Master Response 3.6
Service Providers

Overview

This master response addresses the comments regarding the potential impacts of the plan amendment related to service providers. *Service providers*—as discussed in Chapter 13, *Service Providers*, and in this master response—are public providers of water supply for municipal, industrial, and agricultural uses and providers of wastewater treatment. The concerns of these types of service providers vary based on location and the type of service that they provide. Thus, this master response covers a relatively broad swath of concerns related to providing water for a variety of uses in the plan area. Many commenters asserted that the SED does not adequately address impacts on service providers and are concerned that the ability of service providers to provide safe and reliable water would be jeopardized under the plan amendments. The impacts of all Lower San Joaquin River (LSJR) and Southern Delta Water Quality (SDWQ) alternatives were analyzed using the best available science. Detailed descriptions of the analyses and discussions of the potential impacts can be found in Section 13.4, *Impact Analysis*.

Different levels of reduction in surface water diversion would result under the LSJR alternatives, and that in turn could result in a reduced water supply to some service providers. The extent to which service providers are affected is a function of their ability to use existing alternative supplies (e.g., groundwater or the specific contract agreement that they have with relevant irrigation districts) or develop alternative water supplies (e.g., new wells or purchase of water from another entity). Chapter 16, *Evaluation of Other Indirect and Additional Actions*, describes the actions that affected entities may take to develop alternative water supply sources and the potential environmental impacts from those actions. Implementing one or a combination of those actions could augment the reduction in surface water supplies under the LSJR alternatives would assist service providers' ability to supply safe and reliable water to their customers. In addition, the use of water for domestic purposes is recognized as "the highest use of water" in Water Code section 106. While this does not mean that domestic and municipal uses (or instream uses) can claim an absolute priority (*National Audubon Society v. Superior Court*, (1983) 33 Cal.3d 419, 447 fn. 30), it is nevertheless an important state water policy. When implementing the proposed flow objectives in accordance with the program of implementation, the State Water Resources Control Board (State Water Board) will consider the allocation of responsibility among water right holders to meet the objectives and all applicable legal requirements and state policies, including Water Code section 106. Finally, consistent with the Human Right to Water, Appendix K, *Revised Water Quality Control Plan*, states that the State Water Board "will also take actions as necessary to ensure that implementation of the flow objectives does not impact supplies of water for minimum health and safety needs, particularly during drought periods."

During the recent drought, municipal water suppliers throughout California were subject to voluntary and mandatory water conservation targets established by the State Water Board. As a result of the conservation, statewide cumulative savings from June 2015 to February 2016 were 23.9 percent (State Water Board 2016a) and from June 2015 to March 2017 were 22.5 percent (State Water Board 2017a) when compared with the same months in 2013. The State Water Board acknowledges and appreciates the conservation efforts. The people of California have demonstrated

their ability to conserve when it is needed. Some commenters indicated that service providers may not be able to conserve beyond, or in addition to, the conservation levels achieved during the recent drought. Mandatory urban conservations standards imposed during the recent drought have been lifted. Thus, mandatary conservation associated with the recent drought and any conservation efforts undertaken in response to the flow objectives are not additive. Urban communities in the plan area have shown that they were able to conserve water during the recent drought and this would assist in lessening the effects of potential reduced surface water supplies from the plan amendments.

Groundwater is an important source of water supply for the communities in the plan area (Section 13.2.1, *Lower San Joaquin River and Tributaries*). As discussed in Chapter 9, *Groundwater Resources*, many groundwater basins in the San Joaquin Valley are overdrafted primarily from years of groundwater overpumping for agricultural irrigation. The Sustainable Groundwater Management Act (SGMA) was passed by the Legislature to address the overdraft problem (Section 9.3.2, *Regulatory Background [State];* Master Response 3.4, *Groundwater and the Sustainable Groundwater Management Act*). Under SGMA, groundwater sustainability agencies (GSAs) are required to develop and implement groundwater sustainability plans (GSPs) to achieve basin wide sustainability. Service providers expressed concern with the combined effect of implementing the flow objectives and SGMA.

Some commenters asserted that GSAs would be unable to comply with SGMA if water users in the plan area choose to pump additional groundwater to compensate for the reduction in surface water that could result from the proposed flow objectives. Complying with the plan amendments and SGMA would not be without challenges; however, implementing the flow objectives would not prevent compliance with SGMA. The plan amendments do not require or encourage an increase in groundwater pumping. The SED analysis merely reflects that historically a standard response at a local level to a reduction in surface water availability has been to pump more groundwater. Under SGMA, it is unlikely that water demands for domestic purposes would not be satisfied, because in developing the GSPs, GSAs are required to consider the interests of all beneficial uses and users of groundwater in the basin, including municipal well operators, public water systems, and environmental users of groundwater (Wat. Code, §10723.2.) Knowledge of the plan amendments during the GSP drafting phase would allow for integrated planning of scarce water resources that does not trade impacts between surface and groundwater.

Restoring flows for the reasonable protection of fish and wildlife in the LSJR and its tributaries will reduce surface water supply for users who have relied on that water in the past. Reducing groundwater overdraft and bringing groundwater basins into balanced levels of pumping and recharge under SGMA may also reduce groundwater as a source for water supply. Many water users have relied on both surface and groundwater to meet their water supply needs. Surface water and ground water have both been over extracted for a long time. Over reliance on surface and groundwater for consumptive purposes in the region has degraded commercial, recreational, and native fish populations, increased river temperatures, depleted groundwater basins, and caused land subsidence. LSJR flow objectives and SGMA are responses to the over reliance on surface water and groundwater and are intended to achieve a balanced and sustainable level of water use. LSJR flow objectives and SGMA are establishing complementary paths toward sustainable surface water and groundwater use. The Board recognizes that adjusting to reductions in water supplies will be challenging for water users as these actions progress.

The concerns of service providers in the southern Delta are different than those identified on the three eastside tributaries. Service providers in the southern Delta are primarily wastewater treatment providers and are primarily concerned with having to institute desalination through reverse osmosis (RO) treatment of wastewater effluent to comply with the revised salinity objective. They stated that doing so will not provide any measurable improvements to salinity levels in the southern Delta, but will have high environmental and economic costs that are not reasonable. In response, Appendix K has been revised to state that the State Water Board finds that implementing RO technology for wastewater discharges in the southern Delta is currently not a feasible technology for the purposes of controlling salinity. It further states that where it is infeasible for a publicly owned treatment works discharging to the southern Delta to comply with traditional numeric water quality–based effluent limitations, Clean Water Act permits shall include enforceable effluent limitations in the form of best management practices. It also requires performance-based limits, among other reporting requirements. These service providers also maintain that implementing the methods of compliance described in the SED would not result in further improvements in effluent quality since most of the compliance options (except desalination of effluent) have already been carried out. These methods, particularly source control and pretreatment, are continuing obligations that the dischargers can and should implement to reduce salinity in their discharges,

The State Water Board reviewed all comments related to potential environmental impacts related to service providers and developed this master response to address recurring comments and common comment themes. This master response references related master responses as appropriate where recurring comments and common comment themes overlap with other subject matter areas. This master response addresses concerns related to service providers in greater detail below and includes, for ease of reference, a table of contents on the following page to help guide the readers to specific subject areas. In particular, this master response addresses, but is not limited to, the following topics.

- Availability of municipal water and alternative water supplies
- Water conservation efforts by service providers during the recent drought
- Compliance with SGMA and the plan amendments as a way of integrated planning of groundwater and surface water resources
- Potential effects of the SDWQ alternatives on wastewater treatment plants

For responses to comments regarding disadvantaged communities and community water systems that serve them, a subset of service providers, please see Master Response 2.7, *Disadvantaged Communities*. For a discussion about the SDWQ alternatives and why they would not affect the drinking water quality of the southern Delta, please see Master Response 3.3, *Southern Delta Water Quality*. For a discussion regarding the groundwater resource impact analyses and how SGMA will protect groundwater basins from overdraft to ensure a reliable water supply, please see Master Response 3.4. See Master Response 6.1*, Cumulative Analysis*, for a discussion regarding the consideration of growth and housing development in the context of water supply. For a discussion regarding the cost of water transfers, stranded capital assets, and effects on rate payers, please see Master Response 8.4, *Non-Agricultural Economic Considerations*.

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Municipal Water Supply

In response to comments, this section addresses the approach used in the SED to evaluate the potential effects related to service providers and the potential availability of water in the plan area for municipal uses. A discussion of the overall approach to the impact analysis in the SED is provided. Given the understandable concerns and comments about municipal water supplies, estimates of municipal water demand and agricultural irrigation demand are provided to demonstrate that water is available to supply municipal uses within the plan area under the plan amendments. The economics of water transfer between municipal and agricultural uses and how transfers can be used in water supply infrastructure planning are discussed in Master Response 8.4. This section also addresses other common issues related to municipal water supplies that were raised by commenters. Water supply issues related to the City and County of San Francisco and cities that rely on Hetch Hetchy water are addressed separately in Master Response 8.5, *Assessment of Potential Effects on the San Francisco Bay Area Regional Water System*. This section also discusses the inclusion of public health and safety commitments in the amendments to the water quality control plan. For more information about public health and safety please refer to Master Response 2.1, *Amendments to the Water Quality Control Plan*.

Approach to Impact Analysis

Several commenters asserted that the analysis in the SED ignored the potential impact of reduced surface water availability on municipal water supply and did not discuss such potential impacts on individual service providers. They asserted the SED must quantify reductions to surface water deliveries to each municipal service provider and analyze impacts.

The State Water Board did not ignore potential effects associated with potentially reduced water supplies to service providers. The State Water Board recognizes that municipalities have various mechanisms (e.g., contracts, negotiated agreements, water rights) by which to obtain water supply (Section 13.4.2, *Methods and Approach*, and Chapter 20, *Economic Analyses*, Section 20.3.3, *Effects on Municipal and Industrial Water Supplies and Affected Regional Economies*). The State Water Board also recognizes the unique circumstances of each service provider and acknowledges that because of these unique circumstances the State Water Board cannot predict how each service provider would respond to reductions in surface water supplies. It is speculative to make assumptions regarding how service providers will respond to implementation of the flow objectives because it will depend on many individual and collective decisions including, but not limited to, the discrete actions of other local water users in response to reductions in surface water and alternative sources of water supply. Moreover, as described in Master Response 1.2, Water Quality Control Planning Process, the plan amendments do not assign water rights responsibility to water rights holders to implement the proposed flow water quality objectives; rather, implementation of the objectives will take place through future proceedings. Accordingly, the State Water Board did not quantify or model specific impacts on individual municipal service providers.

The SED qualitatively evaluates at a programmatic level the potential impacts on service providers as described in Section 13.4.2. The qualitative evaluation uses the results of the potential surface water supply reductions calculated by the Water Supply Effects (WSE) model (Table 13-14, *Distribution of Annual Baseline Water Supply and Differences from Baseline (Changes in Diversions) in*

the Eastside Tributaries for the LSJR Alternatives for 1922–2003)[1] and information regarding various mechanisms service providers' use to obtain different sources of water supply in the watersheds. Average water supply reduction in the three eastside tributaries is used because it is representative of the changes in water supply across all water year types. Furthermore, averages are a widely supported metric to characterize the baseline and to evaluate effects in impact analyses. As the Supreme Court noted, "…Environmental conditions may vary from year to year and in some cases it is necessary to consider conditions over a range of time periods." (*Communities for a Better Environment v. South Coast Air Quality Management District* (2010) 48 Cal.4th 310, 328 citing *Save Our Peninsula Committee v. Monterey County Bd. of Supervisors*87 Cal.App.4th 99, 125*.).* This is particularly true for water in California, which is highly variable.

The SED discloses that service providers could experience reductions in water supply, depending on the various mechanisms by which they receive surface water and the type of water they supply, among other factors. The reductions would likely require the construction or expansion of new water treatment facilities or water supply infrastructure, the environmental impacts of which are evaluated in Chapter 16. For further discussion on issues related to assumptions of municipal supply in the WSE model, please see Master Response 3.2, *Surface Water Analyses and Modeling*.

Municipal Water Use Compared to Agricultural Water Use

Municipal water use is a relatively small volume of water compared to agricultural water use. The population overlying the four groundwater subbasins in the plan area is approximately 1,248,000. Of this total, approximately 1,115,000 people (89 percent) receive their water supply from a public water supplier (Section 13.2.1). The municipalities and water suppliers serving this population supply water for residential, commercial, and industrial uses, and rely on both surface water and groundwater sources to do so. Ninety-three public water suppliers within the four groundwater subbasins were identified in Section 13.2.1. As listed in Table 13-2a, 80 of those public water suppliers rely solely on groundwater. In 2014, total water production by the 93 water suppliers was 323 thousand acre-feet (TAF), of which 52 percent was groundwater and 48 percent was surface water. The average residential gallons-per-capita-day (R-GPCD)[2] for June 2014 to December 2016 for the San Joaquin River Basin was 112 gallons per day (gpd) (State Water Board 2017b). Although the population of the San Joaquin River Basin is more than that of the four groundwater subbasins combined, the four subbasins have relatively large population centers: Stockton, Stanislaus, Turlock, Modesto, and Merced account for most of the population of the San Joaquin River Basin. Applying the R-GPCD for the period of June 2014–December 2016 for the San Joaquin River Basin (i.e., 112) to the four groundwater subbasins and taking into account the population served by public water suppliers in the four subbasins (1,115,000), the total calculated annual residential water demand is approximately 140 TAF. The average annual commercial and industrial water uses during the period of June 2014–December 2016 can be estimated to be 183 (323-140) TAF.

As discussed in Chapter 9, *Groundwater Resources*, groundwater levels in the San Joaquin Valley Groundwater Basin have declined primarily as a result of overpumping of groundwater for agriculture. Of the four groundwater subbasins underlying the plan area, two (Eastern San Joaquin

[1] For more information regarding the WSE model, see Master Response 3.2, *Surface Water Analyses and Modeling.*

[2] Residential water use includes both indoor (e.g., personal consumption, toilet flushing, laundry, bathing and showering) and outdoor uses (e.g., landscape irrigation, car washing, swimming pool maintenance).

and Merced) are designated as high priority and critically overdrafted; the other two (Modesto and Turlock) are designated as high priority (DWR 2016). According to the result from the Statewide Agricultural Production (SWAP) model,[3] the average baseline applied water (i.e., water use for irrigation) of all irrigation districts in the plan area for all water year types is approximately 1,520 TAF per year (TAF/y). The model results indicate that under the plan amendments the average applied water of the irrigation districts for all water year types would decrease. Under LSJR Alternative 3, it would be 1,410 TAF/y (a decrease of 110 TAF/y from baseline).

Using the aforementioned 2014 water production as an example, the total municipal water production of 323 TAF is 21 percent of the agricultural water used by all irrigation districts under baseline and 23 percent under LSJR Alternative 3. The estimated total residential water use of 140 TAF/y is 9 percent of the agricultural water used by all irrigation districts under baseline and 10 percent under LSJR Alternative 3.

Alternative Water Supply Sources

A reasonably foreseeable action for service providers to take to augment water supplies where supplies are reduced is to purchase water (Chapter 13 and Chapter 16). Water is purchased from other parties through contracts or water transfers, as discussed in Master Response 8.4 and Chapter 20. A market of water transfers and purchases has existed in California since 1970 and has expanded substantially over the past 20 years. This market allows for the temporary, long-term, or permanent transfer of the right to use water in exchange for compensation (Cooley et al. 2015). This market helps California's overall water use to be more economically efficient (Hanak and Stryjewski 2012). Under standard market principles, willing service providers pay willing irrigation districts a price equal to or higher than the revenue generated from a unit volume of water applied to lower net-revenue crops.

Water transfers are made within the agricultural sector, from agricultural to municipal users and vice versa, or from agricultural users to fish and wildlife. Cooley et al. (2015) found that the agricultural sector was involved as both buyers and sellers in about 99 percent of the water transfers in 2014. Of the $210 million in water transfers in 2014, nearly 70 percent (or $144 million) represented transfers within the agricultural sector, likely from lower- to higher-revenue crops. While agriculture paid nearly $640,000 to purchase water from municipal and industrial users, agriculture received nearly $66 million by selling water to other users (Cooley et al. 2015).

The price of water negotiated for water transfers is influenced by a wide range of supply and demand factors, and prices tend to be region-specific. For example, in the recent drought, the East Bay Municipal Utility District purchased 20 TAF and 12 TAF of water from the Placer County Water Agency (PCWA) in 2014 and 2015 respectively. The price was $75 per acre-foot (AF) for the 2014 purchase and $500 per AF for the 2015 purchase. An example of a long-term water transfer from irrigation districts to municipal water suppliers is the 2003 Water Conservation and Transfer Agreement between the Imperial Irrigation District (IID) and San Diego County Water Authority

[3] For results of the SWAP model, please see Agricultural Economic Analysis spreadsheets presented at the State Water Board's website (https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning).

(SDCWA). IID agreed to provide 277.7 TAF/y to SDCWA for an initial price of $258/AF, with annual adjustments specified in the agreement (SDCWA 2016).

Modeling results indicate that under LSJR Alternative 3, on average, the crops with the lowest net revenue per AF of applied water are pasture, rice, safflower and alfalfa. The revenues generated from each AF of water applied to grow pasture by those four crops are $140, $265, $311 and $314 (2008 dollars), respectively. Together, these four crops consumed 280 TAF of water, 20 percent of the average annual water applied to all crops, and generated $ 66 million, only 4.5 percent of the average annual revenues generated by all crops in all irrigation districts under LSJR Alternative 3. For the purposes of illustration only, if growers sold 50 percent of the water needed for those four crops to service providers, the entire annual residential water demand of the population served by public water systems in the four groundwater subbasins within the plan area would be met. Of course, this is just a hypothetical example, but it illustrates two things. First, it underscores how small municipal water demand is relative to agricultural demand. Second, it shows a large volume of water supplied to lower revenue crops could potentially be transferred to municipalities if municipalities experience reductions in water supply. Master Response 8.4 provides additional information regarding municipal economic effects and water transfers.

Water Code Section 106 and Water for Minimum Health and Safety Needs

Commenters stated that the plan amendments do not recognize Water Code section 106, which is a policy declaration that "the use of water for domestic purposes is the highest use." (Wat. Code, § 106.) Others expressed confusion about the applicability of the code under the plan amendments and whether water uses for domestic purposes would be protected. The California Supreme Court explained that the primary function of Water Code sections 106 and 106.5 (pertaining to municipal water rights) is to establish priorities among competing appropriators, but that the sections also declare principles of California water policy applicable to any allocation of water resources. (*National Audubon Society, supra*, 33 Cal.3d at 447 fn 30.) In the latter context, the Court explained that the policy must be read "in conjunction with later enactments requiring the consideration of in-stream uses . . . and judicial decisions explaining the policy embodied in the public trust doctrine." (*Ibid*.) Thus, the Court concluded "neither domestic and municipal uses nor in-stream uses can claim an absolute priority." (*Ibid*.)

Water Code section 107 similarly states that the declarations of the policy of the state in Water Code sections 100 to 113 are not exclusive and "all other or further declarations of policy in this code shall be given their full force and effect." (Wat. Code, § 107.) An example is the policy in the Delta Reform Act that the "longstanding constitutional principles of reasonable use and the public trust doctrine shall be the foundation of state water management policy and are particularly important and applicable to the Delta." (Wat. Code, § 85023.)

While water for domestic purposes cannot claim absolute priority, it nevertheless is an important policy that must be considered in the administration and protection of the state's water resources. When implementing the LSJR flow objectives in accordance with the program of implementation, the State Water Board will consider the allocation of responsibility among water right holders to meet the objectives and will consider all applicable legal requirements and state policies, including Water Code section 106.

Multiple service providers expressed their concern that the plan amendments would reduce the water available for municipal supply to a level that would be insufficient to meet the public's minimum health and safety needs. Consistent with the Human Right to Water (Wat. Code § 106.3; see Master Response 2.7) and as discussed in Master Response 2.1 and Appendix K, the State Water Board will take actions as necessary to ensure that implementation of the flow objectives does not affect supplies of water for minimum health and safety needs, particularly during drought periods. Actions may include, but are not limited to, assistance with funding and development of water conservation efforts and regional water supply reliability projects and regulation of public drinking water systems and water rights.

Some commenters referred to the 50 GPCD identified in California Code of Regulations, title 23, section 878.1, subds. (a)-(b) [operative March 30, 2015 and repealed Dec. 29, 2015] and 55 GPCD identified in the Water Efficiency Act of 2009 (Wat. Code, § 10608 et seq.) as the amount of water required for "minimum health and safety needs." Neither the 50 nor 55 GPCD is the absolute amount of water required to meet minimum health and safety needs. The amount of water necessary for human consumption, cooking, and sanitary purposes varies by individual circumstance and will evolve with increased efficiencies, but assumptions in current law provide some information regarding a reasonable maximum daily per capita human use. Section 878.1 of the California Code of Regulations, title 23, was adopted as part of an emergency regulation for water curtailments in response to the recent drought; the regulation was repealed on December 29, 2015. The 50 GPCD identified in subds. (a)-(b) of that regulation was the maximum amount of surface water diversion that could be exempted from a curtailment order without further approval from the State Water Board if the water was used for domestic and municipal purposes. The 55 GPCD identified in the Water Efficiency Act of 2009 is a provisional conservation standard for indoor residential water use in order to reach the statewide goal of 20 percent reduction in per capita urban water use by 2020. (Wat. Code, § 10608.20, subd. (b)(2)(A).)

As a reference, according to the World Health Organization, between 50 and 100 liters (i.e., 13–26 gallons) of water per person per day are needed to ensure that most basic needs are met and few health concerns arise (Office of the United Nations High Commissioner for Human Rights et al. 2010). Gleick (1996) recommended 50 liters (i.e., 13 gallons) per person per day as the international standard of basic water requirement for human needs (drinking water, hygiene, sanitation services, and food preparation). A study by the Natural Resources Defense Council and Pacific Institute estimated that an average California resident living in a highly efficient home would use about 32 gpd of water indoors (Natural Resources Defense Council and Pacific Institute 2014). If average urban residential water use was 50 or 55 R-GPCD, then the total annual residential water demand identified in *Municipal Water Use Compared to Agricultural Water Use* above (140 TAF) would decrease to 62.5 TAF/y or 69 TAF/y, respectively. These volumes are an even smaller percentage of the total amount of water used for irrigation by the irrigation districts.

Water Conservation during the Recent Drought

Some commenters indicated that service providers may not be able to conserve beyond the conservation levels achieved during the recent drought. Mandatory urban conservations standards imposed during the recent drought, discussed below, have been lifted. Thus, mandatary conservation from the recent drought and any conservation efforts undertaken in response to the plan amendments are not additive. Urban communities in the plan area conserved water during the

recent drought and this should assist in lessening the effects of potential reductions in surface water supplies. Because the drought emergency and the conservation requirements have been lifted, compliance with the plan amendments would not require the service providers to conserve more water than they have already, or what is already in the statute.

The State Water Board collected and tracked urban water conservation data and appreciates the efforts of service providers in the plan area to reduce potable water use. During the recent drought, municipal water suppliers throughout California were subject to voluntary and mandatory water conservation targets established by the State Water Board. As discussed in Chapter 22, *Integrated Discussion of Potential Municipal and Domestic Water Supply Management Options*, Section 22.3.2, *Managing Water Supplies under Reduced Water Availability Conditions*, in response to Governor Edmund G. Brown's April 2015 Executive Order (EO) B-29-15, which called for statewide 25 percent mandatory conservation by urban water suppliers, the State Water Board adopted Resolution 2015-0032. Resolution 2015-0032 assigned each urban water supplier a conservation target, ranging between 4 percent and 36 percent, to be achieved on a cumulative basis for the compliance period of June 2015–February 2016 (State Water Board 2015). As a result of the conservation requirements, statewide cumulative savings from June 2015 to February 2016 was 23.9 percent (State Water Board 2016a) and from June 2015 to March 2017 was 22.5 percent (State Water Board 2017a) when compared with the same months in 2013.

As described in Chapter 22, 15 water suppliers in the plan area were required to achieve water conservation targets (listed in Table 22-2) during the initial compliance period of June 2015–February 2016. Those 15 water suppliers reported an average cumulative savings of 28 percent for this 9-month period, as compared to the water use for the same months in 2013, with individual supplier savings ranging from 8 percent to 39 percent. Updated information regarding the conservation effort of the 15 water suppliers is provided in Table 3.6-1.

In response to improved water supply conditions throughout most of the state, the State Water Board adopted Resolution 2016-0007, which modified conservation standards for suppliers based on adjustments that accounted for regional climatic variability, water-efficient growth experienced by urban areas, and significant investments made by suppliers toward creating new, local, drought-resilient sources of potable water supply (State Water Board 2016b). In May 2016, the State Water Board further modified the conservation standards by adopting Resolution 2016-0029, which allowed urban water suppliers to replace their prior state-assigned percentage target reduction using a localized "stress test" approach based on whether the suppliers had at least a 3-year water supply under extended drought conditions. Under the stress test approach, conservation standards were modified or removed entirely for those suppliers that could show they would not experience shortage conditions in 2019 (i.e., the 3-year period) (State Water Board 2016c). Of the 14 suppliers[4] subject to conservation reporting requirements in the plan area, 11 suppliers submitted self-certified stress tests by the submission deadline of June 22, 2016 (Table 3.6-1). Seven of these suppliers indicated they would not face a water supply shortage in 2019 and were assigned a conservation standard of zero; four of these suppliers (Cities of Ceres, Lodi, Modesto, and Turlock) indicated that they would face a water supply shortage in 2019 and were assigned conservation standards equal to the shortage amount. The remaining three suppliers (Cities of Atwater, Lathrop,

[4] Winton Water & Sanitary District was reclassified as a small water supplier as of the July 2016 reporting period and is no longer required to submit monthly reports. Therefore, the number of suppliers that were required to achieve water conservation targets became 14 rather than 15.

and Livingston) did not submit the stress tests and retained their previous conservation standard (State Water Board 2016d). The State Water Board adopted Resolution 2017-0004 in February 2017, which extended the stress test requirement. As part of this extension, suppliers who did not submit the self-certification in June 2016 had the option to submit the stress test by March 15, 2017, to be retroactively applied beginning in the March 2017 reporting period (State Water Board 2017c). The City of Atwater submitted a self-certified stress test showing that the city would not face a water supply shortage in 2019 (State Water Board 2017d). The overall cumulative water savings reported by the 14 water suppliers in the plan area for the entire period of mandatory conservation (June 2015–April 2017) was 27 percent, with individual supplier savings ranging from 13 percent to 36 percent.

In response to the Governor lifting the drought emergency for much of the state (EO B-40-17), the State Water Board adopted Resolution 2017-0024 in April 2017, which rescinded the stress test requirements and all remaining mandatory conservation standards for urban water suppliers, while keeping requirements for monthly water use reporting in place (State Water Board 2017e). All municipalities and water suppliers in the plan area continue to conserve voluntarily (Table 3.6-1).

Requirements to reduce urban use are already in the statute. The Water Efficiency Act was enacted in November 2009, setting an overall goal of reducing per capita urban water use by 20 percent by 2020. (Wat. Code, § 10608.16.) Additionally, Governor Brown signed EO B-37-16, *Making Conservation a California Way of Life*, calling for long-term shifts in water use to improve the state's resilience to drought and changes in weather patterns expected as climate change progresses. The framework for implementing EO B-37-16, released in April 2017, builds on the success of the mandatory water restrictions implemented during California's recent drought and develops long-term water conservation measures to ensure that all communities have sufficient water supplies; the framework represents a shift from statewide mandates to a set of conservation standards based on local circumstances, including population, temperature, system leaks, and types of commercial and industrial use.

The Water Efficiency Act was recently amended (see Assem. Bill No. 1668 (2017-2018 Reg. Sess.) and Senate Bill No. 606 (2017-2018 Reg. Sess.)) to require, among other things, urban retail water suppliers to calculate their urban water use objective, which is defined as the estimate of aggregate efficient water use for the previous year based on adopted water use efficiency standards and local service area characteristics for that year, no later than November 1, 2023, and annually thereafter. (Wat. Code, §§ 10609.20, 10608.12 .) The urban water use objective consists of the sum of the aggregate estimated efficient indoor residential use, outdoor use, outdoor irrigation of landscape areas, water losses, and uses in accordance with variances. (Wat. Code, § 10609.20, subd. (c).) The per capita per day standard for indoor residential use is 55 gallons until January 1, 2025, 52.5 gallons from January 1, 2025 to January 1, 2030, and 50 gallons beginning January 1, 2030, unless the Department of Water Resources, in coordination with the State Water Board, recommends to the Legislature a different standard that more appropriately reflects best practices. (Wat. Code, § 10609.4.) Urban retail water suppliers are required to report on the progress towards meeting the urban water use objective no later than November 1, 2023. (Wat. Code, § 10609.24, subd. (a)(4).) The State Water Board may issue informational orders, notices, and conservation orders to an urban retail water supplier not meeting its urban water use objective on and after November 1, 2023, November 1, 2024, and November 1, 2025, respectively. (Wat. Code, § 10609.26.)

Agricultural efficiency is also addressed in Assembly Bill 1668. Agricultural water management plans are required to quantify measures to increase efficiency of agricultural water use efficiency,

include an annual water budget, describe the agricultural water supplier's management strategy with specified elements, and include a drought plan describing the actions of the agricultural water supplier for drought preparedness and management of water supplies and allocations during drought conditions. (See Wat. Code, § 10800 et seq.)

These recent changes to the law would help with both municipal water demand management and the overall availability of water by requiring water efficiencies.

Table 3.6-1. Summary of Conservation Efforts in the Plan Area

Urban Water Supplier	June 2015–February 2016 (Resolution No. 2015-0032)			June 2016–April 2017 (Resolution Nos. 2016-0029 and 2017-0004)			June 2015–April 2017 (Overall Conservation)	
	R-GPCD	Savings Compared to 2013 (%)	Conservation Standard (%)	R-GPCD	Savings Compared to 2013 (%)	Conservation Standard (%)	R-GPCD	Savings Compared to 2013 (%)
Atwater	143	37	36	150	31	0 [a, b]	144	34
Cal Water, Stockton	64	22	20	65	19	0	63	21
Ceres	85	24	28	83	24	13	83	24
Lathrop	84	28	20	81	21	18[b]	81	26
Livingston	97	17	32	100	12	29[b]	96	14
Lodi	107	27	32	106	25	6	104	27
Manteca	98	30	32	101	27	0	99	29
Merced	136	37	36	136	34	0	133	36
Modesto	129	28	36	127	27	20	127	28
Oakdale	112	39	32	135	25	0	122	33
Ripon	161	27	36	144	34	0	150	33
Riverbank	127	8	32	123	11	0	121	13
Stockton	89	27	28	91	22	0	89	26
Turlock	113	26	32	113	22	16	111	25
Winton [c]	121	22	36	NA	NA	NA	NA	NA

Sources: State Water Board 2017d.

NA = Not Applicable

R-GPCD = Residential Gallons Per Capita Day

[a] Supplier did not self-certify supply reliability ("stress test"), and retained the state-determined conservation standards effective June 2016 (http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/docs/emergency_reg/uw_self-cert_summary.pdf.)

[b] Supplier self-certified supply reliability ("stress test") in March 2017 showing that the supplier had at least a 3-year water supply under extended drought conditions (tentative standard for Mar and Apr 2017).

[c] Supplier was reclassified as a small water supplier as of the July 2016 reporting period and is no longer required to submit monthly reports.

Compliance with SGMA and the Plan Amendments

As discussed in Chapter 13, many service providers rely solely or primarily on groundwater as a source of water. Groundwater accounts for approximately 38 percent of the total water supply in the SJR Hydrologic Region (DWR 2013). Most groundwater (81 percent) is used for agriculture; the rest goes to municipal use (13 percent) and managed wetlands (6 percent) in the region. Hence, municipal use of groundwater is small compared to agricultural uses in SJR Hydrologic Region. Groundwater levels in the plan area have generally declined due to long-term pumping to sustain and expand agriculture (Section 9.2.1, *San Joaquin Valley Groundwater Basin and Subbasins*). As a result, the Department of Water Resources (DWR) has designated all four subbasins underlying the plan as high-priority—two of the subbasins (Eastern San Joaquin and Merced) are designated as critically overdrafted (DWR 2016).

SGMA was passed by the Legislature in 2014 to address unsustainable groundwater use in California's high- or medium-priority groundwater basins. SGMA is based on the premise that groundwater management is best accomplished locally (Wat. Code, § 113.) Sustainable groundwater management is the "management and use of groundwater in a manner that can be maintained during the [50-year] planning and implementation horizon without causing undesirable results" (Wat. Code, § 10721 (v).) Undesirable results occur when one of the following effects become "significant and unreasonable:" chronic lowering of groundwater levels, reduction of groundwater storage, seawater intrusion, degraded water quality, land subsidence, and depletions of interconnected surface waters that impact beneficial uses of surface waters (Wat. Code, § 10721 (x).) In order to protect basins and ensure a more reliable water supply for all water users, including water suppliers that rely partially or solely on groundwater, SGMA requires GSAs develop and implement GSPs that achieve sustainability goals within 20 years of implementation. GSAs must develop water budgets that quantify the sustainable yield for each basin (Cal. Code Regs., tit 23, § 354.18 subd. (b)(7)) and outline how each GSA will manage groundwater to avoid undesirable results, including chronic lowering of groundwater levels (Cal. Code Regs., tit. 23, §§ 354.22–354.30.)

Some service providers expressed concern with the combined effect of implementing the proposed flow objectives and SGMA. These commenters asserted that implementing the flow objectives would prevent GSAs from meeting GSP sustainability goals or jeopardize municipal water supplies, because water users in the plan area would pump more groundwater to replace reduced surface water, which would cause further declines in groundwater levels (i.e., overdraft). Some service providers also claimed they had conserved as much as possible during the recent drought, and if GSPs include conservation that extends limits on groundwater extractions, their basins would be out of compliance with SGMA because they would be unable to further reduce their water use. Such assertions mischaracterize the intent and purposes of the plan amendments and SGMA.

The SED analyzes a potential increase in groundwater pumping in the plan area based on past responses to reductions in surface water (Chapter 9; Chapter 13; Chapter 22). However, the SED and plan amendments do not require or encourage increased groundwater pumping. The SED analysis reflects an understanding of baseline groundwater pumping conditions (prior to full SGMA implementation) and recognizes that, historically, the local response to reduced surface water was to pump more groundwater.

In developing basin water budgets, GSAs will have to account for the projected availability of surface water in accordance with relevant water regulations, including the proposed flow objectives. If a GSA determines that groundwater pumping in its basin is unsustainable, the GSA can apply the groundwater management authorities provided by SGMA, including the power to measure groundwater extraction volumes, acquire water rights, construct facilities, implement conservation measures, import surface water, and limit groundwater extractions in order to achieve basin-wide sustainability (Wat. Code, § 10726.4.)

Implementation of the plan amendments does not prevent SGMA compliance—sustainably managing surface water and groundwater resources together is the only way to ensure the protection of both resources. SGMA is designed to protect the beneficial uses of groundwater and the flow objectives are designed to "support and maintain the natural production of viable native San Joaquin River watershed fish populations migrating through the Delta." A sustained natural production of viable native fish is an indicator of a healthy river and its watershed. A healthy river will benefit all users of the river, including agricultural, municipal, and environmental users. In this way, SGMA and the flow objectives are not threats or limiting factors to each other, but two powerful, integrated tools.

In developing a GSP, the GSA is required to consider the interests of all beneficial uses and users of groundwater in its basin; this includes municipal well operators, public water systems, and domestic purposes (which is well established as the highest use of water among competing uses; Wat. Code, 10723.2.; Wat. Code, § 106). The GSA, in consultation with stakeholders, will define sustainability based on the needs and values of the local community. Many municipal and urban water users are represented in the GSAs overlying the plan area. Master Response 3.4 (Table 3.4-1) identifies municipality and water supplier members of each GSA. It is unlikely that these members would consent to a GSP that includes extreme measures that would deny urban water suppliers the ability to ensure a water supply to meet minimum public health and safety needs. Furthermore, GSAs have the ability to safeguard private domestic wells by setting minimum thresholds at levels that protect domestic wells.

For the purposes of SGMA, a minimum threshold is the numeric value that indicates when an undesirable result occurs. For example, if the minimum threshold for groundwater levels in a basin is 100 feet below ground surface (ft bgs), then groundwater levels above the minimum threshold (e.g., 80 ft bgs) would be sustainable, but groundwater levels below the minimum threshold (e.g., 120 ft bgs) would be an undesirable result (i.e., unsustainable). If private domestic wells in the basin are 50 ft bgs, then the GSA could protect private domestic wells by setting the minimum threshold for groundwater levels at 30 ft bgs. GSAs will determine where to set minimum thresholds based on the public process discussed above.

Consistent with California law, SGMA compliance cannot occur at the expense of reasonably protecting surface water beneficial uses (Wat. Code, §§ 113, 10721 (x) (6), 10726.8 (c).) It is unreasonable to use extremely limited surface water resources to address impacts of overdrafted groundwater for SGMA compliance, since diversion of surface water in the plan area has already resulted in adverse impacts on fish and wildlife (Executive Summary, Section ES-4, *Purpose, Needs, and Goals*, and Chapter 19, *Analyses of Benefits to Native Fish Populations from Increased Flow between February 1 and June 30*). The State Water Board has a legal mandate to reasonably protect fish and wildlife beneficial uses in the LSJR Watershed, as the State Water Board is proposing to do with the plan amendments.

The State Water Board acknowledges that reaching sustainability in these overdrafted basins will be challenging, but the plan amendments would not prevent GSAs from meeting sustainability goals. Instead, knowledge of the plan amendments during the GSP drafting phase would allow for integrated planning of scarce water resources that does not trade impacts between surface and groundwater. SGMA and the proposed plan amendments should be viewed as two powerful, integrated tools that together will allow us to manage both groundwater and surface water resources efficiently and holistically in California. For further discussion on groundwater overdraft as a legacy issue caused by overpumping for agricultural irrigation and compliance with SGMA in the context of the plan amendments, please see Master Response 3.4.

Local Resiliency and Drinking Water Quality

The State Water Board evaluated drinking water quality for public water providers in Chapter 13, Impact SP-2a. This impact analysis evaluates potential effects on water quality in public water supply provider wells. As described in the impact analysis, the change in groundwater flow is dependent on the location of pumping, the amount of groundwater pumped and the frequency at which pumping occurs, and hydrogeological characteristics of the aquifer (e.g., consolidated clays with low permeability or unconsolidated sands with high permeability). The impact of groundwater pumping on groundwater quality also depends on a number of different variables including but not limited to the location and depth of the well, amount and frequency of groundwater pumping, number and proximity of nearby wells, hydrogeological characteristics of the aquifer, distance between the well(s) and the contaminant(s), contaminant characteristics (e.g., highly mobile in water or adhering primarily to soil), and land use near the well. In addition, it is not possible to predict how the affected parties would respond to the potential reduction of surface water resulting from the LSJR alternatives. Thus while groundwater pumping can affect groundwater flow and quality, for all of the foregoing reasons, it is speculative to specifically determine what that change in groundwater flow and its impact on groundwater quality could be from the groundwater pumping.

Local management of drinking water quality and compliance with Safe Drinking Water Regulations has protected the majority of groundwater drinking water sources and created local resiliency as discussed in Chapters 13 and 22. More than 98 percent of Californians on a public water supply are served safe drinking water (State Water Board 2013). For example, while it is true that pumping greatly increased during the drought, there was not a greater number of MCL violations compared to those in wet years as reported by service providers (Table 13-5. *Primary Detected Contaminants in Exceedance of Maximum Contamination Level in Drinking Water for Selected Water Suppliers during Representative Non-Drought and Drought Years*; see also Master Response 2.7 for more information on water quality during drought years). Furthermore, in general, water delivered to the end users from municipal drinking water wells does not exceed federal and state MCLs. This is because municipal wells are generally deep, and water quality tends to be better in deeper aquifers. Furthermore, water quality is managed such that if violation of drinking water standards is found at a public well, the well can be brought offline and corrective actions will be taken to ensure that the water meets the MCL requirement again before it is delivered the consumers.

The State Water Board evaluated drinking water quality as it relates to private wells in Chapter 13, Impact SP-2b. It acknowledges the points above, but also that private domestic wells, which are much shallower and on private property, are largely unregulated and are under no state requirements to monitor, test, and treat their water to meet the state and federal Safe Drinking Water Act. There is a lack of data on private wells and it is difficult to determine whether private

wells are suffering from water quality impairment; however, under existing conditions, impairments have occurred. Increased groundwater pumping could affect the quality of drinking water from private domestic wells and the SED concludes the impact would be significant under LSJR Alternative 3. The SED proposes mitigation measures, including for local agencies to exercise their full authorities to address degradation of groundwater quality, both under SGMA and their police powers. "Undesirable results" associated with SGMA includes "significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies" (Wat. Code, § 10721, subd. (x)(4)), and thus these potential effects could be mitigated through the implementation of SGMA, as explained above. Complying with SGMA would prevent and/or mitigate private domestic well drinking water supply impacts. However, due to inherent uncertainty in the degree to which this mitigation and those proposed in the SED may be implemented by local agencies and owners and operators of private domestic wells, drinking water impacts on private domestic wells under LSJR Alternative 3 are nevertheless considered significant and unavoidable. For more information on private domestic wells related to disadvantaged communities and assistance provided by the State Water Board, please see Master Response 2.7, *Disadvantaged Communities*.

Potential effects of SDWQ Alternatives on Wastewater Treatment Plants

This section addresses concerns by commenters of the potential effects the SDWQ alternatives may have on wastewater treatment plants (WWTPs; also referred to herein as publicly owned treatment works or POTWs) discharging to the south Delta waterways.

The existing southern Delta water quality objectives were challenged by the City of Tracy (*City of Tracy v. California State Water Resources Control Board*, Sacramento Super. Ct., Case No. 34-2009-80000392). The Sacramento Superior Court issued a peremptory writ of mandate, under which the court held that the existing Bay-Delta salinity objectives will not apply to the City of Tracy and other municipal dischargers pending reconsideration of the objectives in light of Water Code section 13241 factors and adoption of a program of implementation that includes municipal dischargers. The proposed plan amendments include that reconsideration and adoption of a program of implementation to satisfy the peremptory writ of mandate from the Tracy litigation. After adoption, the Central Valley Water Quality Control Board (Central Valley Water Board) would have to implement the south Delta salinity objectives in National Pollution Discharge Elimination System (NPDES) permits for southern Delta WWTPs. This would result in WWTPs being required to meet the amended salinity objective.

The environmental impacts of the reasonably foreseeable methods by which WWTPs could comply with the revised salinity objectives are analyzed in the SED, as are feasible mitigation measures and alternative means of compliance. As described in Chapter 13, Impact SP-1 (Require or result in the construction of new water supply facilities or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects), implementation of SDWQ Alternative 2 could result in NPDES permits that would require a reduction in salinity concentrations in WWTP discharges and could result in implementation of salinity reduction options (summarized below) that could result in environmental effects.

As discussed in Section 13.4.2, Methods and Approach, and Section 13.4.3, Impacts and Mitigation Measures, and Section 16.4, Southern Delta Water Quality Alternatives—Reasonably Foreseeable Methods of Compliance, the reasonably foreseeable methods of compliance that service providers may take to comply with salinity requirements of SDWQ Alternative 2 are as follows.

- Developing new, lower salinity source water supplies.
- Implementing salinity pretreatment programs that require salinity source controls for residential, commercial, institutional, and industrial sources that would reduce the amount of salts that are discharged to the sewer system.
- Implementing an effluent desalination process, such as RO, at the WWTP before treated effluent is discharged to the southern Delta.

Commenters have taken issue with the fact that the proposed salinity objectives (specifically SDWQ Alternative 2) may necessitate RO treatment of WWTP effluent to meet effluent limitations implementing the revised objective, and have noted that there would be impacts including increased energy consumption, increased greenhouse gas (GHG) emissions, and costs and challenges associated with brine disposal, as well as other potential economic impacts (e.g., increased costs to ratepayers).

The environmental impacts identified by commenters related to RO are consistent with those identified in Chapters 13 (Impact WQ-1) and 16 (Section 16.4.3, *Desalination*). Section 16.4.3 describes the relatively high cost of—and environmental considerations (including brine disposal) associated with—the construction and annual operation and maintenance of RO treatment systems and identifies potential environment impacts associated with RO. In Chapter 16 of the SED (Section 16.4.3), the State Water Board considered a reasonable range of environmental, economic, and technical factors with regard to RO. Table 16-30, *Potential Environmental Effects of Wastewater Treatment Plant Desalination* addresses environmental effects associated with construction and operation of RO treatment facilities.

Environmental impacts associated with construction as well as operation and maintenance would potentially affect resources including but not limited to aesthetics, air quality, aquatic and terrestrial resources, water quality, and greenhouse gases. As noted in Chapter 16 and in Chapter 20, economic considerations are based on unit cost of desalination as presented in the California Water Plan Update 2009. The analysis acknowledges that the costs of RO could vary depending on brine disposal method, quality and quantity of wastewater to be desalinated, and the desired quality of the effluent, among other variables.

Potential ratepayer impacts resulting from WWTP compliance with NPDES permit discharge limitations is discussed in Section 20.4.2, *Effects on Ratepayers and the Regional Economy.* As discussed in Chapter 16, the actual environmental effects associated with RO implementation would depend on the decisions made by the regulated entities. Any potential environmental impacts would depend on the action and the mitigation selected by or required of the entities implementing site-specific projects. Accordingly, as described in Master Response 1.1, the SED provides a program-level, not a project-level, evaluation of potential impacts. CEQA may require a project-level analysis when actions are undertaken or approved.

The relative salinity impacts of southern Delta WWTPs is acknowledged in Section 13.2.3, *Southern Delta*.

> Overall, the WWTPs have only a small effect on southern Delta salinity (Appendix C, Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives, and Appendix F.2, Evaluation of Historical Flow and Salinity Measurements of the Lower San Joaquin River and Southern Delta). For example, Tracy's discharge has limited effects on the overall salinity in the southern Delta compared to other sources of salinity in the area (e.g., water from agricultural activities and groundwater accretions). The permitted maximum salinity loads from the Tracy, Deuel, and Mountain House Community Services District (CSD) entering at the Head of Old River indicates that the salt load from point sources in this part of the southern Delta is a small percentage of the salt load entering from upstream. The salinity from wastewater discharges is generally exported at the CVP Jones Pumping Plant and SWP Banks Pumping Plant.

WWTPs are subject to the Clean Water Act and must control their salt discharges. It is reasonable to view the extent to which they must control their discharges in light of the constraints they face, the *de minimis* effect of their discharges on water quality related to salinity, and the plan amendment's implementation program's focus on water levels and flows to achieve the salinity water quality objectives. Salinity problems in the southern Delta are a complex issue, resulting primarily from low flows, tidal action, diversions by the federal Central Valley Project (CVP) and State Water Project (SWP), local water users, agricultural return flows, poor circulation, and channel capacity. As early as the 1991 Bay-Delta Plan, the State Water Board recognized the need to meet the salinity objectives largely through regulation of water flow. The plan amendments continue State Water Board Revised Decision 1641's obligations on the CVP and SWP to meet the salinity water quality objectives. Studies show the *de minimis* influence of WWTP discharges on downstream ambient electrical conductivity (EC) levels, both in low and high CVP and SWP export scenarios. The extent to which a WWTP can meet salinity water quality objectives in the southern Delta is in part controlled by factors beyond its control, namely flows and circulation patterns, which are largely controlled by tidal action and water diversions. WWTP discharges also reflect the EC levels of their source water, which are high in the southern Delta.

RO treatment can reduce salinity in WWTP effluent such that a WWTP can comply with numeric effluent limitations based on SDWQ Alternative 2. RO treatment, however, would not have a measurable effect on ambient salinity levels of receiving waters in the southern Delta. The WWTP commenters illustrate this point. It submitted a report entitled *Technical Evaluation of a Variance Policy and Interim Salinity Program for the Central Valley Region*, dated December 6, 2012 by Larry Walker and Associates (2012), which analyzed the incremental improvements of RO treatment of effluent and concluded that the improvements in local EC concentrations of the receiving water in the vicinity of Delta dischargers ranged from 0.32 percent to 2.68 percent and that farther away from the discharge there would be no measurable effects on water quality. Thus, there would be no meaningful impact on water quality related to salinity in the southern Delta by implementing RO treatment at WWTP.

RO treatment is also energy intensive and has environmental impacts, as stated above. It may create brine waste disposal issues in an area that is already challenged by high salts. RO treatment may also be cost prohibitive to construct and operate. In accordance with Water Code section 13241, the State Water Board has considered the costs set forth in the SED related to RO treatment and those submitted by the WWTP commenters.

Considering the foregoing, Appendix K has been revised to state that the State Water Board finds that RO treatment from WWTP discharges into the southern Delta is currently not a feasible technology for the purpose of controlling salinity in the southern Delta. Accordingly, in response to comments and in consideration of environmental impacts and Water Code section 13241, the

program of implementation requirements for WWTPs in Appendix K has been revised. The amended language is in the revised Appendix K and below. It allows the use of best management practices to achieve compliance with the revised salinity objectives where it is infeasible to comply with numeric effluent limitations due to the current infeasibility of RO treatment. Where numeric water quality based effluent limitations are infeasible (i.e., not appropriate), narrative best management practice effluent limitations may be imposed. (*Communities for a Better Environment v. State Water Resources Control Board* (2003) 109 Cal.App.4th 1089, 1105.) The amended language in Appendix K allows the Central Valley Water Board to impose numeric water quality based effluent limitations for salinity where it is feasible to comply with them. This approach accounts for the possibility that the facts and circumstances for finding RO treatment currently infeasible could potentially change in the future. For example, RO treatment of wastewater effluent in the southern Delta could improve, become less cost prohibitive, and have less energy and brine disposal impacts. In addition, wastewater discharges could cease to have a *de minimis* effect on salinity in the southern Delta and affect overall compliance with the salinity objective in the southern Delta. Where RO treatment of WWTP effluent in the southern Delta becomes feasible, it could be undertaken as a compliance measure. Accordingly, the SED's analysis of the environmental impacts of RO treatment is retained, but has been revised to reflect the changes to Appendix K.

Revised Implementation Program for WWTPs

The plan amendment's implementation program on how the salinity objective has to be implemented with respect to WWTPs/POTWs has been revised as follows:

> The Central Valley Regional Water Board shall regulate in-Delta discharges of salts by agricultural, municipal POTW, and other dischargers consistent with applicable state and federal laws, including, but not limited to, establishing water-quality based effluent limitations and compliance, monitoring and reporting requirements as part of the reissuance of NPDES permits under the Clean Water Act and the regulations thereunder. In most, if not all, cases, it may be infeasible for POTWs discharging to the southern Delta to comply with traditional numeric water-quality based effluent limitations for salts in NPDES permits. In cases where it is infeasible, the Central Valley Regional Water Board shall include the following types of enforceable effluent limitations:
>
> (a) A performance-based effluent limitation derived using, at a minimum, the past three years of effluent data and one that considers the potential for drought conditions, changing water sources, and water conservation.
>
> (b) Best management practices, including but not limited to: (A) an industrial pretreatment program, implemented through local ordinances, that minimizes salinity inputs from all industrial sources of salinity within the POTW's collection system; (B) source control measures, such as reducing salinity concentrations in source water supplies; (C) actions to limit or ban the use of residential self-generating water softeners or imposing salt efficiency standards on such water softeners; (D) a salinity education and outreach program; and (E) ongoing participation in the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS).
>
> In addition, where it is infeasible for POTWs discharging to the southern Delta to comply with traditional numeric water-quality based effluent limitations for salts, the Central Valley Regional Water Board shall require POTWs to submit the following information, which shall be submitted with a POTW's application for a renewal of its NPDES permit, except for (e) and (f), which shall be submitted in annual reports:
>
> (a) An evaluation of whether technological or economic changes have made previously deemed infeasible upgrades to control salinity in the POTW's effluent feasible.

(b) A survey of industrial sources of salinity regulated by the industrial pretreatment program, along with all annual reports submitted pursuant to that program documenting the implementation of salinity management strategies at the industrial facility within the collection system area.

(c) Documentation of source control measures taken. If alternative lower-salinity source water supplies were available but not utilized, a justification for not using such supplies shall be provided.

(d) An evaluation of the efficacy of actions taken to limit or ban the use of residential self-generating water softeners or to impose efficiency standards on water softeners within the POTW's collection system area. This evaluation shall include the estimated number of such water softeners in the POTW's collection system area. If a ban against the use of self-generating water softeners is not instituted, a justification why a ban is not feasible.

(e) Materials developed and disseminated in support of the salinity education and outreach program.

(f) Documented proof of participation in CV-SALTS.

Where it is or becomes feasible for a POTW to comply with numeric water quality based effluent limitations for salts, the Central Valley Regional Water Board shall require them in the applicable NPDES permit. In such cases, POTW compliance actions include, without limitation, source control, such as reducing salinity concentrations in source water supplies; pretreatment programs, such as reducing water softener use among water users; and desalination. Where appropriate, variance may also be granted in accordance with applicable state and federal law.

Other Concerns by WWTPs Commenters Regarding Implementation of the SDWQ Alternatives

This section discusses the WWTP commenters' concerns for how the south Delta salinity objectives will be implemented in NPDES permits for WWTPs. Many of these comments were made to avoid or lessen the likelihood of WWTPs having to comply with the proposed salinity objective (SDWQ Alternative 2) and institute RO treatment, which have been addressed through revisions to the program of implementation. For comments regarding the justification of SDWQ Alternative 2 and the recommended selection and approval of that alternative over SDWQ Alternative 3, please see Master Response 2.1, *Amendments to the Water Quality Control Plan*.

Reasonable Potential Analysis

Under the federal regulations implementing the Clean Water Act, specifically, 40 C.F.R. section 122.44(d)(1)(i), NPDES permits must include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including narrative objectives. The process of determining whether a discharge has reasonable potential is called a reasonable potential analysis (RPA). The WWTP commenters expressed concerns about how the salinity objectives will be implemented in NPDES permits issued by the Central Valley Water Board. Specifically, they are concerned that the salinity objectives will be applied at the end-of-pipe rather than at the historical compliance locations: San Joaquin River at Airport Way Bridge, Vernalis; San Joaquin River at Brandt Bridge; Old River near Middle River; and Old River at Tracy Road Bridge.

The commenters recommended that the RPA should consider available dilution and assimilative capacity, the existing controls on salinity required in the Bay-Delta Plan (e.g., operation of agricultural barriers and Department of Water Resources' or the U.S. Bureau of Reclamation's water

rights), and the relative impact the WWTPs have on salinity in the south Delta. The Central Valley Clean Water Association (CVCWA) provided implementation language with RPA procedures which state that a finding of reasonable potential should only be made if the discharge is meaningfully or reasonably causing or contributing to an exceedance of the salinity objective at the historical compliance locations. CVCWA recognized that this type of RPA may require water quality modeling to evaluate the impact of the WWTP discharges in the receiving water at the historical compliance locations. CVWCA recommended that in the event there is insufficient information to complete this evaluation (e.g., modeling data is insufficient), the Central Valley Water Board require additional monitoring/modeling in lieu of water quality based effluent limitations (WQBELs) so a complete RPA can be conducted.

Federal regulations already establish that the RPA can be conducted considering dilution and existing controls on salinity in the south Delta (40 C.F .R. § 122.44(d)(ii)). In addition, the U.S. Environmental Protection Agency (USEPA) provides guidance for conducting the RPA in its *Technical Support Document for Water Quality-Based Toxics Control* (EPA/505/2 90 001)(TSD) and the USEPA Permit Writers' Manual (EPA 833-K-10-001). Therefore, additional RPA procedures are not necessary in the Bay-Delta Plan Update. Moreover, the proposed RPA language provided by CVCWA makes the determination of whether a discharge of a pollutant may cause or contribute to an excursion above a water quality objective in the receiving water dependent on whether the pollutant will "meaningfully" affect the receiving water. No such concept exists in the federal regulations. Instead, the regulations require effluent limitations to control the discharge of pollutants "which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard. . . ." (40 C.F.R. § 122.44(d)(1)(i).) Where the projected concentration of a pollutant in the receiving waterbody exceeds the water quality objective, it follows that the discharge is contributing to the excursion of the objective, irrespective of whether the discharge is "meaningfully" contributing to the excursion or whether other sources are causing the excursion. With respect to requiring additional monitoring to conduct the RPA and in lieu of WQBELs, the federal regulations do now allow permitting agencies to not conduct the RPA to determine whether an effluent limitation is required.

Commenters also stated it is unclear as to where the RPA would be conducted, arguing for the historical compliance locations (i.e., specific points in the water body) in the existing Bay-Delta Plan instead of at the point of discharge (i.e., end-of-pipe). Under the Clean Water Act, states are required to develop water quality standards applicable to all waterbodies or segments that lie within the state (33 U.S.C. § 1313, subd. (c); 40 C.F.R. § 131.2, subd. (f), (i).) Water quality standards therefore apply throughout the waterbody for which they were adopted. The same is true here and is the reason for the SED's evaluation of conservative end-of-pipe limits, with which some commenters took issue. The proposed salinity water quality objective applies throughout the southern Delta and, therefore, must be considered at the point of discharge for NPDES permitted dischargers if no dilution is available, discussed below. It is thus not appropriate to categorically use the historical compliance locations as the point of compliance for the RPA for NPDES permitted dischargers.

The trial court in *City of Tracy v. State Water Board* found that RPA for the City of Tracy must be determined at the historical compliance location, Old River/Tracy Road Bridge, not at the end-of-pipe, because the court found that the language of the 2006 Bay-Delta Plan made the objective applicable only at the specified compliance locations. The trial court's determination is, however, no longer applicable here because the proposed salinity objective applies throughout the southern

Delta, consistent with the Clean Water Act, as discussed above. The use of the proposed compliance river segments and gage stations for the salinity objective is necessary for determining compliance by the U.S. Bureau of Reclamation and the Department of Water Resources.[5] Their use for these purposes should not be interpreted as a limitation on the applicability of the salinity objective, which applies throughout the southern Delta. Appendix K, section B.1.ii of the program of implementation has been revised to make this clearer. The following clarification has been added:

> Chapter III of this plan provides the general rule that unless otherwise provided, water quality objectives cited for a general area are applicable for all locations in that general area. Consistent with this, the use of compliance locations and gage stations to determine compliance by DWR and USBR shall not be interpreted as a limitation on the applicability of the southern Delta salinity objective, which applies throughout the southern Delta.

If there is available dilution of the discharge in the receiving water, RPA may be conducted away from the point of discharge.[6] The point of compliance for conducting the RPA depends on the facts and circumstances specific to each NPDES discharge and must be considered on a case-by-case basis through the NPDES permitting process under the Clean Water Act and the regulations thereunder. The facts and circumstances specific to each discharge must be evaluated every 5 years under the NPDES permitting cycle.

The City of Stockton commented that the RPA should not be evaluated at its discharge location because the salinity objectives are not applicable at the location of its discharge, approximately 6 miles downstream of Brandt Bridge. As stated above, the proposed southern Delta salinity objective is intended to apply throughout the southern Delta. The southern Delta, as evaluated in Appendix E, *Salt Tolerance of Crops in the Southern Sacramento–San Joaquin Delta,* and where the proposed water quality objective applies, is identified in red in Figure 1 in Appendix E, except that the entire segment of Middle River from Old River to Victoria Canal is also included since it is a continuous water body that supports agricultural beneficial uses (see also Figure 2-12 in Chapter 2, *Water Resources*). Based on these figures, the City of Stockton's discharge is within the southern Delta; therefore, the salinity objective applies to it and RPA should be evaluated at its discharge location unless there is available dilution.

It is acknowledged that the southern Delta POTWs are not a significant source of salinity. However, this does not mean that a discharge does not have reasonable potential to cause or contribute to an exceedance of a water quality objective. Where there is reasonable potential, and compliance with numeric effluent limitations is not feasible, the plan amendments' revised implementation program allows best management practices to comply with the proposed salinity objective.

[5] The federal regulations implementing the Clean Water Act have their own extensive compliance monitoring and other requirements for NPDES permits. The proposed plan amendments require the Central Valley Water Board to regulate NPDES permittees consistent with applicable laws, including the federal regulations governing NPDES permits.

[6] "To determine whether there is reasonable potential in an incomplete mixing situation, the permit writer would compare the projected concentration of the pollutant of concern at the edge of the regulatory mixing zone or after accounting for the available dilution allowance, with the applicable water quality criterion." *NPDES Permit Writers' Manual*, September 2010, pg. 6-29. In situations where a discharge rapidly and completely mixes with the receiving water an approved mixing zone may not be necessary to conduct the RPA per USEPA's guidance.

Water Quality Based Effluent Limitations

WWTP commenters recommended that the Bay-Delta Plan include procedures for calculating WQBELs based on a watershed approach. They said WQBELs should be mass-based load allocations that consider all controls in the watershed, similar to wasteload allocations established for total maximum daily loads (TMDLs). They further stated that mass-based load allocation for WWTPs should be established at loadings that do not go beyond those achieved through source control efforts, and a performance-based effluent limit should be established. In addition, they said NPDES permits could include provisions to ensure that effluent salinity does not unreasonably increase by implementing pollutant minimization and other best management practices. Alternatively, they commented that WQBELs could be calculated considering dilution. Furthermore, the commenters requested that the salinity variance provisions remain in the Bay-Delta Plan as a compliance option, but also requested a provision to allow the Central Valley Water Board to grant time schedules.

The Clean Water Act allows a wasteload allocation approach to permitting through an approved TMDL. A TMDL is a comprehensive strategy to achieve water quality standards for an impaired waterbody and includes a determination of the total amount of pollutant that can be discharged into an impaired waterbody from all sources. It is the sum of wasteload allocations for point sources, like WWTPs, and load allocations for nonpoint sources and natural background (40 C.F.R. § 130.2(i).) "If best management practices or other nonpoint source pollution controls make more stringent load allocations practicable, then wasteload allocations can be made less stringent. Thus, the TMDL process provides for nonpoint source control tradeoffs" (40 C.F.R. § 130.2(i).) Moreover, if a waterbody is impaired, WQBELs may be relaxed consistent with a TMDL "if the cumulative effect of all such revised effluent limitations based on such total maximum daily load or waste load allocation will assure attainment of such water quality standard . . . ." (33 U.S.C. § 1313(d)(4)(A)(i).) Here, there is no approved TMDL through which the desired permit limits can be imposed. While the State Water Board staff recognizes that WWTPs are not a significant source of salinity, the Clean Water Act does not sanction such an approach.

On the issue of not increasing salinity in effluent, in addition to water quality based effluent limitations in the form of best management practices where a WWTP cannot comply with traditional numeric effluent limitations, the revised program of implementation requires performance limits to ensure that dischargers performances achieved are maintained. Should numeric water quality based effluent limitations be feasible one day, dilution may be considered as appropriate through the permitting process. On the issue of variances, the plan amendments provide that the Central Valley Water Board may grant variances in accordance with applicable law. Nothing in the plan amendments precludes the Central Valley Water Board from granting time schedule orders where appropriate and authorized by law.

Commenters further requested that effluent limits be established as annual average effluent limits because shorter term limits are impracticable under 40 C.F.R. § 122.45(d), or that the salinity objectives be established as an annual average. The commenters contend that applying annual averages will reduce impacts on POTWs due to fluctuations in effluent salinity that can occur on a 30-day basis. Establishing the water quality objectives as annual averages or implementing annual averages for a 30-day average salinity objective may not be protective of the agricultural water supply beneficial use, because short-term spikes can negatively affect crops at critical growing stages. Furthermore, 40 C.F .R. § 122.45(d) requires all effluent limitations be stated as average weekly and average monthly for POTWs, unless impracticable. It is not impracticable to calculate these shorter term effluent limits.

A commenter suggested incorporating Clean Water Act section 302(b)(2), which provides that water quality based effluent limitations that would otherwise be required can be modified in NPDES permits if the applicant demonstrates at the hearing that there is no reasonable relationship between economic and social costs and the benefits to be obtained. This is unnecessary given the revisions to the program of implementation establishing that RO treatment is currently not feasible for purposes of controlling salinity in the southern Delta. The same is true for other similar suggestions made to avoid RO treatment to meet the revised salinity objective. Site-specific objectives for different areas of the southern Delta are not feasible because of the mixed nature of water supply, as explained in Chapter 3, *Alternatives Description*. Suggestions to adopt a salinity water quality objective as high as 1.4 deciSiemens per meter (dS/m) do not meet the project goals and objectives as much as SDWQ Alt. 2, as explained in Master Response 2.1.

Source Control Compliance Strategies

Source control strategies are addressed in the SED because they have been taken in the past, have been shown to work, and are required under the revised plan amendments. Furthermore, the SED acknowledges: "Service providers may choose any method of compliance described in Chapter 16, or a combination of methods, or they may identify another as-yet unknown method of compliance to comply with requirements from the revised objectives" (Section 13.4.2). In addition, the three methods of compliance are not intended to be limiting, but rather as a sampling of methods available during different stages of the domestic water supply cycle or wastewater treatment cycle, and are considered the most likely methods to be implemented by WWTPs (Section 20.4.1, *Costs of Methods of Compliance*). The SED analyzes reasonably foreseeable compliance actions a discharger might choose to undertake. These decisions, which have different cost implications, would be made by individual wastewater treatment agencies based on numerous considerations, including the needs of their service districts, availability of surface water and land, and specific operation of their wastewater facilities.

Wastewater treatment providers identify previous actions, including acquisition of new surface water supplies, implementation of industrial source control and pre-treatment programs, and outreach and education efforts, that have helped reduce salinity in POTW discharges to the southern Delta (Letter 1186). The wastewater treatment providers are generally not opposed to including these types of compliance mechanisms as options in the Bay-Delta Plan amendments; however, they would like recognition that these activities have already been undertaken and that there is little room for improvement beyond current levels through the use of these activities alone (Letter 1186). The State Water Board acknowledges that WWTPs have implemented many salinity source controls, and improvements in water quality have been made. This is acknowledged in Section 13.2.3. Pretreatment and source control, however, are ongoing actions and more can be done to reduce salinity, as further described below.

Assembly Bill (AB) 1366, approved by Governor Schwarzenegger in 2009, authorizes local agencies[7] that own or operate a community sewer system or water recycling facility to control salinity inputs from residential self-regenerating water softeners through ordinance or resolution. This would

[7] Local agencies must be within specified hydrologic regions of the state (Central Coast, South Coast, San Joaquin River, Tulare Lake, and the Counties of Butte, Glenn, Placer, Sacramento, Solano, Sutter, and Yolo), and the regional board must find that the control of residential salinity input contributes to the achievement of water quality objectives.

occur following a public hearing if the appropriate regional board makes a finding that the control of residential salinity input will contribute to the achievement of water quality objectives. As described in Section 13.2.3and Section 16.4.2, *Salinity Pretreatment Programs*, a salinity pretreatment program would target salinity loading in a wastewater service provider's wastewater collection system from domestic (residential) and commercial, institutional, or industrial (CII) sources. It would provide salinity source controls at different locations within a service district to reduce the overall salt loading into the sewer system. This reduction could be achieved through the elimination of household self-regenerating water softeners, for example; through regulatory means such as banning or imposing more stringent standards for residential water softeners; and through desalination devices by CII dischargers to reduce salinity loading to the wastewater collection system.

Some southern Delta cities and local entities have taken measures to eliminate saline source waters to WWTPs by implementing salinity pretreatment programs such as regulating the installation of residential water softeners. The City of Lathrop, for example, has banned the installation of residential self-regenerating water softeners under Ordinance 08-278 (Chapter 13.05) as a means of reducing salinity discharge and thereby achieving compliance with its waste discharge requirements (Lathrop discharges to land). Lathrop also enforces regulatory requirements that limit the volumes and the concentrations of saline discharge from nonresidential sources in the community waste disposal system "to the extent technologically and economically feasible" (Ordinance 08-278, Chapter 13.05.020). Similarly, the City of Brentwood[8] and the community services districts (CSDs) of Mountain House[9] and Town of Discovery Bay[10] have ordinances in place regulating the installation and use of self-regenerating water softeners that discharge to sewer systems tributary to the sewer systems owned and operated by those districts. Stockton, for example, pursuant to its NPDES permit (R5-2014-0070), controls industrial sources of salinity loading to its WWTP through an Industrial Pretreatment Program and total dissolved solids limits in industrial permits. For chemical additions at the city's regional wastewater control facility, Stockton is in the process of selecting a design-build firm to implement further treatment processes at its WWTP that "will meet current and future anticipated regulatory requirements" for salinity and other constituents (City of Stockton 2016). However, as noted in Stockton's May 2016 Salinity Pollution Prevention Plan annual progress report, because the Stockton regional wastewater control facility's discharge has been in compliance with the NPDES permit effluent limitation for EC, no additional actions to control salinity are currently proposed (City of Stockton 2016). The City of Tracy, by means of public outreach through its Utilities and Public Works Departments' FAQs webpages, informs the public that the city "utilizes surface water which is soft," and thus water softeners "are no longer needed in Tracy." Stockton and the Cities of Tracy and Manteca have not, however, enacted regulations targeting residential water softeners as a means to reduce salinity loading to WWTPs. Thus, regulation of water softeners is an opportunity for additional salinity source control now and in the future.

As discussed in Section 13.2.3, some service providers in the southern Delta (e.g., the Cities of Manteca, Tracy, and Stockton) have obtained new source water supplies. The modification of source water supplies with higher quality surface water generally results in a reduction of salinity in treated effluent from WWTPs. However, as noted by WWTP commenters, there have been some

[8] Ordinance No. 956 adopted September 22, 2015.

[9] Ordinance No. 2014-07 adopted June 11, 2014.

[10] Ordinance No. 24 adopted January 24, 2014.

recent increases, potentially attributable to the drought (Letter 1186). Typically, new source water supplies come from surface water rather than groundwater because, in general, surface water has a lower salinity than groundwater in the south Delta (Section 13.2.3). The State Water Board acknowledges, in this master response and throughout the entire SED, that surface water supplies could be affected under the LSJR alternatives, potentially resulting in reduced surface water supplies. As stated in Chapter 13 (Section 13.4.2 and Impact SP-1), Chapter 16 (Section 16.4.1, *New Source Water Supplies*), and Chapter 20 (Section 20.4.1), the particular circumstances of the service provider would need to be considered prior to implementing the potential option of developing new source water supplies from surface water. For example, cities or water districts that do not treat wastewater would have no obligation to try to reduce the salt levels in the water they provide, so this option may not be considered feasible in this circumstance. Specific circumstances also include the service provider's existing water supply(ies), the volume and timing of water to be replaced, and the salinity and cost of the replacement water. Also acknowledged in Chapter 16 (Table 16-25, *Potential Environmental Effects of New Source Water Supply Facilities*), municipalities may need to enter into contracts to purchase surface water from senior surface water users to operate the new source water supply facilities. It is anticipated that the new source water would come from existing entitlements and either purchased through different contracted vehicles, or potentially transferred to municipalities. The cost to purchase replacement water depends on a wide variety of factors including the supply and demand, and as acknowledged in Chapter 20, this may ultimately result in an increase in rates to ratepayers (Section 20.4.2). It is not possible for the State Water Board to identify every possible surface water source that a service provider could obtain or every particular circumstance that may contribute to decisions by service provides. However, clarifications have been made to Chapter 13, Impact SP-1, and Chapter 16 to identify that the LSJR flow objectives may result in reduced surface water supplies, thereby adding a component to the various considerations a wastewater treatment may need to make. These clarifications do not change the impact determinations associated with Impact SP-1 or the impact determinations made in Chapter 16, Table 16-25.

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