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INDIAN WELLS VALLEY GROUNDWATER AUTHORITY

SUPERIOR COURT OF THE STATE OF CALIFORNIA

COUNTY OF ORANGE, CIVIL COMPLEX CENTER

MOJAVE PISTACHIOS, LLC, et al.,

Plaintiffs,

v.

INDIAN WELLS VALLEY WATER DISTRICT, et al. ,

Defendants.

AND CROSS-COMPLAINTS AND RELATED ACTIONS.

Case No. 30-2021-01187275-CU-OR-CJC

(Related to Case Nos.:
30-2021-01187589-CU-WM-CXC;
30-2021-01188089-CU-WM-CXC;
30-2022-01239487-CU-MC-CJC; 30-2022-01239479-CU-MC-CJC; 30-2022 01249146-CU-MC-CJC)

INDIAN WELLS VALLEY GROUNDWATER AUTHORITY AND CITY OF RIDGECREST'S PHASE 2 OPENING TRIAL BRIEF

Action Filed: November 19, 2019
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Hon. William D. Claster

[Exempt from filing fees pursuant to Govt. Code § 6103]

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I. INTRODUCTION

Phase 2 presents a single factual question: what is the safe yield of the Indian Wells Valley Groundwater Basin ("Basin")?

Safe yield is the maximum quantity of water that can be extracted annually from the Basin without causing an undesirable result. The best estimate of the Basin's safe yield is in the range of 6,100 and 8,400 acre-feet per year ("AFY") with **7,650 AFY** being the most reasonable estimate.

This case is unprecedented because the Court is being asked to resolve a safe yield dispute between a handful of large groundwater pumpers and the groundwater sustainability agency ("GSA") that has been charged with preserving the Basin with actions and programs balancing supply and production, thereby making the Basin sustainable pursuant to the Sustainable Groundwater Management Act ("SGMA").[1] That posture raises novel legal issues regarding the deference that must be afforded to the GSA's determination of the Basin's safe yield, which has been reviewed and approved by the California Department of Water Resources ("DWR").

DWR designated the Basin as critically overdrafted because groundwater extractions have regularly exceeded the safe yield causing groundwater levels to decline to such a point that the "continuation of present practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts."[2] The Indian Wells Valley Groundwater Authority ("Authority") was created in 2016 pursuant to SGMA to manage the Basin by developing and implementing a groundwater sustainability plan ("GSP"). Since its formation, the Authority has undertaken a careful technical evaluation of the

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[1] Post SGMA only three other cases have had a safe yield trial phase. The first one, Los Posas Basin, had the safe yield phases determined before a GSP was a adopted and the Authority, stipulated to safe yield. In the second, Cuyama Basin, the parties stipulated to safe yield avoiding a trial and the Authority did not object. In the third case, Oxnard/Pleasant Valley Basin the Authority chose not to participate in the safe yield trial.

[2] Critical conditions of overdraft and other terms are defined in DWR's glossary of common water-related terms available at https://water.ca.gov/Water-Basics/Glossary.

Basin, retaining Stetson Engineers to be its Water Resources Manager, and relying on a Technical Advisory Committee ("TAC") to guide scientific review supporting the GSP.

All of the parties participating in Phase 2 helped shape the GSP. The TAC was chaired by and included representatives of the large pumpers in this adjudication: the Indian Wells Valley Water District ("District"), Meadowbrook Dairy Real Estate, LLC ("Meadowbrook"), Mojave Pistachios, LLC ("Mojave Pistachios"), and Searles Valley Minerals Inc. ("Searles") (collectively, the "Large Pumpers"). Working with Stetson, the TAC reviewed prior Basin studies, evaluated the technical record and data, and guided updates to a groundwater flow model that was then used to evaluate the Basin.

The process produced a consensus that the best estimate of long-term average recharge in the Basin was 7,650 AFY. That estimate would form the basis for the safe and sustainable yield estimate in the GSP of 7,650 AFY.[3] The District then voted, as an Authority Board member, to adopt the GSP, and DWR later approved it as "based on best available science and information."

Having determined the Basin's safe and sustainable yield, the Authority was required by SGMA to address the harder question: how to bring a critically overdrafted basin into balance by 2040. The Authority adopted a Replenishment Fee to fund an imported water project to bring the Basin into balance. Following adoption of the fee, the Large Pumpers switched from allies to opponents. Mojave Pistachios first sued unsuccessfully to invalidate the fee, then turned to this adjudication, openly admitting that their objective is a "physical solution to replace the GSP." As the Large Pumpers have admitted, the real value of this adjudication to the Large Pumpers is to delay or prevent SGMA Basin management, and allow unrestricted pumping for as long as possible.

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[3] The GSP determined the estimated safe yield is 7,650 AFY, it also determined the current estimated sustainable yield to be 7,650 AFY. The Authority acknowledges that its safe/sustainable yield determination does not fully account for evapotranspiration and bare soil evaporation and may result in continued loss of groundwater in storage for a period of time. (Ex. 929-0118.)

The Authority's 7,650 AFY safe yield determination is consistent with the technical record's three basic observations: the Basin is severely overdrafted; its principal natural inflow is mountain-front recharge from surrounding ranges; and its principal natural discharge occurs through evapotranspiration at the China Lake playa. Because those are the controlling water-budget components, safe yield is properly anchored in natural recharge (and not in speculative anthropogenic supplies as the Large Pumpers suggest). Since 1989, ten independent studies have analyzed Basin recharge with an average recharge estimate of 8,314 AFY, and published recharge estimates have trended downward from 11,000 AFY in 1969 to 5,250 AFY in 2019. The Large Pumpers' contention that the safe yield is between 12,329 to 18,200 is a significant departure from the norm.

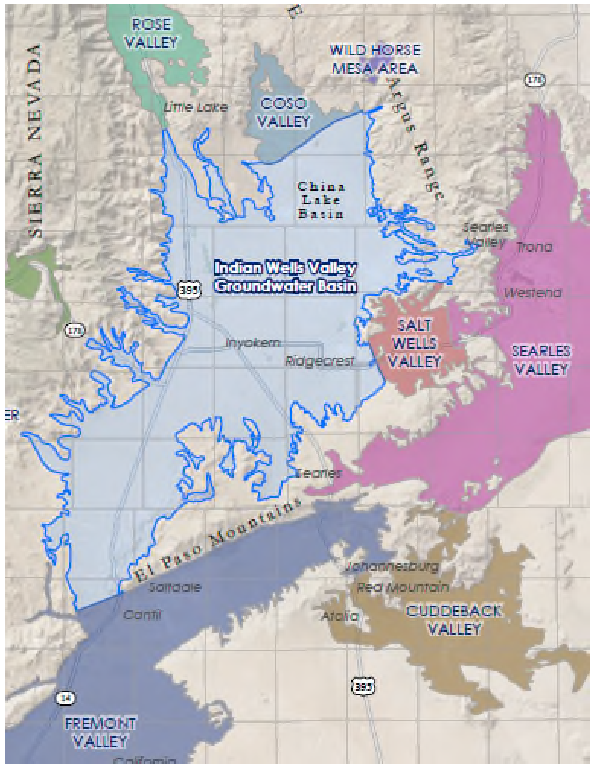
The Large Pumpers' safe yield estimates were not submitted through the public SGMA process for technical review, stakeholder comment, or Board consideration when the Authority adopted the GSP (or proceeded through the SGMA update process) because their estimates were developed for this adjudication. The Court will hear testimony from Jean Moran, PG, CHG and Todd Kincaid, Ph.D., P.G., and the United States' expert, Sean McKenna, Ph.D, that the Large Pumpers do not provide a valid basis to increase the Basin's sustainable yield because they do not identify a reliable new source of recharge, do not reconcile their higher yield estimates with the Basin's long history of declining groundwater levels and chronic overdraft, and do not justify departing from the water budget and modeling record supporting the Authority's 7,650 AFY determination. At most, the Large Pumpers identify areas of uncertainty and data gaps; they do not convert those uncertainties into additional sustainable supply. Therefore, the Court should conclude, as the Authority did, that the most reasonable estimate of the Basin's safe yield is 7,650 AFY or less.

II. FACTUAL BACKGROUND

A. <u>The Indian Wells Valley Basin</u>

The Basin is located in the northwestern part of the Mojave Desert and encompasses 597 square miles, or roughly 382,000 acres, at the junction of Inyo, Kern, and San

Bernardino Counties. (Ex. 955-0007.) Its location and boundaries are depicted below.



(Ex. 957, Fig. 2.)

Approximately 80% of land (302,095 acres) overlying the Basin is owned by the United States Navy for the Naval Air Weapons Station China Lake ("NAWS China Lake"), or managed by the Bureau of Land Management ("BLM"). (Ex. 955-0008.) The remaining 20% is used for residential, industrial and agricultural purposes. (*Ibid.*) Groundwater is the sole supply of potable water and is necessary for domestic users to sustain their livelihoods, and even more fundamentally, to inhabit their homes. (Ex. 955-0012.) There are an estimated 872 shallow wells in the Basin that provide water to thousands of people for domestic uses, many of whom are located in disadvantaged communities. (Ex. 955-0035.) All of these small pumpers will be significantly impacted by continued overdraft and yet they have failed to appear in the Adjudication because of a lack of resources.

B. <u>The Basin Is Critically Overdrafted</u>

DWR designated the Basin as a high-priority basin subject to critical conditions of overdraft.[4] (*Mojave Pistachios, LLC v. Superior Court* (2024) 99 Cal.App.5th 605, 617 ("*Mojave*"); Ex. 955-0042.) DWR's internal guidance provides that "[a] basin is subject to critical overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts." (*Critically Overdrafted Basins*, Cal. Dep't Water Resources, https://water.ca.gov/programs/groundwater-management/bulletin-118/critically-overdrafted-basins (last visited May 22, 2026).) The Basin has been persistently overdrafted for more than six decades with extractions regularly exceeding 25,000 AFY such that "groundwater levels in the Basin have been steadily declining since 1945." (*Mojave Pistachios*, *supra*, 99 Cal.App.5th at p. 614.) The largest pumpers responsible for the majority of the overdraft, collectively referred to herein as the "Large Pumpers," are Meadowbrook, Searles, the District, and Mojave Pistachios. These Large Pumpers are the only parties advancing the Adjudication, and moved for this Phase 2 safe yield trial.[5]

It was estimated that between 2011 and 2015 groundwater extractions in the Basin averaged 27,740 AFY, and another 4,850 AFY was lost to evapotranspiration. Since the GSP was adopted in 2020, extractions are estimated to have reduced from 21,263 in 2020, to 17,848 in 2024. The breakdown of extractions in Water Year 2024[6] was as follows: District (5,908 AF); Naval Air Weapons Station China Lake (1,620 AF); Searles Valley Mineral (2,809 AF); City of Ridgecrest (176 AF); County of Kern (122 AF); Inyokern Community Service District (218 AF); Meadowbrook (4,546 AF); Mojave Pistachios (157 AF)[7]; Quist Farms (537 AF); Sierra Shadows (214 AF); Terese Farms (263 AF); small mutual water companies and independent domestic wells (1,278 AF). That is 7,702 AF for

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[4] Of California's 515 groundwater basins, only 21 are designated by DWR as experiencing critical conditions of overdraft.

[5] We note that Mojave Pistachios has settled its disputed with the Authority and is not participating in this phase.

[6] Water year 2024 spans from October 1, 2023 to September 30. 2024.

[7] Prior to WY 2024, Mojave Pistachios reported extracting between 3,000 and 5,000 AFY since 2014. It is expected that Mojave Pistachios will increase its pumping again to those prior levels, if they have not already.

domestic and municipal uses, 1,620 AF at Naval Air Weapons Station China Lake, 2,809 AF for industrial, and 5,717 for agriculture, which is believed to be underreported for that year. Reported extractions in WY 2024 were more than double the GSP's sustainable yield.

C. <u>SGMA's Regulatory Scheme</u>

Before 2014, groundwater management lacked statewide regulatory oversight, leaving courts to resolve basin disputes and manage basins. Historically, courts resolved groundwater adjudications in three main phases. First, the court determined the basin's boundaries and safe yield. Next, the court determined the parties' water right priorities to the safe yield in the form of groundwater pumping allocations. Last, courts typically relied on their equitable powers to fashion "physical solutions"—physical groundwater management remedies that harmonize water right priorities with Article X, section 2 of the California Constitution, which requires all water, including groundwater, to be put to "reasonable and beneficial" use.

The California Legislature fundamentally altered this landscape with the adoption of SGMA in 2014, establishing a statewide framework for groundwater management for the first time. SGMA requires overdrafted basins designated by DWR as medium- or high-priority to be managed under a GSP, or coordinated GSPs, designed to reach sustainability by 2040. (Wat. Code, §§ 10720.7, subd. (a); 10720.8; 10727; 10723-10724.)

The GSP's purpose is to ensure the basin operates within its sustainable yield—"the maximum quantity of water … that can be withdrawn annually from a groundwater supply without causing an undesirable result." (Wat. Code, §§ 10721, subds. (u), (w); 10727; 10727.2.) Every GSP must include a water budget and sustainable yield calculation, physical and hydrogeologic characteristics of the basin, groundwater conditions and storage, and other technical information. (See Wat. Code, §§ 10727.2; 10727.4; 23 CCR, §§ 354 -354.44.) Because of its technical expertise, DWR is delegated the important duty of reviewing and approving GSPs to determine if they comply with the requirements of SGMA. (23 CCR § 355.2.)

Nearly a billion dollars has been spent by the GSAs and DWR to fulfill their statutory mandates. GSAs and DWR are expending significant public resources to support, administer, and enforce GSPs throughout the State. DWR has provided approximately $500 million dollars to assist GSAs with developing and implementing GSPs.

In 2015, the Legislature passed the Adjudication Statutes—SB 226 and AB 1390—to streamline the legal process for the adjudication of groundwater rights in general, and also to integrate and streamline that process specifically for basins subject to SGMA. (See Stats.2015 ch. 672, AB 1390, p. 1-3; and Stats.2015, ch. 676, SB 226, p. 1-2.) The Legislature mandated that courts "manage the [adjudication] proceedings in a manner that [1] minimizes interference with the timely completion and implementation of a groundwater sustainability plan, [2] avoids redundancy and unnecessary costs in the development of technical information and a physical solution, and [3] is consistent with the attainment of sustainable groundwater management within the timeframes established by this part." (Wat. Code, § 10737.2.) Furthermore, any judgment entered by a court in an adjudication must "not substantially impair the ability of a [GSA], the [SWRCB], or [DWR] to comply with [SGMA] and to achieve sustainable groundwater management." (*Id*., § 10737.8.)

D. <u>The Authority Is the GSA Responsible for Managing the Basin</u>

The Authority is a joint powers authority created under SGMA to serve as the GSA managing the Basin. The Authority was formed in July 2016 and is comprised of five general members—City of Ridgecrest, County of Inyo, County of Kern, County of San Bernardino, and Indian Wells Valley Water District—who make up its Board of Directors. The United States Department of the Interior Bureau of Land Management, and the United States Naval Air Weapons Station China Lake ("NAWS China Lake") are associate non-voting members of the Authority.

E. <u>The GSP Was a Collaborative Effort</u>

The GSP was initially developed through an exhaustive public administrative process that occurred from 2017 to 2020. The Authority retained Stetson Engineers in 2017 to serve as its Water Resources Manager to aide in preparation and implementation of the

GSP. Stetson Engineers is widely considered to be one of the leading groundwater engineering firms in California.[8] Stetson's professional team has been studying the Basin for nearly a decade, and the GSP is the most comprehensive, detailed and ongoing study of the Basin to date.

At the outset, the Authority also formed the TAC and a Policy Advisory Committee ("PAC") to assist with GSP development, and held monthly public meetings and received considerable stakeholder input from local community residents, businesses, large and small-scale agriculture, domestic well owners, academic institutions, State and local agencies, Federal agencies, non-profit organizations, community organizations, and other interested parties including the Large Pumpers. Throughout the development of the GSP, the Authority gathered, shared and discussed all available information on the Basin with the TAC, PAC and the public including previous studies and investigations on the Basin[9] going back 100 years, previous groundwater models, and other sources of information such as hydrographs, well logs, pump tests, climate and precipitation records, water quality and subsidence studies, and geologic, contour and land use maps.[10]

F. The TAC Was Heavily Involved in Determining Sustainable Yield

The Authority's TAC played a significant role in GSP development and the safe/sustainable yield determination. The TAC was established in 2017 for the express

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[8] Since its establishment in 1957, Stetson Engineers has worked with the Department of Justice, Department of Defense, Department of Interior, Tribal, private, municipal, county, and state clients on water issues throughout the western United States. Stetson Engineers has roughly 65 engineers, hydrologists, geologists, as well as other support personnel.

[9] Some of these reports and analyses were prepared for the District or the Indian Wells Valley Cooperative Groundwater Management Group—a public water data-sharing group formed in 1995 to coordinate monitoring and management efforts, share data, and avoid redundancy in data collection and study efforts. Through the years the Cooperative Group has consisted of many of the same entities that were on the TAC, including the District, Navy, Searler, the City, County of Kern, Meadowbrook, Mojave Pistachios, and others.

[10] The Authority maintains a library of the published studies related to the Basin, which is publicly accessible at https://iwvgsp.com/search/search.php?page=1&sort=Year. The library contains studies from 1912 - 2026.

purpose of allowing interested parties to review and conduct a thorough evaluation of each technical element of the GSP.

The TAC was comprised of eight members representing various interests including large agriculture, business interests, domestic well owners, and wholesaler and industrial users. All TAC members were required to have a formal education and experience in a groundwater-related field while also understanding the technical aspects of the Basin or similar basins in California. The District, Mojave Pistachios, Meadowbrook, and Searles each had their own representative on the TAC: Tim Parker represented the District; Wade Major represented Mojave Pistachios; Eddy Teasdale represented Meadowbrook; and Adam Bingham represented Searles.[11] ***Tim Parker and Eddy Teasdale are the same experts testifying in this Phase 2 trial.*** Anthony Brown is the founder and CEO of Aquilogic, where Wade Major is employed, and occasionally attended TAC meetings.

From June 2017 to the adoption of the GSP in January 2020, the TAC formally held 28 meetings.[12] All of these meetings were open to the public and most were recorded with video or audio available after the meeting. During these meetings, the Basin's physical characteristics and water budget were discussed and determined. Additionally, the District and Meadowbrook's representatives, Mr. Parker and Mr. Teasdale, were members of the TAC's Model Ad Hoc Group, a specialized sub-group of the TAC that held meetings, workshops and conference calls to review and comment on the groundwater flow model that was being updated by the Desert Research Institute (DRI) for use in the GSP. (Ex. 108-161, fn. 38, 108-171 - 173.)

Notably, on June 28, 2018, the TAC's Model Ad Hoc Group held a "Recharge and Pumping Workshop" to discuss and determine the Basin's inflows/recharge and water

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[11] The Large Pumpers' technical representatives also served on the PAC. The PAC was comprised of 11 representatives from: agriculture (3); business interests (2); domestic well owners (2); residential water customers (2); the Eastern Kern County Resources Conservation District (1); and wholesale and industrial users. Non-voting members of the PAC included representatives of the Navy, District, BLM, and Kern County. (Ex. 108-30.)

[12] There were also 61 meetings of the Authority and 31 meetings of the PAC.

budget. The Model Ad Hoc Group reviewed the available recharge data and numerous studies, including a USGS Recharge Study using the Basin Characterization Model ("BCM"), a water balance software package occasionally used to try and estimate the amount of precipitation that becomes recharge to a basin, which estimated recharge between 6,000 and 8,600 AFY. The TAC's Model Ad Hoc Group expressed concerns regarding the BCM and decided not to rely on those recharge estimates.[13] Instead, the Model Ad Hoc Group determined that DRI's recharge estimate for the Basin (McGraw et al, 2016) of 7,650 AFY was based on the best available science and information, and concluded that recharge was within the range of 4,100 to 7,700 AFY.

On July 12, 2018, Mr. Teasdale presented a report to the TAC on the findings and conclusions of the TAC's Model Ad Hoc Group. Mr. Teasdale summarized the work of the Model Ad Hoc Group in reviewing prior studies, including the USGS Recharge Study and the DRI/McGraw Study, and "expressed how extremely productive the Ad Hoc format was" for determining the Basin's recharge. At the July 12, 2018 TAC meeting, the TAC unanimously agreed that the DRI/McGraw Study's recharge estimates for the Basin were based on the best available science and information, and "**[t]he TAC agreed with [the] approach on recharge with bookends 4,100 to 7,700 AFY**." (Ex. 951, p. 1.)

On August 29, 2018, the TAC Model Ad Hoc Group held a "Calibration Workshop" to discuss the water budget and the GSP groundwater flow model calibration. The Model Ad Hoc Group reached consensus that 7,650 AFY annual recharge was the best estimate of recharge based on the available data, and that the model should be re-calibrated and run with 7,650 AFY annual recharge. (Ex. 962-0008 [Tim Parker Notes].) The model was then recalibrated and run with a recharge of 7,650 AFY, validating that number. The GSP would later adopt the 7,650 AFY recharge estimate as the sustainable yield of the Basin. (Ex. 108-52, 108-238 fn. 44.)

[13] The BCM is the primary tool that the Large Pumpers now rely on to estimate recharge.

G. GSP Adoption and DWR Approval

The Authority adopted the GSP in January 2020, with the District voting to approve it. After a nearly two-year long review, DWR approved the GSP in 2022. DWR concluded that it "demonstrates a thorough technical understanding of the basin based on best available science and information." (Ex. 936-007.) Specifically, DWR concluded:

> "The Authority developed historical, current, and predicted water budgets using information from studies and investigations, previous groundwater flow models, and historical data, all of which were also used to develop the Numerical Model. **The water budget components in the Plan, including an assessment of sustainable yield and change in storage (i.e., conditions of overdraft), were developed using the best available tools and information available** at the time of preparing the GSP and substantially comply with the requirement outlined in the GSP Regulations."

(Ex. 936-0022.)

DWR further found "[t]he Plan includes a suite of projects and management actions that appear to be conceptually feasible, which if implemented, will make progress towards operating the Basin within its sustainable yield." DWR further found the GSP "demonstrates a thorough understanding of where data gaps exist and demonstrates a commitment to eliminate those gaps." (Ex. 936-0004.) The GSP "identifies data gaps and includes a plan to address them as more information is available." DWR "agree[d] with the Authority's conclusion that filling these data gaps will improve the understanding of the physical system and reduce uncertainty, but [did] not believe that these data gaps materially affect the Authority's ability to progress towards the sustainability goal for the Basin …." (Ex. 936-0011.)

The Authority has worked to addressed those data gaps, as addressed in its annual reports and five-year Periodic Evaluation in 2025. (Ex. 929-0098 - 100.)

H. GSP Implementation and the Replenishment Fee

The Authority has since taken a number of actions to implement its GSP. The Authority prepared a Sustainable Yield Report to provide further information to the public regarding the calculation of the sustainable yield. The Authority adopted a replenishment fee (the "Replenishment Fee") to fund the imported water project and shallow well mitigation program. The Authority also adopted a transient pool and fallowing program to lessen the impacts on those that did not want to purchase replenishment water.[14]

The Authority is in the process of implementing the Import Project. Consultants for the Authority completed an alignment study to identify the best route for the imported water pipeline, and the pipeline design is approaching 90% completion. The EIR is also nearing completion with the final comment and review process set to occur in the fall of this year. The Authority has received three grants totaling more than $13 million for development and implementation of the GSP, which includes a grant of $7,600,000 for the Import Project. Most recently, the United States Congress approved the Water Resources Development Act of 2024 (WRDA 2024), which includes $50 million for the Import Project.

The Authority spent a considerable amount of time, money and effort developing and implementing its GSP. The Authority spent more than two years and $2.5 million preparing the GSP and has received over $13 million from DWR in grants to develop and implement its GSP. Specifically, the Authority received $2,534,400 from DWR for development of the GSP, $7,600,000 from DWR on planning and environmental review for the pipeline, and $3,345,000 from DWR for the consolidation of small water systems, and the Authority reasonably expects to receive millions more from the U.S. Army Corps of Engineers to fund its project to bring imported water into the Basin. To date, the Authority has spent nearly $15 million developing and implementing its GSP.

The GSP continues to be implemented and reports are issued annually as the Authority gathers more information and data. Since 2019, the Authority published seven annual reports as well as a comprehensive five-year Periodic Evaluation in 2025. The Authority has also collected and evaluated new data and information, which was used to address data gaps and develop an updated 2025 GSA/DRI Model.

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[14] Agriculture producers in the Basin, including Meadowbrook, were provided a transient pool allotment they could pump without paying the Replenishment Fee. As more data has been collected and pumping has decreased, the Authority is creating a Second Transient Pool. (Ex. 929-0066.)

The Authority maintains a basin-wide monitoring program because SGMA requires it to measure whether the Basin is progressing toward sustainability, whether undesirable results are occurring, and whether the GSP's projects and management actions are working. At adoption of the 2020 GSP, the monitoring network included 198 groundwater monitoring wells, including 19 multi-level monitoring wells, 60 domestic wells, and 63 wells on the Navy base, along with two stream gages, four weather stations, a DRI eddy-covariance station for evapotranspiration and evaporation, and available InSAR and earthquake data for land-subsidence review. Groundwater levels are measured twice each year, in March and October, to capture seasonal high and low conditions. The network is not static. During the current evaluation cycle, the number of monitored groundwater wells changed from 198 in WY 2020, to 180 in WY 2021, to 182 in WY 2022, and to 183 in WY 2023, including 10 nested monitoring-well sites with 30 piezometers. These changes reflect the Authority's continuing effort to improve spatial coverage, replace inaccessible or unusable wells, address dry or destroyed wells, and fill data gaps in areas such as El Paso, Rose Valley, the southwest Basin, and areas near groundwater-dependent ecosystems.

The Authority uses this monitoring data for several connected purposes: to prepare annual reports, calculate changes in groundwater in storage, evaluate sustainable management criteria, update the Basin Model, identify shallow-well impacts, track water-quality degradation, and determine whether management actions need to be adjusted. Ten representative groundwater-level monitoring sites are tracked semi-annually for SGMA compliance, while changes in groundwater storage are calculated annually using the Modified Thiessen Polygon Method, and then periodically checked against the Basin Model.[15]

[15] The Modified Thiessen Polygon Method is used to estimate loss in storage on an annual basis due to costs. The better approach is to update the GSP/DRI Model with data from the past year, however, that it more costly. As such, the Authority uses a Modified Thiessen Polygon approach for the annual reports and uses an updated model at the 5-year evaluation. In the 2025 Periodic Evaluation the Authority found the Modified Thiessen Polygon Approach was underestimating loss in storage compared to the 2025 GSP/DRI Model. (Ex. 929-0037.)

Water quality is monitored through TDS and arsenic sampling. Since adoption of the 2020 GSP, the Authority has added 24 wells and two surface-water sites to the water-quality monitoring network, samples selected monitoring sites annually, and relies on public-supply/GAMA data that are collected every few years. The Authority also monitors land subsidence through available InSAR data and Navy information, including review of SNORT alignment data made available by the Navy, and the Authority monitors GDE conditions through groundwater-level dataloggers near selected vegetation transects. The purpose of the program is adaptive management: the Authority must have measured Basin conditions to assess whether the Basin is on track to reach sustainability by 2040, or whether additional or modified actions are needed.

III. PROCEDURAL BACKGROUND

A. <u>The Origin of the Adjudication and Related Proceedings</u>

This Adjudication began as an action by Mojave Pistachios seeking to quiet title in alleged water rights against the District, Searles, and Meadowbrook. In response, on June 16, 2021, the District filed a Cross-Complaint for Comprehensive Adjudication of the Basin, pursuant to the Adjudication Statutes. The adjudication was bifurcated, with Phase 1 addressing the U.S. Navy's federal reserved water right for NAWS China Lake, and Phase 2, set to address basin-wide safe yield.

Parallel to this adjudication, Searles and Mojave Pistachios filed actions in September 2020 against the Authority challenging the Replenishment Fee and the GSP. Mojave Pistachios specifically brought a reverse validation action challenging the validity of the GSP. After this Court granted the Authority's demurrers to Searles and Mojave Pistachio's challenges to the Replenishment Fee, Mojave Pistachios sought writ review. On February 8, 2024, the Court of Appeal rejected Mojave Pistachios' claims and upheld the demurrer ruling. (See *Mojave*, *supr*a, 99 Cal.App.5th at 614, reh'g denied (Mar. 4, 2024), review denied (May 15, 2024).)

The Authority subsequently resolved the claims through settlements, with Mojave Pistachios in February 2025, and then with Searles in November 2025, both of whom dismissed all challenges to the GSP. The District unsuccessfully tried to prevent dismissal of Searles' action in an attempt to maintain a challenge against the GSP and Replenishment Fee. There are presently no challenges to the GSP and any attempt to now challenge the GSP would be time barred.

B. <u>Phase 1 Trial on Navy's Federal Reserved Water Right</u>

The Phase 1 trial commenced on April 28, 2025. The proceeding focused exclusively on adjudicating the Navy's reserved right. The Court issued its Statement of Decision on September 15, 2025, ruling the Navy's federal reserved water right totals 2,008 AFY.

C. <u>Phase 2 Trial on Safe Yield</u>

This Phase 2 bench trial is solely to determine "the Basin's safe yield." (Tentative Ruling Adopted by Aug. 5, 2024 Minute Order [ROA 1465].) The trial is scheduled to commence on June 8, 2026, with a fifteen court-day estimate. (See May 15, 2026 Minute Order [continuing the Phase 2 trial date from June 1 to June 8, 2026].)

Searles filed a motion on May 22, 2024, to set a Phase 2 trial to determine the Basin's safe yield and total amount of groundwater in storage, and a Phase 3 trial to adjudicate groundwater rights and establish a physical solution. The motion was joined by the other Large Pumpers. The Authority opposed the motion on several grounds, namely that a Phase 2 trial on storage is unnecessary, and a trial on safe yield is improper because SGMA requires the court in a comprehensive groundwater adjudication to accept a GSP's technical findings, including its sustainable yield determination, unless invalidated in a validation action brought pursuant to Water Code section 10726.6(a). The Authority opposed the Phase 3 trial to establish a physical solution to the extent it would substantially interfere with the GSP, in violation of Water Code section 10737.8.

On August 5, 2024, after supplemental briefing, the Court granted Searles' motion to set a Phase 2 trial on safe yield. As for storage, the Court rejected Searles' proposal and explained in its June 14, 2024 tentative ruling that it would consider groundwater in storage during the Phase 2 trial only if "there is a showing that such storage is relevant to that adjudication." The Court did not set a Phase 3 trial date.

D. <u>Phase 2 Motions *in Limine*</u>

On February 17, 2026, the Authority filed two motions *in limine* ("MIL") to (1) exclude testimony of non-retained expert Anthony Brown and (2) exclude testimony regarding groundwater in storage. MIL No. 1 sought to exclude Mr. Brown's testimony because his testimony will be cumulative of other experts and because he is functioning as a retained expert, not a nonretained expert. MIL No. 2 sought to exclude testimony on the total amount of groundwater in storage because it is not relevant to safe yield, and will result in an undue consumption of time.

On April 6, 2026, the Court issued its tentative ruling on both MILs. The Court denied MIL No. 1 with the caveats that "the Court will not allow multiple witnesses to testify about the conclusions set forth in [the 2024 Safe Yield Paper];" Mr. Brown cannot testify about the Report's conclusion as a non-retained expert; and Mr. Brown's testimony on topics "may lead to the exclusion of other experts' testimony covering the same ground." The Court reiterated this at the April 4, 2026 hearing, stating: "What I say to the TWG is pick your poison, because once you decide to use an expert for one subject, I'm not inclined to let the next expert give his opinion on the same subject."

As for MIL No. 2, the Court tentatively granted the motion "conclud[ing] that overall storage capacity does not appear to be relevant to the safe yield determination." At the hearing, the Court reaffirmed its position but stated it would allow the Large Pumpers to make a record by allowing testimony of only about "three hours or so." Specifically, the Court stated:

> "I'm still unconvinced that total storage capacity has really anything to do with this. Here is my view, though. I'm going to take the TWG at face value, that this is only to take a few hours to put on total storage capacity. I'm inclined to let it go into the record. But I'm then not inclined then to go into anything having to do with a physical solution...So I will put very little weight on it, to tell you the truth. But if you want to make a record, I'm going to let you make a record. And to me, this is just somewhat of an elaborate offer of proof...But if this goes on beyond something like a half a day, three hours or so, I am going to cut it off."

(April 4, 2026 hearing, RT pp. 51-52.)

IV. LEGAL PRINCIPLES GOVERNING SAFE YIELD

A. The Definition of Safe Yield

The California Supreme Court defines "safe yield" as "the maximum quantity of water which can be withdrawn annually from a ground water supply under a given set of conditions without causing an undesirable result." (*City of Los Angeles v. City of San Fernando* (1975) 14 Cal.3d 199, 278 ("*San Fernando*").) The phrase "undesirable result" is generally "understood to refer to a gradual lowering of the ground water levels resulting eventually in depletion of the supply." (*Ibid.*)

SGMA created the term "sustainable yield," which largely mirrors the definition of "safe yield." SGMA defines "sustainable yield" as "the maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result." (Wat. Code, § 10721, subd. (w).) SGMA lists six conditions that if they were to occur in a "significant and unreasonable" manner would constitute an "undesirable result." (*Id.*, § 10721, subd. (w).) These include, among other things, the "(1) Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon…[and] (2) Significant and unreasonable reduction of groundwater storage." (*Ibid.*) GSAs are charged with defining the "undesirable results" for a basin. (23 CCR §§ 354.26; 354.28.) SGMA definition of sustainable yield it is not inconsistent with the common law definition of safe yield because the full scope of "undesirable results" is not fully defined in the caselaw. No court has rejected any of the SGMA-specific undesirable results as not being "undesirable results" in the context of safe yield.

The Court has also recognized that the concepts of "safe yield" and "sustainable yield" are "essentially equivalent terms."[16] (August 5, 2024 Phasing Order, p. 60.)

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[16] Consistent with the Court's reasoning, the GSP treated safe and sustainable yield as equivalent and concluded: "The safe yield is equal to the long-term average natural

Practically speaking, there is no difference in how safe/sustainable yield are calculated. Both safe yield and sustainable yield are determined using the basin's water budget, which is developed by expert opinion and modelling of the basin's "net of inflows less subsurface and surface outflows." (*Santa Maria*, *supra*, 211 Cal.App.4th at p. 279; *San Fernando*, *supra*, 14 Cal.3d at p. 278 ["Basically, safe yield was deemed equivalent to an adjusted figure for net ground water recharge"]; see 23 CCR § 354.18(a) ["Each [GSP] shall include a water budget for the basin that provides an accounting and assessment of the total annual volume of groundwater and surface water entering and leaving the basin"]; *Id.*, subd. (b)(7) [the GSP shall "quantify … An estimate of sustainable yield for the basin"].)

B. <u>Calculating Safe Yield</u>

Safe Yield = Inflows − Outflows

"Safe yield is generally calculated as the net of inflows less subsurface and surface outflows." (*City of Santa Maria v. Adam* (2012) 211 Cal.App.4th 266, 279.) A groundwater basin is similar to a bank account; inflows are the paycheck and outflows are debts owed. (Ex. 108-149.) The money, or groundwater, that is safely available for use each year is the difference between long-term average inflows and outflows. Overdraft occurs when more water is withdrawn than the safe yield, depleting the savings. The accounting of the basin's inflows and outflows is commonly referred to as the basin's "water budget." (Wat. Code, § 10721 [SGMA defines "water budget" as "an accounting of the total groundwater and surface water entering and leaving a basin including the changes in the amount of water

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recharge of the basin, currently estimated to be 7,650 AFY." (Ex. 108-238, fn. 44.) Counsel for Searles and Counsel for Mojave have both acknowledged that "sustainable yield" and "safe yield" are virtually the same. (Eric Garner et. al., The Sustainable Groundwater Management Act and the Common Law of Groundwater Rights-Finding A Consistent Path Forward for Groundwater Allocation (2020) 38 UCLA J. Envtl. L. & Pol'y 163, 174 ["Both terms are linked to the concept of avoiding undesirable results and seem indistinguishable in terms of how the yield is measured"]; see also 2 Slater, California Water Law and Policy, (2022), § 11.06, p. 11-28 ["there does not appear to be any material deviation in the intention of the Legislature in how the [sustainable yield] standard would be applied" as opposed to safe yield]; p. 11-32 ["'sustainable yield' is virtually interchangeable with the term 'safe yield.'"].)

stored"].)

C. Safe Yield's Relevance to Basin Management and Water Rights

The safe yield of the Basin is important to both basin management and water rights. SGMA requires the Basin to be operated within its sustainable yield, consequently the safe/sustainable yield is crucial to determining necessary projects and management actions. For purposes of water rights and this adjudication, safe yield is important because it is the amount of water to be allocated amongst water rights holders. It is, in effect, the "pie" that the Large Pumpers and other parties will be left to divide up—the smaller the pie, the more the Large Pumpers will have to reduce their current extractions, or locate an alternative water source. Accordingly, the Large Pumpers have the motive of reducing their costs driving this attempt to elevate the Basin safe yield to substantially exceed decades of Basin studies and their own conclusions based on the science presented to them as TAC members. Their initial positive motive seemed to be Basin preservation, but the Large Pumpers have lost their way."

The Court's Phase 1 decision allocated 2,008 AFY from the safe yield for the United States Navy's federal reserved water right. If safe yield is 7,650 AFY, then 5,642 AFY remains to be allocated amongst the Large Pumpers and other users in the Basin who are currently extracting approximately 20,000 AFY. The Large Pumpers therefore have a direct incentive to inflate safe yield to minimize future pumping constraints. Having failed in their efforts to invalidate the Replenishment Fee, they now seek a higher safe-yield number to argue that the import project, and the fee funding it, are unnecessary.

D. Total Groundwater in Storage Is Not Relevant to Safe Yield

This Court correctly recognized that the total amount of groundwater in storage does not have "much relevance if any relevance" to determining safe yield. (April 4, 2026 Hearing, RT p. 52.) Nevertheless, the Large Pumpers will contend, as they did in connection with MIL No. 2, that there are "millions and millions of acre feet of water" that should be available for the parties' use under the reasonable and beneficial use doctrine of Article X, section 2 of the California Constitution. (*Id*., p. 14.) But the evidence will show that no such groundwater exists in storage, and the law does not support such an expansion of the concept of safe yield. Moreover, even if such water existed, the evidence will show that the Large Pumpers have not made a determination of how much "recoverable water" is in storage.

The Court correctly observed that "[a]ll the authorities…[are] pretty crisp in terms of how they defined safe yield. Basically, how much water goes out and how much water comes in." (April 4, 2026 Hearing, RT p. 14.) That definition is anchored in Article X, section 2's reasonable and beneficial use doctrine because it allows the maximum quantity of water to be withdrawn without causing *an undesirable result*. It is undesirable, and hence unreasonable, to continue mining a critically overdrafted basin with the hope that the water will get replenished years later.

Surely, there is no *right* to mine groundwater in storage because that would effectively guarantee the continual depletion of the groundwater supply. As the California Supreme Court explained in *City of Pasadena*, when a basin is overdrafted "[e]ach taking of water in excess of the safe yield…[is] wrongful and [is] in injury to the then existing owners of water rights, because the overdraft, from its very beginning, operated progressively to reduce the total available supply." (*City of Pasadena v. City of Alhambra* (1949) 33 Cal.2d 908, 929 ("*City of Pasadena*").) The very purpose of an adjudication is to preserve the supply by determining water rights to the safe yield, which is consonant with Article X, section 2.

The ability to use more water than the safe yield by taking from storage is not a right, it is *a management decision* that rests exclusively with the Authority, subject to DWR oversight.[17] (Wat. Code, §§ 10721(u), (w); 10727.2; 23 CCR, § 354.30(e).) For example,

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[17] The Large Pumpers' own experts, Timothy Parker and Anthony Brown, distinguished safe yield from storage. Mr. Parker explained in his expert report that the "role of storage" is for basin management, not determining safe yield. Similarly, Mr. Brown explained at deposition that "Safe yield…[is] the amount of income you receive. So it's the amount of water that's coming into the basin that's available for production…Whereas groundwater storage is your savings."

depending on the circumstances, it may be prudent policy to allow parties to temporarily extract more groundwater than can be naturally recharged (i.e. a rampdown) instead of immediately restricting water use to the safe yield. But there must be a plan to reach sustainability by 2040. The purpose of a GSP is to design a reasonable plan for the basin to operate sustainably without depleting storage. (Wat. Code, § 10720.1(g) [one of the purposes in enacting SGMA was to "[t]o increase groundwater storage"].)

V. SUMMARY OF SAFE YIELD ESTIMATES OF THE PARTIES' EXPERTS

The determination of the Basin's safe yield is an expert-driven issue. The safe yield estimates that will be advanced by the parties during the Phase 2 trial are as follows:

A. The Authority: Safe Yield is between roughly 6,100 AFY and 8,400 AFY, with a best estimate of 7,650 AFY

1. Jean Moran, PG, CHG

Jean Moran, Stetson's principal hydrogeologist and groundwater modeler, will testify as the Authority's party-affiliated, non-retained expert. Ms. Moran has 25 years of professional experience in the field of hydrogeology and modeling, and worked closely with the TAC during development of the GSP, including modeling updates, water budget development, and management scenarios. Based on that work the GSP determined the safe/sustainable yield to be 7,650 AFY, That determination resulted from a multi-year, science-driven process costing more than $2.5 million. And it will be refined as the Authority evaluates new data. Ms. Moran will testify that Authority's determination that long term recharge in the Basin is 7,650 AFY, which is used in the GSP as the safe yield, is supported by the data and information collected and analyzed by the Authority, the conclusions of the TAC and the Model Ad Hoc Group, and the 2020 and 2025 GSA/DRI Basin Model.

2. Todd Kincaid, Ph.D., P.G.

Dr. Todd Kincaid is the president of GeoHydros and has more than 30 years of professional experience in the field of hydrogeology and modeling. Dr. Kincaid was retained by the Authority to independently review and assess the GSP's safe yield determination. Dr. Kincaid will testify that the Basin's safe yield is best estimated by using the Recharge Method—determining the Basin's long-term average natural recharge and then accounting for natural outflows. Under that approach, he concludes that safe yield falls between 6,100 and 8,400 AFY, and that 7,650 AFY is a reasonable estimate. He will further explain that the 2025 GSA/DRI Model validates his opinion and is a more reliable tool than the Ramboll Model, as it better simulates known conditions. The Ramboll Model contains foundational defects, including hundreds of dry and flooded cells—meaning the model is simulating too much water in some areas, and not enough in others. Dr. Kincaid will testify that there are more than 800 flooded cells near China Lake, effectively, incorrectly simulating a large lake where none exists.

The appearance of the mysterious lake invalidates the use of the Large Pumpers' model because the model cells holding the "lake water" are holding nonexistent claimed deposits of supply to the Basin which the model will not move to a point of production. No calibration confirms that those deposits were ever moved to another point for extraction. This model error overstates Basin supplies significantly and is being used to inflate safe yield, and, in turn, inflate the Large Pumpers' water rights and Basin water production. Of course, these outcomes will exacerbate overdraft and generate undesirable results. The Large Pumpers' failure to deal with this error is evidence of a cynical attempt to inflate the amount water and decrease the cost of water which the Large Pumpers are able to produce.

B. <u>The Navy: No more than 7,650 AFY</u>

1. Sean McKenna, Ph.D

Dr. Sean McKenna, testifying for the United States and the Navy, is the Executive Director of DRI's Division of Hydrologic Sciences and has nearly 40 years of experience in groundwater research and modeling. He is expected to opine that 7,650 AFY is a reasonable estimate of the annual recharge in the Basin, and that the safe yield cannot exceed the recharge the Basin receives, and would need to be lower if transpiration from natural vegetation is considered. Dr. McKenna will further opine that the primary source of recharge in the Basin is mountain front recharge, and that anthropogenic sources—such as irrigation return flows, leakage from the LA Aqueduct, and leakage from the District's distribution system—are not appropriate to consider in this Basin. There is no compelling evidence of leakage from the LA Aquduct in any volume that would create a difference in this basin. And, as to return flows, Dr. McKenna is the only expert that has attempted to calculate how long it would take for irrigation return flows to percolate through the basin to the water table. Dr. McKenna calculates it would take *122 years* or longer. Since neither agriculture nor the District were present in the Basin 122 years ago, it is not appropriate to include those amounts in a water budget.

Dr. McKenna is also expected to testify that 2025 GSA/DRI Basin Model reliably represents the Basin's hydrogeologic framework, incorporates the best available data, including airborne electromagnetic surveys, and is well calibrated in both its steady-state and transient components. In contrast, he is expected to explain that the Ramboll Model relies on unusually wet years, fails to match observed groundwater conditions, and incorrectly simulates a large perennial lake near China Lake where none exists.

C. <u>The Large Pumpers: 12,329 to 18,200 AFY</u>

The Large Pumpers' experts contend the safe yield is between 12,329 and 18,200 AFY, which is roughly double the recharge estimates of nearly every recent study. The higher figure depends primarily on increased mountain front recharge and significant interbasin inflows from Rose Valley, coupled with speculative incidental recharge sources such as LA Aquduct leakage and irrigation return flows. The evidence will show that these estimates rest on an inappropriate polygon method, an unreliable model that does not reflect actual hydrologic conditions, overinflated native recharge estimates, unsupported assumptions about non-native recharge, and an inappropriate base period.

1. Timothy Parker, PG, CEG, CHG

Timothy Parker, testifying for the District, has long served as a District consultant and participated in both the TAC and Model Ad Hoc Group. In 2108 Mr. Parker agreed that a recharge estimate of 7,650 AFY reflected the best available science and information. Following the adoption of the Replenishment Fee, the District withdrew Mr. Parker from the TAC and directed him to estimate safe yield for this adjudication. Mr. Parker, who does not hold any advanced degrees and has not participated as an expert in any other groundwater adjudication, was the primary author of the Large Pumpers' Safe Yield Paper, which estimated safe yield between 14,300 AFY and 17,000 AFY. He now estimates safe yield is within the range of 14,300 to 18,200 AFY, with his best estimate being 14,300 AFY despite also estimating recharge at only 13,300 AFY for 1986 and 2023.[18] His opinions rest on the a Thiessen-polygon change-in-storage analysis, which itself is heavily influenced by the Rambol Model. Using the Thiessen-Polygon approach to determine change in storage is not appropriate. The method is highly uncertain and dependent on safe yield estimates, change in water level estimates, and an appropriate base period. It relies on sparse data and numerous assumptions, that are not thoroughly explained. Simply put, use of Thiessen-Polygons is not the best science and technology for determining safe yield. The evidence will also show that the Ramboll Model is poorly constructed and calibrated and its use in any method is not appropriate.

2. Matthew Tonkin, Ph.D

Dr. Matthew Tonkin, testifying for the District, uses the Ramboll Model to estimate safe yield as recharge minus non-pumping discharge. He estimates safe yield at approximately 14,375 AFY if evapotranspiration is excluded, and 12,329 AFY is included. To support the higher figure, he uses input assumptions that do not match the Rambol model outputs, and uses an inappropriate base period. In his report Dr. Tonkin states that evapotranspiration may be occurring from a perched zone above the principal aquifer, rather than from the principal aquifer itself, and therefore should not reduce safe yield. However, at his deposition Dr. Tonkin stated he did not have an opinion as to whether there was a perched zone. The evidence will show a more appropriate base period without unreasonable anthropogenic sources of recharge will result in a safe yield estimate

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[18] During that timeframe, he estimates the average mountain front recharge at 7,700 AFY, surface runoff at 500 AFY, subsurface inflow from Rose Valley at 2,600 AFY, and incidental recharge at 2,500 AFY.

significantly closer to that stated in the GSP then the Large Pumpers' other experts.

3. Vivek Bedekar, Ph.D, PE

Dr. Vivek Bedekar was retained by the District solely to testify in support of the District's Model. He concludes that the model incorporates components that are necessary for safe yield calculations and that the overall model calibration "seems" or "appears" reasonable, but opportunities exist to refine and strengthen the model framework. Dr. Bedekar does not opine on the safe yield of the Basin.

4. Anthony Brown

Mr. Brown is Mojave Pistachios's retained expert, although the Court is permitting him to testify as a non-retained expert for the District.[19] Mr. Brown did not perform any of the calculations in the Large Pumper's Safe Yield Report, nor did he work on or review the Ramboll Model or the GSP/DRI Model. He also did not submit an expert report.

5. Eddy Teasdale, PG, CHG

Eddy Teasdale, testifying for Meadowbrook, was a member of the TAC and the Model Ad Hoc Group, and agreed that an long term average of 7,650 AFY of recharge in the Basin was based on the best available science and information. After leaving the TAC, he developed the opinion that the safe yield was 15,400 AFY, inexplicably double the best estimate of recharge. Like Mr. Parker, Mr. Teasdale relies on a Thiessen-polygon change-in-storage analysis using specific-yield values drawn from the Ramboll Model, with minor adjustments for values near Meadowbrook's land. His analysis suffers from the same flaws as Mr. Parker's and contains additional computation errors, where Mr. Teasdale claimed groundwater levels were rising when in fact they were falling.

6. Lauren Wicks, PG / Johnson Yeh, Ph.D, PG, CHG

Lauren Wicks is Searles designated expert, but is being called by the District. Ms.

[19] The Authority's MIL No. 1 sought to exclude Mr. Brown from Phase 2 because his opinions are duplicative and he is the retained expert of Mojave Pistachios. Mr. Brown formed his opinions expressly for this adjudication. He is not and cannot be a percipient, *nonretained* expert.

Wicks did not exchange a rebuttal report. Ms. Wicks is expected to simply support Mr. Teasdale's estimate as being a reasonable.

VI. THE COURT SHOULD ADOPT THE GSP'S SUSTAINABLE YIELD BECAUSE IT IS VALIDATED AND IMMUNE FROM CHALLENGE

This phase of trial raises a fundamental separation of powers issue because the Court is being asked to try a safe yield dispute between groundwater pumpers and the SGMA entity that is charged with managing their pumping. As the Authority has reiterated throughout this adjudication, the parties are barred from conducting a safe yield trial because SGMA requires any challenge to the determinations in a GSP to be made under the validation statutes. Here, the GSP determined the safe and sustainable yield to be identical at 7,650 AFY. That number is also a foundation of the water budget set out in the GSP. (Ex. 108-39.)

Because no party succeeded on a reverse validation claim, the GSP's determination is valid as a matter of law and cannot be indirectly challenged in this adjudication. Further, under Water Code section 10737.8 "the court shall not approve entry of judgment in an adjudication action for a basin required to have a groundwater sustainability plan under [SGMA] unless the court finds that the judgment will not substantially impair the ability of a groundwater sustainability agency … to comply with [SGMA] and to achieve sustainable groundwater management." A safe yield determination in this adjudication that is materially different from that in the GSP will undoubtedly substantially impair the ability of the Authority to comply with SGMA.

A. __The Validation Statutes Provide the Exclusive Means for Challenging the the GSP's Sustainable Yield__

The validation statutes, Code Civil Procedure § 860 *et seq*., "provide a simple and uniform method" by which a public agency action may be determined legally valid and not subject to subsequent legal challenge. (*Moorpark Unified School Dist. v. Superior Court* (1990) 223 Cal.App.3d 954, 960.) The validation statutes apply "when 'any other law' authorizes their application." (*Golden Gate Hill Development Co., Inc. v. County of*

Alameda (2015) 242 Cal.App.4th 760, 765–766 ("*Golden Gate*").)

It is well-settled that when the validation statutes apply, they are a party's exclusive remedy. (Code Civ. Proc. 869; *Millbrae School Dist. v. Superior Court* (1989) 209 Cal.App.3d 1494, 1499.) Either the government agency may file a validation action to determine the validity of its action or any interested party may do so through a "reverse validation" action. (Code Civ. Proc. § 863; *Golden Gate*, *supra*, 242 Cal.App.4th at 764 fn. 3.) If no interested party brings a reverse validation action, or if the government prevails, the government's action is "deemed valid and becomes immune from attack." (*Coachella Valley Water Dist. v. Superior Court* (2021) 61 Cal.App.5th 755, 767-68.)

Here, SGMA requires any challenge to the validity of the GSP to be brought under the validation statutes.[20] (Wat. Code §10726.6(a).) Thus, any challenge (direct or indirect) to the GSP's sustainable yield determination must be brought as a validation claim. Mojave Pistachios brought a reverse validation action (Case No. 30-2021-01187589) against the Authority that specifically challenged the GSP's water budget and sustainable yield calculation, but Mojave Pistachios dismissed that action. (Fourth Amended Complaint, ¶¶

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[20] The Legislature's decision to apply the validation statutes to GSPs makes sense. The Legislature intended for adjudications to be managed to take advantage of, and not interfere with, the technical information in GSPs. In basins with GSPs, the Legislature intended for adjudications to proceed in the following manner: (1) The GSP is adopted (Wat. Code, §§ 10727; 10720.7); (2) The GSP, including the water budget and sustainable yield calculation, is presumed valid unless invalidated in a reverse validation action (*Id*., § 10726.6, subd. (a); Code of Civ. Proc. § 869); (3) DWR reviews the GSP for compliance with SGMA (Wat. Code, § 10733.4); (4) Using the determinations and technical studies in the GSP, the court determines groundwater rights, thus "minimiz[ing] interference," and "avoid[ing] redundancy" and "unnecessary costs" (*Id*., § 10737.2); (5) The court considers the GSP as the physical solution for the basin, and, in effect, supplements the GSP, only if necessary, to be consistent with the water rights it has determined (Code Civ. Proc. § 849, subd. (b)); (6) The court enters judgment upon finding that it will not "substantially impair" the ability of the GSA, SWRCB, or DWR to comply with SGMA and to achieve sustainable groundwater management (Wat. Code, § 10737.8); and (7) The GSA then considers the groundwater rights determined in the adjudication in its management of the basin. (*Id*., § 10723.2 [GSA "shall consider the interests of all beneficial uses and users of groundwater …. These interests include … groundwater rights"].)

183-191.) That reverse validation action was the only forum to review the Authority's water budget and safe/sustainable yield calculation with the proper deference given to the Authority. (*Poway Royal Mobilehome Owners Assn. v. City of Poway* (2007) 149 Cal.App.4th 1460, 1479 ["judicial review of a legislative type activity is limited to an examination of the record before the authorized decision makers to test for sufficiency with legal requirements"].) The Large Pumpers cannot use this adjudication to collaterally attack the GSP's sustainable yield determination. (*Santa Clarita Organization for Planning & Environment v. Castaic Lake Water Agency* (2016) 1 Cal.App.5th 1084, 1097 ["where a certain type of action is subject to validation proceedings, a third party cannot sidestep those proceedings by purporting to invoke a different procedural vehicle"].)

B. The Court Should Defer to the GSP's Sustainable Yield Because No Party Successfully Challenged It Through Reverse Validation

Courts invoke the bar of the validation statutes to direct as well as indirect challenges. The validation statutes apply to indirect challenges when the challenged government action is "inextricably bound up" with, or "an integral part of," the action. (*Kaatz v. City of Seaside* (2006) 143 Cal.App.4th 13, 45; *California Commerce Casino, Inc. v. Schwarzenegger* (2007) 146 Cal. App. 4th 1406, 1430-32 ("*Commerce Casino*"); *Graydon v. Pasadena Redevelopment Agency* (1980) 104 Cal.App.3d 631, 645.)

The GSP's safe/sustainable yield calculation is "inextricably bound up" with and "an integral part of" this Phase 2 trial because the implication is that the Court's safe yield determination will involve redoing the water budget for the Basin and possibly overriding the GSP's safe yield and sustainable yield determinations. Rather than conducting this Phase 2 trial to redo the Basin's water budget, the Court should use the GSP's water budget to determine the Basin's safe yield, and then proceed to determining water rights in this adjudication.

The GSP's sustainable yield calculation and water budget are matters that "could have been adjudicated in a validation action, [and] such matters -- including constitutional challenges -- must be raised within the statutory limitations period in section 860 *et seq*. or

they are waived.' [Citation]." (*Commerce Casino, supra,* 146 Cal.App.4th at p. 1420.) Mojave's dismissal of its reverse validation claim challenging the GSP's water budget and sustainable yield calculation, and the failure of any other interested party to bring a timely claim, means the GSP's sustainable yield is valid as a matter of law.[21] (*Golden Gate*, *supra*, 242 Cal.App.4th at 771 [where there is not a successful reverse validation claim, the agency's action is "deemed valid by operation of the validation statutes"].)

VII. THE COURT SHOULD ACCORD DUE DEFERENCE TO THE GSP'S SUSTAINABLE YIELD UNDER LONG-STANDING PRINCIPLES OF DEFERENCE

Irrespective of validation statutes, the Court should extend substantial deference to the Authority's and DWR's expert administrative determinations regarding the Basin's safe/sustainable yield. Such deference stems from settled principles of separation of powers, judicial efficiency and respect for agency expertise in technical matters committed to administrative review. (*California High-Speed Rail Authority v. Superior Court* (2014) 228 Cal.App.4th 676, 699; *California Building Industry Assn. v. San Joaquin Valley Air Pollution Control Dist.* (2009) 178 Cal.App.4th 120, 129 ["Courts exercise such limited review out of deference to the separation of powers between the Legislature and the judiciary, to the legislative delegation of administrative authority to the agency, and to the presumed expertise of the agency within its scope of authority"].)

"The spectrum of judicial review of administrative action ranges from independent judgment on the basis of a trial de novo, to complete nonreviewability." (*California Hotel & Motel Assn. v. Industrial Welfare Com.* (1979) 25 Cal.3d 200, 213.) Administrative agencies' factual findings and decisions are at that point of the continuum at which judicial review is more deferential, and are generally reviewed to determine whether they are

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[21] This does not suggest that a GSP, which is validated, or not challenged in a validation action, will avoid further review. SGMA mandates a separate layer of review conducted by DWR. DWR must also continue to assess implementation of a GSP to ensure the sustainability goal is being met. (Wat. Code §§ 10728.2; 10733.4.)

"arbitrary, capricious, [or] entirely lacking in evidentiary support. (*Carrancho v. California Air Resources Board* (2003) 111 Cal.App.4th 1255, 1265.) Courts defer and do "not interfere with the discretionary judgments made by the agency" because the administrative agency has "technical expertise to aid it in arriving at its decision." (*Dore v. County of Ventura* (1994) 23 Cal.App.4th 320, 326.) Courts recognize that they "have neither the resources nor scientific expertise to engage in such analysis, even if the statutorily prescribed standard of review permitted [them] to do so." (*Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 393, as modified on denial of reh'g (Jan. 26, 1989).) As a result, "courts will permit administrative agencies to work out their problems with as little judicial interference as possible." (*Western States Petroleum Assn. v. South Coast Air Quality Management Dist.* (2006) 136 Cal.App.4th 1012, 1018.)

While the above cases arise out of direct challenges to agency decisions, courts defer to agencies' factual findings regardless of the mode of challenge and specific standard of review. As the California Supreme Court has explained:

> The precise formulation of the standard may be less important than what courts actually do in exercising deferential but not perfunctory review: What matters is that judges generally understand that they may not properly substitute their judgment for administrative judgment *except on questions of law on which they are the experts*, but that something like reasonableness, rational basis, substantial evidence, or clearly erroneous guides what they do on other questions, and that in most cases other factors have a much stronger influence than the words of the formula that is supposed to apply.

(*California Hotel & Motel Assn. v. Industrial Welfare Com.* (1979) 25 Cal.3d 200, 213, emphasis added.)

Here, the Authority and DWR have unique subject matter expertise. The Authority developed its GSP following a multi-year iterative public process in which the Large Pumpers were actively engaged. DWR has reviewed over 80 GSPs and is heavily involved in every other facet of SGMA administration and implementation. DWR's key role in overseeing GSPs all over the State gives DWR a comparative advantage over the Court in understanding water budgets and safe/sustainable yields of basins. Accordingly, the Court should defer in substantial measure to DWR's approval of the GSP and the safe/sustainable yield of 7,650 AFY.

Moreover, even if a court arguably could supersede an approved GSP and re-calculate the safe/sustainable yield, which the Authority does not believe is authorized, *DWR approval is still required*. (Wat. Code, §§ 10737.4(a)(2) ["[DWR] determines that the judgment satisfies the objectives of [SGMA]"; 10737.6 ["[DWR] shall submit to the court the assessments and any recommended corrective actions"].) It is unlikely that DWR would conclude that the Large Pumpers' safe yield calculation—which is double the GSP's sustainable yield calculation—"satisfies the objectives of SGMA" after having already concluded that the GSP's "assessment of sustainable yield and change in storage (i.e., conditions of overdraft), were developed using the best available tools and information." Practically speaking, if the Court approves a safe yield determination different than 7,650 AFY, it is possible that after the conclusion of this lengthy and costly adjudication, DWR rejects that safe yield determination, placing the parties back at square one, with less time to reach sustainability before the 2040 deadline.

Put simply, for policy and practical reasons, this Court should not "interfere with the functions of an administrative agency." (*Water Audit California v. Merced Irrigation District* (2025) 111 Cal.App.5th 1147, 1193.) Rather, it should extend due deference to the expertise of the Authority and DWR.

VIII. THE LARGE PUMPERS BEAR THE BURDEN OF REBUTTING THE GSP'S SUSTAINABLE YIELD AND OTHER PHYSICAL FACTS

In 2025, the California Legislature amended Code of Civil Procedure section 845 to allow a GSA to submit, at its own election, a technical report in an adjudication in which the GSA has adopted a GSP that has been approved by DWR. (Code Civ. Proc., § 845, subdivision (d)(1).) The technical report may include the physical facts of the basin but "shall, *at a minimum*, quantify and describe the groundwater use of parties that have not otherwise appeared before the court." (*Ibid*., emphasis added.) The technical report "shall be prima facie evidence of the physical facts found in the report, but the court shall hear evidence that may be offered by any party to rebut the report or the prima facie evidence. (*Id*., subdivision (d)(4).)

On May 28, 2026 the Authority submitted its "Technical Report for the Indian Wells Valley Groundwater Basin" ("Technical Report"). (Exhs. 955-957.) The Technical Report describes the physical characteristics of the Basin and provides a conceptual model of the groundwater system.[22] The geology and hydrology of the Basin, which is *prima facie* evidence, is as follows:

A. Location and Climate

The Basin is located in the Mojave Desert, and has an arid, high desert climate characterized by hot summers and cold winters. (Ex. 955-0019.) Summer high temperatures on the playa are typically greater than 100 degrees Fahrenheit (°F) and winter lows are typically in the 20s and 30s °F. (*Ibid*.) The surface elevation of the central valley floor generally ranges from approximately 2,150 to 2,790 feet above mean sea level. (Ex. 955-0013.) Precipitation on the valley floor is irregular and sparse, ranging only from 2 to 5 inches per year, and there are no significant interconnected surface water systems which interact with the Basin. (Ex. 955-0019.) The Basin's valley floor also has low infiltration rates due to the presence of fine-grained low-permeability materials, particularly near-surface thick clay layers, which restrict recharge. (Ex. 955-0012, 0014 - 0015.) The Basin primarily relies on precipitation from the surrounding mountain ranges for its recharge. (Ex. 955-0020.)

B. Structure and Sediments

The Basin is a half-graben basin that lies within the tectonically active Eastern California Shear Zone and is transected by numerous faults trending generally north–south and northwest–southeast. (Ex. 955-0014.) There are four primary fault zones and two secondary faults. (Ex. 955-0016.) The four primary fault zones are the Airport Lake fault,

[22] A conceptual model is a non-numerical model of the physical setting, characteristics, and processes that govern groundwater occurrence within a basin, which provides the basis for developing the water budget and determining the safe/sustainable yield of the Basin.

Little Lake fault, Paxton Ranch fault, and Sierra Nevada Frontal fault. (*Ibid*.) Two secondary faults lie in the El Paso Valley subbasin that act as impediments to groundwater flow and are informally named the Freeman and Armistead faults. (*Ibid*.) The faults within the Basin act as partial to effective hydraulic barriers, compartmentalizing the basin and restricting horizontal groundwater flow. (Ex. 955-0018.) These structures produce measurable offsets in groundwater elevations, hydraulically separating pumping areas from natural discharge zones and limiting basin-wide equilibration.

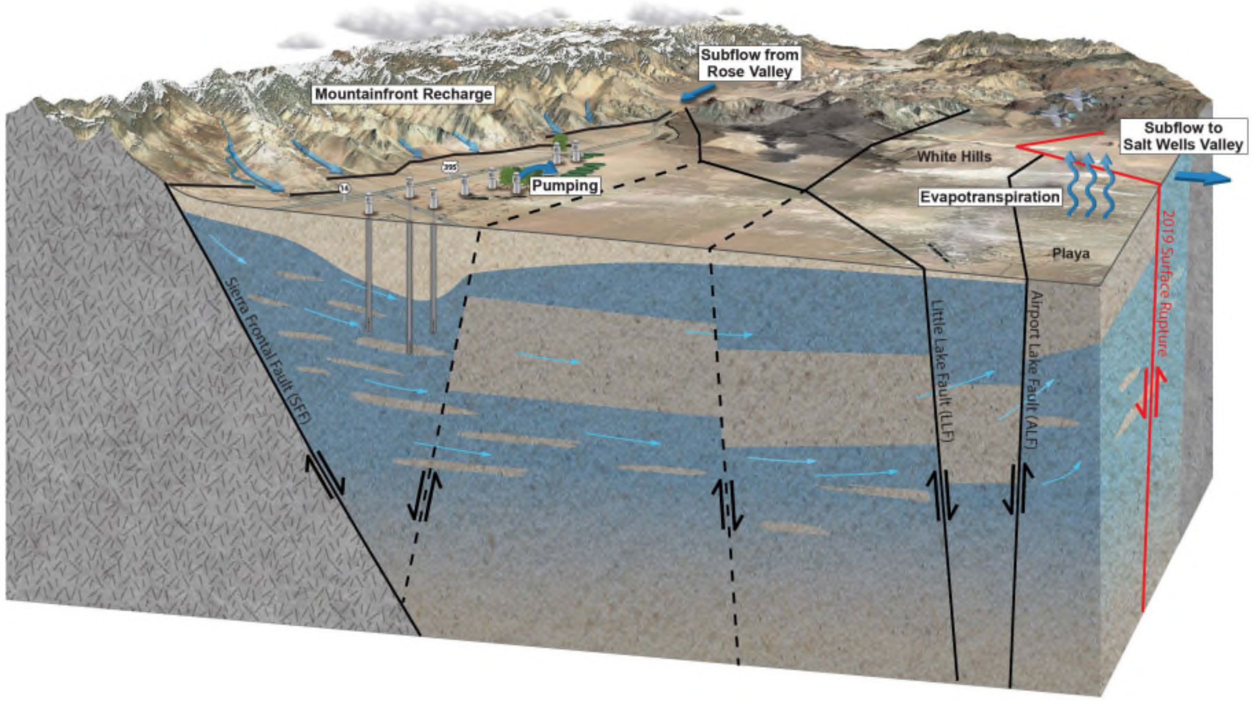
The Basin fill consists of unconsolidated to semi-consolidated clays, silts, sands, and gravels deposited through fluvial and lacustrine processes. (Ex. 955-0013.) The Basin's aquifer system consists of three main hydrogeologic zones: the shallow hydrogeologic zone (SHZ), the intermediate hydrogeologic zone (IHZ) and the deep hydrogeologic zone (DHZ). (Ex. 955-0015.) The SHZ contains the shallow aquifer that consists of highly saline groundwater and connects to the discharge zone and is generally unconfined and has high permeability. The IHZ is generally considered the thick "clay layer" within the Basin that functions as an aquitard separating the shallow aquifer from the deeper principal aquifer in the DHZ where the majority of the pumping is taking place. The DHZ is connected to the shallow aquifer in the west and southwest of the Basin, and is confined in other parts of the Basin. The DHZ is composed primarily of coarse sands and gravels with interbedded clay layers. Older semi-consolidated to consolidated sediments overlie crystalline bedrock at depth and generally exhibit low permeability and limited groundwater productivity.

C. <u>Closed Basin</u>

The Basin is an effectively closed or "terminal" groundwater basin, meaning that nearly all natural inflow is consumed internally through evapotranspiration and groundwater extraction, with little to no natural outflow to adjacent basins. (Ex. 955-0018.) The Basin is bounded by the Sierra Nevada Mountains to the west, the Coso Range and associated volcanic fields to the north, the Argus Range to the east, and the El Paso Mountains, Spangler Hills, and the Garlock Fault zone to the south. (Ex. 955-0050.) These surrounding mountain blocks form effective hydrologic boundaries that constrain lateral groundwater movement, causing the Basin to function effectively as a closed bowl: Water primarily flows in from the surrounding mountains; water does not flow out to other basins; most water leaves through evapotranspiration or pumping; and pumping more than the natural recharge causes overdraft and long-term decline. As a closed Basin, long-term groundwater conditions within the Basin are governed almost entirely by the balance between recharge, internal discharge, and pumping.

D. The Total Inflows Are 7,650 AFY of Mountain Front Recharge

The inflows into the Basin average a total of 7,650 AFY. (Ex. 955-0048 - 0050.) Mountain front recharge is the dominant source of inflow, which originates as precipitation at elevations generally above 4,500 feet, in the bordering Sierra Nevada, El Paso, and Argus and Coso mountain ranges, and possibly underflow from Rose Valley. (Ex. 955-0020.) The average annual precipitation in the mountain areas ranges from about 4 inches up to about 20 inches per year. (Ex. 955-0019.) Runoff occurs at these high elevations, where precipitation is greater and evapotranspiration is smaller than at lower elevations. (Ex. 955-0012.) The rainwater or snowmelt infiltrates into and flows through relatively shallow subsurface pathways and mostly discharges as base flow in ephemeral streams (Sierra Canyon, Rose Valley, El Paso Subarea and Argus Canyon streams) that flow out of the mountains toward the China Lake playa. The margins of the Basin are characterized by coalescing alluvial fans. The surface of these alluvial fans slope gently toward the playa. As the base flow leaves the steep mountain bedrock canyons, it seeps down, percolates and recharges the Basin. Rarely, large storm events generate surface runoff that flows all the way to the playa, where the water evaporates and does not percolate into the Basin. The conceptual model of the Basin is depicted in the figure below:



(Ex. 957, Fig. 9.)

The general flow direction of the Basin's groundwater system is from the mountains (recharge area) towards he China Lake playa (discharge area). Mountain slopes dip steeply to the valley floor that in turn slopes gently to the playa. Importantly, the recharge coming from the Argus and Coso mountain ranges in the north and northeast is not being captured by the current configuration of pumping, which is concentrated near Ridgecrest and Inyokern. Instead, the recharge from the Argus and Coso mountain ranges primarily discharges as evapotranspiration at the playa.

While it is not possible to directly measure mountain front recharge, it can be estimated through data from precipitation stations and stream gages, performing calculations, and verifying those estimates with a groundwater model. In 2016, DRI conducted a compressive review of previous recharge studies in the Basin (McGraw et al, 2016), and performed additional calculations using multiple methodologies. DRI concluded the long-term total average annual recharge to the Basin is 7,650 AFY. After being thoroughly evaluated and reviewed by the TAC, it was determined that DRI's 7,650 AFY recharge determination was the best estimate of recharge into the Basin available.

DRI distributed the recharge for each of the five mountain range/recharge zones using an empirical relationship between precipitation and groundwater recharge. These recharge distributions were used for the GSP. Subsequently, the Authority refined and updated its 2025 GSA/DRI Model with more advanced datasets and redistributed the average recharge as shown in the table below.

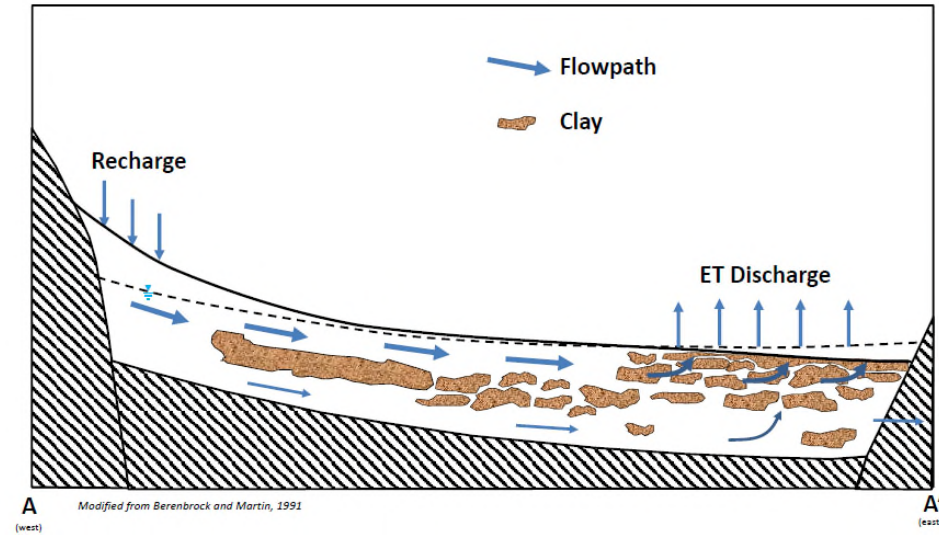
Water Budget Element	2020 GSP Basin Model (AFY)	2025 GSP Basin Model (AFY)
Inflows		
Mountain Front Recharge		
Sierra Nevada North	2,100	2,995
Sierra Nevada South	1,500	377
Rose Valley	2,400	1,919
White Hills	-	296
Argus	1,600	1,739
El Paso	50	324
Total Inflow	**7,650**	**7,650**

(Ex. 955-0049.)

E. The Natural Outflows Are Primarily Evapotranspiration

The primary natural outflow is evapotranspiration. Evapotranspiration is groundwater that is lost from either *evaporation* (from the ground surface) or *transpiration* (consumption of water by vegetation). The two are often considered together as evapotranspiration. Evapotranspiration is particularly relevant in managing groundwater in arid areas because the groundwater will typically discharge at the lowest spot of the dry desert valley floor and evaporate, leaving behind the minerals typically dissolved in groundwater and forming a mineral or salt crust where it evaporates. That is precisely the situation with the China Lake playa: Surface water and groundwater travel toward the playa and evaporate, developing a salt pan.

There is a vertical upward gradient under the playa, which causes the groundwater to discharge to the surface through evapotranspiration from bare soil and groundwater dependent vegetation (phreatophytes).



One of the most comprehensive studies of evapotranspiration in the Basin was performed by Kunkel and Chase (1969), which estimated that total evapotranspiration from the Basin was 8,000 AFY in 1953 and 11,000 AFY in 1912. Current and more modern methods for estimating evapotranspiration often rely on remote sensing satellite data, which estimate the current range from nearly 5,000 AFY to below 3,500 AFY with an average value near 4,000 AFY. The GSP estimates current overall evapotranspiration loss from the Basin at 4,850 AFY. (Ex. 929-0117.) Estimates of evapotranspiration have decreased over time likely because of increases in groundwater extractions intercept some of what would have discharged to the playa. But, the interception of playa outflow by pumping poses a concern to water quality, an *undesirable result* that must be considered when determining safe yield.

Pumping began in the 1900's and has become the most significant component of discharge. Currently, extractions account for approximately 20,000 AFY of discharge form the Basin. Prior to pumping (pre-development), the Basin is assumed to be in natural hydraulic equilibrium with inflows in balance with outflows. Groundwater pumping disrupts the natural hydraulic equilibrium by introducing a new, artificial discharge point, causing some groundwater to move toward the well rather than its natural discharge area. Pumping is able to capture some but not all of the natural outflows.

IX. THE COURT SHOULD ADOPT THE GSP'S SUSTAINABLE YIELD BECAUSE IT IS THE MAXIMUM QUANTITY OF WATER THAT CAN BE WITHDRAWN WITHOUT CAUSING AN UNDESIRABLE RESULT

A. <u>Extractions in Excess of 7,650 AFY Will Cause Undesirable Results</u>

1. Undesirable Result #1: Lowering of Groundwater Levels including annual groundwater-level declines in some areas of approximately 0.5 to 2.5 feet.

Safe yield is primarily concerned with preventing the undesirable results related to the lowering of groundwater levels due to overpumping. (*San Fernando*, supra, 14 Cal.3d at 278.) The mechanism is straightforward: when pumping exceeds recharge over time, groundwater is removed from storage, hydraulic heads decline, and the pumping depressions around major production areas deepen. As the California Supreme Court succinctly explains in *City of Pasadena*:

> "Where the quantity withdrawn exceeds the average annual amount contributed by rainfall, it is manifest that the underground store will be gradually depleted and eventually exhausted, and, accordingly, in order to prevent such a catastrophe, it has been held proper to limit the total use by all consumers to an amount equal, as near as may be, to the average supply and to enjoin takings in such quantities or in such a manner as would destroy or endanger the underground source of water."

(*Pasadena*, *supra*, 33 Cal.2d at 929.)

The GSP therefore treats chronic lowering of groundwater levels as both an independent undesirable result and a condition that contributes to other undesirable results, including reduced groundwater in storage, degraded water quality, and potential land subsidence. The best available science and information demonstrates the Basin's long-term average recharge is between 7,200 and 9,900 AFY, with 7,650 AFY being a reasonable calculation supported by previous research, sound analysis and groundwater modeling. Extracting more than 7,650 AFY will lower groundwater levels and deplete storage.

The practical effects are not theoretical. Declining groundwater levels reduce the margin of safety for municipal, domestic, industrial, and agricultural wells; increase the risk that shallow wells will go dry or require deepening, replacement, or abandonment; and create financial impacts for well owners and groundwater users who must fund mitigation or obtain replacement supplies. There are approximately 872 shallow wells within the Basin—i.e., wells with a depth of 200 feet or less. (Ex. 955-0035.) The Authority uses a shallow-well impact analysis as a principal measure of when groundwater-level decline becomes significant and unreasonable. Under GSP implementation, approximately 22 shallow wells are projected to be impacted, which the Authority determined could be feasibly mitigated. By contrast, baseline "no action" conditions projected far more severe impacts. The 2025 Periodic Evaluation confirms that groundwater levels have generally continued to decline during GSP implementation, that some representative monitoring sites experienced temporary minimum-threshold exceedances, and that reported shallow-well impacts have occurred in the pumping depressions near the District's Southwest Wellfield and the western Ridgecrest/Searles area. The Authority's response is to continue monitoring representative wells, track shallow-well impacts, fund mitigation through the Shallow Well Mitigation Program, and implement the Imported Water Project so that groundwater pumping can be reduced and water levels can stabilize or recover.

2. Undesirable Result #2: Water Quality Issues

Degraded water quality is a principal undesirable result of pumping beyond the Basin's sustainable yield. Groundwater in the Basin generally moves from the mountain recharge areas toward China Lake playa, passing through alluvial and lacustrine deposits that contain evaporites and other soluble minerals. As groundwater moves through those deposits, natural dissolution increases total dissolved solids ("TDS") concentrations. Excessive pumping can worsen that process by lowering groundwater levels, changing hydraulic gradients, and drawing poorer-quality water toward production areas. The GSP treats elevated and increasing TDS concentrations—particularly in areas of high pumping—as evidence of groundwater degradation.

Water-quality degradation becomes an undesirable result when it makes groundwater unsuitable for existing beneficial uses. (Ex. 108-206 - 207; Ex. 929-0048 - 0056.) The GSP identifies potential impacts to shallow wells, domestic, industrial, environmental, and agricultural supplies, well owners, groundwater users, and NAWS China Lake. (Ex. 108-206 - 207.) The Authority monitors this risk through representative water-quality sites, using TDS as the principal indicator. The 2025 Periodic Evaluation reports that TDS generally increases in more populated and heavily pumped areas and decreases in lower-pumping areas, with historically poor water quality in southeastern Ridgecrest likely tied to past groundwater-level declines from the District's pumping. (Ex. 929-0054 The Authority addresses these risks by monitoring TDS, setting minimum thresholds and measurable objectives, reducing pumping through the import project and related management actions, and mitigating shallow-well impacts where degraded water quality affects existing users. (Ex. 929-0048 - 0056.)

Dr. Kincaid will opine that safe yield must necessarily be less than the total natural recharge to the Basin because otherwise the gradient will shift and the poor quality water will start flowing down towards wells, instead of to the playa and there will be a degradation of water quality. Dr. Kincaid estimates long-term average recharge is between 7,200 and 9,900 AFY, but the safe yield is likely between 6,100 and 8,400 AFY to preserve groundwater quality in the principal aquifer. Dr. Kincaid will opine that some amount of natural discharge to the playa must be preserved such that upward gradients between the principal and shallow aquifers are maintained. Additionally, the groundwater dependent ecosystems (GDEs) in the Basin can only be supported by the vertical upward gradient under the playa, which causes groundwater to discharge to the surface. The degradation of water quality and the loss of GDEs are undesirable results to be avoided.

3. Undesirable Result 3: Land Subsidence

Land Subsidence is not a current primary driver of Basin management. (Ex. 929-0056.) However, the areas with the greatest cumulative subsidence are in the northeastern Basin on Navy property, where there are highly sensitive beneficial uses that could be affected including the Navy's SNORT alignment at NAWS China Lake, for which the Authority set a land-subsidence minimum threshold of 2.2 mm/year, or about 0.007 feet/year. (*Ibid*.) For this reason, the Authority continues to monitor subsidence through available datasets, including InSAR data and any information provided by the Navy. Available data show annual vertical displacement within the Basin generally between -0.1 and 0.1 feet, while cumulative vertical displacement from June 2015 to July 2024 ranges from about -1.5 to 2 feet. (*Ibid.*)

The Authority concludes that as the Basin moves toward sustainability through imported water and reduced groundwater-level decline, any subsidence caused by overdraft, as opposed to tectonic movement, should be alleviated. On the other hand, chronic lowering of groundwater as proposed by the Large Pumpers runs the risk of potentially causing additional subsidence and damaging sensitive Navy facilities.

B. The GSP's Recharge Determination Is Consistent with Past Studies, While the Large Pumpers' Recharge Estimates Are Not

The geology and hydrogeology of the Basin have been studied since the early 1900's. It is well documented that the Basin has been in overdraft since at least the 1960s, with reported declines in groundwater levels in almost all areas of the Basin. The recharge estimates in the studies generally range from 5,976 AFY, published in 2019, to 11,000 AFY, published in 1969. Notably, there has been a downward trend in the estimate of total recharge into the Basin as researchers continue to study and better understand the Basin. A chronological history of the recharge studies is summarized below:

- Lee (1913) wrote one of the first reports for the California Conservation to estimate available groundwater resources within the Basin. Lee noted that evapotranspiration is the primary discharge process of the Basin, and he produced a detailed map of phreatophytes.

- Kunkel and Chase[23] (1969) updated Lee's phreatophyte map and evapotranspiration rates to estimate total recharge to be **11,000 AFY** in 1912 and **8,000 AFY** in 1953.

- Bloyd and Robson[24] (1971) reduced Kunkel and Chase's recharge estimate from 11,000 to **9,848 AFY** by calibrating a groundwater flow model, and adjusted the

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[23] This report was prepared for the United States Department of the Interior Geology Survey, in cooperation with the Naval Weapons Center China Lake. (Ex. 1002.)

[24] This report was prepared in cooperation with the District and the Department of the Navy. (Ex. 1011.)

spatial distribution of the recharge from the surrounding mountain ranges.

- Dutcher and Moyle[25] (1973) and St. Amand (1986) evaluated and concurred with Kunkel and Chase's **11,000 AFY** recharge estimates without modification.

- Bean[26] (1989) developed revised estimates of the spatial distribution of groundwater recharge using Bloyd and Robson's recharge estimates, and estimated total groundwater recharge to be **10,100 AFY**, which included recharge from incidental/non-native recharge sources including wastewater pond percolation and leakage from the Los Angeles Aqueduct, as well as deep groundwater flow through the basement rocks which has since been disproven.

- Berenbrock and Martin[27] (1991) developed a three-dimensional groundwater flow model that determined recharge to be **9,852 AFY**, which was derived from Bloyd and Robson, and modified through model calibration.

- Anderson et al.[28] (1992) developed a logarithmic equation to estimate recharge as a function of precipitation using average annual precipitation rates from 1981 through 2010, and estimated total recharge to be **4,100 AFY**.

- Watt (1993) used the Maxey-Eakin method and combined that with the distribution of pinyon-juniper trees to estimate total recharge at **9,851 AFY**.

- Brown and Caldwell[29] (2009) developed a partially independent estimate of total groundwater inflow to the Basin. Their initial conceptual model estimated recharge between 9,000 and 11,000 AFY, but during the model calibration process, they decreased the recharge down to a total of **8,821 AFY**, which included 1,000 AFY of groundwater subflow from the Rose Valley basin.

- Todd Engineers[30] (2014) reviewed numerous hydrogeologic reports and developed a detailed summary of previous groundwater recharge estimates as well their own estimates. Their estimates of total recharge range between 6,100 and 8,900 AFY with an average of **7,440 AFY**. Todd Engineers determined that additional recharge may occur from leakage from water distribution systems in the minimal amount of 80 AFY. Additionally, Todd Engineers provided detailed arguments against large

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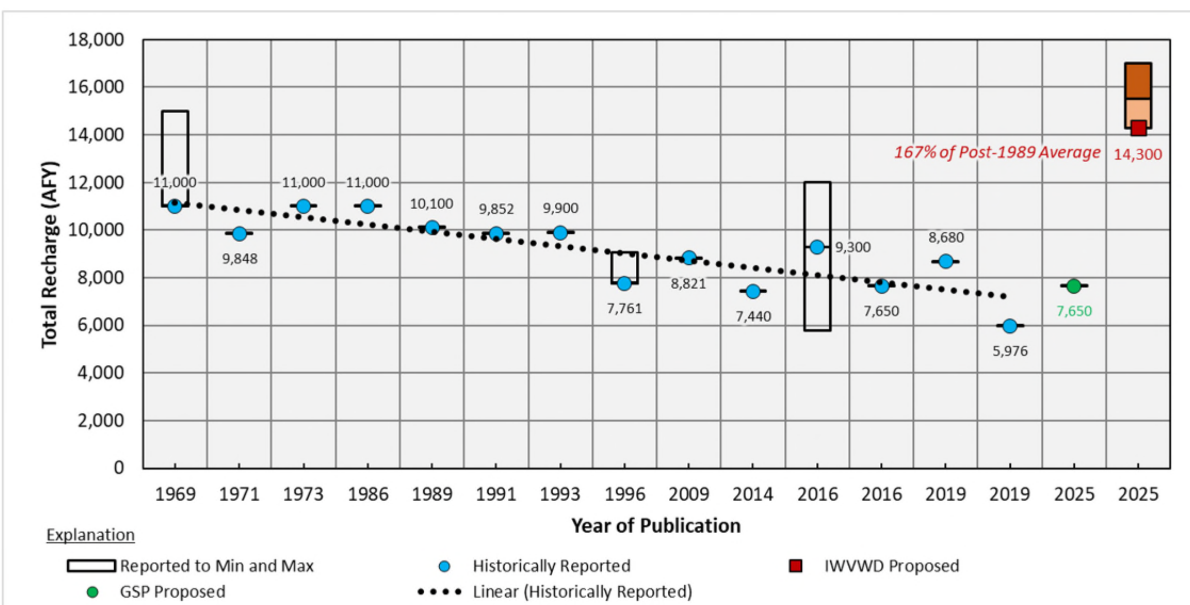
[25] This report was prepared for the United States Department of the Interior, in cooperation with DWR. (Ex. 1012.)
[26] This report was prepared for DWR. (Ex. 1025.)
[27] This report was prepared for the US Geological Surgey, in cooperation with the District and Department of the Navy. (Ex. 1026.)
[28] This report was prepared for the US Department of the Interior and US Geological Survey. (Ex. 64.)
[29] This was prepared for the District. (Ex. 1031.)
[30] This report was prepared for the County of Kern.

estimates of groundwater subflow from the Rose Valley basin.

- DRI/McGraw et al.[31] (2016) conducted a comprehensive review of recharge estimates for the Basin by reviewing fourteen previous studies. DRI conducted field work and estimated evapotranspiration. They determined Kunkel and Chase likely overestimated pre-pumping evapotranspiration and recharge by 33-66%. DRI then used the Brute Force Bootstrap Model ("BBRM") to develop a preliminary estimate of recharge, which they then revised in both magnitude and spatial distribution through groundwater modeling., DRI estimated recharge at **7,650 AFY**.

- USGS (2019) revised the BCM to refine the recharge estimates for the Basin. USGS' recharge estimate for 1981-2010 is **8,680 AFY**, and for 2000-2013 is **5,976 AFY**.

The Authority's recharge determination of 7,650 AFY stands on the shoulders of many of these contributions. Dr. Kincaid will testify that the best available science is represented, not by any one particular estimate, but rather by an evaluation of the range and trajectory of published values through time. Since 1989, researchers' estimates of recharge into the Basin have been declining (see below) and nearly every researcher has estimated total recharge to be less than 10,000 AFY, with the average total recharge estimate being approximately 8,500 AFY.



The Authority's recharge estimate of 7,650 AFY (shown in green) is consistent with the historical trajectory of past studies. On the other hand, the Large Pumpers' recharge

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[31] This report was prepared for the Navy.

estimate of approximately 14,3000 AFY (shown in red) is an extreme outlier. The Large Pumpers' experts do not explain how their analysis fits into or builds upon previous research. Instead, they implicitly reject more than fifty years of published scientific understanding of the Basin's recharge, evapotranspiration, and flow dynamics, without presenting new empirical data sufficient to justify abandoning that accepted conceptual framework. This Court should not depart from decades of research by accepting the Large Pumpers' fiction that there is myriad recharge pouring into this desert Basin.

C. **The GSP's Recharge Estimate Is Supported By Dr. Kincaid's Analysis**

Dr. Kincaid uses the "Recharge Method" to quantify the safe yield. The Recharge Method focuses on determining the long-term average natural recharge to the Basin and calculating safe yield as a percentage of that value based on estimated outflows. Safe yield cannot exceed recharge. Therefore, quantifying the inflow sources (here, principally mountain front recharge) provides a relatively straightforward way to determine the safe yield. Dr. Kincaid concludes the recharge is roughly 7,200 to 9,900 AFY based on the range and trajectory of published recharge values through time. He concurs with other experts that incidental recharge sources—such as Los Angeles Aqueduct leakage, agricultural return flows, and wastewater discharges—should not be included in safe yield because these sources are speculative. Dr. Kincaid estimates that the Basin's safe yield is approximately 15% less than the natural recharge because that is the amount of discharge/evapotranspiration (1,100 - 1,500 AFY) that will continue to occur either because it cannot be intercepted by groundwater extractions or should not be intercepted to preserve the vertical upward gradient under the playa.

D. **The 2025 GSA/DRI Model Validates the GSP's Recharge Determination and It Is a Better Tool to Determine Safe Yield Than the Ramboll Model**

Groundwater flow models are the primary technical tools for understanding and quantifying the inflows and outflows into a basin, determining the safe/sustainable yield, and developing sound groundwater management policy.[32] But groundwater models are only as reliable as the information and assumptions used to build them. One test of whether a groundwater model is reliable is the ability to simulate known conditions, including the degree to which the model calibrates to match observed groundwater levels. Dr. Kincaid will opine that the GSA/DRI Model more accurately represents the physical setting and simulates observed conditions than the Ramboll Model.

1. The 2025 GSA/DRI Model Was Developed in a Public Process to Manage the Basin, Unlike the Ramboll Model Which Was Developed to Fit the Large Pumpers' Litigation Position

The 2025 GSA/DRI Model is an updated version of the groundwater flow model DRI developed for the U.S. Navy in 2016 to support planning for NAWS China Lake amid declining groundwater levels, water quality concerns, and potential subsidence. The 2016 model was originally updated for the 2020 GSP to manage the Basin in compliance with SGMA, and was updated again in 2025 to incorporate new data. By contrast, the Ramboll Model was developed for this adjudication and reflects the Large Pumpers' litigation position rather than the Authority's SGMA-based management process.

The Authority selected the DRI model as the GSP Model only after a comprehensive peer review by Stetson's technical staff, and with TAC approval. The review included evaluating model assumptions and documentation, and assessment of model output files to ensure the model simulates the Basin's hydrogeologic characteristics and inflows/outflows. It also included meeting with DRI modelers and Navy personnel and a hydrogeologic site

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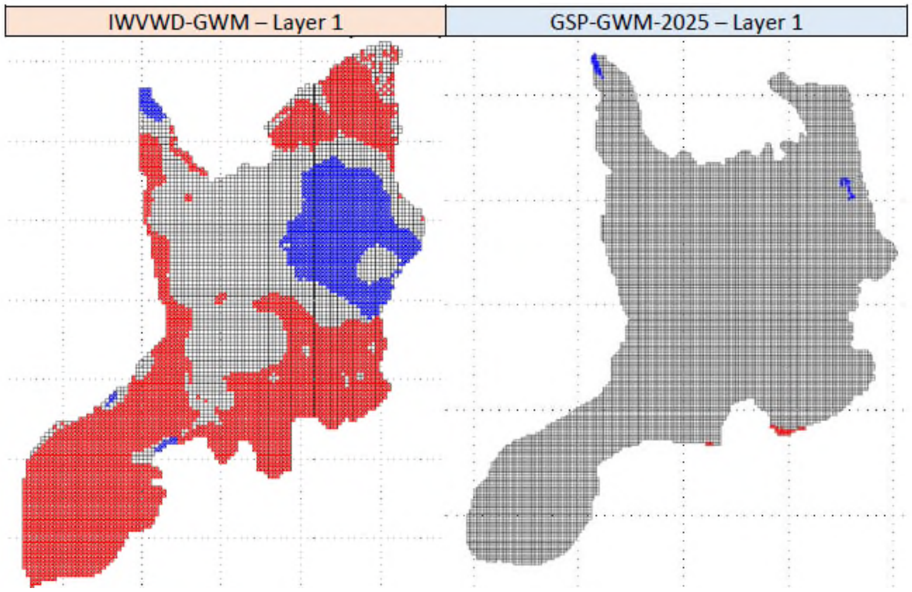
[32] A groundwater model is a series of digital files run through computer software that simulate the movement and distribution of groundwater within the basin. The model converts the basin into a three-dimensional grid of cells with each cell having its own properties (hydraulic conductivity, specific yield, specific storage, thickness and porosity). The model solves mathematical equations to simulate groundwater flow within each cell, and predict how variables like recharge or pumping will affect groundwater levels. Importantly, groundwater models must converge and be calibrated to observed or measured water levels and flows. If the model does not converge or is not able to closely simulate observed water levels and flows, it is not useful.

visit. The review followed USGS guidelines, California's GSP regulations (§ 350, et seq.), and DWR's Best Management Practices for Modeling. The Authority selected the model for use in preparing the GSP because it was the most robust groundwater model available and was built on decades of Basin hydrogeologic investigations.

At first DRI maintained the model because it contains proprietary information and Defense Critical Infrastructure Security Information ("DCRIT"). Eventually the Authority was granted direct access to the model and has adopted procedures to ensure that future model updates would be technically controlled and reliable. A Configuration Management Plan ("CMP") was developed outlining the processes for the model's development, maintenance, upgrade, and use. (See Ex. 929-1501 - 1526; Ex. 920.) The CMP establishes a Technical Model Group ("TMG"), including Navy and DRI representation, to review and evaluate updates and the use of the model. During GSP development, the Authority refined the model by incorporating additional hydraulic-conductivity data, revising portions of the conceptual model, and conducting sensitivity analyses for recharge, hydraulic conductivity, specific storage, and specific yield. The model continues to be updated as the collects and evaluates new Basin data.

2. The 2025 GSA/DRI Model Reflects Reality Unlike the Ramboll Which Simulates Unobserved Water Levels and the Presence of a Nonexistent Lake

A groundwater model is three-dimensional representation of the Basin's aquifer system. It divides the subsurface into vertically stacked layers, each made up of horizontal grid cells that simulate groundwater conditions in that portion of the aquifer, including recharge, pumping, and flow to adjacent cells. Dr. Kincaid will opine that evaluating the distribution of dry and flooded cells is a basic calibration check. Dry cells occur when simulated groundwater levels fall below the bottom of a cell; flooded cells occur when simulated groundwater levels rise above the top of a cell, as might occur in a wetland or lake. Neither condition should materially occur in a properly calibrated model of this Basin. Yet the Ramboll Model contains extensive dry and flooded cells, indicating that it does not reliably represent actual Basin conditions (left figure).

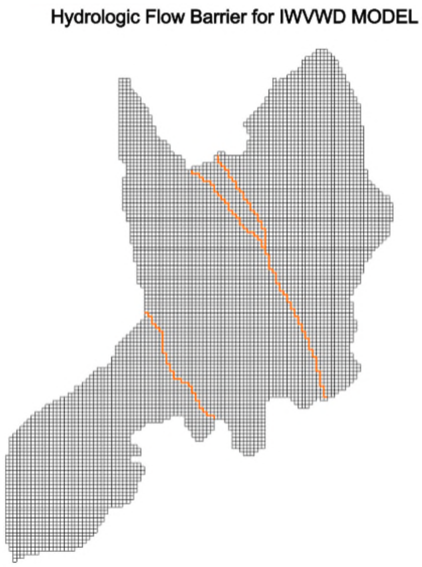


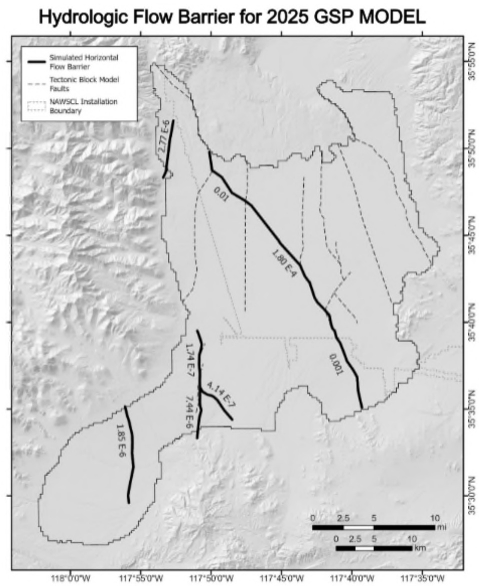
The Ramboll Model's flooded cells at China Lake playa are especially significant because they show that the model cannot reasonably simulate the Basin's water budget. The model incorrectly places groundwater above land surface across roughly 20 square miles, effectively creating a large lake where none exists. It also produces flooded cells in the northwestern corner of the Basin that incorrectly simulate water levels over 1,000 feet above land surface. These errors affect the model's simulation of pumping impacts on aquifer storage and therefore undermine its safe-yield estimates.

3. The 2025 GSA/DRI Model Is Consistent with the Conceptual Model of the Basin and Includes More Advanced Datasets

The 2025 GSA/DRI Model accurately reflects the conceptual understanding of the Basin including the Basin's hydrostratigraphy, aquifer characteristics, storage capacity, flow paths, and structural controls. It incorporates substantial new data new data including Airborne Electromagnetic (AEM) data, the USGS National Crustal Model to assist in modeling geophysical properties, several deep borehole logs, and additional geophysical data regarding subsurface faults. These data improve the model's representation of the Basin by identifying the top of the large clay layer, distinguishing contrasting sedimentary units such as sands, gravels, silts, and clays, and confirming mapped and concealed fault structures.

The differences between the models are stark: as illustrated in the maps below, the Ramboll Model includes only two faults, which the 2025 GSA/DRI Model incorporates the known fault structures necessary to reasonably simulate Basin conditions.





The Ramboll Model represents a materially different and inaccurate conceptual understanding of the Basin that is not supported by the data or past studies. It also fails to reflect the conceptual understanding advanced by the Large Pumpers. Mr. Parker describes the Basin as consisting of four hydrogeologic zones, each "vertically and laterally heterogeneous with interbedded intervals of fine and coarse materials." However, the Ramboll Model does not represent the "vertically and laterally heterogeneous" materials that Mr. Parker describes. Instead, it reduces the aquifer to simplified, largely homogeneous, high-permeability layers, thereby misrepresenting the Basin's actual hydrostratigraphy and groundwater-flow behavior.

The Ramboll Model also relies on low specific yield values and unrealistically high horizontal hydraulic conductivity values that do not accurately reflect the Basin's variable sediment textures. Both assumptions inflate the safe yield of the Basin.[33]

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[33] Low specific-yield values cause the model to attribute less pumped water to storage

4. The 2025 GSA/DRI Model Uses a Steady-State Period Consistent with Best Practices and Representative of Long-Term Conditions

Groundwater models generally use two simulations: a steady-state model and a transient model. The steady-state model represents equilibrium conditions, where inflows and outflows are balanced. The transient model then simulates how that system changes over time as inflows or outflows change, such as when pumping begins or increases. The recommended approach is to use the output of the steady-state model as the initial conditions for the transient analysis. For that reason, where possible, the steady-state model should be calibrated to pre-development conditions, before significant pumping began, because that period provides the best approximation of the Basin's natural equilibrium.

The 2025 GSA/DRI Model follows these best practices. It calibrates to steady-state water levels measured in 136 wells in 1920 before significant pumping began. The calibration results show a strong fit to observed water levels, with a mean absolute error of 0.84 percent—well below the 10-percent relative-error threshold generally considered acceptable for predictive models. By contrast, the Ramboll Model uses average 1980–1985 conditions to establish its initial steady-state conditions, requiring it to reduce pumping below actual known conditions to achieve the steady state. This is not consistent with best practices and is flawed for several reasons.

First, the Ramboll Model's steady-state period does not represent equilibrium conditions. It uses 1980-1985, one of the wettest periods in the Indian Wells Valley. That six-year period includes four of the seven highest precipitation years in the last 120 years, producing average precipitation approximately 60 percent above the long-term average. It is also too short to be representative of equilibrium conditions. When pre-development data are unavailable, modelers should use a longer observation period representative of long-

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depletion and more to recharge, producing a higher recharge and safe-yield estimate. Similarly, higher hydraulic conductivity values allow the model to move too much water too easily across the aquifer from recharge areas to pumping and discharge areas, making the Basin appear capable of supporting more pumping before storage declines. Together, these assumptions artificially increase the model's estimate of safe yield.

term recharge conditions. Ramboll instead selected a brief, unusually wet period dominated by short-term recharge spikes.

Second, the Ramboll Model uses a period marked not only by unusually high precipitation, but also by unusually high pumping. During 1980–1985, pumping approached 30,000 AFY in some years, among the highest levels on record. To simulate equilibrium conditions with inflows equal outflows, the District's modelers reduced simulated pumping by roughly 40 percent, from about 28,000 AFY to 20,000 AFY. That adjustment is artificial and materially distorts the Basin's water budget. A model cannot reliably represent equilibrium conditions by selecting a wet, heavily pumped period and then reducing actual pumping to make the water balance work.

Finally, the Ramboll Model also artificially caps the rate of natural discharge—evapotraspiration—at 2,980 AFY to force inflows and outflows into balance. This cap causes simulated groundwater levels to be higher than the land surface, resulting in flooded cells for the steady-state period that simulate the presence of a non-existent lake in the dry playa. In the actual Basin, this water would discharge through evapotranspiration rather than pond above the ground surface. The Large Pumpers do not resolve this fundamental defect, which undermines the model's water budget, safe yield estimate, and usefulness.

5. The 2025 GSA/DRI Model Better Calibrates to Observed Groundwater Levels Than the Ramboll Model

Model reliability can also be tested by comparing simulated groundwater levels to observed levels at the same wells. That comparison shows that the Ramboll Model generally overestimates groundwater elevations, while the 2025 GSA/DRI Model more closely tracks observed conditions. The hydrographs demonstrate the difference, and the calibration statistics confirm it: the 2025 GSA/DRI Model has a lower root mean square error and a smaller range of residuals, making it the more reliable tool for evaluating Basin conditions and safe yield.

E. The Thiessen Polygon Method, as Applied by Parker and Teasdale, Is Not an Appropriate Method for Determining Safe Yield

The Thiessen Polygon method is not an appropriate method for estimating the Basin's safe yield, particularly as applied by Parker and Teasdale. The method is a simple graphical technique that divides the Basin into polygons based on proximity to selected wells, then assumes each well's groundwater level represents conditions throughout its entire polygon. The annual change in groundwater storage is calculated for each polygon and the sum total represents the estimated storage change for the entire Basin. Parker and Teasdale estimate safe yield by taking average pumping over a selected base period and subtracting the average annual storage decline derived from the Thiessen Polygon analysis. That approach depends heavily on the location and representativeness of the selected wells, the assigned polygon areas, and the assumed specific-yield values used for each polygon.

Parker's and Teasdale's use of the Thiessen Polygon method to estimate safe yield is inappropriate. First, Groundwater modeling is the more comprehensive tool for that purpose because it evaluates the full water budget, including recharge, discharge, pumping, groundwater flow, and storage change. DWR's Water Budget Handbook provides that "[t]he modeling approach is the most comprehensive way of developing the total water budget for a water budget zone." (Ex. 1203, Cal. Dep't of Water Res., *Handbook for Water Budget Development: With or Without Models* (2020), p. 18.) Mr. Teasdale reached the same conclusion while serving on the TAC in 2018, acknowledging that "[t]he flow model would be the most robust tool to determine sustainable yield" as opposed to "performing change in groundwater storage calculations." (Ex. 998-0009.)

Second, the Thiessen Polygon method is too crude for this Basin because it assumes hydraulic uniformity that does not exist. The Basin is structurally complex, with mapped faults that subdivide the aquifer system and act as barriers to groundwater flow. As a result, pumping in the main valley cannot necessarily drain the outlying polygon areas included in Parker's and Teasdale's calculations. Their method also treats recharge from the Argus and Coso ranges as available to pumping wells, even though that recharge discharges primarily through evapotranspiration at the playa and is not intercepted by production wells.

Third, Parker and Teasdale improperly rely on the period 2014 to 2023, a period that is not representative of long-term balanced hydrologic conditions. Their Thiessen Polygon analysis assumes that changes in groundwater storage are caused by pumping, so the selected period must be stable and representative. This period is not. The 2014-2023 period includes a magnitude 6.4 earthquake that struck the Indian Wells Valley in July 2019 and caused vertical ground displacements of up to two meters, which can improperly skew and distort measured water levels. This 10-year period also includes the especially "wet" year of 2017, which the Ramboll Model shows recharge of over 60,000 AF, which is magnitudes more than any other year in their data set. Tropical Storm Hilary also reached the Indian Wells Valley in August 2023, unleashing unprecedented volumes of water. To make matters worse, the period contains a series of data gaps due to the COVID-19 pandemic conditions and regional stay-at-home orders, which prevented data from being collected from domestic wells. The 2014-2023 period is not a representative and reliable period from which the estimation of safe yield can be rendered.

Fourth, Parker and Teasdale improperly use estimates of groundwater level changes that are inconsistent with the available data. Dr. Kincaid will identify multiple data errors, including that the groundwater level changes reported by Parker and Teasdale collectively sum to values approximately 65.4 feet lower than those reflected in the GSP database, understating storage loss on the order of 23 to 30 percent. Parker also defined the areas of certain Thiessen polygons, including Polygons 78 and 83, in a manner inconsistent with the District's own reported data. Teasdale made an additional basic error by relying on depth-to-water measurements rather than groundwater elevations, causing him to report rising water levels where the correctly interpreted hydrographs show declining trends. These errors materially understate storage loss and inflate their safe-yield estimates.

Finally, the results of the Thiessen Polygon method are highly sensitive to the estimated value of specific yield (i.e., the actual amount of water that will drain by gravity and is available for extraction). Parker's and Teasdale's selected values produce unreasonably high safe-yield estimates that are inconsistent with the technical record. Their estimates, ranging from roughly 15,000 to 22,000 AFY, would require total Basin recharge to roughly equal 157 to 217 percent of the maximum reasonable recharge estimates supported by decades of prior studies. They would also require historical pre-development evapotranspiration rates far above those documented in foundational studies such as Kunkel and Chase. (Ex. 1002.)

Dr. Kincaid will also rebut the Large Pumpers' claim that the Thiessen Polygon method is purely data-driven. Their calculations depend critically on specific yield assumptions derived from groundwater modeling, not observation alone.

F. <u>The Large Pumpers' Rely on Unsupported Amounts and Sources of Recharge to Artificially Inflate Their Safe Yield Estimate</u>

Decades of research confirm total natural inflows into the Basin are less than 10,000 AFY. To support a higher safe-yield number, the Large Pumpers therefore rely on alleged non-native recharge sources, including Los Angeles Aqueduct leakage and releases, water-distribution system leakage, wastewater discharge, and irrigation return flows. Those sources are speculative, poorly quantified, and unsupported by any evidence showing they materially recharge the principal aquifer. Even if some incidental recharge occurs, it is minimal, uncertain, and not a natural inflow that can justify increasing the Basin's safe yield.

1. Aqueduct/Water Distribution Leakage

There is no compelling evidence of water leakage from the Los Angeles Aqueduct or from water distribution systems that would create significant recharge to the Basin. The most recent study addressing leakage, Todd Engineers (2014), estimated 0 AFY from the Los Angeles Aqueduct and only 80 AFY from the District's distribution system. Even the District's expert, Mr. Parker, acknowledges that "additional analysis is needed to evaluate the data and assumptions used to develop the leakage estimates."

2. Aqueduct Releases

The Los Angeles Aqueduct is primarily an enclosed conveyance system and there is no controlled schedule for water releases in the Indian Wells Valley. Although releases occurred in 2017 and 2023, future releases are uncertain, as are their timing and volume. There is also no compelling evidence that the released water infiltrates below the root zone to reach the principal aquifer. Mr. Parker acknowledges that "[a]dditional research is needed to determine what these amounts are, when they occurred, and estimate what portion of the discharge(s) recharged groundwater in order to include these volumes in the historic water budget and model simulations." Thus, Los Angeles Aqueduct releases are too uncertain and unsupported to be included in the Basin's safe yield.

3. Wastewater Discharge

The City of Ridgecrest's wastewater facilities are a lined pond so there is no possible return flow to the principal aquifer and should not be included in safe yield. Todd Engineers (2014) explained that any leakage from wastewater treatment ponds should not be included in recharge because "none of the percolated water contributes to the yield of the principal aquifer" due to the "thick clay layers separating the shallow aquifer from the principal aquifer between the WWTP and China Lake playa."

4. Agricultural Return Flows

Agricultural return flows occur when applied irrigation water is not consumed by crops or lost to evaporation and instead percolates downward. This can happen when a greater amount water than is needed for the crop is intentionally used to flush salts from the soil. Agricultural return flows are, by their nature, speculative and dependent on irrigation practices. Dr. Kincaid will opine that some amount of over-irrigation can be inferred if salts are not accumulating in the irrigated zone, but if enough water were percolating to recharge the aquifer, some corresponding salt accumulation would be seen in the aquifer. Here, there is no evidence that there is a significant salt accumulation in either zone that can be attributed to irrigation.

Furthermore, the only calculations done to estimate the time it would take for agricultural return flows to reach the principal aquifer, estimate it would take over 100 years for those return flows to reach the water table because of the depth to the water table below agricultural areas. Therefore, they should not be included in safe yield.

G. <u>The Court Should Conservatively Resolve Any Estimates or Uncertainties as to the Safe Yield</u>

Overestimating the Basin's safe yield will continue to cause groundwater levels to decline, which will most immediately impact shallow domestic users. There are approximately 872 shallow wells in the Basin. The majority of these wells have a total depth of only 250-300 feet, making these wells very susceptible to impacts of groundwater elevation decreases as groundwater in storage is depleted. Since the start of GSP implementation, groundwater levels have decreased by several feet. When addressing uncertainties or unknowns, the Court should error on the side of caution to avoid adverse impacts from overestimating the safe yield.

X. CONCLUSION

Based on the foregoing, the Court should conclude the safe yield is 7,650 AFY.

Dated: May 29, 2026

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