

Groundwater Quality Management Measures for Salts and Nutrients in the Raymond Basin of Los Angeles County

STAFF MEMORANDUM

I. Introduction

The State Water Resources Control Board (State Water Board) adopted the Recycled Water Policy (State Water Board Resolution No. 2009-0011) on February 3, 2009 and revised it on January 22, 2013 (State Water Board Resolution No. 2013-0003). The purpose of the Recycled Water Policy (hereinafter, Policy) is to protect groundwater resources and increase the beneficial use of recycled water from municipal wastewater sources in a manner consistent with state and federal water quality laws and regulations. The Policy provides direction to the Regional Water Quality Control Boards (Regional Water Boards), proponents of recycled water projects, and the public regarding the appropriate criteria to be used by the State Water Board and the Regional Water Boards in issuing permits for recycled water projects.

The Policy recognizes the potential for increased salt and nutrient loading to groundwater basins as a result of increased recycled water use, and therefore, requires the development of regional or sub-regional salt and nutrient management plans. In requiring such plans, the Policy acknowledges that recycled water may not be the sole cause of high concentrations of salts and nutrients in groundwater basins, and therefore regulation of recycled water alone will not address such conditions. The intent of this requirement is to make certain that salts and nutrients from all sources are managed on a basin-wide or watershed-wide basis in a manner that ensures the attainment of water quality objectives and protection of beneficial uses.

The Recycled Water Policy states:

- a)** Every basin/sub-basin shall have a consistent salt and nutrient management plan (hereinafter, SNMP);
- b)** SNMPs shall be tailored to address the water quality concerns in each basin;
- c)** Shall be developed or funded pursuant to the provisions of Water Code sections 10750 et seq. or other appropriate authority;
- d)** SNMPs shall be completed and proposed to the Regional Water Board within five years from the adoption date of the Policy;
- e)** SNMPs are not required in areas where a Regional Water Board has approved a functionally equivalent salt and nutrient plan¹; and

¹ This is not applicable in the Los Angeles Region as there are currently no functionally equivalent salt and nutrient management plans that could be approved by the Regional Water Board.

- f) SNMPs may address constituents other than salt and nutrients that adversely affect groundwater quality.

Within one year of the receipt of a proposed SNMP, the Regional Water Board is expected to consider for adoption revisions to the program of implementation for protection of groundwater in its Basin Plan, consistent with Water Code section 13242, for those groundwater basins within their regions where water quality objectives for salts or nutrients are being, or are threatening to be, exceeded.² The revisions to the program of implementation for protection of groundwater that are incorporated into the Regional Water Boards' Basin Plans are to be based on the salt and nutrient management plans required by the Policy.

The Policy is clear that the SNMP process should be stakeholder-led and conducted in a collaborative manner among interested persons, with participation by the Regional Water Board.

The Policy's intended outcome is that participation in plan development will allow water purveyors and basin management agencies to take advantage of a streamlined permit process for recycled water projects that is intended to expedite the implementation of recycled water projects, since groundwater conditions relative to planned projects will have already been evaluated in a basin-wide context.

The required elements of a SNMP, as specified by the Policy include:

- a) Source identification/source loading and assimilative capacity estimates;
- b) Implementation measures;
- c) Consideration of water recycling/stormwater recharge/use;
- d) Anti-degradation analyses;
- e) Development of a basin-wide monitoring plan; and
- f) Annual monitoring of constituents of emerging concern (CECs).

This Staff Memorandum introduces the Draft Salt and Nutrient Management Plan (SNMP) for the Raymond Basin, which is located in Los Angeles County, California. The Raymond Basin SNMP is developed to provide a framework for the long-term management of salts and nutrients

² The Recycled Water Policy refers to "revised implementation plans" for adoption into regional basin plans pursuant to Water Code section 13242. Water Code section 13242 uses the term "program of implementation." Water Code section 13242 states, "[t]he program of implementation for achieving water quality objectives shall include, but not be limited to:

- (a) A description of the nature of actions which are necessary to achieve the objectives, including recommendations for appropriate action by any entity, public or private.
- (b) A time schedule for the actions to be taken.
- (c) A description of surveillance to be undertaken to determine compliance with objectives."

in the Raymond Basin, while allowing for increased use of recycled water. The SNMP was developed through a collaborative, stakeholder-led process.

II. Background

The Raymond Groundwater Basin underlies the north westerly portion of the San Gabriel Valley in Los Angeles County. It is bounded on the north by the San Gabriel Mountains, on the west by the San Rafael Hills and on the southeast by the Raymond Fault which separates the basin from the Main San Gabriel Basin which is down-gradient. Raymond Basin has a surface area of approximately 40.9 square miles and consists of three sub-units: (i) the Monk Hill Subarea which underlies the City of La Canada Flintridge and the northwestern portion of the City of Pasadena, (ii) the Pasadena Subarea which underlies most of the City of Pasadena and the unincorporated county area of Altadena, and (iii) the Santa Anita Subarea which underlies the Cities of Arcadia and Sierra Madre. The land area overlying the Raymond Basin is largely urbanized with little agricultural lands.

The Raymond Basin is a structural basin filled with permeable alluvial deposits, which is underlain and surrounded by relatively impermeable rock. The Basin aquifer is stratified in some areas by confining or semi-confining layers consisting of impermeable or less-permeable materials such as clay or silt. The Basin aquifer is generally classified as an unconfined to semi-confined aquifer system because the semi-confining or confining layers are not continuous across the Basin. The base of the water bearing zones is considered bedrock with elevations ranging from approximately 500 feet below sea level to 2,000 feet above mean sea level. Depth to bedrock ranges from 450 to 750 feet below ground surface (bgs) in the Monk Hill and Santa Anita subareas to more than 1,200 feet bgs in the Pasadena subarea. Groundwater generally flows southeast from the Monk Hill Subarea in the northwest to the Raymond fault in the southeast

Groundwater provides fifty percent of the potable water demands for water suppliers in the basin. The balance of the demand has historically been met through the purchase of treated imported water from the Metropolitan Water District's Weymouth Treatment Plant (along with a groundwater impaction/withdrawal program historically conducted by the Valley Water Company in the Monk Hill Subarea).

The Raymond Basin is actively managed by the Raymond Basin Management Board (Management Board) which consists of ten representatives appointed by water purveyors within the Basin. The Management Board is charged with the powers and responsibilities of managing the Raymond Basin and protecting the long-term quantity and quality of the groundwater supply.

Natural recharge to the basin consists of direct rainfall, percolation of streamflow from the northern and western sides, underflow from the Verdugo Basin and mountain front recharge. Artificial recharge of the Raymond Basin occurs via infiltration of stormwater runoff in all three subareas and, to a lesser degree, injection of treated imported water in the Monk Hill and Pasadena subareas.

III. SNMP Development

The SNMP for the Raymond Basin was developed collaboratively by the Raymond Basin Management Board and local salt and nutrient contributing stakeholders consisting of the Los Angeles County Sanitation Districts (LACSD), the County of Los Angeles Department of Public Works (LACDPW), and the Metropolitan Water District of Southern California. In addition, RBMB staff regularly kept the Basin groundwater producers up to date with the planning process during Pumping and Storage Committee meetings. Regional Water Board staff actively participated in the Raymond Basin SNMP development process.

The primary goal of the Raymond Basin SNMP was to assist the RBMB and participating stakeholders and interested parties to comply with the Policy regarding the use of the recycled water from municipal wastewater treatment facilities as a safe source of water supply, while maintaining the water quality objectives for salt and nutrients in the Basin Plan. The SNMP is intended to provide the framework for water management practices to ensure protection of beneficial uses, and allow for the sustainable use of groundwater resources.

A data period of 2002-03 to 2011-12 was selected to assess current water quality conditions. On average, groundwater quality in each subarea is currently below Basin Plan objectives for TDS, chlorides, sulfates, and nitrate, and assimilative capacity is available for all constituents. However, review of available data suggests an increasing trend for TDS chloride and sulfate concentrations in the Monk Hill and Pasadena subareas. Also, there is considerable annual variation in water quality for each constituent. Generally, water quality concentrations vary with many environmental factors, including the volume of groundwater in storage. The water quality concentrations in the Raymond Basin appear to be inversely related to groundwater in storage, increasing as groundwater levels decrease, and vice versa.

The SNMP identifies a variety of existing and potential salt and nutrient management measures for the Raymond Basin. These measures include continued basin replenishment efforts; pursuit of potential new replenishment sites; onsite stormwater retention and infiltration, water quality monitoring; and coordination between agencies for salinity management of water imported into the basin.

The SNMP contains all the required elements prescribed by the Recycled Water Policy, including considerations of water recycling and stormwater recharge. The plan also presents current and proposed measures for the management of basin water quality including those to maximize recycled water use in the area. These stakeholder-developed implementation measures for groundwater quality control are being incorporated into the Los Angeles Region's Basin Plan.

IV. California Environmental Quality Act (CEQA) Analysis

In accordance with the salt and nutrient management plan requirements of the Recycled Water Policy, Raymond Basin stakeholders also conducted an analysis of the foreseeable impacts of the salt and nutrient management measures and future (potential) recycled water projects for consideration by the Regional Water Board, which were documented in an accompanying Substitute Environmental Document (SED). The SED considers three program alternatives, including: (i) Alternative 1 - a “No Program” alternative – where no Salt and Nutrient Management Plan is adopted, but current groundwater quality management measures are maintained, (ii) Alternative 2: “Planned Recycled Water Projects” – where current basin management measures are maintained and a planned non-potable recycled water project is implemented, and (iii) Alternative 3: “Planned and Potential Recycled Water Projects and Potential Implementation Measures” – where the measures in Alternative 2 are implemented along with other potential implementation measures including developing new spreading facilities for stormwater conservation, and potentially imported water and recycled water. Alternative 3 was selected as the preferred program alternative.

The CEQA assessment concluded that the environmental effects of the foreseeable methods to implement Alternative 3, including both nonstructural and structural management measures, would not cause significant impacts that cannot be mitigated through commonly used construction, design and operational practices. The SED identifies mitigation methods for impacts with potentially significant effects and finds that these methods can mitigate potentially significant impacts to levels that are less than significant.

V. Anti-degradation Considerations

State Water Resources Control Board Resolution 68-16 (“Statement of Policy With Respect to Maintenance of High Quality Water in California”) requires the Regional Board in regulating discharges of waste to, among other requirements, maintain the highest water quality possible consistent with the maximum benefit to the people of the state. The salt and nutrient management strategies developed by the Raymond Basin stakeholders are measures designed to provide a framework for the long-term management of salts and nutrients in the Raymond Basin, while supporting for increased use of recycled water areas. Use of an assimilative capacity assessment tool developed during the process demonstrated that recycled water projects may be developed and applied within the basin while still maintaining groundwater quality that is supportive of beneficial uses. Given these considerations, the amendment is consistent with State Water Board Resolution No. 68-16

VI. Relevant Documents

The Basin Plan amendment incorporating groundwater management strategies for salts and nutrients in the Raymond Basin is based wholly on the stakeholder-led effort, which culminated in the document titled “Raymond Basin Salt and Nutrient Management Plan. This document contains all the necessary elements of a SNMP. This SNMP, its appendices and the

accompanying SED are appended to this Staff Memorandum and are an integral part of the Administrative Record for this Basin Plan amendment.