

**Excerpts from Draft Staff Report on De-designating  
Municipal and Domestic Supply (MUN) and Agricultural Supply (AGR)  
From a Portion of the Tulare Lake Bed Groundwater Basin**

**Executive Summary**

The purpose of this Staff Report is to provide the rationale and supporting documentation for a proposed amendment to the Water Quality Control Plan for the Tulare Lake Basin (Basin Plan) to de-designate the Municipal and Domestic Supply (MUN) and the Agricultural Supply (AGR) beneficial uses from groundwater within horizontally and vertically delineated areas underlying a portion of the historical Tulare Lake Bed.

The proposed amendment is part of a larger effort by the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) stakeholder initiative to develop a comprehensive Salt and Nitrate Management Plan (SNMP) for the Central Valley. As part of its work on the SNMP, CV-SALTS is reviewing the Basin Plan's beneficial use designations to determine whether these beneficial use designations were appropriately made and, if so, whether the Basin Plan's implementation programs provide an appropriate level of protection for the waterbodies that support these beneficial uses. Where appropriate, CV-SALTS is proposing that the Central Valley Water Board modify the Basin Plan's MUN and/or AGR beneficial use designations and programs of implementation to encourage reuse and recycling, to give regulated entities more flexibility in managing limited water supplies, and to identify potential salt management areas that would help salt to be moved out of sensitive areas.

The Central Valley Water Board has incorporated the Sources of Drinking Water Policy, State Water Board Resolution No. 88-63 (*Sources of Drinking Water Policy*) into the Basin Plans, and has designated all surface and ground water bodies in the Central Valley region as supporting the MUN beneficial use unless a particular water body is specifically designated as not supporting the MUN beneficial use in the Basin Plans. The *Sources of Drinking Water Policy* identifies exceptions to the MUN beneficial use that can apply to certain water bodies, including an exception that applies to water bodies where the total dissolved solids (TDS) exceeds 3,000 milligrams per liter (mg/L) (5,000 microsiemens per centimeter ( $\mu\text{S}/\text{cm}$ ) as electrical conductivity (EC)), provided that the waterbody is not expected to supply a public water system. [Hereinafter in this Staff Report, EC values will be cited instead of TDS values to avoid confusion.] The *Sources of Drinking Water Policy* also provides an exception for water bodies that do not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day. However, these exceptions are not self-implementing – the Central Valley Water Board is required to protect the MUN beneficial use even in water bodies that meet the exception criteria in the *Sources of Drinking Water Policy* unless and until a Basin Plan amendment is adopted that specifically de-designates the MUN use in such water bodies.

With regard to the AGR beneficial use, the Basin Plan states that, unless otherwise designated by the Central Valley Water Board, “all ground waters in the region are considered suitable or potentially suitable, at a minimum, for agricultural supply (AGR)...” Agricultural supply includes the use of groundwater for irrigation, livestock watering, and support of vegetation for range grazing. The water quality objective to protect AGR is a narrative water quality objective that requires waters to not contain chemical constituents in concentrations that adversely affect beneficial uses. Narrative water quality objectives are interpreted by the Central Valley Water Board using the best available scientific criteria in combination with the following six factors:

1. Past, present, and probable future beneficial uses;

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2. Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto;
3. Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area;
4. Economic considerations;
5. The need for developing housing within the region; and
6. The need to develop and use recycled water. (Wat. Code, § 13241.)

The Central Valley Water Board has utilized salinity guidelines identified in Ayers and Westcot (Ayers, 1985) to interpret the Basin Plan's narrative objective, and has previously considered irrigation water supply at 700  $\mu\text{S}/\text{cm}$  to be protective of all crops at all times. The CV-SALTS initiative conducted a review of literature related to salinity impacts on both irrigation and stock watering, and found that the literature concurred with the Ayers and Westcot finding that only the most salt tolerant crops may be sustainably irrigated with water exceeding 3,000  $\mu\text{S}/\text{cm}$  (CV-SALTS, 2013). As part of the literature review, CV-SALTS also identified a range of acceptable salt levels for livestock watering (*Id.*)

The Board identified the need to evaluate the appropriateness of designated beneficial uses as a priority in the Board's 2014 Triennial Review (Central Valley Water Board 2014). Concurrently, the CV-SALTS initiative identified that there was a need to define the salinity-related requirements for the protection of both the MUN and AGR beneficial uses. To support both needs, the Central Valley Salinity Coalition, a discharger group financially supporting and managing the CV-SALTS initiative, and the Tulare Lake Drainage District jointly provided resources for the development of technical information and environmental and economic analyses in support of this MUN and AGR beneficial use evaluation project for a portion of the historical Tulare Lake Bed. The technical and regulatory information developed in support of this beneficial use evaluation is compiled in the *Technical and Regulatory Evaluation of MUN and AGR Beneficial Uses in the Tulare Lake Bed Area* (Beneficial Use Evaluation Report) prepared by Kenneth D. Schmidt and Associates, CDM Smith, and Summers Engineering (CV-SALTS, 2015). Stakeholders participating in the effort provided updates on the project to the CV-SALTS Executive Committee during public meetings. The Executive Committee is comprised of representatives from state, federal, and local agencies, the discharger community, environmental organizations, disadvantaged communities and Environmental Justice groups.

As part of the investigation for the Beneficial Use Evaluation Report, representatives of Tulare Lake Drainage District (TLDD) and Tulare Lake Basin Water Storage District (TLBWSD) initiated meeting with stakeholders within and surrounding the project area. Stakeholder meetings generally were focused on the solicitation of input from the surrounding disadvantaged communities and municipalities, farmers/ranchers, and landowners in the project area with regard to the proposal to de-designate MUN and AGR beneficial uses in a portion of the historical Tulare Lake Bed. This stakeholder effort has resulted in local support for the proposed project. In April 2015, Board staff held an initial CEQA scoping meeting in Corcoran to provide information on the proposed project and solicit additional information from the public to inform development of the Staff Report.

The Project Study Area is located in the southern part of the Central Valley of California in the Tulare Lake Basin. The Tulare Lake Basin essentially functions as a closed basin except during extreme flood years, when some Kings River water moves north through Fresno Slough into the San Joaquin River (Basin Plan). Because the Tulare Lake Basin is a closed basin, salts have been naturally deposited and accumulated since its formation and before any influence from

man. The diversion of water into the basin from other watersheds to support 3 million acres of agriculture (Sholes, 2006), including three of the five most agriculturally productive counties in the United States (2012<sup>1</sup>), has exacerbated the accumulation of salts. The majority of the western and southern Tulare Lake Basin and most of the historical Tulare Lake Bed is underlain by clay layers ranging from the A-Clay near the surface to the F-Clay below the Corcoran Clay (also known as the E-Clay). The Corcoran Clay layer varies in depth from the surface, ranges up to 200 feet thick and serves as a confining layer, splitting the aquifer into a distinct shallow, perched groundwater zone and a lower, confined zone. The other clay layers also cause distinct groundwater zones along the periphery of the study area. The shallow perched groundwater in the proposed de-designation area and in the surrounding area contains highly elevated salinity concentrations. Communities and agricultural operations in the project area utilize either imported water or groundwater from the lower, confined aquifer for their water supplies.

The Beneficial Use Evaluation Report (CV-SALTS, 2015) used historical information for the Project Study Area related to groundwater conditions, subsurface geologic conditions, groundwater quality, and well construction data to establish a preliminary horizontal de-designation boundary for MUN and AGR beneficial uses as an initial step in the process. This information indicates that natural groundwater gradients in the project area are from the surrounding area toward the central area of the historical Tulare Lake Bed. As a second step in the evaluation process, the Project Study Area was divided into five subareas for more detailed examination: Central Subarea, North Subarea, West Subarea, South Subarea, and East Subarea (see **Figure ES 1**). All subareas except the Central Subarea, which is located in the middle of the historical Tulare Lake Bed, extended outside of the preliminary horizontal de-designation boundary. Each subarea was evaluated in greater detail with respect to soil conditions, groundwater conditions, water quality, regional subsurface geology, surface features, active water supply wells and their uses, and nearby cities and communities. This information for each of the four outer subareas – referred to as fringe areas – was used to adjust the preliminary horizontal de-designation boundary to define the proposed horizontal de-designation boundary for MUN and AGR beneficial uses. Additionally, the focused analyses conducted within each of the subareas allowed for delineation of vertical de-designation depths. Vertical de-designation depths within in the de-designation area vary according to the depth of the confining clay layers that separate the shallow, perched groundwater zone from the lower confined zone.

The proposed horizontal de-designation boundary was adjusted to exclude nearby towns. These communities pump their groundwater from locations upgradient from the proposed de-designation area. The technical authors of the Beneficial Use Evaluation Report conducted a zone of capture analysis (CV-SALTS, 2016) to confirm that the pumping of municipal wells outside of the proposed de-designation boundary would not influence the flow of shallow groundwater toward municipal wells and would not result in the extraction of groundwater from within or beneath the de-designation area. The analysis found that pumping groundwater from municipal wells in Stratford, Alpaugh, Kettleman City, and Corcoran would not influence the flow of shallow groundwater, and, in the cases of Kettleman City and Corcoran, where wells tap strata above the Corcoran Clay, these wells would not extract water from within the area proposed for de-designation.

Three active domestic wells are located within the horizontal extent of the proposed de-designation area but outside the proposed vertical de-designation boundary. Two of these three

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<sup>1</sup> [http://agcomm.co.tulare.ca.us/default/assets/File/2012CensusCA\\_1.pdf](http://agcomm.co.tulare.ca.us/default/assets/File/2012CensusCA_1.pdf)

active domestic wells (located southwest of Stratford as shown in **Figure ES 1**) are completed below the Corcoran Clay, while one draws water from a depth of 500-520 feet, below the proposed vertical de-designation boundary (below the A-Clay). A number of active irrigation supply wells have been identified within the proposed horizontal de-designation boundary (see **Figure ES 1**); however, all of these wells are completed below the Corcoran Clay and thus, below the proposed vertical de-designation boundary in which they are located.

Based on the groundwater well reconnaissance work performed as part of the Beneficial Use Evaluation Report, it was determined that the three-dimensional space described by the horizontal and vertical de-designation boundaries shown in **Figure ES 1** contains groundwater that exceeds an EC of 5,000  $\mu\text{S}/\text{cm}$ , and in many portions falls within the range 10,000 to 40,000  $\mu\text{S}/\text{cm}$ . Where wells exhibited EC levels less than 5,000  $\mu\text{S}/\text{cm}$ , proposed de-designation boundaries were adjusted to not include these wells or the zones they extract from. EC levels in the proposed de-designation area meet the water quality conditions of Exception 1a of the *Sources of Drinking Water Policy*, and the groundwater is not reasonably expected to supply a public water system. EC levels of 5,000  $\mu\text{S}/\text{cm}$  or greater also exceed guidelines from the Canadian Council of Ministers for the Environment (CCME) that recommend a maximum EC limit of 5,000  $\mu\text{S}/\text{cm}$  for all classes of livestock (Canada 2012). These Canadian guidelines were included in the CV-SALTS literature review that evaluated salinity impacts on irrigation and stock watering.

Alternatives to the proposed horizontal and vertical de-designation boundaries shown in **Figure ES 1** were identified by stakeholders for both the MUN and AGR beneficial uses in the project area.

Stakeholders identified the following four project alternatives pertaining to the MUN beneficial use designation for a portion of the historical Tulare Lake Bed:

1. No Action.
2. De-designate MUN Beneficial Use within the Historical Footprint of the Tulare Lake Bed at an Elevation of 200 Feet above Mean Sea Level with No Vertical De-designation Boundary.
3. De-designate MUN Beneficial Use in a Portion of the Historical Tulare Lake Bed Based on Application of the Sources of Drinking Water Policy (SWRCB Resolution No. 88-63) Exception 1a.
4. Development of MUN Site-Specific Salinity Objectives within the Proposed MUN De-designation Boundary.

Stakeholders also identified the following six project alternatives pertaining to the AGR beneficial use designation for a portion of the historical Tulare Lake Bed:

1. No Action
2. Development of AGR Site-Specific Salinity Objectives within the Proposed AGR De-designation Boundaries for Irrigation Supply and Livestock Watering.
3. De-designate AGR Beneficial Use within Separate Horizontal and Vertical Boundaries for Irrigation Supply and Livestock Watering.
4. Development of Classes of AGR Uses and Water Quality Objectives that Better Represent Irrigation and Livestock Watering Limitations at Different Groundwater Salinity Concentrations within the Proposed AGR De-designation Boundaries for Irrigation Supply and Livestock Watering.

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5. De-designate AGR Irrigation Supply and Livestock Watering Beneficial Uses within Combined Horizontal and Vertical Boundaries Based on an EC Groundwater Quality Threshold of 5,000  $\mu\text{S}/\text{cm}$ .
6. De-designate AGR Irrigation Supply and Livestock Watering Beneficial Uses within Combined Horizontal and Vertical Boundaries Based on an EC Groundwater Quality Threshold of 7,500  $\mu\text{S}/\text{cm}$ .

This Staff Report contains an analysis of the above described MUN and AGR project alternatives using the nine criteria listed below:

1. Maintain consistency with federal and state water quality laws and policies as applicable
2. Meet exception(s) of Sources of Drinking Water Policy
3. Protect existing and future potential beneficial uses
4. Maintain agricultural production in the project area
5. Support the proactive control and management of salt for application or disposal in the western portion of the Basin, toward the drainage trough of the valley
6. Technically feasible, economically viable, and reasonable action
7. Scientifically supported by existing data
8. Support socioeconomic well-being of the project area
9. Ease of implementation

Based upon use of the above criteria to score and rank the various alternatives, this Staff Report proposes that the recommended alternative for MUN beneficial use de-designation is the application of the *Sources of Drinking Water Policy's* Exception 1a (MUN Alternative 3). The recommended alternative for AGR beneficial use de-designation is to de-designate the AGR use within the proposed de-designation area based on a 5,000  $\mu\text{S}/\text{cm}$  EC threshold value taken from the CCME which established a maximum recommended limit of 5,000  $\mu\text{S}/\text{cm}$  EC for all classes of livestock (Canada, 2012) (AGR Alternative 5). The 5,000  $\mu\text{S}/\text{cm}$  EC threshold value for AGR de-designation exceeds the threshold value for irrigation of most salt tolerant crops as established by the findings of Ayers and Westcot (Ayers, 1985).

Finally, this Staff Report evaluates the proposed Basin Plan Amendment's consistency with existing federal and state laws, regulations and policies, contains an environmental analysis that complies with the applicable requirements of the California Environmental Quality Act (CEQA) and includes antidegradation and economic analyses that evaluate potential impacts of this project. The Board's Basin Planning Program is considered a certified regulatory program, which means that the Board is exempt from the requirement to prepare an environmental impact report for basin planning activities under the California Environmental Quality Act. (Pub. Res. Code, § 21080.5; Cal. Code Regs., tit. 14, § 15251(g).) The Board's environmental review of the proposed Basin Plan Amendments as contained in this Staff Report is considered to be "substitute environmental documentation" or "SED".

## REFERENCES

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