California Regional Water Quality Control Board

Santa Ana Region

December 10, 2021

Item: 15

Subject: Resolution R8-2021-0044, Public Hearing to Consider Proposed Amendment to the Water Quality Control Plan for the Santa Ana Region (Basin Plan) to Incorporate the Maximum Benefit Objectives for Total Dissolved Solids and Nitrate as Nitrogen and Salt and Nutrient Management Plan (Implementation Plan) for the Elsinore Groundwater Management Zone.

Discussion:

The purpose of the public hearing is for the Board to consider adoption of Resolution R8-2021-0044, proposed Amendment to the Basin Plan to: 1) revise Table 4-1 of the Basin Plan to incorporate the maximum benefit total dissolved solids (TDS) and nitrate as nitrogen (nitrate) objectives for the Elsinore Groundwater Management Zone (GMZ), and 2) incorporate the Elsinore GMZ Salt and Nutrient Management Plan (SNMP) into Chapter 5 – Implementation of the Basin Plan. The supporting documents for this public hearing have been published for public comment during the written comment period, and include the following:

1) Draft Staff Report (the following document),
2) Tentative Resolution R8-2021-0044 and Attachment A – track changes to Basin Plan, and Attachment B – clean version of the proposed revised Basin Plan (Enclosure 1),
3) Draft Substitute Environmental Document (SED) (Enclosure 2), and
4) Scientific Peer Review Comments and Draft Response to Comments (Enclosure 3).

Draft Staff Report for the

Proposed Basin Plan Amendment to Adopt

The Maximum Benefit Salt and Nutrient Management Plan

for the Elsinore Groundwater Management Zone

Prepared by:

California Regional Water Quality Control Board -

Santa Ana Region

October 2021

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Executive Summary

The federal Clean Water Act requires states to implement pollution control standards for wastewater discharges and water quality standards for all surface water bodies within the state's jurisdiction. Each state must set surface water quality standards comprised of three components: 1) beneficial uses of the waterbody; 2) water quality criteria to protect the beneficial uses of the respective waterbody; and 3) antidegradation requirements to maintain and protect the integrity of the waterbody.

In California, the Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code [CWC]) sets similar requirements to the federal water quality standards for surface water and groundwater. The Santa Ana Regional Water Quality Control Board (Santa Ana Water Board) establishes beneficial uses and water quality objectives in the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan).

In 2004, the Santa Ana Water Board amended the Basin Plan, in part, to incorporate revised: groundwater management zone boundaries (GMZs), beneficial use designations, total dissolved solids (TDS) and nitrate-nitrogen (nitrate) water quality objectives (water quality objectives or objectives), and an associated TDS and Nitrogen Management Plan for the GMZs.

During the technical work to support the Basin Plan amendment in the early 2000s, it was recognized that the TDS objectives would limit or prevent the reuse of recycled water within several GMZs even though the use of recycled water would not impair beneficial uses of the receiving GMZs. This impacted GMZs where the current TDS concentration is equal to or greater than the historical TDS concentration meaning that there is no assimilative capacity for groundwater quality degradation. In this case, the reuse of recycled water with TDS concentration over the objective will require costly mitigation plans. Recognizing that recycled water reuse was a key component in achieving long-term water supply reliability in rapidly developing watershed, the Santa Ana Water Board also adopted numerically higher water quality objectives compared to the antidegradation objectives for these GMZs to allow reuse of recycled water with TDS concentrations higher than the antidegradation objectives. These adoptions were based on the demonstration by the stakeholders in the GMZs that lowering of water quality is to the maximum benefit of the people of California and that beneficial uses are still protected. Along with these higher objectives, the Santa Ana Water Board adopted time-certain action plans for stakeholders to implement to ensure the long-term protection of beneficial uses of impacted GMZs. These numerically higher objectives are termed maximum benefit objectives and the associated implementation plans to protect beneficial uses are termed maximum benefit commitments (together, maximum benefit salt and nutrient management plan [SNMP]). The State Water Resources Control Board's (State Water Board) Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California (Antidegradation Policy or Resolution No. 68-16) and CWC §13241 served as the basis for the development of the alternative, maximum-benefit-based water quality objectives.

The current TDS concentration in the Elsinore GMZ is 490 milligrams per liter (mg/L) which is greater than the historical/antidegradation objective of 480 mg/L. Because there is no longer assimilative capacity for TDS in the Elsinore GMZ, recycled water use must be limited to the antidegradation objective or conditioned with a salt offset program. The Elsinore Valley Municipal Water District (District) is the sole municipal agency overlying the Elsinore GMZ. The Santa Ana Water Board required the District to develop a plan to address its use of recycled water. The District has proposed amending the Basin Plan to incorporate a Maximum Benefit Salt and Nutrient Management Plan for the Elsinore GMZ as a mitigation plan to offset its historical and ongoing salt loading in the GMZ. As for prior maximum benefit SNMPs, the proposal includes revised maximum-benefit TDS and nitrate objectives and maximum benefit commitments. To support the proposal, the District prepared the 2020 Proposal to Adopt a Maximum Benefit SNMP for the Elsinore GMZ (maximum benefit SNMP proposal package). The results of the work performed for the proposal demonstrate that the proposed Basin Plan amendment will provide maximum benefit to the people of California and will protect beneficial uses of the Elsinore GMZ and downstream GMZs.

The purpose the Basin Plan amendment described in this Staff Report is to:

- Amend Table 4-1 of the Basin Plan to incorporate the maximum benefit TDS and nitrate objectives for the Elsinore GMZ.
- Incorporate the Elsinore GMZ Salt and Nutrient Management Plan (SNMP) into Chapter 5 – Implementation of the Basin Plan.

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1. Introduction and Background

The federal Clean Water Act requires states to implement pollution control standards for wastewater discharges and water quality standards for all surface waterbodies within the state's jurisdiction. Each state must set surface water quality standards comprised of three components: 1) beneficial uses for the waterbody; 2) water quality criteria to protect the beneficial uses of the respective waterbody; and 3) antidegradation requirements to maintain and protect the integrity of the waterbody.[1]

In California, the Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code (CWC)) sets similar requirements to the federal water quality standards for surface water and groundwater. The state's water quality standards are regulated by the nine Regional Water Quality Control Boards (Regional Boards). Each Regional Board identifies waterbodies within its jurisdiction, determines beneficial uses, and establishes water quality criteria or objectives for each waterbody in its Water Quality Control Plan. The federal Clean Water Act and the state's Porter-Cologne Water Quality Control Act mandate the Regional Boards to review and update, as appropriate, their Water Quality Control Plans every three years to ensure that the water quality standards are established using the latest and best available science and data.

The Santa Ana Regional Water Quality Control Board (hereafter, Santa Ana Water Board) establishes beneficial uses and water quality objectives for the waterbodies of the Santa Ana River Basin (Basin) in the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan).

<u>2004 Basin Plan Amendment to Amend the Salt and Nutrient Management Plan</u>

The 1995 Basin Plan contained nitrate-nitrogen (hereafter, nitrate) and total dissolved solids (TDS) objectives that were lower than the ambient nitrate and TDS concentrations over a significant portion of the Basin, which meant no assimilative capacity existed for the Basin. Several watershed stakeholders questioned the validity of the groundwater quality objectives for TDS and nitrate and the Santa Ana Water Board's salt and nutrient management plan that implemented those objectives. Specifically, since wastewaters are high in TDS and nitrate, in part due to high TDS and nitrate concentrations in the source water, the 1995 Basin Plan objectives restricted the use of reclaimed wastewater (hereafter, recycled water), which comprised a major component of many water agencies' plans to conserve potable water, increase local water supply reliability, and meet rapidly growing water demands due to growing populations. Watershed stakeholders voiced these concerns during the 1995 update of the Basin Plan and the Santa Ana Water Board agreed to prioritize the review of the objectives as part of its triennial review process.

A coalition of 22 water supply and wastewater agencies in the Santa Ana Watershed formed the Nitrogen-Total Dissolved Solids Task Force (now called the Basin Monitoring Program Task Force, hereafter, Task Force) to devise a new TDS and

[1] 40 Code of Federal Regulations (CFR) 131

nitrate management plan for the Basin. The Task Force contracted with two consulting firms to guide the process. Wildermuth Environmental, Inc. (WEI) was responsible for performing and documenting the technical analyses and Risk Sciences was responsible for facilitating the regulatory review and developing consensus among the Task Force participants. The technical work was documented in *TIN/TDS Study – Phase 2A Development of Groundwater Management Zones – Estimation of Historical and Current TDS and Nitrogen Concentrations in Groundwater* (WEI, 2000) and *TIN/TDS Study – Phase 2B Santa Ana Watershed Wasteload Allocation Investigation* (WEI, 2002). The Task Force's work culminated in the Santa Ana Water Board's adoption of the Basin Plan amendments on January 2004 (Santa Ana Water Board, 2004) which included revised:

- groundwater subbasin boundaries (now termed "groundwater management zones" or GMZs) based on the hydrology and water quality of the groundwater basins,
- beneficial uses and TDS and nitrate objectives for the GMZs,
- TDS and nitrate wasteload allocations for wastewater discharges to the Santa Ana River and its tributaries,
- surface water reach designations for selected waterbodies in the Santa Ana River,
- TDS and nitrogen objectives and beneficial uses for specific surface water bodies, and
- implementation plans, including monitoring and reporting programs and standard analytical methodologies for periodically evaluating compliance with the new water quality objectives.

While the technical work to revise the antidegradation objectives for the 2004 Basin Plan amendment was being performed in the early 2000s, it was recognized that the TDS objectives would limit or prevent the reuse of recycled water within several GMZs even though the reuse of recycled water would not impair the beneficial uses of receiving groundwater. Permitting recycled water reuse under the antidegradation objectives in these GMZs would have required costly, energy-intensive treatment that would result in little or no water quality benefit.

Recognizing that recycled water reuse was a critical component of achieving a long-term reliable water supply in the rapidly developing watershed and would ultimately improve overall water supply reliability in California, several agencies proposed, and the Santa Ana Water Board approved, alternative "maximum benefit" TDS and nitrate objectives that were numerically higher than the antidegradation objectives and the current ambient concentrations. The establishment of the maximum benefit objectives created assimilative capacity for degradation and allowed the Santa Ana Water Board to permit recycled water reuse without requiring treatment to reduce TDS and nitrate concentrations prior to reuse. The GMZs for which stakeholders received maximum benefit objectives in the 2004 include: Beaumont, Chino-North, Cucamonga, San

Timoteo, and Yucaipa. Later in 2010, the Santa Ana Water Board approved maximum benefit objectives for the San Jacinto Upper Pressure GMZ.

The State Board's Antidegradation Policy and CWC §13241 served as the basis for the development of the alternative, maximum-benefit-based water quality objectives. In addition, each party developed a schedule of time-certain, concentration-based and/or event-based actions, known as maximum benefit commitments, to ensure the long-term protection of the beneficial uses of each GMZ and downstream GMZs with the understanding that failure to comply with the commitments would result in the enforcement of the more stringent antidegradation objectives for the GMZ. Together the maximum benefit objectives and commitments comprise a maximum benefit salt and nutrient management plan (SNMP).

Basin Plan Implementation Pursuant to the 2004 Amendments

The Santa Ana Water Board utilizes the Basin Plan water quality objectives (both antidegradation and maximum benefit objectives), estimates of current ambient groundwater quality, and the wasteload allocation to establish TDS and nitrate concentration limits for waste discharges, including recycled water discharges (e.g. discharge, recharge, and reuse). Current ambient TDS and nitrate of the GMZs are recalculated by the Task Force every three years and the Wasteload Allocation is updated by the Task Force as directed by the Executive Officer of the Santa Ana Water Board (Executive Officer). The groundwater and surface water quality results of these studies are compared to the Basin Plan objectives to determine if the TDS and nitrate concentration limits for recycled water discharges need to be modified to protect groundwater quality from degradation in the receiving GMZ(s).

The ambient groundwater quality determination is a statistics-based calculation that uses 20 years of groundwater quality data and is expressed as volume-weighted average concentration for each GMZ.[2] If the current ambient TDS or nitrate concentration of a GMZ is less than the concentration of the Basin Plan objective, then there is assimilative capacity for degradation and the Santa Ana Water Board has the flexibility to grant access to assimilative capacity for recycled water discharges with TDS and nitrate concentrations in excess of the ambient concentration or the objectives. If the current ambient TDS or nitrate concentration of a GMZ is greater than the Basin Plan objective, then there is no assimilative capacity and the Santa Ana Water Board must either set the discharge limitation at a concentration that is equal to or less than the water quality objective or require the implementation of an approved salt offset program to mitigate loading that occurs in excess of the objective concentration.

[2] For example, the "current" ambient water quality for the 2018 computation was calculated using groundwater quality data from the 20-year period of 1999 to 2018.

Regulatory Problem Statement for the Elsinore GMZ

Figure 1 shows the location of the Elsinore GMZ within the Santa Ana Watershed. The TDS and nitrate antidegradation objectives for the Elsinore GMZ are 480 and 1.0 milligrams per liter (mg/L), respectively. Table 1 below shows the history of the ambient water quality determinations through the most current recomputation effort for 2018 (WSC, 2020) compared to the antidegradation objectives for the Elsinore GMZ.

Table 1
TDS and Nitrate Antidegradation Objectives and Ambient Water Quality Determinations for the Elsinore GMZ

Constituent	Antidegradation Objective (mg/L)	Ambient (mg/L)						
		1997	2003	2006	2009	2012	2015	2018
TDS	480	480	460	470	470	490	490	490
Nitrate	1	2.6	2.4	2.4	2.2	2.1	2.2	2.3

As shown in Table 1, the ambient TDS concentration has exceeded the objective since 2012, meaning there is no longer assimilative capacity for TDS loading in excess of the objective concentration. The ambient nitrate concentration has exceeded the objectives since the adoption of the objectives in the 2004 Basin Plan amendment.

The Elsinore Valley Municipal Water District (hereafter District) is the sole municipal water and wastewater agency overlying the Elsinore GMZ. Figure 2 shows the boundaries of the District's service Area relative to the Elsinore GMZ and its tributary watershed. Figure 2 also shows the District's three water reclamation facilities (WRFs) that treat wastewater generated in its service area (Railroad Canyon, Regional, and Horsethief), three recycled water systems (Railroad Canyon, Wildomar, and Horsethief), and the location of the Regional WRF discharge to Temescal Wash. Of the three WRFs, only Railroad Canyon WRF discharges recycled water to areas overlying or tributary to the Elsinore GMZ.

The District's regulatory compliance challenge in the Elsinore GMZ is twofold. First, the Railroad Canyon WRF produces recycled water at TDS concentrations that exceed the permitted limit of 700 mg/L. Since 2008, the annual average TDS concentration of recycled water from the Railroad Canyon WRF ranged between about 690 and 890 mg/L and averaged 790 mg/L. Second, the TDS concentrations of all the recycled water supplies served in the Railroad Canyon and Wildomar recycled water systems exceed the antidegradation objective. Most of the Railroad Canyon recycled water service area lies within the watershed tributary to the Elsinore GMZ. Due to the geology in this area, the deep infiltration of recycled water used outdoors for irrigation can ultimately become surface water flow in the San Jacinto River, which flows into and recharges the Elsinore

GMZ. A portion of the Wildomar recycled water service area overlies the Elsinore GMZ. Because there is no longer assimilative capacity for TDS in the Elsinore GMZ, mitigation is required. For these two reasons, the Santa Ana Water Board required the District to prepare a salt offset plan to mitigate loading that exceeds these regulatory limits.

In the case of nitrate, although there is no assimilative capacity, the use of recycled water for irrigation at agronomic rates is permittable at concentrations above the antidegradation objective; however, recharge projects would either be limited to the antidegradation objective or require an offset program.

Proposed Regulatory Solution

The District's water supply sources include groundwater pumped from the Elsinore GMZ, local surface water from Canyon Lake, imported water from the State Water Project (SWP) and Colorado River Aqueduct (CRA), and recycled water. The population and water demand in the District's service area are projected to nearly double by 2050. Because the availability of imported water may become less reliable due to climate change and persistent drought, in 2017 the District completed its first Integrated Resources Plan (IRP), to achieve the following foundational goals: establish new local water supplies, increase dry-year supply reliability, decrease dependence on imported water, reuse 100 percent of the District's recycled water supply, improve water quality, improve groundwater management, and promote water conservation. Through the IRP process, a total of 44 projects, grouped into seven water resources management strategies, were evaluated to select a recommended water supply portfolio that optimizes the achievement of the foundational goals of the District's planning efforts. The IRP includes a proposed schedule for the phased implementation of the recommended portfolio of nine new projects over the next 20 years. The estimated capital cost (in 2017 $) of the entire IRP supply portfolio is over $200 million dollars, of which about $132 million is for the cornerstone project for Indirect Potable Reuse in the Elsinore GMZ.

As the District's service area grows in population, a significant amount of additional wastewater will be generated and can be utilized as part of the Indirect Potable Reuse program. The District completed a feasibility study in 2017 and concluded that the optimal strategy for the project is to inject up to 6,750-acre feet per year (afy) of advanced-treated recycled water – via reserve osmosis or microfiltration system – from the Regional WRF into the "Back Basin" of the Elsinore GMZ, the area located southeast of Lake Elsinore.

The Indirect Potable Reuse project is the ideal salt offset strategy for the District's regulatory compliance challenges in the Elsinore GMZ. However, the timing for the implementation of the project will depend on the rate of growth in the District's service area. In addition, District has obligation to provide recycled water to Lake Elsinore to maintain a stable lake level and to offset the evaporation loss, which will improve water quality of the Lake. As a solution to the challenge of the project implementation timing,

the District has proposed a maximum benefit SNMP for the Elsinore GMZ that includes maximum-benefit-based TDS and nitrate objectives and a series of seven commitments that will enable maximum beneficial use of recycled water, mitigate historical and ongoing loading in excess of regulatory limits, and ensure the protection of beneficial uses in the Elsinore GMZ.

Consistent with prior maximum benefit SNMPs approved by the Santa Ana Water Board, the District prepared the 2020 Proposal to Adopt a Maximum Benefit SNMP for the Elsinore GMZ (hereafter, maximum benefit SNMP proposal package) which includes the detailed technical basis, regulatory rationale, and economic considerations in support of the proposal (WEI, 2020). This Staff Report summarizes key details of the maximum benefit SNMP proposal package, which is available in the administrative record, along with other materials in support of this Basin Plan amendment.

Purpose of the Proposed Basin Plan Amendment

The purpose of the proposed Basin Plan amendment described in this Staff Report is to incorporate the maximum benefit SNMP for the Elsinore GMZ. This includes:

- Amend Table 4-1 of the Basin Plan to incorporate the maximum benefit TDS and nitrate objectives for the Elsinore GMZ.
- Incorporate the maximum benefit commitments for the Elsinore GMZ into Chapter 5 – Implementation of the Basin Plan.

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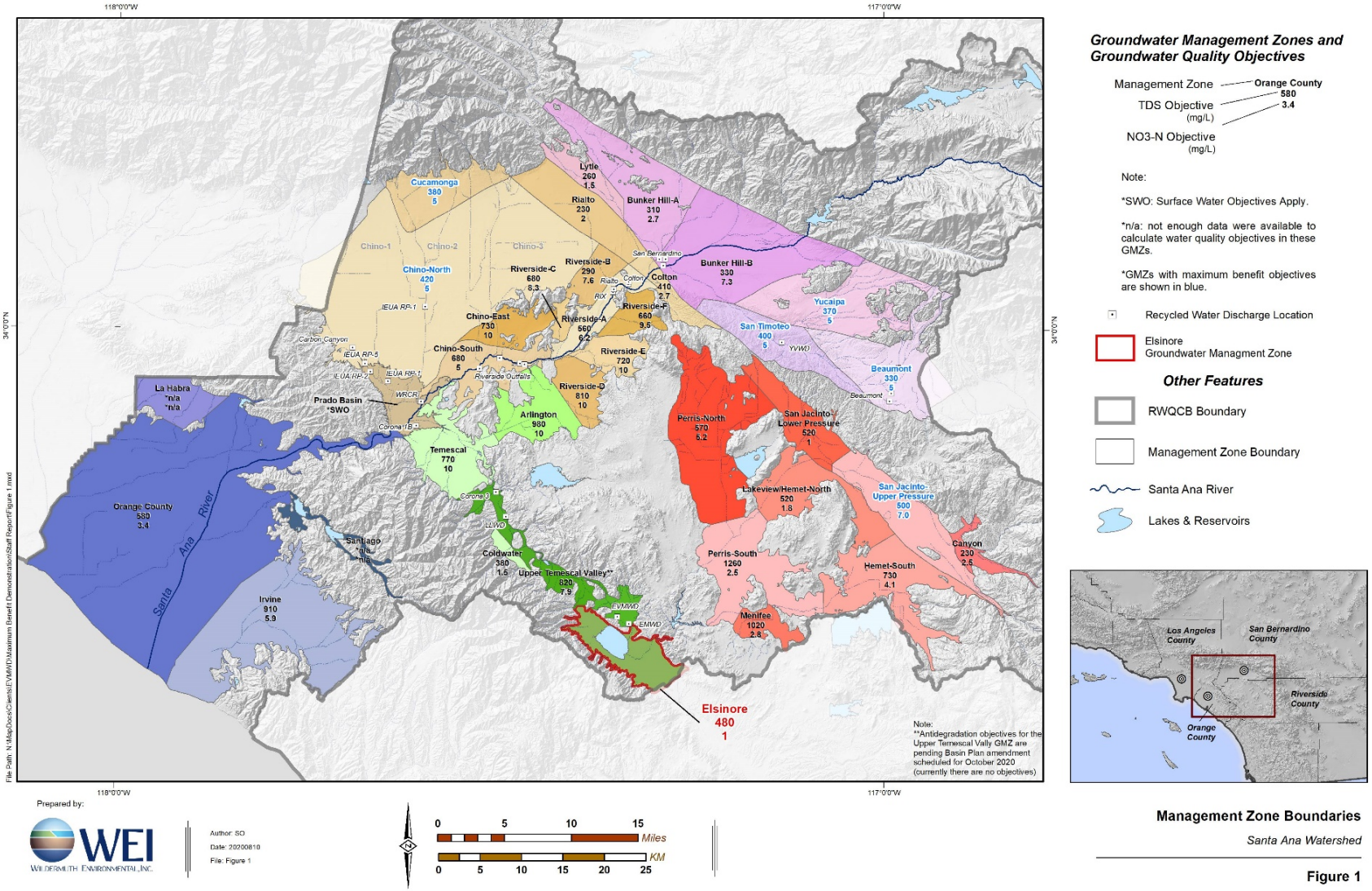

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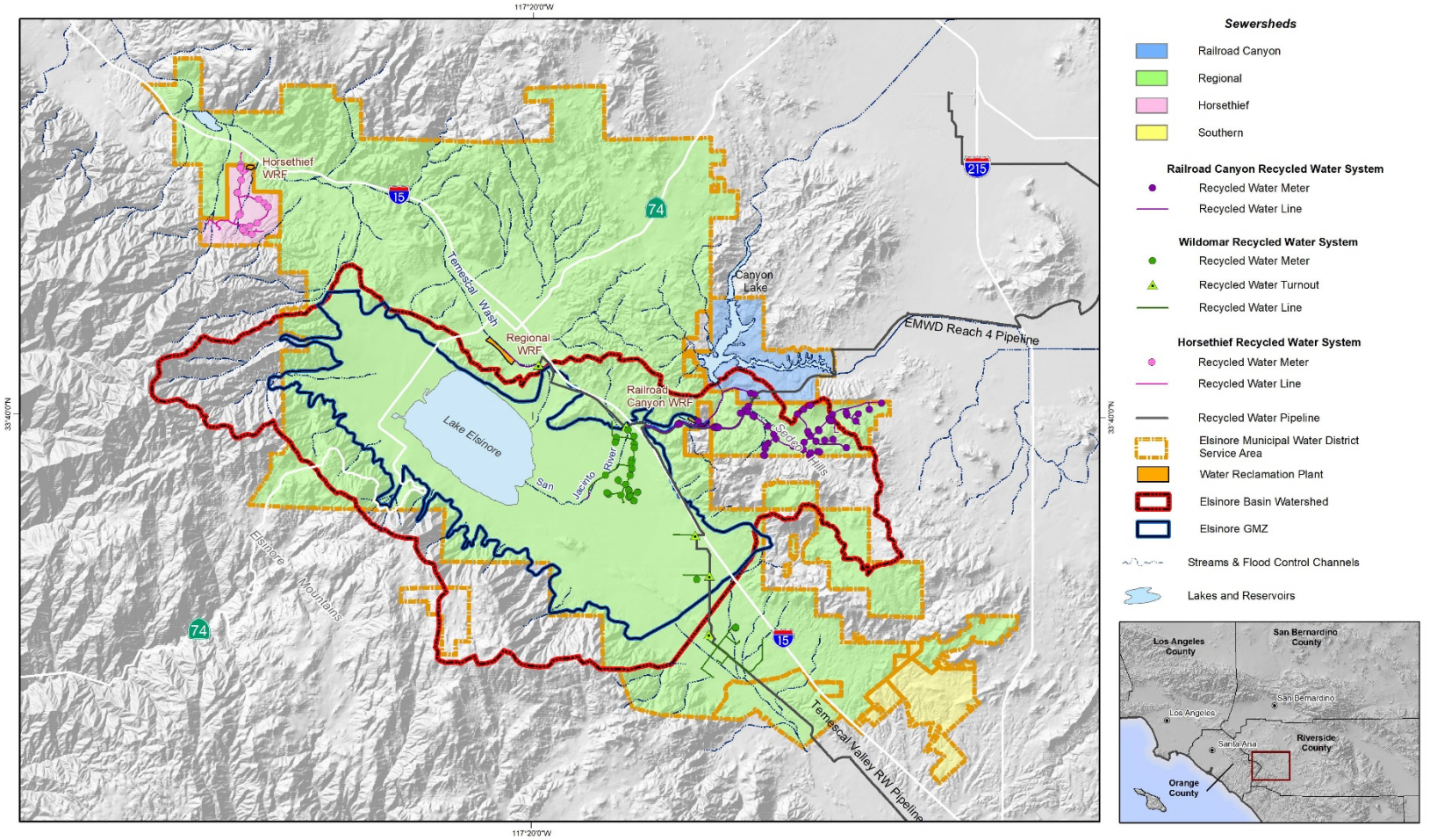

2. Policy and Technical Basis for Adopting Maximum Benefit Objectives

In accordance with the State Water Board's Antidegradation Policy, Regional Boards are required to establish water quality objectives that prevent the degradation of water quality to protect existing high-quality waters. The operable language from Resolution No. 68-16 reads as follows:

> *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.*
>
> *Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposed 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*.

The Antidegradation Policy allows the Regional Boards some flexibility in regulating waste discharge: if it can be demonstrated that allowing degradation of water quality is to the maximum benefit of the people of California and that beneficial uses can reasonably be protected, alternative water quality limitations can be considered.

In addition to Resolution 68-16, Regional Boards are required to consider other requirements when setting water quality objectives. CWC §13241 states:

> *Each regional board shall establish such water quality objectives in water quality control plans as in its judgment will ensure the reasonable protection of beneficial uses and the prevention of nuisance; however, it is recognized that it may be possible for the quality of water to be changed to some degree without unreasonably affecting beneficial uses. Factors to be considered by a regional board in establishing water quality objectives shall include, but not necessarily be limited to, all of the following:*
>
> *(a) Past, present, and probable future beneficial uses of water.*
>
> *(b) Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto.*

(c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area.

(d) Economic considerations.

(e) The need for developing housing within the region.

(f) The need to develop and use recycled water.

Together, Resolution 68-16 and CWC §13241 can be used as the basis for developing alternative, maximum-benefit-based water quality objectives.

The GMZs for which stakeholders have requested and received maximum benefit objectives include: Beaumont, Chino-North, Cucamonga, San Jacinto Upper Pressure, San Timoteo, and Yucaipa. Each responsible party proposing revised water quality objectives for these GMZs prepared a maximum benefit proposal to the Santa Ana Water Board that described how establishing higher TDS and nitrate objectives together with the maximum benefit commitments would satisfy the conditions of Resolution 68-16 and CWC §13241. To support the proposals, the Santa Ana Water Board required that the responsible parties develop projections of future TDS and nitrate concentrations for each GMZ where maximum benefit-based objectives were being proposed. The TDS and nitrate projections were made using a simple mass-balance approach known as a constantly-stirred reactor model. The purpose of this demonstration was to provide the Santa Ana Water Board and the stakeholders with a first-order approximation of the rate of water quality degradation, the rate at which assimilative capacity would be consumed relative to the proposed maximum benefit objectives, and a common understanding of when any concentration-based maximum benefit commitments would be triggered.

Notably, all of the GMZs with maximum benefit objectives are either hydrologically closed or have *de minimis* subsurface outflows. This means that salts added through the deep infiltration of precipitation and applied water, streambed infiltration, and artificial recharge processes stay in the GMZ to which they are added unless they are exported. The TDS and nitrate concentrations in these GMZs have been increasing historically, and the technical work performed demonstrated that they will continue to increase into the future regardless of waste discharge management practices or compliance with antidegradation objectives. Ultimately, in the fullness of time, the TDS concentration of these closed basins will asymptotically approach the volume-weighted concentration of the combined recharge sources to the GMZ. For most of the GMZs, the projections were used to establish the maximum benefit TDS objectives as the projected TDS concentration in the GMZ at the end of a 30-year planning period.

Though these groundwater basins are hydrologically closed, salts from the groundwater basin can be exported via subsurface outflows and recycled water discharge to the Santa Ana River and its tributaries. For this reason, the maximum benefit commitments,

where necessary, contain provisions that ensure protection of downstream beneficial uses – such as the requirement to maintain hydraulic control of outflows to *de minimis* levels in the Chino Basin. Additionally, in no case has a maximum benefit SNMP ever enabled a discharger to increase the TDS or nitrate concentration limit for existing recycled water discharges to the Santa Ana River.

3. Proposed Maximum Benefit SNMP for the Elsinore GMZ

TDS and Nitrate Maximum Benefit Objectives

The proposed maximum benefit TDS and nitrate objectives for the Elsinore GMZ are shown in Table 2 and summarized in the Resolution No. R8-2021-0044 which is provided as Enclosure 1 to this Staff Report. As shown in Table 2, the proposed maximum benefit TDS and nitrate objectives are 530 mg/L and 5 mg/L, respectively.

Table 2
Proposed Maximum Benefit Objectives for the Elsinore GMZ

GMZ	Proposed Maximum Benefit Objectives (mg/L)	
	TDS	Nitrate
Elsinore	530	5

Consistent with past maximum benefit proposals, the District prepared TDS and nitrate concentration projections to support the development of appropriate maximum benefit objectives for the Elsinore GMZ. These projections provide an approximation of the rate and magnitude of water quality degradation in the GMZ under various salt and nutrient management plan alternatives. To prepare the projections, the District coupled a calibrated numerical groundwater flow model (MODFLOW) with a numerical fate and transport model (MT3D), which also enables the evaluation of the spatial and vertical distribution of TDS and nitrate concentrations in the Elsinore GMZ. Attachment B of the maximum benefit SNMP proposal package (WEI, 2020) to the Santa Ana Water Board presents the detailed technical analysis performed by the District.

The District described a series of salt management alternatives to compare water quality outcomes for a planning period of 2017 through 2050. Each scenario is comprised of a recycled water discharge compliance plan and a variation on the District's water supply management plans. The scenarios are:

> SCENARIO A – *District Implements its IRP without Indirect Potable Reuse and No TDS Mitigation Is Implemented for Recycled Water Compliance***.** This scenario characterizes how TDS and nitrate concentrations in the Elsinore GMZ

would change over time without offsetting the District's TDS liabilities[3] accrued through 2050. The purpose of this scenario is to provide a basis for understanding the impact of recycled water reuse, estimating the rate of change of water quality in the absence of a salt offset program, and quantifying the water quality benefit of the alternative regulatory compliance scenarios. For the water supply plan, it is assumed that the District implements all of its IRP projects, except the Indirect Potable Reuse project. The demand that would otherwise have been met by Indirect Potable Reuse is satisfied in this scenario with imported water from the Skinner Water Treatment Plant (WTP).

SCENARIO B – *District Implements its IRP without Indirect Potable Reuse and Desalts Recycled Water to Comply with the TDS Antidegradation Objective*. This scenario characterizes how TDS and nitrate concentrations in the Elsinore GMZ would change over time if the District complied with the antidegradation objectives by serving recycled water that has been treated to reduce the TDS concentration so that recycled water served for irrigation is always equal to 480 mg/L. For the water supply plan, it is assumed that the District implements all of its IRP projects except the Indirect Potable Reuse project. The demand that would otherwise have been met by Indirect Potable Reuse is satisfied in this scenario with imported water from the Skinner WTP.

SCENARIO C – *District Implements its IRP without Indirect Potable Reuse and Desalts Groundwater to Offset its TDS Liabilities*. This scenario characterizes how TDS and nitrate concentrations in the Elsinore GMZ would change over time if the District complied with the antidegradation objectives by implementing a groundwater desalter to mitigate the District's TDS liabilities. For the analysis, it is assumed that the groundwater desalter goes online in 2020 and is operated at a capacity to completely offset the District's cumulative TDS liabilities accrued through 2050. For the water supply plan, it is assumed that the District implements all of its IRP projects except the Indirect Potable Reuse project. The demand that would otherwise have been met by Indirect Potable Reuse is satisfied in this scenario with imported water from the Skinner WTP.

SCENARIO D – *District Implements its IRP without Indirect Potable Reuse and Replaces Recycled Water with Imported Water*. This scenario characterizes how TDS and nitrate concentrations in the Elsinore GMZ would change over time if the District's recycled water reuse would be abandoned and the supply replaced with imported water from the Skinner WTP. For the water supply plan, it is assumed that the District implements all of its IRP projects except the Indirect Potable Reuse project. The demand that would otherwise have been met by Indirect Potable Reuse is satisfied in this scenario with imported water from the

[3] TDS liability means the mass of TDS above the mass discharge allowed with the TDS effluent limit X discharge volume.

Skinner WTP. From a hydrologic and salinity perspective, this scenario is nearly identical to Scenario B and was not simulated using the model.

SCENARIO E – *Create Assimilative Capacity through Maximum Benefit SNMP and District Implements its IRP, Including Indirect Potable Reuse in 2030*. This scenario characterizes how TDS and nitrate concentrations in the Elsinore GMZ would change over time if the maximum benefit SNMP is adopted, which creates assimilative capacity in the Elsinore GMZ and reduces the District's accrual of TDS liabilities for the use of recycled water with TDS concentrations in excess of the antidegradation objective. The District would continue to accrue TDS liabilities for the discharge or reuse of recycled water from the Railroad Canyon WRF that exceeds the TDS limitation of the discharge permit. For the water supply plan, it is assumed that the District implements all of its IRP projects, including the Indirect Potable Reuse project. It is assumed that the Indirect Potable Reuse is implemented beginning in 2030 and serves as the salt offset project that will mitigate the District's historical and ongoing TDS liabilities.

SCENARIO F – *Create Assimilative Capacity through Maximum Benefit SNMP and District Implements its IRP, Including Indirect Potable Reuse after 2050*. This scenario is identical to scenario E with the exception that the Indirect Potable Reuse project is implemented in 2050 instead of 2030. From a hydrologic and salinity perspective, this scenario is identical to Scenario A and was not simulated using the model.

These scenarios were evaluated for their TDS concentration impacts on the following key metrics:

- the volume-weighted TDS concentration of the Elsinore GMZ,
- the volume-weighted TDS concentration of the District's produced groundwater supply from the Elsinore GMZ,
- the volume-weighted TDS concentration of total water supply served in the area tributary to the Elsinore GMZ, and
- the volume-weighted TDS concentration of recharge to the Elsinore GMZ.

Table 3 below summarizes the TDS results derived from the modeling work for two points in time of the projection period: 2030 and 2050.

Table 3
Projected TDS Concentrations (mg/L) for each of the Key Metrics in 2030 and 2050

Key Metrics	Projection Year	Scenario A/F	Scenario B/D	Scenario C	Scenario E
Volume-Weighted TDS of Elsinore GMZ	2030	523	523	523	523
	2050	531	530	530	502
Volume-Weighted TDS of District Produced Groundwater Supply	2030	518	518	518	518
	2050	548	544	547	501
Volume-Weighted TDS of Water Supply Served in the Area Tributary to Elsinore GMZ	2030	457	457	454	453
	2050	439	439	433	411
Volume-Weighted TDS of Recharge to the Elsinore GMZ	2030	628	627	617	464
	2050	683	680	668	360

As shown in Table 2, the projected volume-weighted TDS concentrations in Scenario A/F, B/D, and C are almost indistinguishable from each other for all four water quality impact categories. Scenario E, which assumes the implementation of the Indirect Potable Reuse, has the most immediate and positive water quality impacts for the Elsinore GMZ. More specifically, over the 20-year period from 2030 to 2050, the Indirect Potable Reuse in Scenario E decreases:

- the projected volume-weighted TDS concentration of the Elsinore GMZ by nearly 20 mg/L,
- the projected volume-weighted TDS concentration of the District's produced groundwater supply by nearly 20 mg/L,
- the projected volume-weighted TDS of the combined water supply served in areas that are tributary to the Elsinore GMZ by nearly 40 mg/L, and
- the projected volume-weighted TDS concentration of recharge to the Elsinore GMZ from by more than 100 mg/L.

For nitrate, these scenarios were evaluated for their nitrate concentration impacts in the Elsinore GMZ. Table 4 below summarizes the projected nitrate concentration of the groundwater in the Elsinore GMZ for all planning scenario for the projection period of 2030 and 2050.

Table 4
Projected Nitrate Concentrations (mg/L) of the Elsinore GMZ for All Scenarios for 2030 and 2050

Projection Year	Scenario A/F	Scenario B/D	Scenario C	Scenario E
2030	0.97	0.97	0.97	0.97
2050	1.01	1.01	1.01	0.92

Similar to the projections for the TDS concentration, the projected volume-weighted nitrate concentrations in the Elsinore GMZ in Scenario A/F, B/D, and C are indistinguishable through 2050 and only increase by about 0.2 mg/L over the planning period. The Indirect Potable Reuse project in Scenario E has the effect of improving the nitrate concentration in the GMZ by about 0.1 mg/L relative to Scenario A/F, B/D, and C.

The results of the modeling work demonstrate that all of the management options for complying with the TDS antidegradation objective of 480 mg/L (Scenarios B/D and C) do not provide positive water quality impacts to the volume-weighted TDS concentrations of the Elsinore GMZ, the District's produced groundwater supply, or recharge to the GMZ and will not stop the projected TDS degradation in the Elsinore GMZ. The results demonstrate that the alternative maximum benefit regulatory compliance strategy shown in Scenario E can provide significant water quality benefits to the Elsinore GMZ. Specifically, it improves water quality by decreasing the TDS concentration of the groundwater supply produced from the Elsinore GMZ, of the total water supply served by the District, and of the combined groundwater recharge sources to the GMZ.

The hydrologic and policy rationales for establishing the TDS objective of 530 mg/L are:

- Like the other GMZs with maximum benefit objectives, the Elsinore GMZ is a closed groundwater basin and the only way salt can leave the basin is through groundwater pumping. This means that the TDS concentrations in groundwater will increase over time and eventually approach the volume-weighted TDS concentration of the recharge to the basin, as demonstrated by the projections.
- For the planning scenarios that excluded the Indirect Potable Reuse project during the planning period (Scenario A/F, B/D and C), the volume-weighted TDS concentration of the combined recharge to the GMZ for 2050 is approximately 670 to 680 mg/L. This means that the TDS concentrations in the basin will continue to degrade relative to the current volume-weighted TDS concentration of 520 mg/L. By 2050, the TDS concentration of the Elsinore GMZ is projected to be 530 mg/L for these salinity management scenarios.
- The TDS concentration projections demonstrated that even if the controllable factor that contributes to the TDS concentration of recharge to the basin (e.g.

TDS concentration of outdoor water supplies) is managed through treatment of the supply sources (recycled water or groundwater) or substitute supply, there is no decrease in the TDS concentration in the Elsinore GMZ through 2050 relative to a scenario where no salt mitigation is performed (Scenario A).

- A maximum benefit objective of 530 mg/L is consistent with the requirements of CWC §13241, particularly because this concentration represents the water quality condition that could reasonably be achieved by 2050 even with the coordinated control of the factors that affect water quality in the basin (See Section 4 of this Staff Report for full CWC §13241 demonstration).
- Downstream beneficial uses will not be impacted because:
    - the Elsinore GMZ is operated as a closed basin and has negligible groundwater outflow, and
    - the TDS limit of 700 mg/L for discharges to Temescal Wash are established and will not be changed as a result of adopting the maximum benefit objective.
- A maximum benefit objective of 530 mg/L is consistent with previously approved maximum benefit proposals that based the maximum benefit TDS objective concentrations on 30-year planning projections.

The proposed maximum benefit nitrate objective for the Elsinore GMZ is 5 mg/L. The objective is based on Table A in the Regional Board's Resolution R8-2010-0012, the Declaration of Conformance with the State Recycled Water Policy, which states that this concentration is fully protective of municipal beneficial use. This objective is also consistent with previously approved maximum benefit proposals that have generally limited the objective to one-half of the primary California Maximum Contaminant Level.

Implementation Plan – Maximum Benefit Commitments

CWC § 13242 specifies that Basin Plan's implementation plans must contain a description of the implementation actions to achieve water quality objectives, timeline to implement and complete such actions, and surveillance and monitoring programs to be undertaken to determine compliance with water quality objectives. As part of this proposal to incorporate the maximum benefit TDS and nitrate objectives and maximum benefit commitments for the Elsinore GMZ, Staff proposes changes to the Chapter 5 of the Basin Plan to require the implementation of the maximum benefit commitments defined in the maximum benefit SNMP proposal package. The specific recommended amendments to Chapter 5 of the Basin Plan are shown in the Attachment to draft resolution No. R8-2021-0044 (Enclosure 1 to this Staff Report). Table 5 below summarizes the seven maximum benefit commitments.

Table 5
Maximum Benefit Commitments and Implementation Schedule

Commitment	Milestones	Compliance Schedule
1. Beneficial Use Protection	a. Triennial report of historical, current and future water supply and recycled water quality; the ten-year projection will include estimations of TDS and nitrate concentrations of each District water supply source and a volume-weighted projection of all sources	a. Initial report due by August 15, 2021, subsequent reports due every three years by August 15th
	b. If the need for treatment to meet TDS and nitrate drinking water standards is identified in the ten-year projection, the District will prepare a proposed schedule to plan, design and construct the necessary treatment facilities (treatment plan)	b. A treatment plan will be submitted to the Executive Officer for review and approval within one year of publishing a finding of the need for treatment within the ten-year projection
	c. Implement treatment plan	c. Upon approval of plan and schedule by Executive Officer
	d. Reporting of treatment plan implementation status	d. May 1st (as part of Commitment 7)
	e. Report of pumping and sustainable yield	e. May 1st (as part of Commitment 7)
2. Prioritization of Recycled Water Reuse from Regional WRF to Comply with LECWA Before Initiating IPR Project.	Status report of latest recycled water planning projections for the Regional WRF, its current and projected deliveries to Lake Elsinore, and an estimate of when surplus recycled water supply will be available to initiate the indirect potable reuse program	May 1st (as part of Commitment 7)
3. Salt Mitigation Accounting	Report of monthly, annual and cumulative salt liabilities and offsets	May 1st (as part of Commitment 7)
4. Integrated Resources Plan Implementation	Status report of Integrated Resources Plan implementation	May 1st (as part of Commitment 7)
5. Salt Offset Project Plan and Implementation	a. Complete engineering design for the expansion of the Regional WRF to 12 mgd, including MBR system required to operate IPR project	a. December 31, 2020 (completed)
	b. Complete construction of Regional WRF expansion to 12 mgd, including MBR system	b. December 31, 2025
	c. Complete research studies on potential for arsenic leaching	c. December 31, 2026
	d. When the total recycled water production at the Regional WRF reaches 8.5 mgd, start preliminary engineering and related investigations to provide the information necessary to implement the IPR project and alternative equivalent salt offset projects; and prepare a plan and schedule to construct the project by the time the Regional WRF reaches 10 mgd	d. Start study when Regional WRF reaches 8.5 mgd of recycled water production Submit engineering study and project plan and schedule within 24 months of when Regional WRF reaches 8.5 mgd of recycled water production
	e. Implement the salt offset project plan	e. Upon approval of the project plan and schedule by the Executive Officer
	f. Once the salt offset project plan implementation begins, prepare progress reports to the Regional Board until project startup commences	f. Reporting commences upon Executive Officer approval of the project plan and schedule.
	g. Complete construction and commence operations of IPR or other salt offset	g. When Regional WRP discharge reaches 10 mgd
	h. Once the salt offset project facilities are operational, report the cumulative amount of salt removed by the salt offset project, the balance of its salt mitigation obligation and a projection of the year in which the salt liability will be completely mitigated	h. May 1st (as part of Commitment 7)
6. Monitoring and Analysis	a. Prepare a monitoring and analysis program work plan that is consistent with the State Board's 2019 Recycled Water Policy	a. within 90 days of OAL adoption of the Maximum Benefit Salinity Management Plan
	b. Implement monitoring program work plan	b. Within 60 days of approval of plan by Executive Officer
	c. Periodic update of monitoring plan	c. As requested by the Executive Officer
7. Reporting	Annual report of compliance with the Maximum Benefit Commitments	First report completed by May 1st following OAL adoption of the Maximum Benefit Salinity Management Plan, and every May 1st each year thereafter

The seven maximum benefit commitments are described in more detail below.

1. **Beneficial Use Protection.** The District will ensure that there will be no impairment of beneficial uses of the Elsinore GMZ or downstream GMZs. To accomplish this, the District will sustainably produce groundwater from the Elsinore GMZ, consistent with the newly enacted Sustainable Groundwater Management Act, and will not reduce its groundwater pumping to a volume that is less than the sustainable yield as TDS and/or nitrate concentrations in the Elsinore GMZ increase over time. The District will not abandon the use of Elsinore GMZ groundwater due to the cost of TDS and nitrate treatment. The District will accomplish this by constructing treatment facilities, as necessary, to treat groundwater to ensure that the TDS and nitrate concentrations in the water served to its customers meets drinking water standards. This will be done as follows:

    a. Every three years, the District will prepare a triennial report for the Santa Ana Water Board that describes its historical, current, and projected water supply and wastewater discharge operations and quality. The objectives of the report are to: demonstrate the nexus between the District's water supply and recycled water quality, characterize water and recycled water supply and quality trends over time, and prepare a ten-year projection of the TDS and nitrate concentrations of each District water supply source and a volume-weighted projection of all sources. The water supply quality projections will be based on monitoring data or groundwater model projections at the discretion of the District. Each report will identify if there is a projected need for new groundwater treatment in the ten-year projection period. The first triennial report was submitted to the Regional Board on August 13, 2021 and every three years thereafter by August 15th, unless relieved of this commitment by the Executive Officer.

    b. If the need for treatment to meet TDS and nitrate drinking water standards is identified in the ten-year projection, the District will prepare a proposed schedule to plan, design, and construct the necessary treatment facilities (treatment plan). The treatment plan will be submitted to the Executive Officer for review and approval within one year of publishing the finding in the triennial report.

    c. When the treatment plan is approved by the Executive Officer, the District will begin its implementation pursuant to the schedule in the approved treatment plan.

    d. The District will prepare an annual progress report that describes the activities of the prior year to implement the treatment plan. Once

triggered, the reporting done pursuant to this commitment will be included in the annual maximum benefit report described in Commitment 7 below.

e. Each year, as part of the annual report of the maximum benefit salinity management plan (Commitment 7 below), the District will provide the Santa Ana Water Board with: (1) data on its historical, current and planned pumping from the Elsinore GMZ, (2) a comparison of average pumping to the most current estimation of the sustainable yield of the basin, and (3) to the extent that the current or planned average pumping is less than the sustainable yield of the Basin, the District will provide detailed information as to why the beneficial use of the Basin is not being maximized and will provide a schedule for resuming an average pumping level that is consistent with the sustainable yield.

2. **Prioritization of Recycled Water Reuse from Regional WRF to Comply with Lake Elsinore Comprehensive Water Management Agreement before Initiating Indirect Potable Reuse Project.** The District proposes to use its planned Indirect Potable Reuse project to inject advanced-treated recycled water from the Regional WRF into the Elsinore GMZ to offset its legacy and ongoing salt liabilities. The Regional WRF currently produces about 6.0 mgd: 0.5 mgd of which is discharged to Temescal Wash to maintain riparian habitat, and 5.5 mgd is discharged to Lake Elsinore to help maintain surface water elevation pursuant to the District's agreement with the City of Lake Elsinore under the Lake Elsinore Comprehensive Water Management Agreement (LECWA). The target lake water level pursuant to the LECWA is 1240 ft. Recent studies indicate that the long-term average discharge required to maintain the Lake at or above 1240 feet is about 7.5 mgd. A minimum of 2.5 mgd of effluent is required to operate the Indirect Potable Reuse project. Thus, to meet the commitment to the LECWA, the Indirect Potable Reuse project cannot be operated until the total effluent from the Regional WRF reaches at least to 10 mgd. Current planning projections for growth in the District's service area indicate that there should be 10 mgd of recycled water produced at the Regional WRF to operate the Indirect Potable Reuse project starting in 2035. As the District service area grows, the new recycled water supply will first be needed to maintain surface water levels in Lake Elsinore to comply with the LECWA. The recycled water produced in excess of that required for compliance with the LECWA will be prioritized for the Indirect Potable Reuse project.

a. Each year, as part of the annual report of the maximum benefit salinity management plan (Commitment 7), the District will provide the Santa Ana Water Board with the latest planning information available with regards to recycled water production projections for the Regional WRF,

its current and projected deliveries to Lake Elsinore, and an estimate of when surplus recycled water supply will be available to initiate the IPR program.

3. **Salt Mitigation Accounting**. The District will track its monthly, annual, and cumulative salt mitigation requirements and report on them annually to the Santa Ana Water Board as part of its annual reporting commitment (Commitment 7). The salt liability will be accounted as follows:

    a. The District will prepare an accounting of the TDS mitigation requirements that resulted from exceedances of the Railroad Canyon WRF (RRC) discharge limitation from January 1, 2004[4] through July 1, 2014.[5] The mitigation requirement is calculated based on the mass of TDS in excess of the RRC permit limit of 700 mg/L for the entire volume of recycled water produced by the plant over this period.

    b. The District will prepare an accounting of the TDS mitigation requirements that resulted from the reuse of all sources of recycled water used in the watershed tributary to the Elsinore GMZ that were in excess of the antidegradation objective from July 1, 2014[6] through [*date of OAL adoption of Maximum Benefit objectives*]. The mitigation requirement is calculated based on the mass of TDS in excess of the antidegradation objective of 480 mg/L.

    c. The District will prepare an accounting of the TDS mitigation requirements for the balance of the recycled water produced at the RRC WRF that was not used in the watershed tributary to the Elsinore GMZ from July 1, 2014 through [*date of OAL adoption of Maximum Benefit objectives*]. The mitigation requirement is calculated based on the mass of TDS in excess of the RRC permit limit of 700 mg/L.

    d. As of [*date of OAL adoption of Maximum Benefit objectives*], the District will prepare and maintain an ongoing accounting of the continued salt mitigation requirements that accumulate from ongoing exceedances of the RRC discharge limitation and report them to the Santa Ana Water Board. The mitigation requirement is calculated based on the mass of TDS in excess of 700 mg/L for the entire volume of recycled water produced by the plant.

[4] This is the effective date of the Basin Plan amendment that incorporated the current antidegradation objectives for the Elsinore GMZ.
[5] The accounting starts on July 1, 2014 because this is the effective date of the finding of no assimilative capacity in the Elsinore GMZ per the 2012 Ambient Water Quality findings.
[6] The accounting starts on July 1, 2014 because this is the effective date of the finding of no assimilative capacity in the Elsinore GMZ per the 2012 Ambient Water Quality findings.

e. No offsets will be required for the reuse of imported recycled water sources as of [*date of OAL adoption of Maximum Benefit objectives*] so long as assimilative capacity exists in the Elsinore GMZ. Once assimilative capacity is used up (e.g., when the ambient TDS concentration equals or exceeds 530 mg/L, the mitigation requirement is calculated based on the mass of TDS in excess of the maximum benefit objective of 530 mg/L.

f. Once a Santa Ana Water Board-approved salt mitigation project is initiated (Indirect Potable Reuse or an equivalent alternative), the District will prepare and maintain an ongoing accounting of the mitigation credits attributable to the project and the cumulative remaining offset obligation.

4. **Integrated Resources Plan Implementation.** The District will aggressively pursue the suite of nine water supply projects identified in its IRP and apprise the Santa Ana Water Board of its progress in the annual maximum benefit report described in Commitment 7 below. It is the intent of the District to use its planned Indirect Potable Reuse project, which will inject low-TDS advanced treated water to the Elsinore GMZ, as the salt offset project to mitigate the salt obligations accrued pursuant to Commitment Number 3 as soon as there is sufficient recycled water production at the Regional WRF to support the LECWA commitments and the Indirect Potable Reuse project (e.g. when recycled water production is 10 mgd).

5. **Salt Offset Project Plan and Implementation.** The District will complete construction and commence its salt offset project once the total recycled water production at its Regional WRF reaches 10 mgd. The project will be designed to completely offset the District's cumulative and ongoing salt mitigation obligations. This will be done as follows:

   a. No later than December 31, 2020, the District will complete the design for the expansion of the Regional WRF to 12 mgd, which will include a Membrane Bioreactor (MBR) system that will be required to operate the Indirect Potable Reuse project.

   b. No later than December 31, 2025, the District will complete an expansion of the Regional WRF to 12 mgd, including construction of the MBR system that will be required to operate the Indirect Potable Reuse project.

   c. No later than December 31, 2026, the District will complete a study on the potential for arsenic leaching as a result of the planned Indirect Potable Reuse project. The District's Indirect Potable Reuse Feasibility Study determines that there is potential for increase mobilization of naturally occurring arsenic into the Back Basin of the Elsinore GMZ

during the injection of advanced-treated recycled water. To determine the source and control the mobilization of arsenic, an arsenic study is needed prior to the design and construction of the Indirect Potable Reuse project.

d. Once the recycled water production at the Regional WRF reaches 8.5 mgd, the District will start preliminary engineering and related investigations to provide the information necessary to implement the Indirect Potable Reuse project or alternative equivalent salt offset projects (such as a groundwater desalter). At the completion of the study, the District will prepare a schedule to complete project construction by the time the Regional WRF is producing 10 mgd of recycled water. The engineering study and project plan and schedule must be submitted to the Santa Ana Water Board within 24 months of when the Regional WRF reaches 8.5 mgd of recycled water production.

    i. If Indirect Potable Reuse is the proposed salt offset project alternative, it will be designed to completely offset the District's historical salt liabilities within 10 years of initiating the project.

    ii. If a desalter or other equivalent treatment alternative is the approved salt offset project alternative, it will be designed to completely offset the District's historical salt liabilities within 30 years of initiating the project.

e. Implement the salt offset project plan upon approval by the Executive Officer.

f. Once the salt offset project plan implementation begins, the District will prepare quarterly progress reports to the Santa Ana Water Board until project startup commences. These reports will summarize technical and related findings, achievement of milestones, schedule status and actions being taken to ensure compliance with schedule in the approved salt offset project plan.

g. Complete construction and commence operations of Indirect Potable Reuse or other salt offset project when recycled water production at the Regional WRF reaches 10 mgd

h. Once the salt offset project facilities are operational, the District will document the monthly amount of salt mitigated by the project. Each year, the District will report the cumulative amount of salt removed by the salt offset project, the balance of its salt mitigation obligation and a projection of the year in which the salt liability will be completely mitigated. The reporting done pursuant to this commitment will be

included in the annual maximum benefit report described in Commitment 7 below.

6. **Monitoring and Analysis.** The District will conduct monitoring, investigations, and report results in a manner that is consistent with the State Water Resources Control Board's 2019 Recycled Water Policy.

    a. The District will prepare a monitoring and analysis program work plan and submit it to the Santa Ana Water Board within 90 days of [*date of OAL adoption of Maximum Benefit objectives*]. The work plan will address the requirements of the State Board's 2019 Recycled Water Policy, including: a description of the methodologies for assessing current groundwater quality (e.g. ambient water quality) and assessing impacts of recycled water reuse in the Elsinore GMZ; the data collection and monitoring required to perform the water quality assessments; and a schedule for analysis and reporting.

    b. The monitoring and assessment program will be implemented within 60 days of the Executive Officer's approval of the work plan.

    c. The monitoring plan will be updated, as appropriate, subject to approval of the Executive Officer.

7. **Reporting**. The District will prepare an annual report of activities performed pursuant to the maximum benefit salinity management plan by May 1st of each year. The first annual report will be submitted on the May 1st following OAL adoption of the Maximum Benefit Salinity Management Plan. The annual report will include a detailed status report of compliance with each maximum benefit commitment, including the specific information referenced in each commitment's description above. The reporting schedule will be updated, as appropriate, subject to approval of the Executive Officer.

If the Santa Ana Water Board determines that District is not implementing the maximum benefit commitments and schedule, then maximum benefit is not demonstrated and the antidegradation objectives for the GMZ will apply. In this case, the Santa Ana Water Board will require retroactive mitigation (back to the date of adoption of the maximum benefit SNMP) for the discharge of recycled water overlying and tributary to the GMZ with TDS concentrations over the antidegradation objectives. The Santa Ana Water Board will also require mitigation of any impact of water quality to the downstream GMZs that result from failure to implement the "maximum benefit" commitments.

4. Consistency with CWC § 13241 and Resolution 68-16

The Santa Ana Water Board staff determines that the proposal to amend the Basin Plan to incorporate the maximum benefit SNMP for the Elsinore GMZ is consistent with the State's Antidegradation Policy and CWC § 13241.

<u>CWC § 13241</u>

As previously noted, the Santa Ana Water Board is required to consider the factors such defined in CWC § 13241 when establishing water quality objectives.

The following describes the factors considered in the Staff's recommendation of the proposed maximum benefit TDS and nitrate objectives of 530 mg/L and 5 mg/L, respectively, for the Elsinore GMZ.

CWC § 13241 (a) Past, present, and probable future beneficial uses of water

The beneficial uses in the current Basin Plan for the Elsinore GMZ are:

- MUN – waters used for community, military, municipal, or individual water systems. These uses include, but are not limited to, drinking water supply.
- AGR – waters used for farming, horticulture, or ranching. These uses may include, but are not limited to, irrigation, stock watering, and support of vegetation for range grazing.
- PROC – waters are used for industrial activities that depend primarily on water quality. These uses include, but are not limited to, process water supply and all uses of water related to product manufacturing and food preparation.

The use impairment threshold concentrations for TDS and total inorganic nitrogen (TIN) for these beneficial uses are listed in the current Basin Plan and from Santa Ana Water Board Resolution R8-2010-0012 (Declaration of Conformance with the State Recycled Water Policy) and are summarized in Table 6 below:

Table 6
Beneficial Uses and TDS and TIN Thresholds

Beneficial Use	TDS Threshold (mg/L)	TIN Threshold (mg/L)
MUN	500 - 750	5 - 8
AGR	700 – 750	<10
PROC	nl	nl

NL – Not listed or the Basin Plan is silent on the impairment threshold.

For the MUN use, the Basin Plan states that a TDS concentration less than 500 mg/L will assure the MUN use is fully protected. In addition, 500 mg/L is the secondary Safe Drinking Water Standard based on taste and appearance. In certain areas in the watershed, the TDS concentration in municipal supplies exceeds 500 mg/L, including in the District's services areas. Established TDS objectives within the 500-750 mg/L range are based on historical water quality. Likewise, the GMZs with allowable TDS objectives greater than 750 mg/L are set

based on historic (1954-1973) high-TDS conditions. The Basin Plan threshold for TIN for MUN use is 10 mg/L, which is the maximum allowable concentration for nitrate in drinking water, as set by the DDW for the protection of human health. However, per R8-2012-0012, the threshold for setting Basin Plan objectives that are not based on historic water quality is 5 mg/L.

With the proposed maximum benefit commitments, the proposed TDS and nitrate objectives of 530 mg/L and 5 mg/L are protective of these beneficial uses in the Elsinore GMZ, and because the District manages the Elsinore GMZ to be hydrologically closed, these proposed objectives are protective of downstream beneficial uses. And, as previously discussed, downstream beneficial uses are further protected because the maximum benefit will not enable the District to increase its existing TDS discharge limitations for the recycled water discharges to Temescal Wash.

CWC § 13241 (b) Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto and (c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area

The Elsinore GMZ is a hydrologically closed basin and groundwater and salt can only leave the basin through groundwater pumping. About 25 percent of the groundwater pumped is used for irrigation which, in turn, contributes to groundwater recharge. This means that the TDS in water supplies used for irrigation will accumulate in the GMZ. TDS concentrations in groundwater will increase and eventually approach the volume-weighted TDS concentration of the recharge to the basin. To control degradation, the volume-weighted TDS concentration of groundwater recharge must be reduced.

As demonstrated in Table 3 in Section 2, the Indirect Potable Reuse project (Scenario E) will reduce the volume-weighted TDS concentration of the Elsinore GMZ, of the District's pumped groundwater supply, of the water supply served in the watershed tributary to the Elsinore GMZ, and of the recharge to the GMZ. Without Indirect Potable Reuse project, TDS concentrations of the Elsinore GMZ and its recharge will continue to increase. This increase is attributable to urban development, which increases the volume and TDS concentration of the deep infiltration of water applied outdoors for irrigation. As shown in Table 3 in Section 2, without Indirect Potable Reuse, the TDS concentration of the recharge averages about 620 mg/L over the planning period. Thus, regulating recycled water to comply with the antidegradation objective of 480 mg/L (Scenario A/F, B/D, and C) has no long-term benefit to the water quality of the Elsinore GMZ.

CWC § 13241 (d) Economic considerations

The economic considerations evaluated herein include (1) the net present value of the capital and operating costs of the facilities; (2) the environmental cost of increasing dependence on exports from the Sacramento-San Joaquin Delta, as measured by the increased use of imported water; and (3) the cost of contributing to climate change, as measured by increased energy usage and greenhouse gas (GHG) emissions associated with facilities operations and increased use of imported SWP water.

Dependence on exports from the Sacramento-San Joaquin Delta are considered herein due to the significant environmental costs of operating the State Water Project. Energy usage and GHG emissions are considered herein because according to leading climate scientists from around the world, anthropogenic climate change is a significant and growing problem that must be addressed in order to avoid the worst effects. Minimizing climate change impacts was one of the goals of the District's IRP. Climate change is the result of GHGs that are emitted into the atmosphere, such as carbon dioxide (CO_2) and methane (CH_4), which have a heat forcing effect on the atmosphere.[7] In adopting Assembly Bill 32, the California Global Warming Solutions Act of 2006, the Legislature declared that[8]:

i. Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.

ii. Global warming will have detrimental effects on some of California's largest industries, including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry. It will also increase the strain on electricity supplies necessary to meet the demand for summer air-conditioning in the hottest parts of the state.

Attachment C to the maximum benefit SNMP proposal package (WEI, 2020) details the derivation of the economics of the recycled water discharge compliance alternatives (Scenarios B, C, D, and E) compared to Scenario A

[7] http://www.arb.ca.gov/cc/ab32/ab32.htm
[8] Ibid.

which (is described in detail in Section 3 of this Staff Report) is considered as the no project alternative. For each scenario, the costs evaluated included:

- The annual amortization cost ($) of new capital facilities
- The annual operations and maintenance (O&M) cost ($) of new capital facilities
- The costs ($) to satisfy increases in imported water demand. This would be expressed as a negative cost if the imported water demand decreases because of the scenario.
- The "cost" of contributing to climate change, as measured by the increase in energy usage and GHG emissions associated with operation of new capital treatment facilities and conveyance of new imported water demands. This would be expressed as a negative cost if the energy usage and GHG emissions decreases because of the scenario.

Table 7 below compares the projected present value costs, energy consumption, GHG generation, and imported water use for Scenarios B through E for the period 2018 through 2050. The values in Table 7 are relative to Scenario A (No Project). In other words, all values in Table 7 for Scenario A would be zero (0) such that a positive value for B/C/D/E represents an increase compared to the no project alternative and a negative cost represents a decrease in costs compared to a no project alternative. The annual time histories of the District's projected TDS liability, TDS offsets, imported water requirements, capital and O&M costs, energy usage, and GHG emissions for each scenario are detailed in the Attachment C of the maximum benefit SNMP proposal package (WEI, 2020).

Table 7
Comparison of Present Value Costs, Energy Usage, GHG (CO_2) Emissions, and Imported Water Use Compared to Scenario A (No Project)– 2018 through 2050

Scenario	Change in Present Value Capital, O&M, and Imported Water Costs	Change in Energy Usage (kwh)	Change in GHG Emissions (mt)	Change in Imported Water Use (af)
Scenario B Compliance with Anti Degradation TDS Objective – Recycled Water Desalting	$29.4 million	28 million	8,000	2,400

Scenario C Compliance with Anti Degradation TDS Objective – Groundwater Desalting	$32 million	35 million	9,000	3,900
Scenario D Replace Recycled Water Reuse with Imported Water	$79.5 million	182 million	27,000	40,000
Scenario E Compliance with proposed Maximum Benefit TDS Objective plus Indirect Potable Reuse	-$3.5 million	-333 million	-6,800	-117,000

The recycled water discharge compliance alternatives and the findings of the economic analysis for each alternative are summarized below:

Scenario B – Desalting of Recycled Water to Reduce the TDS Concentration and Comply with the TDS Antidegradation Objective

In this scenario, the District would construct desalters to reduce the TDS concentration in recycled water served in the watershed tributary to and overlying the Elsinore GMZ. The amount of TDS removal from recycled water is tied to the estimated legacy TDS loads accumulated from 2004 through 2019 and the ongoing reuse of recycled water with TDS concentrations in excess of the antidegradation objective of 480 mg/L from 2020 through 2050.

At the end of 2019, the estimated TDS liability for the District is estimated to be about 2,400 tons. The annual TDS mass removal for the recycled water desalter was set to completely offset the legacy and ongoing liabilities over a 30-year facility life. The total amount of TDS mass removal from recycled water required through 2050 is about 23,100 tons, which equates to treating about 675 acre-feet per year (afy) of recycled water. Due to treatment losses, about 2,400 acre-feet (af) of recycled water will be discharged to the brine line over the 30-year period and a like amount of imported water will be required to replace it.

The total annual cost to implement this scenario includes the cost of imported water to replace the treatment waste that is discharged to the brine line, the amortized capital cost of the treatment and related facilities, and the annual O&M cost. The total annual cost is estimated to range from about $1.5 million in 2020

to about $2.3 million in 2050 and have a present value cost of about $29.4 million. The increase in annual energy usage and GHG generation are about 910,000 kilowatt-hours (kwh) per year and 260 metric tons (mt) per year, respectively.

Scenario C – Desalting of Groundwater to Offset the TDS Loading from Recycled Water with TDS Concentration in Excess of the Antidegradation Objective

This scenario is identical to Scenario B except that the offset is achieved by removing TDS from the District's potable groundwater supply pumped from the Elsinore GMZ prior to serving the groundwater to its customers. The TDS liability is identical to Scenario B and the groundwater treatment was also designed to completely offset the liability by 2050.

Due to the lower-TDS concentration of the pumped groundwater supply relative to the recycled water supply in Scenario B, the volume of water that must be treated annually is about 1,100 afy. About 3,900 af of groundwater will be discharged to the brine line over the 30-year period and a like amount of imported water will be required to replace it.

The total annual cost to implement this scenario includes the cost of imported water to replace the treatment waste that is discharged to the brine line, the amortized capital cost of the treatment facilities, and the annual O&M cost. The total annual cost is estimated to range from about $1.6 million in 2020 to about $2.5 million in 2050 and have a present value cost of about $32 million. The increase in annual energy usage and GHG generation are about 1.1 million kwh per year and 290 mt per year, respectively.

Scenario D – Replace Recycled Water with Imported Water

In this scenario, recycled water that would be used for outside irrigation is replaced with imported water. The legacy TDS liability through 2019 of about 2,400 tons is the same as in Scenario B but no new TDS liabilities are accrued that need to be offset after 2019.

The total annual cost to implement this scenario includes the cost of imported water to replace the recycled water used for outdoor irrigation and the amortized capital cost to increase the treatment capacity at the District's Regional Plant and decommission the Railroad Canyon WRF. The increase in O&M incurred at the Regional Plant is assumed to be offset by the elimination of the O&M costs at Railroad Canyon WRF. The total annual cost is estimated to range from about $3.7 million in 2020 to about $6.7 million in 2050 and have a present value of about $79.5 million. The increase in annual energy usage and GHG generation are about 6.0 million kwh per year and 890 mt per year, respectively.

Scenario E – Implement Maximum Benefit-Based TDS Objective and District Implements Indirect Potable Reuse in 2030

In this scenario the TDS antidegradation objective has been replaced by a maximum benefit objective creating assimilative capacity for the use of recycled water without treatment. The only TDS liability that accumulates after 2020 is associated with exceedances of the permitted TDS discharge limitation for the Railroad Canyon WRF. To mitigate its cumulative TDS liabilities in this scenario, the District implements an Indirect Potable Reuse project that involves injection of advanced treated recycled water into the Elsinore GMZ (assumed for this analysis to start in 2030). The TDS concentration in the desalted recycled water is projected to be about 100 mg/L. The District will increase its groundwater production annually by an amount equal to the annual amount of desalted recycled water injected into the basin and will reduce its take of imported water by the same amount.

Injecting recycled water with a TDS concentration of 100 mg/L starting in 2030 completely offsets the accumulated TDS liabilities within three years. The projected TDS liability at the end of 2050 is -95,000 tons (e.g. 95,000 tons more than is required to mitigate). The negative liability that occurs after 2033 demonstrates the potential for TDS concentration reductions in groundwater in the Elsinore GMZ. The groundwater modeling work reported in Attachment B of the Maximum Benefit Proposal package demonstrates that the TDS in both pumped groundwater and the basin as a whole improves after 2030 with the implementation of the Indirect Potable Reuse program.

The total annual cost to implement this scenario includes the avoided cost of importing water to meet future water demands (a negative cost or savings), the amortized capital cost of the treatment and related facilities, and the annual O&M cost. The annual cost is estimated to start at about $5.7 million in 2030 (startup of Indirect Potable Reuse operations), decrease every year thereafter, and reaches about -$9.0 million in 2050. The present value cost of this scenario is about -$3.6 million. The negative cost means that there will be a reduced overall cost to the District compared to implementing the IRP without Indirect Potable Reuse, thus justifying the projects significant capital costs.

The additional benefit of offsetting imported water with the Indirect Potable Reuse project is the significant reductions in energy usage and GHG emissions. The annual energy usage in Scenario E is the sum of the energy savings from not importing water plus the energy used to desalt recycled water and implement Indirect Potable Reuse. The change in energy use ranges from about -7.2 million kwh in 2030 to -19.2 million kwh in 2050 and totals about -333 million kwh by 2050. The change in GHG generation in Scenario E ranges from -150 mt in 2030 to about -400 mt in 2050 and totals about -6,800 mt by 2050.

Given that the Scenario A no project alternative is not a feasible regulatory solution, the cost savings and reductions in energy usage and GHG emission in Scenario E were also compared against Scenarios B, C and D, as shown in Table 8 below.

Table 8
Comparison of Maximum Benefit SNMP (Scenario E) Present Value Costs, Energy Usage, GHG (CO_2) Emissions, and Imported Water Use to Regulatory Compliance Scenarios B, C, and D – 2018 through 2050

	Change in "Costs" Relative to Scenario B	Change in "Costs" Relative to Scenario C	Change in "Costs" Relative to Scenario D
Present Value of Annual Cost[(a)] (PV $)	-$33 million	-$35.5 million	-$83 million
Energy Requirement[(b)] (kwh)	-361 million	-368 million	-515 million
GHG Emissions[(C)] (mt)	-14,800	-15,900	-33,800

Note:
(a) Scenario E generates a negative cost or saving to the District by reducing the District's dependence on imported water. This saving is increased when compared to the higher project costs in Scenario B, C, and D.
(b) Scenario E reduces the total energy requirement by reducing imported water demands in the District service area. This energy saving is increased when compared to the higher energy needs in Scenario B, C, and D.
(c) Scenario E reduces the total GHG emission by reducing the total energy requirement. This reduction in GHG emission is increased when compared to Scenario B, C, and D.

As shown in Table 8, implementing the Maximum Benefit SNMP has significant costs savings, as measured in dollars, energy usage, and GHG emissions—compared to the other management alternatives to address the District's regulatory compliance challenges.

The results of the economic considerations demonstrate that the proposed Basin Plan amendment to incorporate the maximum benefit objectives and implementation plan for the Elsinore GMZ is the most cost-effective strategy for improving water quality, maximizing water supply reliability, and adapting to climate change. This proposal also provides maximum benefit to the people of the State by reducing demand on water exports from environmentally sensitive Sacramento-San Joaquin Delta through increasing the use of local water supplies and reducing overall demand for SWP and CRA water—a statewide economic and environmental benefit.

CWC § 13241 (e) <u>The need for developing housing within the region</u> and (f) <u>The need to develop and use recycled water</u>
The City of Lake Elsinore and the County of Riverside have determined a need for housing in the Lake Elsinore area. The County and City have

adopted general and specific plans that show substantial increases in housing in the Lake Elsinore area as lands are converted to urban uses. All these plans have been approved and have certified environmental documents. The Kuell (SB221) and Costa (SB610) legislation require extensive documentation and demonstrations of water supply reliability prior to allowing new housing to occur.

Until recently, the District planned to meet the future increase in water demand associated with developing housing in the region primarily by increasing the use of imported water from the SWP and the CRA. However, in the face of climate change and the realities of imported water reliability, the District determined that a new water resources planning approach is required. The availability of imported water supplies has become less predictable due to climate change and persistent drought. The Colorado River Basin has experienced drought conditions since 2000, resulting in record-low water levels in Lake Mead. SWP water supplies from northern California continue to be affected by climatic, ecological, and regulatory constraints inherent of the environmentally sensitive Sacramento-San Joaquin Delta.

In response to these challenges, the District developed its IRP in 2017, which provides a roadmap to achieve water supply reliability through robust and flexible water resource management strategies to achieve the following foundational goals: establish new local water supplies, increase dry-year supply reliability, decrease dependence on imported water, reuse 100 percent of the District's recycled water supply, improve water quality, improve groundwater management, and promote water conservation. As discussed in Section 2, the cornerstone investment of the IRP is the Indirect Potable Reuse project, which is key to achieving water supply reliability in an area with increasing population and water demands.

Consistent with the recycled water and housing requirements in CWC § 13241, the proposed Basin Plan amendment to incorporate the maximum benefit SNMP for the Elsinore GMZ will increase water supply reliability and will expand recycled water reuse and conjunctive use to sustainably meet existing and anticipated increased in demands of the District's service area.

Antidegradation Policy

To be consistent with Resolution No. 68-16, the Santa Ana Water Board must demonstrate that the maximum benefit SNMP will satisfy antidegradation requirements. In 1990, the State Water Board adopted APU 90-004 to provide guidance to the Regional Boards for performing antidegradation analyses. APU 90-004 establishes when an antidegradation analysis is required, and how to determine the level of analysis required, and what components should be included as part of the antidegradation

analysis and subsequent antidegradation findings by the Regional Boards. In general, the antidegradation analysis must establish the following:

a. Will the proposed discharge activity lower existing water quality?

b. Will the proposed discharge activity result in water quality that exceeds or threatens to exceed established water quality objectives in the applicable Basin Plan?

c. If the proposed discharge activity will lower existing water quality, or will result in water quality that exceeds or threatens to exceed water quality objectives, is such degradation permissible when balanced against the benefit to the people of the state?

The technical work performed in the maximum benefit SNMP proposal package (WEI, 2020) satisfies the antidegradation analysis requirements and demonstrates that the maximum benefit objectives together with the implementation plan provide maximum benefit to the people of the State as follows:

- As demonstrated in Table 3 in Section 3, the projected TDS concentrations of complying with the antidegradation objective of 480 mg/L through other recycled water compliance plans (Scenario A/F, B/D, and C) are indistinguishable and does not provide long-term benefit to the Elsinore GMZ.

- Based on the projection for Scenario E, implementation of the Indirect Potable Reuse project in 2030 decreases the TDS concentration of the Elsinore GMZ from 523 mg/L to 502 mg/L over the projection period of 2030 to 2050, a significant water quality improvement.

- As demonstrated in Table 4 in Section 3, implementation of the Indirect Potable Reuse project in 2030 (Scenario E) decreases nitrate concentration from 0.97 mg/L to 0.92 mg/L over the projection period of 2030 to 2050 while implementations of other salt management alternatives (Scenario A/F, B/D, and C) increase nitrate concentration over this period.

- The Indirect Potable Reuse project is the most beneficial project for mitigating the District's cumulative TDS liabilities: Attachment C of the maximum benefit SNMP proposal package (WEI, 2020) demonstrates the mitigation rate for the District's accumulated TDS liabilities for each scenario. At a size of about 3,000 afy, the Indirect Potable Reuse project mitigates all of the District's TDS liability accumulated from 2004 through 2030 within three years of implementation.

- Implementation of the Indirect Potable Reuse project will increase local water supply reliability in the District's service area, which in turn will reduce demand on imported SWP water. Reducing exports from the SWP benefits the environment in two ways. First, it reduces the amount of water that is exported from the environmentally sensitive Sacramento-San Joaquin Delta, and second,

it reduces the GHGs associated with transporting water to the District's service area.

- The commitments achieve the Santa Ana Water Board's objective of protecting the beneficial use of groundwater by requiring that the District will sustainably produce groundwater from the Elsinore GMZ, consistent with the newly enacted Sustainable Groundwater Management Act, and will not reduce its groundwater pumping to a volume that is less than the sustainable yield as TDS and/or nitrate concentrations in the Elsinore GMZ increase over time. The District will not abandon the use of Elsinore GMZ groundwater due to the cost of TDS and nitrate treatment.
- The District will continue to implement best practicable treatment or control strategies to treat wastewater generated in its service area.
- The proposal is consistent with the State Board's recycled water policy which encourages the maximum reuse of recycled water supplies in a manner that does not result in unmitigated groundwater degradation by potentially substituting 6,750 afy of imported water with the injection of advanced treated recycled water supplies for Indirect Potable Reuse.

5. California Environmental Quality Act

The Secretary of Resources has certified the Basin Planning process as functionally equivalent to the preparation of an Environmental Impact Report (EIR) or a Negative Declaration pursuant to the California Environmental Quality Act (CEQA). However, in lieu of these documents, the Regional Board is required to prepare the following: the Basin Plan amendment; an Environmental Checklist that identifies potentially significant adverse environmental impacts of the Basin Plan amendment; and, a staff report that describes the proposed amendment, reasonable alternatives, and mitigation measures to minimize any significant adverse environmental impacts identified in the Checklist. The Basin Plan amendment, Environmental Checklist (Substitute Environmental Document [SED]), and staff report together are functionally equivalent to an EIR or Negative Declaration.

The proposed Basin Plan amendment is shown in the draft Resolution No. R8- 2021-0044 which is provided as Enclosure 1 to this Staff Report. The SED, included as Enclosure 2 to this Staff Report, concluded that there could be no potential adverse environmental impacts associated with the Basin Pan amendment to incorporate the maximum benefit SNMP for the Elsinore GMZ. Therefore, no mitigation measures are required.

<u>Alternative Analysis and Analysis of Reasonably Foreseeable Methods of Compliance</u>

Pursuant to the State Water Board's regulations for implementing CEQA in basin planning actions (Certified Regulatory Program) in California Code of Regulations, title 23, section 3777, this environmental review must include an analysis of reasonable

alternatives to the proposed action. The intent of the alternatives analysis is to consider whether there are reasonable alternatives that would fulfill the underlying purpose of the Proposed Action which involves an amendment to the Basin Plan to also achieve and protect water quality standards, but that would minimize or eliminate the potential adverse environmental effects of the Proposed Action.

As described in *Section G. Environmental Checklist* of the SED, there are no reasonably foreseeable significant adverse environmental impacts associated with the proposed action to amend the Basin Plan to incorporate the maximum benefit SNMP for the Elsinore GMZ (maximum benefit objectives and commitments). As there are no reasonably foreseeable significant environmental impacts which could be reduced, the only alternative addressed is the No Project Alternative (with three options).

Under the No Project Alternative, no action would be taken to amend the Basin Plan to incorporate the maximum benefit SNMP for the Elsinore GMZ and the current Basin Plan antidegradation TDS and nitrate objectives would apply to the Elsinore GMZ. As described in *Section D. Project Description* of the SED, three alternatives with management plans that comply with the existing antidegradation objectives were analyzed and compared to the proposed maximum benefit SNMP. These three alternatives are considered variations of the No Project Alternatives where each alternative applies a different management strategy to comply with the antidegradation objectives including:

> *No Project Option 1 – The District Desalts Recycled Water to Comply with the TDS Antidegradation Objective* (referred to as Scenario B in Section 3)
>
> *No Project Option 2 – The District Desalts Groundwater to Offset its TDS Liabilities* (referred to as Scenario C in Section 3).
>
> *No Project Option 3 – The District Replaces Recycled Water with Imported Water* to *Comply with Antidegradation Objective* (referred to as Scenario D in Section 3).

To evaluate and compare the proposed Basin Plan amendment with these three “No Project” alternatives, the water quality and cost outcomes were analyzed. These demonstrations were documented in detail in Attachments B and C in the District’s maximum benefit SNMP proposal package (WEI, 2020) and were summarized in prior sections of this Staff Report. As shown previously in Table 3, in 2030, there is no difference in the TDS outcomes across all four alternatives (the proposed maximum benefit SNMP and No Project Alternatives). However, by 2050, the projected volume-weighted TDS concentrations of the Elsinore GMZ, of the District’s produced groundwater supply, and the District’s total water supply for the three No Project Alternatives are greater than the TDS concentration for the proposed maximum benefit SNMP.

And, as shown previously in Table 8, and shown again below in Table 9 using the No Project descriptors shown above, the Maximum Benefit SNMP results in reduced costs, reduced imported water reduced demands, reduced energy usage, and reduced GHG emissions compared to the No Project Options (B, C, and D).

Table 9
Comparison of Maximum Benefit SNMP Present Value Costs, Energy Usage, GHG (CO_2) Emissions, and Imported Water Use to No Project Options

	Change in "Costs" Relative to No Project Option 1	Change in "Costs" Relative to No Project Option 2	Change in "Costs" Relative to No Project Option 3
Present Value of Annual Cost[(a)] (PV $)	-$33 million	-$35.5 million	-$83 million
Energy Requirement[(b)] (kwh)	-361 million	-368 million	-515 million
GHG Emissions[(C)] (mt)	-14,800	-15,900	-33,800
Note: This is the same data presented in Table 8			

Complying with the antidegradation objectives in the three No Project Alternatives would result in substantial increased new costs, increased energy usage, increased GHG emissions, and increased demand for imported water. And they do not provide measurable water quality benefits to the Elsinore GMZ, the District's produced groundwater supply, or recharge to the GMZ compared to the cost incurred to implement the compliance solutions. For these reasons, the adoption of the proposed maximum benefit SNMP is the most reasonable alternative that ensures beneficial uses and groundwater quality are protected in the Elsinore GMZ.

Further, pursuant to CEQA Section 15187 (and the State Water Board's Certified Regulatory Program regulations (California Code of Regulations, title 23, sections 3777(b)(4)(A) and (B)), this environmental review must also identify reasonably foreseeable methods of compliance with the proposed project and analyze any reasonably foreseeable significant adverse environmental impacts associated with those alternative methods of compliance. As discussed and analyzed in the SED, the reasonably foreseeable methods of compliance with the Basin Plan Amendment are set forth in the maximum benefit commitments to be incorporated into the Implementation chapter of the Basin Plan. The SED concludes that the reasonably foreseeable methods of compliance could not result in any reasonably foreseeable significant adverse environmental impacts.

6. Scientific Peer Review

Pursuant to California Health and Safety Code section 57004, all proposed rules that have a scientific basis must be submitted for external scientific peer review. The staff report, SED, and the maximum benefit SNMP proposal package (WEI, 2020) have been reviewed by scientific peer reviewers selected by the State Board Staff. Comments from the peer reviewers have been received and responded. Enclosure 3 contains the peer review comments and the staff responses to the comments.

7. Staff Recommendation

Board staff recommends adoption of Resolution R8-2021-0044 (Enclosure 1), to certify the Substitute Environmental Document, and adopt the Basin Plan amendment to incorporate the changes to the Basin Plan as shown in the Attachments to Resolution No. R8- 2021-0044, including:

- Amend Table 4-1 of the Basin Plan to incorporate the maximum benefit TDS (530 mg/L) and nitrate (5 mg/L) objectives for the Elsinore GMZ.
- Incorporate the maximum benefit commitments for the Elsinore GMZ into Chapter 5 – Implementation of the Basin Plan.

Enclosure:

Enclosure 1: Tentative Resolution No. R8-2017-0036, including the proposed Basin Plan Amendment

Enclosure 2: California Environmental Quality Act (CEQA) Substitute Environmental Document (SED)

Enclosure 3: Scientific Peer Review Comments and Response to Comments

8. References

California Regional Water Quality Control Board, Santa Ana Region. (2004). *Resolution R8-2004-0001 Amending the Water Quality Control Plan for the Santa Ana River Basin to Incorporate an Updated Total Dissolved Solids (TDS) and Nitrogen Management Plan for the Santa Ana Region.* January 2004.

Water Systems Consulting (WSC). (2020). *Recomputation of Ambient Water Quality for the Period 1999 to 2018*. Prepared for the Santa Ana Watershed Project Authority, June 2020.

Wildermuth Environmental, Inc. (2020). *Elsinore Valley Municipal Water District Proposal to Amend the Basin Plan to Incorporate a Maximum-Benefit-Based Salt and Nutrient Management Plan for the Elsinore Groundwater Management Zone*. Prepared for the Elsinore Valley Municipal Water District, January 2020.

Wildermuth Environmental, Inc. (2002). Technical Memorandum for the TIN/TDS Study – Phase 2B of the Santa Ana Watershed Wasteload Allocation Investigation. Prepared for the TIN/TDS Task Force, October 2002.

Wildermuth Environmental, Inc. (2000). *Development of Groundwater Management Zones – Estimation of Historical and Current TDS and Nitrogen Concentrations in Groundwater. TIN/TDS Study – Phase 2A Final Technical Memorandum.* Prepared for the TIN/TDS Task Force, July 2000.

Figure 1

This map shows the Elsinore GMZ within the Santa Ana Watershed which includes the Santa Ana River and its tributaries. The Santa Ana River is approximately 700 miles long and flows from northeast to southwest through portions of the San Bernardino, Riverside, and Orange Counties and out to the Pacific Ocean. The Elsinore GMZ is located in the Riverside County in the southern portion of the Santa Ana Watershed. This map also shows the TDS and nitrate antidegradation objectives for the Elsinore GMZ which are 480 and 1.0 milligrams per liter (mgl), respectively.

Figure 2

This map shows the boundaries of the District's service area and the Elsinore GMZ located in Southwest Riverside County. Majority of the Elsinore GMZ and Elsinore Valley Watershed fall within the boundary of the District's service area. This map displays the Temescal Wash which flows from southeast to northwest in Southwest Riverside County. This map also shows the District's three WRFs (Railroad Canyon, Horsethief, and Regional) that treat wastewater generated in its service area, three recycled distribution systems (Railroad Canyon, Wildomar, and Horsethief) that provide recycled water use, and the location of the Regional WRF recycled water discharge to Temescal Wash which is located east of the Elsinore GMZ.

California Regional Water Quality Control Board
Santa Ana Region

Resolution R8-2021-0044

Resolution Amending the Water Quality Control Plan for the Santa Ana River Basin to Establish Maximum Benefit TDS and Nitrate Groundwater Quality Objectives and a Salt and Nutrient Management Plan for the Elsinore Groundwater Management Zone (GMZ)

Whereas, the California Regional Water Quality Control Board, Santa Ana Region (hereafter Santa Ana Water Board), finds that:

1. An updated Water Quality Control Plan for the Santa Ana River Basin (Basin Plan) was adopted by the Santa Ana Regional Water Quality Control Board (Santa Ana Water Board) on March 11, 1994 and approved by the State Water Resources Control Board (State Board) and Office of Administrative Law (OAL) on July 21, 1994 and January 24, 1995, respectively.

2. The Basin Plan identifies groundwater and surface water bodies within the Santa Ana Region (Region), establishes water quality objectives for these water bodies, prescribes implementation plans to ensure that the objectives are achieved, and establishes monitoring and surveillance programs.

3. Subsequent amendments have been made to the Basin Plan. The 2004 Basin Plan amendment revised groundwater sub-basin boundaries (groundwater management zones or GMZs) and total dissolved solids (TDS) and nitrate-as-nitrogen (nitrate) objectives for the GMZs. The 2004 Basin Plan amendment was adopted by the Santa Ana Water Board on January 22, 2004, and approved by the State Board and OAL on September 30 and December 23 of 2004, respectively. A water quality monitoring program to implement the revised water quality objectives was approved by the Santa Ana Water Board on April 15, 2005.

4. The TDS and nitrate antidegradation objectives for the GMZs defined in the 2004 Basin Plan amendment are statistically derived values representative of the volume-weighted groundwater TDS and nitrate concentrations over the historical period of 1954 through 1973.

5. During the technical work to support the 2004 Basin Plan amendment, some stakeholders identified concerns that the proposed TDS antidegradation objectives would limit or prevent the use of recycled water within GMZs where the current TDS concentration is equal to or greater than the historical TDS concentration. In these GMZs, there would be no assimilative capacity and

recycled water reuse with TDS concentrations over the TDS objective will require costly mitigation plans.

6. The State Board's Antidegradation Policy (Resolution No. 68-16) allows the Santa Ana Water Board some flexibility in regulating waste discharges if it can be demonstrated that allowing some degradation of water quality is to the maximum benefit of the people of California and that beneficial uses can reasonably be protected.

7. The California Water Code (CWC) section 13241 requires the Santa Ana Water Board to consider other requirements when setting water quality objectives such as the characteristics of the hydrographic unit under consideration, water quality conditions that could reasonably be achieved under coordinated control of all factors which affect water quality, economic considerations, housing development need, the needs to develop recycled water reuse.

8. Recognizing that recycled water reuse was a critical component of achieving a long-term reliable water supply in the rapidly developing watershed and would ultimately improve overall water supply reliability in California, several agencies proposed, and the Santa Ana Water Board approved, alternative "maximum benefit" TDS and nitrate objectives that were numerically higher than the antidegradation objectives and the (then) current ambient concentrations. The establishment of the maximum benefit objectives created assimilative capacity for degradation and allowed the Santa Ana Water Board to permit recycled water reuse without requiring treatment to reduce TDS and nitrate concentrations prior to reuse. In addition, each party developed a schedule of time-certain, concentration-based and/or event-based actions, known as maximum benefit commitments, to ensure the long-term protection of the beneficial uses of each GMZ and downstream GMZs, with the understanding that failure to comply with the commitments would result in the enforcement of the more stringent antidegradation objectives for the GMZ. Together the maximum benefit objectives and commitments comprise a maximum benefit salt and nutrient management plan (SNMP).

9. The GMZs for which maximum benefit SNMPs were adopted in the 2004 Basin Plan amendment include: Beaumont, Chino-North, Cucamonga, San Timoteo, and Yucaipa. In 2010, the Santa Ana Water Board approved maximum benefit objectives for the San Jacinto Upper Pressure GMZ.

10. In 2012, the ambient TDS concentration for the Elsinore GMZ was computed to be 490 mg/L, which is greater than the antidegradation objective of 480 mg/L. Following the adoption of the objectives in the 2004 Basin Plan amendment, the ambient nitrate concentration for the Elsinore GMZ has consistently exceeded

the antidegradation objectives. This means that there is no assimilative capacity for TDS and nitrate loading in excess of the antidegradation objectives in the Elsinore GMZ.

11. The Elsinore Valley Municipal Water District (District) is the sole municipal agency overlying the Elsinore GMZ. Two of the District's recycled water service areas are tributary to and overlie the Elsinore GMZ: Railroad Canyon and Wildomar service areas. The Railroad Canyon Water Reclamation Facility produces recycled water at TDS concentrations that exceed the permitted limit of 700 mg/L. And, the recycled water served in Railroad Canyon and Wildomar service areas exceeds the TDS antidegradation objective of 480 mg/L. For these reasons, the Santa Ana Water Board required the District to prepare a salt offset plan to mitigate salt loading that exceeds these regulatory limits.

12. The District has proposed amending the Basin Plan to incorporate a maximum benefit SNMP for the Elsinore GMZ as a mitigation measure to offset its historical and ongoing salt loading in the Elsinore GMZ. Consistent with prior maximum benefit SNMPs adopted by the Santa Ana Water Board, the District prepared a proposal package which includes the detailed technical analysis, regulatory rationale pursuant to the Antidegradation Policy and CWC 13241, and economic considerations in support of the proposal.

13. Based on the result of work performed and presented in the proposal package, the proposed maximum benefit TDS and nitrate objectives for the Elsinore GMZ are 530 and 5 mg/L, respectively.

14. The District also proposed maximum benefit commitments and the associated time-certain compliance schedules to protect beneficial uses of the Elsinore GMZ and downstream GMZs. The maximum benefit commitments will be incorporated into Chapter 5: Implementation Plan.

15. Amending the Basin Plan to establish the maximum benefit SNMP for the Elsinore GMZ is not an approval of any specific salt offset projects that may be proposed by Elsinore Valley MWD. Approval of any such projects must follow standard Santa Ana Water Board procedures and requirements.

16. The Santa Ana Water Board prepared and distributed the Notice of Filing, Notice of Public Hearing, draft Basin Plan amendment, written report (Staff Report), including the Substitute Environmental Document (SED), regarding adoption of the proposed Basin Plan amendment, to interested persons and public agencies in accordance with the applicable state and federal environmental regulations (California Code of Regulations [CCR] title 23, sections 3720 et seq. and Title 40 of the Code of Federal Regulations [40 CFR] Parts 25 and 131 et seq.). The

Santa Ana Water Board complied with the applicable procedural requirements and provided public participation opportunities to afford the public with reasonable opportunity to participate in consideration of the Basin Plan amendment.

17. The Santa Ana Water Board has considered factors in adopting maximum benefit objectives for the Elsinore GMZ consistent with CWC section 13241. Examinations of these factors can be found in Section 4 of the Staff Report.

18. The Basin Plan amendment complies with Water Code section 106.3, in which it is the policy of the state of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking and sanitary purposes. The Basin Plan Amendment does not lessen water quality protections in any portion of the basin that is currently serving, or is expected to serve, as a domestic or municipal water source.

19. The Santa Ana Water Board has prepared a Substitute Environmental Document (SED), the Environmental Checklist and Analysis, for the proposed Basin Plan amendment. The analysis conducted in the SED demonstrates that there are no potential adverse environmental impacts associated with the proposed action to amend the Basin Plan to incorporate the maximum benefit water quality objectives and SNMP for the Elsinore GMZ. The SED can be found in Enclosure 2 to the Staff Report.

20. The Santa Ana Water Board submitted formal notifications for Tribal consultations to four Native American Tribes that are culturally affiliated with the project area, pursuant to Assembly Bill 52 (AB 52) on June 4, 2020. These four Tribes are Pechanga Band of Mission Indians, Rincon Band of Luiseño Indians, Soboba Band of Luiseño Indians, and Aqua Caliente Band of Cahuilla Indians. No Tribal comments were submitted to the Santa Ana Water Board within the 30-day consultation period. The AB 52 consultation was concluded on July 3, 2020.

21. Pursuant to the State Water Board's regulations implementing the California Environmental Quality Act (CEQA) in CCR title 23, section 3777(a)), no analysis of reasonable alternatives to the proposed action was required since the SED concludes that the project could not result in any reasonably foreseeable adverse environmental impacts (CCR, title 23, sec. 3777(e).). However, the SED did evaluate the no project alternative.

22. Consistent with CEQA Section 15187, the SED also includes identification of reasonably foreseeable methods of compliance and an environmental analysis of any reasonably foreseeable significant environmental impacts associated with the methods. The SED concludes that implementation of the maximum benefit

commitments in the SNMP could not result in reasonably foreseeable significant adverse environmental impacts (CCR, title 23, sec. 3777(f).) The regulatory compliance alternatives analyzed in the SED assumed complying with the antidegradation objective by: (1) desalting recycled water prior to distribution to customers for reuse; (2) desalting groundwater to offset recycled water reuse with TDS concentration over the antidegradation objectives; and (3) replacing recycled water use with imported water. It was concluded in the maximum benefit SNMP proposal package that complying with the antidegradation objectives through these alternatives would not be cost-effective and would not reduce TDS concentration in the Elsinore GMZ.

23. A CEQA scoping meeting was held on June 24, 2020 to provide interested parties the opportunity to comment on the appropriate scope and content of the SED that was prepared for the proposed Basin Plan amendment. Any comments received in the response to the scoping meeting were considered in preparing the subsequent environmental analysis.

24. Based on the environmental analyses described in the SED, the Santa Ana Water Board finds that the proposed Basin Plan amendment could not result in any foreseeable significant adverse environmental impacts; therefore, no mitigation measures are proposed or analyzed.

25. The Final Substitute Environmental Document consists of the Staff Report (including documents referenced therein), the comments and responses to comments on the Staff Report and the Basin Plan amendment, the environmental checklist and this resolution.

26. Pursuant to California Health and Safety Code section 57004, the maximum benefit SNMP proposal package and the Staff Report were submitted for external scientific peer review in 2021. The reviewers found that the proposed regulatory action to adopt the proposed maximum benefit objectives and the SNMP is based on scientifically defensible information. Comments from peer reviewers were addressed in August 2021.

27. The Santa Ana Water Board notified all known interested persons by email distribution list and by publication in newspapers within the affected counties pursuant to CWC section 13244 and Government Code section 6061, of its intent to hold a public hearing on December 10, 2021.

28. On December 10, 2021, the Santa Ana Water Board held a public hearing for, provided interested parties and the public an opportunity to comment on, and carefully considered all comment received and evidence in the administrative record pertaining to, this Resolution and Basin Plan amendment.

29. The Basin Plan amendment must be submitted for review and approval by the State Water Board and by the OAL. Because the proposed Basin Plan amendment makes no changes to water quality standards for surface waters or effluent limits in any National Pollutant Discharge Elimination System (NPDES) permit, U.S. Environmental Protection Agency approval is not required. The Basin Plan amendment will become effective upon OAL approval.

NOW, THEREFORE, BE IT RESOLVED THAT:

1. The Santa Ana Water Board has reviewed and considered the record for this matter, including the information contained in the SED, all written comments and responses to comments, and all oral testimony and responses provided at the public hearing held on December 10, 2021.

2. The Santa Ana Water Board hereby approves and certifies the SED.

3. The Santa Ana Water Board hereby adopts the Basin Plan amendment delineated in Attachment A (Redline) and Attachment B (clean version) to this Resolution, which incorporate maximum benefit TDS and nitrate objectives and commitments for the Elsinore GMZ.

4. The Executive Officer is directed to forward copies of the Basin Plan amendment, and the related Administrative Record, to the State Water Board, in accordance with the requirements in CWC section 13245.

5. The Santa Ana Water Board requests that the State Water Board review and approve the Basin Plan amendment in accordance with the requirements of CWC sections 13245 and 13246 and, thereafter, forward the amendments to OAL for approval.

6. If, during its approval process, the State Water Board or OAL determine that minor, non-substantive corrections to the language of the amendments are needed for clarity or for consistency, the Executive Officer may make such changes and shall inform the Santa Ana Water Board forthwith.

7. The Executive Officer is directed, at the time of filing and posting the Notice of Decision, to take steps to promptly ensure payment of application fee to the California Department of Fish and Wildlife for its review of the SED for this Basin Plan amendment or to file a Certificate of Fee Exemption, whichever is applicable.

I, Jayne Joy, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an order adopted by the California Regional Water Quality Control Board, Santa Ana Region, on December 10, 2021.

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JAYNE JOY, P.E.
Executive Officer

Attachment A to Resolution No. R8-2021-0044

(Proposed Basin Plan amendment changes are shown as redline for additions)

***Chapter 4. Water Quality Objectives* -- Table 4-1 WATER QUALITY OBJECTIVES – Continued (PAGES 4-57 and 4-58)**

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GROUNDWATER MANAGEMENT ZONES	WATER QUALITY OBJECTIVES (mg/l)						Hydrologic Unit	
	Total Dissolved Solids	Hardness	Sodium	Chloride	Nitrate as Nitrogen	Sulfate	Primary	Secondary
UPPER SANTA ANA RIVER BASIN								
Cucamonga “antidegradation”++	210	---	---	---	2.4	---	801.24	801.21
Lytle	260	---	---	---	1.5	---	801.41	801.42
Rialto	230	---	---	---	2.0	---	801.41	801.42
San Timoteo “maximum benefit”++	400	---	---	---	5.0	---	801.62	
San Timoteo “antidegradation”++	300	---	---		2.7	---	801.62	
Yucaipa “maximum benefit”++	370	---	---	---	5.0	---	801.61	801.55, 801.54, 801.56, 801.63, 801.65, 801.66 801.67
Yucaipa “antidegradation”++	320	---	---	---	4.2	---	801.61	801.55, 801.54, 801.56, 801.63, 801.65, 801.66 801.67
MIDDLE SANTA ANA RIVER BASIN								
Arlington	980	---	---	---	10	---	801.26	
Bedford**	---	---	---	---	---	---	801.32	
Coldwater	380	---	---	---	1.5	---	801.31	
Elsinore “maximum benefit”++	530	---	---	---	5.0	---	802.31	
Elsinore “antidegradation”++	480	---	---	---	1.0	---	802.31	
Lee Lake**	---	---	---	---	---	---	801.34	

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++ "Maximum benefit" objectives apply unless Regional Board determines that lowering of water quality is not of maximum benefit to the people of the state; in that case, "antidegradation" objectives apply (for Chino North, antidegradation objectives for Chino 1, 2, 3 would apply if maximum benefit is not demonstrated). (see discussion in Chapter 5).

** Numeric objectives not established; narrative objectives apply.

Section X. Salt Management - Elsinore Groundwater Management Zone – Elsinore Valley Municipal Water District

As shown in Chapter 4, both "antidegradation" and "maximum benefit" objectives for TDS and nitrate-nitrogen are specified in this Basin Plan for the Elsinore GMZ. The application of the "maximum benefit" objectives relies on the implementation of the maximum benefit commitments in Table X by the Elsinore Valley Municipal Water District (EVMWD). Table X identifies the projects and requirements that must be implemented to demonstrate that water quality consistent with the maximum benefit to the people of the State will be maintained. An implementation schedule is also provided in Table X.

Table X
Maximum Benefit Commitments and Implementation Schedule

Commitment	Milestones	Compliance Schedule
1. Beneficial Use Protection	a. Triennial report of historical, current and future water supply and recycled water quality; the ten-year projection will include estimations of TDS and nitrate concentrations of each District water supply source and a volume-weighted projection of all sources.	a. Initial report due by August 15, 2021, subsequent reports due every three years by August 15th
	b. If the need for treatment to meet TDS and nitrate drinking water standards is identified in the ten-year projection, the District will prepare a proposed schedule to plan, design and construct the necessary treatment facilities (treatment plan)	b. A treatment plan will be submitted to the Executive Officer for review and approval within one year of publishing a finding of the need for treatment within the ten-year projection
	c. Implement treatment plan	c. Upon approval of plan and schedule by Executive Officer
	d. Reporting of treatment plan implementation status	d. May 1st (as part of Commitment 7)
	e. Report of pumping and sustainable yield	e. May 1st (as part of Commitment 7)
2. Prioritization of Recycled Water Reuse from Regional WRF to Comply with LECWA Before Initiating IPR Project.	Status report of latest recycled water planning projections for the Regional WRF, its current and projected deliveries to Lake Elsinore, and an estimate of when surplus recycled water supply will be available to initiate the indirect potable reuse program	May 1st (as part of Commitment 7)
3. Salt Mitigation Accounting	Report of monthly, annual and cumulative salt liabilities and offsets	May 1st (as part of Commitment 7)

4. Integrated Resources Plan Implementation	Status report of Integrated Resources Plan implementation	May 1st (as part of Commitment 7)
5. Salt Offset Project Plan and Implementation	a. Complete engineering design for the expansion of the Regional WRF to 12 mgd, including MBR system required to operate IPR project	a. December 31, 2020 - Completed
	b. Complete construction of Regional WRF expansion to 12 mgd, including MBR system	b. December 31, 2025
	c. Complete research studies on potential for arsenic leaching	c. December 31, 2026
	d. When the total recycled water production at the Regional WRF reaches 8.5 mgd, start preliminary engineering and related investigations to provide the information necessary to implement the IPR project or alternative equivalent salt offset projects; and prepare a plan and schedule to construct the project by the time the Regional WRF reaches 10 mgd	d. Start study when Regional WRF reaches 8.5 mgd of recycled water production Submit engineering study and project plan and schedule within 24 months of when Regional WRF reaches 8.5 mgd of recycled water production
	e. Implement the salt offset project plan	e. Upon approval of the project plan and schedule by the Executive Officer
	f. Once the salt offset project plan implementation begins, prepare progress reports to the Regional Board until project startup commences	f. Reporting commences upon Executive Officer approval of the project plan and schedule
	g. Complete construction and commence operations of IPR or other salt offset	g. When Regional WRP discharge reaches 10 mgd
	h. Once the salt offset project facilities are operational, report the cumulative amount of salt removed by the salt offset project, the balance of its salt mitigation obligation and a projection of the year in which the salt liability will be completely mitigated	h. May 1st (as part of Commitment 7)
6. Monitoring and Analysis	a. Prepare a monitoring and analysis program work plan that is consistent with the State Board's 2019 Recycled Water Policy	a. Within 90 days of OAL adoption of the Maximum Benefit Salinity Management Plan
	b. Implement monitoring program work plan	b. Within 60 days of approval of plan by Executive Officer
	c. Periodic update of monitoring plan	c. As requested by the Executive Officer

7. Reporting	Annual report of compliance with the Maximum Benefit Commitments	First report completed by May 1st following OAL adoption of the Maximum Benefit Salinity Management Plan, and every May 1st each year thereafter

Description of Elsinore Valley Municipal Water District Commitments

1. **Beneficial Use Protection.** The District will ensure that there will be no impairment of beneficial uses of the Elsinore GMZ or downstream GMZs. To accomplish this, the District will sustainably produce groundwater from the Elsinore GMZ, consistent with the newly enacted Sustainable Groundwater Management Act, and will not reduce its groundwater pumping to a volume that is less than the sustainable yield as TDS and/or nitrate concentrations in the Elsinore GMZ increase over time. The District will not abandon the use of Elsinore GMZ groundwater due to the cost of TDS and nitrate treatment. The District will accomplish this by constructing treatment facilities, as necessary, to treat groundwater to ensure that the TDS and nitrate concentrations in the water served to its customers meets drinking water standards. This will be done as follows:

    a. Every three years, the District will prepare a triennial report for the Regional Board that describes its historical, current, and projected water supply and wastewater discharge operations and quality. The objectives of the report are to: demonstrate the nexus between the District's water supply and recycled water quality, characterize water and recycled water supply and quality trends over time, and prepare a ten-year projection of the TDS and nitrate concentrations of each District water supply source and a volume-weighted projection of all sources. The water supply quality projections will be based on monitoring data or groundwater model projections at the discretion of the District. Each report will identify if there is a projected need for new groundwater treatment in the ten-year projection period. The first triennial report will be due by August 15, 2021 and every three years thereafter by August 15th, unless relieved of this commitment by the Executive Officer.

    b. If the need for treatment to meet TDS and nitrate drinking water standards is identified in the ten-year projection, the District will prepare a proposed schedule to plan, design and construct the necessary treatment facilities (treatment plan). The treatment plan will be submitted to the Executive Officer for review and approval within one year of publishing the finding in the triennial report.

    c. When the treatment plan is approved by the Executive Officer, the District will begin its implementation pursuant to the schedule in the approved treatment plan.

    d. The District will prepare an annual progress report that describes the activities of the prior year to implement the treatment plan. Once triggered, the reporting done pursuant to this commitment will be included in the annual maximum benefit report described in Commitment 7 below.

e. Each year, as part of the annual report of the maximum benefit salinity management plan (Commitment 7 below), the District will provide the Regional Board with (1) data on its historical, current and planned pumping from the Elsinore GMZ and (2) a comparison of average pumping to the most current estimation of the sustainable yield of the basin, and (3) to the extent that the current or planned average pumping is less than the sustainable yield of the Basin, the District will provide detailed information as to why the beneficial use of the Basin is not being maximized and will provide a schedule for resuming an average pumping level that is consistent with the sustainable yield.

2. **Prioritization of Recycled Water Reuse from Regional WRF to Comply with LECWA before Initiating Indirect Potable Reuse Project.** The District proposes to use its planned indirect potable reuse (IPR) project to inject advanced-treated recycled water from the Regional WRF into the Elsinore GMZ to offset its legacy and ongoing salt liabilities. The Regional WRF currently produces about 6.0 mgd: 0.5 mgd of which is discharged to Temescal Wash to maintain riparian habitat, and 5.5 mgd is discharged to Lake Elsinore to help maintain surface water elevation pursuant to the District's agreement with the City of Lake Elsinore under the Lake Elsinore Comprehensive Water Management Agreement or LECWA. The target lake water level pursuant to the LECWA is 1240 ft. Recent studies indicate that the long-term average discharge required to maintain the Lake at or above 1240 feet is about 7.5 mgd. A minimum of 2.5 mgd of effluent is required to operate the IPR project. Thus, to meet the commitment to the LECWA, the IPR project cannot be operated until the total effluent from the Regional WRF reaches at least to 10 mgd. Current planning projections for growth in the District's service area indicate that there should be 10 mgd of recycled water produced at the Regional WRF to operate the IPR project starting in 2035. As the District service area grows, the new recycled water supply will first be needed to maintain surface water levels in Lake Elsinore to comply with the LECWA. The recycled water produced in excess of that required for compliance with the LECWA will be prioritized for the IPR project.

   a. Each year, as part of the annual report of the maximum benefit salinity management plan (Commitment 7), the District will provide the Regional Board with the latest planning information available with regards to recycled water production projections for the Regional WRF, its current and projected deliveries to Lake Elsinore, and an estimate of when surplus recycled water supply will be available to initiate the indirect potable reuse program.

3. **Salt Mitigation Accounting**. The District will track its monthly, annual, and cumulative salt mitigation requirements and report on them annually to the Regional Board as part of its annual reporting commitment (Commitment 7). The salt liability will be accounted as follows:

   a. The District will prepare an accounting of the TDS mitigation requirements that resulted from exceedances of the RRC discharge limitation from January 1, 2004[1]

[1] This is the effective date of the Basin Plan amendment that incorporated the current antidegradation objectives for the Elsinore GMZ.

through July 1, 2014.[2] The mitigation requirement is calculated based on the mass of TDS in excess of the RRC permit limit of 700 mgl for the entire volume of recycled water produced by the plant over this period.

b. The District will prepare an accounting of the TDS mitigation requirements that resulted from the reuse of all sources of recycled water used in the watershed tributary to the Elsinore GMZ that were in excess of the antidegradation objective from July 1, 2014[3] through [*date of OAL adoption of Maximum Benefit objectives*]. The mitigation requirement is calculated based on the mass of TDS in excess of the antidegradation objective of 480 mgl.

c. The District will prepare an accounting of the TDS mitigation requirements for the balance of the recycled water produced at the RRC WRF that was not used in the watershed tributary to the Elsinore GMZ from July 1, 2014 through [*date of OAL adoption of Maximum Benefit objectives*]. The mitigation requirement is calculated based on the mass of TDS in excess of the RRC permit limit of 700 mgl.

d. As of [*date of OAL adoption of Maximum Benefit objectives*], the District will prepare and maintain an ongoing accounting of the continued salt mitigation requirements that accumulate from ongoing exceedances of the RRC discharge limitation and report them to the Regional Board. The mitigation requirement is calculated based on the mass of TDS in excess of 700 mgl for the entire volume of recycled water produced by the plant.

e. No offsets will be required for the reuse of imported recycled water sources as of [*date of OAL adoption of Maximum Benefit objectives*] so long as assimilative capacity exists in the Elsinore GMZ. Once assimilative capacity is used up (e.g. when the ambient TDS concentration equals or exceeds 530 mgl), the mitigation requirement is calculated based on the mass of TDS in excess of the maximum benefit objective of 530 mgl.

f. Once a Regional Board-approved salt mitigation project is initiated (indirect potable reuse or other), the District will prepare and maintain an ongoing accounting of the mitigation credits attributable to the project and the cumulative remaining offset obligation.

4. **Integrated Resources Plan Implementation.** The District will aggressively pursue the suite of nine water supply projects identified in its IRP and apprise the Regional Board of its progress in the annual maximum benefit report described in Commitment 7 below. It is the intent of the District to use its planned indirect potable reuse project, which will inject low-TDS advanced treated water to the Elsinore GMZ, as the salt offset project to mitigate the salt obligations accrued pursuant to Commitment Number 3 as soon as there is sufficient recycled water production at the Regional WRP to support the LECWA commitments and the IPR project (e.g. when recycled water production is 10 mgd).

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[2] The accounting starts on July 1, 2014 because this is the effective date of the finding of no assimilative capacity in the Elsinore GMZ per the 2012 Ambient Water Quality findings.

[3] The accounting starts on July 1, 2014 because this is the effective date of the finding of no assimilative capacity in the Elsinore GMZ per the 2012 Ambient Water Quality findings.

5. **Salt Offset Project Plan and Implementation.** The District will complete construction and commence its salt offset project once the total recycled water production at its Regional WRF reaches 10 mgd. The project will be designed to completely offset the District's cumulative and ongoing salt mitigation obligations. This will be done as follows:

    a. No later than December 31, 2020, the District will complete the design for the expansion of the Regional WRF to 12 mgd, which will include a Membrane Bioreactor (MBR) system that will be required to operate the IPR project.

    b. No later than December 31, 2024, the District will complete an expansion of the Regional WRF to 12 mgd, including construction of the MBR system that will be required to operate the IPR project.

    c. No later than December 31, 2026, the District will complete a study on the potential for arsenic leaching as a result of the planned indirect potable reuse project. This research studies need to be conducted prior to design and construction of the indirect potable reuse project.

    d. Once the recycled water production at the Regional WRF reaches 8.5 mgd, the District will start preliminary engineering and related investigations to provide the information necessary to implement the IPR project and alternative equivalent salt offset projects (such as a groundwater desalter). At the completion of the study, the District will prepare a schedule to complete project construction by the time the Regional WRF is producing 10 mgd of recycled water. The engineering study and project plan and schedule must be submitted to the Regional Board within 24 months of when the Regional WRF reaches 8.5 mgd of recycled water production.

        i. If indirect potable reuse is the proposed salt offset project alternative, it will be designed to completely offset the District's historical salt liabilities within 10 years of initiating the project.

        ii. If a desalter or other equivalent treatment alternative is the approved salt offset project alternative, it will be designed to completely offset the District's historical salt liabilities within 30 years of initiating the project.

    e. Implement the salt offset project plan upon approval by the Executive Officer.

    f. Once the salt offset project plan implementation begins, the District will prepare quarterly progress reports to the Regional Board until project startup commences. These reports will summarize technical and related findings, achievement of milestones, schedule status and actions being taken to ensure compliance with schedule in the approved salt offset project plan.

    g. Complete construction and commence operations of IPR or other salt offset project when recycled water production at the Regional WRF reaches 10 mgd

    h. Once the salt offset project facilities are operational, the District will document the monthly amount of salt mitigated by the project. Each year, the District will report the cumulative amount of salt removed by the salt offset project, the balance of its salt mitigation obligation and a projection of the year in which the salt liability will

be completely mitigated. The reporting done pursuant to this commitment will be included in the annual maximum benefit report described in Commitment 7 below.

6. **Monitoring and Analysis.** The District will conduct monitoring, investigations, and report results in a manner that is consistent with the State Water Resources Control Board's 2019 Recycled Water Policy.

    a. The District will prepare a monitoring and analysis program work plan and submit it to the Regional Board within 90 days of [*date of OAL adoption of Maximum Benefit objectives*]. The work plan will address the requirements of the State Board's 2019 Recycled Water Policy, including: a description of the methodologies for assessing current groundwater quality (e.g. ambient water quality) and assessing impacts of recycled water reuse in the Elsinore GMZ; the data collection and monitoring required to perform the water quality assessments; and a schedule for analysis and reporting.

    b. The monitoring and assessment program will be implemented within 60 days of the Executive Officer's approval of the work plan.

    c. The monitoring plan will be updated, as appropriate, subject to approval of the Executive Officer.

7. **Reporting**. The District will prepare an annual report of activities performed pursuant to the maximum benefit salinity management plan by May 1st of each year. The first annual report will be submitted on the May 1st following OAL adoption of the Maximum Benefit Salinity Management Plan. The annual report will include a detailed status report of compliance with each maximum benefit commitment, including the specific information referenced in each commitment's description above. The reporting schedule will be updated, as appropriate, subject to approval of the Executive Officer.

If the Regional Board determines that EVMWD is not implementing the maximum benefit commitments and schedule as listed in Table X and described above, then maximum benefit is not demonstrated and the antidegradation objectives for the Elsinore GMZ will apply. In this case, the Regional Board will require retroactive mitigation (back to the date of adoption of the maximum benefit SNMP) for the discharge of recycled water overlying and tributary to the Elsinore GMZ with TDS concentrations over the antidegradation objectives. The Regional Board will also require mitigation of any impact of water quality to the downstream GMZs that result from failure to implement the "maximum benefit" commitments.

Chapter 4. Water Quality Objectives -- **Table 4-1 WATER QUALITY OBJECTIVES – Continued (PAGES 4-57 and 4-58)**

GROUNDWATER MANAGEMENT ZONES	WATER QUALITY OBJECTIVES (mg/l)						Hydrologic Unit	
	Total Dissolved Solids	Hardness	Sodium	Chloride	Nitrate as Nitrogen	Sulfate	Primary	Secondary
UPPER SANTA ANA RIVER BASIN								
Cucamonga “antidegradation”++	210	---	---	---	2.4	---	801.24	801.21
Lytle	260	---	---	---	1.5	---	801.41	801.42
Rialto	230	---	---	---	2.0	---	801.41	801.42
San Timoteo “maximum benefit”++	400	---	---	---	5.0	---	801.62	
San Timoteo “antidegradation”++	300	---	---		2.7	---	801.62	
Yucaipa “maximum benefit”++	370	---	---	---	5.0	---	801.61	801.55, 801.54, 801.56, 801.63, 801.65, 801.66 801.67
Yucaipa “antidegradation”++	320	---	---	---	4.2	---	801.61	801.55, 801.54, 801.56, 801.63, 801.65, 801.66 801.67
MIDDLE SANTA ANA RIVER BASIN								
Arlington	980	---	---	---	10	---	801.26	
Bedford**	---	---	---	---	---	---	801.32	
Coldwater	380	---	---	---	1.5	---	801.31	
Elsinore “maximum benefit”++	530	---	---	---	5.0	---	802.31	
Elsinore “antidegradation”++	480	---	---	---	1.0	---	802.31	
Lee Lake**	---	---	---	---	---	---	801.34	

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++ "Maximum benefit" objectives apply unless Regional Board determines that lowering of water quality is not of maximum benefit to the people of the state; in that case, "antidegradation" objectives apply (for Chino North, antidegradation objectives for Chino 1, 2, 3 would apply if maximum benefit is not demonstrated). (see discussion in Chapter 5).

** Numeric objectives not established; narrative objectives apply.

Chapter 5 – Implementation

Section X. Salt Management - Elsinore Groundwater Management Zone – Elsinore Valley Water District

As shown in Chapter 4, both "antidegradation" and "maximum benefit" objectives for TDS and nitrate-nitrogen are specified in this Basin Plan for Elsinore GMZ. The application of the "maximum benefit" objectives relies on the implementation of the maximum benefit commitments in Table X by the Elsinore Valley Municipal Water District (EVMWD). Table X identifies the projects and requirements that must be implemented to demonstrate that water quality consistent with the maximum benefit to the people of the State will be maintained. An implementation schedule is also provided in Table X.

Table X
Maximum Benefit Commitments and Implementation Schedule

Commitment	Milestones	Compliance Schedule
1. Beneficial Use Protection	a. Triennial report of historical, current and future water supply and recycled water quality; the ten-year projection will include estimations of TDS and nitrate concentrations of each District water supply source and a volume-weighted projection of all sources.	a. Initial report due by August 15, 2021, subsequent reports due every three years by August 15th
	b. If the need for treatment to meet TDS and nitrate drinking water standards is identified in the ten-year projection, the District will prepare a proposed schedule to plan, design and construct the necessary treatment facilities (treatment plan)	b. A treatment plan will be submitted to the Executive Officer for review and approval within one year of publishing a finding of the need for treatment within the ten-year projection
	c. Implement treatment plan	c. Upon approval of plan and schedule by Executive Officer
	d. Reporting of treatment plan implementation status	d. May 1st (as part of Commitment 7)
	e. Report of pumping and sustainable yield	e. May 1st (as part of Commitment 7)
2. Prioritization of Recycled Water Reuse from Regional WRF to Comply with LECWA Before Initiating IPR Project.	Status report of latest recycled water planning projections for the Regional WRF, its current and projected deliveries to Lake Elsinore, and an estimate of when surplus recycled water supply will be available to initiate the indirect potable reuse program	May 1st (as part of Commitment 7)
3. Salt Mitigation Accounting	Report of monthly, annual and cumulative salt liabilities and offsets	May 1st (as part of Commitment 7)
4. Integrated Resources Plan Implementation	Status report of Integrated Resources Plan implementation	May 1st (as part of Commitment 7)
5. Salt Offset Project Plan and Implementation	a. Complete engineering design for the expansion of the Regional WRF to 12 mgd, including MBR system required to operate IPR project	a. December 31, 2020
	b. Complete construction of Regional WRF expansion to 12 mgd, including MBR system	b. December 31, 2025
	c. Complete research studies on potential for arsenic leaching	c. December 31, 2026
	d. When the total recycled water production at the Regional WRF reaches 8.5 mgd, start preliminary engineering and related investigations to provide the information necessary to implement the IPR project and alternative equivalent salt offset projects; and prepare a plan and schedule to construct the project by the time the Regional WRF reaches 10 mgd	d. Start study when Regional WRF reaches 8.5 mgd of recycled water production Submit engineering study and project plan and schedule within 24 months of when Regional WRF reaches 8.5 mgd of recycled water production
	e. Implement the salt offset project plan	e. Upon approval of the project plan and schedule by the Executive Officer
	f. Once the salt offset project plan implementation begins, prepare progress reports to the Regional Board until project startup commences	f. Reporting commences upon Executive Officer approval of the project plan and schedule.
	g. Complete construction and commence operations of IPR or other salt offset	g. When Regional WRP discharge reaches 10 mgd
	h. Once the salt offset project facilities are operational, report the cumulative amount of salt removed by the salt offset project, the balance of its salt mitigation obligation and a projection of the year in which the salt liability will be completely mitigated	h. May 1st (as part of Commitment 7)
6. Monitoring and Analysis	a. Prepare a monitoring and analysis program work plan that is consistent with the State Board's 2019 Recycled Water Policy	a. Within 90 days of OAL adoption of the Maximum Benefit Salinity Management Plan
	b. Implement monitoring program work plan	b. Within 60 days of approval of plan by Executive Officer
	c. Periodic update of monitoring plan	c. As requested by the Executive Officer
7. Reporting	Annual report of compliance with the Maximum Benefit Commitments	First report completed by May 1st following OAL adoption of the Maximum Benefit Salinity Management Plan, and every May 1st each year thereafter

Description of Elsinore Valley Municipal Water District Commitments

1. **Beneficial Use Protection.** The District will ensure that there will be no impairment of beneficial uses of the Elsinore GMZ or downstream GMZs. To accomplish this, the District will sustainably produce groundwater from the Elsinore GMZ, consistent with the newly enacted Sustainable Groundwater Management Act, and will not reduce its groundwater pumping to a volume that is less than the sustainable yield as TDS and/or nitrate concentrations in the Elsinore GMZ increase over time. The District will not abandon the use of Elsinore GMZ groundwater due to the cost of TDS and nitrate treatment. The District will accomplish this by constructing treatment facilities, as necessary, to treat groundwater to ensure that the TDS and nitrate concentrations in the water served to its customers meets drinking water standards. This will be done as follows:

    a. Every three years, the District will prepare a triennial report for the Regional Board that describes its historical, current, and projected water supply and wastewater discharge operations and quality. The objectives of the report are to: demonstrate the nexus between the District's water supply and recycled water quality, characterize water and recycled water supply and quality trends over time, and prepare a ten-year projection of the TDS and nitrate concentrations of each District water supply source and a volume-weighted projection of all sources. The water supply quality projections will be based on monitoring data or groundwater model projections at the discretion of the District. Each report will identify if there is a projected need for new groundwater treatment in the ten-year projection period. The first triennial report will be due by August 15, 2021 and every three years thereafter by August 15th, unless relieved of this commitment by the Executive Officer.

    b. If the need for treatment to meet TDS and nitrate drinking water standards is identified in the ten-year projection, the District will prepare a proposed schedule to plan, design and construct the necessary treatment facilities (treatment plan). The treatment plan will be submitted to the Executive Officer for review and approval within one year of publishing the finding in the triennial report.

    c. When the treatment plan is approved by the Executive Officer, the District will begin its implementation pursuant to the schedule in the approved treatment plan.

    d. The District will prepare an annual progress report that describes the activities of the prior year to implement the treatment plan. Once triggered, the reporting done pursuant to this commitment will be included in the annual maximum benefit report described in Commitment 7 below.

    e. Each year, as part of the annual report of the maximum benefit salinity management plan (Commitment 7 below), the District will provide the Regional Board with (1) data on its historical, current and planned pumping from the Elsinore GMZ and (2) a comparison of average pumping to the most current estimation of the sustainable yield of the basin, and (3) to the extent that the current or planned average pumping is less than the sustainable yield of the Basin, the District will provide detailed information as to why the beneficial use of the Basin is not being maximized and will provide a schedule for resuming an average pumping level that is consistent with the sustainable yield.

2. **Prioritization of Recycled Water Reuse from Regional WRF to Comply with LECWA before Initiating Indirect Potable Reuse Project.** The District proposes to use its planned indirect potable reuse (IPR) project to inject advanced-treated recycled water from the Regional WRF into the Elsinore GMZ to offset its legacy and ongoing salt liabilities. The Regional WRF currently produces about 6.0 mgd: 0.5 mgd of which is discharged to Temescal Wash to maintain riparian habitat, and 5.5 mgd is discharged to Lake Elsinore to help maintain surface water elevation pursuant to the District's agreement with the City of Lake Elsinore under the Lake Elsinore Comprehensive Water Management Agreement or LECWA. The target lake water level pursuant to the LECWA is 1240 ft. Recent studies indicate that the long-term average discharge required to maintain the Lake at or above 1240 feet is about 7.5 mgd. A minimum of 2.5 mgd of effluent is required to operate the IPR project. Thus, to meet the commitment to the LECWA, the IPR project cannot be operated until the total effluent from the Regional WRF reaches at least to 10 mgd. Current planning projections for growth in the District's service area indicate that there should be 10 mgd of recycled water produced at the Regional WRF to operate the IPR project starting in 2035. As the District service area grows, the new recycled water supply will first be needed to maintain surface water levels in Lake Elsinore to comply with the LECWA. The recycled water produced in excess of that required for compliance with the LECWA will be prioritized for the IPR project.

    a. Each year, as part of the annual report of the maximum benefit salinity management plan (Commitment 7), the District will provide the Regional Board with the latest planning information available with regards to recycled water production projections for the Regional WRF, its current and projected deliveries to Lake Elsinore, and an estimate of when surplus recycled water supply will be available to initiate the indirect potable reuse program.

3. **Salt Mitigation Accounting**. The District will track its monthly, annual, and cumulative salt mitigation requirements and report on them annually to the Regional Board as part of its annual reporting commitment (Commitment 7). The salt liability will be accounted as follows:

    a. The District will prepare an accounting of the TDS mitigation requirements that resulted from exceedances of the RRC discharge limitation from January 1, 2004[1] through July 1, 2014.[2] The mitigation requirement is calculated based on the mass of TDS in excess of the RRC permit limit of 700 mgl for the entire volume of recycled water produced by the plant over this period.

    b. The District will prepare an accounting of the TDS mitigation requirements that resulted from the reuse of all sources of recycled water used in the watershed tributary to the Elsinore GMZ that were in excess of the antidegradation objective from July 1, 2014[3] through [*date of OAL adoption of Maximum Benefit objectives*].

---

[1] This is the effective date of the Basin Plan amendment that incorporated the current antidegradation objectives for the Elsinore GMZ.

[2] The accounting starts on July 1, 2014 because this is the effective date of the finding of no assimilative capacity in the Elsinore GMZ per the 2012 Ambient Water Quality findings.

[3] The accounting starts on July 1, 2014 because this is the effective date of the finding of no assimilative capacity in the Elsinore GMZ per the 2012 Ambient Water Quality findings.

The mitigation requirement is calculated based on the mass of TDS in excess of the antidegradation objective of 480 mgl.

c. The District will prepare an accounting of the TDS mitigation requirements for the balance of the recycled water produced at the RRC WRF that was not used in the watershed tributary to the Elsinore GMZ from July 1, 2014 through [*date of OAL adoption of Maximum Benefit objectives*]. The mitigation requirement is calculated based on the mass of TDS in excess of the RRC permit limit of 700 mgl.

d. As of [*date of OAL adoption of Maximum Benefit objectives*], the District will prepare and maintain an ongoing accounting of the continued salt mitigation requirements that accumulate from ongoing exceedances of the RRC discharge limitation and report them to the Regional Board. The mitigation requirement is calculated based on the mass of TDS in excess of 700 mgl for the entire volume of recycled water produced by the plant.

e. No offsets will be required for the reuse of imported recycled water sources as of [*date of OAL adoption of Maximum Benefit objectives*] so long as assimilative capacity exists in the Elsinore GMZ. Once assimilative capacity is used up (e.g. when the ambient TDS concentration equals or exceeds 530 mgl), the mitigation requirement is calculated based on the mass of TDS in excess of the maximum benefit objective of 530 mgl.

f. Once a Regional Board-approved salt mitigation project is initiated (indirect potable reuse or other), the District will prepare and maintain an ongoing accounting of the mitigation credits attributable to the project and the cumulative remaining offset obligation.

4. **Integrated Resources Plan Implementation.** The District will aggressively pursue the suite of nine water supply projects identified in its IRP and apprise the Regional Board of its progress in the annual maximum benefit report described in Commitment 7 below. It is the intent of the District to use its planned indirect potable reuse project, which will inject low-TDS advanced treated water to the Elsinore GMZ, as the salt offset project to mitigate the salt obligations accrued pursuant to Commitment Number 3 as soon as there is sufficient recycled water production at the Regional WRP to support the LECWA commitments and the IPR project (e.g. when recycled water production is 10 mgd).

5. **Salt Offset Project Plan and Implementation.** The District will complete construction and commence its salt offset project once the total recycled water production at its Regional WRF reaches 10 mgd. The project will be designed to completely offset the District's cumulative and ongoing salt mitigation obligations. This will be done as follows:

   a. No later than December 31, 2020, the District will complete the design for the expansion of the Regional WRF to 12 mgd, which will include a Membrane Bioreactor (MBR) system that will be required to operate the IPR project.

   b. No later than December 31, 2024, the District will complete an expansion of the Regional WRF to 12 mgd, including construction of the MBR system that will be required to operate the IPR project.

c. No later than December 31, 2026, the District will complete a study on the potential for arsenic leaching as a result of the planned indirect potable reuse project. This research studies need to be conducted prior to design and construction of the indirect potable reuse project.

d. Once the recycled water production at the Regional WRF reaches 8.5 mgd, the District will start preliminary engineering and related investigations to provide the information necessary to implement the IPR project and alternative equivalent salt offset projects (such as a groundwater desalter). At the completion of the study, the District will prepare a schedule to complete project construction by the time the Regional WRF is producing 10 mgd of recycled water. The engineering study and project plan and schedule must be submitted to the Regional Board within 24 months of when the Regional WRF reaches 8.5 mgd of recycled water production.

    i. If indirect potable reuse is the proposed salt offset project alternative, it will be designed to completely offset the District's historical salt liabilities within 10 years of initiating the project.

    ii. If a desalter or other equivalent treatment alternative is the approved salt offset project alternative, it will be designed to completely offset the District's historical salt liabilities within 30 years of initiating the project.

e. Implement the salt offset project plan upon approval by the Executive Officer.

f. Once the salt offset project plan implementation begins, the District will prepare quarterly progress reports to the Regional Board until project startup commences. These reports will summarize technical and related findings, achievement of milestones, schedule status and actions being taken to ensure compliance with schedule in the approved salt offset project plan.

g. Complete construction and commence operations of IPR or other salt offset project when recycled water production at the Regional WRF reaches 10 mgd

h. Once the salt offset project facilities are operational, the District will document the monthly amount of salt mitigated by the project. Each year, the District will report the cumulative amount of salt removed by the salt offset project, the balance of its salt mitigation obligation and a projection of the year in which the salt liability will be completely mitigated. The reporting done pursuant to this commitment will be included in the annual maximum benefit report described in Commitment 7 below.

6. **Monitoring and Analysis.** The District will conduct monitoring, investigations, and report results in a manner that is consistent with the State Water Resources Control Board's 2019 Recycled Water Policy.

    a. The District will prepare a monitoring and analysis program work plan and submit it to the Regional Board within 90 days of [*date of OAL adoption of Maximum Benefit objectives*]. The work plan will address the requirements of the State Board's 2019 Recycled Water Policy, including: a description of the methodologies for assessing current groundwater quality (e.g. ambient water quality) and assessing impacts of recycled water reuse in the Elsinore GMZ; the data collection and monitoring

required to perform the water quality assessments; and a schedule for analysis and reporting.

b. The monitoring and assessment program will be implemented within 60 days of the Executive Officer's approval of the work plan.

c. The monitoring plan will be updated, as appropriate, subject to approval of the Executive Officer.

7. **Reporting**. The District will prepare an annual report of activities performed pursuant to the maximum benefit salinity management plan by May 1st of each year. The first annual report will be submitted on the May 1st following OAL adoption of the Maximum Benefit Salinity Management Plan. The annual report will include a detailed status report of compliance with each maximum benefit commitment, including the specific information referenced in each commitment's description above. The reporting schedule will be updated, as appropriate, subject to approval of the Executive Officer.

If the Regional Board determines that EVMWD is not implementing the maximum benefit commitments and schedule as listed in Table X and described above, then maximum benefit is not demonstrated and the antidegradation objectives for the Elsinore GMZ will apply. In this case, the Regional Board will require retroactive mitigation (back to the date of adoption of the maximum benefit SNMP) for the discharge of recycled water overlying and tributary to the Elsinore GMZ with TDS concentrations over the antidegradation objectives. The Regional Board will also require mitigation of any impact of water quality to the downstream GMZs that result from failure to implement the "maximum benefit" commitments.

SUBSTITUTE ENVIRONMENTAL DOCUMENT FOR THE MAXIMUM BENEFIT SALT AND NUTRIENT MANAGEMENT PLAN FOR THE ELSINORE VALLEY GROUNDWATER MANAGEMENT ZONE

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SUBSTITUTE ENVIRONMENTAL DOCUMENT

A. INTRODUCTION

As a Lead Agency, the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board, Regional Board, or RWQCB) is required to comply with the California Environmental Quality Act (CEQA) when considering amendments to the Water Quality Control Plan (Basin Plan) for the Santa Ana River Basin. Elsinore Valley Municipal Water District (EVMWD or District) applied to the Regional Board for a Basin Plan amendment to establish maximum benefit objectives for the Elsinore Groundwater Management Zone (GMZ) and incorporate the Salt and Nutrient Management Plan (SNMP) for the Elsinore GMZ.

The District submitted the 2020 Proposal to Adopt the Maximum Benefit SNMP for the Elsinore GMZ (hereafter maximum benefit SNMP proposal package, Attachments A, B, and C are provided as Appendix 1 to this SED) for incorporation into the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan). Regional Board staff worked with the District over the last four years to support the completion of the proposal and are recommending that the maximum benefit SNMP be incorporated into the Basin Plan. The maximum benefit SNMP is consistent with the State Board's Antidegradation Policy and California Water Code §13241, as discussed under Section D: Description of the Proposed Activity: Regulatory Setting, below.

Chapter 4 of the Basin Plan will be amended to include the new maximum benefit total dissolved solids (TDS) and nitrate objectives. Additionally, Chapter 5 of the Basin Plan will be amended to detail maximum benefit commitments and schedule for the Elsinore GMZ. The District's access to the assimilative capacity afforded by the maximum benefit objectives will be contingent on compliance with the maximum benefit commitments.

The SED includes an Environmental Checklist that serves as the basis for a systematic evaluation of the potential for the amendment to result in an adverse environmental impact relative to a variety of environmental factors, such as biological resources, recreation, water quality and other such topics as presented in Section G Environmental Checklist. Section H includes a discussion of alternatives to the Proposed Action.

B. CEQA REQUIREMENTS

Section 21080.5 of the Public Resources Code authorizes the Secretary for Resources to certify State regulatory programs, designed to meet the goals of CEQA, as exempt from its requirements to prepare an Environmental Impact Report, Negative Declaration, or Initial Study. The State Water Resources Control Board's (State Water Board) and the Regional Board's Basin Plan Amendment (BPA) process is a Certified Regulatory Program and is therefore exempt from CEQA's requirements to prepare such documents [14 CCR 15251(g)][1].

The State Water Board's CEQA Implementation regulations (23 CCR 3720 et seq.) describe the environmental documents required for BPA actions. Section 3777 provides:

a) Any standard, rule, regulation, or plan proposed for board approval or adoption must be accompanied by a completed Environmental Checklist contained in Appendix A to this

[1] 14 CCR 15251(g) means Title 14 California Code of Regulations, Section 15251(g).

subchapter or such other completed checklist as may be prescribed by the board, and a written report prepared for the board, containing the following

1. *A brief description of the proposed activity;*
2. *Reasonable alternatives to the proposed activity; and*
3. *Mitigation measures to minimize any significant adverse environmental impacts of the proposed activity; and*
4. *Identification and analysis of reasonable foreseeable methods of compliance.*

b) Upon completion of the written report, the board shall provide a Notice of Filing of the report to the public and to any person who requests, in writing, such notification (23 CCR 3778).

The Board shall not take action on the proposed activity until 45 days after the Notice of Filing contained in Appendix C to this subchapter has been provided.

C. SCOPE OF ENVIRONMENTAL ANALYSIS

CEQA has special provisions that establish the scope of the environmental analysis required for the adoption of this Basin Plan Amendment. CEQA limits the scope of an environmental analysis to the reasonably foreseeable methods of compliance with the amendment. As previously stated, the State Water Board's CEQA Implementation Regulations for Certified Regulatory Programs (23 CCR 3777) require the environmental analysis to include at least the following:

1. A brief description of the proposed activity. In this case, the proposed activity is the Basin Plan Amendment. The amendment is described under "D: Description of the Proposed Activity".

2. Reasonable alternatives to the proposed activity (discussed under "H: Reasonable Alternatives to the Proposed Activity").

3. Mitigation measures to minimize any significant adverse environmental impacts of the proposed activity (discussed under "G: Environmental Checklist").

Additionally, CEQA [PRC 21159(a)] and the CEQA Guidelines [14 CFR 15187(c)] require the following components, some of which are repetitive of the list above:

1. An analysis of the reasonably foreseeable environmental impacts of the methods of compliance. These methods may be employed to comply with the Basin Plan amendment. Reasonably foreseeable methods of compliance are described in Section D. Section G identifies the environmental impacts associated with the methods of compliance.

2. An analysis of the reasonably foreseeable feasible mitigation measures relating to those impacts. This discussion is also in Section F.

3. An analysis of reasonably foreseeable alternative means of compliance with the rule or regulation, which would avoid or eliminate the identified impacts. This discussion is in Section D.

Additionally, the CEQA Guidelines [14 CCR 15187(d), PRC 21159(c)] require the environmental analysis take into account a reasonable range of:

1. Environmental Factors (Section F),
2. Economic Factors (Section D),
3. Technical Factors (Section D),
4. Population (Section D),
5. Geographic Areas (Section E), and
6. Specific Sites (Section E).

A "reasonable range" does not require an examination of every specific project site, but a reasonably representative sampling of them. The statute [PRC 21159(d)] specifically states that the agency shall not conduct a "project level analysis". Rather, a project level analysis must be performed by the agencies that are required to implement the programs in accordance with the Basin Plan Amendment (PRC 21159.2). Notably, the California Regional Water Quality Control Board, Santa Ana Region is prohibited from specifying the manner of compliance with its regulations (WC 13360), and accordingly, the actual environmental impacts will necessarily depend upon the compliance strategy selected by the agencies that are required to implement the programs in accordance with the Basin Plan Amendment. In preparing this Basin Plan Amendment, the California Regional Water Quality Control Board, Santa Ana Region has considered the pertinent requirements of State law (PRC 21159 and 14 CCR 15187), and intends this analysis to serve as a Tier 1 environmental review.

Any potential environmental impacts associated with the Basin Plan Amendment depend upon the specific compliance projects selected by the agencies that are required to implement the programs in accordance with the Basin Plan Amendment, most of which are public agencies and subject to their own CEQA obligations. If not properly implemented or mitigated at the project level, there could be adverse environmental impacts from implementing projects in accordance with the Basin Plan Amendment. The Substitute CEQA Documents identify broad mitigation approaches that could be considered at the project level. Consistent with CEQA, the substitute documents do not engage in speculation or conjecture, but rather consider the reasonably foreseeable methods of compliance, the reasonably foreseeable mitigation measures, and the reasonably foreseeable alternative means of compliance, which would avoid, eliminate, or reduce the identified impacts.

D. DESCRIPTION OF THE PROPOSED ACTIVITY

Regulatory Setting

In 1995, the Regional Board initiated a collaborative study with 22 water supply and wastewater agencies (now called the Basin Monitoring Program Task Force, hereafter, Task Force) to devise a new TDS and nitrate as nitrogen (nitrate) management plan for the Santa Ana Watershed. This study culminated in the Regional Board's adoption of a Basin Plan amendment in January 2004.[2] The 2004 Basin Plan amendment included revised: groundwater subbasin boundaries (groundwater management zones or the GMZs), TDS and nitrate objectives for GMZs, TDS and nitrate wasteload allocations for wastewater discharges to the Santa Ana River and its tributaries, surface water reach designations, and TDS and nitrogen objectives and beneficial uses for specific surface water bodies. The revised TDS and nitrate objectives for the GMZs (termed antidegradation objectives) were established to ensure that water quality is maintained pursuant to the State Board's Antidegradation Policy (Resolution No. 68-16).

[2] Resolution No. R8-2004-0001 Resolution Amending the Water Quality Control Plan for the Santa Ana River Basin to Incorporate an Updated Total Dissolved Solids (TDS) and Nitrogen Management Plan for the Santa Ana Region.

In accordance with the Antidegradation Policy, the Regional Board can set alternative, numerically higher water quality objectives if it can be demonstrated that allowing degradation of water quality is to the maximum benefit of the people of California and that beneficial uses are protected. Additionally, California Water Code (CWC) §13241 states the Regional Board must consider additional factors beyond antidegradation, such as the need for housing development and recycled water reuse when developing water quality objectives. The Antidegradation Policy and CWC §13241 served as the basis for the development of alternative, maximum-benefit-based water quality objectives in the 2004 Basin Plan amendment (R8-2004-0001) for several GMZs in the Santa Ana River Watershed. In order for the Regional Board to establish numerically higher maximum-benefit objectives for a GMZ, the proposing entity must demonstrate that beneficial uses would be protected and that water quality consistent with the maximum benefit to the people of California would be maintained. The proposing entity must also commit to implementing specific programs and projects to monitor groundwater quality and to mitigate TDS and nitrate loading from recycled water reuse when groundwater quality in the GMZ approaches the maximum benefit objective. The schedule of programs and projects are termed maximum-benefit commitments and failure to comply with the commitments would result in the enforcement of the more stringent antidegradation objectives for the GMZ.

The Regional Board utilizes the Basin Plan water quality objectives (antidegradation and maximum benefit objectives), estimates of current ambient groundwater quality, and the wasteload allocation to establish TDS and nitrate concentration limits for recycled water discharge and reuse in the Santa Ana Watershed. The Regional Board recalculates the current ambient TDS and nitrate of the GMZs every three years and compares it to the Basin Plan Objectives to determine if the TDS and nitrate concentration limits for recycled water discharge and reuse need to be modified to protect groundwater quality from degradation in the receiving GMZ. The current ambient groundwater quality is calculated utilizing a statistics-based calculation that employs 20-years of groundwater quality data and is expressed as volume-weighted average TDS and nitrate concentrations for each GMZ.[3]

If the current ambient TDS or nitrate concentration of a GMZ is less than the concentration of the Basin Plan objective, then there exists assimilative capacity for degradation and the Regional Board has the flexibility to grant access to assimilative capacity for recycled water use or discharges with TDS and nitrate concentrations in excess of ambient concentration or the objectives. If the current ambient TDS or nitrate concentration of a GMZ is greater than the Basin Plan objective, the Regional Board must either set the discharge limitation at a concentration that is equal to or less than the water quality objective or require the implementation of an approved salt offset program to mitigate discharges that exceed the objective concentration.

Basin Plan Objectives and Ambient Water Quality in the Elsinore GMZ

TDS and nitrate antidegradation objectives for the Elsinore GMZ are 480 and 1.0 milligrams per liter (mgl), respectively. Table 1 below shows the history of the ambient water quality determinations through the most current recomputation effort for the 2018 period compared to the antidegradation objectives for the Elsinore GMZ.

[3] The current ambient water quality for the 2018 computation was calculated using the groundwater quality from the 20-year period of 1999 to 2018.

Table 1
Elsinore GMZ Basin Plan Objectives and Ambient Water Quality Determinations

Constituent	Historical Ambient and Water Quality Objective	Ambient						
		1997	2003	2006	2009	2012	2015	2018
TDS	480	480	460	470	470	490	490	490
Nitrate-N	1	2.6	2.4	2.4	2.2	2.1	2.2	2.3

As shown in Table 1, assimilative capacity for TDS no longer exists in the Elsinore GMZ as of 2012. There has never been assimilative capacity for nitrate. Because there is no assimilative capacity for TDS or nitrate, the Regional Board must set discharge limitations that do not exceed the Basin Plan objective. In the case of TDS, the Regional Board must set the recycled water discharge limit at 480 mgl or less for recycled water uses (irrigation or recharge) overlying and tributary to the Elsinore GMZ, or require a salt offset program to mitigate the discharge or reuse of recycled water discharge with TDS concentrations that exceed the objective. In the case of nitrate, the use of recycled water for irrigation at agronomic rates is permittable at concentrations above the Basin Plan objective; however, recharge projects would either be limited to the Basin Plan objective or require an offset program.

The Elsinore Valley Municipal Water District (District) is the sole municipal water and wastewater agency overlying the Elsinore GMZ. The District's recycled water reuse activities in the portion of its service area that is tributary to and overlying the Elsinore GMZ are impacted by the finding that there is no assimilative capacity in the GMZ.

Regulatory Compliance Challenges in the Elsinore GMZ

Figure 1 shows the boundaries of the Elsinore GMZ, its tributary watershed, and the Elsinore Valley Municipal Water District's (District) recycled water systems that lies within these boundaries, including its three water reclamation facilities (WRFs) that treat wastewater generated in its service area. A portion of the Railroad Canyon recycled water service area lies within the watershed tributary to the Elsinore GMZ. Due to the geology in this portion of the Railroad Canyon service area, the deep infiltration of recycled water used outdoors for irrigation can ultimately become surface water flow in the San Jacinto River, which recharges the Elsinore GMZ. A portion of the Wildomar recycled water service area directly overlies the Elsinore GMZ. The TDS concentrations of all recycled water supply sources used in these areas exceed the antidegradation objective of 480 mgl. Because there is no assimilative capacity for TDS in the Elsinore GMZ, mitigation is required for the reuse of recycled water with concentrations greater than the antidegradation objective.

Additionally, the Railroad Canyon WRF produces recycled water at TDS concentrations that exceeds its permit limit of 700 mgl. Since 2008, the annual average TDS concentration of recycled water from the Railroad Canyon WRF ranged between about 688 and 886 mgl, averaging 789 mgl. The Regional Board has required the District to prepare a salt offset plan to mitigate historical and ongoing discharges from the Railroad Canyon WRF that are in excess of the discharge limitation.

To address these challenges, the District has proposed a maximum benefit SNMP for the Elsinore GMZ. The goal of the SNMP is to maximize recycled water reuse and define the management activities that the District will implement to comply with new maximum-benefit based TDS and

nitrate Basin Plan objectives for the Elsinore GMZ (530 and 5 mgl, respectively), protect beneficial uses, and ensure that historical and ongoing salt liabilities are mitigated. The Regional Board proposes to amend the Basin Plan to incorporate the maximum benefit SNMP for the Elsinore GMZ.

Elsinore Valley Municipal Water District

The Elsinore Valley Municipal Water District is a water supply and wastewater agency located in Riverside County. The District owns and operates three water reclamation facilities (WRFs) to treat wastewater generated in its service area. Figure 2 shows the boundaries of the District's service area relative to the Elsinore GMZ and its tributary watershed. Figure 2 also shows the District's three water reclamation facilities (WRFs) that treat wastewater generated in its service area (Railroad Canyon, Regional, and Horsethief), three recycled water systems (Railroad Canyon, Wildomar, and Horsethief), and the location of the Regional WRF discharge to Temescal Wash.

Water Demand and Supply

The District provides potable and non-potable water supply service to an area in Riverside County that is growing in population. Table 2 shows the District's historical water demand in five-year increments from 1995 through 2015 and includes groundwater pumped from the Elsinore and Coldwater GMZs, imported water from State Water Project (SWP) and the Colorado River Aqueduct (CRA) via the Mills[4] and Skinner[5] Water Treatment Plants (WTPs), local surface water from Canyon Lake, and recycled water. Table 2 also shows the percent of total demand met by each type of supply sources in 2015.

Table 2
District Water Supply (Acre Feet per Year [afy]) – 1995 through 2015

Time Period	Groundwater	Imported Water	Surface Water	Recycled Water	Total
1995	9,696	3,243	4,055	753	17,747
2000	8,261	12,914	2,138	761	24,074
2005	10,889	15,068	2,913	847	29,717
2010	4,551	15,995	3,002	943	24,491
2015	4,051	15,318	1,964	1056	22,389
2019	3,288	16,177	2,414	1,026	22,905
2015 % of Total	**14%**	**71%**	**11%**	**4%**	

Imported SWP from the Mills WTP is the lowest TDS concentration supply source available to the District, ranging from about 150 to 350 mgl and local surface water from Canyon Lake is the highest TDS concentration supply source, ranging from 425 to 900 mgl. The volume-weighted concentration of all the District's supplies generally ranges between 400 and 500 mgl. The concentration varies from year-to-year depending on the relative amounts of SWP to CRA water available to the District (water delivered from the Skinner WTP is a blend of SWP and CRA water, but can be as much as 100 percent CRA water in some years). However, due to the location of

[4] Serves 100 percent SWP water.
[5] Serves a blend of SWP and CRA water which can be as much as 100 percent CRA water during drought years.

supply connection points, topography, and infrastructure layout, not all areas within the District's service area received the same water sources. In the Railroad Canyon portion of the District's service area, the main sources of supply are Canyon Lake surface water and imported water from the Skinner WTP, two of the highest TDS concentration water sources. This water supply mix results in a volume-weighted TDS concentration ranging from around 500 to 800 mgl in the Railroad Canyon portion of the District's service area.

The decline in total potable demand (groundwater, imported water, and surface water) shown in Table 2 from 2005 through 2015 corresponds with the increase of the District's use of recycled water to meet non-potable demand and the successful implementation of water conservation programs.

Total water demands as of the present are about 24,000 afy. Based on recent planning studies, the District's total water demand is predicted to more than double to 54,000 afy by 2050.

Integrated Resources Plan

Until recently, the District planned to meet the future increase in water demand primarily by increasing the use of imported water from the SWP and the CRA. However, in the face of climate change and the realities of imported water reliability, the District determined that a new water resources planning approach was required. The availability of imported water supplies has become less predictable due to climate change and persistent drought. The Colorado River Basin has experienced drought conditions since 2000 resulting in record-low water levels in Lake Mead. SWP water supplies from northern California continue to be affected by climatic, ecological, and regulatory constraints inherent of the environmentally sensitive Sacramento-San Joaquin Delta. In response to these challenges, in 2017 the District completed its first Integrated Resources Plan (IRP), which provides a roadmap to achieve water supply reliability through robust and flexible water resource management strategies to achieve the following foundational goals: establish new local water supplies, increase dry-year supply reliability, decrease dependence on imported water, reuse 100 percent of the District's recycled water supply, improve water quality, improve groundwater management, and promote water conservation. A total of nine projects including developing local groundwater, accessing the District's rights to groundwater in the Riverside and Bunker Hill GMZs, accessing the District's rights to recover return flows to the Temescal Basin, operational modifications to Canyon Lake Water Treatment Plant to increase annual production, additional water conservation measures, and increasing recycled water reuse primarily through indirect potable reuse (IPR) were identified in the IRP portfolio. Table 3 shows the estimated capacity, average and dry-year yield, capital cost, annual operation and maintenance cost, and TDS concentration of each project.

Table 3
Summary of the Recommended Water Supply Portfolio in the 2017 Integrated Resources Plan

Projects	Capacity (MGD)	Average Yield (afy)	Dry Year Yield (afy)	Capital Cost (Million $)	Annual O&M Cost ($)	Unit Cost ($/af)	TDS (mg/L)	Phasing
Pump Lee Lake Basin Groundwater via the TVP; no salt removal treatment	0.89	1,000	500	$11.3	$227,000	$593	800	2015-2020
Pump Bedford groundwater via the TVP; no salt removal treatment	1.37	1,300	1,045	$6.6	$345,000	$542	800	2015-2020
Palomar Well replacement	0.5	560	560	$3.1	$106,000	$496	400	2015-2020
Extract groundwater from Warm Springs Basin; no salt removal treatment	0.89	1,000	1,000	$6.9	$428,000	$794	1,000	2015-2020
Transfer Bunker Hill Basin groundwater via Riverside and Corona	5.56	6,223	6,223	$30.6	$3,547,000	$847	400	2021-2025
Modify operation of Canyon Lake	2.5	1,500	1,125	$5.9	$502,000	$589	800	2021-2025
IPR at Regional WRF; injection/extraction with AWT	6	5,700	5,415	$132.1	$5,707,000	$2,515	100	2031-2035
Temecula-Pauba groundwater	1.79	2,000	2,000	$7.8	$328,000	$375	725	2031-2035
Implement increased water conservation measures	0	3,100	3,100	$0	$1,240,000	$400	450	2015-2040
Total	**19.5**	**22,383**	**20,968**	**$203.5**	**$12,778,000**	**$1,110**	**506**	

The cornerstone project of the IRP is the IPR program. As the District's service area grows in population, a significant amount of additional wastewater will be generated and can be utilized as part of the indirect potable reuse program. The District completed a feasibility study in 2017 and concluded that the optimal strategy for the project is to inject advanced treated recycled water – via reserve osmosis or microfiltration system – from the Regional WRF into the "Back Basin" of the Elsinore GMZ, an area located in the southeast portion of Lake Elsinore.

The indirect potable project could inject up to 6,750 afy of advanced treated recycled water into the Elsinore GMZ as wastewater flow increases in the District's service area. The estimated TDS and nitrate concentration of the injected water is 100 mgl (as shown in Table 3) and non-detectable, respectively. The timing for the implementation of the indirect potable reuse project will depend on the rate of growth in the District's service area and the design treatment capacity of the Regional WRF. Currently, the Regional WRF's capacity is 8 million gallons per day (mgd) which is insufficient to implement the indirect potable reuse project since the District is required to discharge a majority of its current flow to Lake Elsinore (5.5 mgd) and Temescal Wash (0.5 mgd) for environmental enhancements. To address this issue, the District has begun the expansion work to increase Regional WRF's capacity to 12 mgd by 2024. The District plans to further expand the Regional WRF's capacity to 16 mgd when wastewater inflow into the Regional WRF approaches 10 million gallons per day (mgd) in the future.

Recycled Water Production and Reuse

Wastewater generated in the District's service area is divided into four sewersheds: Regional, Horsethief, Railroad Canyon, and Southern. The wastewater flows generated in each sewershed discharge into a WRF. The District owns and operates three WRFs in its service area: Railroad Canyon WRF, Regional WRF, and Horsethief WRF. Wastewater flows generated in the Southern sewershed is discharged to the Santa Rosa Regional Resources Authority's Santa Rosa WRF in the Temecula Valley under the jurisdiction of the Regional Water Quality Control Board – San Diego Region. Table 4 below shows the District's recycled water discharge permit number, permitted TDS and total inorganic nitrogen (TIN) discharge limits, and permitted capacity under the Regional Board jurisdiction and current production and reuse for each WRF.

Table 4
The District's Permitted Water Reclamation Facilities

WRF and Order. No.	TDS Limit (mgl)	TIN Limit (mgl)	Permitted Capacity (mgd/afy)	Current Production (afy)	Current Reuse (afy)	Receiving Water
Railroad Canyon **R8-96-034**	700	10	1.3 mgd 1,450 afy	0.7 mgd 800 afy	600	Elsinore GMZ
Horsethief **R8-96-063**	850	n/a	0.5 mgd 560 afy	0.4 mgd 500 afy	300	Upper Temescal Valley GMZ
Regional **R8-2013-0017** **(as amended by R8-2015-0005)**	700	13	8 mgd 9,000 afy	6.0 mgd 6,160 afy	6,160*	Lake Elsinore** Upper Temescal Valley GMZ

* The reuse is for environmental enhancement, including maintaining levels in Lake Elsinore and riparian habitat in Temescal Wash.

** Lake Elsinore does not recharge the underlying groundwater (Elsinore GMZ).

The District has four recycled water service areas: Regional, Horsethief, Railroad Canyon, and Wildomar. Portions of the Railroad Canyon and Wildomar recycled water service areas overly the Elsinore GMZ.

Regional. Nearly all of the recycled water generated from the Regional WRF, the District's largest facility, is dedicated to environmental enhancements. About 0.5 mgd is discharged to Temescal Wash to maintain riparian habitat. The remaining flows, about 5.5 mgd, are delivered to Lake Elsinore to maintain the surface water elevation. A small amount of recycled water is used for onsite irrigation at the Regional WRF and nearby office buildings owned by the District. Since 2008, the 12-month running average TDS concentration of recycled water from the Regional WRF ranged between 591 mgl and 791 mgl, averaging 689 mgl.

Horsethief. In this service area, all of recycled water is reused for outdoor irrigation in the Elsinore portion of the District's service area. Since 2008, the monthly TDS concentration

of recycled water from Horsethief WRF ranged between 451 mgl and 786 mgl, averaging 675 mgl.

Railroad Canyon. In this service area, recycled water is used in for outdoor irrigation in the Canyon Lake portion of the District's service area. Prior to 2003, all of the recycled water used in Railroad Canyon recycle water service area was from the Railroad Canyon WRF. Starting in 2003, the District began purchasing surplus recycled water from Eastern Municipal Water District (EMWD) to supplement summertime demand. In 2012, the District also began to supplement peak summertime demands with potable water, as needed. Summertime demand in the Railroad Canyon area exceeds recycled water production at the Railroad Canyon WRF.

Since 2008, the annual average TDS concentration of recycled water from the Railroad Canyon WRF ranged between 688 mgl and 886 mgl, averaging 789 mgl. As previously noted, at these concentrations the recycled water produced by the Railroad Canyon WRF exceeds its permit limit of 700 mgl and the Regional Board has required the District to prepare a salt offset plan to mitigate the historical and ongoing exceedances. The maximum benefit SNMP is intended to satisfy this requirement and includes within the implementation plan the required actions to track and ultimately mitigate historical and ongoing salt liabilities that accrue from the discharge and reuse of Railroad Canyon WRF water with TDS concentrations that are in excess of the permit limitation.

Since 2014, the monthly TDS concentration of the purchased EMWD recycled water has ranged from 570 to 820 mgl, averaging 720 mgl. Because there is no assimilative capacity for degradation in the Elsinore GMZ, the reuse of this recycled water requires mitigation. The maximum benefit SNMP is intended to address this regulatory compliance challenge.

Wildomar.
The southern section of the EVMWD service area discharges wastewater to Santa Rosa WRF. EVMWD has the right to recycled water supply for the amount of wastewater that is discharged from EVWMD's service area and treated at the Santa Rosa WRF. The recycled water from Santa Rosa WRF is conveyed through Temecula Valley Recycled Water Pipeline (TVWRF) and served to Wildomar service area via four existing turnouts. Since the start of recycled water service in the Wildomar area in 2014, the average volume-weighted TDS concentration of recycled water served in this area ranged between 620 mgl and 770 mgl, averaging 720 mgl. Because there is no assimilative capacity for degradation in the Elsinore GMZ, the reuse of this recycled water overlying the Elsinore GMZ requires mitigation. The maximum benefit SNMP is intended to address this regulatory compliance challenge.

Maximum Benefit Salt and Nutrient Management Plan for the Elsinore GMZ
In accordance with the State Board's Antidegradation Policy, Resolution No. 68-16, Regional Boards are required to define water quality objectives that prevent the degradation of water quality to protect existing high-quality waters. The operable language from Resolution No. 68-16 reads as follows:

> *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.*
>
> *Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposed 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*.

The Antidegradation Policy (Resolution No. 68-16) allows the Regional Boards some flexibility in regulating waste discharge: if it can be demonstrated that allowing degradation of water quality is to the maximum benefit of the people of California and that beneficial uses can reasonably be protected, alternative water quality limitations can be considered. In addition to the Antidegradation Policy, Regional Boards are required to consider other requirements when setting water quality objectives. CWC §13241 states:

> *Each regional board shall establish such water quality objectives in water quality control plans as in its judgment will ensure the reasonable protection of beneficial uses and the prevention of nuisance; however, it is recognized that it may be possible for the quality of water to be changed to some degree without unreasonably affecting beneficial uses. Factors to be considered by a regional board in establishing water quality objectives shall include, but not necessarily be limited to, all of the following:*
>
> *(a) Past, present, and probable future beneficial uses of water.*
> *(b) Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto.*
> *(c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area.*
> *(d) Economic considerations.*
> *(e) The need for developing housing within the region.*
> *(f) The need to develop and use recycled water.*

Together, the Antidegradation Policy and CWC §13241 can be used as the basis for developing alternative, maximum-benefit-based water quality objectives. This was first done in the Santa Ana Region as part of the 2004 Basin Plan amendment (R8-2004-0001).

To support the maximum benefit SNMP proposal and develop the technical and economic demonstrations needed to satisfy the Antidegradation Policy and CWC §13241, the District prepared TDS and nitrate concentration projections for the Elsinore GMZ to evaluate the water quality impacts of various recycled water discharge compliance alternatives (planning scenarios). The results were used to develop the final proposal for the maximum benefit SNMP for the Elsinore GMZ. The SNMP includes:

- Adopting new, maximum-benefit based TDS and nitrate objectives of 530 and 5 mgl, respectively (the current TDS and nitrate objectives are 480 and 1 mgl respectively).
- The implementation of seven maximum benefit commitments, which comprise the management plan to protect beneficial uses, to maximize recycled water reuse, to mitigate

historical and ongoing salt liabilities incurred from the exceedance of recycled water discharge permit limits at the Railroad Canyon WRF, and to mitigate any other future salt liabilities associated with recycled water reuse.

Water Quality Impacts of Recycled Water Reuse in the Elsinore GMZ

To evaluate the impact of recycled water reuse, the District used a calibrated numerical groundwater model (MODFLOW) and a numerical fate and transport model (MT3D) to evaluate the spatial and vertical distribution of TDS and nitrate concentrations in the Elsinore GMZ over the planning period of 2017 through 2050 for six planning scenarios. Attachment B of the maximum benefit SNMP proposal package to the Regional Board presents the detailed technical analysis performed by the District.

Each planning scenario is comprised of a recycled water discharge compliance plan. The scenarios are:

SCENARIO A – *District Implements its IRP without Indirect Potable Reuse and No TDS Mitigation Is Implemented for Recycled Water Compliance***.** This scenario characterizes how TDS and nitrate concentrations in the Elsinore GMZ would change over time without offsetting the District's TDS liabilities accrued through 2050. The purpose of this scenario is to provide a basis for understanding the impact of recycled water reuse, estimating the rate of change of water quality in the absence of a salt offset program, and quantifying the water quality benefit of the alternative regulatory compliance scenarios. For the water supply plan, it is assumed that the District implements all of its IRP projects, except the indirect potable reuse project. The demand that would otherwise have been met by indirect potable reuse is satisfied in this scenario with imported water from the Skinner WTP.

SCENARIO B – *District Implements its IRP without Indirect Potable Reuse and Desalts Recycled Water to Comply with the TDS Antidegradation Objective*. This scenario characterizes how TDS and nitrate concentrations in the Elsinore GMZ would change over time if the District complied with the antidegradation objectives by serving recycled water that has been treated to reduce the TDS concentration so that recycled water served for irrigation is always equal to 480 mgl. For the water supply plan, it is assumed that the District implements all of its IRP projects except the indirect potable reuse project. The demand that would otherwise have been met by indirect potable reuse is satisfied in this scenario with imported water from the Skinner WTP.

SCENARIO C – *District Implements its IRP without Indirect Potable Reuse and Desalts Groundwater to Offset its TDS Liabilities*. This scenario characterizes how TDS and nitrate concentrations in the Elsinore GMZ would change over time if the District complied with the antidegradation objectives by implementing a groundwater desalter to mitigate the District's TDS liabilities. For the analysis, it is assumed that the groundwater desalter goes online in 2020 and is operated at a capacity to completely offset the District's cumulative TDS liabilities accrued through 2050. For the water supply plan, it is assumed that the District implements all of its IRP projects except the indirect potable reuse project. The demand that would otherwise have been met by indirect potable reuse is satisfied in this scenario with imported water from the Skinner WTP.

SCENARIO D – *District Implements its IRP without Indirect Potable Reuse and Replaces Recycled Water with Imported Water*. This scenario characterizes how TDS and nitrate concentrations in the Elsinore GMZ would change over time if the District's recycled water

reuse would be abandoned and the supply replaced with imported water from the Skinner WTP. For the water supply plan, it is assumed that the District implements all of its IRP projects except the indirect potable reuse project. The demand that would otherwise have been met by indirect potable reuse is satisfied in this scenario with imported water from the Skinner WTP. From a hydrologic and salinity perspective, this scenario is nearly identical to Scenario B and was not simulated using the model.

SCENARIO E – *Create Assimilative Capacity through Maximum Benefit SNMP and District Implements its IRP, Including Indirect Potable Reuse in 2030*. This scenario characterizes how TDS and nitrate concentrations in the Elsinore GMZ would change over time if SNMP maximum benefit objectives are adopted, which creates assimilative capacity in the Elsinore GMZ and reduces the District's accrual of TDS liabilities for the use of recycled water with TDS concentrations in excess of the antidegradation objective. The District would continue to accrue TDS liabilities for the discharge or reuse of recycled water from the Railroad Canyon WRF that exceeds the TDS limitation of the discharge permit. For the water supply plan, it is assumed that the District implements all of its IRP projects, including the indirect potable reuse project. It is assumed that the indirect potable reuse project is implemented beginning in 2030 and serves as the salt offset project that will mitigate the District's historical and ongoing TDS liabilities.

SCENARIO F – *Create Assimilative Capacity through Maximum Benefit SNMP and District Implements its IRP, Including Indirect Potable Reuse after 2050*. This scenario is identical to scenario E with the exception that the indirect potable reuse project is implemented in 2050 instead of 2030. From a hydrologic and salinity perspective, this scenario is identical to Scenario A and was not simulated using the model.

These scenarios were evaluated for their water quality impacts on:

- the volume-weighted TDS concentration of the Elsinore GMZ,
- the volume-weighted TDS concentration of the District produced groundwater supply,
- the volume-weighted TDS concentration of total water supply served in the area tributary to the Elsinore GMZ, and
- the volume-weighted TDS concentration of recharge to the Elsinore GMZ.

Summary of Results
The coupled use of the MODFLOW and MT3D models produced estimates of the spatial and temporal distribution of groundwater and associated TDS and nitrate concentrations in the Elsinore GMZ. The model results were used to evaluate and compare the planning scenarios. The demonstrations are summarized in Figure 3 to Figure 7

Figure 3 shows the projected time series of the volume-weighted TDS concentration in the Elsinore GMZ for each planning scenario and compares these model results to the historical ambient water quality for 1997 through 2015.

Figure 4 shows the time series of the projected volume-weighted TDS concentration in the District's produced groundwater supply for each planning scenario. Figure 4 also compares these results to the historical TDS concentrations measured in the produced groundwater supply from 1995 through 2016.

Figure 5 shows the projected time series of the volume-weighted TDS concentration of the total water supply served in the portion of the District's service area that is tributary to the Elsinore GMZ for each planning scenario. Figure 5 also compares these results to the historical water supply used from 1995 through 2016.

Figure 6 shows the projected time series of the volume-weighted TDS concentration of all recharge sources to the GMZ for each planning scenario.

Figure 7 shows the projected volume-weighted nitrate concentration in the combined five layers of the Elsinore GMZ for each planning scenario. Figure 7 also compares these results to the historical ambient water quality determinations for 1997 through 2015.

Table 5 below summarizes the TDS results for the planning scenarios for the 2030 to 2050 projection period.

Table 5
Projected 2030 and 2050 TDS Concentrations

Result	Projection Year	Scenario A/F	Scenario B/D	Scenario C	Scenario E
Volume-Weighted TDS of Elsinore GMZ	2030	523	523	523	523
	2050	531	530	530	502
Volume-Weighted TDS of District Produced Groundwater Supply	2030	518	518	518	518
	2050	548	544	547	501
Volume-Weighted TDS of Water Supply Served in the Area Tributary to Elsinore GMZ	2030	457	457	454	453
	2050	439	439	433	411
Volume-Weighted TDS of Recharge to the Elsinore GMZ	2030	628	627	617	464
	2050	683	680	668	360

As shown in Figures 3 to Figure 6 and in Table 5, Scenario E, which assumes the implementation of the indirect potable reuse has the most immediate and positive water quality impacts for the Elsinore GMZ. More specifically, the indirect potable reuse in Scenario E decreases:

- the projected volume-weighted TDS concentration of the Elsinore GMZ from about 520 mgl in 2030 to about 500 mgl in 2050 – a decrease of nearly 20 mgl in 20 years,
- the projected volume-weighted TDS concentration of the District's produced groundwater supply from about 520 mgl in 2030 to about 500 mgl in 2050 – a decrease of nearly 20 mgl in 20 years,

- the projected volume-weighted TDS of combined water supply served in areas that are tributary to the Elsinore GMZ from about 450 mgl in 2030 to about 410 mgl in 2050 – a decrease of nearly 40 mgl in 20 years, and
- the projected volume-weighted TDS concentration of recharge to the Elsinore GMZ from about 460 mgl in 2030 to 360 mgl in 2050 – a decrease of over 100 mgl in 20 years.

Similar to the projections for the TDS concentration, as shown in Figure 7, the projected volume-weighted nitrate concentrations in the Elsinore GMZ for Scenarios A/F, B/D, and C are indistinguishable through 2050 and only increase by about 0.2 mgl over the planning period. The indirect potable reuse project in Scenario E has the effect of improving the nitrate concentration in the basin by about 0.1 mgl relative to scenarios A/F, B/D, and C. Thus, from a water supply planning and water quality standpoint, nitrate concentrations are not a concern in the Elsinore GMZ.

The results of the modeling work demonstrate that all of the options for complying with the TDS antidegradation objective of 480 mgl (Scenarios B/D and C) do not provide positive water quality impacts to the volume-weighted TDS concentrations of the Elsinore GMZ, the District's produced groundwater supply, or recharge to the GMZ. Additionally, the results demonstrate that the alternative maximum benefit regulatory compliance strategy (maximum benefit SNMP and IPR implementation) shown in Scenario E can provide significant water quality benefits to the Elsinore GMZ: it improves the TDS concentration of the groundwater supply, the total water supply, the combined recharge quality and ultimately the groundwater basin.

Complying with the 480 mgl antidegradation-based TDS objective through the direct treatment of recycled water or groundwater, or by discontinuing the reuse of recycled water will not stop the TDS degradation in the Elsinore GMZ and these compliance efforts will incur great cost, with no measurable TDS improvement over the 30-year life of a salt offset project. Regulating the TDS concentration in recycled water is costly, and so, if it provides little to no tangible benefits to groundwater quality, the water agencies responsible for water and wastewater management, or the State, then alternative compliance options that are protective of beneficial uses should be considered.

<u>Economic Consideration of the Alternative Recycled Water Compliance Strategies</u>
The costs of the various recycled water compliance alternatives were evaluated and compared and analyzed. The economic considerations included: (1) the net present value of the capital and operating costs of the facilities; (2) the environmental cost of increasing dependence on exports from the Sacramento-San Joaquin Delta, as measured by the increased use of imported water; and (3) the cost of contributing to climate change, as measured by increased energy usage and GHG emissions associated with facilities operations and increased use of imported SWP water. Attachment C of the maximum benefit SNMP proposal package provides the detailed assumptions used to prepare the economic.

Table 6 below summarizes the increases in cost, imported water usage, energy usage, and GHG emissions relative to Scenario A, which represents the likely investments in water supply projects that could be implemented by the District, excluding the proposed indirect potable reuse project and absent a regulatory requirement to offset the TDS loading from the reuse of recycled water with TDS concentrations in excess of the antidegradation objective through 2050. As was the case in the evaluation of the water quality projections, the purpose of Scenario A is to provide a basis for comparing the costs of the alternative regulatory compliance scenarios.

Table 6
Comparison of Increased Compliance Cost, Imported Water Usage, Energy Usage, and Greenhouse Gas Emissions (CO_2) Relative to Scenario A – 2018 through 2050

Scenario	Increase in Present Value Capital and O&M Costs	Increase in Imported Water Use (af)	Increase in Energy Usage (kwh)	Increase in GHG Emissions (mt)
Scenario B Compliance with Anti Degradation TDS Objective – Recycled Water Desalting	$29.4 million	2,400	28 million	8,000
Scenario C Compliance with Anti Degradation TDS Objective – Groundwater Desalting	$32 million	3,900	35 million	9,000
Scenario D Replace Recycled Water Reuse with Imported Water	$79.5 million	40,000	182 million	27,000
Scenario E Compliance with proposed Maximum Benefit TDS Objective plus IPR	-$3.5 million	-117,000	-333 million	-6,800

The assessment shows that complying with the antidegradation objectives in Scenarios B, C, and D would result in substantial increased new costs, increased energy usage, increased GHG emissions, and increased demand for imported water. The proposed maximum benefit SNMP and IPR program (Scenario E) is the only recycled water discharge and compliance strategy that reduces the District's overall cost and environmental impacts. The total annual cost to implement this scenario includes the avoided cost of importing water to meet future water demands (a negative cost or savings), the amortized capital cost of the treatment and related facilities, and the annual O&M cost. The annual energy usage and GHG emissions in Scenario E are the sum of the savings of not importing water plus the energy and GHG emissions of operating the advanced treatment facilities that will inject recycled water and subsequently extract water for indirect potable reuse.

Components of the Maximum Benefit Salt and Nutrient Management Plan

Based on the technical analysis and economic considerations, the optimal management strategy is to adopt a maximum benefit SNMP for the Elsinore GMZ. The SNMP is comprised of maximum benefit TDS and nitrate objectives and a commitment to management activities that will ensure the protection of the beneficial uses of groundwater in the Elsinore GMZ and downstream GMZs.

Maximum Benefit TDS and Nitrate Objectives

The proposed maximum benefit TDS and nitrate objectives for the Elsinore GMZ are 530 mgl and 5 mgl, respectively. These proposed objectives are based on the results of the water quality projections for the planning scenarios and the hydrological conditions of the Elsinore GMZ. Specifically, the rationales for the proposed objectives are:

- Elsinore GMZ is a closed groundwater basin and the only way salt can leave the basin is through groundwater pumping. This means that the TDS concentrations in the groundwater will increase over time and eventually approach the volume-weighted TDS concentration of the recharge to the basin, as demonstrated by the projections.

- For the planning scenarios that excluded the indirect potable reuse project during the planning period (Scenario A/F, B/D and C), the volume-weighted TDS concentration of the combined recharge to the GMZ for 2050 is approximately 670 to 680 mgl. This means that the groundwater quality of the basin will continue to degrade relative to the current volume-weighted TDS concentration of 520 mgl. By 2050, the TDS concentration of the Elsinore GMZ is projected to be 530 mgl for these planning scenarios.
- The TDS concentration projections demonstrated that even if the controllable factor that contributes to the TDS concentration of recharge to the basin (e.g. TDS concentration of outdoor water supplies) is managed through treatment of the supply sources (recycled water or groundwater) or substitute supply, there is no decrease in the TDS concentration in the Elsinore GMZ through 2050 relative to a scenario where no salt mitigation is performed (Scenario A).
- A maximum benefit TDS objective of 530 mgl represents the water quality condition that could reasonably be achieved by 2050 with the coordinated control of the factor that affect water quality in the basin (groundwater recharge).
- Downstream beneficial uses will not be impacted because:
    - the Elsinore GMZ is operated as a closed basin and has negligible groundwater outflow, and
    - the TDS limit of 700 mgl for discharges to Temescal Wash are established and will not be changed as a result of adopting the maximum benefit objective.

Maximum Benefit Commitments and Timelines

The District's commitments provide assurance to the Regional Board that the beneficial uses of Elsinore GMZ groundwater will be maintained regardless of future degradation of TDS and nitrate concentrations that will occur due to the hydrogeologic characteristics of the Basin and the quality of water sources available to the District. Table 7 below summarizes the milestones, compliance frequency, and schedules for the maximum benefit commitments. These commitments are the reasonably foreseeable methods of compliance with Basin Plan Amendment (23 CRR 3777(b)(4)(A) and (B)).

Table 7
Schedule of Milestones for the District's Maximum Benefit Commitments for Elsinore GMZ

Commitment	Milestones	Frequency	Compliance Schedule
1. Beneficial Use Protection	a. Triennial report of historical, current and future water supply and recycled water quality; the ten-year projection will include estimations of TDS and nitrate concentrations of each District water supply source and a volume-weighted projection of all sources.	Every three years	a. Initial report due by August 15, 2021, subsequent reports due every three years by August 15th
	b. If the need for treatment to meet TDS and nitrate drinking water standards is identified in the ten-year projection, the District will prepare a proposed schedule to plan, design and construct the necessary treatment facilities (treatment plan)	Once; only if triggered	b. A treatment plan will be submitted to the Executive Officer for review and approval within one year of publishing a finding of the need for treatment within the ten-year projection
	c. Implement treatment plan	Once; only if triggered	c. Upon approval of plan and schedule by Executive Officer
	d. Reporting of treatment plan implementation status	Annual, once triggered	d. May 1st (as part of Commitment 7)
	e. Report of pumping and sustainable yield	Annual	e. May 1st (as part of Commitment 7)
2. Prioritization of Recycled Water Reuse from Regional WRF to Comply with LECWA Before Initiating IPR Project.	Status report of latest recycled water planning projections for the Regional WRF, its current and projected deliveries to Lake Elsinore, and an estimate of when surplus recycled water supply will be available to initiate the indirect potable reuse program	Annual	May 1st (as part of Commitment 7)
3. Salt Mitigation Accounting	Report of monthly, annual and cumulative salt liabilities and offsets	Annual	May 1st (as part of Commitment 7)
4. Integrated Resources Plan Implementation	Status report of Integrated Resources Plan implementation	Annual	May 1st (as part of Commitment 7)
5. Salt Offset Project Plan and Implementation	a. Complete engineering design for the expansion of the Regional WRF to 12 mgd, including MBR system required to operate IPR project	Once	a. December 31, 2020 - Competed
	b. Complete construction of Regional WRF expansion to 12 mgd, including MBR system	Once	b. December 31, 2025
	c. Complete research studies on potential for arsenic leaching	Once	c. December 31, 2026
	d. When the total recycled water production at the Regional WRF reaches 8.5 mgd, start preliminary engineering and related investigations to provide the information necessary to implement the IPR project or alternative equivalent salt offset projects; and prepare a plan and schedule to construct the project by the time the Regional WRF reaches 10 mgd	Once	d. Start study when Regional WRF reaches 8.5 mgd of recycled water production Submit engineering study and project plan and schedule within 24 months of when Regional WRF reaches 8.5 mgd of recycled water production
	e. Implement the salt offset project plan	Once	e. Upon approval of the project plan and schedule by the Executive Officer
	f. Once the salt offset project plan implementation begins, prepare progress reports to the Regional Board until project startup commences	Quarterly, once triggered	f. Reporting commences upon Executive Officer approval of the project plan and schedule.
	g. Complete construction and commence operations of IPR or other salt offset	Once	g. When Regional WRP discharge reaches 10 mgd
	h. Once the salt offset project facilities are operational, report the cumulative amount of salt removed by the salt offset project, the balance of its salt mitigation obligation and a projection of the year in which the salt liability will be completely mitigated	Annual	h. May 1st (as part of Commitment 7)
6. Monitoring and Analysis	a. Prepare a monitoring and analysis program work plan that is consistent with the State Board's 2019 Recycled Water Policy	Once	a. within 90 days of OAL adoption of the Maximum Benefit Salinity Management Plan
	b. Implement monitoring program work plan	Ongoing	b. Within 60 days of approval of plan by Executive Officer
	c. Periodic update of monitoring plan	As-requested	c. As requested by the Executive Officer
7. Reporting	Annual report of compliance with the Maximum Benefit Commitments	Annual	First report completed by May 1st following OAL adoption of the Maximum Benefit Salinity Management Plan, and every May 1st each year thereafter

The District's commitments are further described in details below, including a description of the milestones and schedule to achieve compliance with each commitment.

1. **Beneficial Use Protection.** The District will ensure that there will be no impairment of beneficial uses of the Elsinore GMZ or downstream GMZs. To accomplish this, the District will sustainably produce groundwater from the Elsinore GMZ, consistent with the newly enacted Sustainable Groundwater Management Act, and will not reduce its groundwater pumping to a volume that is less than the sustainable yield as TDS and/or nitrate concentrations in the Elsinore GMZ increase over time. The District will not abandon the use of Elsinore GMZ groundwater due to the cost of TDS and nitrate treatment. The District will accomplish this by constructing treatment facilities, as necessary, to treat groundwater to ensure that the TDS and nitrate concentrations in the water served to its customers meets drinking water standards. This will be done as follows:

    a. Every three years, the District will prepare a triennial report for the Regional Board that describes its historical, current, and projected water supply and wastewater discharge operations and quality. The objectives of the report are to: demonstrate the nexus between the District's water supply and recycled water quality, characterize water and recycled water supply and quality trends over time, and prepare a ten-year projection of the TDS and nitrate concentrations of each District water supply source and a volume-weighted projection of all sources. The water supply quality projections will be based on monitoring data or groundwater model projections at the discretion of the District. Each report will identify if there is a projected need for new groundwater treatment in the ten-year projection period. The first triennial report will be due by August 15, 2021 and every three years thereafter by August 15th, unless relieved of this commitment by the Executive Officer.
    b. If the need for treatment to meet TDS and nitrate drinking water standards is identified in the ten-year projection, the District will prepare a proposed schedule to plan, design and construct the necessary treatment facilities (treatment plan). The treatment plan will be submitted to the Executive Officer for review and approval within one year of publishing the finding in the triennial report.
    c. When the treatment plan is approved by the Executive Officer, the District will begin its implementation pursuant to the schedule in the approved treatment plan.
    d. The District will prepare an annual progress report that describes the activities of the prior year to implement the treatment plan. Once triggered, the reporting done pursuant to this commitment will be included in the annual maximum benefit report described in Commitment 7 below.
    e. Each year, as part of the annual report of the maximum benefit salinity management plan (Commitment 7 below), the District will provide the Regional Board with (1) data on its historical, current and planned pumping from the Elsinore GMZ and (2) a comparison of average pumping to the most current estimation of the sustainable yield of the basin, and (3) to the extent that the current or planned average pumping is less than the sustainable yield of the Basin, the District will provide detailed information as to why the beneficial use of the Basin is not being maximized and will provide a schedule for resuming an average pumping level that is consistent with the sustainable yield.

2. **Prioritization of Recycled Water Reuse from Regional WRF to Comply with LECWA before Initiating Indirect Potable Reuse Project.** The District proposes to use its planned IPR project to inject advanced-treated recycled water from the Regional WRF into the Elsinore

GMZ to offset its legacy and ongoing salt liabilities. The Regional WRF currently produces about 6.0 mgd: 0.5 mgd of which is discharged to Temescal Wash to maintain riparian habitat, and 5.5 mgd is discharged to Lake Elsinore to help maintain surface water elevation pursuant to the District's agreement with the City of Lake Elsinore under the Lake Elsinore Comprehensive Water Management Agreement or LECWA. The target lake water level pursuant to the LECWA is 1240 ft. Recent studies indicate that the long-term average discharge required to maintain the Lake at or above 1240 feet is about 7.5 mgd. A minimum of 2.5 mgd of effluent is required to operate the IPR project. Thus, to meet the commitment to the LECWA, the IPR project cannot be operated until the total effluent from the Regional WRF reaches at least to 10 mgd. Current planning projections for growth in the District's service area indicate that there should be 10 mgd of recycled water produced at the Regional WRF to operate the IPR project starting in 2035. As the District service area grows, the new recycled water supply will first be needed to maintain surface water levels in Lake Elsinore to comply with the LECWA. The recycled water produced in excess of that required for compliance with the LECWA will be prioritized for the IPR project.

a. Each year, as part of the annual report of the maximum benefit salinity management plan (Commitment 7), the District will provide the Regional Board with the latest planning information available with regards to recycled water production projections for the Regional WRF, its current and projected deliveries to Lake Elsinore, and an estimate of when surplus recycled water supply will be available to initiate the indirect potable reuse program.

3. **Salt Mitigation Accounting**. The District will track its monthly, annual, and cumulative salt mitigation requirements and report on them annually to the Regional Board as part of its annual reporting commitment (Commitment 7). The salt liability will be accounted as follows:
   a. The District will prepare an accounting of the TDS mitigation requirements that resulted from exceedances of the Railroad Canyon (RRC) discharge limitation from January 1, 2004[6] through July 1, 2014.[7] The mitigation requirement is calculated based on the mass of TDS in excess of the RRC permit limit of 700 mgl for the entire volume of recycled water produced by the plant over this period.
   b. The District will prepare an accounting of the TDS mitigation requirements that resulted from the reuse of all sources of recycled water used in the watershed tributary to the Elsinore GMZ that were in excess of the antidegradation objective from July 1, 2014[8] through (*date of Office of Administrative Board [OAL] adoption of Maximum Benefit objectives*). The mitigation requirement is calculated based on the mass of TDS in excess of the antidegradation objective of 480 mgl.
   c. The District will prepare an accounting of the TDS mitigation requirements for the balance of the recycled water produced at the RRC WRF that was not used in the watershed tributary to the Elsinore GMZ from July 1, 2014 through (*date of OAL adoption of Maximum Benefit objectives*). The mitigation requirement is calculated based on the mass of TDS in excess of the RRC permit limit of 700 mgl.
   d. As of (*date of OAL adoption of Maximum Benefit objectives*), the District will prepare and maintain an ongoing accounting of the continued salt mitigation requirements that

[6] This is the effective date of the Basin Plan amendment that incorporated the current antidegradation objectives for the Elsinore GMZ.
[7] The accounting starts on July 1, 2014 because this is the effective date of the finding of no assimilative capacity in the Elsinore GMZ per the 2012 Ambient Water Quality findings.
[8] The accounting starts on July 1, 2014 because this is the effective date of the finding of no assimilative capacity in the Elsinore GMZ per the 2012 Ambient Water Quality findings.

accumulate from ongoing exceedances of the RRC discharge limitation and report them to the Regional Board. The mitigation requirement is calculated based on the mass of TDS in excess of 700 mgl for the entire volume of recycled water produced by the plant.

e. No offsets will be required for the reuse of imported recycled water sources as of (*date of OAL adoption of Maximum Benefit objectives*) so long as assimilative capacity exists in the Elsinore GMZ. Once assimilative capacity is used up (e.g. when the ambient TDS concentration equals or exceeds 530 mgl), the mitigation requirement is calculated based on the mass of TDS in excess of the maximum benefit objective of 530 mgl.
f. Once a Regional Board-approved salt mitigation project is initiated (indirect potable reuse or other), the District will prepare and maintain an ongoing accounting of the mitigation credits attributable to the project and the cumulative remaining offset obligation.

4. **Integrated Resources Plan Implementation.** The District will aggressively pursue the suite of nine water supply projects identified in its IRP and apprise the Regional Board of its progress in the annual maximum benefit report described in Commitment 7 below. It is the intent of the District to use its planned indirect potable reuse project, which will inject low-TDS advanced treated water to the Elsinore GMZ, as the salt offset project to mitigate the salt obligations accrued pursuant to Commitment Number 3 as soon as there is sufficient recycled water production at the Regional WRP to support the LECWA commitments and the IPR project (e.g. when recycled water production is 10 mgd).

5. **Salt Offset Project Plan and Implementation.** The District will complete construction and commence its salt offset project once the total recycled water production at its Regional WRF reaches 10 mgd. The project will be designed to completely offset the District's cumulative and ongoing salt mitigation obligations. This will be done as follows:
   a. No later than December 31, 2020, the District will complete the design for the expansion of the Regional WRF to 12 mgd, which will include a Membrane Bioreactor (MBR) system that will be required to operate the IPR project.
   b. No later than December 31, 2025, the District will complete an expansion of the Regional WRF to 12 mgd, including construction of the MBR system that will be required to operate the IPR project.
   c. No later than December 31, 2026, the District will complete a study on the potential for arsenic leaching as a result of the planned indirect potable reuse project. These research studies need to be conducted prior to design and construction of the indirect potable reuse project.
   d. Once the recycled water production at the Regional WRF reaches 8.5 mgd, the District will start preliminary engineering and related investigations to provide the information necessary to implement the IPR project or alternative equivalent salt offset projects (such as a groundwater desalter). At the completion of the study, the District will prepare a schedule to complete project construction by the time the Regional WRF is producing 10 mgd of recycled water. The engineering study and project plan and schedule must be submitted to the Regional Board within 24 months of when the Regional WRF reaches 8.5 mgd of recycled water production.
      i. If indirect potable reuse is the proposed salt offset project alternative, it will be designed to completely offset the District's historical salt liabilities within 10 years of initiating the project.
      ii. If a desalter or other equivalent treatment alternative is the approved salt offset project alternative, it will be designed to completely offset the District's historical salt liabilities within 30 years of initiating the project.
   e. Implement the salt offset project plan upon approval by the Executive Officer.

f. Once the salt offset project plan implementation begins, the District will prepare and submit quarterly progress reports to the Regional Board until project startup commences. These reports will summarize technical and related findings, achievement of milestones, schedule status and actions being taken to ensure compliance with the schedule in the approved salt offset project plan.
g. Complete construction and commence operations of IPR or other salt offset project when recycled water production at the Regional WRF reaches 10 mgd.
h. Once the salt offset project facilities are operational, the District will document the monthly amount of salt mitigated by the project. Each year, the District will report the cumulative amount of salt removed by the salt offset project, the balance of its salt mitigation obligation and a projection of the year in which the salt liability will be completely mitigated. The reporting done pursuant to this commitment will be included in the annual maximum benefit report described in Commitment 7 below.

6. **Monitoring and Analysis.** The District will conduct monitoring, investigations, and report results in a manner that is consistent with the State Water Resources Control Board's 2019 Recycled Water Policy.
   a. The District will prepare a monitoring and analysis program work plan and submit it to the Regional Board within 90 days of (*date of OAL adoption of Maximum Benefit objectives*). The work plan will address the requirements of the State Board's 2019 Recycled Water Policy, including: a description of the methodologies for assessing current groundwater quality (e.g. ambient water quality) and assessing impacts of recycled water reuse in the Elsinore GMZ; the data collection and monitoring required to perform the water quality assessments; and a schedule for analysis and reporting.
   b. The monitoring and assessment program will be implemented within 60 days of the Executive Officer's approval of the work plan.
   c. The monitoring plan will be updated, as appropriate, subject to approval of the Executive Officer.

7. **Reporting**. The District will prepare an annual report of activities performed pursuant to the maximum benefit salinity management plan by May 1st of each year. The first annual report will be submitted on the May 1st following OAL adoption of the Maximum Benefit Salinity Management Plan. The annual report will include a detailed status report of compliance with each maximum benefit commitment, including the specific information referenced in each commitment's description above. The reporting schedule will be updated, as appropriate, subject to approval of the Executive Officer.

E. SURROUNDING LAND USES AND SETTING

Figure 1 shows the boundaries of the Elsinore GMZ, its tributary watershed, and the Elsinore Valley Municipal Water District's (District) recycled water systems that lies within these boundaries, including its three water reclamation facilities (WRFs) that treat wastewater generated in its service area. According to the District's 2016 Urban Water Management Plan (UWMP),[9] the population of the District's service area was about 149,300 persons in 2015, and is projected to grow to 238,300 persons in 2040, or by an increase of 59.6%. The 2016 UWMP also demonstrated that the General Plan Land Use shows parcels that are currently vacant or will be developed per specific plan. Approximately two-thirds of the total area within the District's service area was vacant in 2015.

[9] http://leapshydro.com/wp-content/uploads/2017/11/Urban-Water-Management-Plan-2016.pdf

The City of Lake Elsinore, which encompasses the majority of the Elsinore GMZ, was founded in 1883. With the construction of the Atchison, Topeka, & Santa Fe Railroad and the discovery of mineral ores in the late 19th century, the population began to increase significantly to the lake area. Early settlers in the valley subsisted on ranching and farming. Even at the height of its tourist season, the region's agricultural activities remained in peak production. The farmers in the area grew olives, grapes, apricots, and other produce. Many people also visited the newly created town of Elsinore looking for recreational opportunities, which helped to stimulate its tourist industry. However, the area does not have a significant seasonal influx of visitors, beyond those using the lake for day use, at present.

Below is a table extracted from the City of Lake Elsinore General Plan Environmental Impact Report (EIR) that shows the existing land uses within the City Boundaries and Sphere of Influence (SOI), which overlaps with a majority of the Elsinore GMZ. Land uses within the City have shifted from agricultural uses at the City's founding to a more mixed-use development with limited agricultural uses at present. However, as indicated in the table below, in 2005, over 59% of the City and SOI consisted of vacant land, which is consistent, if lower than the average vacant land within the District's service area.

Table 3.1-1, Existing Land Uses within City Boundaries and Sphere of Influence

	CITY		SPHERE OF INFLUENCE	
EXISTING LAND USE	ACRES	% OF TOTAL	ACRES	% OF TOTAL
Agriculture	215.1	0.8	649.6	1.4
Commercial	420.1	1.5	473.7	1.0
Institutional	253.1	0.9	372.3	0.8
Manufacturing/Industrial	1,066.8	3.9	1,328.9	2.9
Parks/Open Space	582.3	2.1	647.9	1.4
Public/Utility	141.0	0.5	148.6	0.3
Residential	4,633.4	17.0	7,875.3	17.1
Transportation	462.9	1.7	569.2	1.2
Vacant	16,134.7	59.1	30,473.6	66.1
Water	3,368.4	12.3	3,551.2	7.7
Total	**27,277.9**	**100.0**	**46,090.4**	**100.0**
Source: Southern California Association of Governments 2005				

F. SPECULATIVE DISCUSSION OF FUTURE ACTIONS

At this time and in the foreseeable future, it is assumed that no physical implementation actions are required to improve TDS or nitrate concentration within the Elsinore GMZ. The implementation of the SNMP is likely to result in the construction of facilities to reduce the TDS concentration in the source water or recycled water, should it be necessary to construct these facilities in the future, the District would prepare a project-level CEQA document discussing the impacts under each category of the Initial Study Checklist, and would address associated mitigation measures

of the individual projects. An evaluation of the impacts that could result from construction of any such facilities would be speculative, and is therefore not included in the analysis herein.

G. ENVIRONMENTAL CHECKLIST

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agriculture and Forestry Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Energy
☐ Geology / Soils	☐ Greenhouse Gas Emissions	☐ Hazards & Hazardous Materials
☐ Hydrology & Water Quality	☐ Land Use / Planning	☐ Mineral Resources
☐ Noise	☐ Population / Housing	☐ Public Services
☐ Recreation	☐ Transportation	☐ Tribal Cultural Resources
☐ Utilities / Service Systems	☐ Wildfire	☐ Mandatory Findings of Significance

EVALUATION OF ENVIRONMENTAL IMPACTS:

1. The board must complete an environmental checklist prior to adoption of plans or policies. The checklist becomes a part of the SED.

2. For each environmental category in the checklist, the Board must determine whether the project will cause any adverse impact. If there are potential impacts that are not included in the sample checklist, those impacts should be added to the checklist.

3. If the board determines that a particular adverse impact may occur as a result of the project, then the checklist boxes must indicate whether the impact is “Potentially Significant”, “Less than Significant with Mitigation Incorporated”, or “Less than Significant”. “Potentially Significant Impact” applies if there is substantial evidence that an effect may be significant. If there are one or more “Potentially Significant Impact” entries on the checklist, the SED must include an “EIR” level analysis. “Less than Significant with Mitigation Incorporated” applies where the incorporation of mitigation measures will reduce an effect from “Potentially Significant Impact” to a “Less than Significant Impact”. The board must either require the specific mitigation measures or be certain of their application by another agency. “Less than Significant” applies if the impact will not be significant, and mitigation is not required. If there will be no impact, check the box under “No impact.”

4. The board must provide a brief explanation for the checked boxes on the checklist. The explanations may be included in the written report described in the Water Boards’ regulations for implementation of CEQA, 23 CCR §3777(a)(1), or in the checklist itself. The explanation of each issue should identify: (a) the significance criteria or threshold, if any, used to evaluate each question and (b) the specific mitigation measure(s) identified, if any, to reduce the impact to less than significance. The board may determine the significance of the impact by considering factual evidence or agency standards or thresholds. If the “No Impact” box is checked, the board should briefly describe the basis for that determination.

5. The board must include mandatory findings of significance if required under CEQA Guidelines §15065.

6. The board should provide references used to identify potential impacts, including a list of information sources and individuals contacted.

The environmental analysis must include an analysis of the reasonably foreseeable environmental impacts of the Basin Plan Amendment (including reasonably foreseeable significant adverse environmental impacts associated with reasonably foreseeable methods of compliance with the amendment) and reasonably foreseeable feasible mitigation measures relating to those impacts.

In answering the checklist questions, this section evaluates the impacts of amending the Basin Plan to establish antidegradation water quality objectives for the Elsinore GMZ and incorporate the SNMP for the Elsinore GMZ. It also evaluates, in a general manner, the impacts of the District's proposed environmental commitments associated with its proposed actions outlined as part of the SNMP.

Potential reasonably foreseeable impacts were evaluated with respect to aesthetics, agricultural resources, air quality, biological resources, cultural resources, energy, geology and soils, greenhouse gas, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, traffic and transportation, tribal cultural resources, utilities and service systems, and wildfire. Additionally, mandatory findings of significance regarding short-term, long-term, cumulative and substantial impacts were evaluated.

A significant effect on the environment is defined in regulations as a "substantial or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. A social or economic change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant." (14 CCR 15382)

A significant effect on the environment is defined in statute as "a substantial, or potentially substantial, adverse change in the environment" where "environment" is defined by Public Resources Code §21060.5 as "the physical conditions which exist within the area which will be affected by a proposed project, including air, water, minerals, flora, fauna, noise, objects of historic or aesthetic significance."

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
I. AESTHETICS: Except as provided in Public Resources Code Section 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning or other regulations governing scenic quality?	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

SUBSTANTIATION

a. *No Impact* – The proposed SNMP is comprised of maximum benefit TDS and nitrate objectives and a commitment to management activities that will ensure the protection of the beneficial uses of groundwater in the Elsinore GMZ and downstream GMZs. The SNMP actions are clerical in nature, consisting of the following: tracking and reporting of cumulative salt liabilities; reporting on progress towards implementation of the District's IRP, reporting on progress towards maximizing the use of recycled water for environmental enhancements, the development of a salt offset project plan when triggered (including progress reports as to the status of the trigger actions); and preparation and implementation of a water quality monitoring and reporting program. As discussed further under Section X, Hydrology and Water Quality, the beneficial uses of Elsinore GMZ groundwater will be maintained, and thus no visual changes are anticipated to occur from raising the maximum benefit objectives for TDS and nitrate to 530 mgl and 5 mgl, respectively. Therefore, given that there are no visual changes that would result from implementing the proposed SNMP, the project would have no potential to have a substantial adverse effect on a scenic vista.

b. *No Impact* – As stated under issue I(a) above, the proposed SNMP actions are clerical in nature. Given that under SNMP, the beneficial uses of Elsinore GMZ groundwater will be maintained, no scenic resources, including trees, rocks or outcroppings that would be impacted by implementation of the proposed SNMP within the Elsinore GMZ (shown on Figure 3). Interstate 15—which is considered to be an eligible state scenic highway that has not been officially designated by the California Department of Transportation[10]— traverses the Elsinore GMZ. No historic buildings will be impacted by the SNMP, and as Interstate 15 and Highway 74 are not designated as official State of California scenic highways, no impacts will occur within a scenic highway corridor from implementation of the SNMP.

c. *No Impact* – As stated under issue I(a) above, the SNMP is generally clerical in nature, and no significant impacts to the Elsinore GMZ are anticipated to occur because the beneficial uses of Elsinore GMZ groundwater will be maintained; therefore, no visual changes are anticipated to occur from raising the maximum benefit objectives for TDS and nitrate to 530 mgl and 5 mgl, respectively.

[10] https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways

Thus, no conflicts with applicable zoning or other regulations governing scenic quality of the SNMP area would occur.

d. *No Impact* – As stated under issue I(a) above, the proposed SNMP actions are clerical in nature. The proposed SNMP is comprised of maximum benefit TDS and nitrate objectives and a commitment to management activities that will ensure the protection of the beneficial uses of groundwater in the Elsinore GMZ and downstream GMZs. Adoption of the proposed SNMP and Basin Plan Amendment would not result in any physical changes to the environment, as no physical changes have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time that would create a new source of light or glare.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
II. AGRICULTURE AND FORESTRY RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

SUBSTANTIATION

a. *No Impact* – According to the California Department of Conservation Important Farmland Finder (Figure II-1), the Elsinore GMZ are does not contain a significant amount of Farmland; only one contiguous parcel of land is located within the Elsinore GMZ, and it is designated as Farmland of Statewide Importance. Should the Regional Board adopt the proposed maximum benefit objectives for TDS and nitrate for the Elsinore GMZ, the availability of a reliable and economic water supply would not change, and therefore would not impact agricultural land within the GMZ area. The SNMP actions are clerical in nature, consisting of the following: tracking and reporting of cumulative salt liabilities; reporting on progress towards implementation of the District's IRP, reporting on progress towards maximizing the use of recycled water for environmental enhancements, the development of a salt offset project plan when triggered (including progress reports as to the status of the trigger actions); and preparation and implementation of a water quality monitoring and reporting program. As discussed further under Section X, Hydrology and Water Quality, the beneficial uses of Elsinore

GMZ groundwater will be maintained, and thus no physical changes have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time that would impact land containing agricultural resources would occur. Therefore, implementation of the SNMP would not convert Prime Farmland, Unique Farmland or Farmland of Statewide Importance to non-agricultural use. No impacts are anticipated and no mitigation is required.

b. *No Impact* – According to the Riverside County Williamson Act map (Figure II-2), there is are no Williamson Act Non-Prime Agricultural Lands within the Elsinore GMZ. Should the Regional Board adopt the District's proposed maximum benefit objectives for TDS and nitrate, the availability of a reliable and economic water supply would not change, and therefore would not impact agricultural land within the GMZ area. As stated under issue I(a) above, the proposed SNMP actions are clerical in nature. Given that under SNMP, the beneficial uses of Elsinore GMZ groundwater will be maintained, no impacts to Williamson Act land would occur from implementation of the SNMP.

c. *No Impact* – No forest land or timberland exists within the Elsinore GMZ. Therefore, implementation of the SNMP has no potential to conflict with existing zoning for, or cause rezoning of, forest land or timberland. No impacts are anticipated and no mitigation is required.

d. *No Impact* – No forest land or timberland exists within the Elsinore GMZ. Therefore, implementation of the SNMP has no potential to result in the loss of forest land or conversion of forest land to non-forest use. No impacts are anticipated and no mitigation is required.

e. *No Impact* – Please refer to the discussions under II(a-d) above. Implementation of the SNMP would have no potential to result in conversion of Farmland, to non-agricultural use, and given that no forestland exists within the Elsinore GMZ, conversion of forest land to non-forest use. No impacts are anticipated and no mitigation is required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☐	☒
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☐	☒

SUBSTANTIATION:

a. *No Impact* – A project is deemed inconsistent with air quality plans if it would result in population and/or employment growth that exceeds growth estimates included in applicable air quality management plans. The 2016 Air Quality Management Plan (AQMP) was adopted by the South Coast Air Quality Management District (SCAQMD) Board in March, 2017. The AQMP is based on general plans from local jurisdictions, which includes the City of Lake Elsinore and County of Riverside General Plans. The AQMP accounts for development that would occur as a result of implementation of these local general plans. The proposed Project is consistent with the AQMP in that it would continue to accommodate development approved in these general plans. Therefore, no impacts to the AQMP from implementation of the SNMP are anticipated and no mitigation is required.

b. *No Impact* – The air quality in a region is considered to be in attainment by the state if the measured ambient air pollutant levels for O3, CO (except 8-hour Lake Tahoe), SO2, NO2, PM10, PM2.5, and visible reducing particles are not to be exceeded at any time in any consecutive three-year period; all other values are not to be equaled or exceeded. The air quality in a region is considered to be in attainment by federal standards if the measured ambient air pollutant levels for O3, PM10, PM2.5, and those based on annual averages or arithmetic mean are not exceeded more than once per year. The Table below outlines the attainment status of the air pollutants in the South Coast Air Basin (SCAB):

Table III-1
ATTAINMENT STATUS OF CRITERIA POLLUTANTS IN THE SOUTH COAST AIR BASIN

Criteria Pollutants	State Designations	Federal Designation
Ozone – 1 hour standard	Nonattainment	--
Ozone – 8 hour standard	Nonattainment	Nonattainment
PM_{10}	Nonattainment	Attainment
$PM_{2.5}$	Nonattainment	Nonattainment
Carbon Monoxide	Attainment	Unclassifiable/Attainment
Nitrogen Dioxide	Attainment	Unclassifiable/Attainment
Sulfur Dioxide	Unclassifiable/Attainment	Unclassifiable/Attainment
Lead[1]	Attainment	Unclassifiable/Attainment

[1] The Federal nonattainment designation for lead is only applicable towards the Los Angeles County portion of the SCAB.

The proposed SNMP is comprised of maximum benefit TDS and nitrate objectives and a commitment to management activities that will ensure the protection of the beneficial uses of groundwater in the Elsinore GMZ and downstream GMZs. The SNMP actions are clerical in nature, consisting of the following: tracking and reporting of cumulative salt liabilities; reporting on progress towards implementation of the District's IRP, reporting on progress towards maximizing the use of recycled water for environmental enhancements, the development of a salt offset project plan when triggered (including progress reports as to the status of the trigger actions); and preparation and implementation of a water quality monitoring and reporting program The efforts required to implement the SNMP would not require construction, result in an increase in traffic, or otherwise require any physical actions that have been sufficiently defined that would generate emissions of criteria pollutants, as none are proposed to meet the Elsinore GMZ SNMP at this time. Therefore, the SNMP would have a less than significant potential to result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard. No mitigation is required.

c. *No Impact* – Please refer to the discussions under III(b) above. Implementation of the SNMP would have no potential to result in any physical actions that have been sufficiently defined that would generate emissions that would impact sensitive receptors, as none are proposed to meet the Elsinore GMZ SNMP at this time. Therefore, the proposed project would have no potential to expose sensitive receptors to substantial pollutant concentrations.

d. *No Impact* – Please refer to the discussions under III(b) above. Implementation of the SNMP would have no potential to result in any physical actions that have been sufficiently defined that would generate odor or other emissions that would adversely affect a substantial number of people, as none are proposed to meet the Elsinore GMZ SNMP at this time and because the SNMP is generally clerical in nature, comprised of maximum benefit TDS and nitrate objectives and a commitment to management activities that will ensure the protection of the beneficial uses of groundwater in the Elsinore GMZ and downstream GMZs. Therefore, no impacts under this issue are anticipated and no mitigation is required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
IV. BIOLOGICAL RESOURCES: Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☒	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☒	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

SUBSTANTIATION: The data from the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) gathered for the Alberhill, CA, and, Lake Elsinore, CA USGS Quadrangles is provided as Appendix 2 to this document.

a. *Less Than Significant Impact* – The CNDDB data gathered for the USGS Quadrangles that correspond to the proposed project indicate that there are several threatened and endangered species that have been identified on a Federal and State level within the quadrangles in which the Elsinore GMZ is located. The CNDDB data is provided as Appendix 2 to this document. The proposed SNMP is comprised of maximum benefit TDS and nitrate objectives and a commitment to management activities that will ensure the protection of the beneficial uses of groundwater in the Elsinore GMZ and downstream GMZs. The SNMP actions are clerical in nature, consisting of the following: tracking and reporting of cumulative salt liabilities; reporting on progress towards implementation of the District's IRP, reporting on progress towards maximizing the use of recycled water for environmental enhancements, the development of a salt offset project plan when triggered (including progress reports as to the status of the trigger actions); and preparation and implementation of a water quality monitoring and reporting program. Given that the SNMP is generally clerical in nature, and that no significant impacts to the Elsinore GMZ are anticipated to occur because the beneficial uses of Elsinore GMZ groundwater will be maintained, the Project would not result in any change in water quality that might adversely affect wildlife or wildlife habitat, nor would the Project

result in a reduction in the availability of water to candidate, sensitive or special-status species when compared to the existing environmental setting. Therefore, the proposed SNMP would have a less than significant potential to have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or U.S. Fish and Wildlife Service.

b. *Less Than Significant Impact* – Please refer to the discussion under IV(a) above. Given that the SNMP is generally clerical in nature, and that no significant impacts to the Elsinore GMZ are anticipated to occur because the beneficial uses of Elsinore GMZ groundwater will be maintained, the Project would not result in any change in water quality that might adversely affect wildlife or wildlife habitat, nor would the Project result in a reduction in the availability of water when compared to the existing environmental setting. Therefore, the proposed SNMP would have a less than significant potential to have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

c. *Less Than Significant Impact* – Please refer to the discussion under IV(a) above. As stated above, the Project would not result in any change in water quality that might adversely affect wetland, nor would the Project result in a reduction in the availability of water that might support wetlands when compared to the existing environmental setting. Therefore, the proposed SNMP would have a less than significant potential to have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

d. *No Impact* – Please refer to the discussion under IV(a) above. As stated above, the Project would not result in any change in water quality that might adversely affect wildlife and thereby impact wildlife movement, nor would the Project result in a reduction in the availability of water that might support wildlife movement when compared to the existing environmental setting. Therefore, the proposed SNMP would have no potential to impact movement of wildlife within the Elsinore GMZ. No mitigation is required.

e. *No Impact* – Please refer to the discussion under IV(a) above. As stated above, the Project would not result in any change in water quality that might adversely affect wildlife and thereby impact biological resources, nor would the Project result in a reduction in the availability of water that might support such habitat or species when compared to the existing environmental setting. Therefore, the proposed SNMP would have no potential to conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance within the Elsinore GMZ. No mitigation is required.

f. *No Impact* – Please refer to the discussions under IV(a) and IV(e) above. As stated above, the Project would not result in any change in water quality that might adversely affect wildlife and thereby impact biological resources, nor would the Project result in a reduction in the availability of water that might support such habitat or species when compared to the existing environmental setting. Therefore, the proposed SNMP would have no potential to conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan within the Elsinore GMZ. No mitigation is required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
V. CULTURAL RESOURCES: Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☐	☒
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒

SUBSTANTIATION

a. *No Impact* – As previously stated, the proposed SNMP is comprised of maximum benefit TDS and nitrate objectives and a commitment to management activities that will ensure the protection of the beneficial uses of groundwater in the Elsinore GMZ and downstream GMZs. The SNMP actions are clerical in nature, consisting of the following: tracking and reporting of cumulative salt liabilities; reporting on progress towards implementation of the District's IRP, reporting on progress towards maximizing the use of recycled water for environmental enhancements, the development of a salt offset project plan when triggered (including progress reports as to the status of the trigger actions); and preparation and implementation of a water quality monitoring and reporting program.. Given that the SNMP is generally clerical in nature, and that no significant impacts to the Elsinore GMZ are anticipated to occur because the beneficial uses of Elsinore GMZ groundwater will be maintained, the Project would not include any activities that would impact a historical resource. Given that implementation of the SNMP would not involve construction, earth movement, or other disturbance which could impact any structures—as there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time—no impacts to historical resources are anticipated and no mitigation is required.

b. *No Impact* – Please refer to the discussion under V(a), above. As stated above, the Project would not include any activities that would impact archaeological resources. Given that implementation of the SNMP would not involve construction, earth movement, or other disturbance which could impact any buried cultural resources—as there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time—no impacts to archaeological resources are anticipated and no mitigation is required.

c. *No Impact* – Please refer to the discussions under V(a) or V(b), above. The SNMP does not include any activities that would require ground disturbance or excavation—as there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time—and therefore the SNMP is not anticipated to have any potential to disturb human remains. No impacts are anticipated under this issue and no mitigation is required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
VI. ENERGY: Would the project:				
a) Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operations?	☐	☐	☐	☒
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒

SUBSTANTIATION

a. *No Impact* – As previously stated, the proposed SNMP is comprised of maximum benefit TDS and nitrate objectives and a commitment to management activities that will ensure the protection of the beneficial uses of groundwater in the Elsinore GMZ and downstream GMZs. The SNMP actions are clerical in nature, consisting of the following: tracking and reporting of cumulative salt liabilities; reporting on progress towards implementation of the District's IRP, reporting on progress towards maximizing the use of recycled water for environmental enhancements, the development of a salt offset project plan when triggered (including progress reports as to the status of the trigger actions); and preparation and implementation of a water quality monitoring and reporting program. The SNMP does not include any activities that would require consumption of energy. Given that the SNMP is generally clerical in nature, and that no significant impacts to the Elsinore GMZ are anticipated to occur because the beneficial uses of Elsinore GMZ groundwater will be maintained, the Project would not consume electricity or other energy resources beyond those which occur under the current environmental setting within the Elsinore GMZ. Given that implementation of the SNMP would not require any new energy consumptive actions—as there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time—the SNMP would have no potential to result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operations; no impacts are anticipated and no mitigation is required.

b. *No Impact* – Please refer to the discussion under VI(a), above. The proposed SNMP is comprised of maximum benefit TDS and nitrate objectives and a commitment to management activities that will ensure the protection of the beneficial uses of groundwater in the Elsinore GMZ and downstream GMZs. The SNMP is generally clerical in nature, and no physical components of the project are proposed that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time, therefore, the proposed project does not include any activities that would consume energy. No applicable plans or policies related to renewable energy or energy efficiency would apply to the proposed SNMP; therefore, no impacts under this issue are anticipated.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
VII. GEOLOGY AND SOILS: Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
(i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
(ii) Strong seismic ground shaking?	☐	☐	☐	☒
(iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
(iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in onsite or offsite land-slide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒

SUBSTANTIATION

a.(i) *No Impact* – The California Department of Conservation Geologic Survey maps Alquist-Priolo Earthquake Fault Zones, which are regulatory zones that encompass surface traces of active faults that have a potential for surface fault rupture. There are several delineated Alquist-Priolo Special Study Zones within the area defined as the Elsinore GMZ. However, the Alquist-Priolo Earthquake Fault Zoning Act generally was adopted to prevent the construction of structures used for human occupancy on the surface trace of active faults. The proposed SNMP is comprised of maximum benefit TDS and nitrate objectives and a commitment to management activities that will ensure the protection of the beneficial uses of groundwater in the Elsinore GMZ and downstream GMZs. The SNMP actions are clerical in nature, consisting of the following: tracking and reporting of cumulative salt liabilities; reporting on progress towards implementation of the District's IRP, reporting on progress towards maximizing the use of recycled water for environmental enhancements, the development of a salt offset project plan when triggered (including progress reports as to the

status of the trigger actions); and preparation and implementation of a water quality monitoring and reporting program. Given that the SNMP is generally clerical in nature, and that no significant impacts to the Elsinore GMZ are anticipated to occur because the beneficial uses of Elsinore GMZ groundwater will be maintained, the SNMP is not anticipated to result in any human safety risks related to fault rupture. As such, given that there are no structures and no ground disturbance proposed as part of the SNMP, implementation of the SNMP would have no potential to expose persons to risk of loss, injury, or death involving rupture of an earthquake fault. No mitigation is required.

a.(ii) *No Impact* – The Elsinore GMZ, as with most of California, is located within a seismically active area that is subject to groundshaking during the life of the proposed SNMP. Please refer to the discussion under VII(a[i]), above. The SNMP does not include any construction activities, no physical components of the project have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time that would result in any human safety risks related to seismic ground-shaking. As such, given that there are no structures proposed as part of the SNMP, implementation of the SNMP would have no potential to expose persons to risk of loss, injury, or death involving seismic related ground shaking. No mitigation is required.

a.(iii) *Less Than Significant Impact* – Soil liquefaction occurs in water-saturated unconsolidated soils affected by seismic waves, which cause ground vibrations during earthquakes. The potential for liquefaction in an area depends on a number of factors including the following: the intensity of the earthquake; the soil type and the density of such soils; and the depth of the groundwater. During liquefaction, soils lose strength and ground failure may occur. Secondary ground failures associated with liquefaction include lateral spreading or flowing of stream banks or fills, sand boils, and subsidence. According to the City of Lake Elsinore General Plan EIR, Geology and Soils Chapter map portraying Liquefaction Susceptibility in Lake Elsinore Area (Figure VII-1), which covers the whole of the Elsinore GMZ, liquefaction susceptibility within the planning area ranges from very low in the former lake footprint to high, to moderate on portions of the remainder of the valley floor, to very high in the valley floor corridor formerly occupied by the axial riverine drainage. Liquefaction potential is also very high along the area's principal tributary drainages and on portions of the alluvial fans on the valley's eastern margin.[11] Implementation of the SNMP would not result in any actions that would interfere with groundwater such that liquefaction would cause lateral spreading or flowing of stream banks or fills, sand boils, and subsidence. As such, because the proposed SNMP does not include the development of any new structures—as there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time—implementation of the SNMP would have a less than significant potential to directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving liquefaction. No mitigation is required.

a.(iv) *No Impact* – Landslides can be caused by steep, bare, slopes; clay-rich rock; deposits of stream or river sediment; and heavy rains. The potential for landslide to occur within the Elsinore GMZ, according to the City of Lake Elsinore General Plan EIR, Geology and Soils Chapter, is high, given that a substantial proportion of the City and its sphere-of-influence contain slopes of 30 percent or steeper, and much of that area is therefore, at substantial risk of seismically induced slope failure. The SNMP does not include any construction activities—as there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time—that would result in any human safety risks related to landslide. Furthermore, implementation of the SNMP would not result in any actions that would interfere with groundwater such that slope instability would occur. As such, given that there are no structures proposed as part of the SNMP, implementation of the SNMP would have no potential to expose persons to risk of loss, injury, or death involving landslide. No mitigation is required.

b. *No Impact* – Please refer to the discussions under VII(a[i-iv]), above. The SNMP does not include any construction or other earthmoving activities—as there are no physical components of the project

[11] http://www.lake-elsinore.org/home/showdocument?id=7228

that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time—that would result in any human safety risks related to seismic ground-shaking. As such, given that there are no structures proposed as part of the SNMP, implementation of the SNMP would have no potential to expose persons to risk of loss, injury, or death involving seismic related ground shaking. No mitigation is required.

c. *Less Than Significant Impact* – The proposed SNMP is comprised of maximum benefit TDS and nitrate objectives and a commitment to management activities that will ensure the protection of the beneficial uses of groundwater in the Elsinore GMZ and downstream GMZs. The SNMP actions are clerical in nature, consisting of the following: tracking and reporting of cumulative salt liabilities; reporting on progress towards implementation of the District's IRP, reporting on progress towards maximizing the use of recycled water for environmental enhancements, the development of a salt offset project plan when triggered (including progress reports as to the status of the trigger actions); and preparation and implementation of a water quality monitoring and reporting program. Please refer to the discussion under issue VII(a[iii]), the potential for liquefaction in an area depends on a number of factors including the depth of the groundwater. Implementation of the SNMP would not result in any actions that would interfere with groundwater such that liquefaction would cause lateral spreading or flowing of stream banks or fills, sand boils, and subsidence. As such, there are no structures and no ground disturbance proposed as part of the SNMP—as there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time—therefore, the adoption of the SNMP would not involve construction or other earthmoving activities on a geologic unit or soil that is unstable or would become unstable, potentially resulting in landslides, lateral spreading, subsidence, liquefaction, or collapse. Furthermore, the stability of the groundwater basin will not change as a result of the SNMP, and therefore no potential for the project to cause groundwater-related geologic instability would occur.

d. *No Impact* – As previously stated, the proposed SNMP is comprised of maximum benefit TDS and nitrate objectives and a commitment to management activities that will ensure the protection of the beneficial uses of groundwater in the Elsinore GMZ and downstream GMZs. The proposed SNMP does not include the development of any new structures—as there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time—therefore, no structures would be located on expansive soil such that substantial risks to life or property would occur. No impacts under this issue are anticipated and no mitigation is required.

e. *No Impact* – As previously stated, the proposed SNMP is comprised of maximum benefit TDS and nitrate objectives and a commitment to management activities that will ensure the protection of the beneficial uses of groundwater in the Elsinore GMZ and downstream GMZs. No alternative wastewater disposal systems are proposed as part of the SNMP, and therefore, no impacts under this issue are anticipated and no mitigation is required.

f. *No Impact* – As previously stated, the proposed SNMP is comprised of maximum benefit TDS and nitrate objectives and a commitment to management activities that will ensure the protection of the beneficial uses of groundwater in the Elsinore GMZ and downstream GMZs. The SNMP does not include any activities that would require ground disturbance or excavation—as there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time—therefore, implementation of the SNMP is not anticipated to affect paleontological resources or unique geological features. No impacts are anticipated under this issue and no mitigation is required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
VIII. GREENHOUSE GAS EMISSIONS: Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☐	☒
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

SUBSTANTIATION

Global Climate Change (GCC) is defined as the change in average meteorological conditions on the earth with respect to temperature, precipitation, and storms. Many scientists believe that the climate shift taking place since the industrial revolution (1900) is occurring at a quicker rate and magnitude than in the past. Scientific evidence suggests that GCC is the result of increased concentrations of greenhouse gases in the earth's atmosphere, including carbon dioxide, methane, nitrous oxide, and fluorinated gases. Many scientists believe that this increased rate of climate change is the result of greenhouse gases resulting from human activity and industrialization over the past 200 years.

An individual project, such as the proposed Elsinore GMZ SNMP cannot generate enough greenhouse gas emissions to effect a discernible change in global climate. However, the Project may participate in the potential for GCC by its incremental contribution of greenhouse gasses combined with the cumulative increase of all other sources of greenhouse gases, which when taken together constitute potential influences on GCC.

a & b. *No Impact* – As previously stated, the proposed SNMP is comprised of maximum benefit TDS and nitrate objectives and a commitment to management activities that will ensure the protection of the beneficial uses of groundwater in the Elsinore GMZ and downstream GMZs. The SNMP actions are clerical in nature, consisting of the following: tracking and reporting of cumulative salt liabilities; reporting on progress towards implementation of the District's IRP, reporting on progress towards maximizing the use of recycled water for environmental enhancements, the development of a salt offset project plan when triggered (including progress reports as to the status of the trigger actions); and preparation and implementation of a water quality monitoring and reporting program. The SNMP is generally clerical in nature and therefore does not involve any groundbreaking activities, generation of new traffic, or otherwise require any physical actions that have been sufficiently defined that would generate or other activities that could generate greenhouse gas emissions, as none are proposed to meet the Elsinore GMZ SNMP at this time. Therefore, the project would have no potential to generate significant greenhouse gas emissions or conflict with a plan, policy, or regulation intended to reduce greenhouse gas emissions. No mitigation is required.

	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply	Potentially Significant Impact
IX. HAZARDS AND HAZARDOUS MATERIALS: Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☒

SUBSTANTIATION

a. *No Impact* – As previously stated, the proposed SNMP is comprised of maximum benefit TDS and nitrate objectives and a commitment to management activities that will ensure the protection of the beneficial uses of groundwater in the Elsinore GMZ and downstream GMZs. The SNMP actions are clerical in nature, consisting of the following: tracking and reporting of cumulative salt liabilities; reporting on progress towards implementation of the District's IRP, reporting on progress towards maximizing the use of recycled water for environmental enhancements, the development of a salt offset project plan when triggered (including progress reports as to the status of the trigger actions); and preparation and implementation of a water quality monitoring and reporting program. The SNMP is generally clerical in nature, and therefore would not involve the transport, use, disposal, release, or transmission of hazardous materials. Therefore, implementation of the proposed SNMP would have no potential to create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

b. *No Impact* – Please refer to the discussion above under issue IX(a). The SNMP is generally clerical in nature, and therefore would not involve the transport, use, disposal, release, or transmission of hazardous materials. Therefore, given that the proposed project would not involve the use of hazardous materials in order to implementation of the proposed SNMP, no potential exists for the

SNMP to create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. No impacts are anticipated, and no mitigation is required.

c. *No Impact* – Please refer to the discussion above under issue IX(a). The SNMP is generally clerical in nature, and therefore would not involve the transport, use, disposal, release, or transmission of hazardous materials. Therefore, given that the proposed project would not involve the use of hazardous materials in order to implementation of the proposed SNMP, no potential exists for the SNMP to emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

d. *No Impact* – Please refer to the discussion above under issue IX(a). The SNMP is generally clerical in nature. According to the California State Water Board's GeoTracker website (consistent with Government Code Section 65962.5), which provides information regarding Leaking Underground Storage Tanks (LUST), there are several open, closed, and remediated LUST cases of groundwater and/or soils contamination within the Elsinore GMZ[12]. There are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time that would create a significant hazard to the public or environment as a result of nearby hazardous material sites. Furthermore, the beneficial uses of Elsinore GMZ groundwater will be maintained, and thus no changes in the environment related to open cleanup sites are anticipated to occur from raising the maximum benefit objectives for TDS and nitrate to 530 mgl and 5 mgl, respectively. Therefore, the project would have no potential to create a significant hazard to the public or environment as a result of nearby hazardous material sites.

e. *No Impact* – The Elsinore GMZ is not located within an airport land use plan or within two miles of a public airport or within the vicinity of a private airstrip. Furthermore, the SNMP is generally clerical in nature, therefore no impacts are anticipated under this issue and no mitigation is required.

f. *No Impact* – Please refer to the discussion above under issue IX(a). The SNMP is generally clerical in nature, and therefore has no physical components that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time that could impair implementation of or otherwise physically interfere with an adopted emergency plan or emergency evacuation plan. Furthermore, the beneficial uses of Elsinore GMZ groundwater will be maintained, and thus no changes in the environment related to traffic or emergency response are anticipated to occur from raising the maximum benefit objectives for TDS and nitrate to 530 mgl and 5 mgl, respectively. Therefore, the implementation of the SNMP would have no impacts under this issue. No mitigation is required.

g. *No Impact* – Please refer to the discussion above under issue IX(a). The Lake Elsinore foothills have been historically subject to wildfires. No structures are proposed as part of the SNMP, and therefore no actions that would occur as part of SNMP implementation would expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires. Therefore, no impacts are anticipated to occur under this issue and no mitigation is required.

[12] http://geotracker.waterboards.ca.gov/

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
X. HYDROLOGY AND WATER QUALITY: Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☐	☒	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	☐	☐	☐	☒
(i) result in substantial erosion or siltation onsite or offsite?	☐	☐	☐	☒
(ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding onsite or offsite?	☐	☐	☐	☒
(iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?; or,	☐	☐	☐	☒
(iv) impede or redirect flood flows?	☐	☐	☐	☒
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

SUBSTANTIATION: Much of the data presented below can be found in the Project Description above; it is presented here secondarily to support the impact analysis for this section of the document.

a. *Less Than Significant Impact* – Adoption of the proposed amendment would change the Basin Plan objective for TDS and nitrate in the Elsinore GMZ. The TDS objective would be increased from 480 to 530 mgl and the nitrate objective would increase from 1 to 5 mgl. The increase in the Basin Plan objectives will create assimilative capacity that is allocated to the District to allow the use of recycled water with TDS concentrations that exceed existing antidegradation objectives for irrigation in the watershed tributary to and overlying the Elsinore GMZ. The Basin Plan amendment will not change the existing TDS or nitrate discharge limitations in any of the District's recycled water discharge and reuse permits.

As described in the Project Description, regardless of the project alternative that is implemented, the District will be unable to comply with the discharge limitation of 700 mgl established for the Railroad Canyon WRF. The proposed project includes a salt offset program to mitigate the TDS loading to the Elsinore GMZ that results from the discharge and reuse of recycled water from the Railroad Canyon WRF when its TDS concentration exceeds 700 mgl. It requires the District to compute and offset salt

liabilities and annually report the salt offsetting progress and activities to the Regional Board pursuant to the maximum benefit commitment number 5.

The District's indirect potable reuse program as described in the Project Description above will reduce the volume-weighted TDS and nitrate concentrations and improve groundwater quality of the Elsinore GMZ in the long-term. As part of the maximum benefit commitments, the District will implement its salt offset project to recharge low-TDS, advanced treated water, to the Elsinore GMZ to completely mitigate its cumulative and ongoing salt mitigation obligations due to the reuse and discharge of all sources of recycled water with TDS concentrations over the respective limits for those sources/uses.

Therefore, the adoption of this amendment would not result in any unmitigated impacts from the reuse of recycled water. And, it is projected that the proposed quality standards will be met in the groundwater basin in the long-term when the program is fully implemented. As such, implementation of the maximum benefit SNMP for the Elsinore GMZ will have less than significant potential to substantially degrade groundwater quality of the GMZ.

b. *Less Than Significant Impact* – Adoption of the proposed amendment would change the Basin Plan objective TDS and nitrate in the Elsinore GMZ to 530 mgl and 5 mgl, respectively. The District's commitments as part of the implementation of the maximum benefit SNMP include ensuring that there will be no impairment of beneficial uses of the Elsinore GMZ or downstream GMZs. To accomplish this, the District will sustainably produce groundwater from the Elsinore GMZ, consistent with the newly enacted Sustainable Groundwater Management Act and Elsinore GMZ's estimated safe yield regardless of increase in TDS and/or nitrate concentrations over time. The District will not abandon the use of Elsinore GMZ groundwater due to the cost of TDS and nitrate treatment. Eventually, through a separate CEQA process, the District will expand the existing regional wastewater reclamation facility to increase recycled water flow and/or construct water treatment facilities as necessary to treat groundwater to ensure that the TDS and nitrate concentrations in the water served to its customers meet the proposed water quality objectives. The District will accomplish this as part of the clerical procedures that would be established by the SNMP. Therefore, adoption of this amendment would not change the circumstances surrounding groundwater recharge within the Elsinore GMZ or involve other activities that could impede sustainable groundwater management of the basin. As such, implementation of the Elsinore GMZ SNMP will have a less than significant potential to substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.

c(i). *No Impact* – Adoption of the proposed amendment would change the Basin Plan objective for TDS and nitrate in the Elsinore GMZ to 530 mgl and 5 mgl, respectively. The SNMP actions are clerical in nature, consisting of the following: tracking and reporting of cumulative salt liabilities; reporting on progress towards implementation of the District's IRP, reporting on progress towards maximizing the use of recycled water for environmental enhancements, the development of a salt offset project plan when triggered (including progress reports as to the status of the trigger actions); and preparation and implementation of a water quality monitoring and reporting program. As discussed further above under issue X(a), the beneficial uses of Elsinore GMZ groundwater will be maintained, and thus no physical changes have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time that would alter drainage within the area would occur. Therefore, implementation of the SNMP would have no potential to substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site. No mitigation is required.

c(ii). *No Impact* – Adoption of the proposed amendment would change the Basin Plan objective for TDS and nitrate in the Elsinore GMZ to 530 mgl and 5 mgl, respectively. The SNMP actions are clerical in nature and as discussed further above under issue X(a), the beneficial uses of Elsinore GMZ groundwater will be maintained, and thus no physical changes have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time that would alter drainage within the area would occur. Therefore, implementation of the SNMP would have no potential to alter the course

of a stream or river in a manner that would result in substantially increasing the rate or amount of surface runoff in a manner that would result in flooding on- or off-site. No mitigation is required.

c(iii). *No Impact* – Adoption of the proposed amendment would change the Basin Plan objective for TDS and nitrate in the Elsinore GMZ to 530 mgl and 5 mgl, respectively. The SNMP actions are clerical in nature. As discussed further above under issue X(a), the beneficial uses of Elsinore GMZ groundwater will be maintained, and thus no physical changes have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time that would alter drainage or create a source of runoff within the area would occur. Therefore, implementation of the SNMP would have no potential to create or contribute runoff which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff. No impacts are anticipated, and no mitigation is required.

c(iv). *No Impact* – Adoption of the proposed amendment would change the Basin Plan objective for TDS and nitrate in the Elsinore GMZ to 530 mgl and 5 mgl, respectively. The SNMP actions are clerical in nature. As discussed further above under issue X(a), the beneficial uses of Elsinore GMZ groundwater will be maintained, and thus no physical changes have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time that would alter drainage within the area would occur. Therefore, implementation of the SNMP would have no potential to impede or redirect flows. No impacts under this issue are anticipated and no mitigation is required.

d. *No Impact* – Adoption of the proposed amendment would change the water quality objective for TDS and nitrate to 530 mgl and 5 mgl, respectively, in the Elsinore GMZ. The SNMP actions are clerical in nature. As discussed further above under issue X(a), the beneficial uses of Elsinore GMZ groundwater will be maintained, and thus, though the Elsinore GMZ contains Lake Elsinore, which may be susceptible to seiche under certain circumstances, the SNMP does not propose any structures, and therefore would not risk release of pollutants from inundation. Furthermore, given that the SNMP is generally clerical in nature, it does not propose the use of any pollutants would could be released in the event of a flood hazard or seiche inundation. Therefore, no impacts are anticipated under this issue. No mitigation is required.

e. *Less Than Significant Impact* – The implementation of the SNMP enables and improves the implementation of the Regional Board's water quality control plan and will provide information that could be useful in preparing sustainable groundwater management plans. Currently the groundwater quality objectives defined for the Elsinore GMZs in the Bain Plan are 480 mgl for TDS and 1 mgl for nitrate. The SNMP would ensure that the District participates in the Task Force efforts and will adopt and implement TDS management strategies that are consistent with any new Regional Board management plan. Ultimately, implementation of the Basin Plan Objectives for the Elsinore SNMP, together with the District's maximum benefit Commitments, would facilitate the incorporation of new objectives to the Basin Plan, which, as stated throughout this environmental evaluation, would not result in any significant environmental impacts.

Implementation of the SNMP includes adopting new, maximum-benefit based TDS and nitrate objectives of 530 and 5 mgl, respectively, and the implementation of seven maximum benefit commitments as previously discussed. Ultimately, the District's commitments provide assurance to the Regional Board that the beneficial uses of Elsinore GMZ will be maintained and any changes to the groundwater quality in the GMZ is consistent to the maximum benefit of the people of the State. Therefore, though the SNMP involves adopting new maximum-benefit based TDS and nitrate objectives for the Elsinore GMZ, and incorporation of the proposed SNMP management actions into the Basin Plan, these actions are not anticipated to cause a significant impact to the groundwater basin. Impacts under this issue are considered less than significant.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XI. LAND USE AND PLANNING: Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

SUBSTANTIATION

a. *No Impact* – Implementation of the SNMP includes adopting new, maximum-benefit based TDS and nitrate objectives of 530 and 5 mgl, respectively, and the following actions which are clerical in nature: tracking and reporting of cumulative salt liabilities; reporting on progress towards implementation of the District's IRP, reporting on progress towards maximizing the use of recycled water for environmental enhancements, the development of a salt offset project plan when triggered (including progress reports as to the status of the trigger actions); and preparation and implementation of a water quality monitoring and reporting program. The SNMP is generally clerical in nature, and therefore would not result in any new construction or other changes that could physically divide an established community. Therefore, no impacts under this issue are anticipated and no mitigation is required.

b. *No Impact* – The adoption of the SNMP would change the Basin Plan objectives for TDS and nitrate in the Elsinore GMZ. The adoption of the proposed amendment would meet statutory and regulatory water quality standards, and would remove an inconsistency, thereby ensuring that the water quality objective can be met. The amendment would not establish any new uses nor would they otherwise conflict with any land use plan, policy, or regulation. Therefore, no impacts under this issue are anticipated and no mitigation is required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XII. MINERAL RESOURCES: Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

SUBSTANTIATION:

a&b. *No Impact* – According to the California Department of Conservation California Geological Survey Mineral Lands Classification[13], there are some mineral resources within the Elsinore GMZ. The SNMP is comprised of maximum benefit TDS and nitrate objectives and a commitment to management activities that will ensure the protection of the beneficial uses of groundwater in the Elsinore GMZ and downstream GMZs. As such, given that the SNMP is generally clerical in nature, there is no construction proposed and there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time that could potentially result in impacts to mineral resources. Thus, it is not anticipated that any mineral resources would be impacted as a result of implementation of the SNMP. Therefore, the project would have no potential to result in the loss of availability of valuable mineral resources or result in the loss of availability of a locally important mineral resource recovery site.

[13] http://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=regulatorymaps

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XIII. NOISE: Would the project result in:				
a) Generation of a substantial temporary noise levels in the vicinity of a project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☒
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

SUBSTANTIATION

a. *No Impact* – The SNMP actions are clerical in nature, consisting of the following: tracking and reporting of cumulative salt liabilities; reporting on progress towards implementation of the District's IRP, reporting on progress towards maximizing the use of recycled water for environmental enhancements, the development of a salt offset project plan when triggered (including progress reports as to the status of the trigger actions); and preparation and implementation of a water quality monitoring and reporting program. Ultimately, adoption of this amendment would not involve construction, a change in land use or an increase in traffic generation, or other noise generating activities—as there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time—that would result in temporary or permanent increase in noise levels. Therefore, implementation of the SNMP would have no potential to generate substantial temporary noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. No mitigation is required.

b. *No Impact* – Implementation of the SNMP includes adopting new, maximum-benefit based TDS and nitrate objectives of 530 and 5 mgl, respectively, and the implementation of the following actions which are clerical in nature: tracking and reporting of cumulative salt liabilities; reporting on progress towards implementation of the District's IRP, reporting on progress towards maximizing the use of recycled water for environmental enhancements, the development of a salt offset project plan when triggered (including progress reports as to the status of the trigger actions); and preparation and implementation of a water quality monitoring and reporting program. . Ultimately, adoption of this amendment would not involve construction or ground-borne vibration or ground-borne noise generating activities—as there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time—that would result in temporary or permanent increase in ground-borne noise levels. Therefore, implementation of the SNMP would have no potential to result in generation of excessive groundborne vibration or ground-borne noise levels. No mitigation is required.

c. *No Impact* – The Elsinore GMZ is not located within an airport land use plan or within two miles of a public airport or is not located within two miles of a private airstrip, therefore the project would not have the potential to expose people residing or working in the area to excessive noise levels as a result of being located near an airport or private airstrip. Therefore, no impacts are anticipated under this issue and no mitigation is required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XIV. POPULATION AND HOUSING: Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

SUBSTANTIATION

a. *No Impact* – Implementation of the SNMP includes adopting new, maximum-benefit based TDS and nitrate objectives of 530 and 5 mgl, respectively, and the implementation of the following actions which are clerical in nature: tracking and reporting of cumulative salt liabilities; reporting on progress towards implementation of the District's IRP, reporting on progress towards maximizing the use of recycled water for environmental enhancements, the development of a salt offset project plan when triggered (including progress reports as to the status of the trigger actions); and preparation and implementation of a water quality monitoring and reporting program. The SNMP is generally clerical in nature and is not anticipated to result in the creation of any new jobs or otherwise result in population growth within the Elsinore GMZ area. As such, implementation of the SNMP would have no potential to directly or indirectly induce substantial population growth. Therefore, no impacts under this issue are anticipated and no mitigation is required.

b. *No Impact* – The adoption of the SNMP would change the Basin Plan objectives for TDS and nitrate in the Elsinore GMZ. The SNMP is generally clerical in nature and is not anticipated to result in any construction or development that could displace substantial numbers of people or housing within the Elsinore GMZ area because there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time. As such, implementation of the SNMP would have no potential to displace housing or persons. Therefore, no impacts under this issue are anticipated and no mitigation is required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XV. PUBLIC SERVICES: Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered govern-mental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
a) Fire protection?	☐	☐	☐	☒
b) Police protection?	☐	☐	☐	☒
c) Schools?	☐	☐	☐	☒
d) Parks?	☐	☐	☐	☒
e) Other public facilities?	☐	☐	☐	☒

SUBSTANTIATION

a. *No Impact* – As previously stated, the proposed SNMP is comprised of maximum benefit TDS and nitrate objectives and a commitment to management activities that will ensure the protection of the beneficial uses of groundwater in the Elsinore GMZ and downstream GMZs. The SNMP actions are clerical in nature, consisting of the following: tracking and reporting of cumulative salt liabilities; reporting on progress towards implementation of the District's IRP, reporting on progress towards maximizing the use of recycled water for environmental enhancements, the development of a salt offset project plan when triggered (including progress reports as to the status of the trigger actions); and preparation and implementation of a water quality monitoring and reporting program. The SNMP is generally clerical in nature, and therefore would not involve construction and there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time that could affect service ratios, response times, or other performance objectives for fire protection services. Therefore, implementation of the proposed SNMP would have no potential to result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives pertaining to fire protection. No mitigation is required.

b. *No Impact* – Please refer to the discussion under XV(a), above. Implementation of the SNMP includes adopting new maximum-benefit based TDS and nitrate objectives of 530 and 5 mgl, respectively, and the implementation of seven maximum benefit commitments. The SNMP is generally clerical in nature, and therefore would not involve construction and there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time that could affect service ratios, response times, or other performance objectives for police protection services. Therefore, implementation of the proposed SNMP would have no to potential result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives pertaining to police protection. No mitigation is required.

c. *No Impact* – Please refer to the discussion under XV(a), above. Implementation of the SNMP includes adopting new maximum-benefit based TDS and nitrate objectives of 530 and 5 mgl, respectively, and

the implementation of seven maximum benefit commitments. The SNMP is generally clerical in nature, and therefore would not involve construction and there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time that could affect performance objectives for school services. Therefore, implementation of the proposed SNMP would have no potential to result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives pertaining to schools. No mitigation is required.

d. *No Impact* – Please refer to the discussion under XV(a), above. Implementation of the SNMP includes adopting new maximum-benefit based TDS and nitrate objectives of 530 and 5 mgl, respectively, and the implementation of seven maximum benefit commitments. The SNMP is generally clerical in nature, and therefore would not involve construction, and there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time that could affect performance objectives for parks. Therefore, implementation of the proposed SNMP would have no potential to result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives pertaining to parks. No mitigation is required.

e. *No Impact* – Please refer to the discussion under XV(a), above. Implementation of the SNMP includes adopting new maximum-benefit based TDS and nitrate objectives of 530 and 5 mgl, respectively, and the implementation of seven maximum benefit commitments. The SNMP is generally clerical in nature, and therefore would not involve construction and there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time that could affect performance objectives for other public services such as libraries. Therefore, implementation of the proposed SNMP would have no potential to result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives pertaining to other public services, such as libraries. No mitigation is required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XVI. RECREATION:				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

SUBSTANTIATION

a. *No Impact* – Please refer to the discussion under XV(d), above. Implementation of the SNMP includes adopting new maximum-benefit based TDS and nitrate objectives of 530 and 5 mgl, respectively, and the implementation of seven maximum benefit commitments. The SNMP is generally clerical in nature, and as there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time, implementation of the SNMP would not induce new growth to the region that could result in an increase in the use of existing neighborhood and regional parks or other recreational facilities. Therefore, implementation of the proposed SNMP would have no potential to increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. No mitigation is required.

b. *No Impact* – Please refer to the discussion under XV(d), above. Implementation of the SNMP includes adopting new maximum-benefit based TDS and nitrate objectives of 530 and 5 mgl, respectively, and the implementation of seven maximum benefit commitments. The SNMP is generally clerical in nature, as there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time. Furthermore, the SNMP does not include recreation facilities or construction or expansion of recreational facilities. Therefore, implementation of the proposed SNMP would have no potential to include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment. No mitigation is required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XVII. TRANSPORTATION: Would the project:				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☐	☒
b) Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	☐	☒
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous inter-sections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
d) Result in inadequate emergency access?	☐	☐	☐	☒

SUBSTANTIATION

a. *No Impact* – Implementation of the SNMP includes adopting new maximum-benefit based TDS and nitrate objectives of 530 and 5 mgl, respectively, and the following actions which are clerical in nature: tracking and reporting of cumulative salt liabilities; reporting on progress towards implementation of the District's IRP, reporting on progress towards maximizing the use of recycled water for environmental enhancements, the development of a salt offset project plan when triggered (including progress reports as to the status of the trigger actions); and preparation and implementation of a water quality monitoring and reporting program. Ultimately, the SNMP is generally clerical in nature and adoption of this amendment would not involve construction, a change in land use or an increase in traffic generation, or otherwise interrupt the circulation system because there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time. Therefore, implementation of the SNMP would have no potential to conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities. No mitigation is required.

b. *No Impact* – Implementation of the SNMP includes adopting new maximum-benefit based TDS and nitrate objectives of 530 and 5 mgl, respectively, and the implementation of seven maximum benefit commitments. As stated above, the SNMP is generally clerical in nature and adoption of this amendment would not involve traffic of any kind as there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time; therefore, implementation of the SNMP would not contribute to the vehicle miles travelled in the Elsinore GMZ area. Therefore, the proposed project would be consistent with CEQA Guidelines section 15064.3, subdivision (b). No mitigation is required.

c. *No Impact* – Implementation of the SNMP includes adopting new maximum-benefit based TDS and nitrate objectives of 530 and 5 mgl, respectively, and the implementation of seven maximum benefit commitments. As stated above, the SNMP is generally clerical in nature and adoption of this amendment would not involve traffic of any kind because there are no physical components of the project that have been sufficiently defined—and none are proposed to meet the Elsinore GMZ SNMP at this time—implementation of the SNMP would not result in development such that hazards due to a design feature or incompatible use would occur. Therefore, the implementation of the project would have no potential to substantially increase hazards due to a design feature. No mitigation is required.

d. *No Impact* – Implementation of the SNMP includes adopting new maximum-benefit based TDS and nitrate objectives of 530 and 5 mgl, respectively, and the implementation of seven maximum benefit commitments. As stated above, the SNMP is generally clerical in nature and adoption of this amendment would not involve generation of traffic of any kind and would not result in development

of any kind because there are no physical components of the project that have been sufficiently defined—and none are proposed to meet the Elsinore GMZ SNMP at this time—such that inadequate emergency access would occur at any location within the Elsinore GMZ area. Therefore, the implementation of the project would have no potential result in inadequate emergency access. No mitigation is required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XVIII. TRIBAL CULTURAL RESOURCES: Would the project cause a substantial change in the significance of tribal cultural resources, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to the California Native American tribe, and that is:				
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☐	☐	☒
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☐	☒

SUBSTANTIATION

a & b. *No Impact* – The Santa Ana RWQCB contacted four tribes that are culturally affiliated with the project area, pursuant to AB 52, on June 4, 2020. These four tribes are: Pechanga Band of Mission Indians, Rincon Band of Luiseño Indians, Soboba Band of Luiseño Indians, and Agua Caliente Band of Cahuilla Indians. In the 30-day consultation period between June 4, 2020, and July 3, 2020, no responses were received from any of the four tribes by the Santa Ana RWQCB, as such, AB 52 consultation has concluded with no comment from any tribe affiliated with the project area.

As previously stated, the proposed SNMP is comprised of maximum benefit TDS and nitrate objectives and a commitment to management activities that will ensure the protection of the beneficial uses of groundwater in the Elsinore GMZ and downstream GMZs. The SNMP actions are clerical in nature, consisting of the following: tracking and reporting of cumulative salt liabilities; reporting on progress towards implementation of the District's IRP, reporting on progress towards maximizing the use of recycled water for environmental enhancements, the development of a salt offset project plan when triggered (including progress reports as to the status of the trigger actions); and preparation and implementation of a water quality monitoring and reporting program. Given that the SNMP is generally clerical in nature, and that no significant impacts to the Elsinore GMZ are anticipated to occur because the beneficial uses of Elsinore GMZ groundwater will be maintained, the project would not include any activities that would impact a tribal cultural resource because there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time. Given that implementation of the SNMP would not involve construction, earth movement, or other disturbance which could impact any tribal cultural resources, no impacts to tribal cultural resources are anticipated and no mitigation is required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XIX. UTILITIES AND SERVICE SYSTEMS: Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment, or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☐	☒
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☒	☐
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☒	☐
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☐	☒
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

SUBSTANTIATION

a. *No Impact* – Adoption of the proposed amendment would change the Basin Plan objective for TDS and nitrate in the Elsinore GMZ to 530 mgl and 5 mgl, respectively. The District's commitments as part of the implementation of the maximum benefit SNMP include ensuring that there will be no impairment of beneficial uses of the Elsinore GMZ or downstream GMZs. To accomplish this, the District will sustainably produce groundwater from the Elsinore GMZ, consistent with the newly enacted Sustainable Groundwater Management Act, and will not reduce its groundwater pumping to a volume that is less than the sustainable yield as TDS and/or nitrate concentrations in the Elsinore GMZ increase over time. At this time, the SNMP does not propose any facilities to reduce the TDS or nitrate concentration in the source water or recycled water used in the Elsinore GMZ. Eventually, through a separate CEQA process, the District will expand the existing regional wastewater reclamation facility to increase treatment capacity and, if triggered, construct water treatment facilities to treat groundwater to ensure that the TDS and nitrate concentrations in the water served to its customers meet the proposed water quality objectives. Should it be necessary to construct these facilities in the future, the District would prepare a project-level CEQA evaluation discussing the impacts from constructing a new water treatment facility, as well as identifying any required mitigation measures. Therefore, adoption of this amendment would not require or result in the relocation or construction of new or expanded water or wastewater treatment facilities. As such, implementation of the Elsinore GMZ SNMP will have no potential to require or result in the relocation or construction of new or expanded water or wastewater treatment, the construction or relocation of which could cause significant environmental effects.

Given that the SNMP is generally clerical in nature, no stormwater, electricity, natural gas, or telecommunication facilities will be required to support the SNMP action items. The SNMP is not anticipated to result in any indirect construction of new or expanded stormwater, electric power,

natural gas, or telecommunications facilities. Therefore, no impacts related to new or expanded electric power, natural gas, or telecommunications facilities are anticipated under this issue and no mitigation is required.

b. *Less Than Significant Impact* – Please refer to the discussion under X(b), Hydrology and Water Quality. Adoption of the proposed amendment would change the Basin Plan objective for TDS and nitrate in the Elsinore GMZ to 530 mgl and 5 mgl, respectively. The District's commitments as part of the implementation of the maximum benefit SNMP include ensuring that there will be no impairment of beneficial uses of the Elsinore GMZ or downstream GMZs. The District will not abandon the use of Elsinore GMZ groundwater due to the cost of TDS and nitrate treatment. Eventually, through a separate CEQA process, the District will expand the existing regional wastewater reclamation facility to increase treatment capacity and, if triggered construct water treatment facilities as necessary to treat groundwater to ensure that the TDS and nitrate concentrations in the water served to its customers meet the proposed water quality objectives. The District will accomplish this as part of the clerical procedures that would be established by the SNMP. Therefore, adoption of this amendment would not change the circumstances surrounding availability of water supply within the Elsinore GMZ or involve other activities that could impact the projected availability of water supply. As such, implementation of the Elsinore GMZ SNMP will have a less than significant potential to adversely impact the availability of water supply to serve the project area and reasonably foreseeable future development during normal, dry and multiple dry years. Therefore, impacts under this issue are considered less than significant, and no mitigation is required.

c. *Less Than Significant Impact* – Please refer to the discussion under X(b), Hydrology and Water Quality, and XIX(b), above. Adoption of the proposed amendment would change the Basin Plan objective for TDS and nitrate in the Elsinore GMZ to 530 mgl and 5 mgl, respectively. The District's commitments as part of the implementation of the maximum benefit SNMP include ensuring that there will be no impairment of beneficial uses of the Elsinore GMZ or downstream GMZs. Eventually, through a separate CEQA process, the District will expand the existing regional wastewater reclamation facility to increase treatment capacity and, if triggered, construct water treatment facilities as necessary to treat groundwater to ensure that the TDS and nitrate concentrations in the water served to its customers meet the proposed water quality objectives. The District will accomplish this as part of the clerical procedures that would be established by the SNMP. Therefore, adoption of this amendment would not adversely impact the ability for the wastewater treatment provider to meet its commitments; in fact, the proposed SNMP would facilitate the planning required for the District to treat wastewater to meet future demand as their service area continues to grow. As such, implementation of the Elsinore GMZ SNMP will have a less than significant potential to result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments. Therefore, impacts under this issue are considered less than significant, and no mitigation is required.

d. *No Impact* – Implementation of the SNMP includes adopting new maximum-benefit based TDS and nitrate objectives of 530 and 5 mgl, respectively, and the following actions which are clerical in nature: tracking and reporting of cumulative salt liabilities; reporting on progress towards implementation of the District's IRP, reporting on progress towards maximizing the use of recycled water for environmental enhancements, the development of a salt offset project plan when triggered (including progress reports as to the status of the trigger actions); and preparation and implementation of a water quality monitoring and reporting program. Ultimately, the SNMP is generally clerical in nature and adoption of this amendment would not involve new construction or other activities that could increase solid waste generation or otherwise affect landfill capacities because there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time. Therefore, implementation of the SNMP would have no potential to generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals. No mitigation is required.

e. *No Impact* – Implementation of the SNMP includes adopting new, maximum-benefit based TDS and nitrate objectives of 530 and 5 mgl, respectively. As stated in XIX(d), the SNMP actions are clerical in nature and these actions are not anticipated to generate any solid waste; therefore, with no physical components of the project that have been sufficiently defined, and none proposed to meet the Elsinore GMZ SNMP at this time, the project would not generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals. No impacts are anticipated under this issue and no mitigation is required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XX. WILDFIRE: If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of wildfire?	☐	☐	☐	☒
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

SUBSTANTIATION

a. *No Impact* – Please refer to issues IX(f) and (g), under Hazards and Hazardous Materials. As previously stated, the proposed SNMP is comprised of maximum benefit TDS and nitrate objectives and a commitment to management activities that will ensure the protection of the beneficial uses of groundwater in the Elsinore GMZ and downstream GMZs. The SNMP actions are clerical in nature, consisting of the following: tracking and reporting of cumulative salt liabilities; reporting on progress towards implementation of the District's IRP, reporting on progress towards maximizing the use of recycled water for environmental enhancements, the development of a salt offset project plan when triggered (including progress reports as to the status of the trigger actions); and preparation and implementation of a water quality monitoring and reporting program. The CAL FIRE Fire Hazards Severity Zone Map indicates that the Elsinore GMZ contains areas within Very High Fire Hazards Severity Zones within Local Responsibility and State Responsibility Areas (Figure XX-1). The SNMP is generally clerical in nature, and there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time that could impair an adopted emergency response plan or emergency evacuation plan. Furthermore, the beneficial uses of Elsinore GMZ groundwater will be maintained, and thus no changes in the environment related to traffic or emergency response to wildfires are anticipated to occur from raising the Basin Plan objectives for TDS and nitrate to 530 mgl and 5 mgl, respectively. Therefore, the implementation of the SNMP would have no impacts under this issue. No mitigation is required.

b. *No Impact* – Please refer to issues IX(f) and (g), under Hazards and Hazardous Materials, as well as XX(a), above. The SNMP is generally clerical in nature, and there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time that could exacerbate fire risk. Furthermore, the District's commitments as part of the implementation of the maximum benefit SNMP include ensuring that there will be no impairment of beneficial uses of the Elsinore GMZ or downstream GMZs. As such, the SNMP will have no potential to impact the availability of adequate water supply required for wildfire suppression. Therefore, implementation of the SNMP would not, due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of wildfire. No impacts are anticipated, and no mitigation is required.

c. *No Impact* – Please refer to issues IX(f) and (g), under Hazards and Hazardous Materials, as well as XX(a) and XX(b), above. The SNMP is generally clerical in nature, and there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time that could exacerbate fire risk. Furthermore, the District's commitments as part of the implementation of the maximum benefit SNMP include ensuring that there will be no impairment of beneficial uses of the Elsinore GMZ or downstream GMZs. As such, the SNMP will have no potential to impact the availability of adequate water supply required for wildfire suppression. Therefore, implementation of the SNMP is not anticipated to exacerbate fire risk or that may result in temporary or ongoing impacts to the environment. No impacts are anticipated, and no mitigation is required.

d. *No Impact* – The SNMP is generally clerical in nature, and does not proposed the development of any structures—as there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time—such that risk of downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes would occur within the Elsinore GMZ. Therefore, no structures or persons would be exposed to significant risks including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes as a result of implementing the SNMP. No impacts under this issue are anticipated and no mitigation is required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XXI. MANDATORY FINDINGS OF SIGNIFICANCE:				
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☒
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

SUBSTANTIATION

The analysis in this SED and the findings reached indicate that the proposed project can be implemented without causing any new project specific or cumulatively considerable unavoidable significant adverse environmental impacts. No mitigation is required to control potential environmental impacts of the proposed project to a less than significant impact level. The following findings are based on the detailed analysis of the SED of all environmental topics and summarized findings following this section.

a. *No Impact* – The Project has no potential to cause a significant impact to any biological or cultural resources. The project has been identified as having no potential to degrade the quality of the natural environment, substantially reduce habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or reduce the number or restrict the range of a rare or endangered plant or animal because the SNMP is generally clerical in nature. Based on the historic disturbance of the project area, and because no construction is proposed under this SED, no potential to impact biological resources exists. The cultural resources evaluation concluded that, while the Elsinore GMZ area may contain important cultural resources, the implementation of the proposed SNMP would not have a potential to impact any such resources. This is because no ground disturbance is proposed as there are no physical components of the project that have been sufficiently defined, and none are proposed to meet the Elsinore GMZ SNMP at this time; therefore, no mitigation is required to ensure that historical, archaeological, and paleontological resources are impacted by the proposed SNMP. Thus, implementation of the SNMP through this SED would have a no potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory.

b. *Less Than Significant Impact* – The proposed SNMP is comprised of maximum benefit TDS and nitrate objectives and a commitment to management activities that will ensure the protection of the beneficial uses of groundwater in the Elsinore GMZ and downstream GMZs. The SNMP actions are

clerical in nature, consisting of the following: tracking and reporting of cumulative salt liabilities; reporting on progress towards implementation of the District's IRP, reporting on progress towards maximizing the use of recycled water for environmental enhancements, the development of a salt offset project plan when triggered (including progress reports as to the status of the trigger actions); and preparation and implementation of a water quality monitoring and reporting program. The proposed SNMP would be beneficial to the environment by protecting the beneficial uses of groundwater and downstream GMZs, and ultimately facilitate the plans that would enable the District to prevent future degradation of TDS and nitrate concentrations within the Elsinore GMZ. Implementation of the SNMP could result in the future construction of facilities to reduce the TDS and nitrate concentrations in the source water or recycled water; however, these facilities will undergo a separate CEQA process, if and when they are defined. Given that the proposed SNMP would not result in a significant impact on the environment, and that beneficial use of groundwater in the Elsinore GMZ would be maintained, the adoption of the proposed amendment would not cause or add to a cumulative impact.

c. *Less Than Significant Impact* – The project will achieve long-term community goals by ensuring that the maximum beneficial use of the Elsinore GMZ is maintained. The short-term impacts associated with the project, are less than significant, and the proposed project is compatible with long-term environmental protection. No issues within this SED require the implementation of mitigation measures to reduce human impacts to a less than significant level. Thus, all environmental issues were found to have no significant impacts on humans. Therefore, the potential for direct human effects from implementing the proposed project have been determined to be less than significant.

Conclusion

This document evaluated all CEQA issues contained in the latest Initial Study Checklist form. The evaluation determined that either no impact or less than significant impacts would be associated with all issues discussed in this SED, which include Aesthetics, Agricultural and Forestry Resources, Air Quality, Biological Resources, Cultural Resources, Energy, Geology and Soils, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning, Mineral Resources, Noise, Population/Housing, Public Services, Recreation, Transportation and Traffic, Tribal Cultural Resources, Utilities and Service Systems, and Wildfire.

H. REASONABLE ALTERNATIVES TO THE PROPOSED PROJECT

As described in *Section G. Environmental Checklist*, there are no potential adverse environmental impacts associated with the proposed Basin Plan amendment to incorporate the maximum benefit SNMP for the Elsinore GMZ, which includes maximum benefit TDS and nitrate objectives of 530 mgl and 5 mgl, respectively, and an implementation plan to protect beneficial uses and monitor groundwater quality of the Elsinore GMZ. Because there are no potential environmental impacts, the only alternative addressed herein is the No Project Alternative.

Under the No Project Alternative, no action would be taken to amend the Basin Plan to incorporate the maximum benefit SNMP for the Elsinore GMZ and the current Basin Plan antidegradation TDS and nitrate objectives would apply to the Elsinore GMZ. As described in *Section D. Project Description*, three alternatives with management plans that comply with the existing antidegradation objectives (planning scenario B, C, and D) were analyzed and compared to the proposed maximum benefit SNMP. These three alternatives are considered variations of the No Project Alternatives where each alternative applies a different management strategy to comply with the antidegradation objectives including:

> *No Project Option 1 – The District Desalts Recycled Water to Comply with the TDS Antidegradation Objective* (referred to as planning scenario B in *Section D. Project Description*). In this alternative, the District would construct and operate one or more desalter facilities to treat recycled water prior to distribution to customers for reuse to ensure that the TDS concentration of recycled water served in watershed tributary to and over lying the Elsinore GMZ is at or below the antidegradation objective of 480 mgl. Based on the projected amount of required salt removal (salt liability) from the recycled water, the desalter(s) would need to treat about 674 acre-feet per year (afy) of recycled water. Over the 30-year planning period of 2020 to 2050, approximately 2,400 af of treated recycled water will be discharged to the brine line due to treatment losses and the District will need to replace that lost water with an equal amount of imported water to meet non-potable demands. The total annual cost to implement this alternative includes the imported water cost to replace the treatment waste that is discharged to the brine line, the amortized capital cost of the treatment and related facilities (assuming construction of one single treatment facility), and the annual operation and maintenance (O&M) cost. The total annual cost is estimated to range from about $1.5 million in 2020 to about $2.3 million in 2050 and have a present value cost of about $29.4 million.
>
> *No Project Option 2 – The District Desalts Groundwater to Offset its TDS Liabilities* (referred to as planning scenario C in *Section D. Project Description*). The District will construct and operate a groundwater desalter as a salt offset project to mitigate salt loading from the use of recycled water with TDS concentrations greater than the antidegradation objective in the watershed tributary to and overlying the Elsinore GMZ. Based on the projected mitigation requirements, the groundwater desalter will treat groundwater at a rate of 1,100 afy. Approximately 3,900 af of treated groundwater will be discharged to the brine line due to treatment losses and the District will need to replace the lost water with an equal amount of imported water to meet potable demands. The total annual cost to implement this alternative includes the imported water cost to replace the treatment waste that is discharged to the brine line, the amortized capital cost of the treatment facilities, and the annual O&M cost. The annual cost is estimated to range from about $1.6 million in 2020 to about $2.5 million in 2050 and have a present value cost of about $32 million.
>
> *No Project Option 3 – The District Replaces Recycled Water with Imported Water* to *Comply with Antidegradation Objective* (referred to as planning scenario D in *Section D. Projection Description*). The District will abandon the use of recycled water in the watershed tributary to and overlying the Elsinore GMZ and replace the supply by increasing the use of imported water from the Skinner WTP. The total annual cost to implement this alternative includes the imported water cost to replace the recycled water and the amortized capital cost to increase the treatment capacity at the District's Regional Plant and decommission the Railroad Canyon WRF. The increase in O&M incurred at the Regional Plant is assumed to be offset by the elimination of the O&M costs at Railroad Canyon WRF. The annual cost is estimated to range from about $3.7 million in 2020 to about $6.7 million in 2050 and have a present value of about $79.5 million.

To evaluate and compare the proposed Basin Plan amendment with the No Project alternatives, the water quality and cost outcomes were analyzed. These demonstrations are documented in detail in the District's maximum benefit SNMP Proposal package (Attachments B and C). Table X below compares the model-projected TDS concentrations in the Elsinore GMZ, the District's groundwater supply, and the Districts total water supply served in area tributary to the GMZ under the three No Project alternatives and the proposed maximum benefit SNMP for 2030 and 2050. In 2030, there is no difference in the TDS outcomes across all four alternatives (the proposed maximum benefit SNMP and No Project Alternatives). However, by 2050, the projected volume-weighted TDS concentrations of the Elsinore GMZ, of the District's produced groundwater supply, and the District's total water supply for the three No Project Alternatives are greater than the TDS concentration for the proposed maximum benefit SNMP.

Table 9
Projected TDS Concentrations for No Project Alternatives Compared to the Proposed Maximum Benefit SNMP

Result	Year	Proposed Maximum Benefit SNMP	No Project Option 1	No Project Option 2	No Project Option 3
Volume-Weighted TDS of Elsinore GMZ	2030	523	523	523	523
	2050	502	530	530	530
Volume-Weighted TDS of District Produced Groundwater Supply	2030	518	518	518	518
	2050	501	544	547	544
Volume-Weighted TDS of Water Supply Served in the Area Tributary to Elsinore GMZ	2030	453	457	454	457
	2050	411	439	433	439

Table Y below compares the costs for the following components of each alternative:

- The annual amortization cost of new capital facilities
- The annual operations and maintenance (O&M) cost of facilities
- The cost associated with required increases in imported water demand
- The "cost" of contributing to climate change, as measured by the increase in energy usage and greenhouse gas (GHG) emissions associated with operation of treatment facilities and conveyance of new imported water demands

As shown in Table Y, the increase in costs, energy usage, GHG emissions, and imported water are lowest for the maximum benefit SNMP where the total annual cost includes the avoided cost of imported water to meet future water demands (a cost savings, expressed as a negative cost value), the amortized capital cost of the treatment and related facilities, and the annual O&M costs. The negative present value cost means that there will be a reduced overall cost to the District. The additional benefit of offsetting imported water under the maximum benefit SNMP is the significant reductions in energy usage and GHG emissions. The annual energy usage and GHG emissions represent the sum of the energy/GHG savings from not importing water plus the energy used/GHGs emitted for the indirect potable reuse project facilities. Detailed computation of the costs, energy usage, and GHG emissions for each alternative can be found in Attachment C.

Table 10
Comparison of Increased Costs, Imported Water Use, Energy Usage, and GHG Emissions (CO_2) for No Project Alternatives Compared to the Proposed Maximum Benefit SNMP from 2018 through 2050

Alternative	Increase in Present Value Capital and O&M Costs	Increase in Imported Water Use (af)	Increase in Energy Usage (kwh)	Increase in GHG Emissions (mt)
Proposed Maximum Benefit SNMP	-$3.5 million	-117,000	-333 million	-6,800
No Project Option 1	$29.4 million	2,400	28 million	8,000
No Project Option 2	$32 million	3,900	35 million	9,000
No Project Option 3	$79.5 million	40,000	182 million	27,000

As demonstrated in Table X and Y, complying with the antidegradation objectives in the three No Project Alternatives would result in substantial increased new costs, increased energy usage, increased GHG emissions, and increased demand for imported water. And they do not provide measurable water quality benefits to the Elsinore GMZ, the District's produced groundwater supply, or recharge to the GMZ compared to the cost incurred to implement the compliance solutions. For these reasons, the adoption of the proposed maximum benefit objectives and SNMP is the most reasonable alternative that ensures beneficial uses and groundwater quality are protected in the Elsinore GMZ.

I. PRELIMINARY STAFF DETERMINATION

☒	The proposed project COULD NOT have a significant effect on the environment, and, therefore, no alternatives or mitigation measures are proposed.
☐	The proposed project MAY have a significant or potentially significant effect on the environment, and therefore alternatives and mitigation measures have been evaluated.

Lead Agency (signature) Date

J. REFERENCES

California Fire Hazard Severity Zone Viewer. CALFIRE. 2020, https://egis.fire.ca.gov/FHSZ/

Caltrans Scenic Highways. California Department of Transportation (Caltrans). 2020, https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways

CGS Information Warehouse: Regulatory Maps. California Department of Conservation: California Geologic Survey. 2016: https://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=regulatorymaps

City of Lake Elsinore General Plan EIR, December 2011

Elsinore Valley Municipal Water District Urban Water Management Plan, June 2016

GeoTracker. California State Water Resources Control Board. 2020, http://geotracker.waterboards.ca.gov/

K. ACRONYMS AND ABBREVIATIONS

af	acre feet/acre foot
AFY	acre feet per year
AQMP	Air Quality Management Plan
Basin Plan	Water Quality Control Plan for the Santa Ana River Basin
BPA	Basin Plan Amendment
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Database
CRA	Colorado River Aqueduct
EIR	Environmental Impact Report
EMWD	Eastern Municipal Water District
EVMWD	Elsinore Valley Municipal Water District
FHSV	Fire Hazard Severity Zone
FT	feet
GCC	global climate change
GHG	greenhouse gas
GMZ	Groundwater Management Zone
IPR	indirect potable reuse
IRP	Integrated Resources Plan
KWH	kilowatt-hour
LECWA	Lake Elsinore Comprehensive Water Management Agreement
LUST	Leaking Underground Storage Tanks
MBR	membrane bioreactor
MGD	million gallons per day
MGL	milligrams per liter
MT	metric tons
N	nitrate
O&M	operation and maintenance
OAL	Office of Administrative Board
Regional Board	Regional Water Quality Control Board, Santa Ana Region
RRC	Railroad Canyon Water Reclamation Facility
RWQCB	Regional Water Quality Control Board
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SED	Substitute Environmental Document
SNMP	Salt and Nutrient Management Plan
SOI	Sphere of Influence
SWP	State Water Project
TDA	Tom Dodson & Associates
TDS	total dissolved solids
TIN	total inorganic nitrogen

TVWRF	Temecula Valley Recycled Water Pipeline
WEI	Wildermuth Environmental, Inc.
WRF	Water Reclamation Facility

FIGURES

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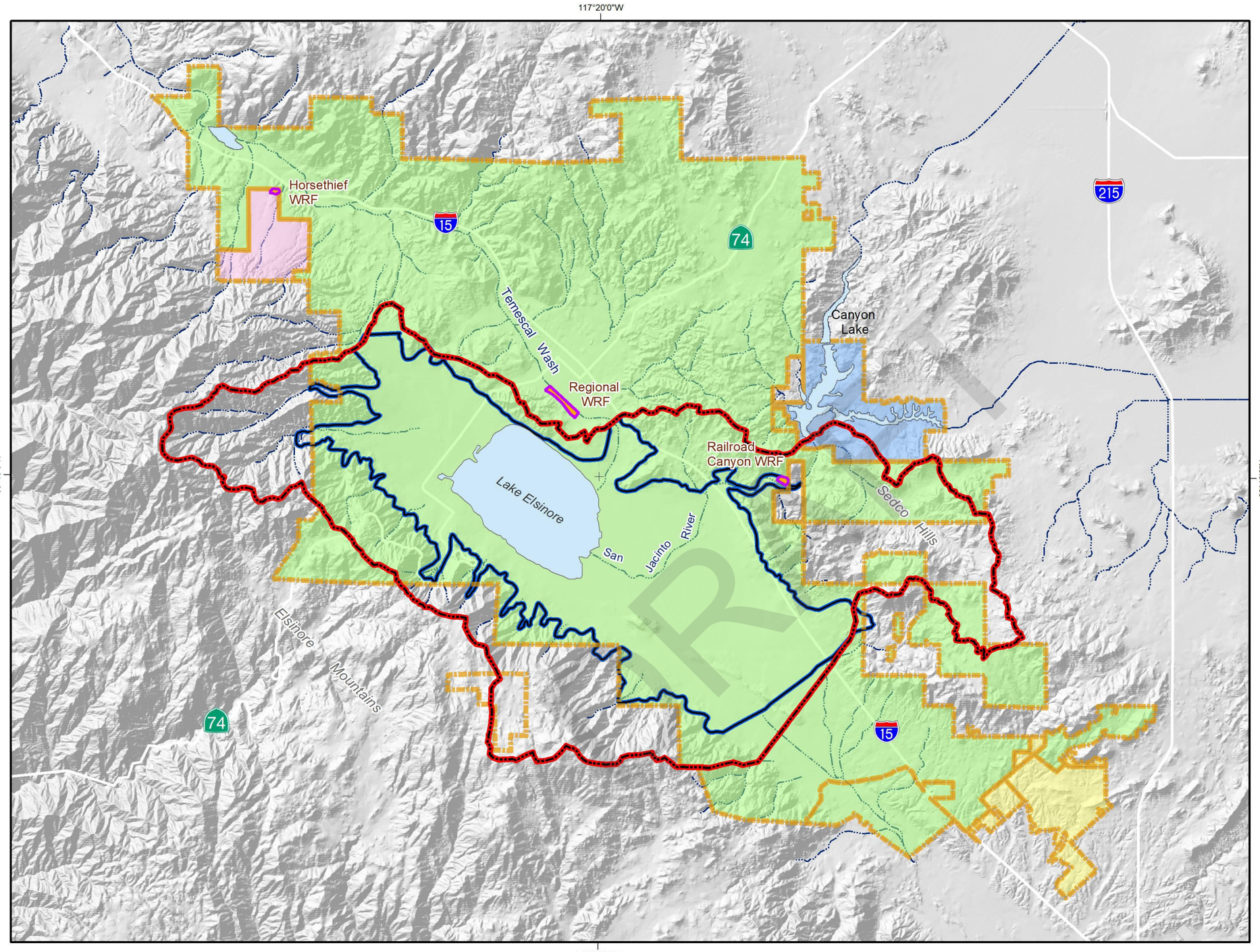
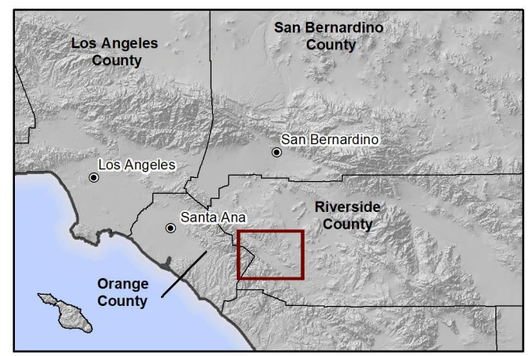


Sewersheds

- Railroad Canyon
- Regional
- Horsethief
- Southern

- Elsinore Municipal Water District Service Area
- Elsinore GMZ
- Elsinore Valley Watershed Tributary
- Water Reclamation Plant
- Streams & Flood Control Channels
- Lakes and Reservoirs



Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: SO
Date: 8/12/2020
Document Name: Figure_1_Elsinore GMZ Locaiton

0 1 2 3 Miles
0 1 2 3 4 KM

EVMWD
Maximum Benefit Proposal for the Elsinore GMZ

The District Service Area and Elsinore GMZ

Figure 1

View text version of map.

117°20'0"W

33°40'0"N

Horsethief WRF

Regional WRF

Railroad Canyon WRF

Temescal Wash

Lake Elsinore

San Jacinto River

Canyon Lake

EMWD Reach 4 Pipeline

Sedco Hills

Elsinore Mountains

Temescal Valley RW Pipeline

15

74

215

Sewersheds

- Railroad Canyon
- Regional
- Horsethief
- Southern

Railroad Canyon Recycled Water System

- Recycled Water Meter
- Recycled Water Line

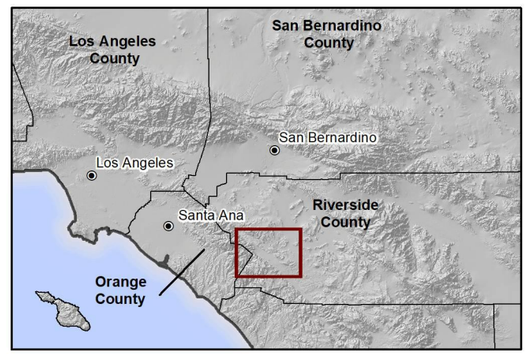
Wildomar Recycled Water System

- Recycled Water Meter
- Recycled Water Turnout
- Recycled Water Line

Horsethief Recycled Water System

- Recycled Water Meter
- Recycled Water Line

- Recycled Water Pipeline
- Elsinore Municipal Water District Service Area
- Water Reclamation Plant
- Elsinore Basin Watershed
- Elsinore GMZ
- Streams & Flood Control Channels
- Lakes and Reservoirs



Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: CS
Date: 8/12/2020
Document Name: Figure_2_RW_Location

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EMWD

Maximum Benefit Proposal for the Elsinore GMZ

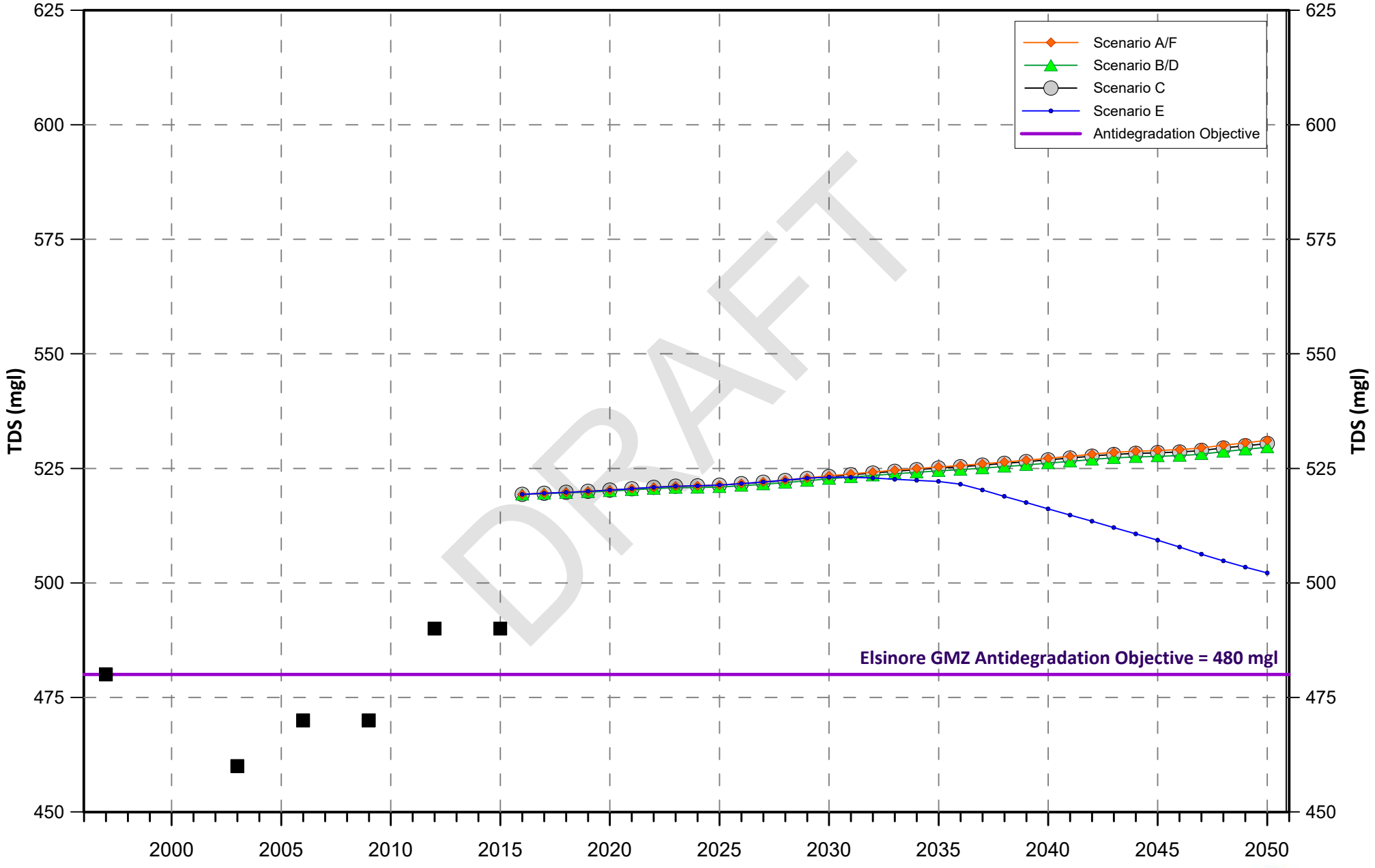
The District Service Area and Elsinore GMZ

Figure 2

Figure 3

TDS Concentration Projections for the Elsinore Groundwater Management Zone

Volume-Weighted Concentration of All Model Layers



Figure_TDS_AllLayers
7/24/2018

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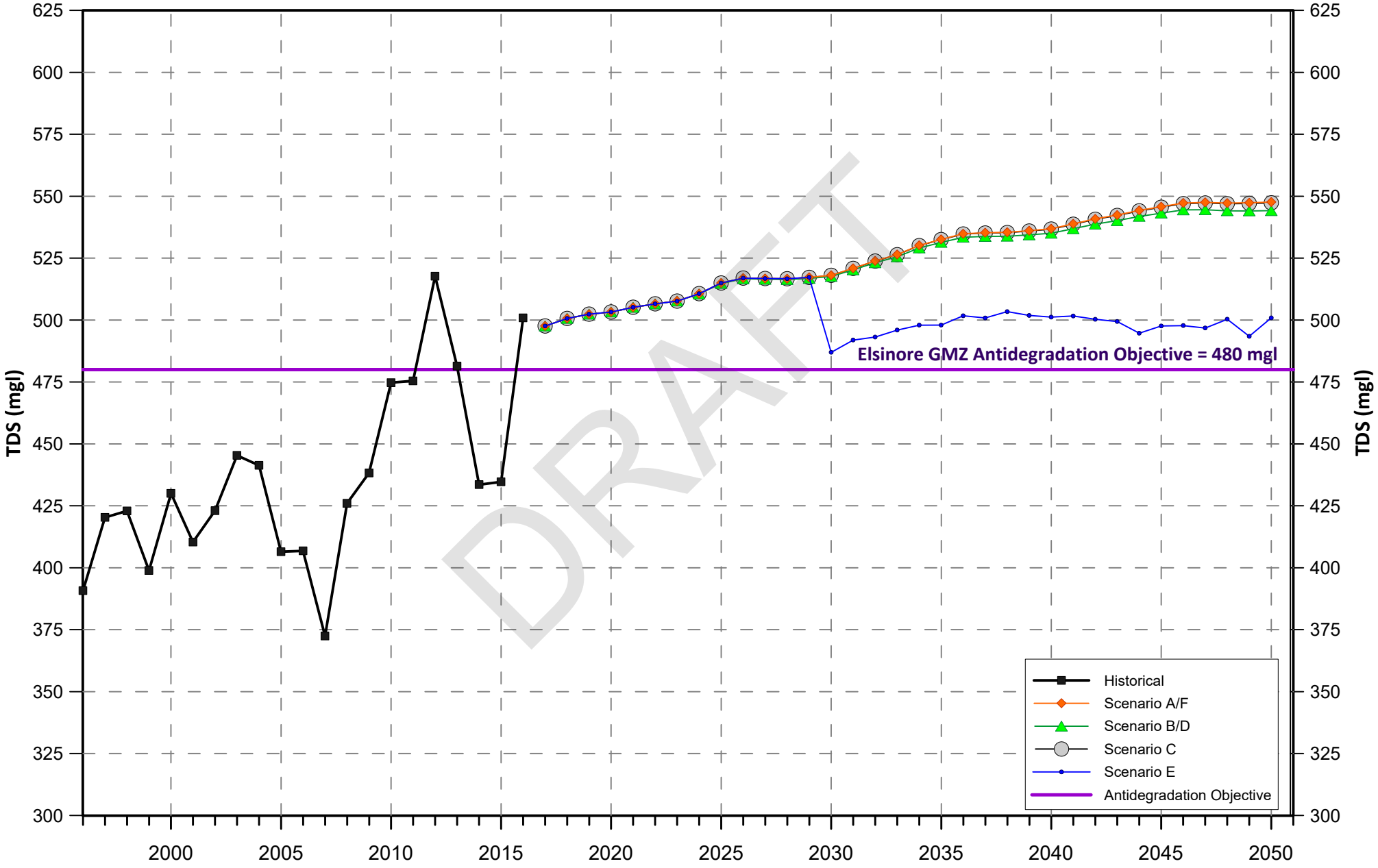
Figure 4

Historical and Projected Volume-Weighted TDS Concentration of the District's Produced Groundwater Supply from the Elsinore GMZ

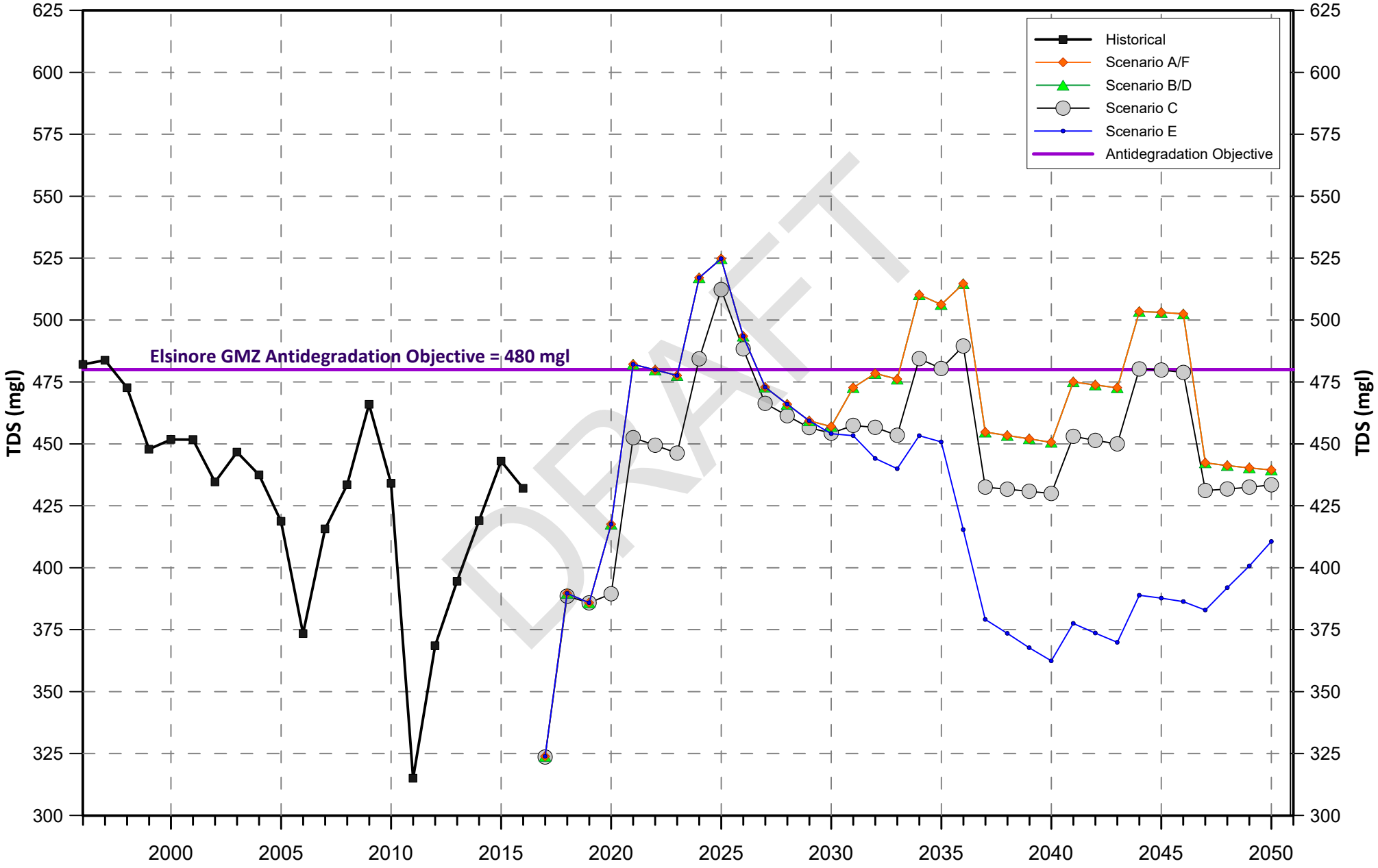


Figure_TDS_AllLayers
7/24/2018

View text version of figure 4.

Figure 5

Historical and Projected Volume-Weighted TDS Concentration of Water Supply Served in District Service Area Tributary to the Elsinore GMZ



Figure_TDS_AllLayers
7/24/2018

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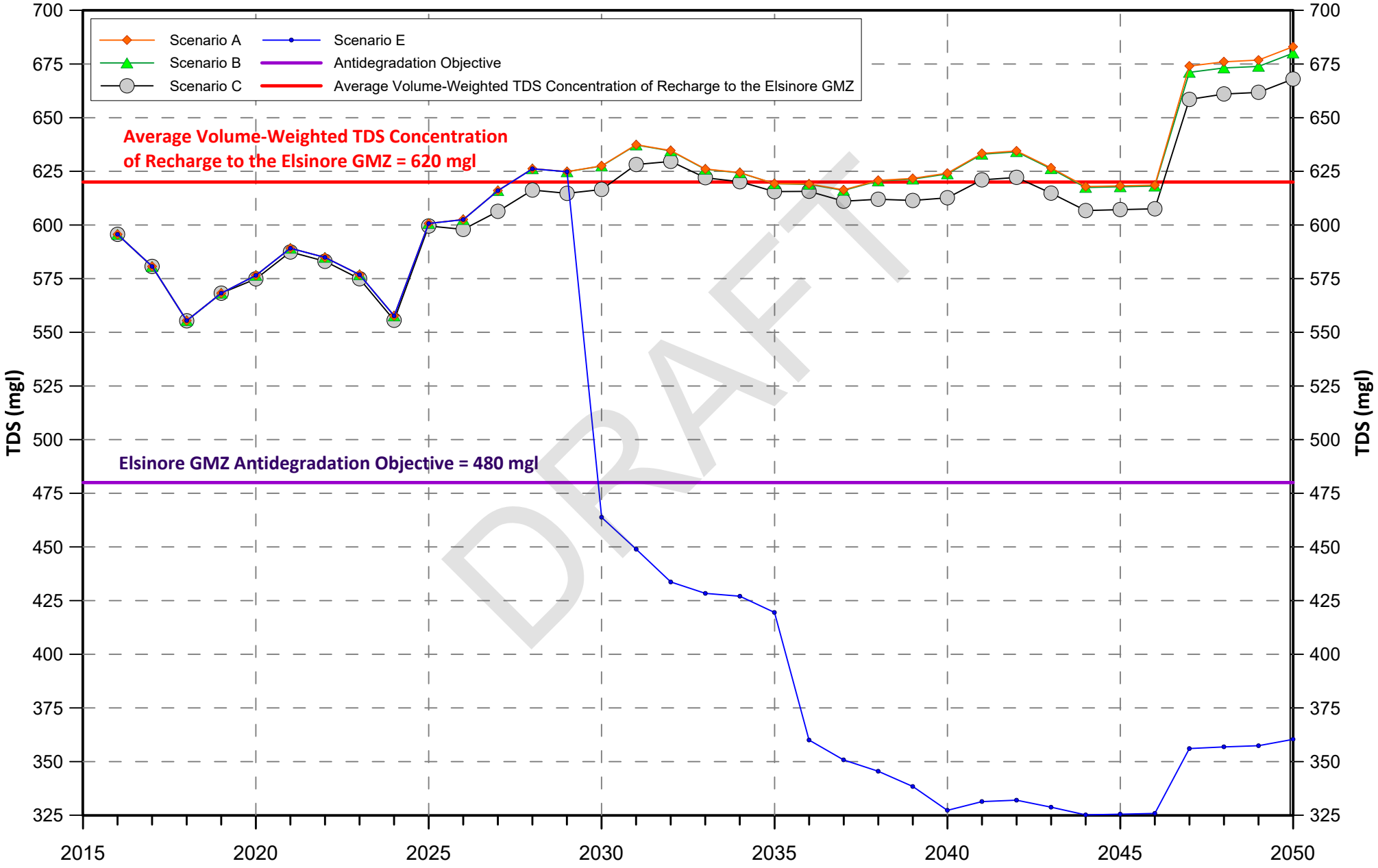
Figure 6
Volume-Weighted TDS Concentration of the Combine Recharges to the Elsinore GMZ



Figure_TDS_AllLayers
7/24/2018

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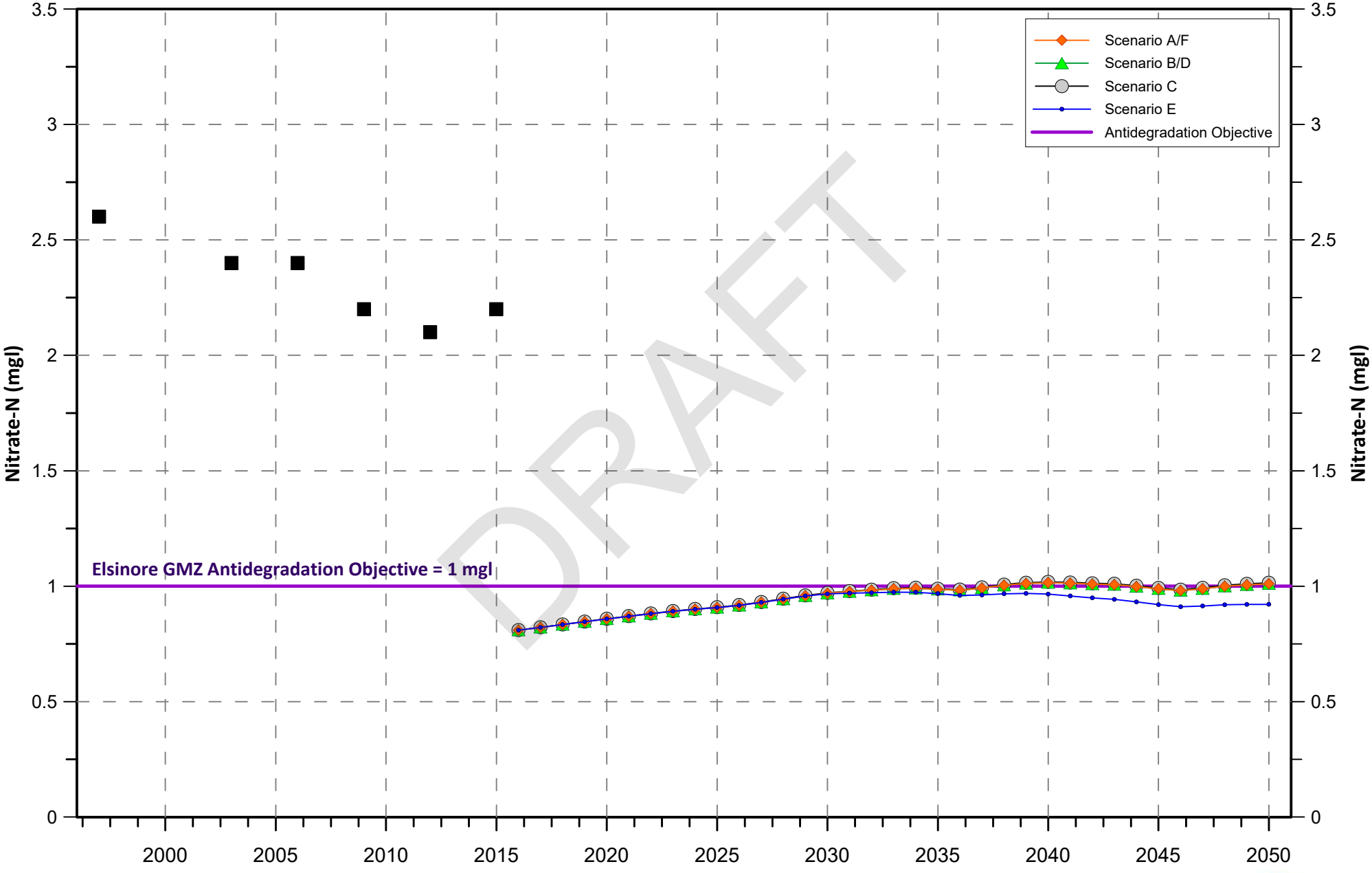
Figure 7

Nitrate-N Concentration Projections for the Elsinore Groundwater Management Zone

Volume-Weighted Concentration of All Model Layers



Figure_N_AllLayers
7/24/2018

View text version of figure 7.

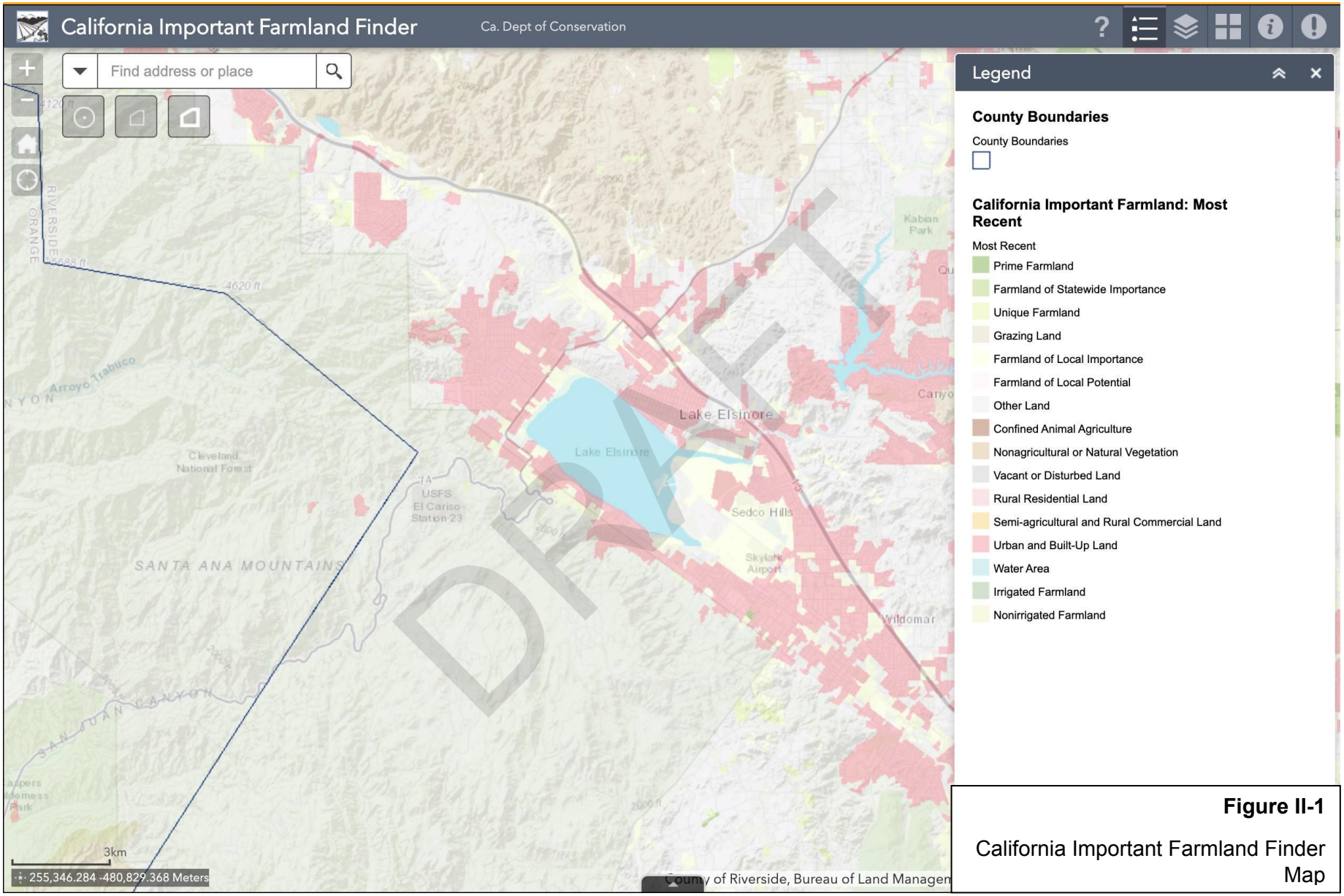


Figure II-1

California Important Farmland Finder Map

View text version of figure II-1.

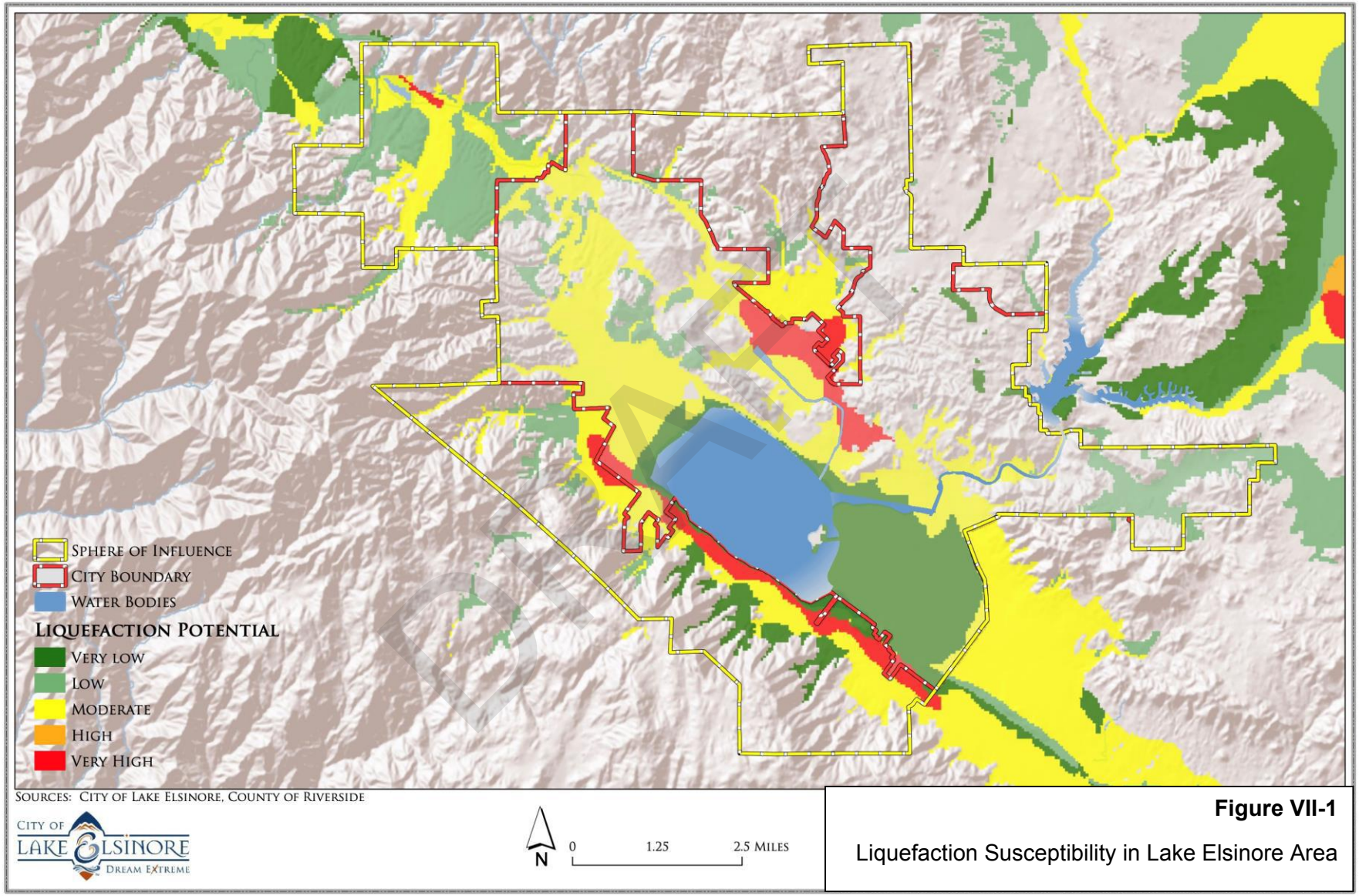


Figure VII-1

Liquefaction Susceptibility in Lake Elsinore Area

View text version of figure VII-1.

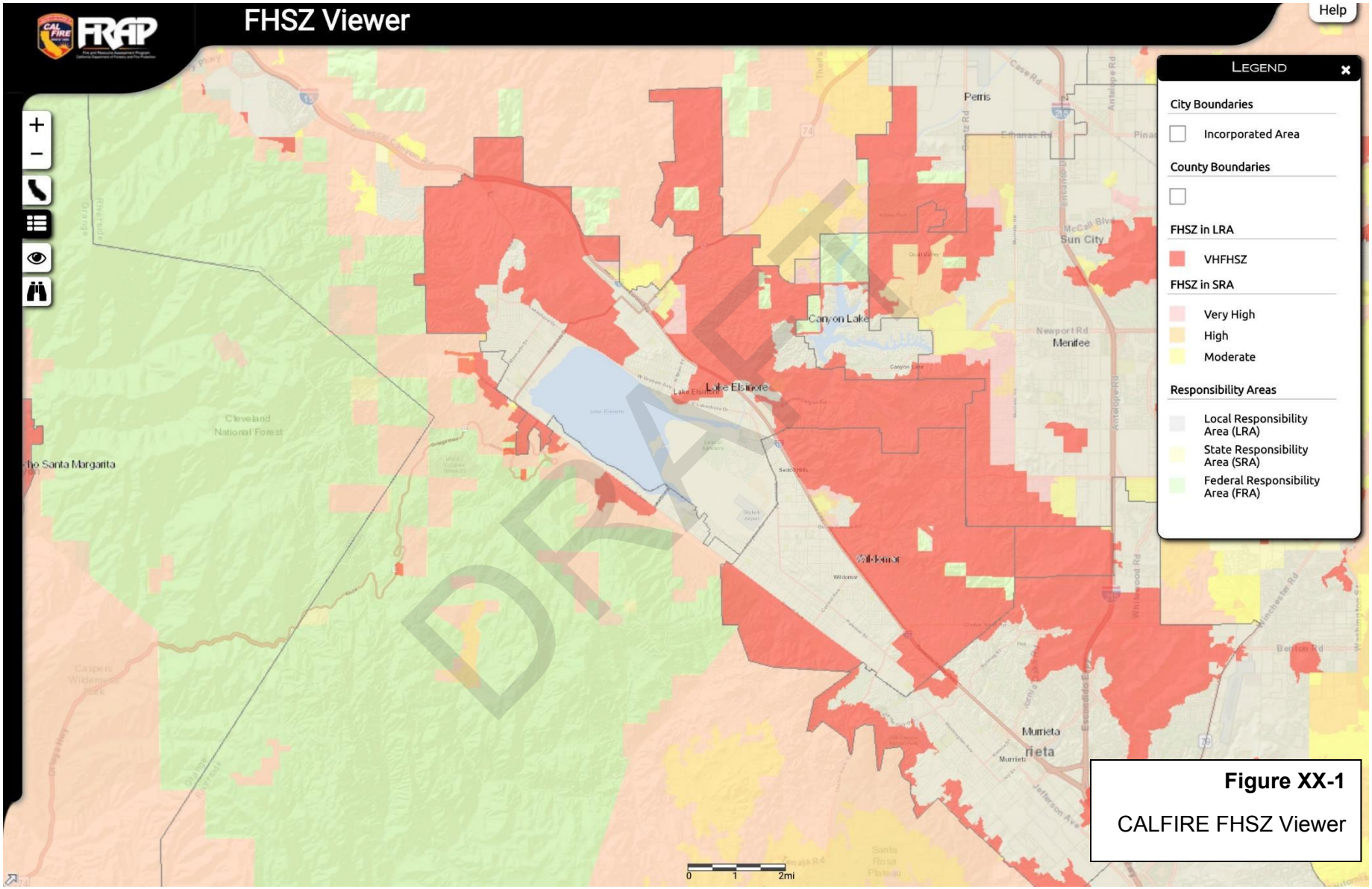


Figure XX-1

CALFIRE FHSZ Viewer

View text version of figure XX-1.

Map and Chart Descriptions

Figure 1

This map shows the boundaries of the District's service area, Elsinore GMZ, and Elsinore Valley Watershed located in southwest Riverside County. Majority of the Elsinore GMZ and Elsinore Valley Watershed fall within the boundary of the District's service area. Interstate 15 and highway 74 intersect within the District's service area. This map also shows the District's three water reclamation facilities (WRFs) (Railroad Canyon, Horsethief, and Regional) that treat wastewater generated in its service area.

Figure 2

This map shows the boundaries of the District's service area and the Elsinore GMZ located in Southwest Riverside County. Majority of the Elsinore GMZ and Elsinore Valley Watershed fall within the boundary of the District's service area. This map displays the Temescal Wash which flows from southeast to northwest in southwest Riverside County. This map also shows the District's three WRFs (Railroad Canyon, Horsethief, and Regional) that treat wastewater generated in its service area, three recycled distribution systems (Railroad Canyon, Wildomar, and Horsethief) that provide recycled water use, and the location of the Regional WRF recycled water discharge to Temescal Wash which is located east of the Elsinore GMZ.

Figure 3

This graph shows the time series of the historical ambient TDS concentration and the projected volume-weighted TDS concentrations of the Elsinore GMZ for Scenario A/F, Scenario B/D, Scenario C, and Scenario E. Also shown in the chart is the antidegradation TDS objective of 480 mgl for the Elsinore GMZ. The Y axis is the TDS concentration in milligram per litter (mgl) and the X axis is the year of the historical and projected TDS concentrations. The historical ambient TDS concentration of the Elsinore GMZ ranged from approximately 460 to 490 and averaged around 475 mgl from 1997 to 2015. The projected TDS concentrations of the Elsinore GMZ for Scenario A/F, Scenario B/D, and Scenario C are indistinguishable throughout the whole planning period increasing from approximately 520 mgl in 2016 to 530 mgl in 2050. The projected TDS concentration of the Elsinore GMZ for Scenario E increased from 520 mgl in 2016 to 525 mgl in 2032 and then decreased to 502 mgl in 2050.

Figure 4

This graph shows the time series of the historical TDS concentration and the projected volume-weighted TDS concentrations of the District's produced groundwater supply for the Scenario A/F, Scenario B/D, Scenario C, and Scenario E. Also shown in the chart is the antidegradation TDS objective of 480 mgl for the Elsinore GMZ. The Y axis is the TDS concentration in mgl and the X axis is the year of the historical and projected TDS concentrations. The historical TDS concentrations measured in the groundwater supply

ranged from approximately 375 to 520 mgl and averaged around 450 mgl from 1997 to 2016. The projected TDS concentrations of the produced groundwater supply for Scenario A/F, Scenario B/D, and Scenario C are indistinguishable throughout the whole planning period increasing from approximately 500 mgl in 2017 to 545 mgl in 2050. The projected TDS concentration of the produced groundwater supply for Scenario E increased from 500 mgl in 2017 to 520 mgl in 2029 and then decreased to 500 mgl in 2050.

Figure 5

This graph shows the time series of the historical TDS concentration and the projected volume-weighted TDS concentrations of the District's total water supply for the Scenario A/F, Scenario B/D, Scenario C, and Scenario E. Also shown in the chart is the antidegradation TDS objective of 480 mgl for the Elsinore GMZ. The Y axis is the TDS concentration in mgl and the X axis is the year of the historical and projected TDS concentrations. The historical TDS concentrations of the total water supply ranged from approximately 313 to 480 mgl and averaged around 400 mgl from 1997 to 2016. The projected TDS concentrations of the total water supply for Scenario A/F, Scenario B/D, and Scenario C increased from around 325 mgl in 2017 to 433/439 mgl in 2050. The projected TDS concentration of the total water supply for Scenario E increased from 325 mgl in 2017 to 451 mgl in 2034 and then decreased to 411 mgl in 2050.

Figure 6

This graph shows the time series of the projected volume-weighted TDS concentrations of all groundwater recharge sources to the Elsinore GMZ for Scenario A, Scenario B, Scenario C, and Scenario E. Also shown in the chart is the antidegradation TDS objective of 480 mgl for the Elsinore GMZ. The Y axis is the TDS concentration in mgl and the X axis is the year of the projected TDS concentrations. The projected TDS concentrations of all recharge sources for Scenario A and Scenario B are indistinguishable and increased from around 600 mgl in 2015 to around 680 mgl in 2050. The projected TDS concentrations of all recharge sources for Scenario C increased from around 600 mgl in 2015 to around 668 mg in 2050. The projected TDS concentrations of all recharge sources for Scenario E increased from around 600 mgl in 2015 to around 625 mgl in 2029 and then decreased to 360 mgl in 2050. The average volume-weighted TDS concentration of all recharge sources to the Elsinore GMZ for all scenarios is 620 mgl.

Figure 7

This graph shows the time series of the historical nitrate concentration and the projected volume-weighted nitrate concentrations of the Elsinore GMZ for the Scenario A/F, Scenario B/D, Scenario C, and Scenario E. Also shown in the chart is the antidegradation nitrate objective of 1 mgl for the Elsinore GMZ. The Y axis is the nitrate concentration in mgl and the X axis is the year of the historical and projected nitrate concentrations. The historical ambient nitrate concentrations of the Elsinore GMZ ranged from approximately

2.1 to 2.6 mgl and averaged around 2.25 mgl from 1997 to 2015. The projected nitrate concentrations of the Elsinore GMZ for Scenario A/F, Scenario B/D, and Scenario C are indistinguishable throughout the whole planning period increasing from approximately 0.8 mgl in 2016 to 1 mgl in 2050. The projected nitrate concentration of the Elsinore GMZ for Scenario E increased from 0.8 mgl in 2016 to 0.9 mgl in 2050.

Figure II-1

This map shows type of land use designations over the District's service area and Elsinore GMZ located in southwest Riverside County. Majority of lands over the GMZ are designated as Urban and Built-up Land.

Figure VII-1

This map shows the liquefaction potential of the area over the District's service area and Elsinore GMZ located in southwest Riverside County. The southern portion of the Elsinore GMZ mainly contains low liquefaction potential with small areas of moderate and very high liquefaction potential. The northern portion of the Elsinore GMZ mainly contains moderate liquefaction potential with small areas of low and very high liquefaction potential.

Figure XX-1

This map shows the California Fire Hazards Severity Zone within Local Responsibility and State Responsibility Areas within the District's service area and Elsinore GMZ located in southwest Riverside County. Majority of the area over the Elsinore GMZ is classified under Very High Fire Hazard Severity Zones (VHFHSZ) within Local Responsibility and State Responsibility Areas.

State Water Resources Control Board

April 19, 2021

Jayne Joy
Assistant Executive Officer
Santa Ana Regional Water Quality Control Board
Riverside, California

SUBJECT: INTERIM RESPONSE TO REQUEST FOR AN EXTERNAL PEER REVIEW OF THE DRAFT BASIN PLAN AMENDMENT TO INCORPORATE A MAXIMUM BENEFIT SALT AND NUTRIENT MANAGEMENT PLAN FOR THE ELSINORE GROUNDWATER MANAGEMENT ZONE, RIVERSIDE COUNTY, CALIFORNIA

Dear Ms. Joy,

This letter responds to the attached December 16, 2020 request for external scientific peer review for the subject noted above. The review process is described below. All steps were conducted in confidence. Reviewers' identities were not disclosed.

To begin the process for selecting reviewers, I contacted the University of California, Berkeley (University) and requested recommendations for candidates considered qualified to perform the assignment. This service is supported through an Interagency Agreement co-signed by CalEPA and the University. The University was provided with the request letter and attachments. No additional material was asked for, nor provided. The University interviews each promising candidate.

Each candidate who was both qualified and available for the review period was asked to complete a Conflict of Interest (COI) Disclosure form and send it to me for review, with Curriculum Vitae. The cover letter for the COI form describes the context for COI concerns that must be taken into consideration when completing the form. "As noted, staff will use this information to evaluate whether a reasonable member of the public would have a serious concern about [the candidate's] ability to provide a neutral and objective review of the work product."

For each candidate judged to be free of conflict, I approved that person as reviewer, affirmed by an approval letter. Reference was made to specific parts of the completed COI form and CV. The approval letter also asked the approved candidate which of the conclusions that person would be able to address “with confidence, based on expertise and experience”.

Later, I sent letters to reviewers to initiate the review. These letters provided access instructions to a secure FTP site where all material to be reviewed was placed. Confirmation was requested that the reviewer could access the site and all documents that had been uploaded to it. Each reviewer was asked to address each conclusion for which he or she had previously agreed, and these were identified in the letter. Thirty days were provided for the review, unless a reviewer requested additional time. I also asked reviewers to direct enquiring third parties to me after they have submitted their reviews.

Following my signature on the initiating letter, guidance was provided a) to ensure confidentiality through the review process; and b) for format presentation to meet “accessibility” requirements.

Reviewers’ names, affiliations, curriculum vitae, initiating letters and reviews are being sent to you now with this letter. This information can be accessed easily through the bookmarks listed on the left of the screen, or by scrolling down.

Approved reviewers:

1. Gretchen R. Miller, Ph.D., Associate Professor
   Zachry Department of Civil & Environmental Engineering
   Texas A&M University
   402D Dwight Look Engineering Building
   3136 TAMU
   College Station, TX 77843

2. Kimberly Rollins, Ph.D.
   Professor of Resource and Environmental Economics
   University of Connecticut – Department of Agriculture and Resource Economics
   1376 Storrs Road Unit 4021
   Storrs, CT 06269-401

3. Sally Thompson, Ph.D., Associate Professor
   Civil, Environmental, and Mining Engineering
   Faculty of Engineering and Mathematical Sciences
   University of Western Australia (M051)
   35 Stirling Highway
   6009 Perth, Australia

4. Alexandra D. Lutz, Ph.D.
   Associate Research Professor
   Affiliated with Division of Hydrological Sciences
   Desert Research Institute
   Nevada System of Higher Education
   2215 Raggio Parkway
   Reno, NV 89512

If you have any questions, or require clarification from the reviewers, please contact me directly.

Sincerely,

Gerald W. Bowes, Ph.D.
Manager, CalEPA External Scientific Peer Review Program
Office of Research, Planning, and Performance
State Water Resources Control Board
1001 “I” Street, 13th Floor Sacramento, California 95814
Gerald.Bowes@waterboards.ca.gov

Attachments:

(1) December 16, 2020 Request by Jayne Joy, for Scientific Peer Review
(2) Letters to Reviewers Initiating the Review
    (1) Gretchen R. Miller, Ph.D.
    (2) Kimberly Rollins, Ph.D.
    (3) Sally Thompson, Ph.D.
    (4) Alexandra D. Lutz, Ph.D.
(3) Curriculum Vitae
    (1) Gretchen R. Miller, Ph.D.
    (2) Kimberly Rollins, Ph.D.
    (3) Sally Thompson, Ph.D.
    (4) Alexandra D. Lutz, Ph.D.
(4) Reviews
    (1) Gretchen R. Miller, Ph.D.
    (2) Kimberly Rollins, Ph.D.
    (3) Sally Thompson, Ph.D.
    (4) Alexandra D. Lutz, Ph.D.

cc: John Wheeler
State Water Resources Control Board
John.Wheeler@waterboards.ca.gov

Teresita Sablan
State Water Resources Control Board
Teresita.Sablan@waterboards.ca.gov

Keith Person
Regional Water Quality Control Board
Keith.Person@waterboards.ca.gov

Xinyu “Cindy” Li
Regional Water Quality Control Board
Cindy.Li@waterboards.ca.gov

Santa Ana Regional Water Quality Control Board

TO: Gerald Bowes
Manager, Cal/EPA Scientific Peer Review Program
Office of Research, Planning and Performance
STATE WATER RESOURCES CONTROL BOARD
Sacramento, CA

FROM: Jayne Joy
Assistant Executive Officer
SANTA ANA REGIONAL WATER QUALITY CONTROL BOARD
Riverside, CA

Jayne Joy Digitally signed by Jayne Joy
Date: 2020.12.16 15:28:12 -08'00'
Water Boards

DATE: December 16, 2020

SUBJECT: REQUEST FOR PEER REVIEW OF DRAFT BASIN PLAN AMENDMENT TO INCORPORATE A MAXIMUM BENEFIT SALT AND NUTRIENT MANAGEMENT PLAN FOR THE ELSINORE GROUNDWATER MANAGEMENT ZONE, RIVERSIDE COUNTY, CALIFORNIA

The Santa Ana Regional Water Quality Control Board (Santa Ana Water Board) staff hereby request initiation of the peer review process pursuant to the requirements of the Health and Safety Code section 57004 for scientific portions of the proposed Basin Plan amendment (BPA) to incorporate a maximum benefit salt and nutrient management plan (SNMP) for the Elsinore Groundwater Management Zone (GMZ). The proposed BPA intends to: 1) establish maximum benefit water quality objectives[1] for total dissolved solids (TDS) and nitrate-nitrogen for the Elsinore GMZ, and 2) incorporate the maximum benefit commitments for the responsible agency, Elsinore Valley Municipal Water District, to ensure that beneficial uses of the Elsinore GMZ are protected. Specifically, the Santa Ana Water Board request review of the scientific components

[1] In accordance with the State's Antidegradation Policy (Executive Order 68-16) and California Water Code 13241, the Santa Ana Board can set a less stringent, numerically higher maximum-benefit-based water quality objective compared to an existing water quality objective for a GMZ if it can be demonstrated that beneficial uses are protected and allowing degradation is to the maximum benefit of the people of California.

employed in the maximum benefit SNMP proposal package[2] that justify the proposed BPA.

The Santa Ana Water Board plans to consider the proposed BPA at a regularly scheduled meeting in March 2021. The Santa Ana Water Board staff anticipates submittal of the peer review package to CalEPA staff by December 18, 2020.

Attachment 2 provides detailed descriptions of the scientific conclusions used in the development of the maximum benefit SNMP for the Elsinore GMZ. The critical component of the maximum benefit SNMP proposal package that requires the independent review is the method that was implemented to derive the maximum benefit TDS and nitrate objectives for the Elsinore GMZ. With that said, the Santa Ana Water Board staff asks that the State Water Board staff solicit three peer reviewers with expertise in one or more of the following areas which covers the conclusions described in Attachment 2:

- A hydrologist, hydrogeologist, geologist, groundwater modeler, or geotechnical/civil engineer familiar with groundwater modeling. This expertise is needed for Conclusion 1, 2, 3, 4, 5, 6a, 6b, 6c, 6d, 6f, 7, 8, 10a, 10c, and 11.

- A civil engineer or water resources manager familiar with the impacts of climate and land uses on salt and nutrient buildup in the arid west and treatment technology and management practices to sustainably manage groundwater resource. This expertise is needed for Conclusions 3, 4, 5, 6b, 6d, 6e, 7, 8, 10b, 10c,10d, 10e, 10f, and 11.

- A water resources manager familiar with monetary and environmental costs associated with increasing energy and imported water uses in the arid west. This expertise is needed for Conclusion 9.

The Santa Ana Water Board also requests that the selected peer reviewers provide comments on the Staff Report and the maximum benefit SNMP proposal package within 30 days or less of the receipt of these documents.

The following summarizes the enclosed attachments to this request:

- Attachment 1 – A summary of the proposed action;
- Attachment 2 – A list of descriptions of the scientific conclusions identified by the Santa Ana Water Board staff as requiring review;
- Attachment 3 – A list of participants who assisted in the development of the maximum benefit SNMP for the Elsinore GMZ; and

[2] Refers to *the Elsinore Valley Municipal Water District Proposal to Amend the Basin Plan to Incorporate a Maximum-Benefit-Based Salt and Nutrient Management Plan for the Elsinore Groundwater Management Zone* prepared by Wildermuth Environmental, Inc. in 2020 as referenced in Attachment 4 of this peer review package.

- Attachment 4 – A list of key references for the draft Staff report and planning documentations that support this proposed BPA.

This BPA package includes an electronic copy of the draft Staff Report, the Substitute Environmental Document, the propose maximum benefit SNMP package, and all references and appendices for the draft Staff Report. The Santa Ana Water Board understands that the State Board staff has set up a secure File Transfer Protocol (ftp) site for posting documents for the peer reviewers. The Santa Ana Water Board will upload all the necessary documents for this review to an FTP site.

While the reviewers are not prevented from commenting on other portions of the referenced documents, the Santa Ana Water Board would like to emphasize to potential reviewers the need to provide a concise evaluation of the conclusions, findings, and conclusions in the proposed maximum benefit SNMP package that have been identified by the Santa Ana Board staff in Attachment 2.

Should you have questions, please contact Cindy Li at Cindy.Li@waterboards.ca.gov, (951) 782-4906.

Attachments 1, 2, 3, and 4

cc:

John Wheeler, SWRCB, John.wheeler@waterboards.ca.gov
Teresita Sablan, SWRCB, Teresita.sablan@waterboards.ca.gov
Keith Person, RWQCB, keith.person@waterboards.ca.gov
Xinyu “Cindy” Li, RWQCB, cindy.li@waterboards.ca.gov

Attachment 1 – The Proposed Action

Draft Basin Plan Amendment to Adopt the Maximum Benefit Salt and Nutrient Management Plan for the for the Elsinore Groundwater Management Zone

Summary of Basin Plan Amendment

The proposed Basin Plan amendment (BPA) would update Chapters 4 and 5 of the Santa Ana Water Board Basin Plan. Chapter 4 includes the water quality objectives to protect beneficial uses. Chapter 5 includes the implementation programs to achieve the water quality objectives established in Chapter 4. The proposed action is to incorporate the maximum benefit salt and nutrient management plan for the Elsinore GMZ. Specifically, the proposed BPA intends to: 1) establish maximum benefit-based water quality objectives for total dissolved solids (TDS) and nitrate-nitrogen (nitrate) for the Elsinore GMZ, and 2) incorporate the maximum benefit commitments for the responsible agency (Elsinore Valley Municipal Water District) to ensure that beneficial uses of the Elsinore GMZ are protected.

The proposed amendment is supported by a technical report prepared by the staff of the Santa Ana Water Board (draft Staff Report). The Staff Report also references technical reports prepared to support the BPA, including a Substitute Environmental Document and the maximum benefit SNMP proposal package submitted by the project proponent, the Elsinore Valley Municipal Water District. The draft Staff Report and the supporting documents provide the detailed basis and scientific and economic analyses supporting the proposed BPA.

Attachment 2 – Scientific Conclusions

Draft Basin Plan Amendment to Adopt the Maximum Benefit Salt and Nutrient Management Plan for the for the Elsinore Groundwater Management Zone (GMZ)

Descriptions of the Scientific Conclusions to be addressed by Peer Reviewers

The statutory mandate for external scientific peer review (Health and Safety Code Section 57004) states that the reviewer's responsibility is to determine whether the scientific portions of the proposed rule is based upon sound scientific knowledge, methods, and practices. We request that the reviewers make this determination for each of the following conclusions that constitute the scientific portion of the proposed regulatory action.

To help with the review, an explanatory statement has been provided for each conclusion. Conclusions are supported by the literature references cited in the draft Staff Report, Substitute Environmental Document, and the maximum benefit SNMP proposal package[1].[2] Majority of the references for the Conclusions listed below are from the maximum benefit SNMP proposal package.

Conclusion 1 – The hydrogeologic conceptual model of the Elsinore GMZ used in the analysis is based on accepted and published seminal documents and models that detail the hydrogeology of the GMZ (Section 4.1 of Attachment B in the maximum benefit SNMP proposal package)

Based on published documents on the Elsinore groundwater basin, this analysis characterized the GMZ as hydrologically closed, meaning that groundwater outflow from the GMZ only occurs through groundwater pumping. This means that salts added through natural and artificial recharge processes accumulate in the GMZ unless they are exported.

The Elsinore GMZ has five-layer aquifer system that consists younger alluvium (layer 1), older alluvium (layer 2), an aquitard (layer 3), the Fernando Group (layer 4), and the Bedford Canyon Formation (layer 5). Most of the District groundwater pumping occurs in layers 4 and 5 with some occurring in layer 2.

[1] Refers to *the Elsinore Valley Municipal Water District Proposal to Amend the Basin Plan to Incorporate a Maximum-Benefit-Based Salt and Nutrient Management Plan for the Elsinore Groundwater Management Zone* prepared by Wildermuth Environmental, Inc. in 2020 as referenced in Attachment 4. This package includes Attachment A, Attachment B, and Attachment C.

[2] The references of the Staff Report, Substitute Environmental Document, and the maximum benefit SNMP proposal package are provided in Attachment 4 of this peer review package.

References of the published documents that detail the hydrogeology of the Elsinore GMZ are included in page 17, Section 4 of Attachment B in the maximum benefit SNMP proposal package.

Conclusion 2 – The coupling of the HYDRUS-2D, MODFLOW, and MT3D models to project future TDS and nitrate concentrations in the groundwater of the Elsinore GMZ is appropriate (Sections 2.2, 2.3 and 2.5 of Attachment B in the maximum benefit SNMP proposal package)

HYDRUS-2D was used in the analysis to estimate the hydraulic travel times of applied water for irrigation from the root zone of plants to the water table (e.g. through the vadose zone). HYDRUS-2D is an industry standard tool that models water flow and solute and heat transport in variably saturated porous media. This program solves the Richards equation for saturated to unsaturated flow and the Fickian-based advection-dispersion equations for heat and solute transport. This program analyzes water and solute movement in unsaturated, partially saturated, or fully saturated porous media like soil. The version of HYDRUS used in this investigation is Version 2.0.

MODFLOW-2005 was used in the investigation to predict the hydraulic response of the Elsinore Basin to future water resources management decisions of the District. MODFLOW is considered an international standard for simulating and predicting groundwater conditions and groundwater-surface water interactions. Flow from external stresses such as flow to wells, areal recharge, evapotranspiration, flow to drains, and flow through riverbeds can be simulated using MODFLOW. Specified head and specified flux boundaries can be simulated as can a head dependent flux across the model's outer boundary that allows water to be supplied to a boundary block in the modeled area at a rate proportional to the current head difference between a "source" of water outside the modeled area and the boundary block.

The MT3D model was used to predict the TDS and nitrate concentration response of the Elsinore Basin to future water resources management decisions of the District. MT3D is a model that simulates advection, dispersion, and chemical reactions of contaminants in groundwater flow systems in 2- or 3-dimensions. The model uses a mixed Eulerian-Lagrangian approach to solve the advection-dispersion-reactive equation, based on combination of the method characteristics and the modified method of characteristics.

The coupling of the three models is appropriate in projecting future changes in groundwater flow conditions and TDS and nitrate concentrations in the Elsinore GMZ.

Conclusion 3 – The initial conditions for groundwater TDS and nitrate concentrations in the analysis are based on observed measurements and are scientifically appropriate in characterizing the initial conditions of the GMZ for the planning scenario analysis (Sections 2.4 and 4.4.2 of Attachment B in the maximum benefit SNMP proposal package).

The initial TDS and nitrate concentrations are based on groundwater quality sampling results collected at wells between 2015 and 2017. For wells that couldn't be sampled, the constituent concentration can be assumed to equal the last measured concentration value, if the data were collected after 2000. Average TDS and nitrate concentrations were calculated, and aquifer layer codes were assigned to each well for estimating spatial and vertical distribution of TDS and nitrate concentrations in the Basin. A weighted interpolation scheme was used to estimate the spatial distribution of TDS and nitrate concentrations in layer 1 through layer 5.

Conclusion 4 – The selection of the six planning scenarios for the projections of potential future water quality outcomes is appropriately based on projected cultural conditions in the Elsinore GMZ (Section 3.3 of Attachment B in the maximum benefit SNMP proposal package).

Information on the spatial and temporal changes in cultural conditions can be used to describe how water and wastes are managed and their subsequent impact on surface and ground waters. Land use is a key component of the cultural conditions and can be used to understand where water is being used outdoors for irrigation, a portion of which will return to the groundwater basin through deep infiltration past the root zone. The historic and future projected water supply plan, and its estimated associated water quality, is necessary to develop a time-history of the TDS concentration of the composite outdoor water supply, which can subsequently be used to compute the TDS concentration of the deep infiltration of applied water entering the vadose zone and discharging to the water table. The TDS concentration in recycled water served over the Elsinore Valley Municipal Water District (MWD)'s service area impacts TDS and nitrate concentrations of the Elsinore GMZ.

The analysis selected six planning scenarios to characterize and quantify the impacts of recycled water reuse in the Elsinore Basin Watershed to the TDS and nitrate concentration of the Elsinore GMZ for a planning period of 2017 through 2050. Descriptions of the six planning scenarios are include on page 15, Section 3.3 of Attachment B in the maximum benefit SNMP proposal package. Each planning scenario is comprised of recycled water discharge compliance plan and a variation on water supply sources that are used over the Elsinore Basin Watershed.

Conclusion 5 – The hydraulic loading rates and travel time applied inside and outside the model domain to simulate the movement of water and TDS and nitrate in the Elsinore Basin Watershed for all planning scenarios are based on scientific data and standard modeling practices (Section 4.2 of Attachment B in the maximum benefit SNMP proposal package).

Figure B-7 in Attachment B of the maximum benefit SNMP proposal package shows the surface geology of the Elsinore Basin Watershed and illustrates that the geology of the watershed outside of the model domain is predominantly non-water bearing sediments. Thus, there is no vadose zone and the recharges in these areas will either discharge to streams or become subsurface inflow to the Basin. To simulate movement of water throughout the whole Elsinore Basin Watershed, this analysis used a science-based method to divide the watershed into two sub-watersheds: 1) Canyon Hills sub-watershed (upstream) and 2) Elsinore sub-watershed (downstream). The model boundary covers the majority of the downstream portion of the Elsinore Basin Watershed.

The Canyon Hills sub-watershed lies outside of the model boundary and the recharges (deep infiltration of precipitation and water applied) in this area will become rising groundwater and discharges to the San Jacinto River or its tributaries which flow (volume and associated TDS and nitrate concentrations) into the Elsinore sub-watershed. In the Elsinore sub-watershed, the deep infiltration of precipitation and applied water that occurs outside the groundwater model domain becomes a subsurface boundary inflow to the uppermost active layer of the model. For this analysis, it is assumed that the hydraulic lag time of the deep infiltration of applied water in the sub-watershed downstream of USGS Gage 11070500 is less than one year, meaning that the precipitation and applied water are tributary to the basin in the same year they are applied at the ground surface.

In the Elsinore sub-watershed within the model boundary, HDYRUS-2D was used to simulate hydraulic travel time of deep infiltration of applied water through the vadose zone based on lithology logs of six boreholes located across the Elsinore sub-watershed. The hydraulic loading rates for streambed recharge and septic tanks are significantly higher than for the deep infiltration of precipitation and applied water because the vadose zone underlying these recharge sources is completely saturated or nearly so. The hydraulic loading rates and lag time were set based on a range of reasonable and commonly observed infiltration rates and vadose zone thicknesses.

Conclusion 6 – Calculations of the recharge and discharge model inputs for the planning scenarios are based on historical data and science-based projections of changes in recharges and discharges and are appropriate for the analysis (Section 4.3 of Attachment B in the maximum benefit SNMP proposal package)

Sources of recharge include streambed infiltration of the San Jacinto River, the deep infiltration of precipitation and outdoor applied water, and discharges from septic tanks. The only

discharge term is groundwater discharge through groundwater pumping by the Elsinore Valley MWD. The methods to calculate the values for recharge and discharge model inputs for all planning scenarios for the planning period of 2017 to 2050 are scientifically appropriate and are detailed below:

a. Estimates of deep infiltration of precipitation are based on the expected long-term average of historical estimates of deep infiltration of precipitation developed in the model calibration. Annual estimates of the deep infiltration of precipitation were prepared by Elsinore Valley MWD's staff for the period of 1990 through 2013.[3] These annual deep infiltration of precipitation values were compared to the annual precipitation at the Riverside County Flood Control and Water Conservation District (RCFCWCD) gage number 67 located downstream of the Canyon Lake Damn where flow from the San Jacinto River enter the model boundary. A regression analysis was developed to predict the annual deep infiltration of precipitation to annual precipitation. The regression equation is provided in Section 4.3.1.1 of Attachment B in the maximum benefit SNMP proposal package.

   The TDS concentration of natural precipitation is approximately 15 milligrams per liter (mgl), with a low pH level. Due to the low pH, infiltrating precipitation causes dissolution of minerals increasing the TDS concentration as it transits the vadose zone. For this analysis, the TDS concentration of deep infiltration of precipitation was assumed to equal to the lowest TDS concentration observed in the Basin historically (220 mgl). The nitrate concentration of deep infiltration of precipitation was assumed to be 1 mgl.

b. Estimates of deep infiltration of applied water are based on water supplies that are used for outdoor irrigation, the fraction of potable water used outdoors, and irrigation efficiency. The volumes of water supplies (potable) and recycled water are based on the Elsinore Valley MWD's historical and projected water supply plans. The fraction of potable water used outdoors is 0.56 for the historical period and 0.5 for the future projections[4]. The equation used to compute the deep infiltration of applied water to the water table within the model boundary is provided in Section 4.3.1.2 of Attachment B in the maximum benefit SNMP proposal package.

[3] Sibbett, S.S. and J. R. Gastelum. (2014). Preliminary Safe Yield Estimation of the Elsinore Valley Groundwater Basin. Letter to Nemesciano Ochoa, Assistant General Manager of the Elsinore Valley Municipal Water District. Dated May 6, 2014.

[4] The fraction of outdoor water use is reduced in the future due to water conservation and the Elsinore Valley MWD's recently enacted landscape irrigation ordinances for new development.

Deep infiltration of applied water in the model boundary varies depending on land use data[5]. Outside of the model boundary, deep infiltration of applied water becomes rising groundwater discharge in the San Jacinto River.

The TDS and nitrate concentration of deep infiltration of applied water at the root zone are based the average TDS concentration in the irrigation supply, the TDS concentration added through application of fertilization which was assumed to be 159 mgl[6], and the irrigation efficiency. The nitrate concentration of deep infiltration of applied water was based on the literature review which is 3.3 mgl.

c. The estimates of streambed infiltration of the San Jacinto River to the model boundary are based on stream gage measurements at USGS gage 11070500 located downstream of the Canyon Lake Dam where the San Jacinto River enters the model boundary and the land use of the watershed upstream of the gage (Canyon Hills sub-watershed). A double mass curve of precipitation and daily stream flow measurements was analyzed to determine the period of record that is considered representative of current watershed land use conditions: 1978 to 2017. To estimate future streambed infiltration, the average annual streambed infiltration for the historical period was adjusted to account for future changes in land use that will increase streamflow. This was accomplished by assuming that 100 percent of the deep infiltration of applied water attributable to the new developments in this sub-watershed will discharge into the San Jacinto River.

   The TDS and nitrate sample results collected from the San Jacinto River by RCFCWCD from 1995 to 2005 were used to estimate TDS and nitrate concentration of the streambed infiltration. A regression analysis of the TDS concentration and average daily stream flow measurements corresponding to the sample data was developed to project the TDS concentrations of San Jacinto River in the future. This regression equation is provided in Section 4.3.2 of Attachment B in the maximum benefit SNMP proposal package.

   A regression equation for nitrate was not possible due to the lack of relationship between nitrate and flow data. Further inspection of the available data demonstrated that, in general, when the daily flow is less than 80 cfs, the nitrate concentration averaged about 1.5 mgl and when the daily flow is greater than 80 cfs,

[5] Description of land use data is provided in Section 3.1 of Attachment B in the maximum benefit SNMP proposal package.
[6] Based on the discussion on page 5 in Appendix B-1 of Attachment B in the maximum benefit SNMP proposal package.

the nitrate concentration averaged about 0.6 mgl. This algorithm was used to calculate the expected nitrate concentration of the San Jacinto River.

d. Estimates of septic tanks recharges are based on the published septic tank study[7] and the Elsinore Valley MWD's 2016 Sewer System Master Plan[8] which identified a plan to convert the septic tanks to the sewer system.

   It was assumed that the TDS concentration of the septic tank discharges is equal to the wastewater TDS concentration of the Elsinore Valley MWD's Regional Water Reclamation Facility which treats wastewater generated in the area. The nitrate concentration of the septic tank discharges was assumed to be 30 mgl consistent with the modeling work performed for the septic tank study.

e. Supplemental water recharge is based on the District's plans to implement an indirect potable reuse (IPR) project in the Elsinore GMZ to meet the increasing water demands of its growing service area. Based on an initial feasibility study, the optimal strategy for IPR is injection of advanced treated recycled water and the project could be sized up to 6,750 afy. The analysis evaluated the future TDS and nitrate concentrations with and without the IPR program. In the scenario that assumes the IPR program is operated (Scenario E), the project is operated beginning in 2030.

   The TDS and nitrate concentrations of the injected water were estimated to be 100 mgl and non-detect, respectively, based on the anticipated treatment level (reverse osmosis/micro filtration) and blending assumed in the feasibility study.

f. Estimates of groundwater pumping from the Elsinore GMZ are based on the Elsinore Valley MWD's pumping activities.[9] The pumping schedule is discussed in Section 4.3.5 of Attachment B.

[7] Kenney/Jenks Consultants. (2013). Impacts of Septic Tanks on Groundwater Quality. Prepared for Elsinore Valley Municipal Water District.
[8] MWH. (2016). 2016 Sewer System Master Plan Final Report. Prepared for Elsinore Valley Municipal Water District.
[9] There are unquantified number of private wells owners pumping from the GMZ. Additionally, field research efforts by the Elsinore Valley MWD and Bedford-Coldwater and Elsinore Groundwater Sustainability Agencies did not identify relevant private pumping activities in the GMZ. Therefore, the private pumping is assumed to be negligible.

Conclusion 7 – The conclusion that all of the management and facilities options for complying with the existing Basin Plan antidegradation objective of 480 mgl for the Elsinore GMZ (Scenarios B, C, and D) provide no TDS water quality benefit to the groundwater basin, the water supply, or the volume-weighted recharge are reasonable based on the scientific conclusions presented in Conclusions 1 through 7 (Sections 5 and 6 of Attachment B in the maximum benefit SNMP proposal package).

For many hydrologically closed groundwater basins in the Santa Ana Watershed, and other regions, the TDS concentrations of groundwater will increase over time due to agricultural operations (irrigation and animal waste management) and urban landscape irrigation. And, that the amount and rate of TDS concentration increases are not sensitive to the TDS concentration in the water supplies available in the watershed, including recycled water. The TDS concentration projections produced using the models shows that complying with the 480 mgl antidegradation-based TDS objective through the direct treatment of recycled water or groundwater, or by discontinuing the reuse of recycled water will not stop the TDS degradation in the Elsinore GMZ.

Conclusion 8 – The groundwater quality model projections shown in Scenario E demonstrate that the alternative maximum benefit regulatory compliance strategy to amend the Basin Plan to change the Basin Plan TDS and nitrate objectives and require implementation of the maximum benefit commitments can provide significant water quality benefits to the Elsinore GMZ (Section 5 of Attachment B, and Result Section of Attachment A of the maximum benefit SNMP proposal package – pages 21-24).

The analysis results demonstrate that the alternative maximum benefit regulatory compliance strategy improves the TDS concentration of the groundwater supply, the total water supply, the combined recharge quality and ultimately the groundwater basin. Part of this compliance strategy includes IPR which has a positive impact in reducing the TDS and nitrate concentrations of the GMZ. In contrast, constructing and operating desalter(s) to reduce the TDS concentration in recycled water used for irrigation and or desalting groundwater for the same purpose will not stop TDS degradation from occurring.

Conclusion 9 – Economic considerations for alternatives in the proposed Basin Plan amendment are appropriate (Attachment C in the maximum benefit SNMP proposal package, Section 4d in the Staff Report, and Section H in the Substitute Environmental Document).

The supporting documents and evidence for the maximum benefit objective for TDS and nitrate concentrations include an economic assessment of the proposed Basin Plan amendment and alternative regulatory compliance plans that do not establish maximum benefit objectives for the Elsinore GMZ. For each scenario, the costs evaluated include:

- The annual amortization cost of new capital facilities
- The annual operations and maintenance cost of facilities

- The cost associated with required increases in imported water demand
- The "cost" of contributing to climate change, as measured by the increase in energy usage and GHG emissions

The economic assessment provides a sound and supportable evaluation of the potential environmental and financial costs of alternative compliance strategies.

Conclusion 10 – The proposed maximum benefit TDS objective for the Elsinore GMZ of 530 mgl is appropriate based on hydrologic considerations (Attachment A to the maximum benefit SNMP proposal package – pages 26-27)

The hydrologic rationale for this objective is as follows:

a. The Elsinore GMZ is a closed groundwater basin and the only way salt can leave the basin is through groundwater pumping. This means that the TDS concentrations in groundwater will increase over time and eventually approach the volume-weighted TDS concentration of the recharge to the basin.

b. For the planning scenarios that excluded the IPR project during the planning period (A/F, B/D and C), the volume-weighted TDS concentration of the combined recharge to the GMZ for the period 2017 through 2050 is about 620 mgl and thus, the groundwater quality of the basin will continue to degrade relative to the current volume-weighted TDS concentration of 520 mgl. By 2050, the TDS concentration of the Elsinore GMZ is projected to be 530 mgl for these salinity management scenarios.

c. The TDS concentration projections demonstrated that even if the controllable factor that contributes to the TDS concentration of recharge to the basin (e.g. TDS concentration of outdoor water supplies) is managed through treatment of the supply sources (recycled water or groundwater) or substitute supply (Scenarios B/D and C), there is no distinguishable improvement in the TDS concentration in the Elsinore GMZ through 2050 relative to a scenario where no salt mitigation is performed (Scenario A/F).

d. A maximum benefit objective of 530 mgl is consistent with the water quality conditions that could reasonably be achieved over a 30-year planning period through the coordinated control of all factors with affect water quality in the basin.

e. A maximum benefit objective of 530 mgl is consistent with previously approved maximum benefit proposals that based the maximum benefit TDS objective concentrations on 30-year planning projections.

f. Downstream beneficial uses will not be impacted because the Elsinore GMZ is operated as a closed basin and has negligible groundwater outflow.

Conclusion 11 – The proposed maximum benefit nitrate objective for the Elsinore GMZ of 5 mgl is appropriate (Attachment A to the maximum benefit SNMP proposal package – page 27)

The objective is based on Table A in the Santa Ana Regional Water Quality Control Board's Resolution 2010-0012, the Declaration of Conformance with the State Recycled Water Policy, which states that this concentration is fully protective of municipal beneficial use. This objective is also consistent with previously approved maximum benefit proposals that have generally limited the objective to one-half of the primary California Maximum Contaminant Level.

The Big Picture

Reviewers are not limited to addressing the specific conclusions presented above. Reviewers are also asked to contemplate the following questions:

1. In reading the technical reports and proposed implementation language, are there additional scientific components of the proposed action not described above? If so, please comment with respect to those components.
2. Taken as a whole, is the scientific portion of the proposed action based upon sound scientific knowledge, methods, and practices?

Reviewers should also note that some proposed actions may rely significantly on professional judgement where available scientific data are not as extensive as desired to support the statute requirement for absolute scientific rigor. In these situations, the proposed action is favored over no action.

The preceding guidance will ensure that reviewers have an opportunity to comment on all aspects of the scientific basis of the proposed action. At the same time, reviewers should also recognize that the Santa Ana Regional Water Quality Control Board has a legal obligation to consider and respond to all feedback on the scientific portions of the proposed action. Thus, reviewers are encouraged to focus on the scientific issues that are relevant to the central elements being proposed.

Attachment 3 – List of Participants

Draft Basin Plan Amendment to Adopt the Maximum Benefit Salt and Nutrient Management Plan for the for the Elsinore Groundwater Management Zone

The maximum benefit salt and nutrient management plan project proponent is the Elsinore Valley Municipal Water District (Elsinore Valley MWD). The Elsinore Valley MWD administered to development of the project proposal, including the supporting technical, economic, and environmental analyses. The Santa Ana Regional Water Quality Control Board (Santa Ana Water Board) worked collaboratively with the Elsinore Valley MWD to initiate and finalize the project from 2015 to 2020.

Elsinore Valley MWD

- Margie Armstrong – Director of Strategic Initiatives
- Parag Kalaria – Water Resources Manager
- Jesus Gastelum – Senior Water Resources Planner/Engineer
- Shane Sibbett – Civil Engineer
- Ganesh Krishnamurthy – former Water Resources Manager
- Norris Brandt – former Assistant General Manager

Santa Ana Water Board

- Hope Smythe
- Jayne Joy
- Cindy Li
- Keith Person
- Ann Sturdivant

The maximum benefit SNMP proposal package was prepared by the Elsinore Valley MWD's consultant, Wildermuth Environmental, Inc. The following participants provided technical reviews, regulatory interpretation, data acquisition, scientific expertise, and on-the-ground experience working in the watershed.

Wildermuth Environmental, Inc.[1]

- Mark Wildermuth*, PE – Principal Engineer, Senior Technical Reviewer
- Samantha Adams*, MESM – Project Manager and Principal Scientist
- Eric Chiang*, PhD – Principal Engineer and Groundwater Modeler
- Veva Weamer*, MS – Supervising Scientist

[1] Note that as of November 9, 2020, Wildermuth Environmental Inc. was acquired by West Yost Associates. All employees marked with a * are now employees of West Yost Associates.

- Carolina Sanchez*, PE – Senior Engineer
- Sodavy Ou*, MESM – Staff Scientist
- Leah Gonzalez, MESM – Former Staff Scientist

Attachment 4 – References

Draft Basin Plan Amendment to Adopt the Maximum Benefit Salt and Nutrient Management Plan for the for the Elsinore Groundwater Management Zone

All available on ftp

References for the Staff Report and key planning documentations:

Fox and Roberts. (1999). Groundwater in Storage -- Lake Elsinore Groundwater Basin. Prepared for Elsinore Valley Municipal Water District.

Kennedy/Jenks Consultants. (2007). Elsinore Valley Municipal Water District Groundwater Investigation for Grant Agreement No. 4600004076. Prepared for Elsinore Valley Municipal Water District.

Kennedy/Jenks Consultants. (2013*).* Impacts of Septic Tanks on Groundwater Quality. Prepared for Elsinore Valley Municipal Water District.

MWH Global. (2005). Elsinore Basin Groundwater Management Plan. Prepared for Elsinore Valley Municipal Water District.

MWH Global. (2008). Draft Elsinore Basin Groundwater Model Update TM. Prepared for Elsinore Valley Municipal Water District.

MWH. (2010). 2008 Elsinore Basin Status Report. Prepared for Elsinore Valley Municipal Water District.

MWH. (2016). 2016 Sewer System Master Plan Final Report. Prepared for Elsinore Valley Municipal Water District.

MWH. (2017) Draft Elsinore Basin Groundwater Model Update Technical Memorandum ™ IPR Feasibility Study. Prepared for Kennedy/Jenks Consultants and Elsinore Valley Municipal Water District.

MWH. (2017). Appendix D: Groundwater Model Update. Appendix to the Indirect Potable Reuse Feasibility Study – Final Report. Prepared for Kennedy/Jenks Consultants for the Elsinore Valley Municipal Water District.

Sibbett, S.S. and J. R. Gastelum. (2014). Preliminary Safe Yield Estimation of the Elsinore Valley Groundwater Basin. Letter to Nemesciano Ochoa, Assistant General Manager of the Elsinore Valley Municipal Water District. Dated May 6, 2014.

Tom Dodson & Associates. (2020). Substitute Environmental Document for the Maximum Benefit Salt and Nutrient Management Plan for the Elsinore Groundwater Management Zone. Prepared for the Elsinore Valley Municipal Water District, August 2020.

Water Systems Consulting (WSC). (2020). Recomputation of Ambient Water Quality for the Period 1999 to 2018. Prepared for the Santa Ana Watershed Project Authority, June 2020.

Wildermuth Environmental, Inc. (2000). Development of Groundwater Management Zones – Estimation of Historical and Current TDS and Nitrogen Concentrations in Groundwater. TIN/TDS Study – Phase 2A Final Technical Memorandum. Prepared for the TIN/TDS Task Force, July 2000.

Wildermuth Environmental, Inc. (2002). Technical Memorandum for the TIN/TDS Study – Phase 2B of the Santa Ana Watershed Wasteload Allocation Investigation. Prepared for the TIN/TDS Task Force, October 2002.

Wildermuth Environmental, Inc. (2020). Elsinore Valley Municipal Water District Proposal to Amend the Basin Plan to Incorporate a Maximum-Benefit-Based Salt and Nutrient Management Plan for the Elsinore Groundwater Management Zone. Prepared for the Elsinore Valley Municipal Water District, January 2020.

State Water Resources Control Board

March 9, 2021

Gretchen R. Miller, Ph.D., Associate Professor
Zachry Department of Civil & Environmental Engineering
Texas A&M University
402D Dwight Look Engineering Bldg.
3136 TAMU
College Station, TX 77843

SUBJECT: INITIATION OF REVIEW OF THE DRAFT BASIN PLAN AMENDMENT TO INCORPORATE A MAXIMUM BENEFIT SALT AND NUTRIENT MANAGEMENT PLAN FOR THE ELSINORE GROUNDWATER MANAGEMENT ZONE, RIVERSIDE COUNTY, CALIFORNIA

Dear Professor Miller,

I recently approved you to be a peer reviewer. The purpose of this letter is to initiate the external peer review.

Components of the review:

1. Request for External Scientific Peer Review, with the following attachments:
    - Attachment 1: Plain English Summary.
    - Attachment 2: Scientific Assumptions, Findings, and Conclusions to Review.
    - Attachment 3: Individuals who Participated in the Development of the Proposal.
    - Attachment 4: References Cited.
2. Document(s) for review.
3. Electronic copies of references cited.
4. Guidance for reviewers, as described after my signature. (Please pay particular attention to the section titled, “The review.”)

All components of the review are posted at a secure FTP site, or addressed in this letter:

- https://ftp.waterboards.ca.gov
- username: gbowes-ftp26
- password: dTN3q9

The findings, assumptions, and conclusions that need review are listed in Attachment 2 of the review request. Please address the subjects you noted you would cover with confidence, in your February 9, 2021 email to me: You will address Conclusions 1,2,3,6a, 6b, 6c,6d,6e,6f, 7,8, 10a, 10b,10c,10d,10e,10f, with confidence, and Conclusions 5 and 11 to the extent possible.

I will help with any questions you have. To ensure a clear record of our communication, all of our communications should be in writing (email is preferred).

Please email your reviews to me by Thursday April 8, 2021. I will subsequently forward all reviews and the curricula vitae of all reviewers to the Santa Ana Regional Water Quality Control Board. All of this information will be posted at the State and Regional Water Boards' Scientific Peer Review web site.

The organization requesting the review may require clarification or additional information on a specific subject. If this occurs, I will contact you to supplement your review to address those comments.

Your acceptance of this review assignment is most appreciated.

Sincerely,

Gerald W. Bowes, Ph.D.
Manager, CalEPA External Scientific Peer Review Program
Office of Research, Planning, and Performance
State Water Resources Control Board
1001 "I" Street, 13th Floor Sacramento, California 95814
Gerald.Bowes@waterboards.ca.gov

Guidance for Reviewers

Communication with the Peer Review Program. As noted above**,** to ensure a clear record of our communication, all of our communications should be in writing (email is preferred).

Confidentiality. You are required to help maintain the confidentiality of this review process.

- Confidentiality began at the point you were contacted by the University of California, Berkeley.
- You should not inform others about your role as reviewer.
- You will not know the names of other reviewers until all reviews are complete and the organization decides to release reviews.

- You not allowed to discuss the proposal with employees of the requesting organization or individuals who participated in development of the proposal. The individuals who participated in development are listed in Attachment 3 of the review request.

Independence. If you learn what you are reviewing was developed by someone with whom you share a common supervisor or have or had a working relationship, you must let us know so that we can determine whether to seek another peer reviewer. For example, if the CalEPA organization asking for the review contracted with someone in your department or organization to help develop the material you were asked to review, you have a potential conflict of interest.

The review. The statutory mandate for external scientific peer review (California Health and Safety Code Section 57004) states that the reviewer's responsibility is to determine whether "the scientific portion of the proposed rule is based upon sound scientific knowledge, methods, and practices." Your task is to make this determination for the assumptions, findings, or conclusions that the CalEPA External Scientific Peer Review Program has determined you can address with confidence, based on expertise and experience. (If you decide to address other assumptions, findings, or conclusions, identify the expertise and experience you are relying on to do so.) We also invite you to address these questions:

- Are there any scientific subjects that are part of the scientific basis of the proposal that are not described above?
- Taken as a whole, is the proposal based upon sound scientific knowledge, methods, and practices?

You may have been asked to review the implementation or application of established work. In some cases, there is a clear, previously-reviewed scientific basis for what you are reviewing but the scientific basis of the specific implementation of it still must be reviewed. For example, a United States Environmental Protection Agency criterion may have a solid peer review record, but you might determine that the proposed implementation or application of the criterion is not based upon sound scientific knowledge, methods, or practices.

You may ask for clarification or for additional specific supporting documents. We will provide what we can to you and all reviewers. Send clarification questions to Dr. Yoram Rubin (rubin@ce.berkeley.edu).

Text to include in your review:

- Your name, professional affiliation, and the date.
- The name of the item you are reviewing.
- Begin your review with, “Based on my expertise and experience, I am reviewing the findings, assumptions, or conclusions I agreed I could review with confidence:” and list them by number, as they are referred to in Attachment 2 of the review request.

Formatting your review. To ensure all people can perceive, understand, navigate, and interact with the materials posted on CalEPA websites, files posted on these websites must meet accessibility criteria. Your peer review may be posted on a CalEPA website so you should submit your review in an accessible format. The recommended way to make your file accessible is to use Microsoft Word to write your review and to use only basic text and headings during document creation. Then, run the built-in Word Accessibility Checker and resolve any accessibility issues.

Making your review accessible is your responsibility. We want to avoid, as much as possible, CalEPA staff making any kind of modification to your final peer review after you submit it. If your document does not meet accessibility requirements, we may send it back to you to fix and resubmit.

General accessibility criteria include:

- Text. Text should be black, in Arial, size 12 points or larger.
- Non-text elements. If you use them, graphs, figures, images, charts, or tables must follow accessibility criteria regarding meaningful captions and alternative text.
- Layout. Avoid complex document layouts, such as having text in more than one column, use of text boxes, use of color, and applying different font styles (i.e., bolding, underlining, etc.). It’s best to avoid letterhead, headers, and footers, aside from page numbers.
- Other requirements. There are also additional accessibility formatting requirements, including meaningful hyperlink text and appropriate use of styles for headings and lists.

The links below provide some information on accessible online content:

- Resources for Creating Accessible Content (created by the California Department of Rehabilitation).
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- State, Federal, and Other Related Laws & Regulations on Digital Accessibility (created by the California Department of Rehabilitation).

You may be asked to supplement your review. The organization requesting the review may require clarification or additional information on a specific subject. If this occurs, I will contact you to revise your review to address those comments.

If you are asked to discuss your comments. After you have submitted your review, you may be approached by third parties, the press, or by colleagues. You are under no obligation to discuss your comments with them and we recommend that you do not. Outside parties are provided an opportunity to address a proposed regulatory action during the public comment period. Discussions outside the provided avenues for comment could seriously impede the established process for vetting the proposal under consideration. Please direct third parties to us.

State Water Resources Control Board

March 11, 2021

Kimberly Rollins, Ph.D.
Professor of Resource and Environmental Economics
University of Connecticut – Department of Agriculture and Resource Economics
1376 Storrs Road Unit 4021
Storrs, CT 06269-401

SUBJECT: INITIATION OF REVIEW OF THE DRAFT BASIN PLAN AMENDMENT TO INCORPORATE A MAXIMUM BENEFIT SALT AND NUTRIENT MANAGEMENT PLAN FOR THE ELSINORE GROUNDWATER MANAGEMENT ZONE, RIVERSIDE COUNTY, CALIFORNIA

Dear Professor Rollins,

I recently approved you to be a peer reviewer. The purpose of this letter is to initiate the external peer review.

Components of the review:

1. Request for External Scientific Peer Review, with the following attachments:
    - Attachment 1: Plain English Summary.
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- https://ftp.waterboards.ca.gov
- username: gbowes-ftp26
- password: dTN3q9

The findings, assumptions, and conclusions that need review are listed in Attachment 2 of the review request. Please address the subjects you noted you would cover with confidence, in your March 10, 2021 email to me: You will address Conclusion 9.

I will help with any questions you have. To ensure a clear record of our communication, all of our communications should be in writing (email is preferred).

Please email your reviews to me by Thursday April 8, 2021. I will subsequently forward all reviews and the curricula vitae of all reviewers to the Santa Ana Regional Water Quality Control Board. All of this information will be posted at the State and Regional Water Boards' Scientific Peer Review web site.

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Your acceptance of this review assignment is most appreciated.

Sincerely,

Gerald W. Bowes, Ph.D.
Manager, CalEPA External Scientific Peer Review Program
Office of Research, Planning, and Performance
State Water Resources Control Board
1001 "I" Street, 13th Floor Sacramento, California 95814
Gerald.Bowes@waterboards.ca.gov

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State Water Resources Control Board

March 9, 2021

Sally Thompson, Ph.D., Associate Professor
Civil, Environmental, and Mining Engineering
Faculty of Engineering and Mathematical Sciences
University of Western Australia (M051)
35 Stirling Highway
6009 Perth, Australia

SUBJECT: INITIATION OF REVIEW OF THE DRAFT BASIN PLAN AMENDMENT TO INCORPORATE A MAXIMUM BENEFIT SALT AND NUTRIENT MANAGEMENT PLAN FOR THE ELSINORE GROUNDWATER MANAGEMENT ZONE, RIVERSIDE COUNTY, CALIFORNIA

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Your acceptance of this review assignment is most appreciated.

Sincerely,

Gerald W. Bowes, Ph.D.
Manager, CalEPA External Scientific Peer Review Program
Office of Research, Planning, and Performance
State Water Resources Control Board
1001 "I" Street, 13th Floor Sacramento, California 95814
Gerald.Bowes@waterboards.ca.gov

Guidance for Reviewers

Communication with the Peer Review Program. As noted above, to ensure a clear record of our communication, all of our communications should be in writing (email is preferred).

Confidentiality. You are required to help maintain the confidentiality of this review process.

- Confidentiality began at the point you were contacted by the University of California, Berkeley.
- You should not inform others about your role as reviewer.
- You will not know the names of other reviewers until all reviews are complete and the organization decides to release reviews.

- You not allowed to discuss the proposal with employees of the requesting organization or individuals who participated in development of the proposal. The individuals who participated in development are listed in Attachment 3 of the review request.

Independence. If you learn what you are reviewing was developed by someone with whom you share a common supervisor or have or had a working relationship, you must let us know so that we can determine whether to seek another peer reviewer. For example, if the CalEPA organization asking for the review contracted with someone in your department or organization to help develop the material you were asked to review, you have a potential conflict of interest.

The review. The statutory mandate for external scientific peer review (California Health and Safety Code Section 57004) states that the reviewer's responsibility is to determine whether "the scientific portion of the proposed rule is based upon sound scientific knowledge, methods, and practices." Your task is to make this determination for the assumptions, findings, or conclusions that the CalEPA External Scientific Peer Review Program has determined you can address with confidence, based on expertise and experience. (If you decide to address other assumptions, findings, or conclusions, identify the expertise and experience you are relying on to do so.) We also invite you to address these questions:

- Are there any scientific subjects that are part of the scientific basis of the proposal that are not described above?
- Taken as a whole, is the proposal based upon sound scientific knowledge, methods, and practices?

You may have been asked to review the implementation or application of established work. In some cases, there is a clear, previously-reviewed scientific basis for what you are reviewing but the scientific basis of the specific implementation of it still must be reviewed. For example, a United States Environmental Protection Agency criterion may have a solid peer review record, but you might determine that the proposed implementation or application of the criterion is not based upon sound scientific knowledge, methods, or practices.

You may ask for clarification or for additional specific supporting documents. We will provide what we can to you and all reviewers. Send clarification questions to Dr. Yoram Rubin (rubin@ce.berkeley.edu).

Text to include in your review:

- Your name, professional affiliation, and the date.
- The name of the item you are reviewing.
- Begin your review with, “Based on my expertise and experience, I am reviewing the findings, assumptions, or conclusions I agreed I could review with confidence:” and list them by number, as they are referred to in Attachment 2 of the review request.

Formatting your review. To ensure all people can perceive, understand, navigate, and interact with the materials posted on CalEPA websites, files posted on these websites must meet accessibility criteria. Your peer review may be posted on a CalEPA website so you should submit your review in an accessible format. The recommended way to make your file accessible is to use Microsoft Word to write your review and to use only basic text and headings during document creation. Then, run the built-in Word Accessibility Checker and resolve any accessibility issues.

Making your review accessible is your responsibility. We want to avoid, as much as possible, CalEPA staff making any kind of modification to your final peer review after you submit it. If your document does not meet accessibility requirements, we may send it back to you to fix and resubmit.

General accessibility criteria include:

- Text. Text should be black, in Arial, size 12 points or larger.
- Non-text elements. If you use them, graphs, figures, images, charts, or tables must follow accessibility criteria regarding meaningful captions and alternative text.
- Layout. Avoid complex document layouts, such as having text in more than one column, use of text boxes, use of color, and applying different font styles (i.e., bolding, underlining, etc.). It’s best to avoid letterhead, headers, and footers, aside from page numbers.
- Other requirements. There are also additional accessibility formatting requirements, including meaningful hyperlink text and appropriate use of styles for headings and lists.

The links below provide some information on accessible online content:

- Resources for Creating Accessible Content (created by the California Department of Rehabilitation).
- Microsoft video lessons for accessible Word documents (created by Microsoft).
- State, Federal, and Other Related Laws & Regulations on Digital Accessibility (created by the California Department of Rehabilitation).

You may be asked to supplement your review. The organization requesting the review may require clarification or additional information on a specific subject. If this occurs, I will contact you to revise your review to address those comments.

If you are asked to discuss your comments. After you have submitted your review, you may be approached by third parties, the press, or by colleagues. You are under no obligation to discuss your comments with them and we recommend that you do not. Outside parties are provided an opportunity to address a proposed regulatory action during the public comment period. Discussions outside the provided avenues for comment could seriously impede the established process for vetting the proposal under consideration. Please direct third parties to us.

State Water Resources Control Board

March 9, 2021

Alexandra D. Lutz, Ph.D.
Associate Research Professor
Affiliated with Division of Hydrological Sciences
Desert Research Institute
Nevada System of Higher Education
2215 Raggio Parkway
Reno, NV 89512

SUBJECT: INITIATION OF REVIEW OF THE DRAFT BASIN PLAN AMENDMENT TO INCORPORATE A MAXIMUM BENEFIT SALT AND NUTRIENT MANAGEMENT PLAN FOR THE ELSINORE GROUNDWATER MANAGEMENT ZONE, RIVERSIDE COUNTY, CALIFORNIA

Dear Professor Lutz,

I recently approved you to be a peer reviewer. The purpose of this letter is to initiate the external peer review.

Components of the review:

1. Request for External Scientific Peer Review, with the following attachments:
    - Attachment 1: Plain English Summary.
    - Attachment 2: Scientific Assumptions, Findings, and Conclusions to Review.
    - Attachment 3: Individuals who Participated in the Development of the Proposal.
    - Attachment 4: References Cited.
2. Document(s) for review.
3. Electronic copies of references cited.
4. Guidance for reviewers, as described after my signature. (Please pay particular attention to the section titled, “The review.”)

All components of the review are posted at a secure FTP site, or addressed in this letter:

- https://ftp.waterboards.ca.gov
- username: gbowes-ftp26
- password: dTN3q9

The findings, assumptions, and conclusions that need review are listed in Attachment 2 of the review request. Please address the subjects you noted you would cover with confidence, in your March 3, 2021 email to me: You will address Conclusion 4 with confidence.

I will help with any questions you have. To ensure a clear record of our communication, all of our communications should be in writing (email is preferred).

Please email your reviews to me by Thursday April 8, 2021. I will subsequently forward all reviews and the curricula vitae of all reviewers to the Santa Ana Regional Water Quality Control Board. All of this information will be posted at the State and Regional Water Boards' Scientific Peer Review web site.

The organization requesting the review may require clarification or additional information on a specific subject. If this occurs, I will contact you to supplement your review to address those comments.

Your acceptance of this review assignment is most appreciated.

Sincerely,

Gerald W. Bowes, Ph.D.
Manager, CalEPA External Scientific Peer Review Program
Office of Research, Planning, and Performance
State Water Resources Control Board
1001 "I" Street, 13th Floor Sacramento, California 95814
Gerald.Bowes@waterboards.ca.gov

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The review. The statutory mandate for external scientific peer review (California Health and Safety Code Section 57004) states that the reviewer's responsibility is to determine whether "the scientific portion of the proposed rule is based upon sound scientific knowledge, methods, and practices." Your task is to make this determination for the assumptions, findings, or conclusions that the CalEPA External Scientific Peer Review Program has determined you can address with confidence, based on expertise and experience. (If you decide to address other assumptions, findings, or conclusions, identify the expertise and experience you are relying on to do so.) We also invite you to address these questions:

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CURRICULUM VITAE
GRETCHEN R. MILLER, PH.D., P.E.

Associate Professor, Department of Civil & Environmental Engineering, Texas A&M University
Phone: (979) 862-2581, Email: gmiller@tamu.edu

PROFESSIONAL PREPARATION

University of Missouri, Rolla	Geological Engineering	B.Sc. 2002
University of Missouri, Rolla	Geological Engineering	M.Sc. 2003
University of California, Berkeley	Environmental Engineering	Ph.D. 2009

APPOINTMENTS

Associate Professor	Texas A&M University	2016- present
Assistant Professor	Texas A&M University	2009 - 2016
Graduate Student Instructor	Univ. of California, Berkeley	2008 - 2009
Research Engineer	Hydrogeophysics, Inc.	2006 - 2007
Graduate Student Researcher	Univ. of California, Berkeley	2005
Project Engineer	Shaw Environmental	2004
Graduate Student Researcher	Univ. of Missouri, Rolla	2003

RECENT AWARDS

Dean of Engineering Excellence Award, TAMU	2016
Editors' Citation for Excellence in Refereeing - *Water Resour. Res.*	2015
Montague Scholar, Center for Teaching Excellence, TAMU	2015
National Science Foundation CAREER Award	2014

REFERRED PUBLICATIONS (SELECTED)

[1] Prior, E.M.*, Brumbelow, K., and G.R. Miller (2019) HPeye: Measurement of above-canopy meteorological profiles using unmanned aerial systems, *Hydrological Processes*. https://doi.org/10.1002/hyp.13631

[2] Grossiord, C., B. Christoffersen, K. Anderson-Teixeira, L.M.T. Aparecido, C. Berry, C. Baraloto, D. Bonal, I. Borrego, J. Chambers, D. Christianson, M. Detto, B. Faybishenko, C. Fortunel, B. Gimenez, K.J. Jardine, L. Kueppers, G.R. Miller, G.W. Moore, R. Negron-Juarez, C. Stahl, N. Swenson, C. Varadharajan, J. Warren, B. Wolfe, L. Wei, J.S. Wright, C. Xu, and N. McDowell (2019). Precipitation mediates transpiration sensitivity to evaporative demand in the neotropics, *Oecologia*, 191(3):519-530. doi: 10.1007/s00442-019-04513-x.

[3] Gou*, S., Saville*, C., Miller*, G.R., Maxwell, R., and Ferguson, I. (2018). Simulating groundwater dependent vegetation in a high-resolution, coupled subsurface-land surface model, *Advances in Water Resources*, doi: 10.1016/j.advwatres.2018.08.008.

[4] Moore, G., G. Orozco*, L.M.T. Aparecido*, G.R. Miller (2018), Upscaling transpiration in diverse forests: Insights from a tropical pre-montane site, *Ecohydrology*, doi: 10.1002/eco.1920.

[5] Rhodes*, K., T. Proffitt*, T. Rowley*, P. Knappett, N. Dimova, D. Tebo, and G.R. Miller (2017). Quantifying groundwater discharged to a low-gradient river with high-frequency differential gaging and natural tracers, *Water Resources Research*, doi:

10.1002/2017WR021619.
[6] Smith*, B., G.R. Miller, and Z. Sheng (2017), Assessing aquifer storage and recovery feasibility in the gulf coastal plains of Texas, *Journal of Hydrology: Regional Studies*, 14:92-108, doi:10.1016/j.ejrh.2017.10.007.
[7] Aparecido, L.M.T.*, G.R. Miller, A.T. Cahill, and G.W. Moore (2017), Photosynthetic responses to leaf surface wetness in tropical and semiarid savanna plants with varying leaf traits, Tree Physiology, https://doi.org/10.1093/treephys/tpx092.
[8] Miller, G.R., and K. Brumbelow (2017), Attitudes of Incoming Civil Engineering Students towards Sustainability as an Engineering Ethic. *Journal of Professional Issues in Engineering Education and Practice*, 143(2), doi:10.1061/(ASCE)EI.1943-5541.0000306.
[9] Aparecido, L.M.T.*, G.R. Miller, A.T. Cahill, and G.W. Moore (2016), Comparison of Tree Transpiration under Wet and Dry Canopy Conditions in a Costa Rican Premontane Tropical Forest. *Hydrological Processes*, doi:10.1002/hyp.10960.
[10] Saville, C.*, G.R. Miller, and K. Brumbelow (2016), Using Envision to Assess the Sustainability of Groundwater Infrastructure: A Case Study of the Twin Oaks Aquifer Storage and Recovery Project. *Sustainability*, 8(5), 501, doi:10.3390/su8050501.
[11] Gou, S.*, S. Gonzales*, and G. R. Miller (2015), Mapping potential groundwater dependent ecosystems for sustainable management, *Groundwater*, 53(1), 99-110, doi: 10.1111/gwat.12169.
[12] Gou, S.* and G. R. Miller (2014), A groundwater–soil–plant–atmosphere continuum approach for modelling water stress, uptake, and hydraulic redistribution in phreatophytic vegetation, *Ecohydrology*, 7(3), 1029-1041, doi:10.1002/eco.1427.
[13] Miller, G. R., Y. Rubin, X. Chen, S. Ma, and D. D. Baldocchi (2010), Groundwater uptake by woody vegetation in a Mediterranean oak savannah, *Water Resources Research,* 46, W10503, doi:10.1029/2009WR008902.
[14] Miller, G. R., Y. Rubin, K. U. Mayer, and P. H. Benito (2008), Modeling vadose zone processes during land application of food-processing wastewater in California's Central Valley, *Journal of Environmental Quality*, 37(5), S-43-S-57, doi: 10.2134/jeq2007.0320.

CONSULTING REPORTS

[1] Binkley, B., D. Hamilton, T. Calvin, L. Chen, G.R. Miller, Z. Sheng, R. Kaiser, J. Seifert, J. Davis (2017), Drainage Reuse Initiative Feasibility Study, for the Harris County Flood Control District and the Harris County Precinct 4 Commissioner's Office.
[2] Rubin, Y., P. Benito, G. Miller, J. McLaughlin, Z. Hou, S. Hermanowicz, U. Mayer, and D. Sillin (2007), Hilmar Supplemental Environmental Project Report, Volume II, Oakland, CA, available at: http://hgp-inc.net/HilmarSEP/HilmarSEP_ExSumm.html

PROFESSIONAL SERVICE

- Board of Directors, Consortium of Universities for the Advancement of Hydrologic Science, Inc (CUAHSI); Chair, 2021, Chair-Elect 2020, Director 2019 – present
- Associate Editor, *Hydrological Processes*, 2016 – present
- Chair, Interdisciplinary Council, Environmental and Water Resources Institute of the American Society of Civil Engineers, officer from 2014 – present
- Peer reviewer for grant proposals (NSF, NASA, and DOE) and 70+ journal articles

Kimberly Rollins, Ph. D.

Professor of Resource and Environmental Economics

University of Connecticut – Department of Agricultural and Resource Economics
1376 Storrs Road Unit 4021 – Storrs, CT 06269-4021
Tel: (860) 486-4394; E-mail: Kimberly.Rollins@UConn.edu
Mobile: (775) 813-4182

(a) Education and Training

Institution	Location	Major	Degree	Date
University of Maine	Orono, ME	Zoology	BA	1982
University of Wisconsin	Madison, WI	Applied Economics	PhD	1990

Postdoctoral Research Associate: Joint with University of Wisconsin, Madison and Tropical Agricultural Research and Higher Education Center (CATIE), Turrialba, Costa Rica, 1990-91

(b) Professional Experience

- Director, Zwick Center for Food and Resource Policy, 2019 - Current
- Professor and Department Head, Department of Agricultural and Resource Economics, University of Connecticut, Storrs CT, 2019 – current.
- Professor Emeritus, University of Nevada, Reno, August 2019 to current
- Visiting Scholar/Economic Advisor, Environment Canada, a branch of the Government of Canada, Ottawa, Canada, 2014-15
- Professor, Department of Economics, University of Nevada, Reno, 2014-2019.
- Associate Professor, Department of Economics, University of Nevada, Reno, 2011-14.
- Associate Professor, Department of Resource Economics, University of Nevada, 2002- 11.
- Visiting Associate Professor, Nicholas School of the Environment, Duke University, Durham, North Carolina, 1998- 99.
- Associate Professor, Department of Agricultural Economics and Business, University of Guelph, Guelph, Ontario, Canada, 1998-02.
- Assistant Professor, Department of Agricultural Economics and Business, University of Guelph, Guelph, Ontario, Canada, 1992-98.

(c) Publications from last 4 years

Brent, D.A., C.G. Lott, M. H. Taylor, K. Rollins, J. Cook and S. Stoddard. 2020. Are Normative Appeals Moral Taxes? Evidence from a Field Experiment on Water Conservation. Accepted for Publication in *Environmental and Resource Economics* 77(October):1-35.

Lee, Gi-Eu, K. Rollins, and L. Singletary. 2020. An Empirical Analysis of the Influence of Permitted Place of Use Transfers on the Performance of Prior Appropriations Water Rights. *Land Economics* 96(3): 384-398.

Zhong, Hua, Michael H. Taylor, Dale T. Manning, Kimberly Rollins, and Christopher Goemans. 2019. Who pays for water scarcity? Evaluating the welfare implications of water infrastructure investments for cities. *Annals of Regional Science* 63:559-600.

Sisante, Angelo, M., Michael H. Taylor, and Kimberly Rollins. 2019. "Understanding Homeowners' Decisions to Mitigate Wildfire Risk and Create Defensible Space: Evidence from Nevada." *International Journal of Wildland Fire* 28(11): 901-911.

Taylor, M.H., L. Christman and K. Rollins. 2019. Choosing the Right Policy to Promote Defensible Space in the Wildland-Urban Interface: Evidence from Homeowners in Nevada. *Land Economics* 95(4):531–556.

Bowman, A., C. Lott, C. Meenan, K. Rollins S. Stoddard and L. Singletary. 2018. Elasticity of Price Demand for Water for Residential and Commercial Sectors in Nevada. University of Nevada Cooperative Extension Special Publication SP-18-05.

Taylor, M.H., K. Rollins and C. Lott. 2018. Exploring the Behavioral and Welfare Implications of Social-Comparison Messages in Residential Water and Electricity. *Economic Letters* 168: 65-69.

(d) Current Research Contracts and Grants

Year	Title and Source	Amount
2020-21	Cost of Dairy Production Survey, State of Connecticut Department of Agriculture	$56,068
2020-23	Integrated economic assessment of nutrient loadings in watersheds, best practice agricultural management, and environmental policies in the North East. NIFA/CAHNR Capacity Grant award	$90,000
2020-24	NEWIR Manure: Nutrients, Energy, and Water Innovations for Resource Recovery. Co-PI, with Charles Coronella, Chemical Engineering, University of Nevada, Reno, PI. Subaward at UConn.	$313, 052
2018-22	Evaluating Alternative Water Institution Performance in Snow-Dominated Basins: Are Food Production Systems at Risk from Changing Snow Water Availability? USDA/NIFA. Co-PI.	$4,917,465

Curriculum Vitae: **Assoc. Prof. Dr. Sally Thompson**

Personal Details

Full Name	Sally Elizabeth Thompson
Present Position	Associate Professor Environmental Engineering (Hydrology)
	Associate Editor, Water Resources Research
	Associate Editor, Journal of Hydrology
	School of Civil, Environmental and Mining Engineering
	The University of Western Australia, Crawley, WA 6009.
	Tel: (61) 459959489 Fax (61 8) 6488 1015
	Email: sally.thompson@uwa.edu.au
	Website: https://research-repository.uwa.edu.au/en/persons/sally-thompson/

Research Interests

Ecohydrology, Hydrology, Climate Change, Complex Systems Science and Nonlinear Dynamics.

Professional History (since 1997)

Since 2019	Associate Professor Environmental Engineering, The University of Western Australia.
Since 2019	Adjunct Associate Professsor, Environmental Engineering, The University of California, Berkeley
Since 2017	Clare and Hsieh-Wen Shen Distinguished Research Chair, The University of California, Berkeley
2017-2018	Associate Professor Civil and Environmental Engineering, The University of California, Berkeley.
2011-2017	Assistant Professor Civil and Environmental Engineering, The University of California, Berkeley.
2010-2011	Visiting Assistant Professor Civil and Environmental Engineering, Purdue University

Qualifications

2010	Doctor of Philosophy, Duke University, NC, USA.
2003	Bachelor of Science (hons) and Bachelor of Engineering (hons) University of Western Australia

Selected grants and awards (values in US dollars unless specified)

- 2018 Effects of long-term fire regime on post-fire erosion, NSF, **$49,999 (USD)**
- 2017 Agroserve: Assessing how intact ecosystems deliver agricultural business value in the Brazilian Amazon and Cerrado. The Gordon and Betty Moore Foundation, **$972,170**.
- 2016 Water balance and Plant Ecophysiology in Coastal California: Linking Models and Mechanisms to project under future climate scenarios. NSF, **$726,511**
- 2016 Assessing controls on hydrologic connectivity, plant water availability and degradation risk in drylands with isotope tracers and Lagrangian modeling, National Science Foundation – Israeli National Science Foundation, **$282,543**
- 2016 Jim Dooge Award, best paper in Hydrology and Earth System Science Journal
- 2016 Editor's Citation for Excellence in Reviewing, Water Resources Research
- 2015 Shifting Baselines in the San Francisco Bay-Delta Watershed: Reconstructing 165 years of Change Through Data Synthesis and Modeling, LA Metropolitan Water District. **$117,924**
- 2015 CAREER: Fire management effects on Sierra Nevada ecohydrology – a dynamical systems approach, National Science Foundation, **$586,987**
- 2014 Hydrology and Fire in the Sierra Nevada: A Possible Win-Win, Joint Fire Sciences Program, **$395,107**
- 2014 The Eel River Critical Zone Observatory: Exploring How the Critical Zone Mediate Watershed Currencies and Ecosystems in a Changing Environment, NSF. **$4,899,996**
- 2014 US-India Collaborative Research Linking Remote Sensing, Citizen Science and Robotics to Address Critical Environmental Problems in Data Sparse Regions, NSF CNIC. **$38,746**

- 2014 RAPID: The Endless Summer: Implications of a 100-year drought for the Functional Biology of Native Californian Plants and Ecosystems, NSF. **$180,411**
- 2014 Co-Aerial Ecologist: Robotic Water Sampling and Sensing in the Wild. USDA/National Robotics Initiative. **$142,857**
- 2013 American Geophysical Union Early Career Award in Hydrology

Professional Service (since 1990)

Reviewer for over 20 international journals and National and International Research Funding Bodies including The National Science Foundation (U.S), the US Department of Energy and several private foundations.

Associate Editor, Journal of Hydrology	2019-Present
Associate Editor, Water Resources Research	2018-Present
NSF Review Panelist "Hydrology"	2018
AGU Early Career Hydrology Award Selection Committee, Chair.	2017– 2017
…, Member.	2015– 2017
AGU Horton Award Selection Committee.	2015– 2017
General Sir John Monash Scholarship Application Reviewer.	2014– present
Handling Editor, Hydrology and Earth Systems Science.	2011– present
Editorial board member, Advances in Water Resources.	2012– present
Editorial board member, Ecohydrology.	2015– present
Editorial board member, Australasian Journal of Water Resources.	2016– present
NSF Review Panelist "Geosciene Graduate Research Fellowships"	2016
Department of Energy Earth Sciences Program Reviewer	2012-present
NSF Hydrological Sciences Program Reviewer	2012-present
National Geographic Society Grant Reviewer	2014

Recent Scientific Publications (2020 publications shown here only)

105 refereed publications & 3 book contributions totalling 3740 citations, h-index 31 & i10-index 67 (Google Scholar - https://scholar.google.com.au/citations?user=U_c9NhgAAAAJ&hl=en&oi=sra).

Claydon, G., Thompson, S., Shanafield, M. and Manero, A., 2020. Guiding urban water management in areas that experience high seasonal groundwater: Expert Panel report.

Penny, G., Srinivasan, V., Apoorva, R., Jeremiah, K., Peschel, J., Young, S. and Thompson, S., 2020. A process-based approach to attribution of historical streamflow decline in a data-scarce and human-dominated watershed. *Hydrological Processes*, *34*(8), pp.1981-1995.

McLaughlin, B.C., Blakey, R., Weitz, A.P., Feng, X., Brown, B.J., Ackerly, D.D., Dawson, T.E. and Thompson, S.E., 2020. Weather underground: Subsurface hydrologic processes mediate tree vulnerability to extreme climatic drought. *Global change biology*, *26*(5), pp.3091-3107.

Stevens, J.T., Boisramé, G.F., Rakhmatulina, E., Thompson, S.E., Collins, B.M. and Stephens, S.L., 2020. Forest Vegetation Change and Its Impacts on Soil Water Following 47 Years of Managed Wildfire. *Ecosystems*, pp.1-19.

Wu, G., Guan, K., Li, Y., Novick, K.A., Feng, X., McDowell, N.G., Konings, A.G., Thompson, S.E., Kimball, J.S., De Kauwe, M.G. and Ainsworth, E.A., 2020. Interannual variability of ecosystem iso/anisohydry is regulated by environmental dryness. *New Phytologist*.

Wang, T., Kelson, S.J., Greer, G., Thompson, S.E. and Carlson, S.M., 2020. Tributary confluences are dynamic thermal refuges for a juvenile salmonid in a warming river network. *River Research and Applications*.

Dralle, D.N., Hahm, W.J., Rempe, D.M., Karst, N., Anderegg, L.D., Thompson, S.E., Dawson, T.E. and Dietrich, W.E., 2020. Plants as sensors: vegetation response to rainfall predicts root-zone water storage capacity in Mediterranean-type climates. *Environmental Research Letters*, *15*(10), p.104074.

Weldegebriel, L., Kruskopf, M., Thompson, S.E. and Tebeje, K., 2020. Detecting the short term impact of soil and water conservation practices using stage as a proxy for discharge—A case-study from the Tana sub-basin, Ethiopia. *Land Degradation & Development*.

Stephens, S.L., Westerling, A.L., Hurteau, M.D., Peery, M.Z., Schultz, C.A. and Thompson, S., 2020. Fire and climate change: conserving seasonally dry forests is still possible. *Frontiers in Ecology and the Environment*, *18*(6), pp.354-360.

Lapides, D.A., David, C., Sytsma, A., Dralle, D. and Thompson, S., 2020. Analytical solutions to runoff on hillslopes with curvature: numerical and laboratory verification. *Hydrological Processes*, *34*(24), pp.4640-4659.

Rakhmatulina, E. and Thompson, S., 2020. Freeze–thaw processes degrade post-fire water repellency in wet soils. *Hydrological Processes*.

Crompton, O., Katul, G.G. and Thompson, S., 2020. Resistance formulations in shallow overland flow along a hillslope covered with patchy vegetation. *Water Resources Research*, *56*(5), p.e2020WR027194.

Alexandra Denise Lutz
Division of Hydrologic Sciences
Desert Research Institute
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Education

2007	**University of Nevada, Reno Ph.D.** Graduate Program of Hydrologic Sciences Field: Hydrogeology/Water Resources	Reno, NV
2006	**Fulbright Scholarship** Mali Rural Water Project Field: Sustainability of Groundwater	Mali, West Africa
2002	**University of Nevada, Reno M.S.** Department of Civil Engineering Field: Water Treatment	Reno, NV
2002	**University of Nevada, Reno M.A.** Department of Literature and Foreign Languages Field: German Literature	Reno, NV
1994	**University of Vermont, B.A.** School of Arts Field: Economics/German Literature	Burlington, VT

Experience ***Work and Research***

2015-Present	Desert Research Institute (DRI) **Associate Research Professor** Division of Hydrologic Sciences (DHS) Water Resources, Climate Change, Water Treatment	Reno, NV
2019-Present	**Associate Director** University of Nevada Reno (UNR) Graduate Program of Hydrologic Sciences	
2010-2015	DRI, DHS **Assistant Research Professor**	Reno, NV
2008-Present	UNR, GPHS **Faculty**	Reno, NV
2009-Present	UNR **Adjunct Professor** Department of Geography Water Resources, Climate Change, Impact of Development Work	Reno, NV
2007-2010	DRI **Post-Doctoral Fellow** Division of Hydrologic Sciences	Reno, NV
1999-2002	UNR **Graduate Research Assistant** Department of Civil Engineering	Reno, NV

1998-1999	UNR **Graduate Teaching Assistant** Department of Foreign Languages and Literatures	Reno, NV
1999-2002	California Water Quality Control Board **Engineering Intern** Northern Watersheds / Leviathan Mine	South Lake Tahoe, CA

Teaching/Advising: DRI and UNR

2019, 2017, 2015, 2013, 2011, 2009	UNR / Dept. of Geography / "Water Issues and Development" (GEOG 701n)	Reno, NV
2011-2018	**Advisor** to Student Association for International Water Issues (SAIWI)	Reno, NV
2009-present	**Major Professor** of Master students (S. Holt, D. Saftner); advisor to Ph.D. student (L. Craig) and Master's students (B. Anderson, Z. Arno, H. Diehl, H. Fillmore, K. Gastineau, L. Gilbertson, E. Mlawsky, M. Reed, S. Thomas)	Reno, NV
2001-2003	**Volunteer/Mentor** in "Get SET" – (Get Science, Engineering and Technology Program) to engage at-risk high school girls to these fields.	Washoe County, NV
1998- 1999	UNR / Dept. of Foreign Languages and Literature **Graduate teaching Assistant** German 101	Reno, NV

Teaching: International Workshops

2019	Navajo Nation, STAR school Accredited, two-day teacher professional development workshop on water quality lessons for local classrooms.	Navajo Nation
2018	Ministry of Water and Water For People, Kyenjojo, Uganda Hardware/software for monitoring groundwater levels and data management.	Uganda
2011	University of Urgench, Uzbekistan Hardware/software for monitoring groundwater levels and calculating water loss from irrigation canals	Uzbekistan
2011, 2013	Ghana Rural Water Project, Tamale, Ghana Using Geographic Information Systems (GIS) and associated tools; Res2-D (geophysical software).	Ghana
2009	Niger Rural Water Project, Zinder, Niger Mali Rural Water Project, Bla, Mali Advanced MS Office, testing water quality	Niger, Mali
2008	Church of Christ, Yendi, Ghana Introduction to GIS and associated tools, MS Office	Ghana

2005-2006	Mali Rural Water Project, Bla, Mali Introduction to GIS and associated tools Chiwara Elementary School, Kati, Mali Introduction to the hydrologic cycle	Mali

Research Grants

Sample of research projects below

2015-2020	USDA "Native Waters on Arid Lands," understand the impacts of climate change, and to evaluate adaptation options for sustaining water resources and agriculture, participant.
2018	Conrad N. Hilton Foundation, "Water Resources Assistance to Water For People and Water4," find sources of water and monitor their long-term sustainability, PI.
2017	State of Wyoming Water Development Commission, Laramie Range Siting and Design, Level III Study. Water resources enhancement under Cloud Seeding in Wyoming.
2017	White Pine County, NV, "Data Gather and Assimilation Services" for update to White Pine County Water Resources Plan, PI.
2015-2017	USGS / Dept. of Interior Southwest Climate Science Center "Climatic, hydrological, and ecological changes at intermediate timescales in a Great Basin Watershed", PI.
2011-2013	Southern Nevada Water Authority / Bureau of Reclamation "Professional Services for Climate and Watershed Investigations in Eastern Great Basin Nevada - Impacts of a Changing Climate on Water Resources in the Eastern Great Basin."
2011-2014	World Vision, "Water Projects Regional-Scale Hydrogeologic Mapping and Sustainability of Groundwater" Co-PI.
2011-2013	US Civilian Research and Development Foundation, "Canal Lining and Afforestation to Prevent Raised Groundwater Tables in Khorezm, Uzbekistan" PI.
2010-2012	Carson Water Sub-Conservancy District / Bureau of Reclamation "Development of a Regional Water Management Plan for the Carson River Watershed – Analysis of Historical Streamflow Patterns" PI.
2010-2012	Carson Water Sub-Conservancy District / Bureau of Reclamation "Development of a Regional Water Management Plan for the Carson River Watershed – Analysis of Historical Streamflow Patterns" PI.

Synergistic Activities

Professional Organizations Fulbright Association; Nevada Water Resources Association; Registered Engineering Intern, State of Nevada OT4153

Community Organizations Board Member, Northern Nevada Math Club

Multi-cultural and multi-faith experience working long-term abroad in developmental and applied science in emerging regions;

Languages: German, French/Spanish, Bambara

Professional Service

Reviewing Responsibilities

2007-Present **Peer Reviewer** for: *Atmosphere*; *Journal of Hydrology; Water Resources Research; Hydrological Processes; Habitat; Environmental Earth Sciences, Journal of Cleaner Production; African Journal of Science and Technology Science; Water;* DRI internal documents.

Grant Reviewer for: New Jersey Water Resources Research Institute; Civilian Resources Defense Foundation; National Environment Research Council, UK.
Panel Participant for: National Science Foundation, International Research Experiences for Students (IRES)

Publications and Presentations

Refereed Publications

Bai, X., Lutz, A. D., Carroll, R. W., Keteles, K., Dahlin, K., Murphy, M., Nguyen, D., 2018: Occurrence, distribution, and seasonality of emerging contaminants in urban watersheds, Chemosphere, 200, 133-42, doi:10.1016/j.chemosphere.2018.02.106

Craig, L., Thomas, J. M., Lutz, A. D., Decker, D. L., 2017: Determining the optimum locations for pumping low-fluoride groundwater to distribute to communities in a fluoridic area in the Upper East Region, Ghana, Chemical Geology, 476, 481-492, https://doi.org/10.1016/j.chemgeo.2017.12.001

Tang, G., Carroll, R. W., Lutz, A. D., 2016: Regulation of precipitation-associated vegetation dynamics on catchment water balance in a semiarid and arid mountainous watershed., Ecohydrology, DOI: 10.1002/eco.1723

Fisher M, Shields K, Chan T, Christenson E, Cronk R, Leker H, Samani D, Apoya P, Lutz A Bartram J. 2015. Understanding handpump sustainability: Determinants of rural water source functionality in the Greater Afram Plains region of Ghana. Water Resources Research, DOI: 10.1002/2014WR016770

Holt, S. E., Lutz, A. D., Saga, B., Berger, D. L., Thomas, J. M., Apambire, W., 2015: Developing an approach for a three-dimensional hydrogeologic framework to find water in Northern Ghana, Open Journal of Modern Hydrology, 5, 105-120 http://dx.doi.org/10.4236/ojmh.2015.54010

Lutz, A., Minyila, S, Saga, B., Diarra, S., Ayamsegna, J. Apambire, B., Thomas, J. 2014, Fluctuation of Groundwater Level and Recharge Patterns in Northern Ghana, *Climate*, 3, (1), 1-15, doi: 10.3390/cli3010001.

Leising, J. F., and Lutz, A., 2014, The Range Fraction: an Applied Method to Characterize Regional Groundwater Responses to Climate Inputs: *Environmental Monitoring and Assessment*

Lutz, A., Diarra, S., Apambire, B., Thomas, J., Ayamsegna, J. 2013, Drinking Water from Hand-Pumps in Mali, Niger, and Ghana, West Africa: Review of Health Effects. *Journal of Water Resource and Protection*. 5, 8A. 10.4236/jwarp.2013.58A002

Jabbarov, K., Eschanov, R., Matniyazova, G., Lutz, A., Shanafield, M., Lamers, J. 2013, Canal Lining to Increase Water Use Efficiency and Remediate

Groundwater Levels in Khorezm, Uzbekistan, Central Asia. *International Journal of Agriculture: Research and Review*. 3, 4, 742-750.

Lutz, A., Thomas, J., Diarra, S. 2013, Chemistry of Hand-Pump Waters in Ghana, Mali, and Niger, West Africa: Potential Health Effects. *Procedia Earth and Planetary Science*. 7, 541-545. Proceedings of the Fourteenth International Symposium on Water-Rock Interaction, WRI 14.

Thomas, S., McGwire, K., Lutz, A., Kratt, C., Trammell, E., Thomas, J., McKay, W. 2012. Geospatial and regression tree analysis to map groundwater depth for manual well drilling suitability in the Zinder region of Niger. *Journal of Hydrology*, 446-447, 35-47, http://dx.doi.org/10.1016/j.jhydrol.2012.04.023.

Lutz, A. 2011, Climate Change and Sustainable Development of Water: Sub-Saharan Africa. In: Climate Change, Socioeconomic Effects. Eds: Blanco J, Kheramand, H. Croatia: Intech.

Lutz, A., Thomas, J., and Keita, M. 2011, Effects of Population Growth and Climate Variability on Sustainable Groundwater in Mali, West Africa. *Sustainability*, 3(1), 21-34; doi:10.3390/su3010021

Lutz, A., Thomas, J., Panorska, A. 2010, Environmental Controls on Stable Isotope Precipitation Values over Mali and Niger, West Africa. *Environmental Earth Sciences*. 10.1007/s12665-010-0655-7

Lutz, A., Thomas, J., Pohll, G., Keita, M., McKay, A. 2008, Sustainability of Groundwater in Mali, West Africa. *Environmental Geology*, DOI 10.1007/s00254-008-1646-9.

Lutz, A., Thomas, J., Pohll, G., McKay, W. 2007,) Groundwater Resource Sustainability in the Nabogo Basin of Ghana. *Journal of African Earth Sciences*, 49, 3, 61-70.

Project Reports (locally peer-reviewed)

McDonough, F., Mejia, J. F., Shourd, K. N., Carroll, R. W., Lutz, A. D., Dean, J., Juchtzer, J. W., Huggins, A. W., Kaplan, M. L., DeLuna, R., Trembath, C., 2017: Weather Modification Feasibility Study – Laramie Range Siting and Design, Level III Study, April 30, 2017, Project report prepared for the Wyoming Water Development Office, Cheyenne, WY.

Bai, X., Lutz, A. D., Carroll, R. W., 2017: Occurrence of contaminants of emerging concern in the Denver-Metro Area: Review of USEPA Monitoring Data, DRI Institute Project Assignment.

Abatzoglou, J. T., Hegewisch, K., Carroll, R. W., Lutz, A. D., Leising, J. F., Rajagopal, S., Brooks, K., Thomas, J. M., 2014: Impacts of a Changing Climate on Water Resources in the Eastern Great Basin, DRI, DRI Report No. 41266

Abatzoglou, J., Diehl, H., Leising, J.F., Lutz, A., Redmond, K. and Thomas, J. (2012) Evaluation of Climate Change Effects on Water Resources in Eastern

Nevada, Lutz, A. ed. Prepared by Desert Research Institute, Reno, NV for Southern Nevada Water Authority (SNWA), October 2012. DRI Publication Number: 41255.

Thomas, J. M., Redmond, K, Lutz, A., Abatzoglou, J., Stone, M., McCurdy, G., Earman, S., Leising, J. F., and Donovan, D. J., (2012). Preliminary Evaluation of Climate Change Effects on Water Resources in Eastern Nevada: Desert Research Institute Publication prepared for the Nevada System of Higher Education and the Southern Nevada Water Authority, 81 pp. DRI Publication Number: 41252.

Arrowood, T., Shanafield, M., Epstein, B., Lutz, A., Woodrow, S., Miller, G., Smith, B. (2008). Evaluation of Linear Anionic Polyacrylamide (LA-PAM) Application to Water Delivery Canals for Seepage Reduction. DRI Publication Number: 41245.

Young, M. Grey, K., Lutz, A. (2004) West Africa Water Initiative: Users Manual for WAWI Database Manager Version 1.2. DRI Publication Number: 41221.

Lutz, A., Thomas, J. (2005) West Africa Water Initiative: Water Chemistry Field Methods Manual, Release 1.1. DRI Publication Number: 41222.

MacDonald, C., Lutz, A. (2000). Staff Report on Recommendation to Remove Pine Creek from the 303(d) List, California Regional Water Quality Control Board, Lahontan Region, April 14.

Presentations at Scientific Meetings

Lutz, A., 2019. Water Quality: Measuring and Mitigating Salinity in Water for Agriculture. Native Waters on Arid Lands Tribal Summit, Reno, Nevada, October 23-24, 2019.

Ramsey, B. A., Collins, M. J., Lutz, A. D., McCarthy, M. I., 2017: The Use of Traditional Knowledge in Increasing Community Resilience and Food Security, Second Annual Conference on Native American Nutrition: Prior Lake, Minnesota, September 17-20, 2017

Lutz, A. D., Holt, S. E., Saga, B., Apambire, W. B., 2015: Groundwater resources and well-drilling challenges How can we increase drilling success rates?, The 2015 University of Oklahoma International WaTER Conference: NCED Conference Center and Hotel, Norman, OK, September 21, 2015-September 23, 2015.

Carroll, R. W., Huntington, J. L., Lutz, A. D., Snyder, K., Niswonger, R., 2015: Vegetation and hydrologic response to climate in the Great Basin, (Invited) American Geophysical Union: San Francisco, CA, December 14, 2015-December 18, 2015.

Holt, S. E., Lutz, A., Berger, D., Saga, B., Boi-Addo, K., Apambire, W., Thomas, J. M. 2014. Developing a Three-dimensional hydrogeologic Framework for Water Management in Northern Ghana, West Africa, AWRA 2014 Summer Specialty Conference Integrated Water Resources Management: Reno, NV, June 30, 2014-July 2, 2014.

Beers, T., Weaver, S., Nejmeh, B., Lutz, A. 2014. A Remote Pump Monitoring System, AWRA 2014 Summer Specialty Conference Integrated Water Resources Management: Reno, NV, June 30, 2014-July 2, 2014.

Lutz, A., Apambire, W., Thomas, J. M. 2013. Estimating water storage in Northern Ghana, U Oklahoma International WaTER Conference: Norman, OK, September 23, 2013-September 25, 2013.

Apambire, W., Thomas, J. M., Lutz, A. 2013. The Desert Research Institute's WASH Capacity Building Efforts over the last 20 years in West Africa, U Oklahoma International WaTER Conference: Norman, OK, September 23, 2013-September 25, 2013.

Lutz, A., Thomas, J., Diarra, S. Chemistry of Hand-Pump Waters in Ghana, Mali, and Niger, West Africa: Potential Health Effects. The Fourteenth International Symposium on Water-Rock Interaction, WRI 14, June 9-14, Avignon, France.

Eshchanov R., Nurmetov, J., Lutz, A., Shanafield, M., Hojyaz, J., Lamers, J. Preventing Water Loss through Agricultural Canals in an Arid Region: A Case Study from Khorezm, Uzbekistan. Ninth International Conference on Environmental, Cultural, Economic & Social Sustainability, January 23-25, Hiroshima, Japan.

Lutz, A., Thomas, J., Abatzoglou, J, and Diehl, H. Analysis of Observational Data: Hydroclimate Trends at Sites in Eastern Nevada. American Water Resources Association, Annual Water Resources Conference, November 7-10. Albuquerque, New Mexico.

Lutz, A., Thomas, J. Engaging students in water resources issues in developing countries. American Geophysical Union Fall Meeting, December 13-17, San Francisco, CA.

Lutz, A., Thomas, J., Keita, M., McKay, A. Ground Water Level Monitoring in Mali and Ghana, West Africa - Ground Water Management Under Climate Change: Implications for Developing Countries. National Ground Water Association, Ground Water Summit, April 20- April 22. Tucson, New Mexico.

Lutz, A., Thomas, J., Apambire, B., Keita, M., McKay, A. (2007) Groundwater Resource Sustainability in Mali. National Ground Water Association, Ground Water Summit, April 29-May 3. Albuquerque, New Mexico.

*Invited Speaker

To: State Water Resources Control Board of California, c/o Gerald W. Bowes, Ph.D.

From: Gretchen R. Miller, Ph.D., P.E., Associate Professor, Zachry Department of Civil and Environmental Engineering, 3136 TAMU, College Station, TX 77845

Subject: Scientific review of the Santa Ana Water Board's Basin Plan Amendment to Incorporate a Maximum Benefit Salt and Nutrient Management Plan for the Elsinore Groundwater Management Zone, Riverside County, California

Submitted: April 16, 2021

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Overview

Based on my expertise and experience, I am reviewing the findings, assumptions, or conclusions I agreed I could review with confidence: 1, 2, 3, 6a, 6b, 6c, 6d, 6e, 6f, 7, 8, 10a, 10b,10c,10d,10e, and10f. After reviewing the materials, I also have confidence that I can comment on Conclusion 11. In this review, I focus on the technical aspects of the Staff Report and the Salt and Nutrient Management Plan as they relate to my primary areas of expertise: groundwater engineering and hydrogeology, evapotranspiration, plant uptake of water and nutrients, and hydrologic modeling.

In general, I find that the proposed action is supported by the best available science and sound modeling practices. I do, however, note and discuss some potentially significant scientific unknowns within the context of the conclusions: 1) the potential for subsurface transfers of water to the Murrieta basin in the southeast (Conclusion 1) and 2) the assumption that Lake Elsinore does not contribute recharge to the basin (Conclusion 6). While these are open scientific questions, I do not disagree with the professional judgement that they would have limited impacts on the results. From a hydrogeological perspective, the analysis makes a strong case for the implementation of the Integrated Resources Plan with the inclusion of indirect potable reuse.

Conclusion #1: The hydrogeologic conceptual model of the Elsinore GMZ used in the analysis is based on accepted and published seminal documents and models that detail the hydrologeology of the GMZ

The hydrogeologic conceptual model used in this analysis follows those previously articulated in the background materials (MWH, 2005; MWH, 2010; Kennedy/Jenks, 2013). The geologic faulting and layering appear to be consistent with these, and the model has been updated appropriately over time. Although the impacts of heterogeneity and faulting on this system are not fully understood, the numerical model represents a reasonable approach based on existing best practices.

However, the description of the Elsinore GMZ as a "hydrologically closed" basin is also important to this analysis, and as such deserves additional scrutiny. Starting from the original GMP document, it is clear that such a statement is an oversimplification. The geometry of the basin is such that it has a physical, subsurface connection with the

Murietta groundwater basin to the southeast (MWH, 2005, pg. 2-35). However, the executive summary makes a more general statement about it being "bounded by either bedrock or faults (pg. ES-5)." According to cross-section presented in this document (Figure 2-6), the two basins are connected via a layer of Fernando Group sediments that extends from an elevation of approximately 1000 ft msl to the ground surface. Thus, the basin is only closed if the water level in the vicinity of this border remains below 1000 ft, or 1100 ft as stated in the accompanying text.

Is this condition met? Based on the available data, it appears that is currently the case. The nearest, regularly monitored well appears to be the Corydon St. Production Well, although MW-2 Deep Monitoring Well is also within this formation and on the southern side of the fault. Based on Figure 2-9 and Table B-1, the Corydon Well typically shows a groundwater elevation of 650 – 750 ft, with the only two historical values (from 1996) exceeding 1000 ft msl (MWH, 2010). Of some additional concern is the failure of the intermediate numerical model to accurately reflect the observed water levels at this well (MWH, 2010, pg. 3-13). In general, it seems possible that pumping in this vicinity is a cause of the disconnection of the two basins. The latest numerical model seems to support this idea as well, as it shows the flow direction in the southeast basin opposite the underlying trend and inward toward the Back Basin area (Kennedy/Jenks, 2013, Figure 4-1).

It should also be noted that Kennedy/Jenks (2013) directly contradicts the idea that the basin is closed, stating: "Minor amounts of outflow occurs from…subsurface outflow from the basin to the Murrieta Basin along the southeastern basin margin." This newer version of the model prescribes a general head boundary at the basin border to allow for these exchanges, which were previously assumed to be low volume but were "included here because of their potential influence on nitrate concentrations (Kennedy/Jenks, 2013, A-2)."

I do find it plausible that the impact of including these subsurface exchanges would be trivial, or even positively impact the results, such that the proposed action is more strongly supported. However, further analysis or data is needed to support such a statement.

Conclusion #2: The coupling of the HYDRUS-2D, MODFLOW, and MT3D models to project future TDS and nitrate concentrations in the groundwater of the Elsinore GMZ is appropriate.

These three software packages were appropriate to use in this analysis and are considered industry standard. They have been used in the manner intended by their original developers and which is consistent with other accepted applications.

The process for "coupling" these codes is harder to follow in the documentation, as they are not coupled in the common scientific use of the term. To my understanding, HYDRUS was run separately from MODFLOW/MT3D in order to develop a set of travel-time based transfer functions. Then these functions, along with a set of empirical

equations, were used to determine the flow and concentration boundary conditions necessary in MODFLOW and MT3D. While codes that more truly couple the processes of relevance are available (e.g., PFLOTRAN), these are typically considered research codes and must be implemented on supercomputing infrastructure. Thus, although the approach taken was not state-of-the-art from a scientific perspective, it is reasonable within the context of this effort.

Conclusion #3: The initial conditions for groundwater TDS and nitrate concentrations in the analysis are based on observed measurements and are scientifically appropriate in characterizing the initial conditions of the GMZ.

The initial concentrations used in the analysis were developed based on a reasonable, recent snapshot of basin conditions. In some key instances, older data were used to develop the plots, and these data may be locally skewing the results. For example, the elevated TDS and nitrate concentrations in the northern area of layer 1 appear to be based on a single monitoring well. This choice could introduce significant error, but given the interpolation method used, I believe it should be limited in its spatial effects. However, it also suggests that hotspots in the basin may need to be monitored more closely in the future.

Conclusion #6: Calculations of the recharge and discharge model inputs for the planning scenarios are based on historical data and science-based projections of changes in recharges and discharges and are appropriate.

The inputs to the hydrogeological model are generally sound and based on available science, although in the future, additional monitoring could improve them. Each of the points are addressed below. I do note a potential issue about inputs not covered at the end.

a) The use of a regression equation relating deep infiltration to annual precipitation is a reasonable simplification, and one that is frequently used in similar efforts (i.e., the Texas Groundwater Availability Modeling program). An r^2 of 0.76 should be considered satisfactory to very good for this type of relationship, especially when used for a 30-year planning horizon.

b) An outdoor use fraction of 0.56 is consistent with that found in similar arid and semi-arid areas. Further projecting a modest decrease in lawn and garden watering based on conservation efforts seems appropriate.

c) The use of a logarithmic regression equation relating TDS concentrations to river flow rates is a reasonable simplification in the absence of other data. Again, an r^2 of 0.72 is good. Modeling nitrate as a step function based on flow rate is not as defensible, but in the absence of an alternative, it is acceptable.

d) The septic tank study cited here was quite comprehensive; relying on its data for modeling inputs here is justified.

e) A 10-year construction horizon for the IPR facility seems short but possible. The concentrations and flow rates anticipated, and used as model inputs, are reasonable. The TDS concentration depends entirely on blending practices, but a 100 mg/L is consistent with industry practices.

f) The assumption of a 10-year put/hold/take cycle is necessary in the absence of more detailed climatological predictions.

Aside from these points, I am concerned about the lack of recharge inputs from Lake Elsinore. In the model documentation, I could find little addressing the potential for leakage from the lake. The original conceptual model simply states “Because of the predominance of clay beneath Lake Elsinore, it is assumed that Lake Elsinore itself does not contribute significant recharge to the groundwater basin and the net inflow from the lake is zero (MWH, 2005).” I do not find this argument, which is presented without evidence, compelling. The lake is situated in direct contact with the Recent alluvium (Qal) which consists of “interfingering gravels, sands, silts and clays resulting from streams originating in the surrounding highland areas.” This type of depositional environment is prone to having areas of high permeability sands immediately adjacent to low permeability clays. Given that it covers a large areal proportion of the groundwater basin, even small discharges to the subsurface could be significant. The assumption that no discharge occurs ideally should be revisited or better defended.

Conclusion #7: The conclusion that all of the management and facilities options for complying with the existing Basin Plan antidegradation objective of 480 mgl for the Elsinore GMZ (Scenarios B, C, and D) provide no TDS water quality benefit to the groundwater basin, the water supply, or the volume-weighted recharge are reasonable based on the scientific conclusions presented in Conclusions 1 through 7.

Based on the science discussed in the previous conclusions, Scenarios B, C, and D would provide only marginal benefits and would not ultimately stop TDS degradation, as assessed by the three metrics described above.

Conclusion #8: The groundwater quality model projections shown in Scenario E demonstrate that the alternative maximum benefit regulatory compliance strategy can provide significant water quality benefits.

Yes, the conclusion that Scenario E would provide significant water quality benefits appears to be well supported by the modeling effort. The main additional component in this scenario is Indirect Potable Reuse, and it is logical that this would be one of the few mechanisms/strategies for long term sustainability in this basin. Since water is essentially circulated through the basin and is subjected to mainly evaporative losses, the only method of improving TDS concentrations in the long-term would be to directly remove salt mass. Scenario E does this via the inclusion of IPR and its use of advanced treatment technology (i.e., reverse osmosis) for significant water volumes.

Scenarios B/C also reduce mass via a proposed groundwater desalter, but they are only required to treat the recycled water and to treat it to a TDS concertation of 480 mg/L. As such, they do not remove the (larger) salt mass needed to improve overall water quality.

Conclusion #10: The proposed maximum benefit TDS objective for the Elsinore GMZ of 530 mgl is appropriate based on hydrologic considerations [as articulated in points a – f.]

The hydrologic rationale for the proposed objective is generally sound. While several potential issues are noted above, in my judgment, these would only create modest errors in the final model outputs. Based on this modeling effort, achieving the 530 mg/L TDS objective should be possible and would be the best possible outcome given the alternatives presented.

Conclusion #11: The proposed maximum benefit nitrate objective for the Elsinore GMZ of 5 mgl is appropriate.

The California and US MCLs for nitrate, which limit its concentration in drinking water to 10 mg/L, have been determined based upon risk assessment practices targeted at protecting the most sensitive populations. A target concentration of 5 mg/L for this basin should preserve its use as drinking water without the need for pretreatment, making it an appropriate objective for the GMZ.

References

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MWH. (2010). 2008 Elsinore Basin Status Report. Prepared for Elsinore Valley Municipal Water District. January 2010.

This peer review addresses: Conclusion 9: Economic considerations

Peer Reviewer: **Dr. Kimberly Rollins, Phd**
Professor of Economics and Department Head
Department of Agricultural and Resource Economics
University of Connecticut
Kimberly.Rollins@uconn.edu
April 17, 2021

Based on my expertise and experience, I am reviewing the findings, assumptions and conclusions I agreed I could review with confidence. This review addresses Conclusion 9, Economic Considerations.

From Page 26, of the Draft Report: "The economic considerations evaluated herein include 1) the net present value of the capital and operating costs of the facilities; (2) the environmental cost of increasing dependence on exports from the Sacramento-San Joaquin Delta, as measured by the increased use of imported water; and (3) the cost of contributing to climate change, as measured by increased energy usage and greenhouse gas (GHG) emissions associated with facilities operations and increased use of imported SWP water." The supporting documents and evidence for the maximum benefit objective for TDS and nitrate concentrations include an economic assessment of the proposed Basin Plan amendment and alternative regulatory compliance plans. Costs evaluated include the annual amortization cost of new capital facilities, annual operations and maintenance cost of facilities, costs associated with required increases in imported water demand, and "cost" of contributing to climate change, as measured by the increase in energy usage and GHG emissions.

This reviewer finds that the economic assessment is based on sound methods and practices for evaluation of potential environmental and financial costs of alternative compliance strategies.

Peer Review Notes: This review considers the methods as described in Attachment C, and conclusions based on these methods.

The methods are sound and are well-described with transparent assumptions. The analysis demonstrates not only cost savings, but also the environmental costs savings, both locally (water quality) and globally (GHG emissions). Costs are calculated as the differences in costs, by category, between a baseline (Scenario A) and alternative scenarios (these vary by mass removal associated with varying levels of TDS concentrations, water imports to balance discharged recycled water, capital and operating and maintenance costs, energy used, and associated GHG emissions). Costs occur over time, with different components hitting at different times, depending on scenario. As is standard practice, the differences in timing are effectively standardized by representing monetary values in present valued terms. Costs considered are amortized annual costs of capital facilities, and annual operations and maintenance. Present values and amortization allow costs per category and scenario that occur over time to be summed over time into single estimates, as has been done in this assessment.

Environmental costs are represented as net differences in water quantity treated and differences in CO2/GHG emissions among scenarios. The assessment does not convert

environmental costs averted in monetary terms, nor is it necessary in this case, given that these are consistently represented for all scenarios as differences in emissions levels / water quantities. However, for future reference, this reviewer points out that the incremental costs of CO2/GHG emissions are likely to be of increasing importance, as these are not solely local in nature, and are the focus of current and future policy targets. Relevant to the State of California. California is unique among the US states in its progress in CO2 emissions policy (see https://ww2.arb.ca.gov/our-work/programs/cap-and-trade-program). Auctions for permits provide short-term monetary values for GHG emissions averted, with values of these permits likely increasing over the 30-year timeline that this analysis considers. While not necessary for this review economic analysis, this reviewer notes that the auction values for CO2 are valid measures of the economic value of GHG emissions averted. Further, inclusion of these costs demonstrates connections between water policy and CO2 policy. This reviewer (an environmental and natural resource economist) is so very happy to see this component for the precedent that it sets related to water quality policy and GHG emissions/air quality goals for the State. This would also be a solid example, should other states consider similar cap and trade policy options for GHG (and potentially water quality).

Other details: Assumptions are clearly stated and reasonable. Definitions of the baseline scenario and deviations from this baseline are clearly stated. In comparing differences with the baseline (Scenario A), Scenario E shows a Net Present valued benefits (negative cost), with all others resulting in present valued net costs ranging between $29.4 and $79.5 million, demonstrating that of the 4 scenarios, E clearly is the most beneficial. Table C-2 summarizes costs savings, including reduction in energy and GHGs as differences between the Scenario with max benefits to achieve the TDS objective with indirect potable reuse (scenario E) and all others. It is not difficult to follow the logic through to the stated conclusions, that Scenario E clearly represents the alternative with maximum societal net benefits.

Sally Thompson, Adjunct Associate Professor University of California, Berkeley.
Associate Professor, University of Western Australia

March 20th, 2021

Review of: Draft Basin Plan Amendment to Adopt the Maximum Benefit Salt and Nutrient Management Plan for the for the Elsinore Groundwater Management Zone

Based on my expertise and experience, I am reviewing the findings, assumptions, or conclusions I agreed I could review with confidence, namely: conclusions 1, 2, 3, 5, 7, 8, 10 and 11.

Conclusion 1: The hydrogeologic conceptual model of the Elsinore GMZ used in the analysis is based on accepted and published seminal documents and models that detail the hydrogeology of the GMZ (Section 4.1 of Attachment B in the maximum benefit SNMP proposal package).

This conclusion is supported, with some semantic caveats.

The hydrogeological conceptual model of the Elsinore GMZ is equivalent to that described in the 2005 Groundwater Management Plan and used subsequently. To the extent that this GMP and references therein are “accepted”, “published” and “seminal” this conclusion is indisputable. I would suggest that perhaps “seminal” and “published” are not the correct adjectives to use to describe all documents. Not all are peer reviewed, and I doubt any would be considered “seminal” in the field. It is correct to say that the software used is industry standard.
All documents appear to be widely accepted in terms of regional water management and all models are certainly accepted in the field. It may be advisable to limit the conclusion to the statement that the *“analysis is based on accepted documents and models”.*

I find it hard to imagine, however, that the conclusion as written conveys the most important point for a reviewer to address in considering the subject of the hydrogeological conceptual model.
Surely the key issue is whether or not the conceptual model used – regardless of its provenance from past work – provides fidelity to the conditions in the Elsinore GMZ (as described in past studies). Surely this is the most important point to consider, rather than the status of the documents on which the model is based?

Because of this, I will briefly outline why there is good reason to consider that the conceptual model proposed is a valid way to describe the Elsinore GMZ.

Hydrogeological study of the Elsinore GMZ has taken place since the 1950s. The subsurface of the basin is densely sampled – for example the 2005 Groundwater Management Plan references bore logs from ~150 wells, and water level data from ~250 wells. Lithological information from these wells, along with additional geophysical investigations, is sufficient to understand the vertical profile of the subsurface. It is clear that the water bearing formations only occur within the faults which bound the graben in which the GMZ is located.
The extensive faulting in the aquifer has created a very complex subsurface geology, so that even the location of faults is inferred rather than confirmed.
However, this uncertainty does not significantly impact the key conclusions for the conceptual model, because key faults forming the boundaries of the basin in the north-east and south-west (the Glen Ivy and Rome Hill Faults) are well mapped and restrict flow; the flow direction within the basin is parallel to the faults that do occur (so that uncertainty around specific fault locations is unlikely to greatly impact predictions of groundwater flow behavior), groundwater levels within the basin are significantly lower than the level of surface water bodies in the area (Lake Elsinore and the San Jacinto River), and the bedrock elevation in the south east (forming the "downgradient end" of the basin) is approximately 1000 feet above the level of groundwater (reflecting the tectonic origins of the basin).

Thus, I would conclude that:

(i) there is ample physical evidence on which to base a conceptual groundwater model for the basin;
(ii) the conceptual groundwater model developed is consistent with past studies, and
(iii) the conceptual groundwater model developed is consistent with the physical evidence from the basin.

Conclusion 2 – The coupling of the Hydrus 2D – Modflow – and MT3D models to project future TDS and nitrate concentrations in the groundwater of the Elsinore GMZ is appropriate.

This conclusion is not well supported.

Again, I take some issue with the precise phrasing of this question and have chosen to interpret it more broadly than it is phrased. There seem to be three issues at play:

(i) Has appropriate modeling software been used for the problem at hand?
(ii) Have the three different models used been appropriately interfaced ("coupled") to produce reliable and meaningful outcomes?
(iii) Does the resulting model system provide a valid representation of hydrogeology and mass transport in the Elsinore Basin?

I address each of these separately.

<u>Has appropriate modeling software been used for the problem at hand?</u> Yes.

Hydrus represents an industry standard for vadose zone transport, Modflow is the industry standard model for groundwater flow, and MT3D is an appropriate reactive transport model. I do not believe any controversy attaches itself to this part of the conclusion.

Have the three different models used been appropriately interfaced ("coupled") to produce reliable and meaningful outcomes? Unclear and perhaps not.

This conclusion referred specifically to the coupling of the models.
The "coupling" of the models – a term which I interpret to specifically mean "how inputs/outputs from each model are linked together" - is not clearly elucidated in the supporting material.
MT3D can run dynamically within Modflow. I assume that this was what was done in the present study.
The use of Hydrus 2D is less clear. I understand that it has been used primarily to estimate a travel time needed for recharge to pass through the unsaturated zone to the groundwater.
I understand that Hydrus 2D has not been used to estimate the volume of water passing through the unsaturated zone, which instead has been estimated using regression equations of the form: $D_{IP} = 2.2965 * P - 2.619$ for precipitation, where P is a benchmark measured rainfall volume, and $D_{IAW} = Q_{aw} / (1.0 - IE)$, where Q_{aw} is the applied water and IE is the infiltration efficiency.
Similarly, Hydrus 2D has not been used to estimate the concentration of dissolved solids or the concentration of nitrogen species in the recharge.

Given that Hydrus 2D can itself estimate recharge volumes and the associated mass fluxes, I find it unclear that the choice to confine the use of Hydrus to estimating a transport timescale is appropriate and valid.

Does the resulting model system provide a valid representation of hydrogeology and mass transport in the Elsinore Basin? Unclear, and validity is unsupported.

Presumably within the purview of this conclusion is the question of whether the models used produce a valid representation of the way the groundwater system behaves.
I was unable to find any reference to testing/validation of Hydrus 2D, MODFLOW or MT3D in the material presented.
Such a test is usually considered essential to have confidence in the models used.

In the absence of a validation exercise of any description, it is unclear that the resulting model system is a valid representation of the functioning of the Elsinore Basin in terms of water flow or mass transport of solutes.

Conclusion 3 – the initial conditions for groundwater TDS and nitrate concentrations in the analysis are based on observed measurements and are scientifically appropriate in characterizing the initial conditions of the GMZ for the planning scenario analysis.

This conclusion is not adequately supported.

In making this statement I do not want to criticize the specific development of the initial conditions. The decision to treat 2015-2016 as representing initial conditions and to draw on as much data as possible is logical and laudable. The difficulties then encountered, namely the limited number of wells screened solely within each aquifer unit, means that the initial conditions developed for the analysis are an appropriate way to work with the data that are present.
The less obvious question is whether this necessary "compromise" in the vertical resolution of the initial condition used has implications for the remainder of the study. It is not clear if this is the case.

That is – it is possible to say that the choice of initial conditions is pragmatic and reasonable. It is not possible to say that it has not impacted the validity of the model findings.

I would strongly suggest that the sensitivity of the modeling to its initial conditions could be undertaken to enable this conclusion to be made more strongly. For example, given the observed TDS and N concentrations, several "extreme" cases of different vertical distributions could be generated and run through the model. If the management objectives are insensitive to these different possible initial conditions, then this conclusion would be supported.
However, if the management solutions are sensitive to different plausible vertical distributions of the solute ICs, it would suggest that constructing additional wells allowing multi-level sampling would be important.

In the absence of testing whether the results are sensitive to the imposed ICs, it is not possible to claim that the IC choice is appropriate – even if it is pragmatic, logical and on the face of it reasonable.

Conclusion 5 – The hydraulic loading rates and travel time applied inside and outside the model domain to simulate the movement of water and TDS and nitrate in the Elsinore Basin Watershed for all planning scenarios are based on scientific data and standard modeling practices.

This conclusion is only partly supported.

The subdivision of the project area into the Canyon Hills and Elsinore Basin domains is supported based on the conceptual hydrogeological model of the area.

If I understand the treatment of Canyon Hills correctly, the argument is that groundwater is not connected between Canyon Hills and the Elsinore Basin. Connection of the basins is argued to only occur via the San Jacinto Creek, and therefore provided flow in the creek & recharge from the streambed is accounted for, Canyon Hills can be broadly neglected for the purposes of the management plan. This approach is supported in principle.
However, there is distinct lack of clarity regarding how this approach was implemented.

Tables B-5 and B6 in Attachment B appear to be missing, and these Tables were meant to detail the hydraulic loading rates from streambed and leach fields.

It is unclear if the rate of flow in San Jacinto Creek is relevant to the streambed leaching that was assumed.

It is unclear if the approach is to model contributions from Canyon Hills via the San Jacinto Creek, and lag them by 1 year (which seems to be indicated by the mention of the 1 year time lag?), or if the approach is to measure flow at the gauge and monitor its concentrations.

Given the potential for significant dilution of groundwater discharge within the stream system by surface flows, it would seem problematic to neglect these potential interactions of the discharged groundwater (and its solutes) with variable volumes of surface flow.

At any rate, more precision regarding the modeling assumptions is necessary. However, I would recommend that before investing effort into rectifying any issues raised here, the sensitivity of the management plan design to possible improvements in methodology in this area should be assessed. That is – simulating some order of magnitude variations in the creek loading and asking if the decisions taken would change – could inform whether it is worth refining the methodology in this area.

Within the model domain, I am not able to support the conclusions with regards to the use of Hydrus 2D, because I have been left with many questions about its use. I will simply list the issues below.

(a) Hydrus 2D is a 2D model. As far as I can tell it has been used for a 1D problem here. Why not use Hydrus1D? What value is added through the 2D capability of the model? Where did 2D flow come into the analysis? This is utterly unclear. Quite possibly a 1D model could be used instead, which may speed up the computation and enable more detailed use of Hydrus' capabilities.

(b) Hydrus (1D or 2D) is a completely appropriate model to use to infer the flux of water leaving the root zone / unsaturated zone. Firstly, I find it surprising that there has been no intercomparison of the predictions of the regression equations for DIP and DIAW with the predictions of deep boundary fluxes in Hydrus. There is a real risk that the models might disagree on the transport in the vadose zone – in which case the "sense" of merging them would be highly questionable. Conversely, agreement between the models would give confidence in the use of the regression equations. Secondly, Hydrus is an efficient model to run. I do not understand the argument for relying on regression equations rather than directly using recharge output from Hydrus for the purposes of estimating DIAW and DIP.

(c) I have equivalent comments to (b) regarding solute transport, which can also be simulated by Hydrus.

(d) The lack of any validation of Hydrus against observations of water content against depth is problematic. For instance, even in very arid situations, much more rapid infiltration of water than predicted via the matrix flow which is all Hydrus can simulate, is possible (see works by Nimmo regarding e.g. fracture flow paths). Even if matrix flow is the dominant transport mechanism, transport is likely to be highly sensitive to the water retention curve used for the purposes of modeling and it is not at all clear how these retention curves were related to the well lithological properties. There is not a one to one correspondence between soil texture and knowing immediately a correct water retention curve.

Thus, overall, my assessment is that the use of Hydrus 2D is (i) unclear in terms of the dimension of the problem analyzed, (ii) under-utilised as a potential source of information regarding recharge volumes and water quality, (iii) untested, and (iv) the calibration of Hydrus based on well data is unclear.
It is possible that this assessment mostly reflects missing information or lack of clarity in the reports provided.

Again, however, I would recommend that before investing effort into rectifying these issues, the sensitivity of the management plan design to possible improvements in methodology in this area should be assessed. Once again I would recommend sensitivity analysis be used to ask how variations in the recharge flux might impact the decisions taken and recommendations made.

Conclusion 7 – The conclusion that all of the management and facilities options for complying with the existing Basin Plan antidegradation objective of 480 mg/L for the Elsinore GMZ provide no TDS water quality benefit to the groundwater basin, the water supply or the volume weighted recharge are reasonable based on the scientific conclusions presented in Conclusions 1-7.

This conclusion – in spite of the concerns raised about methodology earlier in the review – is largely supported.
While there is scope to raise concern about some methodological aspects, these aspects largely do not influence the specific management scenarios tested in developing conclusion 7.
The finding that management is not sensitive as a determinant of groundwater quality is likely to remain robust regardless of any improvements to the modeling that could be argued for.
However, specific predictions of concentrations, their distributions through space or through the vertical profile of the aquifers, and the timing of changes in these spatial distributions should be approached with caution – as these more specifically quantitative measures may be more likely to be influenced by the specific choices made in developing the model.

Please note that this assessment is subject to the correctness of Conclusion 4 and 6 which I have not separately reviewed.

Conclusion 8 – The groundwater quality model projections shown in Scenario E demonstrate that the alternative maximum benefit regulatory compliance strategy to amend the Basin Plan to change the basin Plan TDS and nitrate objectives and require implementation of the maximum benefit commitments can provide significant water quality benefits to the Elsinore GMZ.

It is not clear that this conclusion can be supported.

In particular, the term “significant” is very hard to support in this context.
The reason for this is that at this stage there is no assessment that can be made of the uncertainty in the predictions of the model.
It is well known that all models contain uncertainty – they are not “right”.
What is not well known about any given model is just what that uncertainty looks like – how big it is.

What is clear is that the quantities of change in the TDS concentrations are proportionally small. The 2030 values across the 3 categories considered: – Volume-Weighted TDS of Elsinore GMZ, Volume-Weighted TDS of District-Produced Groundwater Supply and Volume-Weighted TDS of Water Supply Served in the Area Tributary to Elsinore GMZ, show that Scenario E provides effectively no benefit; but by 2050 the benefits are on the order of 5%, 8% and 6% reductions in TDS respectively.

The relevant question is not “is this a good thing?” (clearly any reduction is a good thing, and where a reduction could mean that a water supply stays on the “right” side of a water quality criterion, that will be particularly true). The relevant question is whether we trust the model sufficiently that we believe that changes on the order of 5% are robust and realistic in the face of the considerable uncertainties associated with the model inputs.

No uncertainty estimation, and no sensitivity analyses have been performed, which makes it very difficult to know if these kinds of changes are likely to be robustly predicted by the model. (If the model uncertainty is ~0.5% then we’re in great shape here…). However, based on experience with complex hydrological models in general, errors in a model of ~5% would often be considered quite normal and acceptable. My best estimate is that the predicted changes are not likely to be very different to the uncertainty in the model. This means that it is not necessarily true that they represent significant water quality benefits.

What could be said with more confidence is that there is no evidence that the management proposed in Scenario E would be harmful to the basin. If there are other reasons than water quality improvements that would support the use of these management proposals, then there is no reason to think that water quality should create an impediment to them. However if the reason to adopt Scenario E is 100% motivated by the potential to improve water quality, then the results would not provide a convincing basis on which to proceed – certainly not until uncertainty estimates were made.

Conclusion 10 – The proposed maximum benefit TDS objective for the Elsinore GMZ of 530 mg/L is appropriate based on hydrologic considerations.

The hydrological arguments presented regarding the closed nature of the Elsinore Basin are supported. The overall rationale that relaxing the TDS objective to enable IPR is unlikely to cause harm is supported.

However, as noted above, it is not clear what uncertainties are attached to the concentration predictions associated with the modeling – uncertainties that might impinge upon the suitability of 530 mg/L specifically as a target. Provided uncertainties are on the order of +/-10 mg/L, however, 530 mg/L is appropriate.

Conclusion 11 – The proposed maximum benefit nitrate objective for the Elsinore GMZ of 5 mg/L is appropriate

As this proposal is based on existing guidelines for municipal water use, this is supported.

The Big Picture

The efforts made to understand and model the behavior of the Elsinore GMZ are considerable and represent a laudable effort in the face of a well characterized hydrogeological system, with poorly characterized vertical water quality profiles and poorly characterized vadose zone properties. The modeling effort undertaken provides a good platform by which to compare scenarios and their likely effects on water yield and water quality.

Broadly, the modeling effort appears to have:

(i) Missed some opportunities to make full use of the tools available – specifically Hydrus 2D
(ii) Not considered the importance of sensitivity analysis and uncertainty characterization for the interpretation of model findings.
(iii) Not been documented fully such that complete interpretation of the modeling undertaken was challenging from a reviewer perspective.

Of these points, it is (ii) that is most concerning. If the differences in water quality scenarios were very large then it might be reasonable to expect the differences would be robust to model uncertainties. But the differences are relatively small. And the model uncertainty is not characterized. Basing a decision upon such relatively small changes in model output in the absence of knowing if these small changes are large or small relative to expected errors in model parameters or model performance is risky. In the present case, where the important argument – it seems to me – is less about whether IRP will improve water quality than whether it would harm water quality – the risks may not be so large as in a situation where the decision was hinging on a water quality improvement.

Throughout the study, taking opportunities to validate and test models and to check their sensitivity to errors or changes in the assumptions about inputs could have strengthened this work and would be recommended if similar future studies are to be undertaken. I would also caution against future work repurposing the existing model without carefully considering whether the assumptions made are fit for purpose – particularly with regards to the vadose zone elements.

Allowing for and measuring model uncertainty is not an admission of "failure" to model well. It is a necessary measure to enable end users to understand the risks entailed when relying on a model for decision-making. I would urge the State of California and consultants to the State to embrace and demand a transparent characterization of model uncertainty.

References cited:

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Nimmo JR. Preferential flow occurs in unsaturated conditions. Hydrological Processes. 2012 Feb 28;26(5):786-9.

To: State Water Resources Control Board of California, c/o Gerald W. Bowes, Ph.D.

From: Alexandra Lutz, Ph.D Associate Research Professor affiliated with Desert Research Institute, Reno, Nevada

Subject: Review and comments on Conclusion 4 of "Draft Basin Plan Amendment to Incorporate a Maximum Benefit Salt and Nutrient Management Plan for the Elsinore Groundwater Management Zone, Riverside County, California."

Submitted: April 7, 2021

CONCLUSION 4: The selection of the six planning scenarios for the projections of potential future water quality outcomes is appropriately based on projected cultural conditions in the Elsinore GMZ.

Section 3.3 Attachment B in the maximum benefit SNMP proposal package describes an approach for six planning scenarios defined for characterizing and quantifying the TDS and nitrate concentration impacts to the Elsinore GMZ resulting from recycled water reuse for a planning period of 2017 through 2050. Land use and water management activities are presented as both cultural conditions and a regulatory paradigm. Difficulties are caused by recycled water exceeding permitted discharge limitations and/or antidegradation objectives.

The Integrated Resources Plan (IRP) identifies a portfolio of nine new or expanded local water supply projects to satisfy more than 22,000 afy of future demands by various means (p 14 Attachment B). All six scenarios assume all nine IRPs to be 100% successful. The timeline is 20 years, so this may be a reasonable assumption. Perhaps at least one scenario should consider less than 100% success of all nine projects during 20 years. A sentence or two explaining why are all likely to be successful and lack of a scenario considering otherwise should be provided.

The "cornerstone" of the IRP is an indirect potable reuse program to recycle wastewater via advanced treatment methods. Only Scenarios E and F consider implementation of indirect potable reuse. Scenario F is considered to be similar to Scenario A, which is identified as "not realistic." So, only Scenario E considers implementation of indirect potable reuse. If reuse is a cornerstone, it is not clear as to why it is not considered in more than one scenario. A sentence or two explanation should be provided.

Summary: Selection of the six planning scenarios for the projections of potential future water quality outcomes **is** appropriately based on projected cultural conditions in the Elsinore GMZ.

Reponses to Peer Review Comments on the Proposed Elsinore GMZ Maximum Benefit SNMP

Responses to Dr. Gretchen R. Miller's Peer Review Comments (Reviewed Conclusion 1, 2, 3, 6a through 6f, 7, 8, 10a through 10f, and 11)

Summary of Miller's comment on Conclusion 1: The hydrogeologic conceptual model, layering, and faulting are consistent with background material and the model has been updated appropriately. However, the description of the Elsinore GMZ as a "hydrologically closed" basin is an oversimplification. According to the Groundwater Management Plan prepared by MWH in 2005, the cross-section in Figure 2-6 demonstrates that Elsinore GMZ and Murietta Basin are connected via a layer of Fernando Group Sediments that extends from 1,000 ft amsl to the ground surface. Thus, the GMZ is only closed if the groundwater level in this area remains below 1,000 ft. Based on the data presented, groundwater level in this area has remained below 1,000 ft with only two historic measurements that exceeded 1,000 ft. Thus, there can be minor amount of subsurface flow between the two basins however it's plausible that the impact of including these minor flow exchanges would be trivial.

> **Response:** It is correct that the Elsinore GMZ and Murietta Basin are connected and subsurface flow between the two basins can occur when groundwater elevation is greater than 1,000 ft. Groundwater elevation in this area is expected to remain below 1,000 ft and any increase of groundwater above this level is expected to occur only during rare conditions as demonstrated in the historical groundwater levels. Thus, we agree that impact of this minor flow is trivial.

Summary of Miller's comment on Conclusion 2: The coupling of the three models is reasonable within the context of this effort.

> **Response:** Noted

Summary of Miller's comment on Conclusion 3: This approach is reasonable. In the northern area of layer 1, older and elevated TDS and nitrate concentrations were used to develop the initial concentrations which can locally skewed the results, but the method used in this analysis limited their effects. However, it is suggested that hotspots in the basin may need to be monitored more closely in the future.

> **Response:** Noted

Summary of Miller's comment on Conclusion 6: This approach is acceptable. However, the assumption that Lake Elsinore does not contribute recharge inputs is a concern. This assumption should be revisited or better defended.

> **Response:** In all prior conceptual models and numerical modeling work in the Elsinore GMZ (MWH Global, 2005; Kennedy/Jenks Consultants, 2013), it is assumed that the recharge of Lake Elsinore to the groundwater basin is negligible. This is a reasonable assumption due to the build-up of fine-grained sediment layers that have been deposited on the lakebed over time. These deposits create a shallow zone of saturation that is largely disconnected from the underlying

regional aquifer.[1] Additionally, there is no water level data that supports a conclusion that the Lake contributes measurable recharge to the Basin.

Summary of Miller's comment on Conclusion 7: This conclusion is appropriate.

Response: Noted

Summary of Miller's comment on Conclusion 8: This conclusion is supported.

Response: Noted

Summary of Miller's comment on Conclusion 10: The hydrologic rationale for this proposed objective is sound.

Response: Noted

Summary of Miller's comment on Conclusion 11: The proposed objective is appropriate.

Response: Noted

Responses to Dr. Kimberly Rollins's Peer Review Comments (Reviewed Conclusion 9)

Summary of Rollins's comment on Conclusion 9: The economic assessment is based on sound methods and practices.

Response: Noted

Responses to Dr. Sally Thompson's Peer Review Comments (Reviewed Conclusion 1, 2, 3, 5, 7, 8, 10a through 10f, and 11)

Summary of Thompson's comments on Conclusion 1: There is an issue with the phrasing of the conclusion (the use of "published" and "seminal" since the referenced documents may not be peer reviewed). However, the conceptual groundwater model is based on ample evidence, consistent with past studies, and consistent with the physical evidence from the basin.

Response: Noted

Summary of Thompson's comments on Conclusion 2 (sub-part bullets added for ease of addressing comments): There is an issue with the phrasing of the conclusion. However, the three models used and that coupling of MT3D with Modflow are appropriate.

(a) The use of the Hydrus-2D and the coupling of this model to MT3D and Modflow are unclear. The Hydrus-2D was used to estimate travel time for recharge to travel through the unsaturated zone to reach groundwater; however, it was not used to estimate volume of water passing through

[1] Kirby MEC, Patterson WP, Lachniet M, Noblet JA, Anderson MA, Nichols K and Avila J (2019) Pacific Southwest United States Holocene Droughts and Pluvials Inferred from Sediment $\delta^{18}O_{(calcite)}$ and Grain Size Data (Lake Elsinore, California). Front. Earth Sci. 7:74. doi: 10.3389/feart.2019.00074

the unsaturated zone or to estimate the concentration of TDS or nitrate in the recharge. Instead, the deep infiltration of applied water and precipitation were estimated by using regression equations. Given that Hydrus-2D can estimate recharge volumes and the associated mass fluxes, it is unclear why this model was confined to just estimating a transport timescale.

(b) Additionally, there was no validation testing of the model predicted results to the actual behavior of this groundwater system. Without this testing, it is unclear that the model system is a valid representation of the Elsinore Basin.

Response:

(a) Hydrus-2D was used to estimate the hydraulic travel time of recharge pulses through the vadose zone based on the lithologic logs for six boreholes located across the Elsinore GMZ, under specific land use and irrigation conditions. The model simulations at each location were generalized to establish an assumed vadose zone lag time that is then applied universally across the entire basin. The volume of recharge terms and the associated TDS and nitrate concentrations for these terms were calculated using regressions equations established based on published works on the Elsinore GMZ (MWH, 2005; Kennedy/Jenks Consultants, 2013) and observed data. The decision to use the regression equations to estimate the recharge volumes and the associated TDS and nitrate concentrations was based on: 1) estimating recharge volumes and associated TDS and nitrate concentrations using Hydrus-2D is computationally intractable at basin and watershed scales; and 2) using Hydrus-2D to estimate these volumes and concentrations is not consistent with the hydrologic methods used to develop and calibrate the groundwater flow model (MODFLOW).

Hydrus-2D and the regression equations generated hydraulic lag time and recharge terms that were used as input terms for MODFLOW and MT3D to predict hydraulic and TDS and nitrate responses, respectively, of the Elsinore GMZ.

(b) Due to insufficient observations of soil and vadose zones water content, Hydrus-2D results could not be directly calibrated and validated. For the same reasons, MT3D was not calibrated or validated. MODFLOW used in this analysis was calibrated by MWH Global in 2005 in the *Elsinore Groundwater Model* (MHW Global, 2005) which is provided as a reference document in the peer review package.

Please see Addendum A for comprehensive description of the modeling approach.

Summary of Thompson's comments on Conclusion 3: The decision to base the initial conditions on all available data from the 2015 to 2017 period is logical and the initial conditions developed for this analysis are an appropriate way to work with the available data. However, it is harder to determine if the initial conditions have not impacted the validity of the model findings. It is recommended for a sensitivity analysis to be performed to determine how sensitive the results are to the initial conditions. For example, given the observed TDS and nitrate concentrations, several "extreme" cases of different vertical distributions could be generated and run through the model; if the management objectives are insensitive to these different initial conditions, then the Conclusion would be supported.

Response: The developed initial conditions were used in all scenarios to project future TDS and nitrate concentrations in the Elsinore GMZ under different management scenarios. The model projections in the first ten years are consistent with observed historical trends suggesting that no arbitrary artifacts or anomalies due to initial conditions or other model assumptions have been introduced into the model through its construction and input data. We followed standard industry practice in developing the initial conditions including multiple interpretations of all the data and review by senior professional staff.

Please see Addendum A for comprehensive description of the modeling approach.

Summary of Thompson's comments on Conclusion 5 (sub-part bullets added for ease of addressing comments):

(a) The connection between the two basins only occurred through the San Jacinto Creek which provides flow and streambed recharge to the Elsinore Basin. Because of this, Canyon Hills was considered to be outside of the model domain and was broadly neglected for the purpose of this management plan. This approach is supported; however, it is unclear how this approach was implemented. It is unclear if the rate of flow in the San Jacinto River is relevant to the streambed leaching that was assumed. It is unclear if the approach is to model contributions from Canyon Hills through San Jacinto River and lag them by 1 year or to measure the flow at the gauge and monitor its concentrations. It is also unclear how the associated TDS and nitrate concentrations are treated when subsurface flow from Canyon Hill is discharged to the river.

(b) The use of Hydrus-2D within the model domain is unclear. It seems that Hydrus-2D was used for 1D problem, underutilized (why rely on regression equations for deep infiltration of applied water or precipitation?), untested for validation against observed data, and the calibration of the model based on well data is unclear. A sensitivity analysis to estimate how variations in the recharge flux might impact the proposal is recommended.

(c) Additionally, Table B-5 and B-6 which show hydraulic loading rates in Attachment B are missing.

Responses:

(a) The daily San Jacinto River discharge measured at the USGS stream gage located at the boundary of the Canyon Hills sub-watershed and the model domain provides a measure of the total discharge, including rising groundwater and stormwater, from the Canyon Hills sub-watershed into the model domain. The estimated TDS and nitrate concentrations in rising groundwater were based on historical data and future projections of the water supplies provided in the Canyon Hills sub-watershed. The estimated TDS and nitrate concentration in stormwater were based on historical water quality data and a regression analysis of that data to daily stormwater discharge when stormwater was present. It is assumed that rising groundwater and its associated TDS and nitrate concentrations from Canyon Hills sub-watershed will discharge into San Jacinto River and ultimately into the model domain within the same year that water was applied outdoor in this sub-watershed.

(b) Please see the responses under Conclusion 2 above.

(c) These rates and lag times are included in Table B-5 and B-6 located on pages 51 and 52 of the Attachment B PDF file which was provided in the peer review package.

Please see Addendum A for comprehensive description of the modeling approach.

Summary of Thompson's comments on Conclusion 7: This conclusion is mainly supported.

Response: Noted

Summary of Thompson's comments on Conclusion 8: There are uncertainties in the model predictions. Because of these uncertainties, it cannot be said if Scenario E provides "significant" water quality benefits compared to other scenarios. Uncertainty estimation and/or sensitivity analyses can strengthen this conclusion. Without these analyses, a more accurate statement for Scenario E is: it does not harm the water quality of the basin

Response: While sensitivity studies would improve the understanding of modeling uncertainty, it is still fair to conclude that Scenario E provides more water quality benefits compared to the other scenarios under the same base assumptions and conditions that were applied across all scenarios.

Sensitivity or uncertainty analysis is a useful tool in communicating uncertainty in model prediction to decision makers and to focus future monitoring and modeling efforts. This analysis utilized multiple tools to project TDS and nitrate concentrations. Of these tools, only the groundwater flow (MODFLOW) model was calibrated. The MT3D and Hydrus-2D were not calibrated due to the lack of data. Given the complexity of the modeling approach and the lack of available data for calibration it is very difficult to conduct a meaningful uncertainty analysis.

We agree that future improvements to the model are warranted, and this is considered in the maximum benefit commitments, which appropriately provide for (1) monitoring programs to fill data gaps and track water quality trends, (2) periodic analysis of the data as a check on the understanding of historic and predicted trends, and (3) update the implementation actions of the salt and nutrient management plan (SNMP) as appropriate.

Summary of Thompson's comments on Conclusion 10: The rationale that the proposed TDS objective is unlikely to cause harm is supported.

Response: Noted

Summary of Thompson's comments on Conclusion 11: The proposed objective is appropriate.

Response: Noted

Responses to Dr. Alexandra Lutz's Peer Review Comments (Reviewed Conclusion 4)

Summary of Lutz's comment on Conclusion 4: The selection of the six planning scenarios is appropriate. All six scenarios assume all the Integrated Resources Plan (IRP) projects to be 100 percent successful. Perhaps at least one scenario should consider less than 100 percent successful on some of the projects. A discussion on why they are likely to be successful and lack of a scenario considering otherwise should be provided.

Addendum A – Responses to Dr. Thompson

This attachment provides detailed responses to Dr. Thompson's comments. Specifically, this attachment provides responses to Dr. Thompson's comments and concerns that are highlighted throughout her peer review letter. The concerns on the modeling approach addressed here comprehensively are: the lack of model calibration/validation, the approach for estimating flow and TDS and nitrate concentrations outside of model domain, the initial TDS and nitrate conditions, and the lack of uncertainty/sensitivity analyses.

Modeling approach and model calibration. The analysis to project TDS and nitrate concentrations in the Elsinore GMZ utilized a regression model for deep infiltration of precipitation, a spreadsheet-based water budget model to estimate deep infiltration of applied water, Hydrus-2D to estimate vadose zone lag time, MODFLOW to estimate groundwater flow, and USGS MT3D to estimate solute fate and transport. The modeling approach, specifically the coupling of MODFLOW and MT3D, was based on previous published works on the Elsinore basin including the *Elsinore Basin Groundwater Management Plan* (MWH Global, 2005), *Elsinore Groundwater Model Update* (MWH Global, 2008), and *Impacts of Septic Tanks on Groundwater Quality* (Kennedy and Jenks, 2013). Improvements were made as needed in order to properly update the approach for the purpose of this analysis.

Hydrus-2D was used as a 2D representation of lag time at specific locations with detailed lithology data in the Elsinore GMZ. Specifically, Hydrus-2D was used to estimate the hydraulic travel time of recharge pulses through the vadose zone based on the lithologic logs for six boreholes located across the Elsinore GMZ, under specific land use and irrigation conditions. The model simulations at each location were generalized to establish an assumed vadose zone lag time that is then applied universally across the entire basin. The volume of recharge terms and the associated TDS and nitrate concentrations for these terms were calculated using regressions equations established based on published works on the Elsinore GMZ (MWH Global and Kennedy and Jenks) and observed data. The decision to use the regression equations to estimate these recharge volumes and the associated TDS and nitrate concentrations was based on: 1) estimating recharge volumes and associated TDS and nitrate concentrations using Hydrus-2D is computationally intractable at basin and watershed scales; and 2) using Hydrus-2D to estimate these volumes and concentrations is not consistent with the hydrologic methods used to develop and calibrate the groundwater flow model (MODFLOW).

Hydrus-2D and the regression equations generated hydraulic lag time and recharge terms that were used as input terms for MODFLOW and MT3D to predict hydraulic and TDS and nitrate responses, respectively, of the Elsinore GMZ. Due to insufficient observations of soil and vadose zones water content, Hydrus-2D results could not be directly calibrated and validated. For the same reasons, MT3D was not calibrated or validated. MODFLOW used in this analysis was calibrated by MWH Global in 2005 in the *Elsinore Groundwater Model* which is provided as a reference document in the peer review package.

***Approach for estimating flow and associated TDS and nitrate concentration outside the model domain*.** The Canyon Hills sub-watershed is outside of the model domain. Due to the geology and topography of this sub-watershed, the only way for recharges at the ground surface at this area (from precipitation and applied water) to enter the model domain is through rising

groundwater discharges to the San Jacinto River and its tributary, which flow into the model domain. The daily San Jacinto River discharge measured at the USGS stream gage located at the boundary of the Canyon Hills sub-watershed and the model domain provides a measure of the total discharge, including rising groundwater and stormwater, from the Canyon Hills sub-watershed into the model domain. The estimated TDS and nitrate concentrations in rising groundwater were based on historical data and future projections of the water supplies provided in the Canyon Hills sub-watershed. The estimated TDS and nitrate concentration in stormwater were based on historical water quality data and a regression analysis of that data to daily stormwater discharge when stormwater was present. It is assumed that rising groundwater and its associated TDS and nitrate concentrations from Canyon Hills sub-watershed will discharge into San Jacinto River and ultimately into the model domain within the same year that water was applied outdoor in this sub-watershed.

***Initial TDS and nitrate conditions*.** The initial conditions for TDS and nitrate concentrations in the Elsinore GMZ were developed using TDS and nitrate concentrations sampled at wells in the Elsinore GMZ from 2015 through 2017. Based on the observed TDS and nitrate concentrations at wells, well locations and screening intervals, the spatial and vertical distribution of TDS and nitrate concentrations of the Elsinore GMZ were estimated. These initial conditions were used in all scenarios to project future TDS and nitrate concentrations in the Elsinore GMZ under different management scenarios. The model projections in the first ten years are consistent with historical trends suggesting that no arbitrary artifacts or anomalies due to initial conditions or other model assumptions have been introduced into the model through its construction and input data. We followed standard industry practice in developing the initial conditions including multiple interpretations of all the data and review by senior professional staff.

Uncertainty/sensitivity analyses. Sensitivity or uncertainty analysis is a useful tool in communicating uncertainty in model prediction to decision makers and to focus future monitoring and modeling efforts. As previously mentioned, this analysis utilized multiple tools to project TDS and nitrate concentrations. Of these tools, only the groundwater flow (MODFLOW) model was calibrated. The MT3D and Hydrus-2D were not calibrated due to the lack of data. Given the complexity of the modeling approach and the lack of available data for calibration it is very difficult to conduct a meaningful uncertainty analysis.

We agree that future improvements to the model are warranted, and this is considered in the maximum benefit commitments, which appropriately provide for (1) monitoring programs to fill data gaps and track water quality trends, (2) periodic analysis of the data as a check on the understanding of historic and predicted trends, and (3) update the implementation actions of the salt and nutrient management plan (SNMP) as appropriate.

This analysis is the first-of-its-kind of MT3D modeling for basin-scale projects of TDS and nitrate concentrations to support SNMP. It utilized existing published works on the Elsinore GMZ (as provided in the reference list in the peer review package) to economically and reasonably determine a management plan to protect the beneficial uses of the Elsinore GMZ. Additionally, this analysis utilized model tools such as Hydrus-2D in a manner that is consistent with these previous works and achievable on a basin-wide scale to estimate hydraulic lag time. As mentioned above, future improvements to the modeling

approach will be considered during periodic updates and the SNMP will be adjusted based on the results.

References

Kennedy/Jenks Consultants. (2013). *Impacts of Septic Tanks on Groundwater Quality*. Prepared for Elsinore Valley Municipal Water District.

MWH Global. (2005). *Elsinore Basin Groundwater Management Plan*. Prepared for Elsinore Valley Municipal Water District.

MWH Global. (2008). *Draft Elsinore Basin Groundwater Model Update TM*. Prepared for Elsinore Valley Municipal Water District.

Response: Of all the IRP projects, the indirect potable reuse is the only project that would have significant impacts on water quality within the Elsinore GMZ. The scenarios in this analysis were prepared to evaluate the impacts to groundwater quality with and without the implementation of the indirect potable reuse project. Scenarios E and A/F provide a bookend projection of the potential outcomes: A/F represents no indirect potable reuse and E represents full implementation of the indirect potable reuse project as conceptualized in initial feasibility studies. A smaller or "less successful" project would have a water quality benefit that is somewhere between the A/F and E outcomes and additional modeling of various sized projects was not deemed necessary to support the proposal. The maximum benefit commitments are designed with actions that require development of a salt mitigation program regardless of the success of the IRP and thus ensure mitigation even in the event that the indirect potable reuse project is not successfully implemented.

References

Kennedy/Jenks Consultants. (2013). *Impacts of Septic Tanks on Groundwater Quality*. Prepared for Elsinore Valley Municipal Water District.

MWH Global. (2005). *Elsinore Basin Groundwater Management Plan*. Prepared for Elsinore Valley Municipal Water District.