Section 6: Implementation Measures

6.1 Managing Salt and Nutrient Loadings on a Sustainable Basis

The baseline water quality analyses for the Antelope Valley Groundwater Basin indicates that overall groundwater quality with respect to the SNMP constituents of concern is below the SNMP water quality management goals. These goals are consistent with the Regional Board's Basin Plan to protect the beneficial uses of the water. The analysis of future water quality (through 2035) indicates slowly increasing trends and that, with implementation of the projects identified to have a potential effect on the salt and nutrient load to the groundwater basin, the overall basin groundwater salt and nutrient quality will remain below the SNMP water quality management goals. Under conservative assumptions, future water use is projected to increase arsenic concentrations in the groundwater above existing background levels in the 25-year planning period. However, the basin average will remain within an acceptable range over the long term to protect present and anticipated beneficial uses and any increases will be most likely due to naturally occurring causes. Therefore, no new implementation measures as part of the SNMP process are recommended at this time. Nevertheless, existing measures or practices are already in place to manage water quality, and frequent monitoring should also be implemented to assess trends in water quality.

In the case of some Antelope Valley sub-basins, average baseline water quality may already exceed the SNMP water quality management goals. However, none of the projects identified are located within those sub-basins or considered to have an impact on them since the projects are located hydrologically downgradient.

6.2 Existing Implementation Measures

As mentioned, the projected future groundwater quality concentrations are not expected to exceed the SNMP water quality management goals and implementation of the identified projects will not unreasonably affect the basin's designated beneficial uses. Therefore, no new implementation measures are recommended to manage salts and nutrients within the basin. Several programs are already underway in the basin, which help manage groundwater supplies and quality. These programs fall under five categories, as follows:

- Municipal Wastewater Management
- Recycled Water Irrigation
- Groundwater Management
- Onsite Wastewater Treatment System Management
- Agricultural

Implementation measures that are underway in the basin within these broad categories are described below.

6.2.1 Municipal Wastewater Management

Most of the municipal wastewater treatment agencies in the Antelope Valley have implemented source control programs including industrial waste management measures (i.e., pre-treatment program, educational outreach, coordination with customers) to control salinity and nutrients in influent waters, which ultimately improves the quality of recycled water.

The Palmdale and Lancaster Wastewater Reclamation Plants (WRPs) owned and operated by the Los Angeles County Sanitation Districts have undergone upgrades from secondary to tertiary treatment that include nitrification-denitrification treatment processes. This has led to a reduction in nitrate and overall nitrogen content in the recycled water produced at these plants. With the new tertiary treatment, the plants' effluents have also experienced reductions in TDS. The Rosamond Community Services District (RCSD) Wastewater Treatment Plant has undergone upgrades to treat a portion of its flow to tertiary standards, but has not yet expanded its recycled water use program.

6.2.2 Recycled Water Irrigation

The implementation of recycled water is regulated by the Title 22 California Code of Regulations (Title 22). Numerous BMPs and operating procedures must be followed when using recycled water for irrigation to ensure safety. The following BMPs, amongst others, are implemented in recycled water operations, per permitting by the Regional Board:

- Water quality monitoring at the treatment plant to ensure regulatory compliance with Title 22 and meet monitoring requirements as part of the Recycled Water Policy.
- Irrigation at agronomic rates – irrigation water is applied at a rate that does not exceed the demand of the plants, with respect to water and nutrients (typically monitored as nitrogen), and does not exceed the field capacity of the soil.
- Site Supervisor – a site supervisor who is responsible for the recycled water system and for providing surveillance to ensure compliance at all times with regulations and Permit requirements is designated for each site. The Site Supervisor is trained to understand recycled water, and supervision duties. In addition to monitoring the recycled water system, the Site Supervisor must also conduct an annual self-inspection of the system.
- Minimize runoff of recycled water from irrigation – Irrigation is not allowed to occur at any time when unauthorized runoff may occur, such as during times of rainfall or very low evapotranspiration, and any excessive overspray must be controlled.

6.2.3 Groundwater Management

Measures and practices to protect the basin include the following:

- The Antelope Valley Integrated Regional Water Management Plan (IWRMP) development process provided a mechanism for: 1) coordinating, refining and integrating existing planning efforts within a comprehensive, regional context; 2) identifying specific regional and watershed-based priorities for implementation projects; and 3) providing funding support for the plans, programs, projects and priorities of existing agencies and stakeholders. The process also includes public outreach and groundwater management strategies and objectives for the Region (including this SNMP), as well as a list of implemented and proposed projects to meet the management objectives.
- Basin-wide groundwater level monitoring.
- Groundwater quality monitoring, such as the State's GAMA program and other local efforts. Also includes groundwater quality analyses, such SNMP efforts to track water quality and improve the SNMP prediction model
- Groundwater banking and recharge studies and pilot-projects.
- Stormwater has low to no concentrations of salt and nutrients. Proposed projects for the region incorporates stormwater management and groundwater recharge.
- Arsenic treatment study and projects.
- Water recycling projects to offset groundwater pumping.
- Groundwater cleanup site programs.

- A water purveyor's Urban Water Management Plan (UWMP) provides a summary of an agency's water supplies, demands, and plans to ensure future reliability, such as potential water transfers and exchanges, desalination, and recycled water opportunities.
- The Antelope Valley Groundwater Basin is currently undergoing a groundwater rights adjudication process.

6.2.4 Onsite Wastewater Treatment System Management

A large percentage of the groundwater basin is overlain by rural areas that manage waste through individual onsite wastewater treatment system (OWTS), also known as septic systems. Individual property owners are responsible for managing their own system and employ a variety of BMPs such as monitoring and frequent pumping to manage the operation of the system. In 2012, the State Water Resources Control Board adopted the Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems. The intent of the Policy is "to allow the continued use of OWTS, while protecting water quality and public health". BMPs required in the Policy include site evaluations, setbacks, and percolation tests for new systems.

6.2.5 Agriculture

Agricultural areas include various ongoing BMPs that may include:

- Drip irrigation – water application is minimized by focusing the amount and area applied.
- Soil and plant testing – it is common practice for agricultural site managers to conduct annual soil testing to understand soil characteristics for crop production efficiencies and refine crop nutrient needs. Soil testing includes review of TDS and nitrate and other salts.
- Focused application of fertilizer and soil amendments

6.3 Additional Implementation Measures

As mentioned earlier, the projected future groundwater quality concentrations are not expected to exceed the SNMP water quality management goals and implementation of the identified projects will not unreasonably affect the basin's designated beneficial uses. It is the intention of the SNMP monitoring plan to obtain water quality results that will be used to compare future groundwater quality to applicable SNMP water quality management goals and determine whether additional measures are necessary to manage constituent load to the basin. After confirmation of results indicating that either the current average water quality of the basin exceeds the available baseline assimilative capacity use by 50% or that significant increases in the groundwater quality are projected within the next 10 years that would affect the designated beneficial uses, the implementation measures identified below will be evaluated and the most appropriate measures will be recommended for implementation.

Implementation measures to reduce salt and/or nutrient concentrations in groundwater that may be considered include, but are not limited to, the following:

- Reducing the amount of salts/nutrients imported into the basin by implementing imported water treatment processes that remove salts and/or nutrients (e.g. reverse osmosis).
- Reducing the amount of salts added to groundwater via source water - wastewater treatments, modified processes such as increased retention time, or blending prior to use for irrigation or basin recharge.
- Reducing the amount of salts and nutrients added to water via anthropogenic sources – BMPs, public outreach, and land management guidelines.
- Natural treatment such as a wetland system.
- Ultrafiltration treatment (i.e., reverse osmosis) of source or recycled water. This treatment

is typically very costly and results in a waste stream that must be managed, which can itself be challenging and costly. Options for briny waste include: transporting and exporting salts to a landfill or other site, disposing of salts via brine lines (not cost effective or practical), or deep well injection.

- An ordinance or ban on water softeners that uses salts may result in reduced chloride and slightly reduced TDS concentrations in the wastewater and ultimately reduced concentrations in the recycled water produced.
- Evaluating industry (e.g. commercial, industrial, agricultural, etc.) processes.
- Replacing chlorination disinfection processes with ultraviolet light (UV) disinfection to reduce chloride concentrations.
- Developing BMPs such as limiting excess fertilizing (set realistic goals for maximum crop yield) and eliminating over-irrigation to curtail the leaching transport process.
- Developing nutrient management programs and crop-specific nutrient application rates to improve crop fertilizer efficiency (decrease the total residual mass of nitrogen in the soil by using nitrification inhibitors or delayed release forms of nitrogen).
- Encouraging Low Impact Development (LID), to increase stormwater recharge and limit salt and nutrient loading to runoff.