-40% reduction in total water production from baseline.	35%-50% reduction in total water production from baseline.
Requested Consumer Actions			
* Outdoor water use prohibited daily from noon - 7 p.m.* Odd-numbered addresses water W, F, Su Even-numbered addresses water, T, Th, Sa No outdoor water use on Mondays. * Car washing subject to above-cited limitations with use of a positive shutoff nozzle * Hosing concrete areas, building exteriors, etc.., is prohibited except for health/safety concerns and only with use of a positive shutoff nozzle. * Water leaks, once identified by home owner, must be repaired within 24 hours. * Restaurants encouraged serving water only on request.	* Outdoor water use prohibited daily from 9 a.m. - 7 p.m.* Odd-numbered addresses water W, Su Even-numbered addresses water, T, Sa No outdoor water use on Mondays, Thursdays, & Fridays. * Car washing subject to above-cited limitations with use of a positive shutoff nozzle * Hosing concrete areas, building exteriors, etc.., is prohibited except for health/safety concerns and only with use of a positive shutoff nozzle. * Water leaks, once identified by home owner, must be repaired within 24 hours.	Odd-numbered addresses water Sunday Even-numbered addresses water Saturday * Outdoor water use prohibited Saturday and Sunday from 9 a.m. - 7 p.m.* No outdoor water use on Mondays, Tuesdays, Wednesdays, Thursdays, & Fridays. * Car washing subject to above-cited limitations with use of a positive shutoff nozzle * Hosing concrete areas, building exteriors, etc.., is prohibited except for health/safety concerns and only with use of a positive shutoff nozzle. * Water leaks, once identified by home owner, must be repaired within 24 hours.	* No outdoor water use except for trees shrubs by hand, and vegetation maintained through drip irrigation. * Car washing permitted at car wash facilities only. * Hosing concrete areas, building exteriors, etc.., is prohibited except for health/safety concerns and only with use of a positive shutoff nozzle. * Water leaks, once identified by home owner, must be repaired within 24 hours. * Restaurants prohibited from serving water except upon request. * Mandatory retrofit of low flow showerheads and toilets in homes when Remodeling occurs. * No use of outdoor fountains except for maintenance purposes.

* New landscaping to comply with existing & future landscape ordinances. * Water meter installation on all new single-family homes. * Hours of restricted outdoor use may be extended to 9 a.m. – 7 p.m. at Council discretion.	* Restaurants and food service establishments prohibited from serving water except upon request. * New landscaping to comply with existing & future landscape ordinances. * Mandatory retrofit of low flow showerheads in homes when building remodeling occurs. * No use of outdoor fountains except for maintenance purposes. *Water meter installation on all new single-family homes. *No irrigating turf or ornamental landscapes during and 48 hours following measureable rain. * Operators of hotels and motels must provide guests with the option of choosing not to have towels and linens laundered daily and prominently display notice of this option.	* Restaurants and food service establishments prohibited from serving water except upon request. * New landscaping to comply with existing & future landscape ordinances. * Mandatory retrofit of low flow showerheads in homes when building remodeling occurs. * No use of outdoor fountains except for maintenance purposes. *Water meter installation on all new single-family homes. *No irrigating turf or ornamental landscapes during and 48 hours following measureable rain. * Operators of hotels and motels must provide guests with the option of choosing not to have towels and linens laundered daily and prominently display notice of this option.	*Moratorium on all new landscaping. *Building moratorium on all new connections, including new swimming pools.
Penalties * for Excessive Use			
$ 50 Administrative Fee assessed upon 2nd violation. $200 Admin. Fee assessed upon 3rd violation (includes meter installation $500 Administrative fee assessed for each subsequent violation.	$ 150 Administrative Fee assessed upon 2nd violation. $250 Admin. Fee assessed upon 3rd violation (includes meter installation $500 Administrative fee assessed for each subsequent violation.	$ 150 Administrative Fee assessed upon 2nd violation. $250 Admin. Fee assessed upon 3rd violation (includes meter installation $500 Administrative fee assessed for each subsequent violation.	$ 200 Administrative Fee assessed upon 2nd violation. $300 Admin. Fee assessed upon 3rd violation (includes meter installation $500 Administrative fee assessed for each subsequent violation.

** Applies to residents inside the City limits or with a City of Modesto water service agreement.*

** Penalties assessed for violations occurring within 12 months of first violation.*

MODESTO IRRIGATION DISTRICT

RESOLUTION NO. 20__-xxx

APPROVING ACTION RELATED TO THE IMPLEMENTATION OF AN ALTERNATIVE CURTAILMENT FORMULA OR WATER ALLOCATION BASIS IN ACCORDANCE WITH THE PROVISIONS INCLUDED IN THE AMENDED AND RESTATED TREATMENT AND DELIVERY AGREEMENT BETWEEN MODESTO IRRIGATION DISTRICT AND CITY OF MODESTO

WHEREAS, on October 11, 2005, the Modesto Irrigation District Board of Directors and the City of Modesto City Council approved the Amended and Restated Treatment and Delivery Agreement Between Modesto Irrigation District and City of Modesto, and

WHEREAS, Section 17 of the Amended and Restated Treatment and Delivery Agreement describes provisions for the delivery of water by the Modesto Irrigation District to the City of Modesto, and

WHEREAS, Section 17.2 of the Amended and Restated Treatment and Delivery Agreement provides a formula for water allocation to the City of Modesto based on the actual number of inches of water allocated by the Modesto Irrigation District Board of Directors to agricultural water users for the subject irrigation season commencing immediately prior to each Domestic Water Year, and

WHEREAS, Section 17.4 of the Amended and Restated Treatment and Delivery Agreement describes provisions for the adjustment of curtailment of water deliveries, and

WHEREAS, only__ inches of water were allocated by the Modesto Irrigation District Board of Directors for the 20__ irrigation season, and thus the 20__ allocation for the City of Modesto is only _____ acre-feet of treated water, significantly less than the maximum treated water allocation of 67,204.2 acre-feet per year, and

WHEREAS, the current severe and prolonged drought threatens the ability of the City of Modesto to deliver adequate drinking water to its customers despite its efforts to impose rationing and to utilize all water resources available to it, and

WHEREAS, the parties have met and conferred for the purpose of reaching an agreement as to an alternative curtailment formula or water allocation basis which more equitably and more fairly meets the needs of the agricultural and municipal water users within the Modesto Irrigation District's boundaries.

NOW, therefore, BE IT RESOLVED, That the Board of Directors of the Modesto Irrigation District does hereby adopt the Adjustment for Curtailment Provisions described in Section 17.4 of the Amended and Restated Treatment and Delivery Agreement to be implemented as follows:

[*Based on specific hydrologic, water supply, and water demand conditions present at the time of this proposed resolution, describe alternative curtailment formula or water allocation basis which more equitably and more fairly meets the needs of the agricultural and municipal water users within the District's boundaries*]

Moved by Director _____, seconded by Director_____, that the foregoing resolution be adopted.

The following vote was had:
Ayes: Directors_____
Noes: Directors_____
Absent: Directors_____
The President declared the resolution adopted.

oOo

I, Pat Mills, Secretary of the Board of Directors of the MODESTO IRRIGATION DISTRICT, do hereby CERTIFY that the foregoing is a full, true and correct copy of a resolution duly adopted at a [regular/special] meeting of said Board of Directors held the ____ day of _____ 20___.

Secretary of the Board of Directors
of the Modesto Irrigation District

MODESTO CITY COUNCIL
RESOLUTION NO. 2015-455

RESOLUTION APPROVING REVISIONS TO THE CITY OF MODESTO DROUGHT CONTINGENCY PLAN AND ENACTING DROUGHT STAGE IIA REQUIREMENTS THAT RESTRICT OUTDOOR WATERING TO ONE DAY A WEEK EFFECTIVE DECEMBER 1, 2015

WHEREAS, On March 17 2015, the State Water Resources Control Board adopted additional emergency drought regulations to govern the use of urban water in California, which requires the City of Modesto to meet a 36 percent (36%) cumulative reduction for the period of June 2015 through February 2016, and

WHEREAS, Section 11-1.14 of the Modesto Municipal Code authorizes the City Council to establish rules and regulations by resolution concerning the City's municipal water system, the use of water, and water conservation, and

WHEREAS, on May 1, 2015, the City Council, by Resolution No. 2015-134, implemented the Stage II Plan requirements of the Drought Contingency Plan, which included an increase in the monetary penalty amounts for excessive water use and restricted outdoor watering to twice weekly, and

WHEREAS, California continues to endure severe drought conditions and most of the state, including our area, is experiencing exceptional drought conditions as defined by the United States Drought Monitor, and

WHEREAS, staff is tracking water production reduction percentages and as of October 31, 2015, the City is at a 29% reduction, and

WHEREAS, to assist us in sustaining our water supply and meet state-mandated reduction goals, staff has revised the Drought Contingency Plan to add a Stage IIA that implements one-day per week watering for all City of Modesto customers, and

WHEREAS, addresses ending in an even number will water only on Saturday and addresses ending in an odd number will water only on Sunday, and

WHEREAS, staff recommended that the City Council approve the revisions to the Plan and implement Stage IIA requirements effective December 1, 2015.

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Modesto that it hereby approves revisions to the City of Modesto Drought Contingency Plan and enacts Drought Stage IIA requirements that restrict outdoor watering to one day a week effective December 1, 2015.

The foregoing resolution was introduced at a regular meeting of the Council of the City of Modesto held on the 24th day of November 2015, by Councilmember Madrigal, who moved its adoption, which motion being duly seconded by Councilmember Kenoyer, was upon roll call carried and the resolution adopted by the following vote:

AYES:	Councilmembers:	Ah You, Grewal, Kenoyer, Madrigal, Ridenour, Zoslocki, Mayor Marsh
NOES:	Councilmembers:	None
ABSENT:	Councilmembers:	None

ATTEST: _____
STEPHANIE LOPEZ, City Clerk

(SEAL)

APPROVED AS TO FORM:

By: _____
ADAM U. LINDGREN, City Attorney

MODESTO CITY COUNCIL
RESOLUTION NO. 2016-178

RESOLUTION APPROVING REINSTATEMENT OF THE DROUGHT STAGE II REQUIREMENTS OF THE CITY OF MODESTO DROUGHT CONTINGENCY PLAN TO ALLOW OUTDOOR WATERING TO TWO DAYS A WEEK EFFECTIVE MAY 1, 2016 THROUGH OCTOBER 31, 2016

WHEREAS, on March 17 2015, the State Water Resources Control Board (SWRCB) adopted additional emergency drought regulations to govern the use of urban water in California, which required the City of Modesto to meet a thirty-six percent (36%) cumulative reduction for the period of June 2015 through February 2016, and

WHEREAS, Section 11-1.14 of the Modesto Municipal Code authorizes the City Council to establish rules and regulations by resolution concerning the City's municipal water system, the use of water, and water conservation, and

WHEREAS, on November 24, 2015 City Council, by Resolution No. 2015-455, revised the City of Modesto Drought Contingency Plan and enacted Drought Stage IIA requirements to restrict outdoor watering to one day a week effective December 1, 2015, and

WHEREAS, California continues to endure severe drought conditions and most of the state, including our local area, is experiencing exceptional drought conditions as defined by the United States Drought Monitor, and

WHEREAS, the Governor recently extended the emergency drought regulations through October 2016 by executive order, and

WHEREAS, the SWRCB eased the restriction for the City of Modesto to require a thirty-four percent (34%) cumulative reduction in water use through October 2016, and

WHEREAS, staff recommended that the City Council approve returning to Drought Stage II of the Drought Contingency Plan effective May 1, 2016 through October 31, 2016 and,

WHEREAS, Drought Stage II of the Drought Contingency Plan implements a two-day per week outdoor watering schedule for all City of Modesto customers with addresses ending in an even number watering only on Tuesdays and Saturdays and addresses ending in an odd number watering only on Wednesdays and Sundays, and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Modesto that it hereby approves reinstatement of the Drought Stage II requirements of the City of Modesto Drought Contingency Plan that restrict outdoor watering to two days a week effective May 1, 2016 through October 31, 2016.

The foregoing resolution was introduced at a regular meeting of the Council of the City of Modesto held on the 26th day of April, 2016, by Councilmember Ridenour, who moved its adoption, which motion being duly seconded by Councilmember Kenoyer, was upon roll call carried and the resolution adopted by the following vote:

AYES:	Councilmembers:	Ah You, Grewal, Kenoyer, Madrigal, Ridenour, Zoslocki, Mayor Brandvold
NOES:	Councilmembers:	None
ABSENT:	Councilmembers:	None

ATTEST: _____
STEPHANIE LOPEZ, City Clerk

(SEAL)

APPROVED AS TO FORM:

By: _____
ADAM U. LINDGREN, City Attorney

APPENDIX J

Water Conservation Program Information

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MODESTO CITY COUNCIL
RESOLUTION NO. 2011-192

RESOLUTION ADOPTING THE MODESTO WATER CONSERVATION PLAN

WHEREAS, effective January 2009, Assembly Bill 1420 (AB 1420) amended the State Water Code to require agencies to implement or have a plan to implement the specific Demand Management Measures (DMMs) accepted by the State Department of Water Resources (DWR) as qualifying conservation plans before being eligible for state water management grants and loans, and

WHEREAS, agencies can demonstrate to DWR their implementation of the DMMs or their implementation plan by completing and submitting AB 1420 Self-Certification Statement Tables, which summarize their Conservation Plan DMM implementation schedule and other required details, and

WHEREAS, although Modesto has had an active and managed Water Conservation Program for many years, a Conservation Plan document describing these DMMs that support the Self-Certification Statement Tables has not been formally developed, and

WHEREAS, on April 27, 2010, the City Council, by Resolution No. 2010-151, amended an existing agreement with RMC Water and Environment to use remaining contract funds to develop a Conservation Plan, and

WHEREAS, the Conservation Plan describes the process to meet all of the goals for the DMMs over the next ten years, and

WHEREAS, the overall intent of the Conservation Plan is to promote water conservation programs and maximize real water conservation results in the most effective an economical means available, and

WHEREAS, the DMMs also serve as a plan to achieve the mandated 2015 Interim and 2020 Final per-capita water use targets developed in the 2010 Urban Water Management Plan (2010 UWMP), which was adopted under a separate Council action, and

WHEREAS, on March 28, 2011, the City submitted for DWR's review the completed AB 1420 Self-Certification Statement Tables, and

WHEREAS, on April 14, 2011, the City received notification from DWR affirming the City's compliance with AB 1420 which states that Modesto is eligible to receive water management grants and loan funds,

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Modesto that it hereby adopts the Modesto Water Conservation Plan.

The foregoing resolution was introduced at a regular meeting of the Council of the City of Modesto held on the 24th day of May, 2011, by Councilmember Marsh, who moved its adoption, which motion being duly seconded by Councilmember Muratore, was upon roll call carried and the resolution adopted by the following vote:

AYES:	Councilmembers:	Burnside, Geer, Hawn, Lopez, Marsh, Muratore, Mayor Ridenour
NOES:	Councilmembers:	None
ABSENT:	Councilmembers:	None

ATTEST: _____
STEPHANIE LOPEZ, City Clerk

(SEAL)

APPROVED AS TO FORM:

By: _____
SUSANA ALCALA WOOD, City Attorney

THIS IS TO CERTIFY THAT THIS
IS A TRUE COPY OF THE DOCUMENT ON
FILE WITH THIS OFFICE.
DATE May 31, 2011
_____
SIGNATURE
CITY CLERK
CITY OF MODESTO, CA

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CITY of MODESTO

City of Modesto
Water Conservation Plan

Prepared by:

RMC
Water and Environment

May 2011

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Table of Contents

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List of Abbreviations

AF	Acre-feet
AFY	Acre-feet per year
BMP	Best Management Practice
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CII	Commercial, Industrial, and Institutional
CUWCC	California Urban Water Conservation Council
DMM	Demand Management Measure
DPH	Department of Public Health
DWR	California Department of Water Resources
EDU	Equivalent Dwelling Unit
EIR	Environmental Impact Report
ETo	Reference Evapotranspiration
gpd	gallons per day
gpm	gallons per minute
HEWM	High Efficiency Washing Machine
ID	Improvement District
IRWMP	Integrated Regional Water Management Plan
mgd	Million gallons per day
MID	Modesto Irrigation District
MOU	Memorandum of Understanding
NPDES	National Pollutant Discharge Elimination System
PG&E	Pacific Gas and Electric
TID	Turlock Irrigation District
ULFT	Ultra-Low-Flush Toilet
UWMP	Urban Water Management Plan
WSS	WaterSense Specification

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Chapter 1 Introduction

The City of Modesto (City) has acknowledged the importance of water conservation and management, and has implemented significant water conservation efforts during the drought years of 1976-1977 and 1987-1992 in addition to maintaining ongoing conservation programs. In March 1990, the City of Modesto City Council approved a Water Conservation Program (Section 11-1.14 of Title XI of the Modesto Municipal Code) which combined a strong education program with watering restrictions and prohibition of water waste. The City of Modesto has now developed this Water Conservation Plan, building upon the demand management measures and conservation strategies identified and documented in the 2005 Urban Water Management Plan (UWMP) Update, with the intent to better define the City's Conservation Program and to plan for conservation program implementation in the future.

The City's Water Conservation Program is administered through the City's Water Operations Division of the Public Works Department. The City has implemented, or plans to implement, all of the Best Management Practices (BMPs) included in the 2005 UWMP program as defined in the December 2008 California Urban Water Conservation Council (CUWCC) Memorandum of Understanding (MOU), the corresponding document to the demand management measures denoted in the 2005 UWMP Guidelines and the State's AB1420 water use efficiency program. The City is currently preparing its 2010 UWMP which will include this conservation plan. This plan will then be adopted by the City of Modesto's City Council in conjunction with its 2010 UWMP.

1.1 History

The City of Modesto began providing potable water service in 1895 following the purchase and acquisition of several private water companies. Until 1995, the sole source of water supply to the City was groundwater from the Modesto and Turlock groundwater subbasins (part of the San Joaquin Valley Groundwater Basin). Groundwater levels started to decline in 1924, particularly in the downtown area, due to increased groundwater pumping for urban uses. In the early 1990s, the City of Modesto, Modesto Irrigation District (MID), and Del Este Water Company formed a partnership to use a portion of MID's surface water supplies for municipal use, resulting in the implementation of the Modesto Domestic Water Project (MDWP). Phase 1 of the MDWP consists of a 30 million gallon per day (mgd) surface water treatment plant and storage and delivery facilities, all of which were operational in 1995. Phase 2 of the program includes the expansion of the Modesto Regional Water Treatment Plant (MRWTP), built and operated by MID, to treat an additional 30 mgd. This plant upgrade is scheduled to come on-line by 2013.

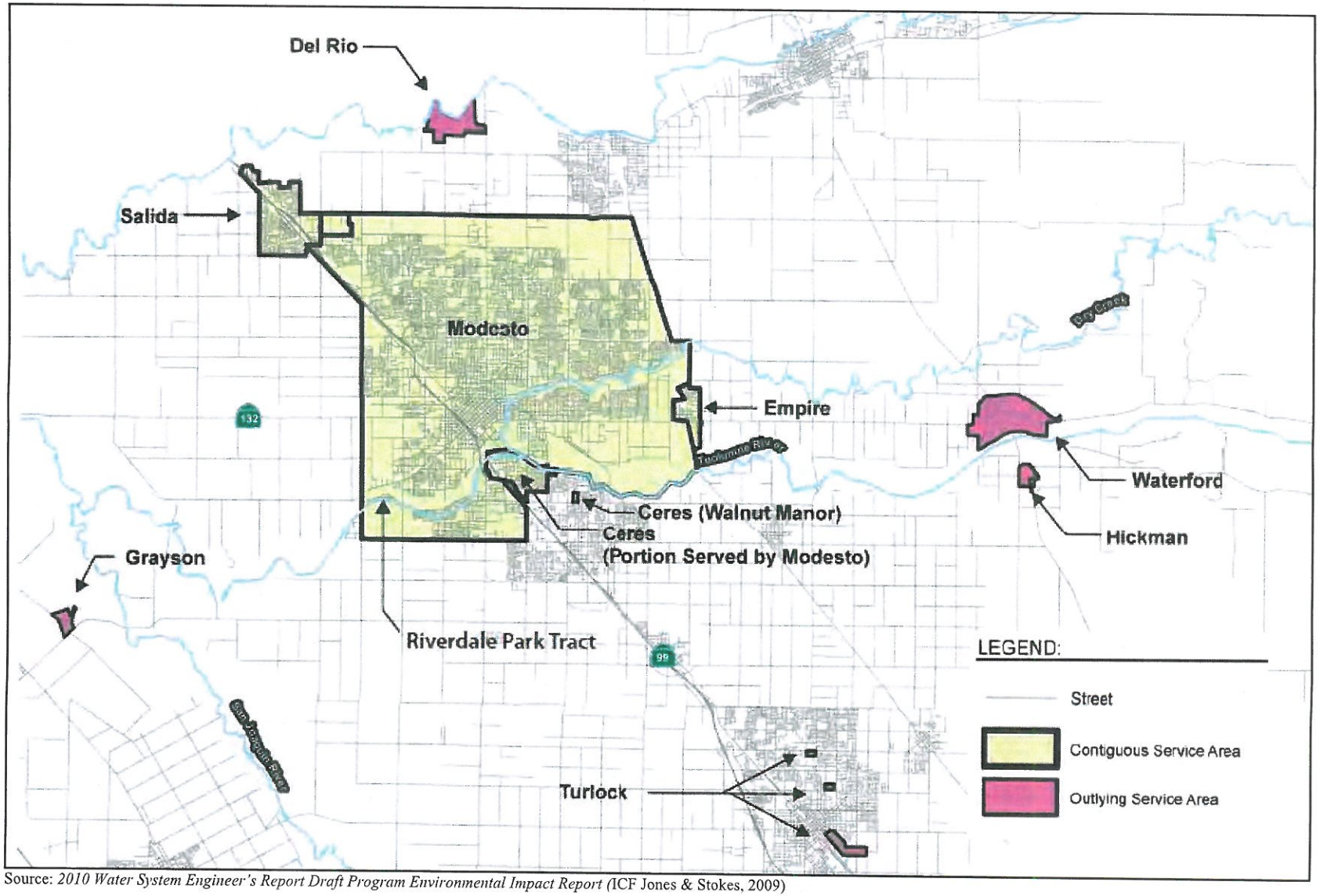
In July 1995, the City acquired the Del Este Water Company, which had previously served approximately 30% of the municipal customers in the Modesto area. As a result of this acquisition, the City of Modesto became the primary domestic water purveyor in Stanislaus County, serving not only the City of Modesto, but also the communities of Waterford, Hickman, Del Rio, Salida, Grayson, Empire and parts of Ceres and Turlock. The MRWTP delivers water to municipal customers within the city limits of the City of Modesto north of the Tuolumne River, as well as the communities of Salida and Empire. The City serves municipal customers south of the Tuolumne River in the Turlock Irrigation District (TID) service area from groundwater. TID currently serves only agricultural customers and does not supply water for municipal uses.

The City of Modesto is currently dependent on groundwater for up to 60 percent of its total supply during summer and fall months. Recently, the City entered into an agreement with TID to participate in design of a Regional Surface Water Supply Project (RSWSP), to be located east of Modesto on the south side of the Tuolumne River. Under a future Treatment and Delivery Agreement (TDA) with TID, up to 6,720 AFY (6 MGD) of TID surface water from the RSWSP Phase 1 would be delivered to the south Modesto area, enhancing the City's ability to manage its surface and groundwater supplies conjunctively. Upon completion of Phase Two of the MRWTP, the City will increase surface water use and reduce groundwater pumping to below current usage, allowing for in-lieu groundwater banking in which

groundwater supplies accumulate in the groundwater basin for use in meeting normal and dry year demands in the future. The City of Modesto's water service area is shown in Figure 1-1.

As the City manages its water service area, it recognizes that water is a regional resource as well as a local one. Therefore, regional partnerships, in addition to local projects and conservation measures, play a large role in maximizing resources. The City is currently participating in the preparation of an Integrated Regional Water Management Plan (IRWMP) with other local entities, including the Cities of Ceres, Hughson and Turlock, as well as Turlock Irrigation District and Modesto Irrigation District. Participation in the IRWM planning process allows the City and its partners to develop a regional plan to identify resources and develop projects to provide sustainable water resources to meet regional water needs.

Figure 1-1: City of Modesto Water Service Area



Source: *2010 Water System Engineer's Report Draft Program Environmental Impact Report* (ICF Jones & Stokes, 2009)

1.2 Physical Setting

Water use within the Modesto area is dependent upon various climate factors such as temperature, precipitation, and evapotranspiration (ET). ET is a term used to describe water lost through evaporation from the soil and surface-water bodies combined with plant transpiration. In general, the reference evapotranspiration (ETo) is given for turf grass, and then corrected for a specific crop type. Local ETo data was obtained from California Irrigation Management Information System (CIMIS) station #71, located west of Modesto, California and operated by DWR. Table 1-1 shows the historic climate characteristics affecting water management in the Modesto area.

Table 1-1: Modesto Climate

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
Monthly Average ETo[1] (in)	0.87	1.71	3.43	5.24	6.7	7.4	7.85	6.75	4.93	3.37	1.66	0.87	50.78
Average Total Precipitation[2] (in)	2.37	2.13	1.94	1.07	0.46	0.09	0.03	0.04	0.2	0.64	1.36	2.1	12.42
Average Max Temperature[2] (°F)	53.7	60.8	66.9	73.4	81.1	88.2	94.1	92.1	87.7	78	64.4	54.2	74.5
Average Min Temperature[2] (°F)	37.7	40.9	43.4	46.8	51.7	56.4	59.8	58.7	56	49.7	41.7	37.8	48.4

Notes:
1. Data from CIMIS Station #71. CIMIS information is available only from June 1987 to the present.
2. Data from Western Regional Climate Center (http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?camode+nca) for Modesto, CA. Period of record is 1/1/1931 through 12/31/04.

Other climate characteristics that affect water management in the Modesto area include solar radiation, relative humidity, dew point, wind speed, and soil temperature.

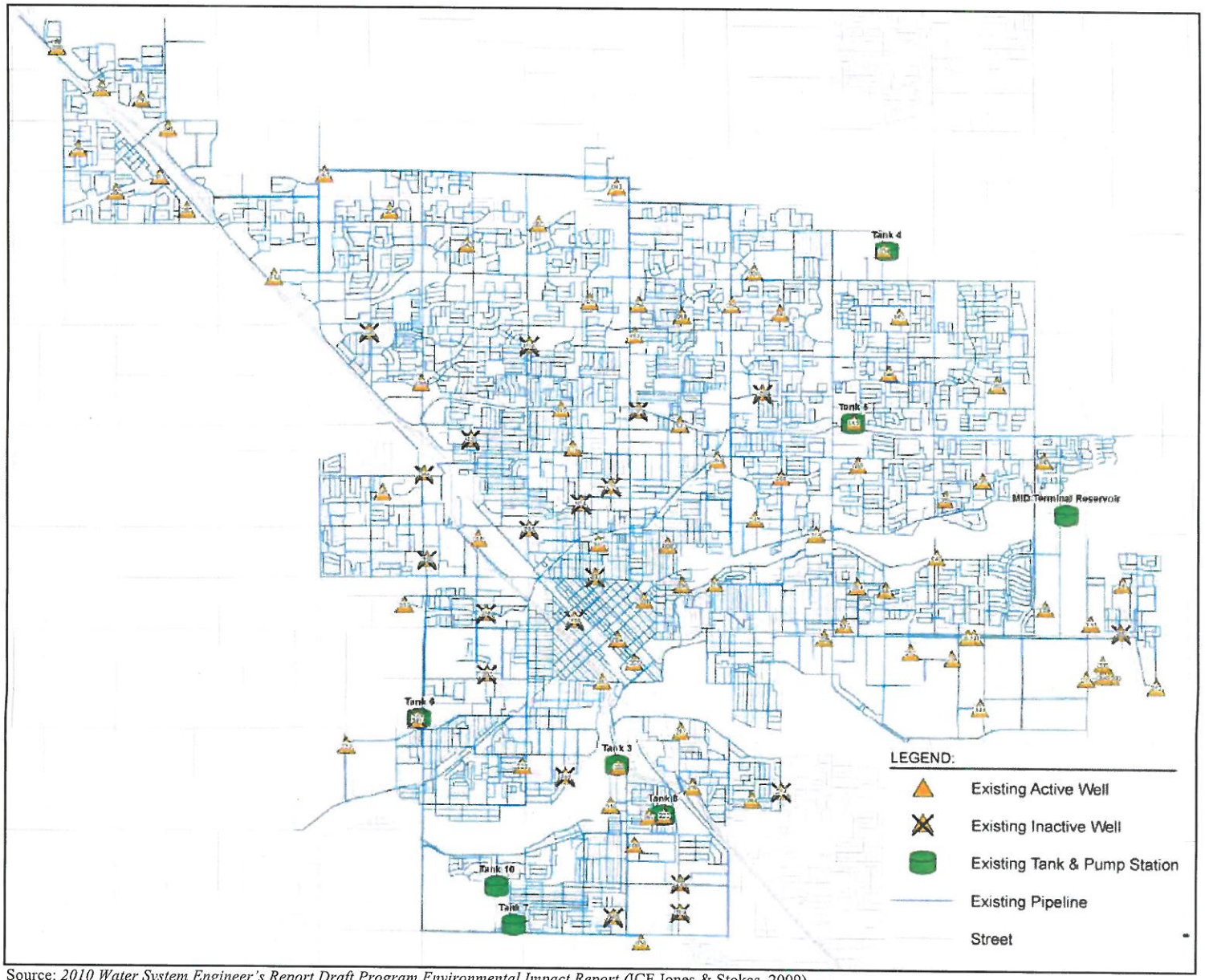
1.3 System Description

The City of Modesto obtains its water supply from groundwater from the Modesto and Turlock groundwater subbasins and from treated Tuolumne River water from MID. As previously noted, the City of Modesto's water service area includes former Del Este Water Company systems in Empire, Salida, Waterford, Hickman, Grayson, Del Rio, and portions of Ceres and Turlock in Stanislaus County. There are over 77,000 water connections, 940 miles of water lines in the water system, 113 groundwater wells (21 are currently not operated due to water quality reasons), and eleven water tanks (one is not yet operational and one is older and not currently used). There are two raw water reservoirs serving the Modesto area: the Modesto Reservoir and New Don Pedro Reservoir. Completed in 1911, owned and operated by MID, Modesto Reservoir has a gross storage capacity of 28,000 acre-feet (AF). The New Don Pedro Reservoir, owned and operated by MID and TID, is located four miles northeast of La Grange in the Sierra Nevada foothills and is 26 miles long with a capacity of 2.03 million AF.

1.4 Conservation Policy

The City updated their 2005 UWMP which discussed the fourteen water conservation measures that were being implemented by the City (referred to by the California Department of Water Resources (DWR) as Demand Management Measures or DMMs). Historically, the City has directly budgeted for conservation programs each fiscal year and implemented programs as deemed prudent. The fourteen existing DMMs, as set forth in the 2005 UWMP Update, are described and updated accordingly in Chapter 3, Conservation Programs.

Figure 1-2: Major Water Facilities



Source: *2010 Water System Engineer's Report Draft Program Environmental Impact Report* (ICF Jones & Stokes, 2009)

Chapter 2 Conservation Policies and Program Goals

The City's goals are to conserve water through public relations, education, customer service, and enforcement. The City strives to meet this challenge by working in a friendly, respectful and positive manner with homeowners, businesses and property managers (RMC, 2007).

In preparation of this Water Conservation Plan, the City of Modesto developed the following policy statement, reflecting its belief in water conservation:

> *To protect, conserve, and manage all water resources for the current and future needs of the community and the environment.*

The overall goal is to develop a system-wide water conservation plan containing acceptable water efficiency measures and an implementation plan which will decrease water use and water loss while using the most cost-effective methods.

Furthermore, with the preparation and implementation of this plan, the City aims to:

1. Be compliant with Assembly Bill 1420 (AB 1420) requiring the implementation of fourteen baseline conservation measures of Best Management Practices (BMPs).
2. Meet California Urban Water Conservation Council goals as outlined in the Memorandum of Understanding Regarding Urban Water Conservation in California for the fourteen conservation measures identified in the 2005 UWMP.
3. Create an implementation program for conservation measures based on affordability and feasibility.

Chapter 3 Conservation Programs

This section describes the existing water conservation measures or programs, referred to interchangeably as Best Management Practices (BMPs) or Demand Management Measures (DMMs), that the City is implementing and/or plans for future implementation.

As previously stated, the City of Modesto prepared a 2005 UWMP Update in 2007. The UWMP summarized fourteen primary conservation measures, referred to as DMMs, as required by the 2005 UWMP Guidebook. These fourteen conservation measures are the same fourteen measures referred to as BMPs in the California Urban Water Conservation Council (CUWCC) *Memorandum of Understanding Regarding Urban Water Conservation in California* (MOU), adopted the 1991 and amended in December 2008. These BMPs are considered base or foundational programs required to expedite implementation of reasonable water conservation measures in urban areas. Furthermore, these same fourteen measures have since become the primary measures by which the California Department of Water Resources (DWR) Office of Water Use Efficiency measures compliance with Assembly Bill (AB) 1420. AB 1420 amended the Urban Water Management Planning Act, Water Code Section 10610 *et seq.* to require effective January 1, 2009, that the terms of and eligibility for any water management grant or loan made to an urban water supplier and awarded or administered by the DWR, State Water Resources Control Board (SWRCB) or California Bay-Delta Authority (CBDA) or its successor agency, be conditioned on the implementation of the water DMMs described in Water Code Section 10631(f). AB 1420 certification requires that each DMM be implemented to the levels of coverage as specified in the CUWCC MOU.

This Conservation Plan was prepared considering the City's conservation needs, the requirements of the Urban Water Management Planning Act and the requirements of AB 1420 certification. To that end, of the fourteen DMMs documented in the UWMP guidelines and the AB1420 certification documents is discussed below. For each DMM, the measure is described and the requirements for CUWCC MOU compliance and compliance documentation required are presented. The CUWCC MOU requirements were used herein as measures for City compliance as the AB1420 legislation uses this document as its measure for State-wide compliance with the legislation.

3.1 DMM 1: Water Survey Programs for Single-Family Residential and Multi-Family Residential Customers

3.1.1 CUWCC Description

DMM 1 is intended to provide water survey programs for both single-family and multi-family residential customers. Survey programs are to encompass both indoor and outdoor water use. Specifically, DMM 1 is to include the following.

> Residential Assistance - Provide site-specific leak detection assistance that may include, but is not limited to a water conservation survey, water efficiency suggestions, and/or inspection.
>
> Landscape Water Survey - Perform site-specific landscape water surveys that shall include, but are not limited to, the following: check irrigation system and timers for maintenance and repairs needed; estimate or measure landscaped area; develop customer irrigation schedule based on precipitation rate, local climate, irrigation system performance, and landscape conditions; review the scheduling with customer; provide information packet to customer; and provide customer with evaluation results and water savings recommendations.

3.1.2 CUWCC Documentation Requirement

Provide reports, disaggregated by single-family and multi-family units, identifying the number of:

- residential assistance/leak detection survey visits completed
- WaterSense Specification (WSS) showerheads distributed
- WSS faucet aerators distributed during the reporting period

In addition, provide the number of single-family and multi-family account landscape water surveys completed during the reporting period.

3.1.3 CUWCC Goal

Provide leak detection assistance averaging 1.5% per year of single-family accounts and 1.5% of multi-family accounts per year for the first ten years. After meeting the 10 year 15% target, maintain the program at level of high-bill complaints or not less than 0.75% per year of current single-family accounts and 0.75% per year of current multi-family accounts. The same level of compliance will be provided for landscape surveys.

3.1.4 Implementation Status

The City has not yet implemented this DMM.

3.1.5 Existing Program

Water surveys for residential users help raise awareness of water conservation in the home and helps conserve water during everyday use. The City's Water Conservation Program was established in 1990, and during that first year, 1,732 contacts were made at residences and businesses to explain the program. The number of contacts made each year continues to grow, with more than 7,800 contacts made in the Summer of 2004 alone. Program staff members are available to set sprinkler timers upon request, adjust sprinkler heads, and provide minor advice on sprinkler systems. Staff members agree that the small amount of extra time spent assisting customers creates goodwill, ultimately reducing the likelihood of enforcement staff having to return in the future. In the past, the City has offered these free services upon request, but has not had a formal surveying program.

3.1.6 Future Program

Herein, the City has formalized its program for residential water surveys and landscape water surveys. Table 3-1 summarizes the estimated number of surveys to be completed over the next 10 years. The City will identify the high water users in its service and focus on those areas; service technicians and/or City interns will visit the residential users to provide leak detection assistance by performing surveys that include both indoor and outdoor investigations and to offer suggestions for both single-family and multi-family residences to improve water use efficiency. The numbers included in Table 3-1 assume residential landscape surveys will be conducted at the same time as indoor residential surveys. Surveys are offered via mailers, bill inserts and/or the City's website.

Table 3-1: Projected Water Survey Program

	FY11	*FY12*	*FY13*	*FY14*	*FY15*	*FY16*	*FY17*	*FY18*	*FY19*	*FY20*
Surveys Offered	14,192	14,192	14,192	14,192	14,192	14,192	14,192	14,192	14,192	14,192
# of single family surveys	990	990	990	990	990	990	990	990	990	990
# of multi-family surveys	72	72	72	72	72	72	72	72	72	72

3.2 DMM 2: Residential Plumbing Retrofit

3.2.1 CUWCC Description

DMM 2 provides site-specific leak detection to residential customers by providing plumbing retrofits, including showerheads and faucet-aerators that meet the current water efficiency standard as stipulated in the WaterSense Specifications (WSS).

3.2.2 CUWCC Documentation Requirement

Provide reports, disaggregated by single-family and multi-family units, identifying the number of residential assistance/leak detection survey visits completed, number of WSS showerheads distributed, and number of WSS faucet aerators distributed during the reporting period.

3.2.3 CUWCC Goal

Plumbing device distribution and installation programs will be maintained at a level sufficient to distribute high quality, low-flow showerheads to not less than 10% of single-family residences and 10% of multi-family units constructed prior to 1992 each reporting period; or enactment of an enforceable ordinance requiring the replacement of high-flow showerheads and other use fixtures with their low-flow counterparts. Continue until coverage includes 75% of single family and multi-family units.

3.2.4 Implementation Status

The City is currently implementing this program, but has not yet achieved the CUWCC goal.

3.2.5 Existing Program

The City of Modesto requires water efficient equipment to be installed in all new construction and remodels. In addition, Water Conservation Kits are distributed by the City through its Water Conservation Program. Conservation kits are also distributed after each water conservation presentation to both adults and children. Over 30,000 kits have been distributed since 1983. Each kit contains one toilet displacement bag, dye tablets to detect toilet leaks, general conservation information, and installation instructions. When using the displacement bag in a standard toilet, approximately one gallon of water is saved with each flush. It is estimated that 20 percent of all toilets leak, and that the average leak wastes nearly 47 gallons a day. Using the dye tablet will help citizens detect those leaks. The water savings from using lawn watering guides is estimated to be 20 percent per household with automatic sprinklers and 10 percent for manual systems.

3.2.6 Future Program

In addition to the distribution of the Water Conservation Kits, implementation of this DMM will be combined with DMM 8, school education. As part of the school education programs discussed in DMM 8, the City will distribute low-flow showerheads to the fifth-grade classes targeted for presentations each year. Under this program, the City will aim to distribute approximately 6,000 WSS showerheads each year.

In addition to providing low-flow showerheads to the 5th grade classes under DMM 8, the City will also distribute additional low-flow showerheads as giveaways at other public events.

Table 3-2 summarizes the total number of planned low-flow showerhead giveaways provided for residential plumbing retrofits each fiscal year.

Table 3-2: Planned Residential Showerhead Retrofits

	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20
# Showerheads to SF Accounts	4,583	4,583	4,583	4,583	4,583	4,583	4,583	4,583	0	0
# Showerheads to MF Accounts	1,554	1,554	1,554	1,554	1,554	1,554	1,554	1,554	0	0
AFY savings showerheads	85.9	85.9	85.9	85.9	85.9	85.9	85.9	85.9	0	0

Note: Rebates for low-flow toilets will not be included in DMM 2, as DMM 14 is devoted solely to providing WSS toilets.

3.3 DMM 3: System Water Audits, Leak Detection, and Repair

3.3.1 CUWCC Description

Per the CUWCC program, implementation of DMM 3 shall consist of at least the following actions:

1. Annually complete a pre-screening system audit to determine the need for a full-scale system-wide water audit. The pre-screening system audit shall be calculated as follows:
    a. Determine metered sales
    b. Determine other system verifiable uses
    c. Determine total supply into the system
    d. Divide metered sales plus other verifiable uses by total supply into the system (if this quantity is less than 0.9, a full scale system audit is indicated).
2. When indicated, agencies shall complete water audits of their distribution systems using methodology consistent with that described in AWWA's Water Audit and Leak Detection Guidebook.
3. Agencies shall advise customers whenever it appears possible that leaks exist on the customer's side of the meter, perform distribution system leak detection when warranted and cost-effective, and repair leaks when found.

3.3.2 CUWCC Documentation Requirement

Documentation required in support of this DMM includes pre-screening audit results and supporting documentation and in-house records of audit results or the completed AWWA Audit Worksheets for each completed audit period.

3.3.3 CUWCC Goal

Complete one pre-screening audit per year.

3.3.4 Implementation Status

The City is currently implementing this program, but has not yet achieved the CUWCC goal.

3.3.5 Existing Program

Repair and maintenance of the water distribution systems are priorities for the City. In addition to the City's Water Conservation Program, the City also has Capital Improvement Projects that provide for maintenance programs that maximize efficiency of water distribution system operations and minimize water losses. These programs include using SCADA systems to monitor groundwater and surface water production, quick responses to water main leak detection and repair, recalibration of each well meter

every four years, annual pump efficiency testing, and water quality efforts including main flushing and water quality testing.

Daily water production from the City of Modesto's wells and water treatment plant is recorded and used to monitor water use. Additionally, the City of Modesto maintains records of main breaks which are used to identify mains to be replaced and estimate system water loss.

Water Line workers (four servicemen and one supervisor) are responsible for identifying excessive water waste, standing water and system leaks. At the customer's request, City staff will investigate and, where appropriate, repair leaks within the City's right-of-way. In addition, staff conducts repairs of water line leaks and replaces or repairs meters. A repair crew will repair leaks in areas where leak detection equipment has pinpointed hidden leaks.

Each year, 25 percent of well sites are serviced and meters are recalibrated as routine maintenance. Pump efficiency tests are completed annually. Repairs are promptly made on pumps showing decreased efficiency, and well meters found to be inaccurate or exhibiting signs of wear are promptly replaced. Well efficiency is consistently tracked through the City of Modesto's SCADA System.

A Maintenance Avoidance Program was implemented in 1995 to analyze motor well vibration using a probe and recorder. This program allows the City to schedule maintenance on motors and pumps based on predictive trends calculated by the vibration analysis instruments. As a result, motors and pumps can be repaired or parts replaced before their complete failure, extending their useful life.

The City's Water Division uses Geographical Information Systems (GIS) and Global Positioning Systems (GPS) to record fire hydrant locations, valves, water meters, and to map water lines of all water distribution systems. The GIS data is organized in a database of the water system. In conjunction with the data assembled through SCADA, the database aids in hydraulic modeling of the water system. Additionally, the City uses CASS WORKS, a maintenance management system. The management system benefits the City by improving efficiency in completing work orders, managing imported records and scheduling maintenance. These programs are effective tools for providing customers with an efficiently operated and dependable water distribution system.

In the past, the City has contracted out a leak detection crew to complete a visual inspection of the system. The City Engineering staff work with City Operations crews to identify old pipelines that are leaking, and provide follow-up in replacing those lines. This is, and will continue to be, conducted as part of the City's Annual Pipe Replacement Program.

3.3.6 Future Program

The City's work on its Annual Pipe Replacement Program has allowed them to identify six large areas within its service area that are problematic with high percentages of leaking due to pipe age. A schedule and budget have been developed to systematically replace the pipes in these identified areas. In addition to the City's existing program, the City will also begin conducting an annual pre-screening audit in which they will determine metered sales and other verifiable uses (in acre-feet). These amounts will be summed and divided by the total supply into the system. If the number is less than 0.9, a full water system audit will be conducted; if the number is greater than or equal to 0.9, then nothing more will be completed as part of this DMM. For the purposes of budgeting for this DMM, it was assumed that a detailed water audit will be conducted every five years.

3.4 DMM 4: Metering with Commodity Rates for All New Connections and Retrofit for Existing Connections

3.4.1 CUWCC Description

Implementation of this DMM consists of the following actions:

1. Require meters for all new service connections.
2. Establish a program for retrofitting existing unmetered service connections.
3. Read meters and bill customers by volume of use.
    - Establish and maintain billing intervals that are no greater than bi-monthly (every two months) for all customers.
    - For each metered connection, perform at least five actual meter readings (including remotely sensed) per twelve month period.
4. Prepare a written plan, policy or program that includes:
    - A census of all meters, by size, type, year installed, customer class served and manufacturer's warranty accuracy when new;
    - A currently approved schedule of meter testing and repair, by size, type and customer class;
    - A currently approved schedule of meter replacement, by size, type, and customer class; and
5. Identify intra- and inter-agency disincentives or barriers to retrofitting mixed use commercial accounts with dedicated landscape meters, and conducting a feasibility study(s) to assess the merits of a program to provide incentives to switch mixed use accounts to dedicated landscape meters.

Service lines dedicated to fire suppression systems are exempt from this requirement.

3.4.2 CUWCC Documentation Requirement

Documentation required for compliance with the CUWCC MOU for DMM 4 is as follows:

- Confirmation that all new service connections are metered and are being billed by volume of use and provide:
    - Number of metered accounts
    - Number of metered accounts read
    - Number of metered accounts billed by volume of use
    - Frequency of billing (i.e. six or twelve times per year) by type of metered customer (e.g. single-family residential, multiple-family residential, commercial, industrial, and landscape irrigation)
    - Number of estimated bills per year by type of metered customer (e.g. single-family residential, multiple-family residential, commercial, industrial, and landscape irrigation) vs. actual meter readings
- Number of unmetered accounts in the service area. For the purposes of evaluation, this shall be defined as the baseline meter retrofit target and shall be used to calculate the agency's minimum annual retrofit requirement.
- Number of unmetered service connections retrofitted during the reporting period.
- Estimated number of CII accounts with mixed-use meters.
- Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period.

3.4.3 CUWCC Goal

Meter 100% of existing unmetered accounts and bill by volume, including:

1. Initiating volumetric billing for all metered customers within one year
2. Complete meter installation for all service connections within 6 years
3. For unmetered service areas newly acquired or newly operated by otherwise metered agencies, meter installation shall be completed in these service areas within 6 years of the acquisition or operational agreement
4. A feasibility study examining incentive programs to move landscape water uses on mixed-use meters to dedicated landscape meters to be completed by the end of Year Four
5. A written plan, policy or program to test, repair and replace meters shall be completed and submitted electronically within one year

3.4.4 Implementation Status

The City is currently implementing this program, but has not yet achieved the CUWCC goal.

3.4.5 Existing Program

The City's water system is not fully metered. The City has been installing meters on new homes since the City Council enacted the Modesto Municipal Code 11-1 on May 14, 1991. Of the total 70,960 residential connections, 32,035 (as of July 2010) are unmetered. All but one of the City's non-residential services are metered, and all new development in the City since 1991 has had meters installed.

As accounts are converted to metered accounts, the City implements the rate structure shown in Table 3-12. This rate structure encourages conserving behavior by incorporating a uniform volume charge in addition to the fixed meter charge. In this way, water usage reductions directly reduce cost to the user, while excessive water use results in increased costs.

3.4.6 Future Program

Table 3-3 summarizes the planned commodity rate metering and retrofits for the next ten fiscal years; the City anticipates being fully metered by 2025. By developing and implementing the ongoing meter installation and replacement program, the City is developing a more focused and direct monitoring tool allowing them to detect high water usages, contributing to the implementation of DMM 1 and DMM 3. In 2009, the City budgeted two new positions in the billing division of the Finance Department, one of which is currently filled. In the future, the City will fill the other position and plans to have both positions supporting the City's meter program in a customer service role, taking phone calls, answering questions and comments, and providing information on water usage, meter installation schedule, conservation measures, and leak detection by communicating directly with homeowners. These two finance positions will also support the Water Conservation Coordinator.

Table 3-3: Planned Commodity Rate Metering and Retrofits

	FY11	*FY12*	*FY13*	*FY14*	*FY15*	*FY16*	*FY17*	*FY18*	*FY19*	*FY20*
# of meter conversions	5,300	3,400	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250
# of accounts converted from flat to volumetric use	5,300	3,400	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250

3.5 DMM 5: Large Landscape Conservation Programs and Incentives

3.5.1 CUWCC Description

Under DMM 5, the City will provide support and incentives to improve non-residential customers' landscape water use efficiency. Support shall include:

1. Accounts with dedicated irrigation meters:
    - Identify accounts with dedicated meters and assign ETo-based water use budgets equal to no more than an average of 70% of ETo of annual average local ETo per square foot of landscape area.
    - Provide notices each billing cycle to accounts with water budget showing the relationship between the budget and actual consumption.
    - Offer site-specific technical assistance to reduce water use to accounts that are 20% over budget.
2. Commercial, industrial, and institutional (CII) accounts without meters or with mixed-use meters
    - Develop and implement strategy targeting large landscape water use surveys to CII accounts with mixed-use meters.
    - In un-metered service areas, actively market landscape surveys to existing accounts with large landscapes or accounts with landscapes that are not water efficient.
3. Offer financial incentives.

3.5.2 CUWCC Documentation Requirement:

Under this DMM, the City will preserve water use records and budgets for customers with dedicated landscape irrigation accounts for at least four years. In addition, the following information will be preserved for CII accounts without meters or with mixed-use meters:

- Number of accounts
- Number, type, dollar value of incentives, rebates, and no- or low-interest loans offered to, and received by, customers
- Number of surveys offered
- Number of surveys accepted
- Estimated annual water savings by customers receiving surveys and implementing

3.5.3 CUWCC Goal

Per the CUWCC MOU (set by AB1420 as the standard for DMM compliance), the goals for DMM 5 are as follows:

- At least 90% of all dedicated meters and 15% of all mixed-use and non-metered accounts will receive assistance over a ten year period.
- Develop ETo-based water use budget for 9% of all dedicated accounts per year over 10 years.
- Offer site specific technical assistance annually to accounts that are 20% over their budget within 6 years of the date of implementation.

3.5.4 Implementation Status

The City has not yet implemented this DMM.

3.5.5 Existing Program

The City of Modesto Public Works Water Division has implemented an efficient, ETo-based irrigation system at eleven city parks. The ETo-based irrigation systems involve irrigating parks using field

computers connected by modem to a weather station. The weather station relays weather forecasts and evapotranspiration data to the field computers and the irrigation is adjusted according to incoming weather forecasts. Currently, there are plans to expand the system to include more parks and public land. The City's three certified landscape auditors oversee landscaping maintenance of the City's parks and golf courses.

The City also strives to match water quality with use. For example, the shallower aquifers in the area are generally not tapped for potable water uses due to the presence of contaminants that require treatment. The City has been evaluating the conversion of older, shallower wells or developing new shallow wells to be used exclusively for park landscaping irrigation instead of using the treated surface and groundwater sources for these demands. This strategy serves as both a cost savings to the Parks & Recreation Department and as a means by which available potable water supply sources can be conserved for potable uses. Irrigation conservation measures are still utilized at the parks, regardless of water source; but using the shallower water-bearing aquifer zones puts a supply to use that would otherwise go unused in highly urban areas. In the future, this strategy may be applied to local schools within the service area.

3.5.6 Future Program

In addition to the actions the City is already taking (as described in Section 3.5.5), the City also intends to begin a program to formally offer surveys to large landscape accounts. Under this program, the City will visit customers who irrigate and recommend an efficient irrigation schedule and improvements. The City will provide each dedicated irrigation account with an ETo-based water use budget equal to no more than an average of 70% of ETo of annual average local ETo per square foot of landscape area. The recreational areas, such as parks, may require additional water than allotted in the budget, but their use still may not exceed 100% of ETo on an annual basis.

To aid the customer in tracking their water use, the City will provide notices each billing cycle to the accounts with water use budgets showing the relationship between the budget and actual water consumption. The City will offer technical assistance to customers that are 20% over budget. Surveys will also be provided to commercial, industrial and institutional (CII) accounts. There is currently only one CII account that is not metered; this account will have a meter installed as part of the City's meter conversion program (DMM 4). Finally, the City will implement a weather-based irrigation controller (WBIC) rebate program, offering a $50 rebate per WBIC purchased.

Table 3-4 summarizes the projected number of the large landscape surveys and rebates to be offered to customers under this DMM. Also shown below is the projected water savings resulting from the program implementation.

Table 3-4: Planned Large Landscape Conservation Programs

	FY11	*FY12*	*FY13*	*FY14*	*FY15*	*FY16*	*FY17*	*FY18*	*FY19*	*FY20*
# of budgets created	84	84	84	84	84	84	84	84	84	84
# of surveys completed	71	71	71	71	71	71	71	71	71	71
# of follow-up visits	21	21	21	21	21	21	21	21	21	21
# of rebates	5	5	5	5	5	5	5	5	5	5
Projected Water Savings- AFY	164.3	164.3	164.3	164.3	164.3	164.3	164.3	164.3	164.3	164.3

3.6 DMM 6: High-Efficiency Clothes Washers

3.6.1 CUWCC Description

DMM 6 is implemented to provide incentives or establish ordinances requiring the purchase of high-efficiency clothes washing machines (HECWs) that meet an average water factor value of 5.0. If the WaterSense Specification (WSS) is less than 5.0, then the average water factor value will decrease by that amount. WaterSense is a partnership program sponsored by the U.S. Environmental Protection Agency (EPA) which makes it easier for Americans to save water by purchasing water-efficient products. Consumers can look for products with the WaterSense label to choose quality, water-efficient products. More information about WSS can be found at http://www.epa.gov/watersense/index.htm.

A water factor is the number of gallons per cycle per cubic foot that the clothes washer uses. The lower the water factor, the more efficient the water is. For example, if a washer uses 30 gallons per cycle and has a tub volume of 3.0 cubic feet, then the water factor is 10.

3.6.2 CUWCC Documentation Requirement

Documentation required for DMM 6 includes the number of installations credited to the City's replacement program for HECWs with an average water factor value of 5.0. If the WSS is less than 5.0, then the water factor value will decrease to that amount.

3.6.3 CUWCC Goal

Incentives shall be provided to 0.9% of current single-family accounts during the first reporting period following implementation, rising to 1% per year for the remainder of a ten year period.

3.6.4 Implementation Status

The City has not yet implemented this DMM.

3.6.5 Existing Program

MID offers $35 rebates for energy-efficient washing machines for its qualifying electric customers and similarly, Pacific Gas & Electric (PG&E) offers $50 rebates for energy-efficient clothes washers. Because MID and PG&E customers are also City of Modesto water customers, in the past the City has referred water users to PG&E and MID rebates available for clothes washers but did not provide their own rebates.

3.6.6 Future Program

The City plans to provide $100 rebates to users towards the purchase of HECWs meeting the average WSS water factor value of 5.0 or better. As part of the implementation of this program, the City will develop and maintain a list of qualifying HECWs for residents to use. Table 3-5 summarizes program implementation and water savings.

Table 3-5: HECWs Rebate Program

	FY11	*FY12*	*FY13*	*FY14*	*FY15*	*FY16*	*FY17*	*FY18*	*FY19*	*FY20*
# of rebates	600	660	660	660	660	660	660	660	660	660
Projected Water Savings (AFY)[a]	14.7	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2

Note: Assumes 400 loads/household/year with non-conserving washing machines using 40 gal/load and HECWs using 20 gal/load.

3.7 DMM 7: Public Education Programs

3.7.1 CUWCC Description

Public information programs shall be implemented to promote water conservation and water conservation-related benefits. Implementation shall consist of at least the following actions:

1. The program should include, when possible, providing speakers to employees, community groups and the media; using paid and public service advertising; using bill inserts; providing information on customers' bills showing use for the last billing period compared to the same period the year before; providing public information to promote water conservation measures; and coordinating with other government agencies, industry groups, public interest groups, and the media.
2. The program should include, when possible, social marketing elements which are designed to change attitudes to influence behavior. This includes seeking input from the public to shape the water conservation message; training stakeholders outside the utility staff in water conservation priorities and techniques; and developing partnerships with stakeholders who carry the conservation message to their target markets.
3. When mutually agreeable and beneficial, the wholesale agency or another lead regional agency may operate all or part of the public information program. If the wholesale agency operates the entire program, then it may, by mutual consent with the retail agency, assume responsibility for CUWCC reporting for this BMP. Under this arrangement, a wholesale agency may aggregate all or portions of the reporting and coverage requirements of the retail agencies joining into the mutual consent.

3.7.2 CUWCC Documentation Requirement

Agencies may report on all of the following activities, although agencies are only expected to meet the minimum requirements described above:

1. Newsletter articles on conservation
2. Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets
3. Landscape water conservation media campaigns
4. General water conservation information
5. Website
6. Email messages
7. Website - provide link to or list of qualified landscape professionals (WaterSense, California Landscape Contractors Association, Irrigation Association, etc.) and other helpful sites
8. Direct mail - seasonal postcards noting irrigation requirement changes
9. Direct mail or other notification to customer if water use is significantly higher than neighbors with similarly-sized lots
10. Customer notification when neighbor reports runoff or runoff is noticed by employees or meter reads show rise in use of 20% or more from same time previous year
11. Dedicated phone line or "on hold" messages with recorded conservation information
12. Booths at local fairs/events
13. Monthly water use reports provided with comparison of water use to water budget
14. Presentations

15. Point of purchase pieces, including internet point of purchase by type: high-efficiency clothes washers, weather based irrigation controller, high-efficiency toilets, plant palette information, other
16. Media outreach: news releases, editorial board visits, written editorials, newspaper contacts, television contacts, radio contacts, articles or stories resulting from outreach. Provide names of local media markets: newspaper, TV stations, radio stations reached via media outreach program during the reporting period
17. Adult Education/Training Programs: Topic(s), number of presentations, number of attendees
18. Water Conservation Gardens: involvement in a garden that promotes and educates the public about water-efficient landscaping and conservation techniques. May include "corporate" or "business" sponsorship or membership
19. Sponsor or co-sponsor landscape workshops/training for homeowners and/or homeowners associations: number of presentations; number in attendance
20. Landscape watering calculator and watering index to assist with weekly irrigation scheduling
21. Additional program(s) supported by agency but not mentioned above
22. Total reporting period budget expenditure for public outreach/training/adult education programs (include all agency costs)

3.7.3 CUWCC Goal

At the minimum, a public information program shall consist of the following components:

1. Contacts with the public at least four times per year
2. Water supplier contacts with media at least four times per year
3. An actively maintained website that is updated at least four times per year
4. Description of materials used to meet minimum requirement
5. Annual budget for public outreach program

3.7.4 Implementation Status

The City has fully implemented this DMM and has achieved the CUWCC goal for Public Information Programs beginning in 1987.

3.7.5 Existing Program

The City of Modesto's water conservation program distributes information to the public through a variety of methods including personal contact, brochures, radio and television public service announcements, a dedicated conservation website, bill inserts, exhibits at community events, school presentations and videos. A water conservation telephone line is available to provide residents with any additional information they might request regarding water conservation. This same phone number is kept open after business hours to create a 24-hour water waste hotline.

The City of Modesto has available, upon request, numerous brochures and informational handouts on both indoor and outdoor water conservation, as well as landscape ideas incorporating the use of drought-tolerant landscaping and irrigation systems. Many of these handouts are available at the City of Modesto Utility Payment Division and the Department of Public Works at 1010 Tenth Street, and the Public Works Department Water Division at the City Corporation Yard located at 501 N. Jefferson. They are also available at the Neighborhood Preservation Unit office at 1010 Tenth Street and at each of the four Modesto Police Department Area Command offices. In addition, the City's monthly utility bill has inserts which periodically offer water conservation tips and articles about water conservation programs. These

inserts also remind citizens of the City's outdoor watering restrictions. The City also provides water conservation information at public facilities, such as the library and City Hall, and at community gatherings such as Earth Day in the Park and the Stanislaus County Home Show.

Media coverage of the City's water conservation program is provided through public service announcements on television and radio in both English and Spanish, live interviews and taped cable television. The City's local newspaper, the *Modesto Bee*, also provides frequent and extensive coverage of current water conditions within the Modesto area.

The City has asked restaurants to serve water only upon request. Restaurants participating in the City's Water Conservation Program receive free table tent cards explaining what the program is and why it helps to save water. "Precious," the water conservation mascot, is a water drop that has participated with City staff and other local agencies in the annual Stanislaus County Home and Garden Show, Earth Day activities and the dedication of the MRWTP. City staff continue to be very active in the promotion of Water Awareness Month by having displays at the local minor league baseball team, the Modesto Nuts, games. In addition, City staff speak to numerous community service organizations such as Kiwanis, Lions Club, Boy's and Girls' Cub Scout troops, and Empire Municipal's Advisory Board. City staff has also conducted training sessions on water conservation to members of the Division and the communities of Grayson, Hickman and Salida.

Videotapes on water conservation and efficient landscaping practices are available from the Modesto Public Works Department, Water Division for use by the public. Copies of these tapes have also been donated to the Stanislaus County Library and several landscape nurseries in the City. Available films include "Water Follies" and "Beautiful Gardens with Less Water."

Within the last two years, the City has attended the Home and Garden show, Home Improvement Show, Stanislaus County Annual Retreat, Earth Day, Stanislaus County Fair, Jaycees 4th of July parade, Public Works Week, March of Dimes Walk-a-thon, made a presentation at the Kiwanis Club and all water systems municipal advisory councils. At these events, the City provides conservation kits for both children and adults providing a total of approximately 250 kits per event. There are three conservation kits the City distributes for different purposes. These include:

Child's Water Conservation Kit

- *A Water Wise* bag
- *BE WATER WISE* coloring book with crayons and stickers
- A NIAGARA water conservation "showering Coach" timer
- Water conservation website links for parents

Use Water Wisely Kit

- *Five Tips to Save Water* bag
- A use Water Wise Wheel
- *Our World of Water* activity book
- 6" Use Water Wisely Ruler
- Water Conservation website links

Water Conservation Adult Kit

- *15 Ways to Use Water Wisely* bag
- Leak detection dye tablets
- Water Conservation slide guide

- Use Water Wisely note pad.
- Water Conservation Brochures (2-4)
- Water conservation website links

The City has also coordinated with the media to better inform the public. For example, the City publishes an article in the City Beat every other month, and had various campaigns with Stott Outdoor Buses, Citadel (2 radio stations; KAT 103.3 Country and the HAWK 104.1) and Clear Channel Radio (2 stations, Sunny 102 and 96.7 FM). The City also attends County Municipal Advisory meetings, some of which are televised, and provides information. The City will continue these efforts into the future. Examples of the public outreach and school education materials are included in Appendix A.

3.7.6 Future Program

The City will continue to implement public outreach strategies as described in their Existing Program for this DMM. The number of each planned activity per fiscal year is shown in Table 3-6.

Table 3-6: Planned Public Education Programs

	FY11	*FY12*	*FY13*	*FY14*	*FY15*	*FY16*	*FY17*	*FY18*	*FY19*	*FY20*
Public Presentations/Demos	6	6	6	6	6	6	6	6	6	6
Contacts with Media	12	12	12	12	12	12	12	12	12	12
Commercial/Radio Ads	650	650	650	650	650	650	650	650	650	650
Update website	4	4	4	4	4	4	4	4	4	4

3.8 DMM 8: School Education Programs

3.8.1 CUWCC Description

School education programs are implemented to reach the youngest water users at an early age and enforce the need to engage in water conservation as a life-long behavior. Implementation shall consist of at least the following actions:

1. Implement a school education program to promote water conservation and water conservation-related benefits.
2. Programs shall include working with school districts and private schools in the water suppliers' service area to provide instructional assistance, educational materials, and classroom presentations that identify urban, agricultural, and environmental issues and conditions in the local watershed. Educational materials shall meet the state education framework requirements and grade-appropriate materials shall be distributed.
3. When mutually agreeable and beneficial, the wholesale agency or another lead regional agency will operate all or part of the education program; if the wholesale agency operates all or part of the retail agency's school education program, then it may, by mutual consent with the retail agency, assume responsibility for CUWCC reporting of this BMP; under this arrangement, a wholesale agency may aggregate all or portions of the reporting and coverage requirements of the retail agencies joining into the mutual consent.

As part of this DMM, an active school education program should be maintained to educate students in their service area about water conservation and efficient water use. An agency or other local entity may participate in a mutual arrangement as described above.

3.8.2 CUWCC Documentation Requirement

Agencies may report on all of the following activities, although they are only expected to meet the minimum requirements described above:

1. Classroom presentations: number of presentations, number of attendees, topics covered: conservation, recycled water, water sources, pollution prevention, etc.
2. Large group assemblies: number of presentations, number of attendees
3. Children's water festivals or other events: number of presentations, number of attendees
4. Cooperative efforts with existing science/water education programs (various workshops, science fair awards or judging) and follow-up: number of presentations, number of attendees
5. Other methods of disseminating information (i.e. themed age-appropriate classroom loaner kits); Description; number distributed
6. Staffing children's booths at events & festivals: number of booths, number of attendees
7. Water conservation contests such as poster and photo: description, number of participants
8. Offer monetary awards/funding or scholarships to students: number offered, total funding
9. Teacher training workshops: number of presentations, number of attendees
10. Fund and/or staff student field trips to treatment facilities, recycling facilities, water conservation gardens, etc.: number of tours or field trips, number of participants
11. College internships in water conservation offered: number of internships, total funding
12. Career fairs/workshops: number of presentations, number of attendees
13. Additional program(s) supported by agency but not mentioned above: description, number of events (if applicable), number of participants
14. Total reporting period budget expenditures for school education programs (include all agency costs)

3.8.3 CUWCC Goal

The following are the goals for obtaining compliance with this DMM:

1. Curriculum materials developed and/or provided by agency (including confirmation that materials meet state education framework requirements and are grade-level appropriate).
2. Materials distributed to K-6 students. When possible, school education programs will reach grades 7-12 as well.
3. Description of materials used to meet minimum requirement.
4. Annual budget for school education program.
5. Description of all other water supplier education programs.

3.8.4 Implementation Status

The City has fully implemented this DMM and has achieved the CUWCC goal for School Education Programs beginning in 1987.

3.8.5 Existing Program

Each year, City staff gives school presentations to students at elementary schools in Modesto's service area. Also, in past years, the Water Conservation Coordinator has met with school district principals to encourage participation in the program as it focuses on water conservation while incorporating state content standards. Two American Water Works Association (AWWA) publications, "Splash" and the

"Story of Water," as well as the video "Water Follies," are used in conjunction with school programs and other community events. Elementary school students are particularly receptive to the conservation message and they share that message with their parents. Though fifth graders are targeted with the school presentations, similar presentations are given to junior and high school students upon request. As part of the program, Water Conservation Kits are distributed to the students. In the last two years, the City has distributed over 250 kits to City of Modesto classrooms. School education materials, which at times are used for public education as part of DMM 7 are included in Appendix A.

3.8.6 Future Program

The City will continue to implement their School Education Program as described in Section 3.8.5. Each student will be given a conservation kit that also includes a low-flow showerhead (in conjunction with DMM 2) to install in their own homes with their parents' permission. Table 3-7 summarizes the planned school education presentations to fifth grade classes and the estimated water savings that may result from the low-flow showerhead distribution.

Table 3-7: Planned School Education Presentations

	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20
# of kit giveaways	125	125	125	125	125	125	125	125	125	125
# presentations	5	5	5	5	5	5	5	5	5	5
total water savings	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8

Note: The cost of showerheads included in DMM 2.

3.9 DMM 9: Commercial, Industrial, and Institutional

3.9.1 CUWCC Description

Commercial, industrial, and institutional (CII) water use varies dramatically between business sectors and location. This DMM includes implementing measures to achieve a water savings. Potential measures include, but are not limited to:

- Industrial process water use reduction
- Industrial laundry retrofits
- Car wash recycling systems
- Water efficient commercial dishwashers
- Wet cleaning

3.9.2 CUWCC Documentation Requirement

Required documentation for DMM 9 includes reporting the measure type and quantity installed, as well as water savings attributed to water shortage measures, intervention and actions.

3.9.3 CUWCC Goal

The CUWCC goal is to save 10% of baseline CII water use over a 10-year period by reducing water use as follows:

- 0.5% by end of first reporting period (i.e. year 2)
- 2.4% by the end of year 4
- 4.3% by the end of year 6
- 6.4% by the end of year 8
- 9% by the end of year 10

Table 3-8: Demonstrated CII Water Savings[1]

Measure	Annual Savings (AF)	Measure Life (years)
HE Toilets	0.041748	25
HE Urinals	0.069086	25
Ultra Low Volume Urinals	0.080603	25
Zero Consumption Urinals	0.0921146	25
Commercial HE Single Load Clothes Washers	0.116618	10
Cooling Tower Conductivity Controllers	1.032250	5
Cooling Tower ph Controllers	3.981543	5
Connectionless Food Steamers	Per Steamer Compartment – 0.25	10
Medical Equipment Steam Sterilizers	1.538	20
Water-Efficient Ice Machines	0.834507	10
Pressurized Water Brooms	0.1534	5
Dry Vacuum Pumps	0.64	7

1. Source: CUWCC MOU Regarding Urban Water Conservation (December 2008)

3.9.4 Implementation Status

The City has not yet implemented this DMM.

3.9.5 Existing Program

Historically, the City has provided water use audits to any CII customer upon request as an informal service, but historical records have not been kept. The City implements two different strategies, one for new CII accounts and one for existing CII accounts. For new users, the City works to inform the user of potential wastewater saving measures by having them conduct a self-audit of their operations and equipment. This effort can save the user wastewater connection charges in addition to reducing their water consumption per square foot of operation. The City plans to develop tools and information sources to inform new CII customers of these potential savings. For existing CII users, a similar effort can be developed to display the economic savings through self-audits. It is estimated the savings on both the water and wastewater side will offset the cost of the self-audit in a short time. In the future, the City may have staff attend training that would increase their knowledge of such water saving measures. Currently, the City's Environmental Compliance Division, who handles wastewater discharge permits among other regulatory tasks, is instrumental in assisting larger CII users with water savings measures to reduce wastewater discharge impacts.

3.9.6 Future Program

Currently, the City has about 4,712 CII accounts, one of which is unmetered and will be retrofitted under DMM 4. Under this DMM, the City will develop a formal survey program for CII accounts that will consist of free water use surveys (performed upon request) and evaluations of water using apparatus and processes, as well as recommended efficiency measures.

Table 3-9 summarizes the projected CII conservation program. Rebates could be provided for some water saving devices such as those included in Table 3-10. Also, in the future, the City anticipates adopting the Commercial Green Building Code which will provide for higher water use efficiency standards (i.e. 20% reduction).

Table 3-9: Estimated CII Programs

	FY11	*FY12*	*FY13*	*FY14*	*FY15*	*FY16*	*FY17*	*FY18*	*FY19*	*FY20*
# of on-site surveys	100	100	100	100	100	100	100	100	100	100
# of rebates provided	30	75	150	255	200	220	220	220	270	295
# of follow-up visits	30	30	30	30	30	30	30	30	30	30
Projected water savings - AFY	23.4	58.5	117.0	198.9	156.0	171.6	171.6	171.6	210.6	230.1

Table 3-10: City CII Rebates

Device	Incentive Amount
High Efficiency (HE) Toilets	$200
HE Urinals	$200
Ultra Low Volume Urinals	$200
Zero Consumption Urinals	$200
Commercial HE Single Load Clothes Washers	$200
Cooling Tower Conductivity Controllers	$400
Cooling Tower pH Controllers	$400
Connectionless Food Steamers	$400
Medical Equipment Steam Sterilizers	$400
Water-Efficient Ice Machines	$250
Pressurized Water Brooms	$125
Dry Vacuum Pumps	$125

3.10 DMM 10: Wholesale Agency Programs

The City is not a wholesale water agency and therefore is not required to implement DMM 10.

3.11 DMM 11: Retail Conservation Pricing

3.11.1 CUWCC Description

DMM 11 promotes water conserving retail water rate structures. This DMM recognizes that each agency or water enterprise fund has a unique rate setting system and history. When creating a rate case, professional judgments are made to determine whether costs are accounted to a variable or fixed cost center by the staff of the agency. The final water rate case is an accumulation of all the decisions and judgments made by staff and supplemented by the financial projections leading an agency to establish its

final water rate recommendation. DMM 11 is not intended to supplant this process, but rather to reinforce the need to establish a strong nexus between volume-related system costs and volumetric commodity rates.

DMM 11 also applies to retail sewer service. Conservation pricing of sewer service provides incentives to reduce average or peak use, or both. Such pricing includes rates designed to recover the cost of providing service, and billing for sewer service based on metered water use. Conservation pricing of sewer service is also characterized by one or more of the following components: rates in which the unit rate is the same across all units of service (uniform rates); rates in which the unit rate increases as the quantity of units purchased increases (increasing block rates); rates in which the unit rate is based upon the long-run marginal cost or the cost of adding the next unit of capacity to the sewer system. Rates that charge customers a fixed amount per billing cycle for sewer service regardless of the units of service consumed do not satisfy the definition of conservation pricing of sewer service. Rates in which the typical bill is determined by high fixed charges and low commodity charges also do not satisfy the definition of conservation pricing of sewer service.

Conservation pricing requires volumetric rates. While this DMM defines a minimum percentage of water sales revenue from volumetric rates, the goal of this DMM is to recover the maximum amount of water sales revenue from volumetric rates that is consistent with utility costs (which may include utility long-run marginal costs), financial stability, revenue sufficiency, and customer equity. In addition to volumetric rates, conservation pricing may also include one or more of the following other charges:

1. Service connection charges designed to recover the separable costs of adding new customers to the water distribution system.
2. Monthly or bimonthly meter/service charges to recover costs unrelated to the volume of water delivered or new service connections and to ensure system revenue sufficiency.
3. Special rates and charges for temporary service, fire protection service, and other irregular services provided by the utility.

The following volumetric rate designs are potentially consistent with the above definition:

1. Uniform rate in which the volumetric rate is constant regardless of the quantity consumed.
2. Seasonal rates in which the volumetric rate reflects seasonal variation in water delivery costs.
3. Tiered rates in which the volumetric rate increases as the quantity used increases.
4. Allocation-based rates in which the consumption tiers and respective volumetric rates are based on water use norms and water delivery costs established by the utility.

Adequacy of Volumetric Rates: A retail agency's volumetric rate shall be deemed sufficiently consistent with the definition of conservation pricing when it satisfies at least one of the following two options.

- Option 1: Let V stand for the total annual revenue for the volumetric rate(s) and M stand for total annual revenue from customer meter/service (fixed) charges, then:

$$\frac{V}{(V+M)} \geq 70\%$$

  This calculation shall only include utility revenues from volumetric rates and monthly or bimonthly meter/service charges. It shall not include utility revenues from new service connection charges; revenue from special rates and charges for temporary service, fire protection, or other irregular services; revenue from grants or contributions from external sources in aid of construction or program implementation; or revenue from property or other utility taxes.

- Option 2: Use the rate design model included with the Municipal Water and Wastewater Rate Manual published by the Canadian Water & Wastewater Association with the signatory's water system and cost information to calculate V', the uniform volumetric rate based on the signatory's

long-run incremental cost of service, and M', the associated meter charge. [Let HCF be annual water delivery (in hundred cubic feet).] The volumetric rate(s) shall be deemed sufficiently consistent with the definition of conservation pricing if:

$$\frac{V}{(V+M)} \geq \frac{V'}{(V'+M')}$$

The rate design model can be downloaded at http://www.cuwcc.org/resource-center/technical-resources/bmp-tools.aspx.

This calculation only includes utility revenues from volumetric rates and monthly or bimonthly meter/service charges. It does not include utility revenues from new service connection charges; revenue from special rates and charges for temporary service, fire protection, or other irregular services; revenue from grants or contributions from external sources in aid of construction or program implementation; or revenue from property or other utility taxes.

As part of this DMM, a rate structure that satisfies at least one of the options specified above needs to be maintained. Conformance to Option 1 or Option 2 will first be assessed using the revenue from the most recent year. If the most recent year does not satisfy the option, the average revenue from the three (3) most recent years will be used.

3.11.2 CUWCC Documentation Requirement

For water, provide the following:

1. Report the rate structure in effect for each customer class for the reporting period.
2. Report the annual revenue derived from volume charges for each retail customer class, as defined above. (Note: Compliance with BMP 11 will be determined based on the City's total revenue from all retail customer classes.)
3. Report the annual revenue derived from monthly or bimonthly meter/service charges for each retail customer class, as defined above.
4. If agency does not comply with Option 1 in Section A, report v' and m' as determined by the Canadian Water & Wastewater Association rate design model described above.
5. If agency does not comply with Option 1 in Section A, submit the completed Canadian Water & Wastewater Association rate design model described above.

For sewer, provide the following:

1. Report annual revenue requirement for sewer service by customer class for the reporting period.
2. Report annual revenue for sewer service from commodity charges by customer class for the reporting period.
3. Report rate structure by customer class for sewer service.

3.11.3 CUWCC Goal

The CUWCC goal for DMM 11 varies depending on the option for volumetric pricing selected. Table 3-11 summarizes the CUWCC goals.

Table 3-11: CUWCC Goals for DMM 11

Years After Start Year	For Option 1	For Option 2
1	$\frac{V}{(V+M)} > 70\%$ x 0.70	$\frac{V}{(V+M)} > \frac{V'}{(V'+M')}$ x 0.7
2	$\frac{V}{(V+M)} > 70\%$ x 0.80	$\frac{V}{(V+M)} > \frac{V'}{(V'+M')}$ x 0.8
3	$\frac{V}{(V+M)} > 70\%$ x 0.90	$\frac{V}{(V+M)} > \frac{V'}{(V'+M')}$ x 0.9
4	$\frac{V}{(V+M)} > 70\%$ x 1.00	$\frac{V}{(V+M)} > \frac{V'}{(V'+M')}$ x 1.0

3.11.4 Implementation Status

The City is currently implementing this program, but has not yet achieved the CUWCC goal of

$$\frac{V}{(V+M)} > 70\%.$$

3.11.5 Existing Program

The Modesto City Council adopted Resolution 2000-45, which established charges for metered and unmetered services as of February 1, 2000. The rate structure was designed to promote conservation, with metered services paying a flat monthly service charge if water usage was kept below 1,680 cubic feet per month, or approximately 419 gallons per day. Water usage over this amount was charged an additional 82 cents for every 100 cubic feet (25 gallons) used. In addition, administrative fees were assessed upon second violations of restricted outdoor water use and repair of identified water leaks within 24 hours. The third and all subsequent violations required mandatory meter installation in addition to the administrative fee.

In 2005, the City converted from a three-zone structure that was adopted when the City purchased Del Este Water Company in 1995 to a uniform rate structure across all zones. Under this revised rate structure, metered accounts pay the current uniform volume charge of $1.31/hundred cubic feet. The City's current rate structure is shown in Table 3-12.

Table 3-12: City of Modesto Current Water Rates and Charges

Meter Size	Water Rate
Flat Rate Residential – Monthly Service Charge	
0 – 5,000 sq ft lot	$40.29
5,0001 to 7,000 sq ft lot	$45.79
7,001 to 11,000 sq ft lot	$54.34
11,001 to 17,000 sq ft lot	$57.69
Over 17,000 sq ft lot	$67.82
Metered Charge (Residential & Commercial)	
Uniform Volume Charge ($/hcf)	$1.31
Fixed Meter Charges	
5/8 inch to ¾ inch	$14.00
1 inch	$19.86
1 ½ inch	$34.37
2 inch	$51.86
3 inch	$98.54
4 inch	$150.99
6 inch	$296.61
8 inch	$471.45
10 inch	$675.47
12 inch	$1,258.19

Conservation pricing requires volumetric rates, so metered service is a necessary condition. The City is implementing its Meter Conversion Program in which it is installing meters at unmetered accounts and replacing (converting) existing old meters with new automatic read models. Once the meter has been installed, the City begins charging volumetrically, using a uniform volume charge as shown in Table 3-12.

The City's calculated V/(V+M) currently equals 52%. V is equal to the total annual revenue from volumetric rates and M equals the total annual revenue from customer service (fixed) charges. For the City, V is equal to $13.8 million and M is equal to $12.7 million. The City is currently meeting the requirement for Year 1 for Option 1, as 52% is greater than 0.7 x 70% (or 49%).

3.11.6 Future Program

The City will continue to charge volumetric pricing and increase the volumetric component until full coverage is achieved, estimated to occur in 2014. As required, the City will evaluate the need to readjust rates in order to ensure continued compliance for this DMM.

3.12 DMM 12: Water Conservation Coordinator

3.12.1 CUWCC Description

Under DMM 12, a person is designated as the agency's responsible conservation coordinator for program management, tracking, planning, and reporting on BMP implementation. Coverage consists of staffing

and maintaining the position of trained conservation coordinator, or equivalent consulting support, and providing that function with the necessary resources to implement BMPs.

3.12.2 CUWCC Documentation Requirement

Provide the contact information for the conservation coordinator, or consultant assigned, and verification that the position is responsible for implementing the tasks identified above.

3.12.3 CUWCC Goal

Staff and maintain a position of a trained conservation coordinator.

3.12.4 Implementation Status

The City has fully implemented this DMM and has achieved the CUWCC goal.

3.12.5 Existing Program

A full-time water conservation coordinator position was authorized by the City Council and was filled in 2001. This position remains filled today. The Water Conservation Coordinator's role is to develop, implement and manage the City of Modesto's water conservation program and to coordinate with ongoing conservation programs in other departments and other agencies. The Water Conservation Coordinator runs school education outreach programs; trains and directs activities of other staff assigned to water conservation functions; provides conservation information to residents and commercial businesses, coordinates the development of uniform conservation policies and enforcement; develops, recommends and maintains various media sources for providing conservation information to both internal and external customers; plans, coordinates and administers various day-to-day activities pertaining to the City's Water Conservation Program; promotes the efficient use of the City's water supply by residential, irrigation, industrial, commercial public agencies and other customers to ensure sufficient pressure throughout the system for fire protection and other essential City services; investigates and identifies compliance issues; and communicates with regulatory agencies as required.

3.12.6 Future Program

The City will continue to keep the position of the Conservation Coordinator filled. Additionally, the City has budgeted for an additional technical position in which a person could be hired to provide assistance to the Water Conservation Coordinator, most likely with the specific implementation of DMM 1 and DMM 2.

3.13 DMM 13: Water Waste Prohibition

3.13.1 CUWCC Description

The CUWCC describes this DMM as applying in three different ways:

1. New development –Enact, enforce, or support legislation, regulations, ordinances, or terms of service that (1) prohibit water waste such as, but not limited to: single-pass cooling systems; conveyer and in-bay vehicle wash and commercial laundry systems which do not reuse water; non-recirculating decorative water fountains and (2) address irrigation, landscape, and industrial, commercial, and other design inefficiencies.
2. Existing users – Enact, enforce, or support legislation, regulations, ordinances, or terms of service that prohibit water waste such as, but not limited to: landscape and irrigation inefficiencies, commercial or industrial inefficiencies, and other misuses of water.
3. Water shortage measures – Enact, enforce, or support legislation, regulations, ordinances, or terms of service that facilitate implementation of water shortage response measures.

To successfully implement this DMM, one or more of the following must be implemented:

a) Enact and enforce an ordinance or establish terms of service that prohibit water waste

b) Enact and enforce an ordinance or establish terms of service for water efficient design in new development

c) Support legislation or regulations that prohibit water waste

d) Enact an ordinance or establish terms of service to facilitate implementation of water shortage response measures

e) Support local ordinances that prohibit water waste

f) Support local ordinances that establish permits requirements for water efficient design in new development.

3.13.2 CUWCC Documentation Requirement

Documentation requirements for DMM 13 include the following:

- A description of, or electronic link to, any ordinances or terms of service adopted by water agency to meet the requirements of this BMP
- A description of, or electronic link to, any ordinances or requirements adopted by local jurisdictions or regulatory agencies with the water agency's service area.
- A description of any water agency efforts to cooperate with other entities in the adoption or enforcement of local requirement consistent with this BMP.
- A description of agency support positions with respect to adoption of legislation or regulations consistent with this BMP.

3.13.3 CUWCC Goal

Adopt and enforce a water waste ordinance.

3.13.4 Implementation Status

The City has implemented this DMM through its adoption of a water conservation policy that supports local ordinance that prohibit water waste.

3.13.5 Existing Program

On March 25, 2003, City Council adopted Resolution No. 2003-162 which approved the implementation of Stage I of the City's Drought Contingency Plan (see Appendix B). Any violations of the rules and regulations established as part of Stage I Drought Contingency Plan are considered water waste. The rules and regulations are as follows:

1. Outdoor water use shall be prohibited daily from 12:00 p.m. to 7:00 p.m.
2. Odd-numbered addresses shall water outdoors only on Wednesdays, Fridays, and Sundays.
3. Even-numbered addresses shall water outdoors only on Tuesdays, Thursdays, and Saturdays.
4. No outdoor water use is permitted on Mondays.
5. City residents shall not wash cars without the use of a quick-acting positive shut-off nozzle or permit others to do so on their behalf. In addition, car washing must be done in compliance with the schedule for outdoor water use. There shall be no washing of building exteriors, mobile home exteriors, recreational vehicle exteriors, sidewalks, patios, driveways, gutters, or other exterior surfaces unless a permit is issued by the Public Works Director or his designee and the washing is done with a quick-acting positive shut-off nozzle on the hose.

6. City residents shall not have leaky faucets or plumbing fixtures on their premises for more than 24-hours after the leak has been identified or notice has been received from the City, whichever comes first.
7. Eating establishments are encouraged to serve water only at the customer's request.
8. New landscaping installations must comply with all applicable landscape ordinances.
9. Exceptions to the regulations set forth herein may be made by the Public Works Director or his authorized designee upon a showing of good cause and necessity.
10. The following penalties may be added to the utility service customer's account upon violation of the above regulations:
    a. A penalty in the sum of $50 upon the second violation within one year after having received a Notice of Violation.
    b. A penalty of $200 upon the third violation within said one-year period.
        i. Upon the third violation within one year of having received a Notice of Violation, the resident shall also have a water meter installed if one is not present and metered billing shall commence.
    c. A penalty of $250 upon the fourth and any subsequent violations within said one-year period.
    d. The customer shall be advised of these charges through a Notice of Intention to Impose a Penalty.

3.13.6 Future Program

The City will continue to enforce its water waste ordinance by having the Public Works Department perform site visits, as shown in Table 3-13.

Table 3-13: Water Waste Ordinance Enforcement

	FY11	*FY12*	*FY13*	*FY14*	*FY15*	*FY16*	*FY17*	*FY18*	*FY19*	*FY20*
Waste ordinance in effect?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# on-site visits	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500

3.14 DMM 14: WaterSense Specification (WSS) Toilets

3.14.1 CUWCC Description

Under DMM 14, the City will provide financial incentives or ordinances requiring the replacement of existing toilets using 3.5 or more gallons per flush (gpf) with a toilet meeting WaterSense Specifications. WSS high efficiency toilets use a maximum of 1.28 gpf, which is 20% less than the current federal standard of 1.6 gpf. Ultra low-flow toilets (ULFT) differ in that they cannot be WSS certified as they do not save as much water. Numerous toilets have been certified to meet the WSS criteria and retailers are committed to making them available in stores. A complete list of certified toilets can be accessed here:

http://www.epa.gov/WaterSense/pp/find_het.htm.

3.14.2 CUWCC Documentation Requirement

Documentation requirements for DMM 14 include a description of the program and the number of WSS toilet installations credited to the City's replacement program disaggregated by single-family or multi-family units.

3.14.3 CUWCC Goal

Demonstrate a number of toilet replacements of 3.5 gpf or greater, toilets at or above the level achieved through a retrofit on resale ordinance until 2014, or a market saturation of 75% is demonstrated, whichever is sooner.

3.14.4 Implementation Status

The City has not yet implemented this DMM.

3.14.5 Existing Program

The State of California passed legislation requiring all toilets sold and installed after January 1, 1994 to be ultra-low flush toilets (ULFT) using no more than 1.6 gallons per flush. There have been approximately 9,000 homes built in the City of Modesto water service area since January 1994 equipped with ultra-low flush toilets. In addition to the new home construction, an unknown number of pre-1994 toilets have been replaced with ultra-low flush toilets. The City has not implemented a formal rebate program to provide financial incentive for customers to meet the WaterSense Specifications.

3.14.6 Future Program

The City's future WSS toilet replacement program may take one or more forms. Two potential options include the City offering $50 rebates on customer purchases of qualifying toilets and/or the City hiring a firm to manage implementation of this DMM in coordination with the City. The program could also include the use of city facilities and/or schools as drop-off and distribute sites for the WSS toilets. Coordination with other organizations may come in the form of utilizing volunteers. Furthermore, in the future, the City may adopt a retrofit-on-resale ordinance, but at this time the City is looking to provide $50 rebates as incentives instead. Table 3-14 summarizes the planned program costs and water savings.

Table 3-14: Single Family WSS Toilet Replacement Program

	FY11	*FY12*	*FY13*	*FY14*	*FY15*	*FY16*	*FY17*	*FY18*	*FY19*	*FY20*
# of rebates	50	75	100	125	150	175	200	225	250	275
Projected Water Savings (AFY)[a]	1.5	2.2	2.9	3.6	4.4	5.1	5.8	6.6	7.3	8.0

Note: Assumes 2.5 people per household with non-conserving toilets using 18.7 gal/day/person and WSS toilet using 8.3 gal per day per person.

References

California Department of Water Resources, Office of Water Use Efficiency. 2009. *Compliance with AB1420 Requirements.*

California Urban Water Conservation Council. 2008. *Memorandum of Understanding Regarding Urban Water Conservation in California.* December 10.

California Urban Water Conservation Council. 2010. *Memorandum of Understanding Regarding Urban Water Conservation in California.* June 9.

RMC Water and Environment. 2007. *City of Modesto / Modesto Irrigation District Joint Urban Water Management Plan 2005 Update.* May.

http://www.ci.modesto.ca.us/pwd/utilities/water/conservation/city_restrictions.asp

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Appendix A - School Educational and Public Outreach Materials Examples

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Parent/Student Water Conservation Checklist

INDOOR USE

Bathrooms

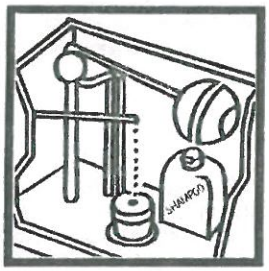
1 Have toilets been checked for leaks? — [ ] **Yes** [ ] **No**

Suggestions

Place a few drops of food coloring in toilet tank (be sure the water is clear, not colored by in-toilet cleaning dispensers).

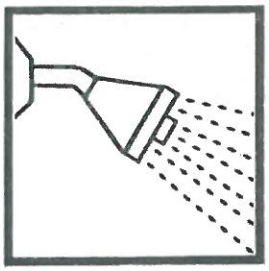
2 Is the toilet being used as a wastebasket? — [ ] **Yes** [ ] **No**

Extra toilet flushes can waste as much as 5 plus gallons each.



3 Is there either a plastic bottle or bag in the toilet tank so that each flush uses less water? — [ ] **Yes** [ ] **No**

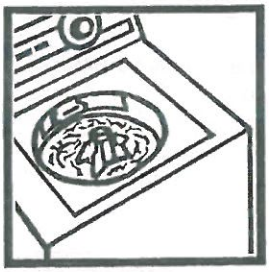
If you have an older model toilet, put an inch or two of sand or pebbles in the bottom of a one-quart plastic bottle (an empty plastic shampoo bottle works well) and fill the rest of the bottle with water. Cap the bottle tightly. Place the bottle in the toilet tank, safely away from all moving parts. Better yet, consider buying a new ultra-low flow toilet which uses 1.6 gallons per flush (instead of up to 5 plus gallons per flush). See your hardware or plumbing store or contact your local water agency for further information.



4 Are family members taking short showers (5 minutes or less)? — [ ] **Yes** [ ] **No**

Taking quicker showers can help you save up to 3 gallons of water for each minute of shower time reduced. Consider installing a new low-flow shower head which uses 2.5 gallons per minute.

Kitchen/Laundry



5 Are dishwashers and washing machines used only with full loads? — [ ] **Yes** [ ] **No**

Wait until full loads before using appliances. This saves water and energy.

6 Is water left running while rinsing vegetables, dishes, shaving or brushing teeth? [ ] **Yes** [ ] **No**

Suggestions

Ponding water (keeping it in the sink with a stopper) is a smart way to conserve water.

7 Have kitchen and all other faucets been check for leaks? [ ] **Yes** [ ] **No**

Repair leaks as soon as possible. Even small leaks add up to large losses over time.

OUTDOOR USE

8 Is the landscape watered only when the plants really need water? [ ] **Yes** [ ] **No**

Check lawns and shrubs to see if they need water. A lawn that springs back after being stepped on doesn't need water. Check with your water utility to see what local restrictions apply.

9 Is the landscape being watered before 10:00 a.m. or after 5:00 p.m.? [ ] **Yes** [ ] **No**

Do not water during the hottest part of the day. The sun can make a lot of the water evaporate before thirsty plants get a chance to drink it.

10 Are your walkways or driveways hosed off for cleaning? [ ] **Yes** [ ] **No**

Using a broom gets the cleaning job done while saving water, too. A car can be washed using a bucket of soapy water and a fine spray to finish the job. Install a shut-off nozzle on the hoses.

I have reviewed the water-saving tips mentioned above with my son/daughter.

Parent's Signature _____

Local hardware and plumbing stores stock many devices to help you save water and meet current California law. Contact your local water agency for more information on water conservation programs.

PRINTED BY
DEPARTMENT OF WATER RESOURCES
REPROGRAPHICS

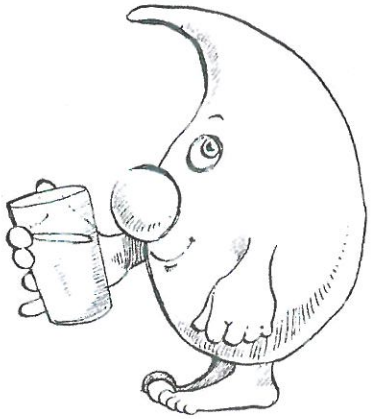
Slow
the flow.

Tips to conserve water
in your lawn and garden.

A Consumer's Guide to Water Conservation

The Outside Story

Coloring Fun for Little Water Users



CITY OF MODESTO
Water Conservation Program

NOTICE

Case Number: _____

Time: _____ AM/PM

Date of Notice: _____

Address: _____

The following was noted on your property:

- ☐ Flooded areas, including gutters
- ☐ Water running or spraying off property
- ☐ Outdoor water use on the wrong day
- ☐ Outdoor water use during restricted hours
- ☐ Washing car without shutoff nozzle
- ☐ Washing concrete, building, etc…without City permit
- ☐ Repairs and adjustments_____
- ☐ Other Comments_____

_____

_____

_____

For information regarding this **NOTICE**, please call:
City of Modesto Water Division
(209) 342-2246

This is a **NOTICE**. However, if additional instances occur within 12 months of this **NOTICE**, a violation could be given to you and penalties added to your water/sewer bill from the City of Modesto.

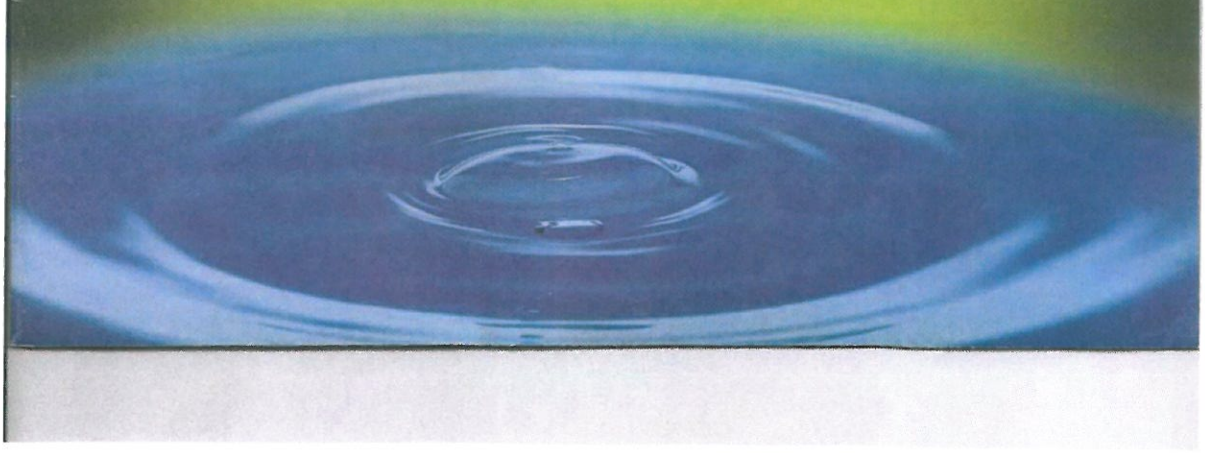
Be a
WISER WATER MISER
CITY OF MODESTO

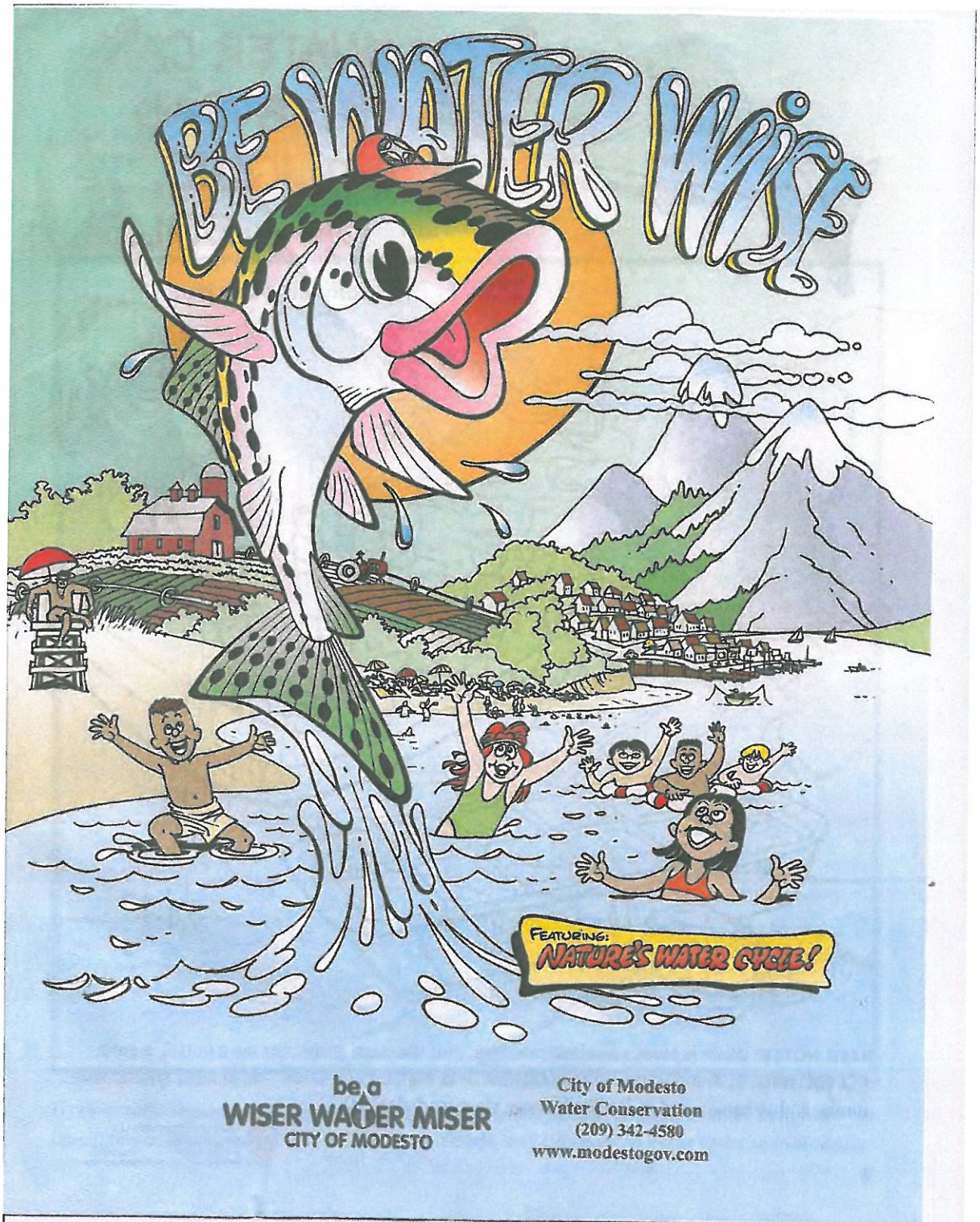
A Consumer's Guide to Water Conservation

The Inside Story

CITY of MODESTO

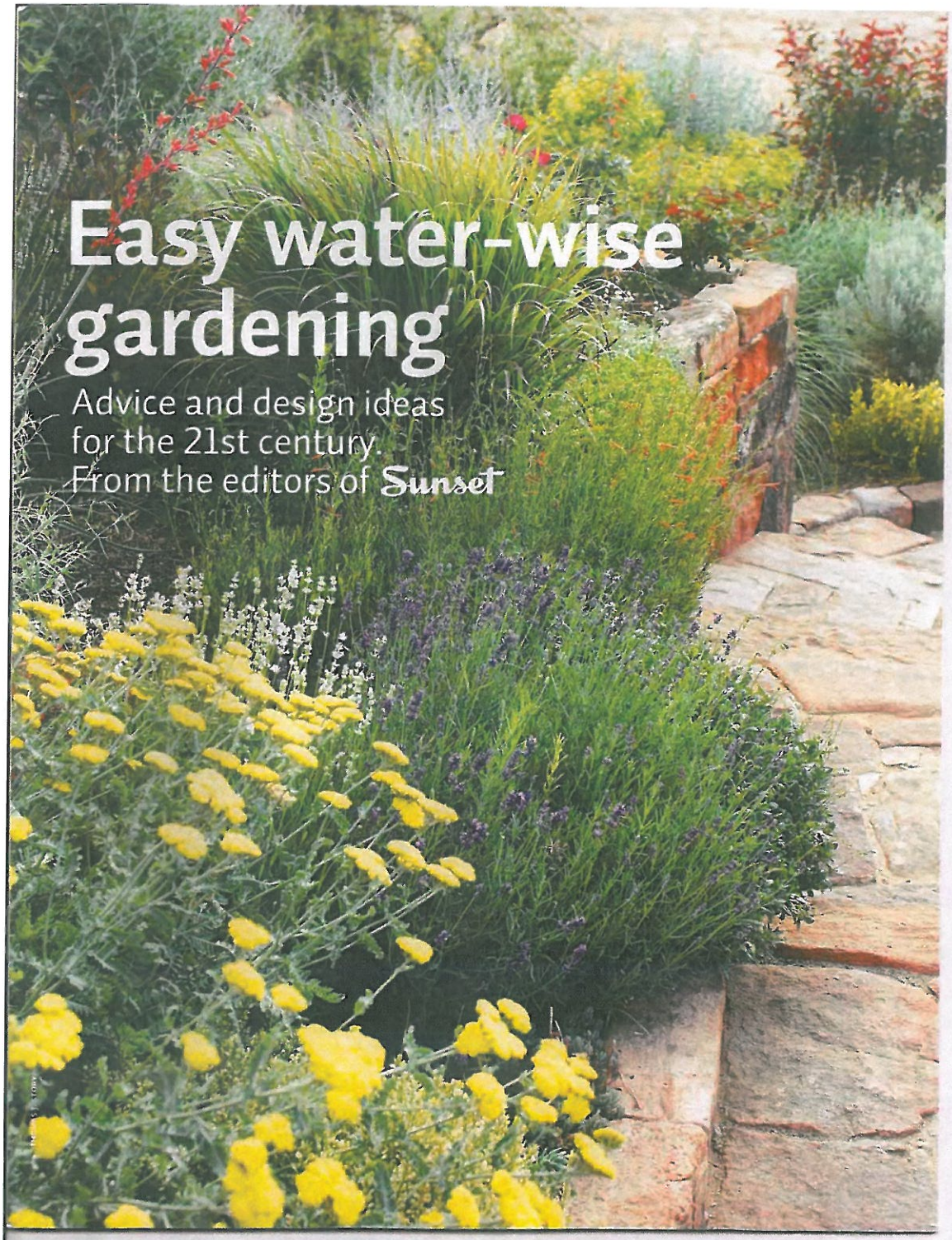
Water-Wise Gardening Guide



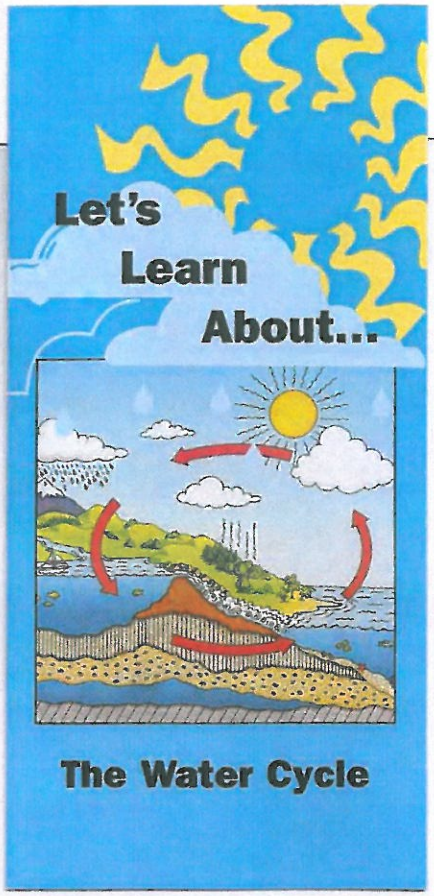


be a
WISER WATER MISER
CITY OF MODESTO

City of Modesto
Water Conservation
(209) 342-4580
www.modestogov.com


Easy water-wise gardening
Advice and design ideas for the 21st century. From the editors of Sunset

The Inside Story: Water Conservation at Home



YEAR-ROUND STAGE ONE WATER RESTRICTIONS FOR CITY OF MODESTO CUSTOMERS

CITY of MODESTO

be a
WISER WATER MISER
CITY OF MODESTO

- Outdoor watering must be kept on your property... avoid water runoff.
- ***Outdoor water use prohibited between noon and 7 p.m. daily.***
- Odd-numbered addresses ending in 1, 3, 5, 7 or 9 water on Wednesday, Friday and Sunday.
- Even-numbered addresses ending in 2, 4, 6, 8 or 0 water on Tuesday, Thursday and Saturday.
- **NO OUTDOOR WATER USE ON MONDAYS.**
- Car washing is subject to above with use of positive shut-off nozzle.
- Hosing concrete areas, building exteriors, etc. may be done with a city-issued permit and only with a positive shut-off nozzle.
- Water leaks, once identified, must be repaired within 24 hours.
- Restaurants are encouraged to serve water only upon request.

Violations of the water use restrictions can result in penalties being added to your water/sewer bill from the City of Modesto.

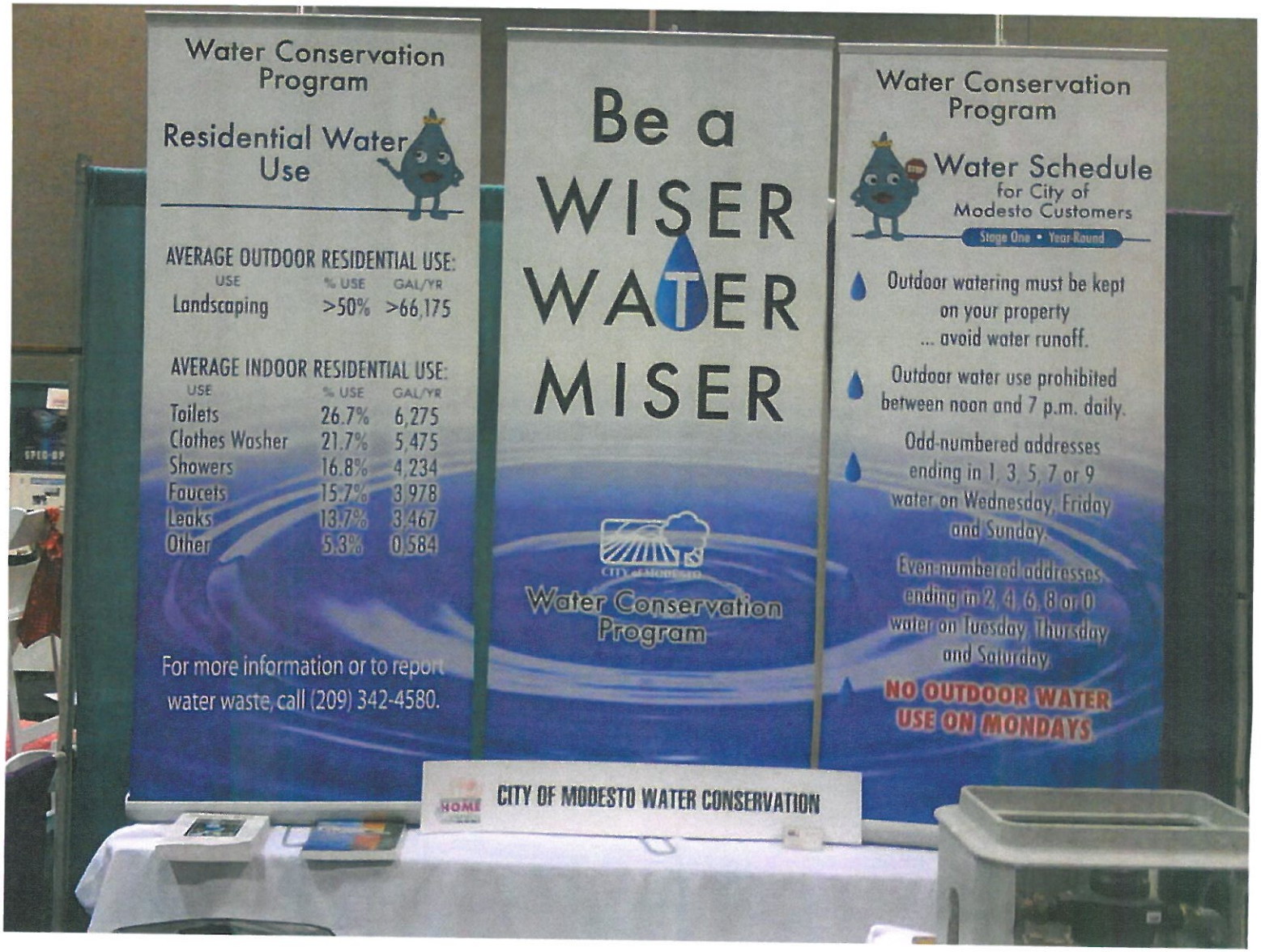
TO REPORT WATER WASTE, CALL (209) 342-4580

FOR WATER CONSERVATION TIPS, GO TO *www.modestogov.com/pwd* **AND CLICK ON WATER CONSERVATION**

Water Conservation School Presentation Materials

Water Conservation Adult Kit

Water Conservation Kit



Public Education Poster

City of Modesto Water Conservation Advertisement

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Appendix B - City of Modesto Water Shortage Contingency Plan

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CITY OF MODESTO – DROUGHT CONTINGENCY PLAN - Drought Stage 1 is in Effect as of May 1, 2003

Drought Stage 1–Minor Shortage Potential	Drought Stage II–Moderate Shortage Potential	Drought Stage III–Critical Shortage Potential
	Phasing Criteria	
Groundwater levels are dropping due to the increased use associated with a warm, dry season, and due to lower than average precipitation and runoff.	Groundwater levels are dropping due to the increased use associated with a warm, dry season, and due to lower than average precipitation and runoff. Production from wells is decreasing. There is a possibility that customer demands and system pressure requirements cannot be met at all times.	Groundwater levels are dropping due to the increased use associated with a warm, dry season, and due to lower than average precipitation and runoff. Production from wells is decreasing. Customer demands and system pressure requirements cannot be met.
	Reduction Objectives	
10%-20% reduction in total water production from baseline.	20%-35% reduction in total water production from baseline.	35%-50% reduction in total water production from baseline.
	Requested Consumer Actions	
* Outdoor water use prohibited daily from noon - 7 p.m.* Odd-numbered addresses water W, F, Su Even-numbered addresses water, T, Th, Sa No outdoor water use on Mondays. * Car washing subject to above-cited limitations with use of a positive shutoff nozzle * Hosing concrete areas, building exteriors, etc., may only be done with a City-issued permit and only with use of a positive shutoff nozzle. * Water leaks, once identified, must be repaired within 24 hours. * Restaurants encouraged to serve water only on request. * New landscaping to comply with existing & future landscape ordinances. * Water meter installation on all new single-family homes. *Hours of restricted outdoor use may be extended to 9 a.m. – 7 p.m. at Council discretion.	* Outdoor water use prohibited daily from 9 a.m. – 7 p.m. Odd-numbered addresses water W, F, Su Even-numbered addresses water T, Th, Sa No outdoor water use on Mondays. No watering of front yards except for trees and shrubs by hand, and vegetation maintained through drip irrigation. Backyard watering subject to above-cited limitations. * Car washing subject to above-cited limitations with use of a positive shutoff nozzle. * Hosing concrete areas, building exteriors, etc., is prohibited except for health/safety concerns. * Water leaks, once identified, must be repaired within 24 hours. * Restaurants prohibited from serving water except upon request. * New landscaping to comply with existing & future landscape ordinances. * Mandatory retrofit of low flow showerheads in homes when building remodeling occurs. * No use of outdoor fountains except for maintenance purposes. * Water meter installation on all new single-family homes. * Creation of a community-based task force to deal with possible implementation of State III restrictions.	* No outdoor water use except for trees and shrubs by hand, and vegetation maintained through drip irrigation. * Car washing permitted at car wash facilities only. * Hosing concrete areas, building exteriors, etc., is prohibited except for health/safety concerns. * Water leaks, once identified, must be repaired within 24 hours. * Restaurants prohibited from serving water except upon request. * Mandatory retrofit of low flow showerheads and toilets in homes when building remodeling occurs. * No use of outdoor fountains except for maintenance purposes. * Moratorium on all new landscaping. * Building moratorium on all new water connections, including new swimming pools.
	Penalties* for Excessive Use	
$ 50 Administrative Fee assessed upon 2nd violation. $200 Admin. Fee assessed upon 3rd violation (includes meter installation). $250 Administrative fee assessed for each subsequent violation.	$150 Administrative fee assessed upon 2nd violation. $250 Admin. fee assessed upon 3rd violation (includes meter installation). $300 Administrative fee assessed for each subsequent violation. *Penalties assessed for violations occurring within 12 months of first violation.	$200 Administrative fee assessed upon 2nd violation. $300 Admin. fee assessed upon 3rd violation (includes meter installation). $400 Administrative fee assessed for each subsequent violation.

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APPENDIX K

UWMP Adoption Resolution

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MODESTO CITY COUNCIL
RESOLUTION NO. 2016-276

RESOLUTION ADOPTING THE JOINT 2015 URBAN WATER MANAGEMENT PLAN

WHEREAS, the State Department of Water Resources (DWR) requires Urban Water Management Plans (UWMPs) to be updated and submitted every five years under the Urban Water Management Planning Act of the State Water Code, and

WHEREAS, in addition to being a required document, an UWMP is necessary for water purveyors to be eligible for state water management grants or loans, and

WHEREAS, as a wholesale water supplier to the City of Modesto, the Modesto Irrigation District (MID) is also required to submit an UWMP because it provides municipal water supply to more than 3,000 customers, and

WHEREAS, the City and MID have previously submitted joint UWMPs in 1995, 2000, 2005, and 2010 in order to simplify the required efforts and coordinate the urban water needs more closely, and

WHEREAS, on January 13, 2016, the City and MID entered into a Letter of Agreement for cost sharing for the development of the Joint 2015 UWMP, and

WHEREAS, on November 10, 2015, by Resolution No. 2015-437, the City Council approved an Agreement with West Yost Associates to develop the Joint 2015 UWMP, and

WHEREAS, on February 22, 2011, by Resolution No. 2011-063, the City Council conducted a public hearing and adopted a Methodology Consumption Calculation determining 2015 and 2020 per capita water use targets and associated per capita water uses as required by the State's Water Code, and

The foregoing resolution was introduced at a regular meeting of the Council of the City of Modesto held on the 28th day of June, 2016, by Councilmember Ridenour, who moved its adoption, which motion being duly seconded by Councilmember Zoslocki, was upon roll call carried and the resolution adopted by the following vote:

AYES:	Councilmembers:	Grewal, Kenoyer, Ridenour, Zoslocki, Mayor Brandvold
NOES:	Councilmembers:	None
ABSENT:	Councilmembers:	Ah You, Madrigal

ATTEST: _____
STEPHANIE LOPEZ, City Clerk

(SEAL)

APPROVED AS TO FORM:

By: _____
ADAM U. LINDGREN, City Attorney

THIS IS TO CERTIFY THAT THIS
IS A TRUE COPY OF THE DOCUMENT ON
FILE WITH THIS OFFICE.
DATE July 1, 2016
_____
SIGNATURE
CITY CLERK
CITY OF MODESTO, CA

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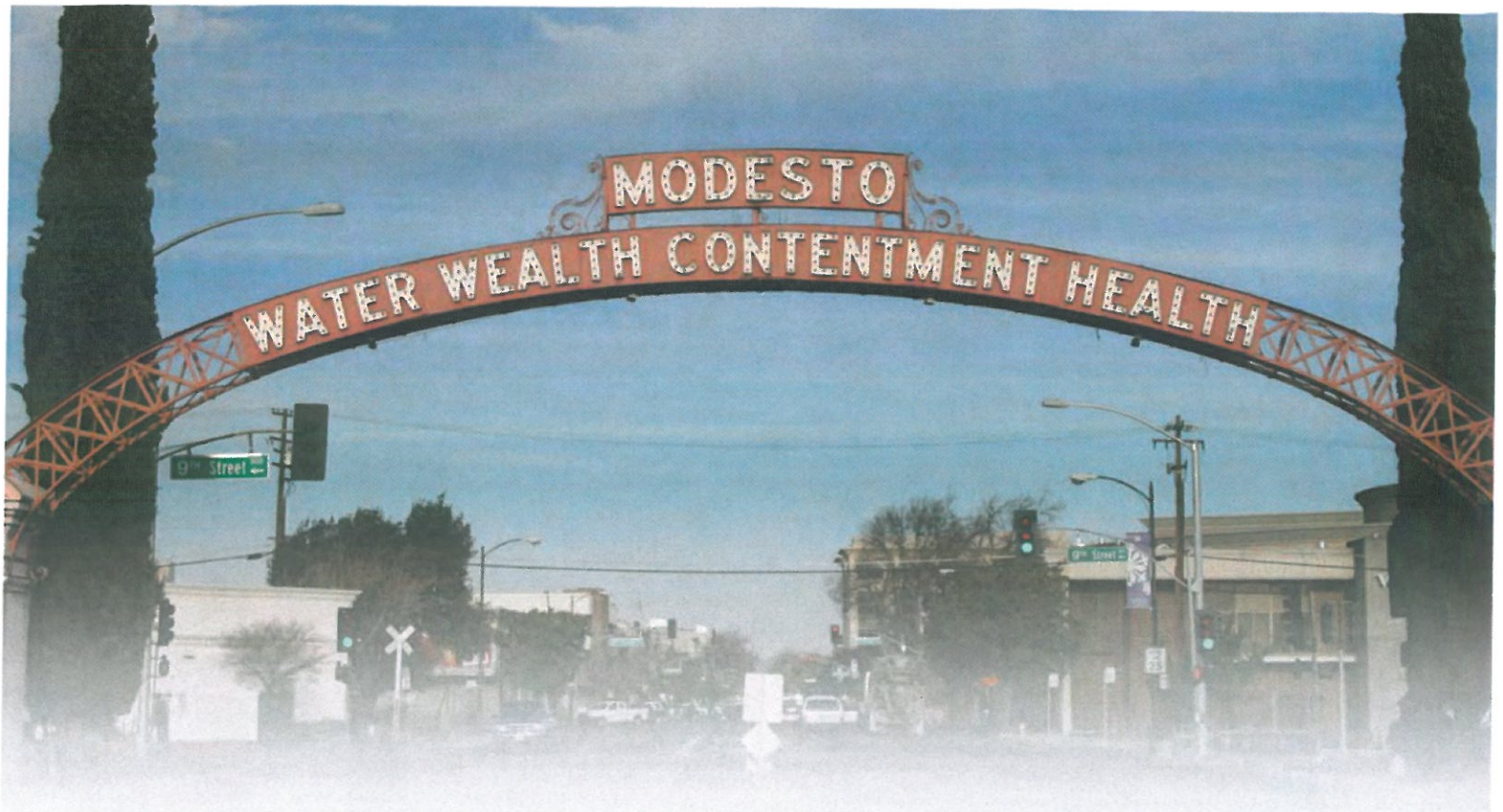

WEST YOST ASSOCIATES

MODESTO CALIFORNIA