9 Implementation Measures to Manage Salt and Nutrient Loading in the Groundwater Basin on a Sustainable Basis

The primary goal of the SNMP is to protect, conserve, and augment water supplies and improve water supply reliability. Recycled water projects serve a key role in the SNMP area to support water supply reliability. However, the implementation of the projects needs to be done in a way that ensures the protection of the groundwater basin. This section outlines existing management measures that are currently in place in the SNMP area that will be maintained under any future scenario and outlines a process for evaluating recycled water projects and determining whether additional management measures are needed. Potential future management measures are identified that can be selected if needed to implement a planned project.

9.1 EXISTING MANAGEMENT MEASURES

The objective of SNMP implementation measures is to manage salt and nutrient loadings on a sustainable basis and to maintain long term supply for multiple beneficial uses. Per the guidance provided in the document, *Regional Water Board Assistance in Guiding Salt and Nutrient Management Plan Development in the Los Angeles Region*, these strategies should be tailored to basin specific characteristics and conditions, but should be generally focused on:

- Pollution prevention;
- Source load reductions to groundwater basins;
- Treatment and management of areas of impaired water quality;
- Boosting or stabilizing declining water levels where water quality is not affected;
- Increasing groundwater recharge by stormwater; and
- Increasing recycled water use.

In the LSCR planning area, salt and nutrient management has been ongoing for a number of years. There are a number of existing management measures and activities that contribute to reducing loads and improving groundwater quality. Salt and nutrient load pathways are described in **Section 6** and shown in **Figure 6-1**. Understanding these source pathways is helpful in tailoring implementation measures to the LSCR planning area.

The existing management measures are categorized by source and pathway for reducing salt and nutrient contributions to the groundwater. For example, some management measures prevent loads from entering the basin (e.g., water conservation or water softener bans), others offset loads from another source (e.g., changing the source water for an irrigation project), and others remove loading from the basin (e.g., groundwater treatment). The categories used to describe the management measures are:

- Improve wastewater and reclaimed water quality;
- Improve municipal water quality;
- Reduce septic system leachate and improve quality;
- Manage urban stormwater runoff to support basin water quality;
- Improve non-stormwater discharge control and quality;

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- Improve agricultural runoff control and quality;
- Increase recycled water use;
- Increase aquifer recharge with lower concentration water sources;
- Improve urban and agricultural water efficiency/conservation;
- Reduce saltwater intrusion and protect groundwater quality; and
- Manage groundwater pumping and water levels.

Table 9-1 summarizes the existing management measures. The table of existing measures was developed from existing documents and through communication with stakeholders.

Implementation of the existing management measures has resulted in reductions in the discharges of salts and nutrients to the groundwater basins. Average effluent concentrations from the wastewater treatment plants for chloride, TDS and total nitrogen has decreased as a result of the existing management measures shown in **Table 9-1**. Estimated annual effluent concentrations prior to the treatment plant upgrades and water softener bans are shown in **Table 9-2.** For Piru, Fillmore, and Santa Paula, the installation of new treatment facilities have reduced the discharge of total nitrogen into the watershed by over 75%. For salts, the water softener bans appear to have reduced total dissolved solids and chloride concentrations from Fillmore and Santa Paula.

Table 9-1 Existing Management Measures

Category	Specific Measure	Agency/Action	Description	Effect
Wastewater and reclaimed water quality	Source control - salts	City of Santa Paula – Water Softener Ban	Prohibits replacement or enlargement any apparatus for treating the water supply to a property if the apparatus is of a kind that produces any wastewater with a mineral content higher than that of the water supply of the property.	Fewer self-regenerating water softeners (or other treatment devices that produce a high mineral waste) will reduce the salt load in residential wastewater.
Wastewater and reclaimed water quality	Source control – salts	City of Fillmore - Water softener rebate program	Outreach and rebate program aimed at reducing the number of self-regenerating water softeners in the Fillmore community. Approximately 85 rebates completed to date.	Fewer self-regenerating water softeners will reduce the salt load in residential wastewater.
Wastewater and reclaimed water quality	Source control – salts	City of Fillmore	Prohibits self-regenerating water softeners discharging to the sanitary sewer.	Prohibits the additional salt load wastewater from water softener brine.
Wastewater and reclaimed water quality	Source control – salts and nutrients	City of Santa Paula – Industrial Discharge Ordinance	Local limits for TDS (2,000 mg/L), chloride (110 mg/L) and ammonia nitrogen (30 mg/L).	Provides an upper limit on the concentration of salts and nutrients in industrial contributions to wastewater.
Wastewater and reclaimed water quality	Source control – salts	City of Ventura – Local Limits	Local limit for TDS (4,270 mg/L).	Provides an upper limit on the concentration of salts in industrial contributions to wastewater.
Wastewater and reclaimed water quality	Source control – salts	City of Ventura – Ordinances on Industrial discharges	Prohibits discharge of saltwater or brine from commercial or industrial activities. Establishes local limits for industrial/commercial facilities. Establishes permit requirements for non-domestic wastewater discharges.	Prohibits the additional salt load to wastewater from saltwater or brine from commercial or industrial activities.
Wastewater and reclaimed water quality	Treatment control – nutrients	City of Santa Paula – Upgraded treatment facilities	Construction of new wastewater treatment facilities with nutrient removal to replace secondary treatment facility.	Reduction in total nitrogen concentrations in effluent.

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Table 9-1 Existing Management Measures

Category	Specific Measure	Agency/Action	Description	Effect
Wastewater and reclaimed water quality	Treatment control – nutrients	City of Fillmore – Upgraded treatment facilities	Construction of new wastewater treatment facilities with nutrient removal to replace secondary treatment facility.	Reduction in total nitrogen concentrations in effluent.
Wastewater and reclaimed water quality	Treatment control – nutrients	Ventura County Waterworks District 16 – Upgraded treatment facilities	Construction of new wastewater treatment facilities with nutrient removal and subsequent upgrade to tertiary treatment.	Reduction in total nitrogen concentrations in effluent.
Septic system leachate volume and quality	Leachate volume reduction	City of Santa Paula – Septic tank policy	Prohibits installation of new septic tanks in service area and requires tie-in of a septic tank to the sewer if located within 200 feet of a sewer line. County areas adjacent to the service area also are required to tie in.	Reduces the volume of septic system leachate that percolates into shallow groundwater. Tie-in to a treatment plant ultimately leads to a treated waste stream with a lower nutrient load.
Municipal water quality	Provide treatment of a compromised supply	City of Ventura – Water Conditioning Facilities	City of Ventura has two water condition facilities that treat extracted groundwater from the Mound basin before potable use. The conditioning facilities are designed to reduce iron and manganese in the extracted groundwater and help comply with secondary drinking water standards. The City's current (interim) approach to continued use of this supply is to blend the water from the Mound basin with water from the Oxnard Plain prior to delivery to customers.	Reduces salt concentration in municipal water supply.

Table 9-1 Existing Management Measures

Category	Specific Measure	Agency/Action	Description	Effect
Stormwater runoff management	Increase stormwater recharge through LID and improve quality through BMPs	Ventura County – MS4 permit	Requires specified New Development and Redevelopment projects to control pollutants, pollutant loads, and runoff volume emanating from impervious surfaces through infiltration, storage for reuse, evapotranspiration, or bioretention/ bioinfiltration by reducing Effective Impervious Area to 5% or less of the total project area.	Promotes infiltration of rainwater (low in salt and nutrients) into the groundwater. Through treatment, reduces pollutant loads to groundwater and surface waters (that may recharge groundwater basins).
Stormwater runoff management	Increase stormwater recharge and improve water quality through BMPs	Ventura County – Green Street Demonstrations	Demonstration projects to illustrate stormwater capture and treatment BMPs.	Promotes infiltration of rainwater (low in salt and nutrients) into the groundwater. Through treatment, reduces pollutant loads to groundwater and surface waters (that may recharge groundwater basins).
Non-stormwater discharge control and quality	Source control of non-stormwater discharges	Ventura County – MS4 permit	Requires discharges of debrominated/ dechlorinated swimming pool water to meet water quality standards for salts.	Provides an upper limit on the concentration of salts in non-stormwater contributions to stormwater.
Agricultural runoff control and quality	Source control through fertilizer BMPs	VCAILG – Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands within the Los Angeles Region	Fertilizers are applied in multiple smaller applications, as opposed to one large application. Fertilizer applications are adjusted to account for other nutrient sources, such as: irrigation water, cover crops, and residuals from previous fertilizations. Fertilization rates are adjusted based on the results of soil fertility measurements.	Reduces the load of nitrogen that is transported by runoff to surface waters and by infiltration to groundwater.

Table 9-1 Existing Management Measures

Category	Specific Measure	Agency/Action	Description	Effect
Agricultural runoff control and quality	Source control through salinity/leaching BMPs	VCAILG – Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands within the Los Angeles Region	Leaching is performed only when necessary, as determined by measuring soil solution electrical conductivity. Saline or high selenium wells are decommissioned and other sources of water are used. Fertilizers and amendments with low salt index are used.	Reduces the load of salts to the groundwater from leaching activities.
Wastewater Reuse	Offset supply with reclaimed wastewater	City of Ventura	Urban irrigation of golf courses and landscaping. Recycled water permit establishes nitrate plus nitrite limit of 10 mg/L as N.	Limits the nitrate concentration in the applied irrigation water.
Wastewater Reuse	Offset supply with reclaimed wastewater	City of Fillmore	Urban irrigation of schools, parks and other locations. Recycled water permit establishes concentration limits for irrigation water, including; 5 mg/L as N for nitrate plus nitrite 2,000 mg/L for TDS, and 155 mg/L for chloride.	Limits the concentrations of salts and nitrate in irrigation water.
Agricultural Water Conservation	Conservation through efficiency criteria	FCGMA – Agricultural Pumpers Use Irrigation Efficiency Criteria	Agricultural users may use "Efficiency Criteria" in place of historical groundwater allocations. Must have 20% or less of applied water going to leaching, deep percolation or runoff.	Through conservation, reduces the load of salt associated with irrigation water that is ultimately conveyed in irrigation runoff or in percolation.
Agricultural Water Conservation	Conservation through irrigation management practices	VCAILG – Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands within the Los Angeles Region	Irrigation is varied to accommodate plant growth stage and weather. Irrigation conducted by personnel who understand and practice irrigation practices related to runoff management. Irrigation is halted if significant runoff occurs.	Through conservation, reduces the load of salt associated with irrigation water that is ultimately conveyed in irrigation runoff or in percolation.

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Table 9-1 Existing Management Measures

Category	Specific Measure	Agency/Action	Description	Effect
Saline intrusion and groundwater quality	Groundwater quality improvement	City of Fillmore, Piru basin – Control of Saline Intrusion and protect groundwater quality	Current programs to achieve basin management goals include: Management of wellhead protection areas, well abandonment and destruction program, overdraft mitigation measures, replenishment of extracted groundwater	Improvement in groundwater quality protection.

Table 9-2 Estimated Reduction in Effluent Salt and Nutrient Concentrations Resulting from Existing Management Measures

Facility	Estimated concentrations pre-management measures[1]			Current average concentrations		
	TDS	Chloride	TN	TDS	Chloride	TN
Piru	1,200	162	43[2]	1,261	165	2
Santa Paula	1,321			1,202	150	8
Fillmore	1,286	132	29	1,189	100	6

[1] Estimated average concentrations prior to treatment plant upgrades.
[2] Estimated maximum concentration for Total Nitrogen (TN).

While quantification of the impact of agricultural management measures on loading reductions is more challenging, significant implementation of management measures to reduce irrigation and fertilizer discharges to surface and groundwater has occurred in the SCR watershed. The following summarizes the "yes" responses to implementing BMPs that fall into the irrigation and salinity management and nutrient management categories. These percent implementation rates consider all survey data collected in 2014, which covers 82.71% of the irrigated acres enrolled in VCAILG within the SCR watershed. Overall, there are 27,493 irrigated acres in the SCR watershed enrolled in VCAILG and the surveys cover 22,740.5 irrigated acres. As shown in **Table 9-3**, management measures for salts and nutrients have been implemented on the majority of agricultural acreage in the watershed, and over half of the management measures have been implemented on more than 70% of the watershed acreage.

Table 9-3 Percent Implementation of Agricultural Management Measures for Nutrients and Salts

Management Practice Question		% SCR Watershed Acres Enrolled in VCAILG Implementing this Practice [1]	% Surveyed SCR Watershed Acres Implementing this Practice [2]
Irrigation and Salinity Management			
1	Sprinkler irrigation runoff is captured or kept on the property.	46.92%	56.73%
2	At least every 5 years, the irrigation system is tested for distribution uniformity by monitoring water delivery or pressure differences within a block.	63.11%	76.30%
3	Regular maintenance is performed on the irrigation system to maintain distribution uniformity and prevent runoff caused by leaks or clogged lines.	80.87%	97.78%
4	Pressure regulators or pressure compensating emitters are used.	68.80%	83.18%
5	Sprinkler heads and drip emitters of the same flow rate are used within each block and replaced with the same heads or emitters, when necessary.	79.00%	95.5%

Table 9-3 Percent Implementation of Agricultural Management Measures for Nutrients and Salts

Management Practice Question		% SCR Watershed Acres Enrolled in VCAILG Implementing this Practice [1]	% Surveyed SCR Watershed Acres Implementing this Practice [2]
6	Soil moisture is measured using any of the following: • Sensors • Tensiometers • Probes • Irrigation monitoring service	59.61%	72.06%
7	Flow meters are used to measure actual water use and are coupled with known crop use values or other measurements to match irrigation to plant needs.	61.77%	74.68%
8	Irrigation water quality is tested for parameters of interest including: • Nitrate • pH • Electrical Conductivity (EC) • Sodium • Chloride • Bicarbonate • Boron	71.83%	86.84%
9	Water use for plant establishment has been reduced by adopting more efficient irrigation methods such as: • Early drip use • Intermittent sprinklers • Microsprinklers	73.00%	88.26%
10	Irrigation decisions are made by trained personnel who understand appropriate irrigation management.	80.25%	97.02%
11	Salt leaching is performed only when necessary, as determined by measuring soil solution electrical conductivity (EC).	38.28%	46.28%
Nutrient Management			
12	Soil or leaf/petiole tests are conducted to determine fertilization needs and the minimum amount necessary is applied based on the results.	76.25%	92.18%
13	Fertilizer applications are split into multiple smaller applications to maximize plant uptake.	79.93%	96.63%
14	Fertilizer levels in fertigation water are tested to ensure that injectors are correctly calibrated.	54.21%	65.54%
15	Fertilizer applications are timed to consider irrigation and potential rain events.	80.19%	96.95%
16	Fertilizer applications are adjusted to account for other nutrient sources, such as: irrigation water, cover crops, and residuals from previous fertilizations.	77.01%	93.11%

Table 9-3 Percent Implementation of Agricultural Management Measures for Nutrients and Salts

Management Practice Question		% SCR Watershed Acres Enrolled in VCAILG Implementing this Practice [1]	% Surveyed SCR Watershed Acres Implementing this Practice [2]
17	Fertilizer decisions are made by trained personnel who understand the "4R's" of nutrient management: • Right fertilizer source • Right time • Right rate • Right place	80.50%	97.33%
18	Fertilizers are stored where they are protected from rain and on an impermeable pad with a curb to contain spills.	73.24%	88.54%
19	Backflow prevention devices are installed and maintained.	73.99%	89.45%

[1] Denominator used was 27,493 ac. for conservative estimate.
[2] Denominator used was 22,740.5 ac., thus considering only the acres that were surveyed.

The existing management measures that have already been implemented in the watershed cover the majority of source control and treatment activities that can be implemented at wastewater treatment plants to address salts and nutrients, with the exception of costly reverse osmosis treatment. Most of the agricultural acres have implemented management measures and continued implementation of additional management measures is required by the conditional waiver for irrigated lands. The existing management measures represent significant efforts to improve water quality and reduce salt and nutrient discharges in the planning area.

Sources of salts and nutrients in the planning area are expected to remain similar into the future. Land uses in the planning area have remained relatively constant for the past 20 years and local ordinances are designed to maintain existing urban boundaries and minimize the conversion of agricultural lands to other land uses. Maintaining existing management measures will support sustainable management of the sub-basins. As a result, the management measures outlined in this table will be maintained to support management of salts and nutrients in the SNMP area. Additionally, management measures for agricultural and stormwater discharges identified in the table that result from conditional waivers of permit requirements[1] or permit requirements[2] will over time be implemented in larger portions of the SNMP area, resulting in additional reductions in salt and nutrient loadings from these sources over time.

9.2 APPROACH FOR EVALUATING PROJECTS AND IDENTIFYING NEED FOR POTENTIAL FUTURE MANAGEMENT STRATEGIES

As described in **Section 7**, assimilative capacity is available in all subareas except for TDS in the Mound basin. The overall approach to evaluating projects is based on evaluating the amount of assimilative capacity that would be used by a project or group of projects and determining whether the amount of assimilative capacity used would result in degradation of the basin as outlined in the antidegradation analysis. If a project would result in degradation of the basin, management measures can be selected from the list of potential future management measures to

[1] Such as the Conditional Waiver for Discharge from Irrigated Lands (Order No.R4-2010-0186.)

[2] Such as the Ventura County MS4 Permit, Order No. R4-2010-0108.

offset the additional loading. Alternatively, a full antidegradation analysis could be conducted for the project to determine if the degradation is offset by important social and economic benefits to the people of the state.[3] This section outlines the process for evaluating projects and determining if additional management measures are needed or if a full antidegradation analysis is needed.

It is important to remember that the implementation of recycled water projects in the LSCR SNMP is in and of itself a management measure for sustainable management of the groundwater basins. In the LSCR SNMP project area, the groundwater is the primary source of agricultural and municipal water supply. Recycled water projects provide a mechanism to offset groundwater use and therefore contribute to the availability of groundwater supplies. Additionally, using recycled water to irrigate vegetation instead of disposing of the effluent in percolation ponds reduces the loading, particularly of nutrients, that reaches the groundwater through uptake of nutrients and salts by the plants.

The procedure for evaluating projects is shown in **Figure 9-1** and described in detail in this section.

[3] Water Code Section 13000; California Antidegradation Policy Resolution 68-16.

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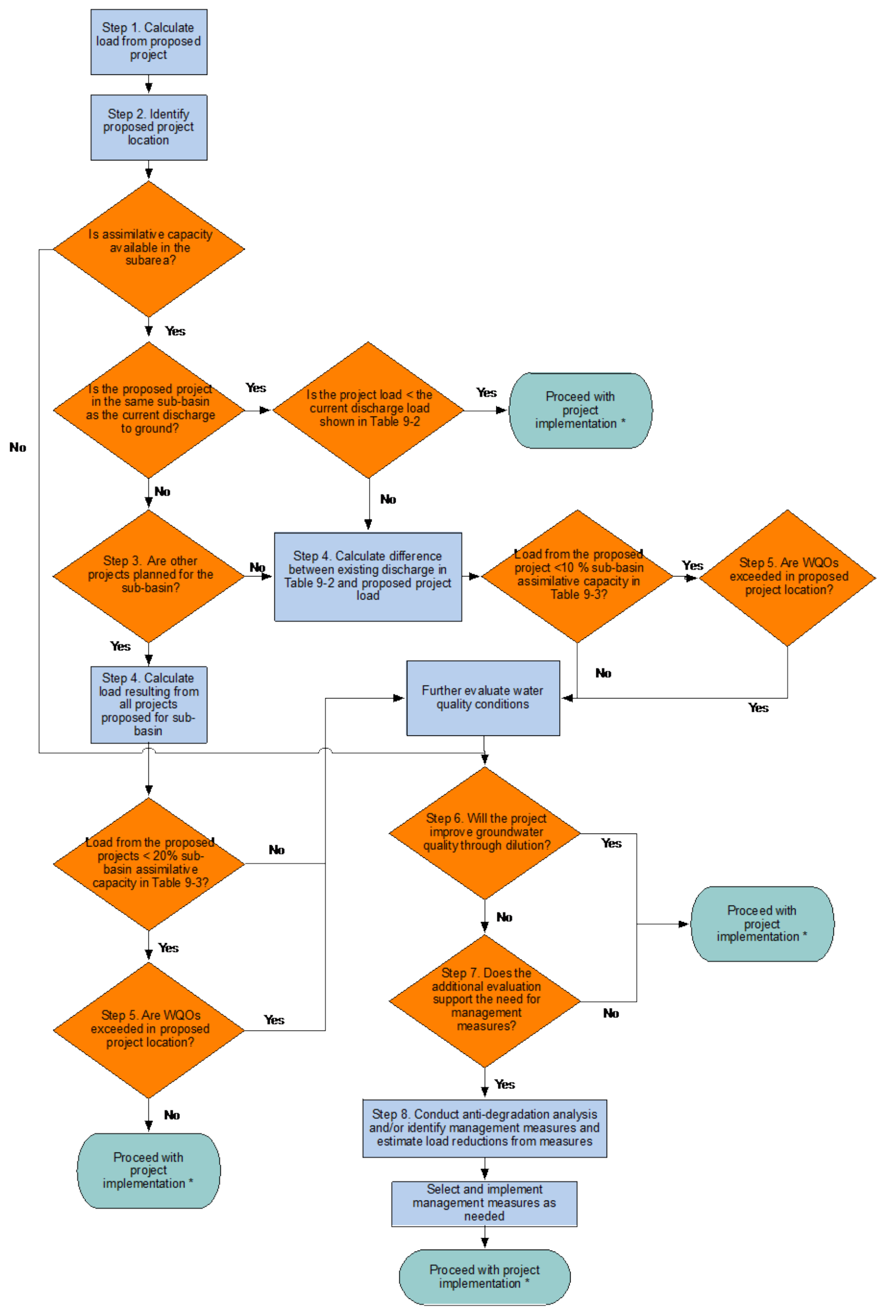

*Contingent upon compliance with other regulatory requirements

Figure 9-1 SNMP Project Evaluation Process

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9.2.1 Calculate Loading from the Proposed Recycled Water Project

The first step in the evaluation process is to calculate the loading that will result from the proposed recycled water project.

Step 1. Multiply the volume of water to be recycled by the average concentration of the discharge and any applicable conversion factor to calculate the load (in pounds per day) applied to the ground. For volume in AFY and concentrations in mg/L, the equation would be:

$$AFY*mg/L*0.00745=lbs/d$$

Step 2. Determine whether assimilative capacity exists in the subarea where the project is proposed to be located and whether the recycled water project is in the same subarea as the effluent is currently discharged.

a. If no assimilative capacity is available in the subarea, proceed to the analysis outlined in **Subsection 9.2.4**.

b. If the project is in the same subarea, compare the load calculated in Step 1 to the current load being discharged to percolation ponds outlined in **Table 9-4**.

i. If the calculated load is less than the load in **Table 9-4**, the project is not adding any new load to the groundwater basin and no further evaluation or management measures are needed.

ii. If the calculated load is higher than the load in **Table 9-4**, determine the difference between the two loads. The difference is the project load for evaluation.

c. If the project is in a different subarea, all of the load calculated in step 1 is considered a new load to the subarea.

Step 3. Determine if any other recycled water projects are existing or proposed for the subarea.

a. If other projects are existing or proposed, the loadings from all planned projects in the subarea must be considered together in the evaluation. Calculate the total loading from all the projects using the steps in this section. (See **Subsection 9.2.6** for other considerations.)

Table 9-4 Summary of Current Wastewater Loadings to Percolation Ponds

POTW	Piru	Fillmore	Santa Paula	Todd Road	Saticoy	Limoneira	Olive Lands
TDS (lbs/d)	1,945	9,221	18,843	350	1,531	842	69
Cl (lbs/d)	255	772	2,351	29	117	45	5
NO_3 (lbs/d)	2	26	103	0	3	4	1

9.2.2 Compare Loading to Available Assimilative Capacity

Once the loading from the project(s) has been determined, a comparison of the project loading to the available assimilative capacity needs to be conducted.

Step 4. Compare the project loadings calculated to the available assimilative capacity loads shown in **Table 9-5**.

a. If there is no assimilative capacity in the subarea, go to the next step for further evaluation.

b. If the project loads are **less than** the 10% assimilative capacity threshold, no degradation is expected from the project.[4] Proceed to the next step.

c. If the project loads are **less than** the 20% assimilative capacity threshold for multiple projects, no degradation is expected from the project. Proceed to the next step.

d. If the percent of assimilative capacity used is **greater than** these thresholds or there is no available assimilative capacity, further evaluation or implementation of management measures is needed. Proceed to the analysis outlined in **Subsection 9.2.4**.

9.2.3 Evaluate Local Conditions

Although a project may be below the assimilative capacity thresholds, the thresholds were developed based on a sub-basin analysis. In some cases, individual wells or small portions of the sub-basin were identified in the analysis as exceeding water quality objectives. If a project is to be implemented in the vicinity of areas that currently exceed water quality objectives, further evaluation is needed to determine if management measures are warranted even if the project loading is below the assimilative capacity thresholds.

Step 5. To conduct this evaluation, the location of the project should be compared to the maps of localized higher water quality, shown in **Figure 9-2** and **Figure 9-3**.

a. If the project is located near an area of localized water quality objective exceedances, proceed to the analysis outlined in **Subsection 9.2.4**.

b. If the project is not located near an area of localized water quality objective exceedances, no management measures are necessary and the project may proceed as planned, contingent upon compliance with other regulatory requirements.

The generalized locations of the potential planned recycled water projects are shown in **Section 8**. For Fillmore, the potential locations of the recycled water projects are not in the vicinity of areas that currently exceed water quality objectives. For Santa Paula and Piru, the majority of the potential recycled water project is not near an area that currently exceeds water quality objectives, but some areas could be in the vicinity so specific project evaluation may be necessary depending on the specific project location.

[4] Justification for the 10% and 20% thresholds is discussed in the Antidegradation Analysis in **Section 11**.

Table 9-5 Assimilative Capacity Thresholds

Basin	Subarea	TDS 10% Threshold (lbs/d)	TDS 20% Threshold (lbs/d)	Chloride 10% Threshold (lbs/d)	Chloride 20% Threshold (lbs/d)	Nitrate-N 10% Threshold (lbs/d)	Nitrate-N 20% Threshold (lbs/d)
Piru	Upper Area below Lake Piru	NA	NA	NA	NA	NA	NA
	Lower Area East of Piru Creek	48,000	96,000	7,050	14,100	115	230
	Lower Area West of Piru Creek	13,000	26,000	550	1,100	485	970
Fillmore	Pole Creek Fan Area	41,500	83,000	500	1,000	240	480
	South Side of Santa Clara River	13,000	26,000	950	1,900	255	510
	Remaining Fillmore [1]	0	0	0	0	150	300
Santa Paula	East of Peck Road	11,000	22,000	1,500	3,000	30	60
	West of Peck Road [1]	53,000	106,000	3,150	6,300	0	0
Oxnard Forebay		10,000	20,000	5,500	11,000	1,245	2,490
Mound		0	0	8,150	16,300	635	1,270

[1] Zeros in the table indicate that the model predicts that existing loads will use up 20% of available assimilative capacity over the 17-year period. As a result, any new loads from recycled water projects in these areas would require further evaluation and could not be considered under the assimilative capacity thresholds. A discussion of the model analysis that resulted in the assimilative capacity thresholds is presented in Section 7.

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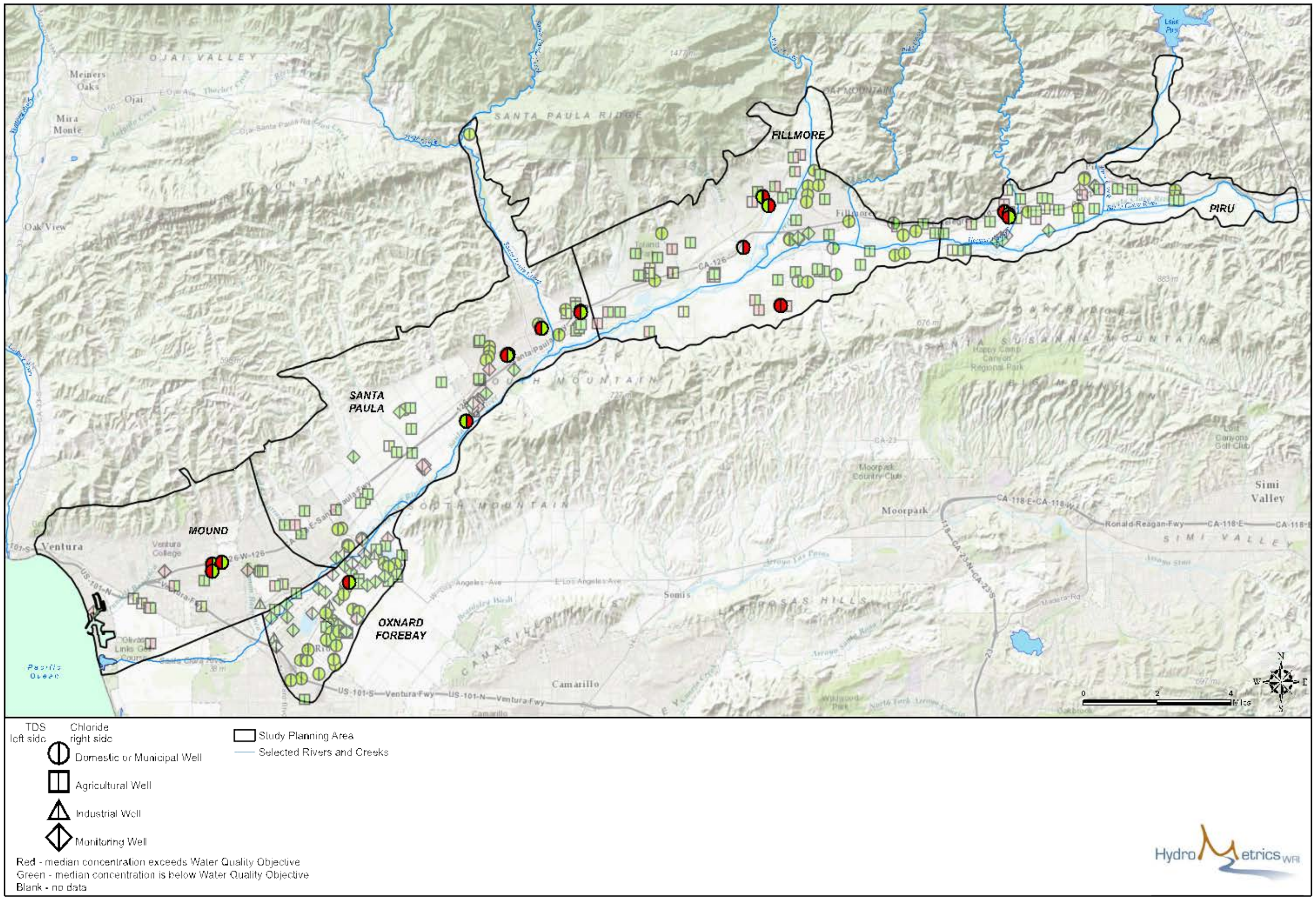

Figure 9-2 LSCR SNMP Wells with Identification of Wells Exceeding Chloride and TDS Water Quality Objectives

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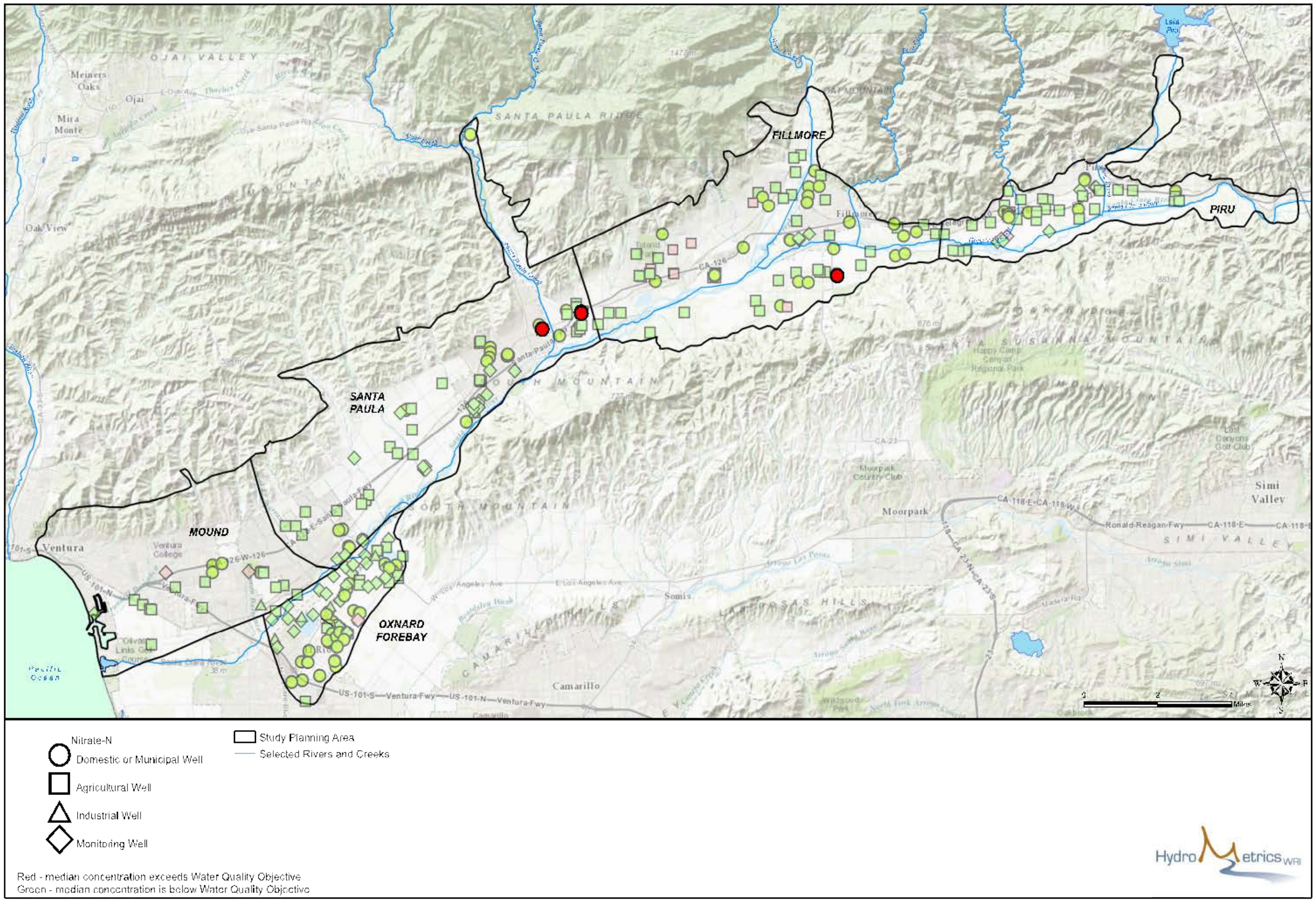

Figure 9-3 LSCR SNMP Wells with Identification of Wells Exceeding Nitrate Water Quality Objectives

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9.2.4 Further Evaluation

If the project will exceed the thresholds, further evaluation may be warranted prior to the implementation of management measures.

Step 6. If there is no assimilative capacity in the subarea or if the project is in an area of local water quality objective exceedances, determine if the proposed project will create assimilative capacity in the subarea through dilution. This will ideally be done using a model, but also could be done by comparing the concentrations in the recycled water to the concentrations in the groundwater basin.

a. If the project will create assimilative capacity, proceed with the project, contingent upon compliance with other regulatory requirements.

b. If the project will not create assimilative capacity, either conduct further analysis as outlined in Step 7 or select management measures to offset the load.

Step 7. If the project will not create dilution, additional analysis could be conducted as follows or management measures could be selected in accordance with the next step.

a. Utilize more recent data collected through the SNMP monitoring program or other available data to recalculate the assimilative capacity.

b. If the analysis is needed for a localized water quality objective exceedance, further evaluation of the monitoring data specific to the wells could be conducted (particularly if only one well is showing higher concentrations). This analysis could include evaluation of the depth and type of well to assess if the data are reflective of conditions in the groundwater that could be impacted by the proposed project.

c. Evaluate model results to determine if modifications are appropriate. Conservative assumptions were included in the model to calculate the available assimilative capacity that could be modified with additional information and modeling.

9.2.5 Selection of Management Measures

Step 8. If the need for management measures is identified after completing the analysis in Steps 1 through 7, the project proponent will need to do one of the following:

1. Conduct a full antidegradation analysis to demonstrate that the additional loading from the project or the project with identified management measures to offset part of the additional loading would be allowed under the antidegradation policy.
2. Select from the list of potential future management measures to reduce the loading from the project below the thresholds.
3. Work with other sources of salts and nutrients in the subarea to reduce their loading to offset the loading above the thresholds through implementation of potential future management measures.

a. If this method is selected, the project proponent will need to identify potential management measures that can be implemented within the same subarea to offset the load.

b. During the permit process, the project proponent must provide a calculation of the estimated loading reduction to be provided by the proposed management measures.

Potential future management measures are provided in **Table 9-7**.

All management actions taken at the treatment plant to reduce salt or nutrients loads are a direct loading reduction for the proposed recycled water project. Estimates of the amount of load reduced from the management measure should be subtracted from the estimated project load to evaluate if the assimilative capacity thresholds will now be met.

If management measures being implemented by another entity are to be used to offset the excess load from a project, the following steps must be taken to provide reasonable assurance that the management measures will be implemented.

1. Calculate the estimated load reduction from the proposed management measure. Effectiveness for treatment management measures will utilize design parameters or peer reviewed effectiveness information when available.
2. Develop a map that shows the location of the management measure implementation as compared to the recycled water project implementation to demonstrate the management measures will occur within the same sub-basin.
3. Develop a comparison of the implementation period for the management measure and the proposed recycled water project. Demonstrate that the management measure will be in place for the same period of time as the recycled water project.

9.2.6 Other Considerations

Within some sub-basins, multiple treatment plants are present that could propose projects within the same subarea. To the extent a project utilizes available assimilative capacity it will reduce the amount available to other projects. As a result, the SNMP identifies the following procedure to be used:

1. Projects identified in the project scenarios receive priority over other projects for the subarea.
2. If the project is not identified in the project scenarios, the project proponent would need to notify the other facilities within the sub-basin to identify if any conflicts would arise.

One sub-basin, Mound, was determined to be exceeding water quality objectives for one constituent, TDS. During SNMP development, potential additional management measures were considered to support a reduction in loadings to the Mound basin. The primary controllable sources to the basin are municipal and agricultural irrigation. TDS in these sources comes primarily from the water supply. Irrigation management and water conservation measures that are already being implemented will support loading reductions in the sub-basin. As discussed in previous sections, the presence of naturally occurring salts from connate water that were likely not considered during objective development are likely to be causing or contributing to the exceedances. The exceedances are currently not impacting the beneficial use of the water as a

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drinking water supply as the water is conditioned and blended with other water sources prior to use. Additionally, a potential future management measure to treat the municipal supply to reduce salts is included in the SNMP. Finally, as discussed in **Section 2**, it would be consistent with the SNMP to consider site-specific objectives or consider variances to support recycled water use in the Mound basin if the appropriate information were to be developed in the future to justify the action.. Combined, all of these efforts will support improving water quality and sustainable management of the Mound basin.

9.3 PROJECT SCENARIO EVALUATION

For the project scenarios identified in the plan in **Section 8**, the evaluation of the projects has been completed through the identification of the assimilative capacity used. The following table summarizes the results of the analysis. Based on this analysis, an identification of which scenarios would require additional analysis or selection of management measures was identified. This analysis was used to support the California Environmental Quality Act evaluation for the SNMP. However, since none of these projects have been clearly defined, projects may be modified or revised to avoid the need to conduct further analysis or implement management measures, consistent with the procedures outlined in the SNMP.

Table 9-6 Preliminary Comparison of Recycled Water Project Scenarios to Assimilative Capacity Thresholds

		Scenario 1 (lbs/d)/% assimilative capacity used		Scenario 2 (lbs/d)/% assimilative capacity used		Scenario 3 (lbs/d)/% assimilative capacity used		Scenario 4 (lbs/d)/% assimilative capacity used
		Piru Basin-Lower Area West of Piru Creek						
Piru Estimated Project Load	**TDS**	167 / 0.1%		3,312 / 2.5%		3,312 / 2.5%		
	Chloride	22 / 0.4%		433 / 7.9%		433 / 7.9%		
	Nitrate	0.1 / 0.003%		3 / 0.1%		3 / 0.1%		
		Fillmore Basin-Pole Creek Fan Area						
Fillmore Estimated Project Load	**TDS**	0 / 0%		0 / 0%		12,724 / 3.1%		
	Chloride	0 / 0%		0 / 0%		1,066 / 21%		
	Nitrate	0 / 0%		0 / 0%		36 / 1.5%		
		Santa Paula Basin						
		West of Peck Road	East of Peck Road	West of Peck Road	East of Peck Road	West of Peck Road	East of Peck Road	
Santa Paula Estimated Project Load	**TDS**	0 / 0%	3,580 / 3.3%	0 / 0%	14,515 / 13%	15,235 / 2.9%	34,078 / 31%	
	Chloride	0 / 0%	447 / 3.0%	0 / 0%	1,811 / 12%	1,901 / 6.0%	4,253 / 28%	
	Nitrate	0 / 0%	20 / 6.6%	0 / 0%	80 / 27%	84 / -[3]	187 / 62%	
		Mound Basin						
Ventura Estimated Project Load	**TDS**	665		16,629		49,076		32,447
	Chloride	130 / 0.2%		3,239 / 4.0%		9,598 / 12%		6,359 / 7.8%
	Nitrate	4 / 0.1%		89 / 1.4%		252 / 4.0%		163 / 2.6%
		Oxnard Forebay						
Oxnard Estimated Project Load	**TDS**	TBD [1]						
	Chloride	TBD [1]						
	Nitrate	TBD [1]						

Notes: Green boxes indicate the project load is below the 10% assimilative capacity threshold.
Yellow boxes indicate the project load is between the 10% and 20% assimilative capacity thresholds.
Orange boxes indicate the project load is above the 20% assimilative capacity threshold.
Red boxes indicate that no assimilative capacity is available.

[1] While the volume and quality of water that could be applied in the Forebay from the Oxnard AWPF is unknown at this time, the highly treated water will be of better quality than the existing concentrations in the Forebay and will therefore likely create additional assimilative capacity in the basin rather than using assimilative capacity. When a specific project is identified, it will need to be evaluated through the process outlined in this section to confirm this assumption.

[2] For Scenarios 3 and 4, the application of partially RO treated water for agricultural irrigation would be at concentrations that are below existing concentrations in the Mound Basin for salts and nutrients. As a result, the agricultural irrigation may increase the available assimilative capacity, particularly for TDS and could be considered as a management measure to offset loads from any landscape irrigation at current discharge concentrations.

[3] The existing loads are anticipated to use more than 20% of the assimilative capacity.

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Based on the analysis presented in the **Table 9-6**, projects with loadings less than or equal to the loadings presented in the analysis above for the same sub-basin can proceed without further analysis or management measures.

- Piru-all scenarios;
- Fillmore-planned low and planned high scenarios; and
- Santa Paula-planned low and planned high if applied west of Peck Road and planned low east of Peck Road.

For Piru, the analysis assumes implementation of projects by the Los Angeles County Sanitation Districts to reduce chloride concentrations in the discharge from the Valencia and Saugus WRPs to meet applicable effluent limitations will result in concentrations at or below 100 mg/L as a three month, flow weighted average at the County line will by 2019. If these projects do not occur, the model predicts that increasing trends in the Piru basin resulting from upstream chloride discharges will use up 20% of the available assimilative capacity within the next 17 years. If the upstream discharges are not reduced within the predicted time frame, recycled water projects within the Piru basin may require additional evaluation to determine if management measures are necessary.

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9.4 POTENTIAL FUTURE MANAGEMENT MEASURES

The potential future management measures include those that were identified as potential measures in planning studies, as well as other measures tailored to the site specific conditions in the LSCR SNMP study area. The potential future management measures represent a menu of potential management measures that could be implemented if needed to manage salts and nutrients on a sustainable basis. The list is intended to represent a wide-range of potential options that could be considered based on the project specific evaluation listed above and do not represent management measures that will definitely be implemented.

In addition to the management measures outlined in this document, the SNMP considers the potential impact of management measures identified for the Upper Santa Clara River Chloride TMDL and in the Upper Santa Clara River SNMP in the evaluation of assimilative capacity for the Piru basin. The Upper Santa Clara River SNMP includes a basin objective to:

> *"…manage groundwater levels associated with groundwater discharge to the Santa Clara River at the west end of the basin, and thus not adversely impact surface and groundwater discharges to the downstream basins(s)."*

As a result it is anticipated that the Upper Santa Clara River SNMP will not impact the analysis done for the LSCR SNMP potential projects.

As discussed in **Section 1**, the LSCR SNMP has a goal to support the use of stormwater recharge as a management measure where appropriate. Specific regional stormwater recharge projects have not been identified in the plan, but will be considered if management measures are needed for a project. Additionally, when development and redevelopment projects occur, stormwater recharge will result from implementation of required low impact development techniques.

Table 9-7 Other Potential Future Management Measures

Category	Specific Measure	Agency/Action	Description	Effect
Wastewater and reclaimed water quality	Source control – salts	Ventura County - Water softener outreach and rebate program	Implementation of outreach, removal and incentive program aimed at reducing the number of self-regenerating water softeners in unincorporated areas of Ventura County within the LSCR SNMP project area.	Fewer self-regenerating water softeners will reduce the salt load in residential wastewater.
Wastewater and reclaimed water quality	Source control – salts	Ventura County – Water Softener Ban	Implementation of a water softener ban in the City of Ventura, and the unincorporated areas of the County that are within the LSCR SNMP project area.	Fewer self-regenerating water softeners will reduce the salt load in residential wastewater.
Wastewater and reclaimed water quality	Source control – industrial control, pretreatment program	Ventura County and Municipalities	Consideration of modified local limits to improve influent wastewater quality.	Limits the pollutant concentrations in influent wastewater.
Septic system leachate	Provide connections to sewer systems	Ventura County and Municipalities	Consideration of a septic system conversion program to reduce the number of septic systems in the basins	Reduces the volume of septic system leachate that percolates into shallow groundwater. Tie-in to a treatment plant ultimately leads to a treated waste stream with a lower nutrient load.
Non-stormwater discharge control and quality	Source control of non-stormwater discharges	Ventura County – MS4 permit	Ordinance banning installation and discharges of debrominated/dechlorinated swimming pool water.	Reduce primary source of salts in non-stormwater discharges.
Municipal Water Quality	Replace/augment compromised groundwater supplies with surface water sources	Ventura County and Municipalities	Consideration of using SWP allocations to replace or augment compromised groundwater supplies.	Through use of an alternative supply, reduces salt load in potable water that is pass through to wastewater. Reduces need for residential water softeners.

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Table 9-7 Other Potential Future Management Measures

Category	Specific Measure	Agency/Action	Description	Effect
Municipal Water Quality	Softening of groundwater supplies	Water Purveyors	Consideration of water softening to reduce hardness.	Reduces need for the self-regenerating residential water softeners. Fewer self-regenerating water softeners will reduce the salt load in residential wastewater.
Municipal Water Quality	Advanced treatment of compromised groundwater supplies	Water Purveyors	Consideration of RO treatment to remove salts from groundwater supplies, with likely participation in development of a regional brine line.	Through treatment, reduces salt load in potable water that is pass through to wastewater. Reduces need for residential water softeners.
Municipal Water Quality	Desalination	Water Purveyors	Consideration of desalination to replace existing groundwater supplies	Through use of an alternative supply, reduces salt load in potable water that is pass through to wastewater. Reduces need for residential water softeners.
Agricultural Supply	Improve agricultural irrigation water quality	Ventura County	Consideration of drilling deeper wells to access water with lower salt concentrations.	Improves irrigation water quality through use of an alternative supply. Reduces the load of salt and nutrients attributed to irrigation water.
Stormwater Recharge	Additional groundwater recharge with stormwater	Ventura County and Municipalities	Consideration of capture and recharge of stormwater, including opportunities identified in TMDL implementation plans and other stormwater resource plans developed for the planning area.	Provides dilution of groundwater through recharge of water with potentially low salt and low nutrient concentrations.
Municipal Water Quality	Improves municipal water quality	Ventura – RO of Mound Groundwater	If other alternatives including groundwater recharge or direct potable reuse are not implemented, then additional treatment, RO, will be provided water extracted from the Mound basin.	Improves potable water quality through treatment. Reduces salt load in potable water that is pass through to wastewater. Reduces need for residential water softeners.

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