# Proposed Permitting Strategy for Nitrate Discharges to Groundwater

**Regulatory Considerations**

The California Water Code (CWC) requires each Regional Water Board to *"formulate and adopt water quality control plans for all areas with the region."*[1] The water quality control plans identify beneficial uses for designated waterbodies, establish water quality objectives that *"will ensure reasonable protection of beneficial uses and the prevention of nuisance,* and specify a program of implementation."[2]

To guide the Regional Water Board's basin planning effort, the State Water Resources Control Board enacted a Sources of Drinking Water Policy and declared that: *"all surface and ground waters of the State are considered to be suitable , or potentially suitable, for municipal or domestic water supply and should be so designated by the Regional Board"* unless certain exceptions apply.[3]

Consistent with statewide policy, the Central Valley Regional Water Quality Control Board incorporated the Sources of Drinking Water Policy into both of its water quality control plans (i.e. Basin Plans).[4] In general, waterbodies that the Regional Water Board exempted from the MUN designation, in accordance with the Sources of Drinking Water Policy, are also identified in the Basin Plans.[5]

In addition to the Sources of Drinking Water Policy, the Central Valley Regional Water Board has adopted the following water quality objective to protect drinking water:

> *"At a minimum, waters designated for domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs) specified in the following provisions of Title-22 of the California Code of Regulations which are incorporated by reference into this plan: Tables 64431-A (Inorganic Chemicals)..."*[6]

The MUN beneficial use is defined to mean: *"uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply."*[7] *For waterbodies designated MUN, t*he Maximum Contaminant Level for nitrate is 10 mg/L as nitrogen.[8]

[1] CWC §13240
[2] CWC §13241
[3] State Water Resources Control Board Resolution No. 88-63 (adopted May 19, 1988).
[4] Water Quality Control Plan (Basin Plan) for the Sacramento River Basin and the San Joaquin River Basin – 4th Ed., pg. II-3.0 and Water Quality Control Plan for the Tulare Lake Basin - 2nd Ed., pg. II-2.
[5] See, for example, Water Quality Control Plan for the Tulare Lake Basin - 2nd Ed., pg. II-7.
[6] Water Quality Control Plan (Basin Plan) for the Sacramento River Basin and the San Joaquin River Basin – 4th Ed., pg. III-10.0 and Water Quality Control Plan for the Tulare Lake Basin - 2nd Ed., pg. III-7.
[7] Basin Plan, pg. II-1
[8] 22 CCR §64431(a); see Table 64431-A: Maximum Contaminant Levels for Inorganic Chemicals. Prior to January 1, 2016 the MCL was expressed as 45 mg/L (as NO3) which is equivalent to 10 mg/L Nitrate as Nitrogen.

When prescribing waste discharge requirements (WDRs), the Regional Water Board must implement any relevant water quality control plans that have been adopted.[9] In 2013, the State Water Board reaffirmed the importance of developing appropriate WDRs to manage nitrate discharges:

> *"The Water Boards will evaluate all existing Waste Discharge Requirements to determine whether existing regulatory permitting is sufficiently protective of groundwater quality at these sites. The Water Boards will use the findings to improve permitting activities related to nitrate."*[10]

In addition, when the Recycled Water Policy was adopted in 2009, the State Water Board determined that:

> *"Some groundwater basins in the state contain salt and nutrients [nitrate] that exceed or threaten to exceed water quality objectives established in the applicable Water Quality Control Plans… It is the intent of this policy that salts and nutrients from all sources be managed on a basin-wide or watershed-wide basis in a manner that ensures attainment of water quality objectives and protection of beneficial uses. The State Water Board finds that the appropriate way to address salt and nitrate issues is through development of regional or sub-regional salt and nutrient management plans…"*[11]

In 2012, the state legislature approved Assembly Bill 685 which amended the California Water Code to declare that:

> *"…every human being has the right to safe, clean, affordable and accessible water adequate for human consumption, cooking and sanitary purposes. All relevant state agencies, including the Department of Water Resources, the State Water Resources Control Board, and the State Department of Public Health, shall consider this state policy when revising, adopting or establishing policies, regulations, and grant criteria when these policies, regulations and criteria are pertinent to the uses of water described in this section.*[12]

In consideration of these policies, this section of the Salt and Nutrient Management Plan (SNMP) sets forth CV-SALTS recommendations for regulating discharges of nitrate to groundwater with special emphasis on the permitting options in groundwater management zones that exceed or threaten to exceed the Primary MCL.

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[9] CWC §13263(a)

[10] State Water Resources Control Board. Report to the Legislature: Recommendations for Addressing Nitrate in Groundwater (February, 2013). See recommendation #15 at page 43 of the report.

[11] Policy for Water Quality Control for Recycled Water. Res. No. 2009-0011 (Feb. 3, 2009); §6(a) @ pg. 5

[12] Assembly Bill No. 685 added §106.3 to the California Water Code. Signed by Gov. Brown on September 25, 2012.

**Water Quality Conditions**

Several independent studies have reported that nitrate concentrations exceed the established MCL at numerous well locations throughout the Central Valley.[13] The State Water Board reported that 90 public water supply systems reported violations of the MCL for nitrate in 2012.[14] CV-SALTS comprehensive assessment of available water quality data is consistent with these previous studies but also indicates that nitrate concentrations vary considerably depending on depth (see Table 1) and location (see Fig. 1). The long-term trend also appears to vary by location (see Fig. 2).

**Table 1: Nitrate Concentrations in Shallow and Deep Groundwaters of the Central Valley[15]**

| | IAZ | Shallow Median (2003-2012) | Estimated Deep (2003) |
|---|---|---|---|
| Northern Central Valley | 1 | 0.1 | 0.8 |
| | 2 | 0.6 | 1.4 |
| | 3 | 0.9 | 1.5 |
| | 4 | 2.8 | 0.2 |
| | 5 | 0.4 | 0.9 |
| | 6 | 0.6 | 2.0 |
| | 7 | 0.7 | 1.1 |
| Middle Central Valley | 8 | 1.2 | 1.1 |
| | 9 | 0.4 | 0.5 |
| | 10 | 2.7 | 4.2 |
| | 11 | 4.9 | 3.2 |
| | 12 | 10.4 | 3.0 |
| | 13 | 6.1 | 2.2 |
| | 22 | 7.4 | 1.9 |
| Southern Central Valley | 14 | 0.4 | 1.0 |
| | 15 | 3.0 | 0.4 |
| | 16 | 11.1 | 3.1 |
| | 17 | 8.5 | 2.9 |
| | 18 | 10.7 | 3.0 |
| | 19 | 3.3 | 1.1 |
| | 20 | 3.4 | 2.0 |
| | 21 | 0.2 | 1.5 |

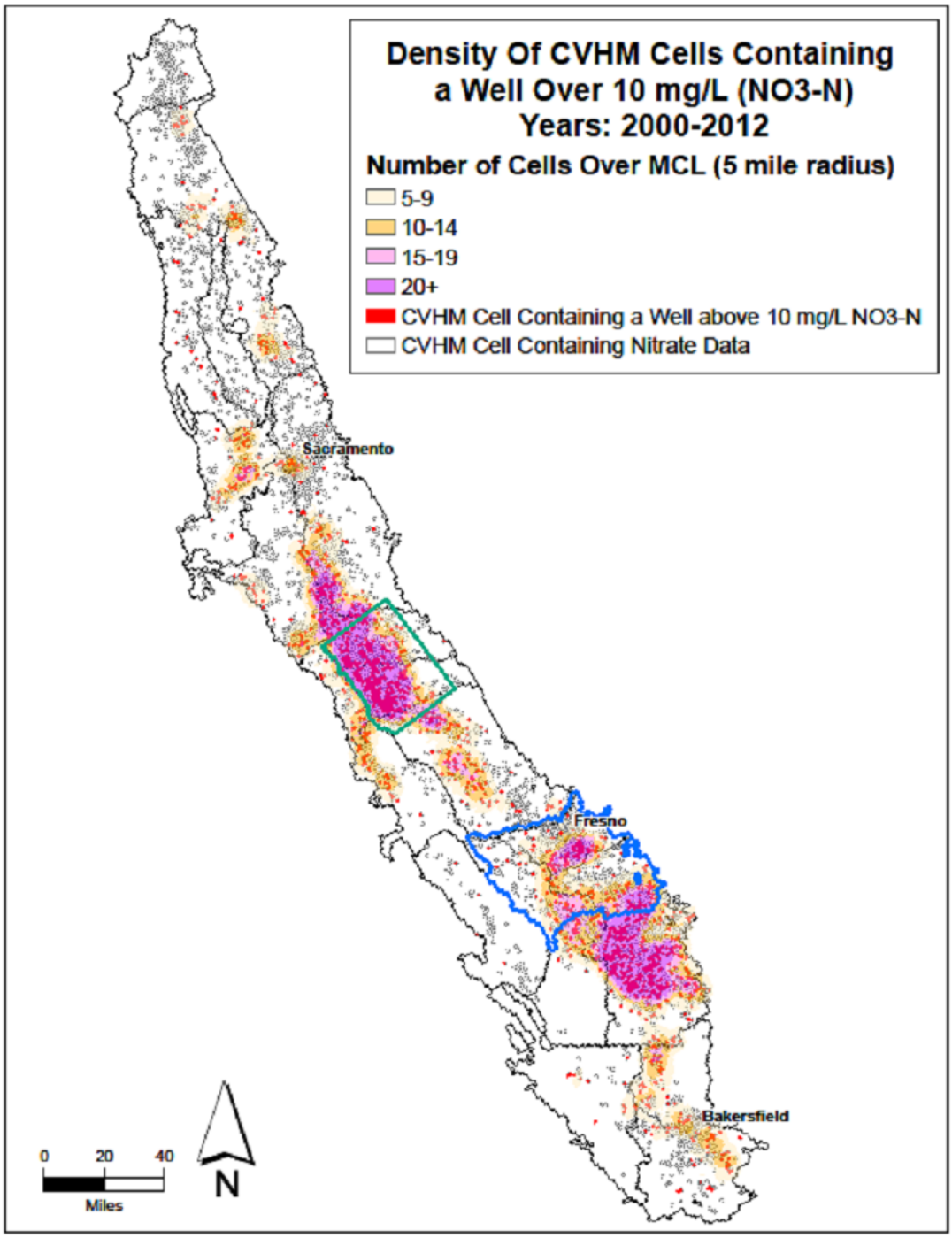
Note: IAZ=Initial Analysis Zones; a more detailed discussion of how these zones are defined and the data limitations inherent in the preliminary characterization may be found in Sec. XXX of the SNMP.

[13] See, for example, Thomas Harter, et al. Addressing Nitrate in California's Drinking Water: Report to the California State Water Resources Control Board. U.C. Davis Center for Watershed Sciences. January, 2012. See, also, Communities that Rely on Contaminated Groundwater. State Water Resources Control Board Report to the Legislature. January, 2013.

[14] State Water Resources Control Board. Safe Drinking Water Plan for California: Report to the Legislature in Compliance with Health and Safety Code Section 116365. June, 2015 (see Table 4.13 on page 77)

[15] Initial Conceptual Model (ICM) Technical Services Tasks 7 and 8 – Salt and Nitrate Analysis for the Central Valley Floor Final Report. December, 2013 (Table 10-5 @ pg. 10-20 in original).

**Fig. 1: Nitrate Concentrations in Groundwaters of the Central Valley**[16]




Note: CVHM = Central Valley Hydrologic Model; see detailed discussion in Sec. XXX of the SNMP.

[16] Initial Conceptual Model (ICM) Technical Services Tasks 7 and 8 – Salt and Nitrate Analysis for the Central Valley Floor Final Report. December, 2013 (Fig. 7-18 @ pg. 7-25 in original).

**Fig. 2: Trends for Nitrate Concentrations in Shallow Groundwaters of the Central Valley**[17]

| | | 1910-1964 | | 1965-1970 | | 1971-1979 | | 1980-1989 | | 1990-2002 | | 2003-2012 | | Trend |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | IAZ | Median | Value Count | Median | Value Count | Median | Value Count | Median | Value Count | Median | Value Count | Median | Value Count | |
| Nothern Central Valley | 1 | | | | | 0.1 | 1 | | | | | 0.1 | 41 | No apparent trend |
| | 2 | 1.1 | 29 | 1.3 | 13 | 2.2 | 86 | 3.0 | 30 | 2.4 | 12 | 0.6 | 75 | No apparent trend |
| | 3 | 2.3 | 6 | 1.2 | 6 | 1.3 | 34 | 1.3 | 7 | 0.7 | 22 | 0.9 | 62 | No apparent trend |
| | 4 | | | 0.2 | 7 | 0.2 | 11 | 0.0 | 2 | 0.1 | 7 | 2.8 | 17 | No apparent trend |
| | 5 | 1.1 | 8 | 1.2 | 4 | 1.4 | 48 | 2.5 | 7 | 0.8 | 13 | 0.4 | 80 | No apparent trend |
| | 6 | | | 1.8 | 8 | 3.6 | 14 | 3.4 | 17 | 0.2 | 3 | 0.6 | 106 | Slightly decreasing |
| | 7 | 0.8 | 8 | 1.2 | 2 | 1.5 | 5 | 1.8 | 4 | 1.7 | 9 | 0.7 | 76 | No apparent trend |
| Middle Central Valley | 8 | 1.1 | 24 | 2.5 | 9 | 1.9 | 13 | 2.4 | 12 | 1.5 | 11 | 1.2 | 345 | No apparent trend |
| | 9 | 4.9 | 8 | 2.9 | 4 | 0.1 | 7 | 0.1 | 7 | 0.1 | 10 | 0.4 | 218 | No apparent trend |
| | 10 | 3.4 | 4 | | | | | 2.7 | 7 | 2.2 | 4 | 2.7 | 65 | No apparent trend |
| | 11 | | | 3.2 | 3 | 7.5 | 4 | 12.6 | 8 | 8.1 | 4 | 4.9 | 254 | Increasing to decreasing? |
| | 12 | | | | | | | 0.1 | 1 | 3.4 | 11 | 10.4 | 220 | Increasing |
| | 13 | | | 7.9 | 3 | | | 4.4 | 8 | 5.4 | 21 | 6.1 | 195 | Slightly increasing |
| | 22 | 3.4 | 1 | | | | | 13.1 | 18 | 17.5 | 17 | 7.4 | 83 | Slightly decreasing |
| Southern Central Valley | 14 | 3.4 | 1 | 2.5 | 1 | | | 23.0 | 75 | | | 0.4 | 14 | No apparent trend |
| | 15 | | | | | | | 1.2 | 67 | 11.3 | 26 | 3.0 | 192 | Increasing to decreasing? |
| | 16 | 5.7 | 1 | | | | | 8.2 | 6 | 7.9 | 19 | 11.1 | 36 | Slightly increasing |
| | 17 | 6.0 | 2 | | | 8.1 | 1 | 8.0 | 10 | 10.1 | 33 | 8.5 | 100 | Slightly increasing |
| | 18 | | | | | | | 14.5 | 8 | 15.0 | 21 | 10.7 | 362 | No apparent trend |
| | 19 | 3.6 | 3 | | | | | 4.9 | 40 | | | 3.3 | 42 | No apparent trend |
| | 20 | 0.6 | 6 | | | | | 1.6 | 1 | | | 3.4 | 14 | Slightly increasing |
| | 21 | 0.7 | 8 | | | 8.6 | 1 | 8.6 | 23 | 0.3 | 5 | 0.2 | 45 | Increasing to decreasing? |

*Value count refers to the number of values the calculated median concentration is based on.

Understanding and being able to characterize current and projected water quality conditions is desirable because regulatory requirements differ when existing water quality is better than the applicable standard(s).[18] Under such conditions, the range of permitting options also increases when the Regional Water Board determines that there is assimilative capacity available.[19]

Following a preliminary assessment of discharge quality and receiving water quality, CV-SALTS recommended permitting strategy for nitrate discharges to groundwater is separated into two paths. The first path describes proposed approach when existing groundwater quality exceeds the nitrate objective and there is no assimilative capacity available. The second path describes the proposed approach when current groundwater quality is better than the objective and there is assimilative capacity available for nitrate.

[17] Initial Conceptual Model (ICM) Technical Services Tasks 7 and 8 – Salt and Nitrate Analysis for the Central Valley Floor Final Report. December, 2013 (Table 7-8 @ pg. 7-50 in original).

[18] State Water Resources Control Board. Resolution No. 68-16: Statement of Policy with Respect to Maintaining High Quality of Waters in California. (Oct 28, 1968)

[19] The specific method CV-SALTS recommends for determining whether and how much assimilative capacity is available is described in Section XXX of this Salt and Nitrate Management Plan.

**Preliminary Assessment**

Establishing appropriate WDRs for nitrates requires consideration of a number of key factors including, but not limited to:

1) The current nitrate concentration in the receiving water.
2) The nitrate concentration in the discharge when it reaches the groundwater.
3) The nitrate concentration of other recharges to the same management zone.

The range of permitting options available to the Regional Water Board, and the demonstrations required to authorize the various options, depends on the relationship between these variables. An initial assessment is appropriate to determine how the regulated discharge is likely to affect nitrate concentrations in the receiving water (see Fig 3).

In the simplest case, groundwater quality currently complies with the primary MCL and nitrate concentrations in the discharge are even lower. No special consideration is necessary because the discharge complies with water quality standards and does not cause water quality degradation. Traditional WDRs will work well in such instances.

At the other end of the spectrum, where groundwater quality already exceeds the primary MCL for nitrate and there is no reasonably feasible or practical means for assuring that nitrate concentrations will be less than 10 mg/L when the discharge reaches the groundwater, an alternative compliance option may be needed.

**Fig. 3: Initial Antidegradation Review**

| **NITRATE CONDITIONS** | **Receiving Water Nitrate < 10 mg/L** *(assimilative capacity available)* | **Receiving Water Nitrate > 10 mg/L** *(no assimilative capacity)* |
|---|---|---|
| **Nitrate Concentration in Recharge < Concentration in Receiving Water** | Discharge meets WQO and will not degrade receiving water quality.<br><br>Require traditional compliance thru WDRs and periodic monitoring. | 1) If recharge quality <u>can meet</u> WQO, require traditional compliance with the WQO thru the WDR.<br><br>2) If discharge quality <u>cannot meet</u> WQO, authorize conditional exception because discharge improves receiving water quality. |
| **Nitrate Concentration in Recharge > Concentration in Receiving Water** | Derive appropriate WDRs, including any allocation of assimilative capacity, in accordance with Antidegradation Policy (68-16).<br><br>Offsets and ACPs may be used to avoid causing pollution or nuisance and to demonstrate BPTC consistent with Maximum Benefit. | 1) Require functionally-equivalent compliance using offset project(s) and a "bubble permit" encompassing both the discharge and these projects.<br><br>2) Authorize a variance/exception for discharges that cannot be offset. ACPs may be a condition of the variance/exception. |

**Permitting Strategy for Discharges to Groundwaters with Assimilative Capacity Available**

When water quality in the groundwater basin is better than water quality objective specified in the Basin Plan, then the state's antidegradation policy requires the Regional Water Board to regulate in a manner designed to maintain that highest quality water that is reasonable. [20] Therefore, when the nitrate concentration in the receiving water is less than 10 mg/L, the Regional Water Board's preferred permitting strategy will be to establish WDRs that preserve high quality water unless if finds that lowering water quality is consistent with the state's antidegradation policy.

The Regional Water Board will continue to consider reductions in nitrate mass or concentration as the discharge percolates to groundwater through the soil. The Regional Water Board will also continue to consider any dilution that may occur from other sources recharging to the same aquifer.

When deriving an appropriate WDR for nitrate, the Regional Water Board will initially presume that the discharge can comply with such restrictions by implementing the Best Practicable Treatment or Control (BPTC) measures. In such cases, the Regional Water Board will likely allow the discharge and require appropriate monitoring to demonstrate on-going compliance. If dischargers require additional time to implement the necessary pollution control measures, the Regional Water Board is authorized to include a compliance schedule in the WDRs.

In some cases, however, there may be no reasonably feasible means of achieving compliance with the default WDRs even after implementing Best Practicable Treatment or Controls. At such times, the Regional Water Board has two options available. It can prohibit the discharge or, in certain circumstances, it can authorize the discharge by allocating some of the available assimilative capacity provided that doing so complies with the requirements set for in the state antidegradation policy.

Assimilative capacity represents the amount of nitrate that a given groundwater management zone can absorb without exceeding the applicable water quality objective. Assimilative capacity is calculated by subtracting the current average nitrate concentration in the aquifer from the water quality objective (usually 10 mg/L). [21] In practice, the actual computation is a good deal more difficult because nitrate concentrations can vary dramatically based on depth, location and sampling date, even in the same groundwater basin.[22] This introduces some uncertainty into the calculation and, as a result, the Regional Water Board is reticent to allocate all of the assimilative capacity that is estimated to be available - especially when state law does not obligate them to do so.[23]

Because groundwater quality can vary so significantly, and assimilative capacity is calculated based on the average concentration, it is possible for a management zone to be considered "high quality" despite the fact that nitrate concentrations at some individual well locations may exceed the MCL. Under such circumstances, the Regional Water Board is still allowed to allocate some of the available assimilative capacity but must develop WDRs designed to ensure that groundwater users are not unreasonably affected if a permitted discharge is allowed to lower water quality.

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[20] SWRCB. Statement of Policy with Respect to Maintaining High Quality of Waters in California. Res. No. 68-16 (Oct. 28, 1968)

[21] SWRCB. Policy for Water Quality Control for Recycled Water; Res. No. 2009-0011 (Feb. 3, 2009)

[22] A detailed explanation of the procedure that CV-SALTS recommends for estimating available assimilative capacity is described in Section XXX of the SNMP.

[23] CWC §13263(c)

**Allocating Assimilative Capacity**

The state antidegradation policy sets forth the specific conditions that must be met and demonstrations that must be made before the Regional Water Board can make an allocation of assimilative capacity and, thereby, allow a discharge to lower existing water quality:

> *"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."*[24]

To determine that the allocation of assimilative capacity "will not result in water quality less than that prescribed in the policies," the Regional Water Board will require dischargers to demonstrate that the permitted discharge will not cause the average nitrate concentration in the relevant groundwater management zone to exceed 10 mg/L.

To determine that the allocation of assimilative capacity "will not unreasonably affect present and anticipated beneficial use of water," the Regional Water Board will require dischargers to demonstrate that the permitted discharge will not cause the average nitrate concentration at existing or planned wells to exceed 10 mg/L. For permitted discharges that are likely to lower water quality, the Regional Water Board will presume that present and probable future beneficial uses will not be unreasonably affected if the discharge consumes less than 10% of the available assimilative capacity by itself and not more than 20% of the available assimilative capacity in combination with other authorized discharges to the same management zone. This approach is consistent with the recommendations set forth in the Recycled Water Policy.[25]

If a discharge is likely to consume more than 10% of the available assimilative capacity, or a combination of discharges to the same groundwater basin or sub-basin is likely to consume more than 20% of the available assimilative capacity, then the discharger(s) must demonstrate that allowing lower water quality will not unreasonably affect other users operating within the same management zone or downgradient beneficial uses. In addition, the Regional Water Board may elect to apply a reasonable "buffer" to account for data uncertainties and other potential operational difficulties. The Regional Water Board is not required to allocate all of the estimated assimilative capacity available and, for this reason, may decide to maintain an appropriate safety factor to ensure that high quality receiving waters do not exceed the water quality objective for nitrate.

[24] SWRCB. Statement of Policy with Respect to Maintaining High Quality of Waters in California. Res. No. 68-16 (Oct. 28, 1968)

[25] SWRCB. Policy for Water Quality Control for Recycled Water; Res. No. 2009-0011 (Feb. 3, 2009)

To determine whether the discharger is implementing "best practicable treatment or control necessary to assure that a pollution or nuisance will not occur," the Regional Water Board will look at whether BPTC (at the discharge) can assure that the average nitrate concentrations at affected wells downgradient of the discharge will remain consistently below 10 mg/L. If not, then the Regional Water Board will next consider whether mitigation strategies applied at any other point between the discharge and any actual downgradient water users (e.g. well-head treatment or alternative water supply, etc.) can effectively prevent nuisance.

To determine whether allocating assimilative capacity to authorize a discharge that is expected to lower water quality is "consistent with maximum benefit to the people of the state," the Regional Water Board will consider the following factors:

1) Economic and social costs, tangible and intangible, direct and indirect, of the proposed discharge compared to the benefits for both the discharger and all others that may be affected by the discharge. This includes an evaluation of the discharger's capacity to bear the cost of compliance (e.g. "affordability") and any potential adverse impacts to the surrounding community. This is not intended to be a formal Cost-Benefit Analysis.

2) Environmental effects of allowing or prohibiting the proposed discharge (esp. the net on water quality in the region). In some cases, where the net effect on receiving water quality shown to be spatially and/or temporally-limited, the Regional Water Board may conclude that the discharge does not result in significant degradation.

In general, the Regional Water Board is less likely to allocate assimilative capacity to discharges where there is a reasonably feasible and practicable means for achieving compliance with traditional waste discharge requirements. The Regional Water Board is also unlikely to prohibit discharges where no such means exist and considers this option only as a last resort. Nevertheless, assimilative capacity is a scarce and finite resource.

Therefore, CV-SALTS recommends that the Regional Water Board should be predisposed to allocate assimilative capacity, and allow lower water quality, where doing so assures a significantly better outcome for the people of California than would requiring strict compliance with default waste discharge requirements. And, the Regional Water Board should prioritize allocations of assimilative capacity when and where it would provide a demonstrably more effective means of assuring safe drinking water than other available permitting alternatives. To this end, CV-SALTS intends to develop more detailed regional guidance document describing what sorts of demonstrations might constitute "maximum benefit to people of the state."[26] The recommended guidance will be submitted for consideration by the Regional Water Board as part of the final Basin Plan Amendment package to implement the SNMP.

If the Regional Water Board is concludes that, even after implementing BPTC, a discharge will unreasonably affect present or anticipated beneficial uses of water, or result in water quality less than that prescribed in the Basin Plan, or cause pollution or nuisance to occur, or is inconsistent with maximum benefit to the people of the state, then lower water quality cannot be authorized by allocating a portion of the available assimilative capacity.

[26] NOTE: To be developed as part of the SNMP Basin Plan Amendment Package based on the concepts described in Attachment A (below).

**Permitting Strategy for Discharges to Groundwaters with No Assimilative Capacity Available**

The California Water Code requires Regional Water Boards to implement the Water Quality Control Plan (Basin Plan) when establishing waste discharge requirements (WDRs).[27] Consequently, when existing nitrate concentrations in the groundwater already exceed 10 mg/L, and there is no assimilative capacity available, the State Water Board has previously ruled that Regional Water Boards may not authorize waste discharge requirements (WDRs) greater than the applicable water quality objective.[28]

For discharges to groundwater, compliance with the objective is generally assessed at the point-of-discharge or immediately below the root zone of an irrigated field.[29] Exceptions to this approach *"may be granted where it can be shown that a higher discharge limitation is appropriate due to system mixing or removal of the constituent by the process of percolation through the ground to the aquifer."*[30] So, for example, the Regional Water Board may take into consideration crop uptake, mixing with stormwater recharge, and transformation through the soil when assessing whether a discharge will meet the water quality objective when it reaches the groundwater. The burden of providing adequate technical information to support such findings generally falls on the dischargers.

The above approach describes the Regional Water Board's current permitting strategy for discharges of nitrate to groundwater when there is no assimilative capacity available. If discharges are unable to immediately comply with such restrictions, and require additional time to implement the necessary pollution control measures, the Regional Water Board is authorized to establish an appropriate compliance schedule in the WDRs.[31]

In some cases, there may be no reasonably feasible or practicable means for dischargers to comply with WDRs limiting the discharge of nitrate to groundwater to concentrations less than 10 mg/L.[32] In such circumstances, under the current regulatory framework, the Regional Water Board may have no legal option but to prohibit the discharge.[33] This, in turn, may be tantamount to prohibiting any activity producing a discharge that is unable to comply with water quality objectives, or is unable to assure that the receiving water will comply with water quality objectives, using reasonable best efforts. Such an outcome is inconsistent with the State Water Board's declaration that *"Resolution 68-16 is not a 'zero-discharge' standard but rather a policy statement that existing quality be maintained when it is reasonable to do so."*[34]

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[27] CWC §13263(a)

[28] See, for example, SWRCB Order No. 73-4: In the Matter of the Petition of Orange County Water District for Review of Order No. 72-16 of the California Regional Water Quality Control Board, Santa Ana Region, Prescribing Waste Discharge Requirements for Rancho Caballero Mobile Home Park (Feb. 1, 1973).

[29] SWRCB Order No. WQ-88-12: In the Matter of the Petition of Carol Ann Close; San Diego County Milk Producers Council, el al. (pg. 14)

[30] SWRCB Order No. WQ-81-5: In the Matter of the Petition of the City of Lompoc for Review of Order No. 80-03 (NPDES Permit No. CA 0048127), California Regional Water Quality Control Board, Central Coast Region. (March 19, 1981).

[31] CWC §13263(c)

[32] See, for example, a more detailed discussion in: "Conclusions of the Agricultural Expert Panel: Recommendations to the State Water Resources Control Board pertaining to the Irrigated Lands Regulatory Program" Sept. 9, 2014.

[33] CWC §13243 and CWC §13301; see also SWRCB Order No. 88-12: In the Matter of the Petition of Carol Ann Close; San Diego County Milk Producers Council, el al. (pg. 15).

[34] SWRCB Order No. 86-8; In the Matter of the Petition of the County of Santa Clara, et al. May 5, 1986; pg. 29

In many instances, prohibiting the discharge may also be infeasible, impracticable or unreasonable. Municipal wastewater treatment plants, for example, cannot simply halt the flow of sewage into the facility without severe adverse consequences on public health and the environment. Similarly, prohibiting nitrate discharges from commercial agriculture may result in substantial and widespread adverse social and economic impacts on residents of the state while doing little to resolve the existing water quality impairments in the region. For this reason, the State Water Board had concluded that:

> *"Pollution prevention and cleanups … may not be feasible. Consequently, any practical solution to groundwater contamination must also focus on strategies to provide safe drinking water to consumers through treatment and alternative water supplies."*[35]

To that end, the State Water Board has also declared that:

> *"The single most important action that can be taken to help ensure safe drinking water for all Californians is to provide a stable, long-term source(s) of funding to assist those impacted by nitrate-contaminated groundwater."*[36]

Requiring strict compliance, even where a discharger is actually able to meet standards, will do little in the near-term to address prior discharges slowly moving through the vadose zone.[37] Nor does prohibiting the discharge when compliance cannot be achieved.[38]

Where existing groundwater quality already exceeds the MCL for nitrate, the Regional Water Board's foremost goal should be to encourage rapid implementation of safe drinking water alternatives. To achieve this goal, the Regional Water Board requires additional permitting options. Specifically, CV-SALTS recommends that the two Central Valley Basin Plans be amended to extend and expand the Regional Water Board's current authority to authorize conditional exceptions under certain circumstances.[39] The following section describes how such exceptions authority should be applied with respect to permitting nitrate discharges to groundwater. A more detailed description of the specific basin plan revisions required to enact a broader exceptions policy and the rationale for such changes is provided in Section XXX of the SNMP.

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[35] State Water Resources Control Board. Report to the Legislature: Recommendations for Addressing Nitrate in Groundwater. February, 2013; pg. 5 (citing Thomas Harter, et al. Addressing Nitrate in California's Drinking Water: Report to the California State Water Resources Control Board. U.C. Davis Center for Watershed Sciences. January, 2012).

[36] State Water Resources Control Board. Report to the Legislature: Recommendations for Addressing Nitrate in Groundwater. February, 2013; pg. 24.

[37] State Water Resources Control Board. Report to the Legislature: Recommendations for Addressing Nitrate in Groundwater. February, 2013; pg. 5 (citing the UC-Davis Report identified in Footnote #3, above).

[38] State Water Resources Control Board. Report to the Legislature: Communities that Rely on Contaminated Groundwater. Jan., 2013. See discussion at pages 18-20 in the report. See also the United Nations Report of the Special Rapporteur on the Human Right to Safe Drinking Water and Sanitation. A/HRC/18/33/Add.4 (Aug. 2, 2011); http://www2.ohchr.org/english/bodies/hrcouncil/docs/18session/A-HRC-18-33-Add4_en.pdf

[39] Central Valley Regional Water Quality Control Board Resolution No. R5-2014-0074 (June 6, 2014); subsequently approved by the SWRCB in Res. No. 2015-0010 (March 17, 2015).

**Conditional Exceptions**

If authorized by the Basin Plan and approved by the Regional Water Board, an "exception" allows a discharge to occur even where doing so would otherwise violate applicable water quality standards in the receiving groundwater basin.[40] Exceptions are most commonly employed when there is no feasible, practicable or reasonable means for a discharger to comply with applicable WDRs and it is not feasible, practicable or reasonable to prohibit the discharge.

Exceptions are an appropriate option when state authorities determine that prohibiting a discharge would do more harm than good and allowing it to continue is in the best interests of the people of the state. Exceptions may also be an appropriate tool to authorize the time required to implement other regulatory solutions (e.g. developing site-specific objectives or reevaluating the applicable beneficial use) or to support a program of phased implementation and reasonable resource allocation including the planning and permitting activities required in such programs. However, exceptions are not intended to be a permanent waiver from compliance obligations. They are conditional and reviewable.

Exceptions are conditional for two reasons. First, dischargers are still expected to make reasonable Best Efforts intended to comply with applicable WDRs when there exists a feasible and practicable means for doing so. Second, in lieu of meeting the applicable water quality objective, dischargers will be expected to propose an Alternative Compliance Program (ACP) designed to mitigate the significant adverse effect(s) of their permitted discharge as it relates to constituent for which a conditional exception is granted.[41] In the case of nitrates, an ACP will likely need to assure that groundwater users downgradient of the discharge have drinking water that meets applicable state and federal standards. ACPs may include both interim actions (e.g. bottled water in the short-term) and permanent solutions such as well-head treatment or alternative drinking water supplies in the intermediate term and efforts to re-attain the water quality objective (where feasible and practicable) over the long-term.

Exceptions are reviewable for two reasons. First, although the means to assure compliance may not currently exist, new source control and treatment technologies may be developed in the future. therefore, exceptions must be periodically reassessed. Second, permanent exceptions would be tantamount to nullifying the designated use. Therefore, where compliance cannot be assured (even over the long-term), the State Water Board has stated that the Regional Water Boards should consider whether the water quality standard itself is appropriate.[42] Exceptions are intended to complement, not replace, the water quality standards review process.

The current exceptions policy is restricted to a limited number of salinity constituents (electrical conductivity, TDS, chloride, sulfate and sodium).[43] The policy should be revised in order to provide the Regional Water Board additional authority to allow exceptions for nitrate.

[40] Exceptions from compliance with water quality standards in a groundwater basin is similar to the concept of a "variance" for surface waters. The key distinction is that exceptions are governed exclusively by state law and variances are subject to both state and federal authority. See, for example, Res. No. R5-2014-0074.

[41] A more detailed description of the mandatory elements in an ACP is described in section XXX of this SNMP.

[42] SWRCB Order No. WQ-81-5: In the Matter of the Petition of the City of Lompoc for Review of Order No. 80-03 (NPDES Permit No. CA 0048127), California Regional Water Quality Control Board, Central Coast Region. (March 19, 1981).

[43] Res. No. R5-2014-0074

The current exceptions policy was deliberately designed to provide interim relief from meeting salinity objectives while CV-SALTS was in the process of developing the long-term Salt and Nitrate Management Plan. As such, the interim policy does not allow exceptions longer than 10 years and it prohibits the Regional Water Board from approving any new exceptions after June 30, 2019. Before that date, it was expected that the interim policy would be replaced by a more permanent exceptions policy – one that was developed in conjunction with the CV-SALTS stakeholder process and was well-integrated with the regional SNMP.[44]

In this SNMP, CV-SALTS recommends that the expiration date specified in the interim policy be deleted so that that the Regional Water Board is authorized to approve exceptions after June 30, 2019. In addition, CV-SALTS recommends that the 10-year time limit specified in the interim policy be revised by allowing the Regional Water Board to authorize or reauthorize exceptions for much longer periods where necessary to facilitate implementation of the long-term restoration strategies described in the SNMP.[45] Regardless, dischargers are expected to comply with water quality standards if and when a feasible and practicable means for doing so becomes available. The existing requirement to periodically assess and confirm discharger conformance with the terms and conditions of any exception would remain unchanged.

In general, the Regional Water Board should consider the following factors when contemplating whether to grant a conditional exception for discharges of nitrate:

1) Nitrate concentrations in the groundwater basin exceed or threaten to exceed the MCL.
2) There is no feasible, practicable or reasonable means to assure compliance with the relevant WDRs governing nitrate.
3) It is infeasible, impracticable or unreasonable to prohibit the discharge. The Regional Water Board will prepare guidelines for making such an assessment.
4) Authorizing the discharge is in the best interests of the people of the State.
5) The discharger requests an exception and proposes to implement an Alternative Compliance Program (ACP) in lieu of meeting the relevant WDRs for nitrate.
6) The ACP provides appropriate well-head treatment or an alternative drinking water supply to downgradient groundwater where nitrate levels exceed or threaten to exceed the MCL…[46]
7) The discharger continues to make reasonable Best Efforts, where feasible and practicable, to further reduce nitrate concentrations in the discharge.
8) The discharger agrees to actively support implementation of the long-term nitrate compliance strategy (NIMS) described in the SNMP.

In order to approve an exception for nitrate, the Regional Water Board should consider whether the Alternative Compliance Program will result in a higher level of public health protection (e.g. greater or faster risk reduction) than is likely to otherwise occur if the discharge were prohibited or is a key part of a long-term restoration strategy. In other words, will the ACP do a better job of achieving the real-world outcomes originally sought by requiring strict compliance with WDRs to meet water quality standards?

[44] R5-2014-0074; Regional Board Staff Response to Public Comments, pg. 12 & 13.
[45] The long-term Nitrate Implementation Measures Strategy (NIMS) is described in Section XXX of the SNMP.
[46] The discharger may propose to participate in a regional project or make one or more payments to a regional nitrate mitigation fund approved as an ACP subject to Regional Water Board review and approval.

**Attachment A: "Maximum Benefit" concepts to be developed in regional Anti-Deg guidance.**

1) Allowing lowering water quality will result in more effective protection of actual beneficial uses than would occur by imposing more stringent WDRs or prohibiting the discharge. Example: the discharge is coupled with a project to provide well-head treatment or alternative drinking water supplies in an area where the MUN use is already severely impaired.

2) Allowing receiving water quality to degrade, in relation to the historical baseline condition, would actually improve current water quality or would significantly reduce the rate at which receiving water quality is already degrading (or is expected to degrade). Example: creating barriers to groundwater migration or diluting contaminants in the vadose zone.

3) Lowering water quality at one location will result in higher water quality in the same or another location such that there is a net improvement in water quality and beneficial use protection in the receiving water, watershed, region or state as a whole. Example: a groundwater clean-up project removes TCE, but the air stripping process increases the concentration of TDS.

4) Lowering water quality would facilitate increased use of recycled water (particularly by displacing demand for potable water) and thereby increase the overall water supply in the watershed, region or state. Example: using recycled water for landscape or agricultural irrigation.

5) Lowering water quality would facilitate increased recharge and storage to groundwater basins and particularly where DWR has determined the underlying aquifer is in a significant overdraft condition.

6) Allowing lower water quality is necessary to protect infrastructure or industries deemed vital to national security, public safety, public health, or the environment.

7) Lowering water quality would produce significantly less adverse environmental impact than imposing more stringent effluent limitations or discharge prohibitions. Example: additional treatment results in significant cross-media waste streams (e.g. brines, greenhouse gases, etc.) or requires significant energy consumption without any corresponding reduction in risk to public health or the environment.

8) Lowering water quality is necessary to accommodate important social and economic growth in the region particularly where more stringent WDRs or prohibiting the discharge would result in widespread and substantial adverse socioeconomic impacts in the area.

Note: the above examples are intended to illustrate some, but not all, possible approaches to making a Maximum Benefit demonstration.