

## Attachment A-3

# Salinity Management Strategy

### 1.0 Problem Statement

The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (SRSJR Basin Plan) and the Water Quality Control Plan for the Tulare Lake Basin (TLB Basin Plan) (“Basin Plans”) establish regulations for the management of salinity to protect beneficial uses in surface and ground waters. In general, the Basin Plans have identified the following beneficial uses as being applicable to groundwater: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Service Supply (IND), and Industrial Process Supply (PRO). The TLB Basin Plan includes additional beneficial uses for Water Contact Recreation (REC-1), Recreation (REC-2) and Wildlife Habitat (WILD), and further varies from the SRSJR Basin Plan by specifying the beneficial uses that exist in specified groundwater Basins. These and other beneficial uses also apply to surface waters, depending on the surface water in question. (See Section 2.1 below for further discussion regarding beneficial uses).

Depending on the applicable beneficial use and specific waterbody, the Basin Plans also contain numeric and/or narrative water quality objectives for salinity that apply to waters of the state, which includes both surface and ground waters. With respect to salinity, the two beneficial uses most often impacted by salinity levels are AGR and MUN. For AGR uses, differing levels of salinity can negatively impact crop growth and yield. For MUN uses, salinity at some levels may impact consumer acceptance of drinking water. Water quality objectives set to protect the AGR and/or MUN beneficial uses are implemented in Waste Discharge Requirements or Conditional Waivers (WDRs/Conditional Waivers). The current permitting approach with respect to salinity in discharges does not account for, or address, the long-term complexity associated with managing salinity. With respect to surface waters, the issues of salinity are further complicated due to the interaction with water rights, mandated environmental flow releases, Delta salinity standards, and other compounding factors such as statewide policies for water conservation and mandatory water use restrictions.

In summary, the slow and steady accumulation of salts in Central Valley groundwater basins threatens not only the long-term viability of agriculture and industry, but also the water supplies of more than 25 million people. Salt accumulation poses many challenges. For example, many city and regional wastewater facilities cannot meet current Basin Plan water quality objectives, industries struggle to comply with salinity limitations, which often places limitations on their growth, agricultural activities are limited and face increased costs due to the management of saline waters, and drinking water sources throughout the region are impacted by high levels of salts. These conditions have been evident and worsening since the 1970s. To date, 1.5 million acres of irrigated land have been identified as salinity impaired, and a quarter million acres have been taken out of production. Unless steps are taken to address these issues, salts will affect an even greater portion of California’s communities, economy, and environment.

The Salt and Nitrate Management Plan (SNMP) and its associated technical documents propose long-term solutions for addressing salinity. For example, the Strategic Salt Accumulation Land and Transportation Study (SSALTS) identified and evaluated potential salt management strategies. Current salinity management activities may only address about 15% of the annual salt load. Long-term solutions, including development of regional de-salters, a regulated brine line, or other identified projects or control strategies are needed to address the other 85%.<sup>1</sup> These long-term management strategies will require significant state and federal funding to implement. In the meantime, the Central Valley Water Board must implement the Basin Plans through the adoption of WDRs/Conditional Waivers that consider the beneficial uses to be protected and the water quality objectives associated with those beneficial uses.

Because the solutions for addressing salinity are long-term in nature, the Central Valley Water Board needs be able to consider innovative salt management strategies for both the short term and the long term that move the region toward salt balance and restoration of impacted areas where feasible. This strategy provides additional regulatory flexibility in the issuance of WDRs/Conditional Waivers with salinity related requirements. Some salinity-related policies being proposed with the SNMP include:

- Revisions of the Exceptions Policy for Waste Discharges to Groundwater (SNMP Attachment A-4)
- Salinity Management to Provide Reasonable Protection of AGR Beneficial Uses in Groundwater (AGR Policy) (SNMP Attachment A-5)
- Revisions to the Salinity Variance Program Policy (SNMP Attachment A-6)
- Offsets Policy (SNMP Attachment A-7)
- Drought and Water Conservation Policy (SNMP Attachment A-8), and
- Guidance to Implement Secondary Maximum Contaminant Levels (SNMP Attachment A-9).

The applicability of the various policies will vary depending on implementation of this Salinity Management Strategy.

Overall, the Salinity Management Strategy provided here is intended to provide the Central Valley Water Board with a process for moving forward with long-term salinity management while identifying a reasonable interim permitting approach for salinity discharges.

## **2.0 Existing Regulatory Requirements**

### **2.1 Basin Plans**

As indicated previously, the Basin Plans designate the beneficial uses for waters of the state (i.e., surface and groundwaters) in the Central Valley, and establish water quality objectives to protect those uses. Water quality objectives are defined to mean, “the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.”<sup>2</sup> Such objectives may be either

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<sup>1</sup> CV-SALTS, *Strategic Salinity Alternatives Land and Transportation Study, Final Phase 2 Report: Development of Potential Salt Management Strategies*, prepared by CDM Smith, October 1, 2014

<sup>2</sup> Wat. Code, Section 13050

narrative or numeric. When objectives are expressed as a narrative, the Central Valley Water Board must then interpret the narrative objective with a numeric value or criteria. The Basin Plans include a Policy for Application of Water Quality Objectives, which is typically followed by Central Valley Water Board staff to interpret narrative objectives when setting permit limits and/or restrictions.

A summary of Basin Plan provisions for each Basin Plan are provided here.

### 2.1.1 SRSJR Basin Plan

#### 2.1.1.1 Beneficial Uses

In accordance with the State Water Resources Control Board's (State Water Board) Sources of Drinking Water Policy (Res. 88-63), the SRSJR Basin Plan states that "unless otherwise designated by the Regional Water Board, all ground waters in the Region are considered as suitable or potentially suitable, at a minimum, for municipal and domestic water supply (MUN)." Similar presumed uses include "agricultural supply (AGR), industrial service supply (IND), and industrial process supply (PRO)."<sup>3</sup> With respect to MUN designations, the SRSJR states that in making exceptions to the designation of MUN, the Central Valley Water Board will apply the exception criteria from State Water Board Resolution No. 88-63.

The exception criteria for MUN relevant to salinity, adopted into the Basin Plan via Central Valley Water Board Res. 89-056 are as follows:

- The total dissolved solids (TDS) exceed 3,000 mg/L (5,000 µmhos/cm, electrical conductivity) and it is not reasonably expected by the Regional Water Board [for the ground water] to supply a public water system, or
- There is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot be reasonably treated for domestic use using either Best Management Practices or best economically achievable treatment practices, or
- The water source does not provide sufficient water to supply a single well capable of producing an average sustained yield of 200 gallons per day.

With respect to the AGR, IND and PRO beneficial uses, the SRSJR Basin Plan includes the following salinity relevant exception criterion:

- There is pollution, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for agricultural use [or industrial use] using either Best Management Practices or best economically achievable treatment practices.<sup>4</sup>

For surface waters, Figure II-1 and Table II-1 identify the existing, potential, and existing limited beneficial uses applicable in the area covered by the SRSJR Basin Plan.<sup>5</sup> MUN and AGR are among the uses that are designated in Table II.1. For water bodies that are not listed in Table II-7, beneficial uses of any specifically identified waterbody in Table II-1 generally apply to its tributary streams unless specifically excepted in the Basin Plan. Like with groundwater, the MUN use has been assigned to

<sup>3</sup> SRSJR Basin Plan, Pg. II-3.00

<sup>4</sup> SRSJR Basin Plan, Pg. II-3.00; TLB Basin Plan, Pg. II-3

<sup>5</sup> SRSJR Basin Plan, Pg. II-4.00 – 8.00

surface water in the Basin Plan through the Central Valley Water Board's incorporation of Res. 88-63. Exceptions to this designation are included in the Basin Plan. The Basin Plan notes that in some cases a beneficial use may not be applicable to the entire body of water, and that in these cases the Central Valley Water Board's judgment will be applied. Furthermore, the Basin Plan notes it is impractical to list every surface water body in the Region; for water bodies not listed in Table II-1, the beneficial uses will be evaluated on a case-by-case basis.<sup>6</sup>

### 2.1.1.2 Water Quality Objectives

The SRSJR Basin Plan does not establish an explicit water quality objective for salinity in groundwater. Instead, the SRSJR Basin Plan relies on the following general narrative water quality objective to protect water quality in inland surface waters:<sup>7</sup> *“Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses.”* Secondary Maximum Contaminant Levels (MCLs) applicable to specific salinity ions are incorporated by reference. The SRSJR Basin Plan also includes language that acknowledges that specific treatment requirements are imposed by state and federal drinking water regulations on the consumption of surface waters under specific circumstances. In addition to the narrative water quality objective described above, the SRSJR Basin Plan includes water body-specific water quality objectives for salinity-related constituents. Specifically,

- *Electrical Conductivity and Total Dissolved Solids - Special Cases in the Sacramento and San Joaquin River Basins Other Than the Delta*<sup>8</sup> - Table III-3 establishes objectives for electrical conductivity that are applicable to specific surface waters: Sacramento River, portions of the Feather River watershed, and the segment of the San Joaquin River from the Friant Dam to the Mendota Pool.<sup>9</sup> Table III-3 also establishes water quality objectives for TDS that apply to portions of the American River watershed, Folsom Lake and Goose Lake.<sup>10</sup> With regards to the implementation of the Table III-3 water quality objectives, the Basin Plan states that if there is any conflict with the general Chemical Constituents water quality objectives, the more stringent of the objectives shall apply.
- *Electrical Conductivity, Total Dissolved Solids, and Chloride - Delta Waters*<sup>11</sup> – The SRSJR Basin Plan incorporates the salinity objectives applicable to the Delta by reference to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, 2006.

Incorporated into the SRSJR Basin Plan is the Control Program for Salt and Boron Discharges into the Lower San Joaquin River (LSJR).<sup>12</sup> The Control Program establishes salt load limits to achieve compliance at the Airport Way Bridge near Vernalis with salt and boron water quality objectives for the LSJR. The Control Program establishes timelines for: (1) developing and adopting salt and boron water quality objectives for the San Joaquin River upstream of the Airport Way Bridges near Vernalis; (2) a Control Program to achieve these objectives; and (3) developing and adopting a groundwater Control Program. As part of the implementation of this Control Program, the Central Valley Water

<sup>6</sup> SRSJR Basin Plan, Pg. 2.00

<sup>7</sup> SRSJR Basin Plan, Pg. III-3.00

<sup>8</sup> SRSJR Basin Plan, Pg. III-6.02

<sup>9</sup> SRSJR Basin Plan, Pg. III-7.00

<sup>10</sup> SRSJR Basin Plan, Pg. III-7.00

<sup>11</sup> SRSJR Basin Plan, Pg. III-6.02

<sup>12</sup> SRSJR Basin Plan, Pg. IV-32.00

Board is currently in the process of developing a Basin Plan amendment in collaboration with watershed stakeholders to set salt and boron water quality objectives and add/modify an implementation program for the Lower San Joaquin River.<sup>13</sup>

## 2.1.2 TLB Basin Plan

### 2.1.2.1 Beneficial Uses

The TLB Basin Plan includes the same general beneficial uses, and exceptions criteria as the SRSJR Basin Plan. The MUN beneficial use was designated by the Central Valley Water Board via Res. 89-098, which contained the following:

- The total dissolved solids (TDS) exceed 3,000 mg/L (5,000 µmhos/cm, electrical conductivity) and it is not reasonably expected by the Regional Water Board [for the ground water] to supply a public water system, or
- There is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot be reasonably treated for domestic use using either Best Management Practices or best economically achievable treatment practices, or
- The water source does not provide sufficient water to supply a single well capable of producing an average sustained yield of 200 gallons per day.

The TLB Basin Plan also includes a table of the various hydrologic units that identifies the applicable designated beneficial uses. Generally, all hydrologic units are designated with MUN unless otherwise footnoted. Further, the TLB Basin Plan includes language that states, "Existing beneficial uses generally apply within the listed Detailed Analysis Unit (DAU). Due to the size of the DAUs, however, the listed uses may not exist throughout the DAU."<sup>14</sup>

For surface water, Figure II-1 and Table II-1 in the TLB Basin Plan identify existing and probable future beneficial uses adopted for specific surface waters in the area covered by the TLB Basin Plan.<sup>15</sup> The applicability of MUN or AGR as beneficial uses on surface waters listed in Table II-1 varies to some degree. The TLB Basin Plan states that the beneficial uses of any specifically identified water body generally apply to its tributary streams. The Basin Plan also notes that (a) in some cases a beneficial use may not be applicable to the entire body of water, and that in these cases the Central Valley Water Board's judgment will be applied; and (b) it is impractical to list every surface water body in the region; for unidentified water bodies the beneficial uses will be evaluated on a case-by-case basis.<sup>16</sup> The TLB Basin Plan supplements the designations in Table II-1 by stating, "Upstream from the foothill reservoirs, the quality of surface waters remains good to excellent. The quality of the major streams is suitable for all beneficial uses."<sup>17</sup>

<sup>13</sup> [http://www.waterboards.ca.gov/centralvalley/water\\_issues/salinity/upstream\\_salt\\_boron/index.shtml](http://www.waterboards.ca.gov/centralvalley/water_issues/salinity/upstream_salt_boron/index.shtml)

<sup>14</sup> TLB Basin Plan, Pg. II-2

<sup>15</sup> TLB Basin Plan, Pg. II-4

<sup>16</sup> TLB Basin Plan, Pg. II-2

<sup>17</sup> TLB Basin Plan, Pg. II-2

### 2.1.2.2 Water Quality Objectives

The TLB Basin Plan includes the same narrative water quality objective and incorporation by reference of the secondary MCLs as the SRSJR Basin Plan, as described in Section 2.2.1.<sup>18</sup> In addition, the TLB Basin Plan establishes a policy that allows for controlling the rate of increase of salinity (“managed degradation”) by regulating both the maximum increase in salinity concentrations attributable to consumptive use (“*maximum EC shall not exceed the quality of the source water plus 500  $\mu\text{mhos/cm}$* ”)<sup>19</sup> and the maximum average annual increase in groundwater salinity on a basin-specific basis:<sup>20</sup>

*“All ground waters shall be maintained as close to natural concentrations of dissolved matter as is reasonable considering careful use and management of water resources.*

*No proven means exist at present that will allow ongoing human activity in the Basin and maintain ground water salinity at current levels throughout the Basin.*

*Accordingly, the water quality objectives for ground water salinity control the rate of increase.*

*The maximum average annual increase in salinity measured as electrical conductivity shall not exceed the values specified in Table III-4 for each hydrographic unit shown on Figure III-1.*

*The average annual increase in electrical conductivity will be determined from monitoring data by calculation of a cumulative average annual increase over a 5-year period.”*

The maximum average increase in groundwater electrical conductivity allowed varies by hydrographic unit, ranging from 1  $\mu\text{S/cm}$  to 6  $\mu\text{S/cm}$  in the Westside (North and South) and Tule River and Poso hydrographic units, respectively.<sup>21</sup>

As noted above, the TLB Basin Plan allows for managed degradation by regulating the maximum average annual increase in groundwater salinity on a basin-specific basis. The Basin Plan assumed that average annual increase would be determined from monitoring data using the prescribed method. However, an appropriate data monitoring network was never developed as planned and the allowable rate of increase of salt incorporated into the regulation has not been implemented as intended.

The TLB Basin Plan relies on the same general narrative water quality objective applied to groundwater to protect water quality in inland surface waters: “*Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses.*”<sup>22</sup> To support this water quality objective as related to municipal and domestic supply (MUN), secondary MCLs are incorporated by reference. The TLB Basin Plan also includes language that acknowledges that specific treatment

<sup>18</sup> TLB Basin Plan, Pg. III-7.

<sup>19</sup> TLB Basin Plan, Pg. IV-11

<sup>20</sup> TLB Basin Plan, Pg. III-8 (see TLB Basin Plan for referenced table and figure)

<sup>21</sup> TLB Basin Plan, Pg. III-8, Table III-4

<sup>22</sup> TLB Basin Plan, Pg. III-3

requirements are imposed by state and federal drinking water regulations on the consumption of surface waters under specific circumstances.

The TLB Basin Plan includes the following salinity narrative water quality objective applicable to surface waters: *“Waters shall be maintained as close to natural concentrations of dissolved matter as is reasonable considering careful use of the water resources.”*<sup>23</sup> The TLB Basin Plan also includes water quality objectives for electrical conductivity. Specifically, Table III-2 establishes objectives for specific reaches of the Kings, Kaweah, Tule and Kern Rivers,<sup>24</sup> and Table III-3 specifies objectives at selected streamflow stations on the Kings, Kaweah, Tule and Kern Rivers.<sup>25</sup>

## 2.2 Application of Water Quality Objectives

In the recent past, the Central Valley Water Board staff have generally interpreted narrative objectives in a conservative manner, applying the most stringent available criterion that applies to the most sensitive beneficial use. For example, to protect the AGR beneficial use, the most stringent criterion identified is the agricultural goal of 450 mg/L for TDS (700 µmhos/cm for electrical conductivity).

When MUN is the most sensitive beneficial use, Central Valley Water Board staffs have typically applied the secondary MCL for TDS or electrical conductivity, chloride and sulfate, which actually consists of a range of three different values: recommended, upper and short-term.<sup>26</sup> Often, the lowest recommended value is adopted into permits as a limitation, which is either 500 mg/L for TDS or 900 µmhos/cm for electrical conductivity.

Depending on what is the most sensitive beneficial use, the Central Valley Water Board has in the past established permit limitations and/or receiving water limitations based on the lowest recommended values. For some dischargers, the values are expressed as numeric effluent limitations that apply to the discharge at the end of pipe. For other dischargers, permit limits may include consideration of assimilative capacity in either surface or groundwater. In either case, compliance with such salinity limitations can be difficult, and such difficulty will increase over time as salts continue to concentrate in wastewater discharges and agricultural return flows. Costs to meet such stringent limitations in many instances is exorbitant, and provides little overall environmental benefit.

With respect to the managed degradation objectives in the TLB Basin Plan, they are not implemented as permit limitations (i.e., as numeric effluent limits or receiving water limits) because there is a lack of data and an appropriate process for determining compliance with such objectives.

Notably, both Basin Plans indicate that the objectives (narrative and numeric) do not require improvement over naturally occurring background concentrations.

## 2.3 Other Basin Plan Provisions

Beyond the designation of beneficial uses and water quality objectives, the Basin Plans include other provisions in their respective implementation chapters relevant to salinity. For example, the TLB Basin

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<sup>23</sup> TLB Basin Plan, Pg. III-4

<sup>24</sup> TLB Basin Plan, Pg. III-5

<sup>25</sup> TLB Basin Plan, Pg. III-6

<sup>26</sup> 22 CCR Table 64449-B

Plan specifically calls out the long-term problem of increasing salinity in groundwater and recognizes that degradation of ground waters by salts is unavoidable without a plan for removing salts from the Basin.<sup>27</sup> With respect to the sources of salt, the TLB Basin Plan indicates that:

Salts come from imported water, soil leached by irrigation, animal wastes, fertilizers and other soil amendments, municipal use, industrial wastewaters, and oil field wastewaters. These salt sources, all contributors to salinity increases, should be managed to the extent practicable to reduce the rate of ground water degradation.<sup>28</sup>

The SRSJR Basin Plan also recognizes that salt management is becoming increasingly important, and both the SRSJR and TLB Basin Plans recognize that strategies for development of a valley-wide drain for elevated salt discharges need to be pursued.<sup>29</sup>

The TLB Basin Plan includes specified effluent limits and/or provisions relevant to salinity discharges from municipal, industrial and oil field wastewater discharges to land.<sup>30</sup> These specific limitations are very conservative, and difficult for many dischargers to achieve. Because these limits are part of the TLB Basin Plan, the Central Valley Water Board has little discretion with respect to their application even in instances where compliance with such limitations results in no measurable environmental benefit.

## 2.4 State Policies

Many State Policies may impact salinity levels in both surface and ground waters in the Central Valley. Such policies include water quality-based policies as well as water rights based decisions. For the purposes of this Salinity Management Strategy, only key water quality related policies are discussed. Further evaluation of the impact of broader state policies that impact salinity levels in the Central Valley will be part of Phase I of the Salinity Management Strategy, which is discussed further below.

### *Recycled Water Policy*

State Water Board Resolution 2009-0011 (as amended by Resolution 2013-0003) established a Recycled Water Policy for the State of California. The purpose of the Recycled Water Policy is to increase the use of recycled water from municipal wastewater sources in a manner that implements state and federal water quality laws. Policy implementation is intended to encourage the use of recycled water, stormwater recharge, water conservation, conjunctive use of surface and groundwater, and improve the use of local water supplies. The Recycled Water Policy requires the development of salt and nutrient management plans for each groundwater basin in California. The specific requirements for the development of these plans is found in the State Water Board Resolution.

### *Sources of Drinking Water Policy*

The Sources of Drinking Water Policy (State Water Board Resolution 88-63) establishes a policy that all waters are considered suitable or potentially suitable to support the MUN beneficial use, with certain

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<sup>27</sup> TLB Basin Plan, Pg. IV-5.

<sup>28</sup> TLB Basin Plan, Pg. IV-6.

<sup>29</sup> SRSJR Basin Plan, Pg. IV-2.00.

<sup>30</sup> TLB Basin Plan, Pgs. IV-11 - IV-15.



exceptions. The Basin Plans implement this policy by generally assigning the MUN beneficial use to all surface waters and groundwaters in the Central Valley unless those waters were previously identified as not supporting the MUN use in the Basin Plans. Under existing Basin Plan interpretations, exemptions to the MUN beneficial use can only be made through Basin Plans amendments.

### ***State Water Board Resolution 68-16 – Statement of Policy with Respect to Maintaining High Quality Waters of California***

Resolution 68-16, otherwise referred to as the state’s antidegradation policy, applies when surface and/or groundwater is better than the applicable water quality objective specified in the Basin Plan for a particular constituent. The policy requires the Central Valley Water Board to regulate in a manner designed to maintain the highest quality of water that is reasonable. The state’s antidegradation policy sets forth the specific conditions that must be met and demonstrations that must be made before the Central Valley Water Board can allow a discharge (or discharges) to lower existing high quality waters:

- “1) Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies.*
- 2) Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.”<sup>31</sup>*

For surface waters, the federal antidegradation policy<sup>32</sup> also applies.

## **3.0 Salinity Management Strategy**

CV-SALTS recommends a long-term Salinity Management Strategy through the SNMP that:

- Controls the rate of degradation (“managed degradation”)
- Achieves long-term sustainability (salt balance) where feasible, practicable and reasonable
- Protects beneficial uses by meeting applicable water quality objectives and applying appropriate antidegradation concerns.

Because of the long-term nature of salinity management, this Salinity Management Strategy is phased over time. The first phase consists of developing a Prioritization and Optimization Study for salinity

<sup>31</sup> State Water Board. Statement of Policy with Respect to Maintaining High Quality of Waters in California. Res. No. 68-16 (Oct. 28, 1968).

<sup>32</sup> Title 40 Code of Federal Regulations, Section 131.12, Antidegradation Policy and Implementation Methods.

management for the entirety of the Central Valley Region. The overall goal of the Prioritization and Optimization Study is to further define the conceptual design of SSALTS into a feasibility study that identifies appropriate regional and sub-regional projects, including location, routing and implementation/operation of specific projects. In general, the Prioritization and Optimization Study is expected to include the following activities:

- Evaluate the impact of all state policies that impact management of salinity in the Central Valley region (e.g., Bay Delta Plan) to both surface and ground waters;
- Identify physical projects and proposed locations for long-term management of salinity (e.g., regulated brine line, salt-sinks, regional/sub-regional de-salters, recharge areas, deep well injection, etc.);
- Identify non-physical projects that help with managing salinity;
- Develop governance structures for implementation of the physical projects;
- Identify funding sources necessary for implementation of large-scale capital physical projects (state and federal capital expenditures);
- Identify the various environmental permits (and time-line for obtaining the permits) needed to implement the preferred physical projects;
- Identify and propose any necessary Basin Plan changes that may be necessary to implement the next Phase or Phases of the Salinity Management Strategy (e.g., offset policy);
- Develop the conceptual design for applicable projects; and
- Other related activities.

**Figure A3-1** provides an illustration of anticipated key milestones to be completed during the Phase I Prioritization and Optimization Study. While it is anticipated that completion of these milestones will take approximately 10-years, CV-SALTS recommends that the Executive Officer of the Central Valley Water Board be given the direct authority to extend this time frame if compelling reasons or adequate justification is provided for an extension. Once the Prioritization and Optimization Study is completed, and any Basin Plan amendments necessary to implement the next phase are adopted, Phase II of the Salinity Management Plan will be implemented. Implementation of Phase II, in whole or part, will occur as indicated in the Prioritization and Optimization Study, and after approval of any necessary Basin Plan amendments.

Phase II will generally consist of environmental permitting, obtaining funding, and engineering and design. The duration of Phase II is anticipated to be approximately 10 years. As with Phase I, the Executive Officer of the Central Valley Water Board should be given the authority to extend the anticipated time frame for compelling reasons, which may include availability of adequate funding to move forward with implementation of Phase II. Actual construction of the physical projects, and in particular a regulated brine line, identified in the Prioritization and Optimization Study, would then follow after completion of Phase II (i.e., Phase III). Implementation of Phase III construction of a regulated brine line is highly dependent on obtaining the necessary public funding, completion and approval of environmental impact studies, and other necessary approvals.

### 3.1 Funding and Overseeing the Prioritization and Optimization Study

Conducting the Prioritization and Optimization Study is anticipated to cost up to \$10 million, and as indicated, is expected to take 10 years to complete. In light of the cost and time associated with this comprehensive, valley-wide effort, CV-SALTS recommends that all (or almost all) dischargers of salinity help fund its implementation. CV-SALTS further recommends that entities beyond dischargers that also benefit from salinity management in the Central Valley participate in funding the Priority and Optimization Study as well as implementation of Phases II and III as applicable. Further, others that benefit from the Central Valley's control of salinity should also be part of this effort and assist in funding this Study. For dischargers, their level of participation will be determined by the lead entity based, in part, on ambient conditions, proportional contribution of salts and other factors as determined appropriate.

The likely entity that would take the lead in moving forward with the Prioritization and Optimization Study, including determining the appropriate level of financial participation for dischargers and others, is the existing Central Valley Salinity Coalition (CVSC). However, the CVSC may need to adjust its membership and policy structures slightly with respect to conducting the Prioritization and Optimization Study to ensure that the CVSC is properly organized for addressing Central Valley salinity issues. It is also anticipated that CVSC activities related to implementation of the Prioritization and Optimization Study will also be discussed in an open stakeholder process through an entity like the CV-SALTS Executive Committee. Like with the CVSC, the CV-SALTS Executive Committee may need to adjust its membership and policy structure for implementation of the Prioritization and Optimization Study.

### 3.2 Interim Salinity Permitting Approach

While the Prioritization and Optimization Study is being implemented, CV-SALTS recommends that the Basin Plans be amended to include an Interim Salinity Permitting Approach for discharges of salinity. This approach would allow the Central Valley Water Board to manage degradation while the long-term salinity efforts are being implemented. Because this approach is intended to be interim in nature, this approach would likely include a sunset provision in the Basin Plan, which could be renewed depending on the efforts associated with implementing the various applicable phases of the Salinity Management Strategy. At the outset, CV-SALTS recommends that the interim permitting approach be set in place for 15 years to allow for implementation of Phase I of the Salinity Management Strategy, which includes conducting and completing the Prioritization and Optimization Study and approving any Basin Plan amendments that are necessary for implementation of Phase II. At the end of Phase I, the Interim Salinity Permitting Approach may need to be extended to allow for implementation of Phase II, or to adjust the approach as deemed appropriate to implement Phase II. Any such change may require a Basin Plan amendment, which also takes time. The Interim Salinity Permitting Approach is discussed in more detail in Section 4.0 below.

### 3.3 Recommendations to Other Agencies

The programs of implementation in the Basin Plans include Central Valley Water Board recommendations to other agencies that are deemed necessary to implement water quality objectives and to obtain and/or maintain beneficial uses. Implementing long-term salinity management and achieving salt sustainability in the Central Valley is a statewide issue. Accordingly, efforts to achieve salt sustainability in the Central Valley will take extraordinary effort on the part of many, including the

California Legislature, State Water Board, California Department of Water Resources, United States Bureau of Reclamation, the Central Valley Water Board, dischargers and many others. For example, with respect to the State Water Board, it is responsible for adoption and implementation of the Water Quality Control Plan for the Bay Delta (Bay-Delta Plan), which includes salinity objectives for the Delta. CV-SALTS recommends that the State Water Board revise and implement the Bay-Delta Plan in a manner that is consistent with the SNMP and this Salinity Management Strategy. Further, many other actions related to water rights and water deliveries taken by the State Water Board, Department of Water Resources and the U.S. Bureau of Reclamation impact salinity build up in the Central Valley. Actions to improve the Delta by the Delta Stewardship Council, state and federal environmental protection agencies (e.g., U.S. Fish and Wildlife Service), and others also impact salinity levels in the Central Valley. Also, efforts being taken to comply with the Sustainability Groundwater Management Act will likely impact groundwater salinity issues in the Central Valley. In light of these many related actions and efforts, it is appropriate that the Basin Plan be amended to recognize the impact of other local, state and federal agency actions, and make recommendations for how these agencies should interact and be part of implementing the Central Valley's Salinity Management Strategy.

#### **4.0 Proposed Interim Permitting Approach for Discharges of Salinity**

CV-SALTS recommends implementation of an Interim Salinity Permitting Approach that is consistent with the Salinity Management Strategy described above and addresses the existing regulatory challenges, also described above. The approach, described in Section 4.2, is based on the findings and governing principles described below.

##### **4.1 Findings and Governing Principles**

The proposed interim permitting approach for salinity is based on the following findings and governing principles:

- This approach applies to permitting salinity discharges to surface and groundwater in the defined interim period.
- The proposed approach for permitting salinity discharges to surface and groundwater must be implemented in a manner consistent with state and federal Antidegradation Policies (i.e., Resolution No. 68-16 and 40 CFR 131.12), as applicable.<sup>33</sup>
- No proven means exist at present that will allow ongoing human activity in the Central Valley Region and maintain salinity levels throughout every groundwater basin.<sup>34</sup> Water conservation and increased recycled water use also increase salinity levels in groundwater. Therefore, the Interim Salinity Permitting Approach focuses on managing degradation while the long-term components of the Salinity Management Strategy are being implemented.
- It is reasonable to employ a long-term interim permitting approach. For example, the salt load currently existing in the vadose zone is typically unknown, but this load can impact the quality of

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<sup>33</sup> State Water Board Resolution 68-16. *Statement of Policy with Respect to Maintaining High Quality of Waters in California* (Antidegradation Policy) and Title 40 Code of Federal Regulations, Section 131.12, Antidegradation Policy and Implementation Methods.

<sup>34</sup> TLB Basin Plan, Pg. III-8.

the underlying groundwater over many years. In addition, the time required for recharge water to transit the vadose zone and return to use as groundwater at an irrigation supply well can be significant.

- Because of the long-term nature for implementation of the Salinity Management Strategy, it is reasonable to expect that dischargers will not be able to implement such strategies individually, but will need to participate in a larger region-wide collective effort. The larger collective effort would begin with implementation of the Prioritization and Optimization Study (Phase I), followed by Phases II and III. Due to the anticipated costs of these efforts, it is appropriate that most discharges not be subject to extensive and/or expensive salinity permit requirements during this interim period as long as they are actively participating in efforts to conduct to the Prioritization and Optimization Study.
- It is reasonable and appropriate to phase in permit requirements (e.g., WDRs/Conditional Waivers, National Pollutant Discharge Elimination System [NPDES] Permits) with respect to implementing the long-term Salinity Management Strategy to allow time to address drinking water issues for nitrates first. The SNMP identifies nitrate drinking water issues as its first near-term priority. Salinity is also a priority, but due to the complexities associated with salinity, it will need to be addressed over the long-term.
- To allow for the phased approach, and the interim permitting approach described in Section 4.2, the managed degradation objectives and specified salinity limitations in the TLB Basin Plan need to be deleted from the Basin Plan.
- The Central Valley Water Board retains authority to identify high priority saline discharges and/or areas where more stringent control programs must be implemented.

#### **4.2 Proposed Framework for Interim Salinity Permitting Approach – Phase I**

Given the findings and governing principles described above, CV-SALTS recommends an interim permitting approach for salinity-related discharges to surface and groundwater. To implement this approach in WDRs/Conditional Waivers, it will be necessary for the Central Valley Water Board to renew/revise existing WDRs/Conditional Waivers and NPDES Permits. Further, during this interim period, there will be new dischargers, or existing dischargers seeking facility modifications, that will have salinity discharges. The SNMP recommends a prioritization approach for addressing nitrate drinking water issues based on the severity of water quality contamination and immediate impact to users. It is not the intent of the Salinity Management Strategy to use limited available resources to revise individual WDRs/Conditional Waivers and NPDES Permits for salinity, especially where there are significant nitrate water quality issues. However, there is a need to ensure that efforts are moving forward with respect to the Prioritization and Optimization Study. To balance these two needs, CV-SALTS recommends that the Central Valley Water Board, in cooperation with stakeholders, develop a process whereby a series of resolutions/orders that amend applicable WDRs/Conditional Waivers are considered for adoption by the Central Valley Water Board to implement the Interim Permitting Approach that is described here. In summary, the Interim Salinity Permitting Approach would provide for discharger compliance with salinity water quality objectives during Phase I as long as the discharger is in compliance with Interim Permit Provisions applicable to their discharge, rather than

through stringent water receiving limits and/or effluent limits. Recommended Interim Permit Provisions are identified in section 4.2.1.

#### 4.2.1 Interim Permit Provisions

Interim Permit Provisions would require dischargers to continue current reasonable, feasible and practicable efforts to control levels of salinity in their discharges while participating in efforts to conduct the Prioritization and Optimization Study. Interim Permit Provisions may include the following requirements as applicable and appropriate:

- Implement salinity management practices and/or source control efforts;
- Implement pollution prevention plans, watershed plans, and/or salt reduction plans;
- Monitor for salinity in surface and groundwater as part of existing monitoring programs, or through regional monitoring programs as appropriate, which should be coordinated with the CV-SALTS Surveillance and Monitoring Program established to support implementation of the SNMP;<sup>35</sup>
- Maintain current discharge levels of salinity to the extent feasible, reasonable, and practicable, while accounting for conservation, salinity levels in the water supply source, and some appropriate increment of growth; and/or

Comply with interim permit limits, to the extent that the Central Valley Water Board finds it appropriate and necessary to adopt such limits. All dischargers would be required, and all interim permits would need to include, the following requirement:

- Participate in efforts related to conducting the Prioritization and Optimization Study, and subsequent Phases II and III as applicable. The level of participation would vary based on salinity in the discharge as well as local conditions, and the needed level of participation would be established by the lead entity (i.e., CVSC) that is overseeing the Prioritization and Optimization Study.

It is recommended that the resolutions/orders establish the time-frame for application of the interim permitting approach and associated provisions, which could not exceed 15 years in length. For NPDES dischargers, which are subject to federal regulatory requirements, CV-SALTS recommends that as NPDES permits are renewed on their normal five-year cycle, that the Central Valley Water Board consider approval of a salinity variance per the Salinity Variance Policy, which would include a requirement to participate in the Prioritization and Optimization Study in order to receive the variance for meeting applicable surface water quality objectives for salinity. Or, in the alternative, the Central Valley Water Board could consider a NPDES watershed-based permit for salinity as it deems appropriate, which too would require those covered by the watershed-based permit for salinity to participate in the Prioritization and Optimization Study efforts.

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<sup>35</sup> The Central Valley Water Board would retain its authority to identify high priority saline discharges where more stringent control programs must be implemented.

#### 4.2.2 Opting Out of Participation in Prioritization and Optimization Study Efforts

It is anticipated that the Central Valley Water Board will encourage and that most dischargers will choose to participate in efforts related to conducting the Prioritization and Optimization Study. However, the Central Valley Water Board does not have the authority to force dischargers into the Interim Permitting Approach, and to participate in the Prioritization and Optimization Study. Further, some dischargers have already made significant changes to their operation in order to meet restrictive salinity limitations and may decide that the Interim Permitting Approach does not provide them with an appropriate incentive to participate. Accordingly, it is important that the Salinity Management Strategy include an option for dischargers that choose to opt out of participating in efforts related to the Prioritization and Optimization Study. For those dischargers that choose to opt out, CV-SALTS recommends that the Central Valley Water Board permit such dischargers by implementing the following principles:

1. *Interpreting Narrative Water Quality Objectives* – When it interprets narrative water quality objectives for dischargers opting out, the Central Valley Water Board should select applicable salinity water quality objectives in a conservative manner. For the AGR beneficial use, the Central Valley Water Board should apply a conservatively protective agricultural goal (e.g., 700  $\mu\text{hos/cm}$  for electrical conductivity). However, in determining the agricultural goal that should be used to interpret the narrative objective, the Central Valley Water Board should consider whether a site specific agricultural goal has been developed and/or previously adopted for the discharger in question. If a site specific goal has been developed and/or previously adopted, CV-SALTS recommends that the Central Valley Water Board continue to apply that value if still appropriate. For the MUN beneficial use, the Central Valley Water Board should interpret water quality objectives in a manner consistent with the guidance contained in Attachment A-9, for Implementation of Secondary Maximum Contaminant Levels.<sup>36</sup>
2. *Allocation of Assimilative Capacity* – For dischargers opting out, no new allocation of assimilative capacity, or expansion of an allocation of assimilative capacity should be granted by the Central Valley Water Board. However, if a discharger has previously received an allocation of assimilative capacity, and such allocation was granted with the support of an antidegradation study/analysis, then the Central Valley Water Board should continue to allocate the previously approved assimilative capacity if still appropriate. For groundwater dischargers wishing to opt out, this would essentially mean that they would need to show that they do not cause or contribute to exceedances of groundwater limitations for salinity constituents in shallow groundwater unless they had previously been permitted the use of assimilative capacity in the groundwater, and such previously authorized use of assimilative capacity was reauthorized by the Central Valley Water Board.
3. *Issuance of Time Schedules* - CV-SALTS recommends that the Central Valley Water Board use its discretion to issue time schedules for meeting salinity limitations for those opting out sparingly, and for minimal time periods. In other words, a discharger opting out should generally be allowed no more than five years for meeting a restrictive salinity limitation. However, the Central Valley

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<sup>36</sup> If there are site specific water quality objectives for salinity constituents in the applicable Basin Plan, such objectives would apply.

Water Board maintains the discretion to determine if a time schedule is appropriate, and the length, for dischargers seeking to opt out.

4. *NPDES Permittees* – For surface water dischargers subject to an NPDES permit that wish to opt out, the Central Valley Water Board needs to determine reasonable potential in a manner that is consistent with 40 CFR § 122.44(d), and should determine if a compliance schedule is appropriate based on current applicable laws and policies, including consideration of meeting the SNMP goals. When interpreting a narrative water quality objective to conduct a reasonable potential analysis, the Central Valley Water Board must employ principle 1 above. Further, NPDES permittees should not be allowed to opt out if they are seeking a new allocation of assimilative capacity (i.e., mixing zone/dilution credit) in a surface water for meeting the salinity limitation. However, the Central Valley Water Board should consider maintaining any previously approved mixing zone/dilution credits. Salinity variances would not be an available option for those seeking to opt out of the Prioritization and Optimization Study. In summary, NPDES dischargers wishing to opt out would essentially need to show that (1) the discharge does not have reasonable potential to exceed the applicable criteria; (2) the discharge is able to comply with a water quality-based effluent limit if there is reasonable potential; or (3) the discharge will be able to comply with a water quality-based effluent limitation subject to the terms of a compliance schedule approved by the Central Valley Water Board.

#### **4.2.3 Process for Development and Adoption of Resolutions/Orders to Implement Interim Permitting Approach**

To prepare the appropriate resolutions/orders that amend the salinity provisions in existing permits, and that establish such provisions for future permits, CV-SALTS recommends that the Central Valley Water Board and relevant stakeholders begin the process for developing such resolutions/orders as soon as possible. It is recommended that such resolutions be prepared and ready for Central Valley Water Board consideration within one (1) year of the Basin Plan amendments becoming effective. In the meantime, while such resolutions are being developed, CV-SALTS recommends that the Central Valley Water Board permit salinity discharges in a reasonable manner that looks forward towards implementing the Salinity Management Strategy as set forth in the SNMP.

#### **4.3 Potential Future Permitting Approach**

At the close of Phase I, or potentially at the end of Phase II, the Central Valley Water Board may determine that it is necessary to revise the interim permitting approach for salinity. This may include the need to provide further guidance with respect to interpretation and application of salinity standards for protection of the AGR and MUN beneficial uses. Through the CV-SALTS process, policy documents have been prepared that address application of salinity standards for protection of AGR, as well as application of the Secondary MCLs for salinity. The documents are part of the SNMP, and may result in Basin Plan amendments in 2017 as determined appropriate. However, for the AGR Policy in particular (see SNMP Attachment A-5), it may be more appropriate to not amend the Basin Plan in 2017 to incorporate those policy recommendations but rather wait until after completion of Phase I of the Salinity Management Strategy.



## 5.0 Proposed Modifications to the Basin Plans to Support Policy Implementation

The following subsections summarize the key changes anticipated for each Basin Plan to support adoption of this policy.

### *Existing and Potential Beneficial Uses*

No changes are proposed to either Basin Plan

### *Water Quality Objectives*

Remove the managed degradation objectives from the TLB Basin.

### *Implementation*

(1) Remove salinity related limitations in the TLB Basin Plan, Implementation Chapter for municipal, industrial and oil field wastewater, (2) Adopt the Interim Salinity Permitting Approach into both the SRSJR and TLB Basin Plans.

Figure A3-1. Proposed Phase I Prioritization and Optimization Study Schedule

Category	Year of Implementation									
	1	2	3	4	5	6	7	8	9	10
Stakeholder Coordination	Stakeholder Coordination Meetings (as needed frequency)									
	SGMA GSA Coordination Meetings (as needed frequency)									
Strategic Planning	Regulatory and Policy Evaluations								Phase II Planning	
Governance	Governance Plan – Formation and Structure					Implementation and Refinement of Governance Plan				
Funding	Funding Plan and Financing Strategy					Implementation of the Funding Plan and Financing Strategy				
Prioritization & Salinity Management Analyses	Prioritization/Salt Management Analyses to Support Identification of Salt Management Projects				Interim Report					
Conceptual Design of Salt Management Project						Concept Design for Subregional Salt Management Projects and Regional CVBL Project				
Special Studies				Groundwater Quality Trace Constituent Stud						
			Emerging Tech Update No. 1			Emerging Tech Update No. 2			Emerging Tech Update No. 3	
						Recycled Water Imports Study				
								Stormwater Recharge Master Plan Study		