

Section 1

Executive Summary

California's Central Valley is one of the most productive agricultural regions in the world and is home to almost 20% of California's population (estimated at over 38 million in 2015). By 2030 the state population is expected to increase by more than 13% to over about 44 million people and by 2050 the population is expected to be close to 50 million people. This steady growth will put significant, increased demands on state and regional water resources.^{1,2} Communities in the Central Valley rely on surface and groundwater to support many beneficial uses, including agriculture and drinking water supplies. However, elevated salt and nitrate concentrations in portions of the Central Valley impair, or threaten to impair, the region's water and soil quality. Such impairment, in turn, threatens agricultural productivity and/or the region's drinking water supplies. For example, a 2009 economic study, projected that if salt management did not change, direct economic costs could exceed \$1.5 billion a year within the Central Valley by 2030.³

While the threats to the region's water supplies with respect to salts and nitrates is fairly well understood, the solutions for addressing such threats are complex and multi-faceted. As a result, to address these complex issues, a broad coalition of representatives from agriculture, cities, industry, state and federal regulatory agencies and the public (including Environmental Justice advocates on behalf of Disadvantaged Communities and populations) banded together, starting in 2006, to develop an environmentally and economically sustainable plan for the management of salts and nitrates in the Central Valley. This effort became known as the Central Valley Salinity Alternatives for Long-Term Sustainability initiative, or otherwise CV-SALTS. The overarching goals adopted by CV-SALTS include⁴:

- Sustain the Valley's lifestyle;
- Support regional economic growth;
- Retain a world-class agricultural economy;
- Maintain a reliable, high-quality urban water supply; and
- Protect and enhance the environment.

CV-SALTS was tasked with developing a Salt and Nitrate Management Plan (SNMP)⁵ for the entirety of the Central Valley Regional Water Quality Control Board's (Central Valley Water

¹ *Groundwater Quality Protection Strategy A "Roadmap" for the Central Valley Region*, Central Valley Water Board, August 2010

² <http://www.dof.ca.gov/research/demographic/reports/projections/P-1/>

³ *The Economic Impacts of Central Valley Salinity*. Final Report to the State Water Resources Control Board; prepared by Howitt et al., University of California Davis, March 20, 2009

⁴ <http://cvsalinity.org/>

⁵ Since salt and nitrate are of critical concern in Central Valley groundwater, the SNMP does not address constituents of emerging concern (CECs) or nutrients other than nitrate.

Board's) jurisdictional area (also referred to as "Central Valley" or "Region 5")⁶ (**Figure ES-1**). The Central Valley SNMP builds on a range of water quality management policies and mechanisms already in existence, proposes additional policies and tools needed to provide the Central Valley Water Board with flexibility in addressing legacy and ongoing loading of salt and nitrate in the diverse region, and presents a comprehensive regulatory and programmatic approach for the sustainable management of salt and nitrate.

Although broader in overall scope, the SNMP was also developed to meet requirements set forth in the State Recycled Water Policy⁷ (RWP), adopted in 2009 by the State Water Resources Control Board (State Board). The RWP provides statewide direction regarding the appropriate criteria to be used when issuing permits for recycled water projects. In addition, the RWP articulates the State Board's policy that every groundwater basin/sub-basin in California needs to have a consistent salt/nutrient management plan (i.e., SNMP). To ensure that such plans were developed in a timely manner, the RWP establishes criteria and timelines for their development. One of the overarching goals of the RWP is to develop salt and nutrient management plans (for groundwater basins or sub-basins) that are sustainable on a long-term basis and to provide the state with clean, abundant water. It is the intent of the RWP that local stakeholders work collaboratively to fund and develop locally driven SNMPs. Specific goals identified by the RWP include:

- Facilitate the development of local SNMPs that are consistent and/or integrated with the Central Valley SNMP;
- Support increased recycled water use in the region;
- Support the use of stormwater recharge as a water management measure;
- Maintain a reliable, high-quality water supply by protecting the beneficial uses of groundwater;
- Balance the use of assimilative capacity and the implementation of management measures within the region; and
- Monitor the implementation of SNMPs to determine if desired outcomes are being achieved.

Addressing the goals and requirements of the SNMP components of the RWP through the CV-SALTS initiative was a logical progression, and to that end, the State Board allocated \$5-million of Clean-up and Abatement Account funds to facilitate the effort. Stakeholders have matched the \$5-million with over \$2-million directly related to the SNMP development, and several million directed to funding ongoing control and monitoring activities.

⁶ The Central Valley Regional Water Quality Control Board is a state agency, organized under the Porter Cologne Water Quality Control Act at Water Code section 13200(g). The water code defines the Central Valley's jurisdictional area as "all basins, including Goose Lake Basin draining into the Sacramento River and San Joaquin Rivers to the easterly boundary of the San Francisco Bay region near Collinsville."

⁷ State Water Resources Control Board Resolution No. 2009-0011, amended by Resolution No. 2013-0003 http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2013/rs2013_0003_a.pdf

1.1 Management Goals & Priorities

Overall, to achieve desired outcomes for the management of salt and nitrate within the Central Valley, this Central Valley SNMP addresses the requirements of the RWP, and also addresses legacy and ongoing salt and nitrate accumulation issues. Further, the Central Valley SNMP looks to address both surface and groundwater issues with respect to salts and nitrates. However, the primary focus for early actions is on the need to address salt and nitrate issues in groundwater in a manner that leads to environmental and economic sustainability. The Central Valley SNMP is built on the following management goals:

Goal 1: Ensure a Safe Drinking Water Supply

The most important salt and nitrate management goal for the Central Valley Region is to ensure that a safe drinking water supply is available to all residents of the region. The need to ensure a safe drinking water supply is the highest priority for this SNMP and shall be addressed as quickly as possible in areas in the Central Valley Region where residents do not have drinking water that meets applicable drinking water standards.

Goal 2: Achieve Balanced Salt and Nitrate Loadings

Goal 2 seeks to establish a balance of the mass of salt and nitrate in groundwater underlying each permitted or managed area, meaning that achievement of this goal results in no additional degradation of the receiving water.

Goal 3: Implement Managed Aquifer Restoration Program

This goal seeks to restore salt and nitrate levels within groundwater basins/sub-basins, or locally managed areas, to concentrations that are at or below the applicable water quality objectives established for each constituent. Studies commissioned by CV-SALTS,^{8, 9} as well as studies conducted by others in the Central Valley,¹⁰ demonstrate that achieving applicable salt and nitrate objectives in already impaired waters represents a significant challenge. Given this challenge, this SNMP not only focuses on restoring water quality to meet the applicable objectives where possible, but it also seeks to minimize or prevent further degradation so that additional impairments do not occur.

In general, these goals recognize the need to focus limited resources first on health risks, and then focus on balancing salt and nitrate loading followed by restoring impacted water. Notably, however, activities (both regulated and unregulated) leading to salt and nitrate balance are ongoing now (e.g., preparation and implementation of nutrient management plans, improved

⁸ *Nitrate Implementation Measures Study (NIMS) Final Report*. Report prepared by CDM Smith on behalf of CV-SALTS, March 31, 2016

⁹ *Strategic Salt Accumulation Land and Transportation Study (SSALTS), Final Phase 2 Report: Development of Potential Salt Management Strategies*. Report prepared by CDM Smith on behalf of CV-SALTS. October 1, 2014; *SSALTS, Final Phase 1 Report: Identification and Characterization of Existing Salt Accumulation Areas*. Report prepared by CDM Smith on behalf of CV-SALTS. December 13, 2013.

¹⁰ See for example: (a) King et al. 2012. *Groundwater Remediation and Management for Nitrate*. Technical Report 5 in: *Addressing Nitrate in California's Drinking Water with a Focus on Tulare Lake Basin and Salinas Valley Groundwater. Report for the State Water Resources Control Board Report to the Legislature*. Center for Watershed Sciences, University of California, Davis. (b) Harter et al. 2012. *Addressing Nitrate in California's Drinking Water with a Focus on Tulare Lake Basin and Salinas Valley Groundwater. Report for the State Water Resources Control Board Report to the Legislature*. Center for Watershed Sciences, University of California, Davis.

irrigation practices, real-time management of discharges, pilot studies, etc.) and are anticipated to continue and improve moving forward. With respect to the ultimate goal of restoring the region's groundwater basins, the SNMP recognizes that it will be a time and resource intensive effort. The SNMP provides a framework with milestones and timelines for undertaking such restoration efforts. The Central Valley SNMP also identifies a number of proposed policy changes that will support this effort, and recommends that the Central Valley Water Board take action to adopt these policy recommendations.

1.2 Central Valley SNMP

The Central Valley SNMP provides the over-arching framework, including default identification of current ambient water quality and available assimilative capacity in the Central Valley's groundwater basins, for the Central Valley. However, due to the diversity of the region, the SNMP also provides for local flexibility and encourages local-scale management plans to be developed and implemented by local and/or regional entities as local stakeholders deem appropriate. For the purposes of this SNMP, these locally developed management areas are referred to as Management Zones, which are discussed in detail in Attachment A of this SNMP.

The SNMP includes the required elements from the RWP and recommends new policies to be considered for adoption by the Central Valley Water Board. The Regional Board's water quality control policies/regulations are adopted into water quality control plans, as is required by law.¹¹ For the Central Valley, there are two such plans: *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) (collectively referred to as "Basin Plans"). Thus, to the extent that the SNMP includes recommended policies, or proposed changes/clarifications to existing Regional Board policies, such revisions would need to be adopted by the Central Valley Water Board as part of a process for amending the Basin Plans. Thus, the SNMP includes recommended policy/clarification changes to facilitate implementation of the SNMP; however, the Central Valley Water Board reserves the right and authority to adopt or reject the recommended changes. If adopted, the outcome would be a revised regulatory framework with the flexibility necessary to make salt and nitrate management decisions at the appropriate temporal, geographic and/or management scales.¹²

To better explain some of the proposed policy changes (and how they might work in reality), the SNMP is supported by archetype/prototype studies ("proofs of concept") that provide examples and/or guidelines for consideration when implementing various elements of this SNMP. Further, findings from technical studies provide the basis for SNMP recommendations for the short and long term management of salt and nitrate throughout the Central Valley.¹³

¹¹ California Water Code, §13240.

¹² See CV-SALTS Strategy and Framework at <http://www.cvsalinity.org/index.php/docs/committee-document/executive-committee-docs/1411-cv-salts-program-work-plan-v-8-approved-3912pdf/file.html>

¹³ <http://www.cvsalinity.org/index.php/committees/technical-advisory/technical-projects-index.html>

1.2.1 Implementation Framework

The Central Valley SNMP establishes the minimum or default expectations for the management of salt and nitrate in discharges to surface and groundwater in the Central Valley Region. Generally, and after the relevant recommendations are adopted into Basin Plans, the SNMP recommends that management measures identified in the SNMP be implemented through the Central Valley Water Board's issuance of Waste Discharge Requirements (WDRs) (individual or General Order) or Conditional Waivers (Waivers).¹⁴ The SNMP recommends that incorporation of the management measures from the plan be phased-in across the Region to allow focus on the most significant water quality priorities first, and to allow for a reasonable allocation of resources. For some dischargers, current WDR and/or Conditional Waiver requirements may already be set at a level necessary to implement or meet the management measures recommended in the SNMP. For others, additional requirements may be necessary.

Where a group of dischargers desire to work collaboratively to comply with and implement this SNMP within a delineated area, these dischargers are encouraged to establish a Management Zone in accordance with the recommended Management Zone Policy, which is provided in section Attachment A of the SNMP. Once a Management Zone is established, WDRs and/or Conditional Waivers for multiple dischargers participating in the zone will likely need to be amended (individually or collectively) to incorporate the salt and nitrate management measures that are established specifically for that Management Zone.

1.2.2 Protection of Beneficial Uses

Groundwater basins in the Central Valley are considered suitable or potentially suitable for the following beneficial uses: Municipal and domestic water supply (MUN), agricultural water supply (AGR), industrial service supply (IND), and industrial process supply (PRO). Water quality objectives have not been established for IND or PRO. For MUN¹⁵ and AGR,¹⁶ the following nitrate or salinity water quality objectives provide the basis for the protection of these uses:

1.2.2.1 MUN Beneficial Use

Nitrate

The existing nitrate water quality objective for the protection of drinking water supplies in the Central Valley is 10 mg/L (nitrate measured as nitrogen). This SNMP reaffirms that objective for the protection of a waterbody used as a drinking water supply.

¹⁴ All persons discharging wastes, or threatening to discharge wastes, to waters of the state are required to obtain authorization for such discharges from the Central Valley Water Board. The Central Valley Water Board's authorization is provided through the adoption of waste discharge requirements or adoption of a conditional waiver from waste discharge requirements, which are essentially permits that allow the discharge. See Wat. Code § 13260 et seq.

¹⁵ The Basin Plans define MUN as "Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply."

¹⁶ The SRSJR Basin Plan defines AGR as: "Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation (including leaching of salts), stock watering, or support of vegetation for range grazing"; the TLB Basin Plan defines AGR as: "Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing".

Salinity

Implementation of this SNMP is based on the protection of a range of total dissolved solids (TDS) or electrical conductivity (EC) concentrations established in 22 California Code of Regulations (CCR) Table 64449-B (“Secondary Maximum Contaminant Levels [SMCL] Ranges”) and incorporated by reference into the Basin Plans (Chapter 3, Water Quality Objectives, Chemical Constituents). This SNMP recommends that the salinity water quality objective to protect the MUN beneficial use be 1,000 mg/L TDS or 1,600 $\mu\text{S}/\text{cm}$ EC, consistent with the “Upper” level provided in 22 CCR Table 64449-B.

1.2.2.2 AGR Beneficial Use

Nitrate

No water quality objective has been established for nitrate to protect the AGR beneficial use.

Salinity

The Central Valley Basin Plans do not establish explicit numeric water quality objectives for salinity in groundwater for the protection of the AGR beneficial use. Instead, the Basin Plan relies on a narrative water quality objective to protect AGR. To support translation of the narrative water quality objective, this SNMP recommends the establishment of four AGR classes based on levels of protection required for crop irrigation and stock watering (see Policy: “Salinity Management to Provide Reasonable Protection of AGR Beneficial Uses in Groundwater”, Attachment A):

- *AGR Class 1:* TDS < 1,000 mg/L (EC < 1,500 $\mu\text{S}/\text{cm}$).
- *AGR Class 2:* 1,000 mg/L < TDS < 2,000 mg/L (1,500 $\mu\text{S}/\text{cm}$ < EC < 3,000 $\mu\text{S}/\text{cm}$).
- *AGR Class 3:* 2,000 mg/L < TDS < 5,000 mg/L (3,000 $\mu\text{S}/\text{cm}$ < EC < 7,500 $\mu\text{S}/\text{cm}$).
- *AGR Class 4:* TDS > 5,000 mg/L (EC > 7,500 $\mu\text{S}/\text{cm}$).

These classes are assigned to groundwater basins/sub-basins based on existing ambient TDS water quality conditions determined for the production zone (see Section 4.2).

1.2.3 Existing Water Quality Conditions & Assimilative Capacity

The SNMP uses the groundwater basins/sub-basins established by the Department of Water Resources (DWR)¹⁷ as the basic or default unit for the management of salt and nitrate in the Central Valley. The SNMP establishes existing water quality conditions and water quality trends within each of these basins and sub-basins for Upper, Lower, and Production Zones, where sufficient data are available.¹⁸

Table 1-1 summarizes the estimated average nitrate (mg/L) and TDS concentration (mg/L) in groundwater wells in the Upper Zone of groundwater basins/sub-basins in the valley floor of the Central Valley Region (**Figure 1-1**), where sufficient data are available. **Table 1-2** provides

¹⁷ *California’s Groundwater*, 2003. DWR Bulletin 118, Update 2003. October 2003. See Sacramento River, San Joaquin River and Tulare Lake Hydrological Regions

¹⁸ See Section 4 of this SNMP for definitions of the upper, lower and production zones.

nitrate and TDS data for groundwater basins located outside the valley floor of the Central Valley Region, again where sufficient data are available. For these basins the water quality data represent the average of all available data, not just for the Upper Zone.

Table 1-1 also provides information regarding the volume-weighted nitrate and TDS concentrations in the Production Zone of groundwater basins/sub-basins in the valley floor of the Central Valley Region, where sufficient data are available. Water quality characteristics of the Production Zone as identified in Table 1-1 are expected to be used in the SNMP to establish the default amount of assimilative capacity that may be available on a sub-basin basis for the assimilation of salt and nitrate up to a certain level, and that would still be protective of beneficial uses.

Notably, the default values established in the SNMP for existing water quality conditions and assimilative capacity are applied broadly to an entire groundwater basin/sub-basin and do not consider variability in salt and nitrate concentrations at the local or sub-regional scale. For example, the broad default values presented in the SNMP do not evaluate existing water quality conditions or available assimilative capacity for Management Zone areas or for the specific zone of influence for a single discharge. To address concerns related to the creation of broad default values, the SNMP recommends that discharger(s) confirm available assimilative capacity for the defined Management Zone area, or for the area of influence associated with an individual (or collective individuals) that are covered by a single order. Use of assimilative capacity is further discussed in the Nitrate Permitting Strategy in Attachment A, and any permitted use of assimilative capacity must be consistent with Basin Plans and applicable State Policies.

1.2.4 Process for Implementing the SNMP in WDRs & Conditional Waivers

As indicated, the SNMP includes recommended management measures that will need to be addressed and/or incorporated into WDRs or Conditional Waivers. Thus, the SNMP anticipates that all existing dischargers covered by a WDR or Conditional Waiver will need to seek a revised WDR/Waiver so that the management measures established in the SNMP can be formally incorporated into their permit requirements. Or, at the very least, existing dischargers will need to provide the Central Valley Water Board with an appropriate level of information to demonstrate that their existing WDRs or Conditional Waiver sufficiently complies with the SNMP.

The SNMP recognizes that there are hundreds of existing dischargers in the Central Valley covered by individual WDRs, and thousands of individuals subject to General Orders. Accordingly, it is not feasible or possible for the Central Valley Water Board to amend all WDRs and General Orders at once to incorporate provisions from the SNMP. To address this simple reality, the SNMP will establish an orderly and priority process for reviewing existing WDRs and Conditional Waivers for the incorporation of applicable measures specified in the SNMP. In short, dischargers will be notified by the Central Valley Water Board when their WDRs/Waivers must be evaluated to determine if their applicable permit needs to be updated to incorporate elements from the SNMP. Notification by the Central Valley Water Board will be provided based on a priority scheme that focuses on the most significant water quality concerns first.

Table 1-1. Nitrate and Total Dissolved Solids Concentrations in Groundwater Basins/Sub-basins in the Central Valley Floor, as shown in Figure 1-1 (Upper Zone – arithmetic average of well data; Production Zone – volume-weighted average of upper and lower zones)

Region	Groundwater Basin Code ¹	Nitrate (mg/L) ²		Total Dissolved Solids (mg/L) ²	
		Upper Zone	Production Zone	Upper Zone	Production Zone
Northern Central Valley	5-6.01	2.17	1.05	164	172
	5-6.02	ND	1.16	ND	176
	5-6.03	0.83	1.12	169	168
	5-6.04	0.66	1.22	667	198
	5-6.05	0.65	1.28	ND	154
	5-6.06	ND	0.87	ND	176
	5-21.50	3.42	1.67	627	238
	5-21.51	2.25	2.16	343	272
	5-21.52	3.53	3.06	516	533
	5-21.53	ND	1.77	ND	250
	5-21.54	2.25	2.66	283	320
	5-21.55	2.87	1.80	323	224
	5-21.56	ND	1.67	ND	186
	5-21.57	3.76	2.28	216	195
	5-21.58	3.42	1.80	473	343
	5-21.59	1.69	1.31	339	320
	5-21.60	2.08	2.28	351	317
	5-21.61	4.22	2.30	529	391
5-21.62	7.78	1.67	849	950	
5-21.64	13.83	2.37	957	353	
5-21.67	36.78	7.63	1,488	647	
5-21.68	ND	4.58	ND	823	
Middle Central Valley	2-3	3.18	3.47	1,062	900
	2-4	ND	2.68	ND	1628
	5-21.65	3.35	1.78	646	270
	5-21.66	14.16	3.36	1,868	669
	5-22.01	22.43	4.72	2,418	385
	5-22.02	9.58	5.53	602	280
	5-22.03	17.87	7.74	506	322
	5-22.04	11.30	4.85	498	334
	5-22.05	9.78	8.21	625	774
	5-22.06	8.41	4.09	500	325
	5-22.07	13.67	5.01	1,234	1184
	5-22.15	7.43	3.04	1,714	1091
5-22.16	3.85	1.87	380	220	
Southern Central Valley	5-22.08	11.24	6.84	637	464
	5-22.09	0.91	1.80	1,305	1744
	5-22.10	1.15	1.37	4,056	2025
	5-22.11	18.20	12.64	936	465
	5-22.12	10.32	3.23	4,006	1173
	5-22.13	9.92	8.30	708	465
5-22.14	9.79	3.76	2,418	1177	

¹ Groundwater Basin Codes established by the California Department of Water Resources (DWR) in *California's Groundwater*, 2003. DWR Bulletin 118. October 2003.

² ND - Indicates insufficient data to calculate average or volume-weighted concentrations for nitrate or TDS.

Table 1-2. Nitrate and Total Dissolved Solids Concentrations in Groundwater Basins/Sub-basins Outside the Central Valley Floor, where Data Available (see Figure 1-2)

Region	Groundwater Basin Code ¹	Average Concentration ^{2, 3}	
		Nitrate (mg/L)	Total Dissolved Solids (mg/L)
North Central Valley	5-2.01	0.76	ND
	5-2.02	0.60	ND
	5-4	0.56	129
	5-5	1.08	107
	5-7	0.25	178
	5-9	0.32	207
	5-10	0.34	165
	5-11	0.67	394
	5-12.01	0.54	ND
	5-12.02	0.95	ND
	5-13	1.09	621
	5-14	0.87	327
	5-15	1.35	299
	5-16	0.23	1,084
	5-17	1.33	325
	5-18	1.76	381
	5-19	0.56	393
	5-30	1.58	252
	5-35	1.49	42
	5-46	0.23	112
	5-50	0.88	140
	5-56	0.38	258
	5-60	0.69	280
	5-62	0.34	568
	5-63	0.18	33
	5-66	0.27	325
5-68	0.23	664	
5-87	0.22	93	
Middle Central Valley	5-69	0.16	632
South Central Valley	5-25	3.16	577
	5-27	4.37	408
	5-28	6.10	254
	5-29	3.47	310
	5-80	2.74	470
	5-82	3.44	528
	5-83	3.00	167
	5-84	1.28	234
	5-85	0.85	184

¹ Groundwater Basin Codes established by the California Department of Water Resources (DWR) in *California's Groundwater*, 2003. DWR Bulletin 118. October 2003. If a Groundwater Basin is not included in the table; insufficient data available to calculate average nitrate or TDS concentrations

³ Data for outside valley floor groundwater basins not separated into upper or lower zones.

² ND - Indicates insufficient data to calculate average or volume-weighted concentrations for nitrate or TDS.



Figure 1-1. Groundwater Basins/Sub-basins in the Valley Floor of the Central Valley Region (Source: California Department of Water Resources)

Newly proposed dischargers, or existing dischargers looking to substantially modify current discharges, will need to propose how they expect to comply with the SNMP when they submit their application for WDRs to the Central Valley Water Board (otherwise referred to as a “Report of Waste Discharge”). For these dischargers, the submittal schedule as well as Steps 1 and 2 of the implementation process described below in Section 1.2.4.2 do not apply. The remaining steps provide information regarding the requirements to comply with the SNMP.

1.2.4.1 Priority for Implementation

Implementation of this SNMP will be prioritized based on the findings of technical work conducted by CV-SALTS.¹⁹ Prioritizing implementation is necessary so that Central Valley Water Board and discharger resources are focused on the most significant areas of water quality concern first, particularly with regards to nitrate levels and the protection of drinking water supplies. Prioritization is likely to be based on existing ambient water quality conditions in the Upper Zone of groundwater basins/sub-basins in the Central Valley Region.

Tables 1-1 and 1-2 summarize existing average water quality conditions for nitrate and TDS in the Central Valley Region. While this information provides a foundation for prioritizing SNMP implementation, additional factors may be considered to refine the prioritization process, including, but not limited to, the estimated number of public or domestic water supply wells at risk from elevated nitrate concentrations in the groundwater, spatial and temporal variability in the available water quality data, and the trend in nitrate concentrations, if known.

Ultimately, the Central Valley Board plans to establish four priority designations (Priority 1 through 4) to stagger the implementation of this SNMP, beginning with the areas with the most significant nitrate water quality concerns first. Groundwater basins/sub-basins in the valley floor, especially in the southern part of the Central Valley Region are expected to receive the highest priority for implementation. In contrast, given the generally lower nitrate and TDS concentrations in areas outside the valley floor, it is anticipated that these areas will receive the lowest priority for SNMP implementation. Although initial SNMP implementation will likely be based on nitrate water quality concerns, the SNMP recognizes the importance of salt issues and their potential impact to the Central Valley and the state. Prioritizing nitrates first is not meant to underscore the importance of addressing salts long-term, and where salt issues overlap with nitrate issues of concern, the SNMP recommends that these areas be considered as having a higher priority.

1.2.4.2 Compliance with the Central Valley SNMP²⁰

Figure 1-2 illustrates the implementation process for complying with the Central Valley SNMP, and **Table 1-3** summarizes the SNMP’s proposed compliance deadlines associated with this process. Below is an overview of the key requirements in the implementation process. For dischargers that decide to establish a Management Zone, a different process and time schedule is established in the Management Zone Policy. Moreover, the time lines presented below are intended to represent maximum timelines. The SNMP recommends that individuals and those

¹⁹ Draft *Region 5: Updated Groundwater Quality Analysis and High Resolution Mapping for Central Valley Salt and Nitrate Management Plan*; prepared by Larry Walker Associates and Luhdorff & Scalmanini on behalf of CV-SALTS. May 2016

²⁰ For new dischargers or an existing discharger that has applied for permit renewal through the submittal of a Report of Waste Discharge, Steps 1 and 2 in Table 1-3 and Figure 1-2 do not apply.

seeking to comply through development of a Management Zone comply with the steps as outlined below as soon as possible, but no later than the number of days specified for each category.

- **Step 1** - The Central Valley Water Board must notify existing dischargers of their responsibility to comply with the SNMP. The notification shall occur in the Priority 1 areas no later than 90 days after the Basin Plan amendments to incorporate the SNMP become effective²¹. It is anticipated, however, that between the time that the SNMP is submitted to the Central Valley Water Board and while the Basin Plan amendments are going through the adoption/approval process, the Central Valley Water Board will be communicating directly with dischargers in the Priority 1 area to discuss and explain the SNMP, and the upcoming need to implement the SNMP. Table 1-3 summarizes notification dates for other priority areas.
- **Step 2** - No later than 270 days after the Basin Plan amendments become effective, dischargers (or an initial group of dischargers in a specified area) seeking to comply with the SNMP through development of a Management Zone shall submit a Preliminary Management Zone Proposal to the Central Valley Water Board. As part of development of the Preliminary Management Zone proposal, the initiating group of dischargers shall solicit other regulated dischargers to participate. To assist the initiating group of dischargers, the Central Valley Water Board staff will assist in identifying other regulated dischargers that should be approached with respect to participating in a Management Zone.

To address Goal 1 of the SNMP as early as possible, it is imperative that there not be delay with respect to ensuring that residents within the proposed Preliminary Management Zone area have safe drinking water. Accordingly, the Preliminary Management Zone Proposal must include an initial identification of public supply wells, and/or domestic wells that exceed the drinking water standard for nitrate, to the extent that the information is readily available, for such wells within the Preliminary Management Zone boundaries. For purposes of developing a Preliminary Management Zone Proposal, it is anticipated that information regarding an initial identification of public supply and/or domestic wells will already be available and assembled by the Central Valley Water Board, State Board's Division of Drinking Water and/or others, and will be available to the those dischargers that are working to develop a Preliminary Management Zone Proposal.

Along with identifying the initial public supply wells/and or domestic drinking water wells, the Preliminary Management Zone Proposal must include an Early Action Plan (EAP), which must include specific actions and a schedule of implementation, to address the immediate needs of those initially identified within the Preliminary Management Zone boundary that are drinking groundwater that exceeds nitrate standards.

²¹ The SNMP will become effective after approvals are obtained from the Central Valley Water Board, State Board and the Office of Administrative Law.

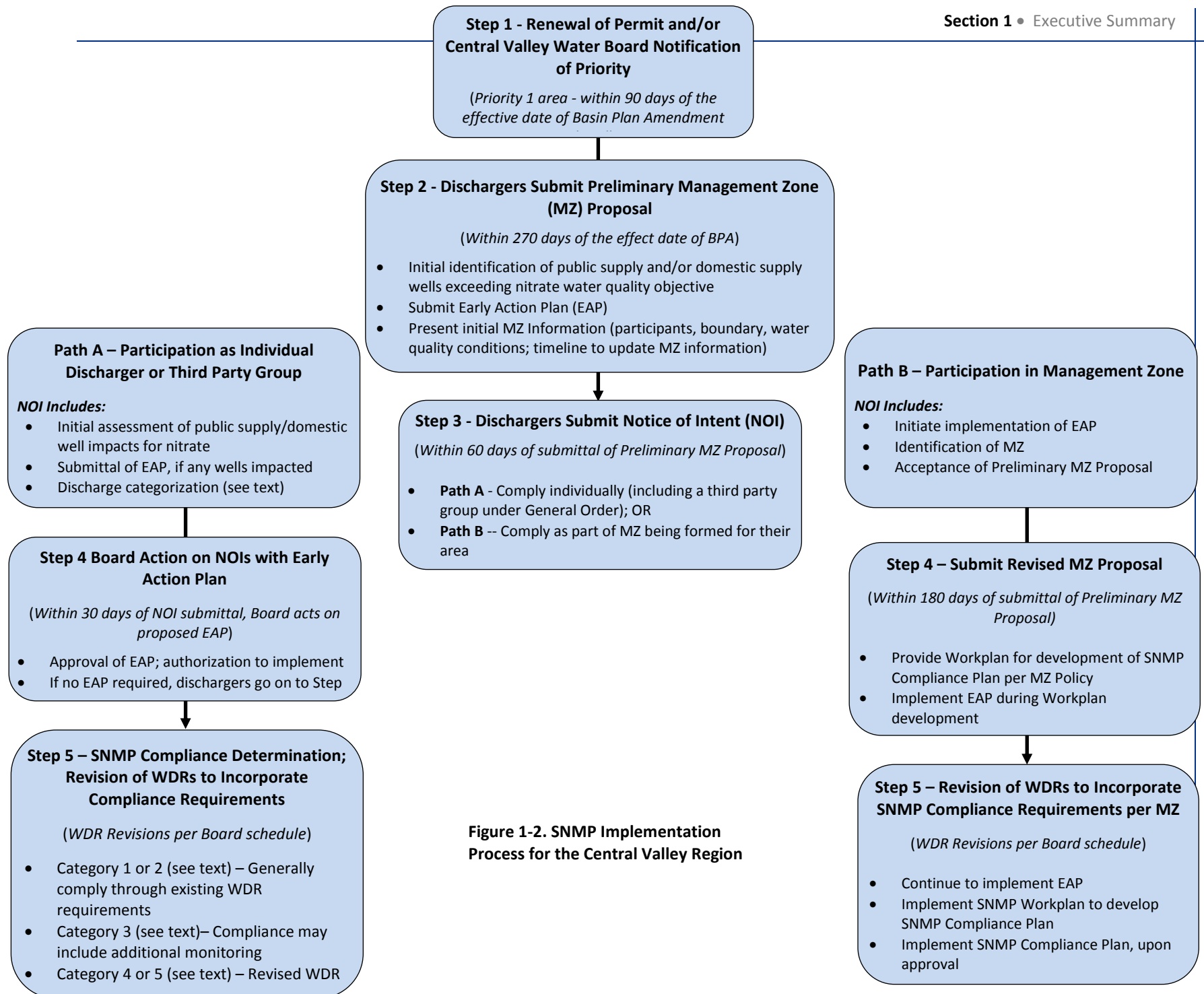


Figure 1-2. SNMP Implementation Process for the Central Valley Region

Table 1-3. SNMP Implementation Schedule (See text; stepwise process illustrated in Figure 1-3)

Implementation Steps		Compliance Date	
Step 1 - Central Valley Water Board (CVWB) Notification		<ul style="list-style-type: none"> • Priority 1 - No later than 90 days of the effective date of BPA • Priority 2 – Within 1.5 years of adoption of BPA • Priority 3 – Within 3 years of adoption of BPA • Priority 4 – Within 5 years of adoption of BPA 	
Step 2 - Submittal of Preliminary Management Zone Proposals (including Early Action Plan [EAP])		Within 270 days of the effective date of the BPA	
Step 3 - Dischargers Submit Notice of Intent (NOI) to Comply via Path A or Path B .		Within 60 days of submittal of the Preliminary Management Zone Proposal	
Path A - Comply individually (including a third party group under General Order)		Path B - Comply as part of a Management Zone being formed within discharger’s area	
Implementation Step	Compliance Date	Implementation Step	Compliance Date
Step 4 - Board Action on NOIs with EAP (if no EAP, continue to Step 5)	Within 30 days of NOI submittal, Board acts on proposed EAP	Step 4 – Submit Revised Management Zone Proposal	Within 180 days of submittal of Preliminary Management Zone Proposal (Step 2)
Step 5 – SNMP Compliance Determination and Revision of WDRs to Incorporate SNMP Compliance Requirements	CVWB revises WDRs in a timely manner	Step 5 – Revision of WDRs of Management Zone Participants to Incorporate SNMP Compliance Requirements	CVWB revises WDRs in a timely manner

The Preliminary Management Zone Proposal should also include, to the extent feasible, the following information:

- Identification of initial participants;
- Proposed timeline for:
 - Identifying additional participants;
 - Plan for outreach to communities and residents within the management zone boundaries;
 - Further defining boundary areas;
 - Development of proposed governance and funding structure; and
 - Additional evaluation of groundwater conditions across the proposed Management Zone area, including consideration of salts.

The Central Valley Water Board will promptly post Preliminary Management Zone Proposals on its website, and make them available to the public for review and comment as they are received.

While Preliminary Management Zone Proposals are being developed, individual dischargers (or collective groups of dischargers covered by a single order) need to be conducting their own initial assessment of their discharge, and of receiving water conditions for both salts and nitrates. This information will be necessary for individuals to determine if they intend to comply with the SNMP as an individual, or be part of a Management Zone.

- **Step 3 - (Notice of Intent [NOI])** Within 60 days after Preliminary Management Zone Proposals are due to be submitted to the Central Valley Water Board (i.e., 330 days after the Basin Plan amendment becomes effective), dischargers in the priority area that received notice must notify the Central Valley Water Board of their intent to either comply with the components of the SNMP as an individual discharger, or as part of a Management Zone. For purposes of this notification, individual dischargers that are subject to General Orders that cover a specified geographic area and that are administered by a Third Party (e.g., Third Party Orders for Irrigated Agriculture), the Third Party may provide notice as required in this step on behalf of its members. For individual dischargers in the specified priority area that are subject to a General Order that is not administered by a Third Party (e.g., Dairy General Order), the individual must provide the necessary notice as indicated in this step.
 - **Individual Dischargers:** For those intending to comply with the SNMP as an individual discharger (or as a single Third Party group subject to a General Order), the Individual Discharger would follow the steps as identified below as **PATH A**. Further, the NOI required here must include information as described under **PATH A**.
 - **Management Zone Participants:** For those intending to participate in a Management Zone, they must identify the name of the Management Zone in which they intend to participate, and acknowledge that they have reviewed and understand the Preliminary Management Zone Proposal that applies to their area of discharge. For those intending to comply with the SNMP through participation in a Management Zone, the Management Zone (and thus its participants) would follow the steps further identified below as **PATH B**.

PATH A - INDIVIDUAL DISCHARGER/THIRD PARTY GROUP SUBJECT TO GENERAL ORDER WISHING TO PROCEED AS AN INDIVIDUAL DISCHARGER

- **Step 3 - PATH A**
 - Individual/Third Parties seeking to comply with the SNMP under PATH A must include as part of their NOI an initial assessment of receiving water and/or discharge conditions. This includes an initial assessment to determine if the discharge (or collective discharges) are impacting any nearby public water supply or domestic wells for nitrates. If there are public water supply or domestic wells impacted by nitrates within the area of influence of discharges covered by the NOI, the initial assessment shall include an EAP, including specific actions and a schedule of implementation to address the immediate needs of those in that are drinking groundwater that exceeds the nitrate drinking water standard.

- The NOI must also indicate, based on the initial assessment, what category the discharge (or discharges) falls within with respect to nitrates:
 - *Category 1 - No Degradation Category:* Discharge²² is equal to or less than the nitrate water quality objective of 10 mg/L, and the discharge is better than receiving water quality as measured in First Encountered Groundwater.
 - *Category 2 - De minimus Category:* Receiving water has assimilative capacity in First Encountered Groundwater (i.e., is better than the water quality objective). For this category, the discharge may be above the water quality objective as it enters First Encountered Groundwater, but the discharge will use less than 10% of the available assimilative capacity, and is thus considered *de minimus*.
 - *Category 3 - Degradation Below 75% of the Water Quality Objective Category:* Discharges will be considered as part of this category if they anticipate using available assimilative capacity in First Encountered Groundwater that is considered to be more than *de minimus* but will not cause First Encountered Groundwater to exceed a trigger of 75% of the water quality objective for nitrate over a 20 year planning horizon. To allow use of assimilative capacity in this circumstance, the Central Valley Water Board may find it necessary to include additional monitoring and trend evaluations as part of the WDRs in order to make appropriate findings consistent with Resolution 68-16 and the SNMP. (See Nitrate Permitting Strategy in Attachment A).
 - *Category 4 - Degradation Above 75% of the Water Quality Objective Category:* Discharges will be considered as part of this category if they anticipate using available assimilative capacity in First Encountered Groundwater, and use of assimilative capacity will cause First Encountered Groundwater to exceed the trigger of 75% of the water quality objective for nitrate over a 20 year planning horizon. To allow use of assimilative capacity in this circumstance, the Central Valley Water Board may find it necessary to include additional conditions as part of the WDRs in order to make appropriate findings consistent with Resolution 68-16 and the SNMP.
 - *Category 5 - Discharge Above Objective and No Available Assimilative Capacity:* Discharges that exceed the water quality objective for nitrate, and where First Encountered Groundwater has no available assimilative capacity, will be considered to be part of this category. Discharges in this category may need to seek an exception pursuant to the Exceptions Policy under the SNMP (see Attachment A).

²² Discharge as used here is intended to mean the quality of the discharge as it enters first encountered groundwater. Thus, the quality of the discharge itself may exceed the standard but due to transformation and other variables, it meets or is better than the objective as it enters first encountered groundwater.

- The NOI must also provide a preliminary evaluation, based on the initial assessment, the impact that the discharge has (or does not have) with respect to salts in groundwater.
- **Step 4 - PATH A –Board Action on NOI with EAP**
 - *NOI That Includes EAP* - Within 30 days of receiving an Individual NOI that includes an EAP to address immediate drinking water needs, the Central Valley Water Board shall provide notice to the NOI applicant of its comments on the EAP, and indicate if the discharger may proceed forward with implementing the EAP.
 - *NOI and No EAP Necessary* - If there are no immediately identifiable drinking water needs in the area impacted by the discharge, then the discharger shall proceed forward under Step 5.
- **Step 5 - PATH A - Determination of Compliance with SNMP**

Categorization of the discharge with respect to nitrates (as indicated in Step 3 - PATH A), as well as other information contained in the NOI, should provide the Central Valley Water Board with the information necessary for it to determine if the discharger can comply with the SNMP with no further action, or if the discharger will be required to submit additional information to indicate how the discharger proposes to comply with the SNMP. For example, discharges that fall within the No Degradation and *De Minimus* categories described above will be considered to comply with the SNMP for nitrates. Discharges that fall within the next two categories will require the Central Valley Water Board to make findings consistent with Resolution 68-16. Depending on the level of degradation for nitrates that will occur, or impacts to salts as identified in the NOI prepared under Step 3 of Path A, the Central Valley Water Board may require additional conditions in WDRs to implement the SNMP. The additional conditions should be commensurate with the level of degradation and the level of assimilative capacity that it intends to allocate. For the last category, the Central Valley Water Board will require the discharger to meet and comply with the exceptions policy (see Attachment A).

As part of Step 5 - PATH A, it is anticipated that the Central Valley Water Board will revise WDRs for discharges of nitrate that fall within Categories 1,2 and 3 in a relatively short time frame, depending on available resources. For discharges that fall within Categories 4 and 5, the Central Valley Water Board will revise the WDRs for discharges of nitrate to require development and implementation of a plan that indicates how the discharger plans to comply with the nitrate elements of the SNMP (referred to as the SNMP Compliance Plan). To the extent that the discharge of salt is an issue within the permitted area, the Central Valley Water Board will take that into consideration as it revises the WDRs. The SNMP Compliance Plan shall include the following components to address the SNMP Management Goals as they apply to nitrates:

- Identification of nitrate related drinking water supply issues in the area of influence of the discharge(s) (beyond those identified under an applicable EAP);

- A plan, with a proposed time schedule and milestones, for addressing newly-identified nitrate related drinking water supply issues that address in the area influenced by the discharge;
- Preliminary identification of steps that will be taken to evaluate actions necessary to meet Management Goals 2 and 3;
- Milestones related to implementation of steps required to meet Management Goals 2 and 3 may be phased in over time, and will likely require further evaluation and assessment to identify proposed long-term actions.

If salts are also an issue for the discharge(s) in question, the SNMP Compliance Plan shall also address compliance with SNMP Management Goals 2 and 3, as they pertain to salts. The time frame allowed by the Central Valley Water Board for development of the SNMP Compliance Plan for discharges within Categories 4 and 5 will vary depending on the complexity and size of the discharge, and the size of the area influenced by the discharge. The implementation time frame with actions and milestones will be included in the revised WDR. Implementation of the SNMP Compliance Plan will begin upon approval by the Executive Officer.

PATH B - COMPLIANCE THROUGH A MANAGEMENT ZONE

- **Step 4 - PATH B**

Within 180 days after submittal of the Preliminary Management Zone Proposal, the Management Zone shall submit a Revised Management Zone Proposal, which must include a Workplan for development of a SNMP Compliance Plan for the Management Zone. During development of the Workplan for the SNMP Compliance Plan, the Management Zone must implement the Early Action Plan, as provided in the Preliminary Management Zone Proposal. Implementation of the Early Action Plan as well as development of a Revised Management Zone Proposal must consider any comments provided by the Central Valley Water Board as well as comments submitted by the public. Requirements for the Revised Management Zone Proposal and SNMP Compliance Plan are provided in the Management Zone Policy (see Attachment A).

- **Step 5 - PATH B**

Upon receipt of the Revised Management Zone Proposal, it is anticipated that the Central Valley Water Board will revise WDRs for those discharger participants in the Management Zone. Revisions to WDRs may be made through a Resolution that revises specified WDRs to include requirements for development of the SNMP Compliance Plan, as well as requirements and milestones for implementing the SNMP Compliance Plan upon its approval by the Executive Officer of the Central Valley Water Board. The Central Valley Water Board will include EAP requirements into the WDRs as applicable. However, it is not the intent of the SNMP for implementation of the EAP to wait until after WDRs have been revised to include requirements associated with SNMP compliance.

1.2.5 Recommended New Policies, Regulatory Tools and Clarifications

Through the CV-SALTS process, stakeholders developed recommendations for clarifications to the Basin Plans, adoption of new or modified policies, and regulatory tools for incorporation into the Central Valley Basin Plans. These recommended clarifications, policies and tools are designed to facilitate implementation of the SNMP and efforts to achieve the Central Valley salt and nitrate management goals. Recommendations include:

- *Establish Default Management Areas* - Incorporate the DWR Bulletin 118 groundwater basin/sub-basin boundaries for use as default salt and nitrate management areas unless a group of dischargers elects to establish a Management Zone, which is a delineated area within groundwater basin/sub-basin (see below). The SNMP documents the existing salt and nitrate conditions in the upper, lower and production zones within each of these groundwater basins/sub-basins.
- *Provide Secondary Maximum Contaminant Level (SMCL) Guidance* - Incorporate guidance on appropriate use of 22 CCR §64449 SMCLs for the protection of the MUN beneficial use in surface waters and groundwater. In particular, provide guidance on the appropriate use of the “Recommended”, “Upper”, and “Short Term” consumer acceptance levels established for total dissolved solids and electrical conductivity in 22 CCR Table 64449-B.
- *Clarify Protection of the AGR Beneficial Use* - Incorporate guidance on interpretation of the existing narrative objective for chemical constituents for setting numeric salinity objectives for the protection of the AGR beneficial use. AGR covers both crop irrigation and stock watering protection. Salinity requirements to protect these uses vary widely depending on the crop or type of stock. This guidance will provide the basis for tailoring the protection of the AGR beneficial use to reflect local and regional differences in water use for agriculture and also identify triggers that will determine if additional action is needed to improve existing/trending water quality.
- *Authorize Implementation of Alternative Compliance Strategies* - Develop a framework for alternative compliance strategies that focuses on ensuring safe drinking water, minimizing degradation, and implementing long-term restoration when discharges cause salt and nitrate degradation in a receiving water. Strategies may include use of offsets, which provide an indirect approach to compliance with a WDR/Waiver requirement for a given pollutant by managing other sources and loads so that the net effect on receiving water quality from all known sources is functionally-equivalent to or better than that which would have occurred through direct compliance with the WDR at the point-of-discharge.
- *Clarify Factors to Support a Maximum Benefit Finding* – To authorize a discharge that is expected to lower water quality, the Central Valley Water Board must make a finding that authorizing the discharge is "consistent with maximum benefit to the people of the state". It is recommended that guidance be incorporated into the Basin Plan regarding factors to be considered when making a maximum benefit finding.
- *Support Establishment of Management Zones* - Amend the Basin Plans to allow and encourage management of salt and/or nitrate through the establishment of management zones. In general, a Management Zone consists of multiple dischargers working collectively

to manage salt and/or nitrate to first insure safe drinking water supplies, then create a balance within the defined Management Zone area, and then ultimately to develop a long-term plan for restoration of groundwater (where feasible) to meet applicable water quality objectives. The Basin Plans do not currently prevent the creation of a Management Zone to manage salt/nitrate; however, it is recommended that the Basin Plans be amended to clearly define requirements for establishment of a Management Zone and ensure that criteria for approval of a Management Zone by the Central Valley Water Board are properly established in regulation.

- *Clarify Allocation of Assimilative Capacity* – Establish guidance on the requirements for allocation of assimilative capacity in groundwater basins/sub-basins or Management Zones. Guidance will include the basis for calculating assimilative capacity within a managed area.
- *Revise the Exceptions Policy* – Revise requirements for granting exceptions in the Central Valley Region to facilitate efforts to achieve water quality objectives in impaired groundwater or to provide the time needed to revise an inappropriate water quality objective. Specifically, it is recommended that the following revisions be made to the current exceptions policy: (a) amend the existing policy to add nitrate to the list of chemical constituents for which the Central Valley Water Board may authorize an exception; (b) remove the existing sunset provision that prohibits the granting of exceptions beyond June 30, 2019; and (c) retain the existing provision that limits the term of an exception to no more than 10 years, but add a new provision stating that exceptions may be reauthorized for one or more additional 10-year periods and that a status report (summarizing compliance with the terms and conditions of the exception) must be presented to the Central Valley Water Board every 5 years.
- *Establish Drought and Water Conservation Policy* – Incorporate into the Basin Plan automatic triggers that may be used to implement a drought-based exception to salinity water quality objectives. Incorporation of such a trigger prevents the need for individual requests for an exception and ensures timely application when the specified conditions exist.

The recommendations are based on technical reviews, case studies, and extensive review and discussion by CV-SALTS stakeholders. Details on each are either included in this document or summarized here with the details referenced in supporting documents.

1.3 CEQA and Economics Analysis

To be developed:

- CEQA Scoping for the SNMP was completed in 2013
- Findings from the CEQA/Economic Analysis of the SNMP

1.4 SNMP Technical Support

To be developed: Executive Summary level discussion of technical findings that support this SNMP.

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