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Exempt from filing fee pursuant to Gov't. Code Section 6103

SUPERIOR COURT OF THE STATE OF CALIFORNIA

IN AND FOR THE COUNTY OF RIVERSIDE

Coordination Proceeding Special Title
(Cal. Rules of Court, rule 3.550)

MOJAVE BASIN WATER CASES

CITY OF BARSTOW,

Plaintiff,

vs.

CITY OF ADELANTO, et al.,

Defendant.

AND RELATED CROSS ACTIONS

JCCP NO.: 5265
Lead Case No: CIV 208568

Dept. 1, Riverside Superior Court
Hon. Harold W. Hopp, Judge Presiding

WATERMASTER'S AMENDED OPPOSITION TO GOLDEN STATE WATER COMPANY'S MOTION TO ENFORCE JUDGMENT; DECLARATION OF ROBERT C. WAGNER

Date: October 22, 2024
Time: 1:30 p.m.
Dept.: M302, Menifee Justice Center
Reservation ID: 562595011427

Hon. Craig G. Riemer, Judge Presiding By Assignment

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Watermaster submits this Amended Opposition to the motion of Golden State Water Company ("GSWC") purportedly to enforce the judgment.

I.
Introduction

Watermaster and GSWC have conducted a series of meetings that were interrupted by the COVID pandemic. One such meeting occurred on February 10, 2022, which included a field meeting to address GSWC's specific concerns and questions which are again raised in GSWC's pending motion. Among the issues raised during the February 10, 2022 meeting were (a) the possible installation of an additional stream gaging station, and (b) additional geophysical investigations. Subsequent to the February 10, 2022 field meeting, MWA installed a new stream gage at Hinkley Road near Hodge, upstream of the GSWC wells. MWA also conducted extensive geophysical investigations at a cost of approximately $150,000.00. In 2022, MWA also imported to the Centro Subarea 1,994 acre-feet of water to address impacts to GSWC wells due to drought conditions; the imported water was delivered to the Lenwood recharge site that benefits the area where the GSWC wells are located. (See Technical Memorandum, p. 11, Exhibit 1 to Wagner declaration, attached as Exhibit A hereto.)

In December of this year, Watermaster will complete the expansion of its current Upper Mojave River Basin Model ("UMRBM"), to include the Transition Zone ("TZ"), the Centro Subarea, and the Baja Subarea. The model expansion will inform the estimates of flow into the Centro subarea, the water balance in the TZ, and provide tools for evaluating recharge and pumping scenarios for optimal basin management. (See Technical Memorandum, p. 11, Exhibit 1 to Wagner declaration, attached as Exhibit A hereto.)

As demonstrated herein, GSWC's motion and the Aquilogic reports upon which it is based contain fundamental errors as to: what the Judgment requires; the cause of declining groundwater levels in Golden State's well fields; whether the Alto Producers are meeting their Subarea Obligation; whether there are any unaccounted for water losses in the Transition Zone; and whether Watermaster has over-estimated the average long-term inflows to Centro.

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II.

Declining groundwater levels were caused by severe drought conditions.

Golden State argues "Production wells operated by Golden State in Centro are experiencing chronic water level declines." After concluding its groundwater extractions are not the sole cause of the declining water levels, Golden State jumps to the conclusion that Alto Producers may not be meeting their Subarea Obligation, or water losses may be occurring in the Transition Zone that are unaccounted for. Golden State is mistaken on both points. As demonstrated below, the cause of the groundwater decline is quite simple and is not the reason suggested by Golden State; the Alto Subarea Producers have met their Subarea Obligation; and there is no unaccounted for water losses in the Transition Zone.

A. Prolonged and severe drought caused by declining water levels.

Watermaster agrees the declining groundwater levels in Golden State's well fields have not been caused solely by Golden State's groundwater extractions. Which raises the question: If the "long-term" average recharge to Centro is about 36,000 acre-feet annually – as estimated by Watermaster -- why have the groundwater levels in Golden State's well fields shown significant declines during the last 10 years?

The answer is quite simple: During the eleven-year period from 2012 to 2022, the Mojave Basin Area – a desert environment -- experienced severe and prolonged drought conditions. During that period of prolonged drought, the entire basin area including the Centro Subarea did **not** receive recharge or inflows equal to the **long-term average** recharge. The simple reason: there was little or no rain during that period of severe drought. Mr. Wagner's declaration attached hereto explains that:

> Importantly, the flow across Helendale Fault, which represents the long-term average supply to Centro, will not occur every year. The Mojave River system is episodic, meaning there are long periods of well below average flow followed by occasional periods of well above average flow. The Judgment is predicated on long term average flow.

(Wagner Declaration, Exhibit A hereto, p. 2.)

> The Upper Mojave Basin Model is an adequate tool for estimating flow into the TZ from the upstream portion of Alto. The Model is currently being expanded to include the TZ and the Centro and Baja subareas and when complete (December 2024) will provide another tool for basin management.

(Wagner Declaration, p. 5.)

B. Water supplied to Centro during periods of severe drought.

During periods of severe drought, Centro receives inflows across the Helendale Fault and other deliveries directly to Centro equal to: (a) total stream flow to the Transition Zone at Lower Narrows which is measured by USGS; (b) discharge of treated wastewater measured by VVWRA; (c) subsurface flow entering the TZ; (d) local runoff and precipitation; (e) less consumptive uses in the TZ of pumping and riparian habitat water use (Wagner Dec., Exhibit A hereto, p. 1). Water in excess of the total consumptive uses in the TZ passes the Helendale Fault into Centro. The amount of water reaching the Helendale Fault in any given period is dependent on climate and precipitation, and runoff from snowmelt in the San Bernardino Mountains.

C. During severe drought, groundwater levels decline because Centro's total discharges exceed its inflows.

As shown in Exhibit 5 to the Wagner declaration (Exhibit A hereto), during the extended drought period from 2012 to 2022, the total water supply to Centro averaged 16,861 acre-feet annually, i.e., average inflow of 12,238 acre-feet from the Transition Zone through the Helendale Fault, plus 4,623 acre-feet of estimated return flow in Centro; however, total outflow during that same time period averaged 24,527 acre-feet annually. Accordingly, during this eleven-year period of severe drought, Centro's total outflow, on average, exceeded its average inflows by 7,666 acre-feet annually (Wagner Dec., Ex. A hereto, p. 2). This demonstrates that the severe drought conditions from 2012 to 2022, in this very arid environment, caused the decreased groundwater levels observed in Golden State's wells.

Exhibit 6 to Mr. Wagner's declaration includes two hydrographs from monitoring wells, both of which are located in the Centro Subarea – one near Hodge, and the other near Lenwood. The hydrographs starkly illustrate the effects of severe drought conditions in this desert environment. The hydrographs vividly illustrate the severe drought conditions that existed from 2012 to 2022, resulting in dramatic and immediate declines in groundwater levels in the Centro Subarea. Likewise, the significant storm event that occurred in 2023 resulted in a similarly

dramatic and immediate increase in groundwater levels in the Centro Subarea. These hydrographs demonstrate quite clearly that groundwater levels in this desert environment, including the Centro and Baja subareas, are entirely driven by the presence or absence of significant storm events.

D. Average Discharges from the Centro Subarea.

As noted, from 2012 to 2022, the average total of all discharges from the Centro subarea is 24,527 acre-feet annually. This includes: average groundwater pumping (including minimal producers) of 20,046 acre-feet; plus subsurface outflowto Baja, 1,462 acre-feet; 3,000 acre-feet for Riparian habitat use; and 19 acre-feet of flow at Barstow (Wagner Dec., Exhibit A hereto, p. 2, and Exhibit 3 thereto).

E. The cause of the declining water levels in Golden State's wells is the severe drought conditions that existed from 2012 to 2022.

Rocket science is not required to understand why groundwater levels in GSWC's well fields have declined during the eleven year period of pronounced drought from 2012 to 2022, during which time the inflow, surface and subsurface, to Centro has averaged only 16,861 acre-feet annually, while the total discharge from Centro has averaged of 24,527 acre-feet annually.

Therefore, **the principal cause of declining groundwater levels** in the aquifers underlying the Golden State well fields is clear, i.e., during the eleven year period of severe drought from 2012 to 2022, total discharge from the Centro Subarea, on average, has exceeded recharge by at least 7,666 acre-feet annually (i.e., 24,527 - 16,861). This explains the observed declining groundwater levels in Golden State's well fields due to the combination of the severe drought conditions and groundwater pumping.

Golden State's motion and its experts' supporting declarations do not demonstrate otherwise.

In fact, the Golden State motion does not even consider, much less address the question as to whether prolonged and severe drought conditions are the reason for the declining groundwater levels observed in Golden State's well fields.

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F. Golden State's expert report makes an unwarranted leap of logic.

The Expert Report of Anthony Brown (GSWC 0002-0086) makes a wholly unwarranted leap of logic. It first states:

> In simple terms, declining groundwater levels (i.e., loss of storage) result from excess discharge (e.g., over pumping) and/or insufficient recharge (e.g., stream bed seepage) in a hydrologic system. (GS 0032.)

That is correct. The report then concludes that groundwater extractions from Golden State's wells are not the sole reason for the declining water levels. That also is correct. However, Golden State's expert report then asserts:

> Given this, the declining water levels call into question whether groundwater Producers in Alto are meeting their obligation to deliver defined volumes of annual recharge **to Centro as specified in the Judgment**. (GS 0032, emphasis added).

There are many flaws in Golden State's last statement:

• It misstates the Judgment, which provides that the Alto Producers' Subarea Obligation **is to the Transition Zone**, not the Centro Subarea. Exhibits G of the Judgment provides:

> 1. Subarea Obligations. Producers in the respective Subareas shall have the obligation to provide the following average annual and minimum Annual Subsurface Flows and/or Base Flows per Year:
>
> . . .
>
> e. Alto subarea Producers – an average Annual combined Subsurface Flow and Base Flow of 23,000 acre-feet per Year **to the Transition Zone**. . . .

Therefore, the Subarea Obligation owed by the Alto Subarea Producers is to the Transition Zone, not to the Centro Subarea.

• As noted, the expert report completely overlooks the impacts of the severe drought conditions during the eleven year period from 2012 to 2022.

• Golden State expert's report also overlooks the fact that the Alto Producers' compliance with their Subarea Obligation to deliver 23,000 acre-feet annually to the Transition Zone is based only on two components: 1) measured discharges of treated effluent to the TZ by VVWR; and, 2) Base Flow at Lower Narrows derived from the USGS measured flow at Lower Narrows. Notably, satisfaction of the obligation does not include Storm Flow, which is intended to pass the TZ as a result of maintaining stable water levels in the TZ. That is one reason the area is referred to as the "Transition Zone."

The Judgment defines "Base Flow" as "That portion of the total surface flow measured Annually at Lower Narrows which remains after subtracting Storm Flow" (paragraph 4, subd. "h"). Inflows to the TZ from the Alto Subarea are determined by actual measurement through the gage located at the Lower Narrows near Victorville; those measurements are taken each week by USGS staff (see Technical Memorandum, p. 3, attached as Exhibit 1 to Wagner declaration, Exhibit A hereto).

As to the Alto Producers' obligation to provide subsurface flow, paragraph 1, subd. (e) of Exhibit G of the Judgment, in pertinent part states: "For the purposes of Paragraph 6 of this Exhibit G, the Subsurface Flow **shall be deemed to be 2,000 acre-feet per year**" (emphasis added). Later studies confirmed the accuracy of that estimate (Exhibits 8-10 of Wagner Declaration, Exhibit A hereto). Paragraph 6 of Exhibit G to the Judgment, in pertinent part, provides:

> Subsurface Flow Assumptions. Some Subarea Obligations are expressed as average Annual or minimum Annual Subsurface Flow. In all cases the Subsurface Flow obligations have been established initially at amounts equal to the estimated historical average Subsurface Flow across Subarea boundaries. Not later than two years following entry of this Judgment MWA shall begin to install monitoring wells to be used to obtain data to enable improved estimates of Subsurface Flow at each Subarea boundary where there is a Subsurface Flow obligation and to develop methodology for future determination of actual Subsurface Flow. Not later than ten years following entry of this Judgment Watermaster shall prepare a report setting forth the results of the monitoring program and the future methodology. Following opportunity for review of Watermaster's report by all Parties, Watermaster shall prepare a recommendation to the Court as to the likely accuracy of the estimated historical Subsurface Flows and any revision of Subarea Obligations that may be indicated.

In compliance with that requirement of the Judgment, on February 22, 2006, during Watermaster's public meeting at which three representatives from Golden State Water Company were in attendance, the Watermaster Engineer's detailed "Summary Report Subsurface Flows Between Subareas" was submitted for review and was explained (see Exhibits 8 and 9 to Wagner declaration, Exhibit A hereto). At Watermaster's March 22, 2006 meeting (during which two Golden State Water Company representatives were in attendance), the Watermaster adopted the "Summary Report Subsurface Flows Between Subareas," which confirms "there is not a reason to recommend a change in the estimated subsurface flow from Alto to Centro" (see Exhibit 10, pp. 2-3, attached to Wagner Dec., Exhibit A hereto).

In its Motion to Adjust Free Production Allowance filed April 3, 2006, Watermaster reported:

> Watermaster considered and adopted a recommendation to establish subsurface flow obligations as required by the Judgment. Notification was given to all the parties that an investigation was conducted and a report was prepared to determine changes to the subsurface flow amounts specified in the Judgment. No requests were received for copies of the report or for inspection and no comments were received. Watermaster held a detailed workshop on February 22, 2006 and took formal action on March 22, 2006 to adopt the recommended subsurface flow obligations.
>
> . . .
>
> The subsurface flow obligations for Este to Alto (200 acre feet), Alto to Centro (2,000 acre feet) and Centro to Baja (1200 acre feet) are recommended to remain unchanged.

Accordingly, the Alto Subarea's estimated Subsurface Flow to the TZ remains at 2,000 acre-feet annually.

Therefore, Golden State expert's questioning as to whether the Alto Producers have met their Subarea Obligation under the Judgment is nothing more than an unwarranted leap of logic, which among other things ignores (a) the impacts of the severe drought conditions from 2012 to 2022, and (b) Watermaster's verification of the Alto Producers' compliance, by actual measurement of Base Flow to the Transition Zone and studies confirming the quantity of Subsurface Flow at the TZ. Accordingly, if GSWC does not receive sufficient water to meet its needs, or experiences declining water levels in its well fields, it is **not** because the Alto Subarea Producers have failed to meet their obligation under the Judgment to provide defined quantities of water to the TZ.

G. Golden State expert's repeated misdirection in this matter.

Golden State expert's report states,

> Watermaster should address the following recommendations:
>
> . . .
>
> 4. Based on results from the above [declining water levels that are not caused solely by Golden State's pumping], Watermaster should determine whether Producers in Alto have met, are currently meeting, and will meet in the future their obligation **to deliver defined volumes of water to Centro as specified in the Judgment**.
>
> . . .
>
> 6. If Watermaster determines the obligation has been, is being, and will be met, Watermaster should recommend and implement additional analyses that would evaluate why chronic water levels [sic] declines are being observed at Golden State's production wells in Centro.

(Emphasis added.)

Once again, the Alto Subarea Obligation (Base Flow and Subsurface Flow) is to the Transition Zone, not to the Centro Subarea; the evidence is quite clear that the Alto Producers have met their Base Flow and Subsurface Flow obligations to the Transition Zone; and the groundwater level declines observed from 2012 to 2022 are clearly the result of severe drought conditions. Moreover, as demonstrated in Mr. Wagner's declaration and exhibits attached thereto, the Watermaster's water budget for the Transition Zone is supported by evidence that is both substantial and persuasive (Wagner Dec., Exhibit A hereto, pp. 3-4); in response, Golden State merely speculates the Alto Producers may not have been meeting their Subarea Obligation to the TZ, and there may be water losses in the TZ that are unaccounted for.

H. Production Safe Yield for the Centro Subarea.

The question remains: Is the Wastermaster Engineer's conclusion as to the Production Safe Yield for Centro correct? If we were to look only at the inflows to Centro from 2012 to 2022, the answer would clearly be "no." However, the Judgment requires that PSY be calculated based a representative "long-term average." It provides:

> The highest average Annual Amount of water that can be produced from a Subarea: (1) over **a sequence of years** that is representative of **long-term average** annual natural water supply to the Subarea net of **long-term average** annual natural outflow from the Subarea, (2) under given patterns of Production, applied water, return flows and Consumptive Use, and (3) without resulting in a long-term net reduction of groundwater in storage in the Subarea. (Emphasis added.)

Several factors are important to the PSY calculation including long-term average inflow, and the current environment of water use and disposal (pumping and outflow). Inflow to Centro is one part of that calculation. Watermaster's estimate of flow across the HF on a long-term average basis is consistent with various investigations for different time periods (Technical Memorandum, page 3, line 4). In this instance, looking only at inflow to the TZ, at Lower Narrows, and VVWRA discharges, for two different periods, 1951-1990, and 1991-2023, the total surface flow is essentially the same, about 49,000 acre-feet annually (Exhibit 7 to Mr. Wagner's Declaration, Exhibit A hereto). If the current pumping and land use within the TZ is similar in the future to current uses, the long-term calculated flow crossing the HF will be 36,700 acre-feet annually (Exhibit 3), consistent with Watermaster's current estimated inflow to Centro for the 2024-25 PSY calculation.

Golden State apparently believes Watermaster should utilize only the recent period of severe drought, i.e., from 2012 to 2022, as the controlling "long-term average." That would not be truly representative, however, because the Mojave Basin Area also has experienced many wet years from 1931 to the present (see Exhibit 2). In fact, a significantly wet year was experienced in 2023 and, as demonstrated in the hydrographs attached as Exhibit 6 to Mr. Wagner's declaration (Exhibit A hereto), the 2023 storm events succeeded in significantly replenishing depleted groundwater storage in the Centro subarea near Golden State's wells.

Based upon the Watermaster's foregoing explanations and responses, the only disagreement Golden State may have with the Watermaster that has any merit at all, relates to the appropriate time period or time periods to be utilized to determine PSY for the Alto, Centro and Baja subareas. Watermaster will continue to utilize the most representative long-term averages, as mandated by the Judgment and as directed by the Court.

I. When completed later this year, the UMRBM will provide the data and information needed to adequately estimate PSY.

To accurately calculate PSY for the Centro Subarea, the "average" water supply from all sources must be determined. After the UMRBM is completed later this year (to include the Transition Zone and the Centro and Baja subareas), it will provide data and information needed to estimate PSY for all Subareas, including the Alto, Centro and Baja subareas.

GSWC's experts agree the UMRBM needs to be completed; the Watermaster engineer has committed to completing the UMRBM by the end of this calendar year. Therefore, GSWC's motion actually is premature. Watermaster should be allowed to continue its work to complete the UMRBM to include the TZ and the Centro and Baja subareas; Watermaster need not be ordered to do so.

III.
Request for additional stream gage near the Helendale fault.

GSWC asks the Court to Order Watermaster to establish a stream gage at or near the Helendale Fault to directly measure surface water inflows into the Centro Subarea and additional monitoring wells in the TZ. Mr. Wagner's declaration notes that installation of a

stream gauge at or near the Helendale Fault would "be subject to the same conditions that resulted in [the Wild Crossing gage's] abandonment, as noted by USGS, . . . Similarly, installing a stream gage at or near the Helendale Fault as suggested by GSWC would encounter the same conditions, resulting in an unreliable record" (Wagner Declaration, Exhibit A hereto, p. 5).

Moreover, the Court envisioned that after flows enter the Transition Zone, water levels are to be determined by monitoring wells, not by gages. As outlined in the Court's Statement of Decision, the TZ is intended to function as described below:

> 2. The flow requirements between subareas are as follows: . . . c) Alto to Centro 21,000 acre-feet average annual surface flow *as measured at the lower narrows* (And maintained by an immediate replacement water obligation in the transition zone to form a water bridge down to the Helendale Fault) plus a 2,000 acre-feet average annual subsurface flow as estimated in Bulletin 84; . . . f) these estimates and other subsurface estimates will need to be up-dated *by the use of monitoring wells* which will determine the water table slope at the boundaries. [RT 128:27-130:14]
>
> The transition zone has a fairly stable water level. It is necessary to maintain that water level so that the surface flows passing the Lower Narrows and the subsurface inflow into the transition zone will reach the Helendale Fault, and hence downstream subareas; the flows at the Helendale Fault will in the future be *measured using monitoring wells to insure that water levels are maintained within the transition zone.*

(Court's Amended Statement of Decision, excerpts from which are attached as Exhibit B hereto, page 15 of 30.)

Therefore, based upon the Transition Zone's intended use as a "water bridge down to the Helendale Fault," monitoring of water levels in the Transition Zone is to be performed by "**monitoring wells** to insure that water levels are maintained within the transition zone" -- not by stream gages. Performing this essential function, there are now 30 monitoring wells in the Transition Zone -- confirming that water levels are maintained within the Transition Zone as intended by the Judgment and the Court's Amended Statement of Decision (see Wagner Dec., Exhibit A hereto, pp. 1-4; and Exhibit A [Alto Subarea Transition Zone Hydrographs 2024] to the Technical Memorandum, which is Exhibit 1 to Mr. Wagner's Declaration, Exhibit A hereto). Data from the monitoring wells located at or near the Helendale Fault are used by the Watermaster and the Watermaster Engineer annually. Such

data is published in the Watermaster's Report every year.[1]

For the reasons set forth in Mr. Wagner's declaration, GSWC's request that Watermaster be "ordered" to install a stream gauge or additional monitoring wells at or near the Helendale Fault is without merit and should be denied.

IV.
Request for annual water budget for the TZ.

GSWC also argues Watermaster should be required to prepare an annual water budget for the Transition Zone "as recommended by Aquilogic." For the following reasons, this suggestion also is without merit and unwarranted. As Mr. Wagner explains in his declaration:

> In response to GSWC's suggestion that Watermaster prepare a water budget for the TZ as recommended by Aquilogic, there are three significant elements of the water balance to the TZ that are measured/metered. The waste stream from the Victor Valley Wastewater Treatment Plant is discharged within the TZ and is measured. The flow at Lower Narrows is measured directly by USGS weekly to estimate the mean daily discharge. Pumping as noted above is metered/measured. These measured data are the basis for the water balance in the TZ and calculating outflow across the Helendale Fault.

(Wagner Dec., Exhibit A hereto, p. 4.)

Mr. Wagner's declaration describes further the methodologies used to calculate the water budget (Exhibit A hereto, pp. 3-4). For the foregoing reasons, Watermaster should not be required to install an additional stream gage near the Helendale fault, and Watermaster should not be ordered to comply with Aquilogic's recommendations for a water budget.

V.
Golden State has not considered other possible causes of declining water levels in its well fields.

GSWC starts by assuming there are only two possible causes for decreasing water levels in the area of its well field, i.e., groundwater extractions through its pumping operations or decreased flows into the Centro Subarea from the TZ. GSWC then proffers the Aquilogic report to prove, counter-intuitively, that GSWC's water extractions are not a

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[1] The Amended Statement of Decision also makes clear that the Alto Producer's 21,000 acre-feet Base Flow obligation is to be *"measured at the lower narrows."*

significant cause of the decreasing water levels observed in GSWC's well fields. As noted, GSWC has not considered the impacts of severe drought conditions from 2012 to 2022.

For numerous reasons, Aquilogic's analysis is unpersuasive, to wit: (1) there are more possible reasons for decreasing water levels in GSWC's wells; (2) GSWC has not proven its groundwater pumping does not contribute significantly to the decreasing water levels in its wells; (3) GSWC's analysis does not take into consideration groundwater extractions in the same localized area by large agricultural operations and others.

A. More than two possible reasons exist for the decreasing water levels observed in GSWC's well field.

Other possible reasons for decreased water levels in the GSWC well field (besides pumping and decreased flows because of severe drought) include flow-impeding faults, frequency and intensity of storms, groundwater flow patterns and transmissivity distribution (ability of the sediments to transmit water to the wells), flow migrating to the Harper Valley or Iron Mountain areas, and significant groundwater recharge between the HF and GSWC's well field (i.e., the normally dry channel between the HF and Barstow induce more recharge in that area). (See Technical Memorandum, pp. 9-10, attached as Exhibit 1 to Wagner declaration, Exhibit A hereto.)

GSWC has not demonstrated that the complex set of processes described above, together with groundwater extraction in and around the GSWC well field, are not additional contributing causes of the declining water levels observed in the GSWC well field. GSWC makes no such demonstration. In fact, GSWC's motion does not address or consider any of the above-described other complex processes and possible contributing causes of declining water levels within the GSWC well field.

B. GSWC has not proven its groundwater pumping does not cause decreased water levels in its well fields.

The Aquilogic statistical analysis of depth to water versus pumping is based on the hypothesis that if chronic water level decline is due to over-pumping alone, there should be a correlation between pumping and depth to water. Similarly to the explanation given in point

"A" above, this approach overlooks the complexity of the aquifer system and the other processes that also determine water levels in the GSWC well fields.

Also, the correlation presented by Aquilogic is calculated using pumping rate from the well where the water level is measured. Such an approach overlooks the fact that a well can be influenced by pumping from other wells in the basin or even in the same well field. Moreover, even with this approach, the results are not conclusive. This is illustrated by the fact that 5 out of 17 wells are indicated to have statistically significant correlations/trends that show depth to water decreasing (**water level rising**) as pumping magnitude increases – which clearly demonstrates that the aquifer system underlying GSWC well fields has more complexity than GSWC's simplified statistical analysis can capture. (See Technical Memorandum, p. 9, attached as Exhibit 1 to Wagner declaration, Exhibit A hereto.)

In short, GSWC's purported showing that concentrated pumping in the segmented aquifers feeding GSWC's wells is not a significant contributing factor to declining water levels in its well fields, is not persuasive.

C. GSWC's analysis also does not take into consideration groundwater extractions in the same localized area by large agricultural operations and others.

Mr. Wagner's Technical Memorandum (p. 9 of Exhibit 1 to Wagner Dec., Exhibit A hereto) also notes other factors that may affect the water levels in GSWC's well field, including pumping by other wells in the area of influence of GSWC water level measurements; and pumping by nearby agricultural interests that purchased thousands of acre-feet of excess FPA from GSWC (see Exhibit 6 to Wagner declaration). Yet, Aquilogic's analysis fails to consider the effects of such additional pumping on water levels in GSWC's wells.

D. The Watermaster's analysis demonstrates that the Centro Subarea receives, on average, 36,338 acre-feet of flow annually.

The long-term average flows to the TZ total approximate 48,899 acre-feet annually. The calculated consumptive losses in the TZ (based on 2023 land use and climate) are as follows: (a) average pumping of 6,859 acre-feet annually (i.e., approximately 10,039 acre-

feet pumping in the TZ, less return flows); and (b) average riparian habitat use of 5,702 acre-feet annually (see Figure 2 and p. 5 of Technical Memorandum, attached as Exhibit 1 to Wagner declaration, attached as Exhibit A hereto). Therefore, the calculated flow out of the TZ to the Centro Subarea is, on average, 36,338 acre-feet annually (i.e., 48,899 acre-feet delivered to the TZ, minus 6,859 acre-feet lost through consumptive use from groundwater extractions, and 5,702 acre-feet lost through phreatophyte use).

GSWC claims a portion of the flow into the TZ recharges the TZ in an amount equal to the groundwater extractions less return flows in the TZ. That is true. However, as noted above, the Watermaster engineer's calculation of the volume of flows received, on average, by the Centro Subarea includes the amount of water lost in the TZ by consumptive uses (including groundwater extractions and phreatophyte use). Therefore, the fact that a portion of the 48,899 acre-feet that flows to the TZ is lost to the calculated consumptive uses in the TZ is fully accounted for in the Watermaster's calculations – which, as noted, demonstrate that, on a long-term average basis, the Centro Subarea receives 36,338 acre-feet of flow annually from the TZ.[2]

What then caused the declining water levels in GSWC's well field? The decrease is primarily the result of lack of stormflow to Centro because of the severe drought conditions from 2012 to 2022, significant groundwater recharge between the HF and the GSWC well fields (following the meandering river, a distance of 15.5 to 21 miles), groundwater extractions in an around GSWC's well fields, and other factors.

VI.
GSWC's motion is premature

GSWC's motion correctly states that the flow dynamics between the TZ and the Centro Subarea are not yet included in the Watermaster's Upper Mojave River Basin Model. Although that will soon be remedied, GSWC has argued erroneously that, "Watermaster

[2] That a portion of the 48,899 acre-feet delivered to the TZ recharges TZ ground water levels (to replace losses from the consumptive uses described above), also confirms the Watermaster Engineer's conclusion of Zero change in groundwater storage in the TZ.

does not intend to further update the ... modeled calculations contained in the water budget that comprises its PSY calculations" (Mot., 9:25-27). That claim is patently false and made without any supporting evidence.

The Watermaster Engineer has represented to the Court and stakeholders that Watermaster is continuing to develop the model to include data and estimates for all Subareas within the Basin, including the TZ and the Centro and Baja subareas, and that the updated model is expected to be completed before the end of this calendar year. GSWC simply needs to be a bit more patient. It will soon be able to evaluate the updated model; if it then believes the model can or should be improved, it will be free to make suggestions at that time.

Moreover, the declarations supporting GSWC's motion and the Aquilogic report fail to demonstrate that Aquilogic's recommendations, if implemented, would yield better or more reliable results than those from the soon-to-be-completed Upper Mojave River Basin Model (to be renamed the Mojave Regional Groundwater Model, when completed). Until the updated model is completed, it is premature to "order" the Watermaster to "consider" other steps and methodologies for developing water budgets and PSY estimates.

VII.

Conclusion

Golden State's motion fails to demonstrate that the declining water levels observed in its wells are the result of anything other than the combined effects of the severe drought conditions that existed from 2012 to 2022, together with groundwater extractions by Golden State and other Centro Subareas Producers.

The primary driver of water levels in the Centro Subarea are the frequency, or infrequency, of storm events, together with groundwater extractions through pumping. That groundwater extractions during periods of prolonged drought conditions result in declining groundwater levels, is both intuitive and self-evident. Golden State's motion fails to consider the impacts of the severe drought conditions that existed from 2012 to 2022 -- during which time there were, for that reason alone, significantly reduced flows across the

Helendale Fault and into the Centro Subarea.

Golden State's speculation to the contrary, the evidence demonstrates the Alto Producers have met their Subarea Obligation to the Transition Zone.

The Court's Amended Statement of Decision makes clear that the key for the Transition Zone, is to maintain stable groundwater levels so the TZ may continue to act as a "water bridge" to the Centro Subarea, and that condition is to be confirmed and measured by monitoring wells, not by stream gages.

Watermaster's annual water budget for the Transition Zone is accurate and based upon the best available data. Golden State has not demonstrated that better or more reliable results would be obtained by implementing Aquilogic's recommendations.

When completed later this year, the UMRBM will provide the data and information needed to adequately estimate PSY for each subarea within the Mojave Basin Area. Golden State will have ample opportunity to comment on the updated UMRBM.

For all of the reasons stated, Watermaster respectfully submits the Court should deny GSWC's motion, in its entirety.

Dated: October 9, 2024

BRUNICK, McELHANEY & KENNEDY PLC

By: _____

William J. Brunick
Leland P. McElhaney
Attorneys for Defendant/Cross-complainant,
MOJAVE WATER AGENCY

EXHIBIT A

DECLARATION OF ROBERT C. WAGNER

I, Robert C. Wagner, declare as follows:

I serve in the capacity of Engineer for the Mojave Basin Area Watermaster. I have served as Watermaster Engineer for approximately 27 years; I have been studying the hydrology of the Mojave Basin Area for approximately 33 years. I have personal knowledge of the matters set forth herein and, if called as a witness, I could and would testify competently thereto.

The Technical Memorandum (TM, October 9, 2024), prepared by me and under my supervision and attached hereto as Exhibit 1, evaluates the Expert Report dated September 2024, prepared by Aquilogic and submitted by Golden State Water Company with its motion to enforce the Judgment.

At the hearing on October 2, 2024, Golden State Water Company (GSWC) stated that GSWC well fields have been experiencing water level declines during the recent five years. During the eleven years 2012 to 2022, the Mojave Basin Area experienced well below average water supply. Exhibit 2, prepared under my supervision, from USGS stream gage records, shows the historical inflow to Mojave River reckoned at the Forks. As shown on Exhibit 2, the Mojave River flow at the Forks during the period of 2012 to 2022 was 27,614 acre-feet per year, which is only 42 percent of the long-term average flow.

Exhibit 3 shows the results of the Transition Zone Water Balance with the estimated flows across the Helendale Fault (HF) since 1991. The period 2012 – 2022 was well below the long-term average, similar to the observed behavior of the Mojave River at The Forks (Exhibit 2). The Transition Zone Water Balance provides the surface and subsurface outflows to Centro. In general, the Centro subarea receives inflows across the HF and other deliveries directly to Centro. Inflows to Centro are calculated as (a) total streamflow to the Transition Zone measured at the Lower Narrows by the USGS; (b) discharge of treated wastewater by Victor Valley Water Reclamation Authority (VVWRA); (c) subsurface inflow measured at the Lower Narrows; (d) precipitation; (e) minus consumptive uses of pumping and riparian habitat water use.

Consumptive uses of pumping are estimated, but 99% of water pumped is metered/measured and has been since at least 2012. Exhibit 4 is a table of information maintained by Watermaster showing the

methods to measure verified production in the TZ for the period of 2012 to 2023. This demonstrates that the amount of verified production is precisely determined.

The TM presents an analysis of the conditions of the Mojave River near HF, presents estimates of flow across the HF over various time periods, documents the stability of water levels at and near the HF. According to the TM, the change in storage in the TZ over time has been relatively constant, meaning water levels show limited variability over time. The channel surface of the river will remain saturated, water cannot percolate into the sediments and is therefore rejected as streamflow allowing storms to pass through the TZ into Centro, as intended by the Judgment. The streamflow losses between Lower Narrows and Helendale Fault are due to consumptive uses as described later herein.

The TM explains that the flow that enters Centro from the Transition Zone has been declining over the recent years due to the severe drought conditions experienced from 2012 to 2022. This is the reason that GSWC wells are experiencing chronic water level declines during that time. Exhibit 5 shows an estimated water balance for Centro subarea during years 2012 to 2022. The average total inflow to Centro subarea at the HF during the 2012-2022 drought period was only about 16,861 acre-feet (including return flow or production) which is well below the long-term base period average inflow to Centro of 36,700 acre-feet (1931-1990) and the recent total average flow to Centro of 37,500 acre-feet during 1991-2023. During the same drought period of 2012-2022, the average total outflow from the Centro subarea was 24,527 acre-feet annually. This includes the average groundwater pumping of 20,046 (including minimal producers), subsurface flow to Baja subarea of 1,462 acre-feet, surface flow to Baja subarea of 19 acre-feet, and riparian vegetation consumptive use of 3,000 acre-feet. In other words, the total average discharge from Centro has exceeded total recharge by at about 7,666 acre-feet during the eleven-year drought period evaluated herein. This demonstrates that the severe drought conditions during the 2012 to 2022 period caused the observed chronic decline on groundwater levels within the area of the Golden State's well fields.

Importantly, the flow across Helendale Fault, which represents the long-term average supply to Centro, will not occur every year. The Mojave River system is episodic, meaning there are long periods of well below average flow followed by occasional periods of well above average flow. The Judgment is predicated on long term average flow.

Exhibit 6 is a map showing some of the production wells in the area of the Hinkley and West Barstow. This exhibit includes water production for GSWC and other producers in the specific areas of focus. This exhibit also includes two hydrographs corresponding to observed water levels at monitoring wells 09N02W06L11-14 and 09N03W23F01,03 and 04. These wells are representative of water level responses to pumping and recharge within this area. The hydrographs show the continued decline in water levels during the period of 2012-2022 and other dry periods. The hydrographs also show the water level response to significant storm events, such as the event of 2023. This demonstrates that the Mojave Basin Area is a storm dependent system.

GSWC states that if the average flow to Helendale Fault is about 36,000 acre-feet per year, and the pumping is only 17,000 acre-feet per year, the water levels should not be declining. As explained above, the decline in water levels during the recent years is drought related. Furthermore, the Water Balance for Centro subarea for the years 2012 to 2022 shows that the average annual flow to Centro across the Helendale Fault was only 12,238 acre-feet per year (Exhibit 5) and not the long-term average of 36,000 acre-feet per year for the above-mentioned reasons. The calculated deficit during the drought period within Centro was 7,666 acre-feet, which means more water left the system through pumping and outflow (surface, subsurface, and consumptive uses) than was recharged. Hence water levels in wells would fall.

In regard to the Transition Zone Water Balance, GSWC complains that it is a simplified calculation that relies on several assumptions and estimates and therefore, it is inadequate to estimate inflows to Centro subarea. We disagree.

In response to GSWC's suggestion that Watermaster prepare a water budget for the TZ as recommended by Aquilogic, there are three significant elements of the water balance to the TZ, that are measured/metered. The waste stream from the Victor Valley Wastewater Treatment Plant is discharged within the TZ and is measured. The flow at Lower Narrows is measured directly by USGS weekly to estimate the mean daily discharge. Pumping as noted above is metered/measured. These measured data are the basis for the water balance in the TZ and calculating outflow across the Helendale Fault. The return flows from domestic and municipal consumptive uses are calculated based on population to estimate indoor water use and disposal. Outdoor water use for domestic irrigation is considered to

contribute no return flow (a conservative and simplifying assumption). Consumptive use for irrigation (agriculture) is determined with crop coefficient and climate data based on the Victorville CIMIS station; total agricultural pumping is about 10% of the total pumping in the TZ (by one producer). The riparian habitat consumptive use is determined based on the riparian water use as determined with the remote sensing study presented in 2011 by the United States Bureau of Reclamation (USBR), adjusted on a yearly basis for that year's climate data. The riparian water uses vary between 5,700 and 6,300 acre-feet, or about 6,000 acre-feet per year; the value determined by Lines and Bilhorn, (USGS and CDFG, 1996). On a long-term average annual basis (1951-2023), the stream flows at Lower Narrows including VVWRA discharges, is about 49,000 acre-feet per year (see Exhibit 7). Pumping in the TZ during 2023 was about 11,000 acre-feet determined by meters/measurements. Riparian habitat uses, as estimated by Lines and Bilhorn (1996) and confirmed by USBR through remote sensing techniques has been about 6,000 acre-feet. The estimated consumptive use of pumping about 6,600 acre-feet is less than 10% of the total measured values. The calculation of the flow across the Helendale Fault (by arithmetic) is no less precise than other methods available.

The use of the USGS Basin Characterization Model (BCM) and the Parameter-elevation Regressions on Independent Slopes Model (PRISM) are included in the Upper Mojave Basin Model and as appropriate will be incorporated into the model expansion.

Having studied the data from the unreliable Wild Crossing gage and USGS conclusions as to its unreliability, it is my opinion that he installation of a stream gage at or near the Helendale Fault would be subject to the same conditions that resulted in the Wild Crossing gage's abandonment, as noted by USGS; similarly, installing a stream gage at or near the Helendale Fault as suggested by GSWC would encounter the same conditions resulting in an unreliable record.

GSWC's Expert Report also indicates that Alto producers are not meeting their Subarea Obligation to deliver 23,000 acre-feet annually to the Transition Zone. The surface flow component of this obligation (21,000 acre-feet annually) has been satisfied every year and is reported in the Watermaster's Annual Reports to the Court. The surface flow component consists of base flow estimated from measured streamflow at Lower Narrows, and VVWRA discharges (see Exhibit 7). The subsurface flow component of this obligation (2,000 acre-feet annually) has been deemed by the Judgment and has

been confirmed by later Watermaster studies: Report titled "Subsurface Flow Between Subareas" dated February 22, 2006 (included as Exhibit 8). This Watermaster study and report was presented during the Watermaster Board meeting on February 22, 2006 (agenda and adopted Board actions are included in Exhibit 9) and was unanimously adopted by Watermaster Board during the Watermaster Board meeting on March 22, 2006 (agenda and adopted Board actions are included in Exhibit 10).

The TM also includes information about Mojave Water Agency and Watermaster's efforts to expand the Upper Mojave River Basin Model, improve data collection, installation of a stream gaging station between the HF and Barstow, and performance of geophysical investigations.

In the furtherance of the foregoing, I have reviewed the water level hydrographs for the TZ. The hydrographs are published by Watermaster annually in its Annual Report to the Court and are posted on the Mojave Water Agency website and are also included herein as Exhibit A to the TM. The TZ hydrographs support the Watermaster's conclusion that over time, the TZ water levels have been stable indicating that there is limited change in storage with the TZ.

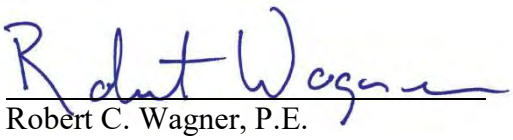
During dry periods, there is some depletion in storage due to consumptive use of water by riparian habitat, domestic, municipal, recreation and a small amount of agricultural use. This depletion is replaced when flow in the river increases in the fall and winter of each year and following storm events. The amount of the depletion is equal to the consumptive uses; this is evidenced by the stability over time of the water levels, within the TZ and at and near the HF. Thus, the changes in storage in the TZ are cumulatively zero or near zero over time.

The Upper Mojave Basin Model is an adequate tool for estimating flow into the TZ from the upstream portion of Alto. The Model is currently being expanded to include the TZ and the Centro and Baja subareas and when complete (December 2024) will provide another tool for basin management.

The expanded model will be a useful tool to estimate flow at boundaries like the TZ to Centro and to predict water level changes for future basin management.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct.

Dated: October 9, 2024



Robert C. Wagner, P.E.

EXHIBIT 1

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TECHNICAL MEMORANDUM

To: Mr. Lee McElhaney
Attorney, Mojave Basin Area Watermaster
Brunick, McElhaney & Kennedy
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From: Robert Wagner, P.E., A. Leonardo Urrego-Vallowe

Date: October 9, 2024

Re: **Aquilogic Expert Report, September 2024**

This Technical Memorandum summarizes and responds to the statements and conclusions presented by Aquilogic in their Expert Report (September 2024) on behalf of Golden State Water Company (GSWC). In summary, the Expert Report provided opinions and recommendations from two experts, analyzed the water budgets prepared by Watermaster Engineer, and conducted a statistical analysis of water levels in Centro. The statistical analysis evaluated the Mann-Kendall(MK) correlation/trend tests for seventeen active GSWC wells for water levels versus time and water levels versus total pumping. Many of the issues raised in the Aquilogic Expert Report, are similar to or variations of the same arguments and analysis previously presented by Aquilogic on February 28, 2024.

Watermaster Engineer provided a detailed response to GSWC (Aquilogic) in a Technical Memorandum (TM) to Mr. Lee McElhaney Attorney, Mojave Basin Area Watermaster dated April 12, 2024. We provide additional details in this memorandum as well as incorporating by reference data and information in our April 12, 2024 TM.

Opinions Expressed by Aquilogic

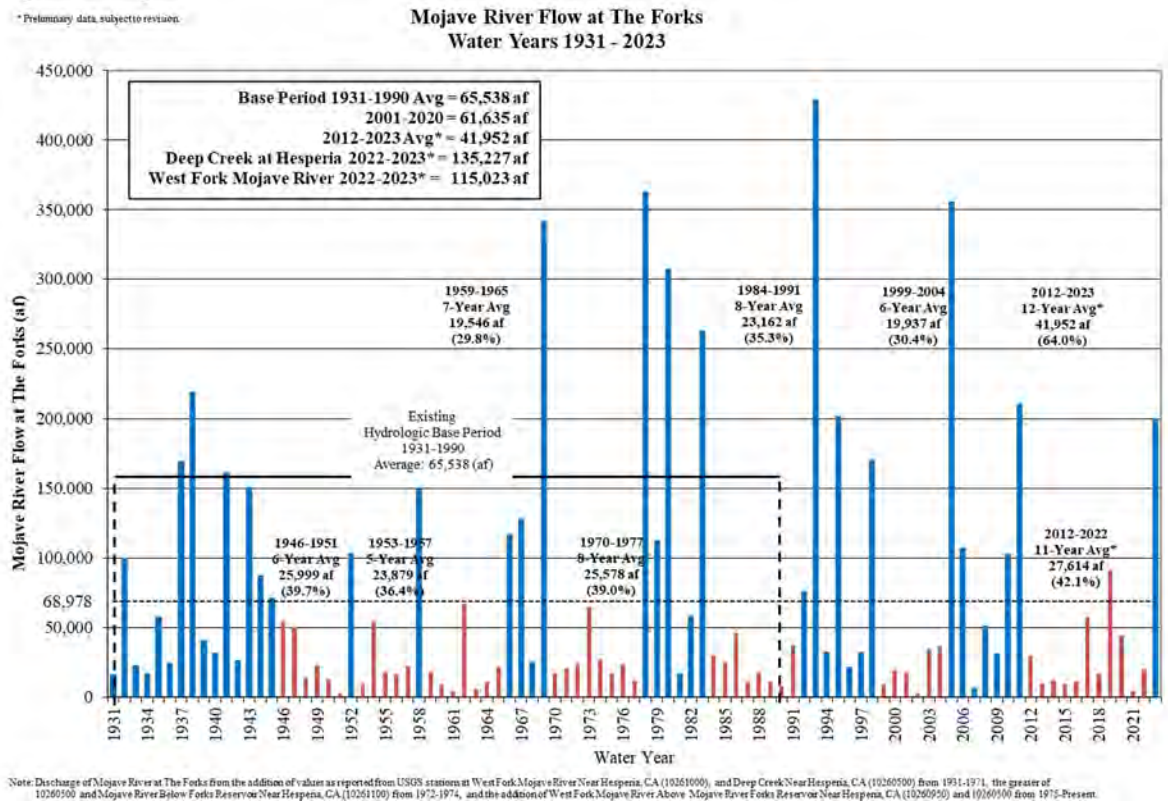
The Expert Report presented several opinions prepared by Mr. Anthony Brown and Mr. Robert Abram, wherein they claim groundwater levels in Centro have been decreasing as a result of either excessive discharge (over pumping) and/or insufficient recharge in Centro. As explained herein the Expert Report does not consider other possible causes of water level decline in the GSWC wells, notable the impacts of the prolonged period of severe drought from 2012 to 2022.

The Expert Report concluded that the decline in observed groundwater levels at the GSWC's production wells is not a result of over-pumping. Instead, the Expert Report indicated that it is more likely the result of decreased recharge to Centro from Alto, or a failure of the Alto Producers to meet their Subarea Obligations under the Judgment. While there has been a significant decrease in recharge to Centro as a result of severe drought conditions from 2012 to 2022 as reflected in the hydrographs of monitoring wells located near Hodge and Golden State's well fields, the evidence is quite clear the Alto Producers have been meeting, and are meeting, their Subarea Obligation to the Transition Zone.

Flow from Alto to Centro (Helendale Fault)

The Mojave Basin Area (MBA) experiences frequents periods of below average water supply as indicated in the chart below. The chart shows the history of inflow as measured at the Forks near Hesperia; approximating the surface inflow to the Basin Area. As shown, the 11 year period from 2012-2022 experienced only about 42% of the long term average water supply see Figure 1.

Figure 1. Mojave River Flow at the Forks



The Transition Zone, or TZ (area between the Alto and Centro Subareas) includes about 15 miles of Mojave River channel between the Lower Narrows, Mojave River, and the Helendale Fault; a geologic structure separating Alto and Centro Subareas. There is a United States Geological Survey (USGS) stream gage at the Lower Narrows. Surface flows across the Helendale Fault,

that become recharge to the Centro subarea, are episodic, resulting from large infrequent storm events.

Flow at the Helendale Fault (HF) has been estimated by various researchers over time. Shown below are estimates of average annual flow at HF for different time periods:

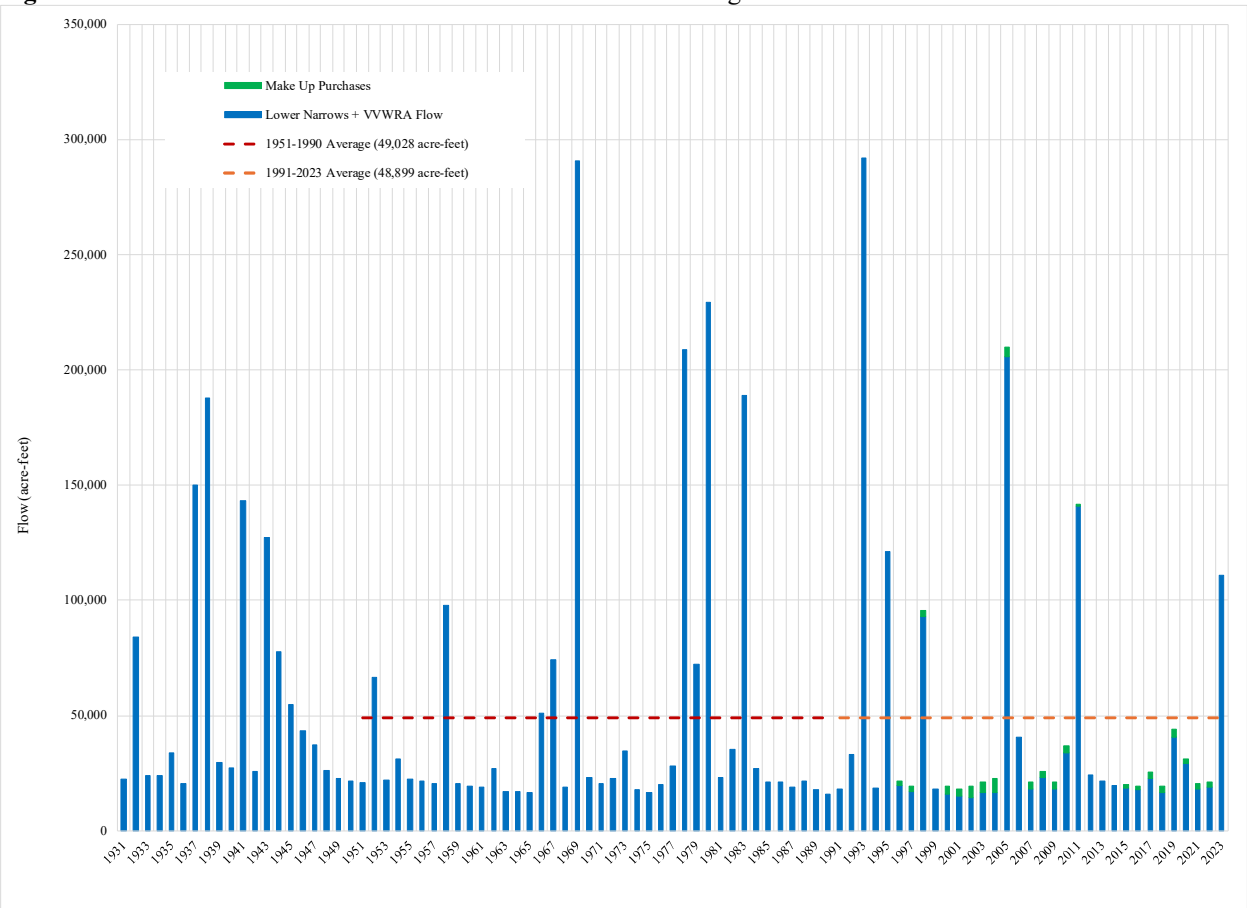
California Department of Water Resources, (1967) for the period 1936-1961 = **35,500 AF**
USGS, (Stamos, 2001) for the period 1951-1999 = **35,819 AF**
Albert A. Webb and Assoicates (Webb, 2000) 1931-1990 = **36,700 AF**
Watermaster (2024), 1991-2023 = 34,900 AF plus 2,305 AF Make Up water purchases = **37,205 AF**.

Thus, total average annual surface flows from the TZ into the Centro subarea, as estimated at Helendale Fault have not changed significantly since at least the period 1936-1961.

Measured Surface Flow into the TZ

Surface flow into the TZ is measured by USGS at the Mojave River Lower Narrows, near Victorville (measurements made weekly by USGS staff). Treated sewer effluent is measured and discharged by the Victor Valley Wastewater Reclamation Authority (VVWRA) into the TZ. Shown below as Figure 2 is a graph of the measured flow at Lower Narrows, and the measured VVWRA discharges since 1951. Treated effluent discharge to the river began in about 1981.

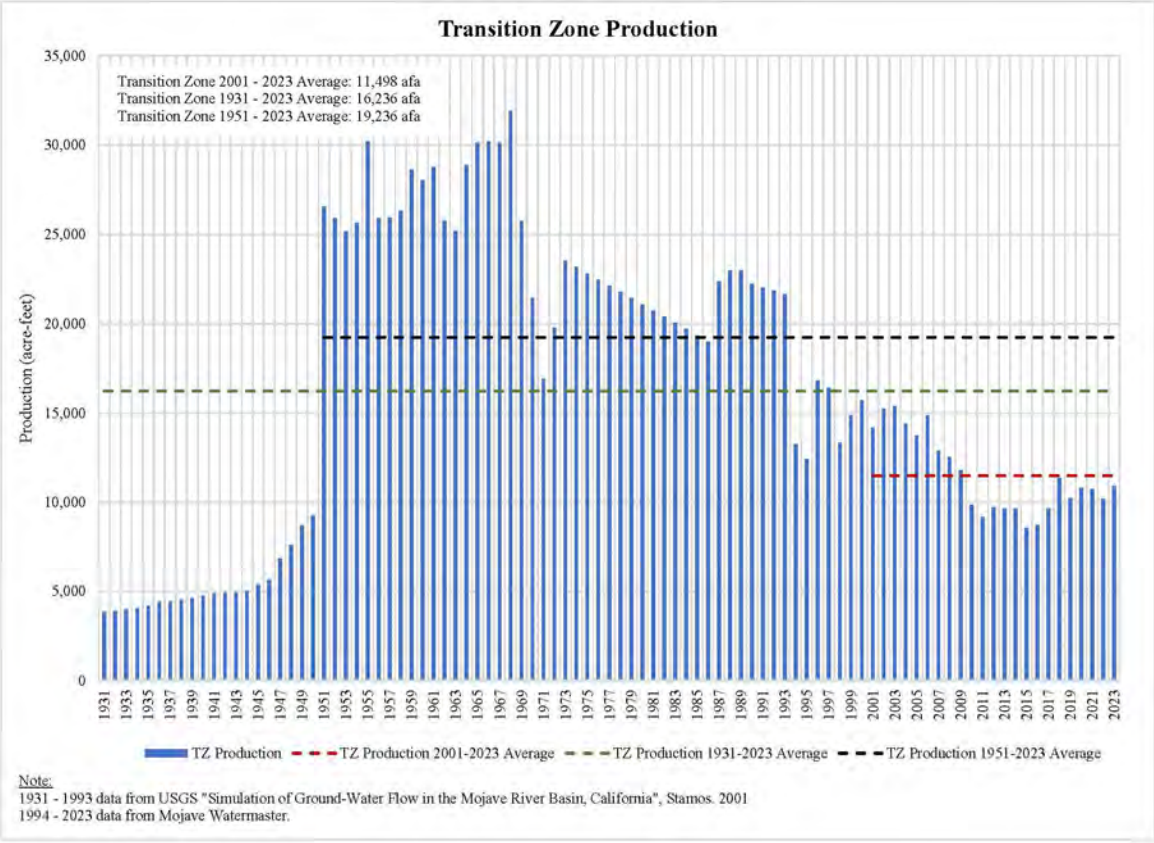
Figure 2. Total stream flows at Lower Narrows + VVWRA Discharge



As shown above, the average inflow to the TZ between 1951 and 1990 (49,028 AF), and between 1991 and 2023 (48,899 AF) is little changed (-0.26%). The graphic (Figure 2) is based on measurements as reported by USGS and VVWRA, and not on any estimates made by Watermaster.

Further, pumping in the TZ has declined significantly from the past. The graphic below shows changes in pumping within the TZ:

Figure 3. Historic groundwater pumping in the Transition Zone.



Average annual pumping in the TZ declined by 40.2% from the period 1951-2023 to the 2001-2023 period. Pumping during 2023 was 10,039 AF, and consumptive use of pumping (losses) were about 6,859 AF. Phreatophyte use, which also contributes to losses in the TZ was about 5,702 AF in 2023.[1] If the future average annual flow into the TZ, is similar to the past (about 48,899 AF) and consumptive uses are about the same as they are now, *average annual* outflow to Centro will be about 36,338 AF.

The average annual water supply into the TZ has remained constant over time, and the water demands have fallen. This has resulted in stable water levels in the TZ, allowing storms to pass to Centro; consequently, the estimated flow across the HF is about the same now as in the past.

[1] Phreatophytes consumptive use is calculated by Watermaster on an annual basis based on values reported in "Evapotranspiration Water use Analysis of Saltcedar and Other Vegetation in the Mojave River Flood plain, 2007 and 2010, Mojave Water Agency Water Supply Management Study, Phase 1 Report". Values are adjusted to annual climatological conditions.

This condition is reflected in the TZ water levels as presented in the Watermaster's Annual Report (Figures 3-7, 3-8 and 3-9). The compilation of hydrographs in the TZ are included herein as Exhibit A.

The change in storage in the TZ over time has been relatively constant, meaning water levels show limited variability over time. The Centro Subarea hydrographs shown in Exhibit B show the sites located in the vicinity of the TZ in the Centro subarea (downstream of the Helendale Fault). These hydrographs show groundwater elevations to be relatively stable over time (08N04W21M-01-04 [Exhibit C], 08N04W12Q01 [Exhibit D], 08N03W04A07 [Exhibit E]). Exhibits A, B, C, D, and E all show stability of the groundwater levels within the TZ. Specifically, wells located in the Centro subarea closest to the TZ, as reflected in Exhibits C, D, and E indicate stable water levels, also the average surface inflow to the TZ (Figure 3) has not changed from 1951 to 2023. This confirms that the historical flows to the Centro Subarea have not been significantly reduced. Therefore, we conclude that the flow across the Helendale Fault has remained consistent as evidenced by these exhibits.

Importantly, the river reach between the HF and Barstow is normally a dry channel. Figure 4 is an aerial image showing the extent of the river reach between the HF and Barstow; the photo is dated August 22, 1969. Notably water year 1969 was an extreme flow event on the Mojave River. The flow at Barstow that year was reported by USGS to be (146,000 AF). Figure 5 shows the same reach of the river in 2022 following several years of drought. As noted, the channel in the photo is dry. This is the normal condition of the channel between the HF and Barstow (a distance of about 20 miles). There is only continuity of surface flow between the HF and Barstow during extreme storm events. During dry periods, sometime lasting many years, there is no flow in this reach of the river.

The statistical analysis presented by Aquilogic, intending to correlate pumping and water level change, and concluding that diminished flow into Centro must be the reason for declining water level in the GSWC wells, ignores time and distance, in its conclusion. As indicated above the average annual flow at HF is about 36,000 AF per year and has not significantly changed over time. In any given year, the flow will be substantially less than or greater than 36,000 AF, and in fact, it is likely to be low in some years. But the limited variability in water levels in the TZ as reflected in the hydrographs indicates little if any change in storage within the TZ over time; hence storms pass through the TZ in much the same way as they have in the past.

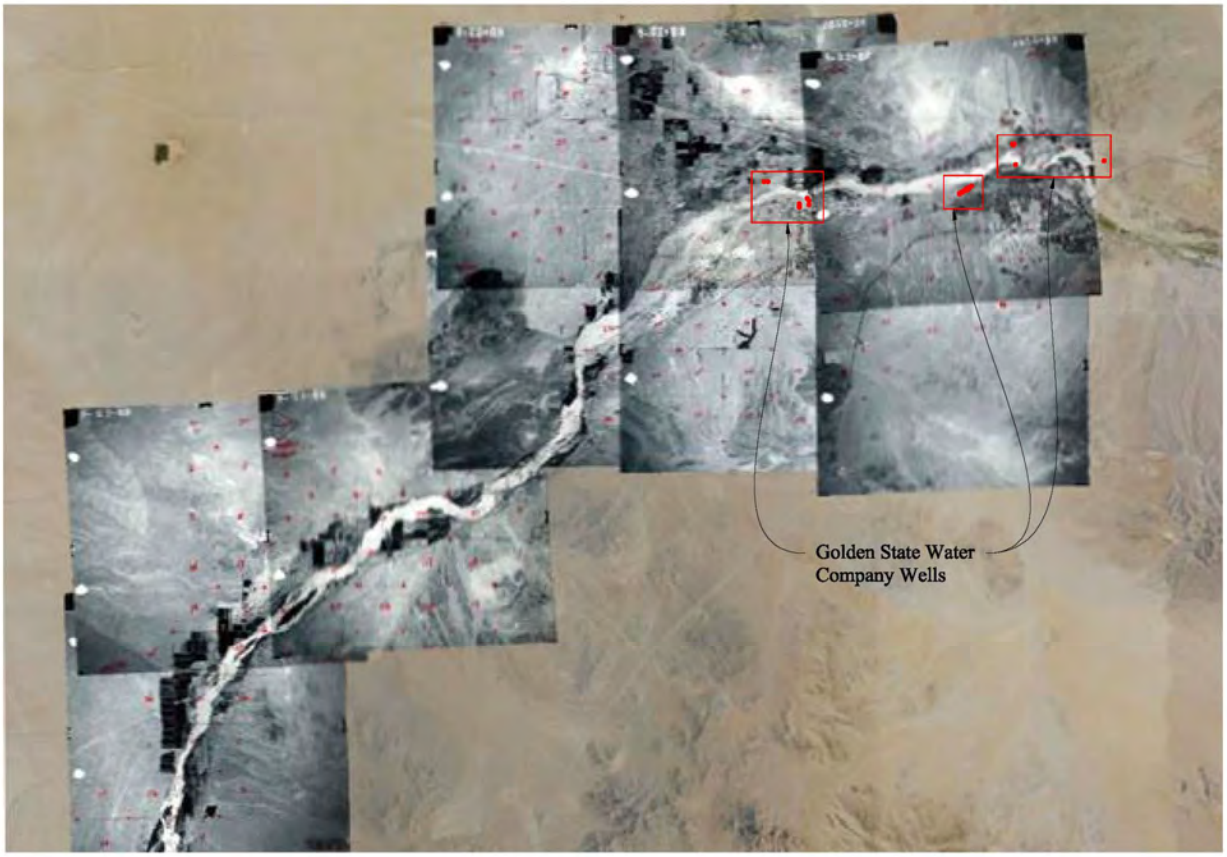


Figure 4. Aerial imagery of the area of interest taken in 1969 with the 2022 background image.

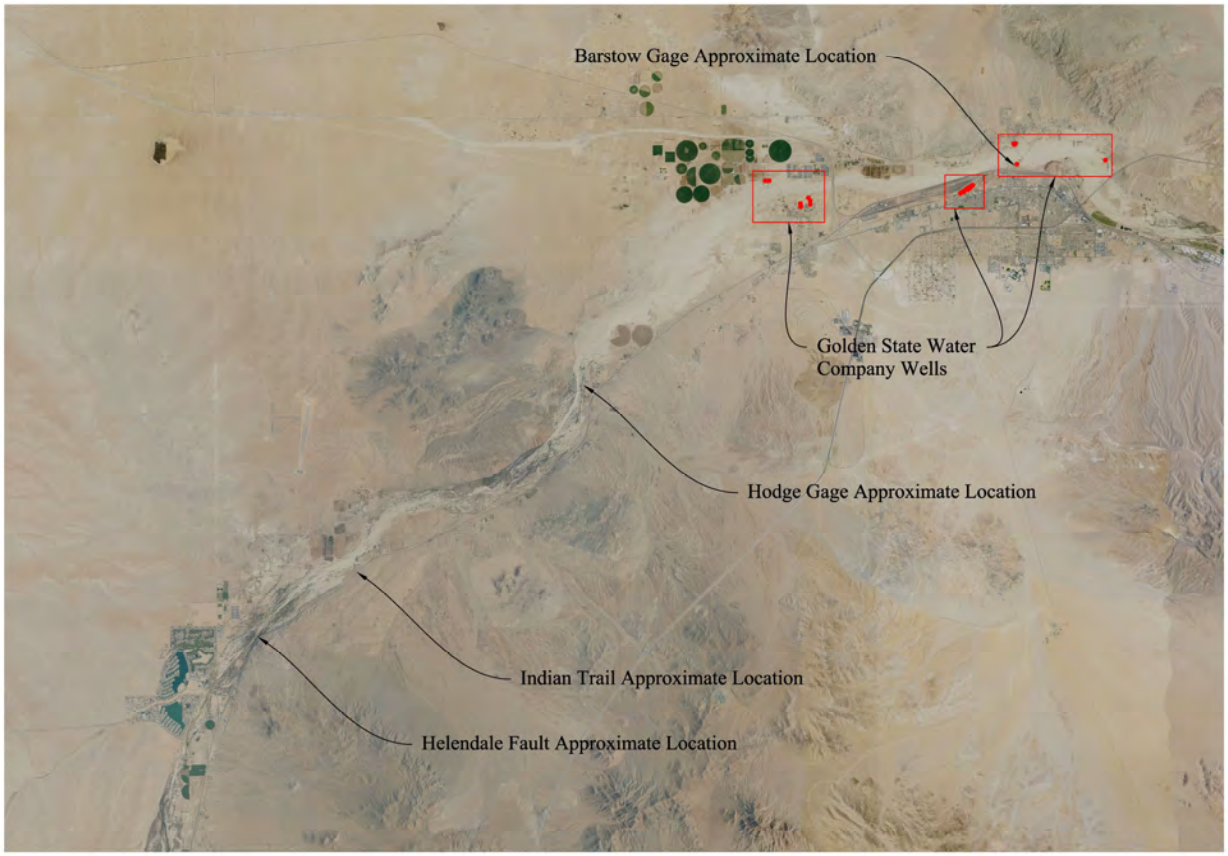


Figure 5. Aerial imagery of the area of interest taken in 2022.

Statistical Analysis From Expert Report

Section 5 of the Expert Report is the analysis of water levels in the GSWC production wells. The figures shown in the Expert Report contain monthly Mojave River flows, measured at the Lower Narrows stream gage. The Expert Report provides a qualitative analysis of the relationship of stream flows and depth to water by stating that depth to water generally decreases during and after large storm events, (i.e., groundwater levels rise when Mojave River flows are higher). However, this does not support the Expert Report conclusion that the flow that enters Centro from the Transition Zone has been declining over the years for reasons other than diminished flow directly attributable to the severe drought conditions experienced from 2012 to 2022. The correlation between groundwater level rise and flows in the Mojave River is well known and is not disputed by the Watermaster. What is not addressed by the Expert Report is that the portion of streamflow that can eventually reach GSWC's extraction wells depends on a complex set of processes that a simple correlation cannot capture. These processes include but are not limited to the impact of severe drought conditions during various time periods, flow-impeding faults, frequency and intensity of the storms, prior state of the basin (due to dry

conditions and past pumping patterns), groundwater flow patterns and transmissivity distribution (ability of the sediments to transmit water). An intense and fast-moving storm might generate less recharge and generate more surface outflow from Centro to Baja. Also, as noted above, the normally dry channel between HF and Barstow will induce more recharge in that area.

The Expert Report's statistical analysis of depth to water versus pumping is based on the hypothesis that if chronic water level decline is due to over-pumping alone, there should be a correlation between pumping and depth to water. Similarly to the explanation given in the previous paragraph, this approach overlooks the complexity of the aquifer system and the processes that determine water levels. Also, the correlation presented by the Expert Report are calculated using pumping rate from the well where the water level is measured. Such an approach overlooks the fact that a well can be influenced by pumping from other wells in the basin or even the same wellfield. Even with this approach the results are not convincingly conclusive as 5 out of 17 wells are indicated to have statistically significant correlations/trends that show depth to water decreasing (water level rises) as pumping magnitude increases which shows that the aquifer system has more complexity than this simplified method can capture. Ultimately the lack of a clear correlation between water levels and pumping does not prove that chronic decline of water levels in the GSWC wells is due to a decline of inflow into Centro, except during periods of extreme drought such as occurred from 2012 to 2022. Other explanations that take into account the complexity of the basin should be considered. As an example, a well-calibrated model is a much better tool for this type of study as it incorporates the actual physical laws of groundwater flow, surface geology, and hydro-stratigraphy (geometry and extent of aquifers).

Importantly, there are many other possible reasons for water level declines in the GSWC wells other than the conclusion in the Expert Report, i.e. that the only possible reason is reduced outflow to Centro from Alto. For example:

1) Reduced flows to Centro through the HF during periods of extreme drought, such as was experienced from 2012 to 2022
2) The conclusion is incorrect based on the correlation; 5 of 17 wells indicate water level increases with pumping
3) Pumping by other wells in the area influence the GSWC water level measurements
4) Recharge between the HF and Barstow due to its dry channel characteristics and decades of pumping between 1950 and 1990
5) Export of domestic return flow to the Barstow WWTP located downstream near the Baja Centro boundary
6) Concentrated pumping within the narrow cross section, fault bounded area near GSWC's production wells and others
7) Pumping by nearby Agricultural interest that purchase excess Free Production Allowance from GSWC

8) Recharge lost to the north around Iron Mountain and through the Hinkely Gap, both toward Harper Lake

Table 4-3 of the Expert Report, Aquilogic described the various components of the estimated water budget for the Transition Zone. On this table, Aquilogic marked some entries as "Assumed". The "assumed" entries include the subsurface outflows (2,000 AFY), and the Consumptive Use by phreatophytes (6,000 AFY). Subsurface outflows are not assumed. This value was established by the parties to the Judgment. The Consumptive Use by phreatophytes was determined by the Lines and Bilhorn study from 1996 and is considered representative of long-term conditions in the area. These amounts were agreed to by the parties and California Department of Fish and Wildlife.

The Expert Report states that Watermaster's calculations of the amount of consumptive use by agriculture and phreatophytes are based on outdated studies and techniques and recommend the use of satellite remove sensing data to redefine the estimates of ET. The Expert Report recommends Watermaster consider installing a new stream gage near the Helendale Fault. If this is determined to be infeasible, the Expert Report recommends the use of remote sensing to approximate the Mojave River flow discharge, and the approximations can be calibrated with stream gage measurements at the existing USGS gages (Lower Narrows, Hodge, and Barstow).

In response to these recommendations, Watermaster has not refused and is not opposed to use of remote sensing technologies to improve and/or update estimates of consumptive use by agriculture and phreatophytes. Watermaster is working on studying the riparian vegetation using satellite-based remote sensing tools to update consumptive use values for Phreatophytes. However, there are limitations in the ability of remote sensing to accurately determine the quantity of river flows, particularly in the environment existing at the HF compounded with the relative infrequency of significant storm events resulting in detectable storm flow at the HF, as will be explained in Mr. Wagner's declaration,

We note that making reliable measurements in wide sandy unstable channels like the Mojave River is challenging as the channel geometry, a critical element in stream flow calculation is constantly changing. Furthermore, the episodic occurrence of flow makes direct measurements, upon which reliable stream gage calculations also depend, hard to collect, as predicting when to mobilize staff to make a measurement is dependent on the episodic nature of the flow in the river. Static measurements (staff gage) or remote sensing techniques, will be highly unreliable in such environments. Regarding the of use of remote sensing to approximate the Mojave River flow discharge, Watermaster will study this recommendation and implement this as appropriate or necessary.

Watermaster has met with representatives of GSWC several times in the past in a series of meetings that were interrupted by the Covid pandemic:

June 11, 2019, MWA Office 1-3 p.m. (MWA staff and GSWC staff and attorney)

October 23, 2019, MWA Office, 1:30 – 3:30 p.m. MWA staff and GSWC staff and attorney)
February 10, 2022, Helendale Field Trip, (Allison Febbo/Tony Winkle, Dave Peterson, WBE, with Toby Moore and GSWC staff)

Among issues raised by GSWC, were the installation of an additional stream gaging station, and geophysical investigations.

Subsequently, MWA, installed a stream gage at Hinkley Road near Hodge, upstream of the GSWC wells. MWA also conducted extensive geophysical investigations (approximately $150,000) in the area of Helendale.

MWA also imported 1,994 AF of water in 2022 to address impacts to GSWC wells due to drought. That water was delivered to the Lenwood recharge site that benefits the area where GSWC wells are located. During 2023 MWA imported 9,229 AF to the Hodge and Lenwood recharge sites near GSWC wells. The total amount imported to the Mojave Basin Area was 94,690 AF (Jeffrey Ruesch, Watermaster Service Manager).

MWA is also working to expand its current Upper Mojave River Basin Model which will include the TZ, Centro, and Baja subareas. In June of 2024 we informed the Court that this work was in progress and scheduled to be completed by the end of 2024 (The Mojave Regional Groundwater Model). The model expansion will inform the estimates of flow into the Centro subarea, the water balance in the TZ, and provide tools for evaluating recharge and pumping scenarios for optimal basin management.

Enclosures:

Exhibit A – Alto Transition Zone Hydrographs 2024

Exhibit B – Centro Subarea Hydrographs 2024

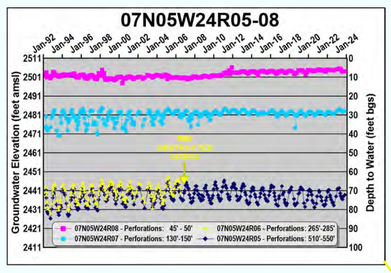
Exhibit C – Centro Subarea 08N04W21M01_04 Hydrographs

Exhibit D – Centro Subarea 08N4W12Q01 Hydrograph

Exhibit E – Centro Subarea 08N03W04A07 Hydrograph

EXHIBIT A

07N05W24R05-08



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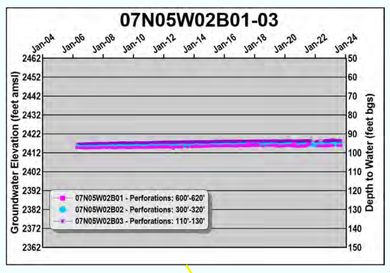

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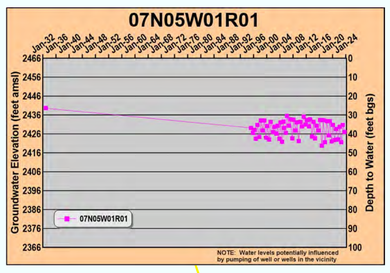

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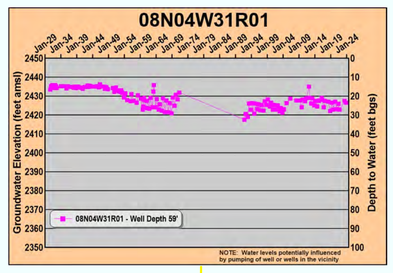

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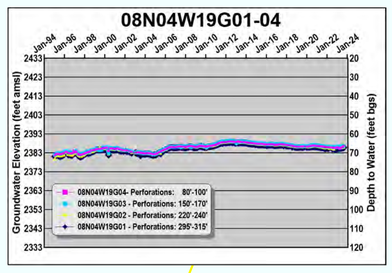

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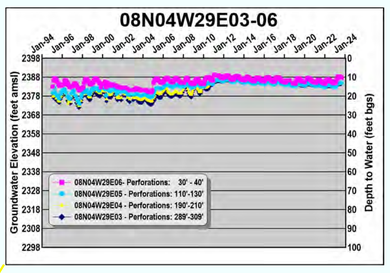

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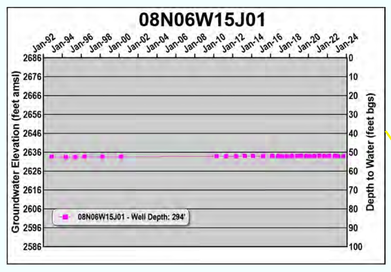

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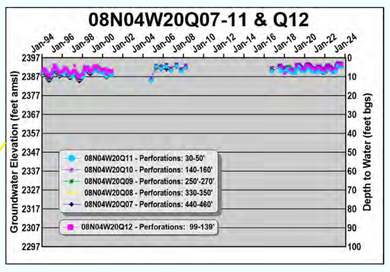

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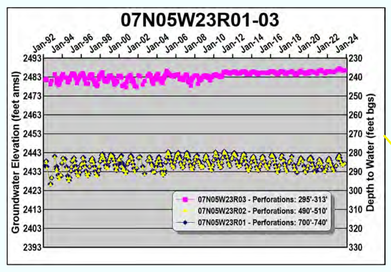

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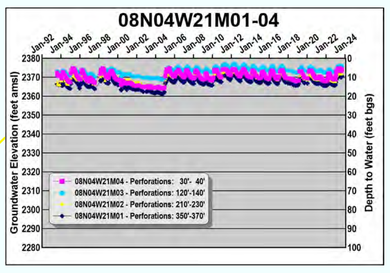

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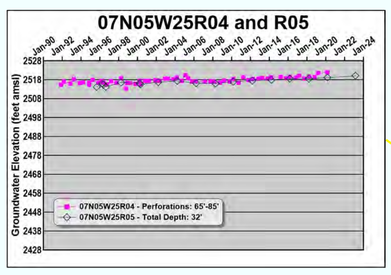

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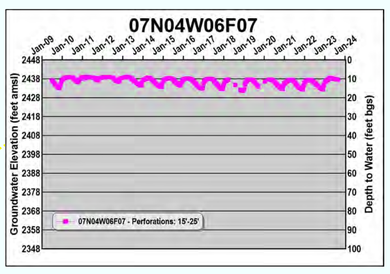

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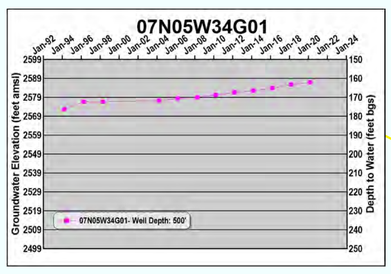

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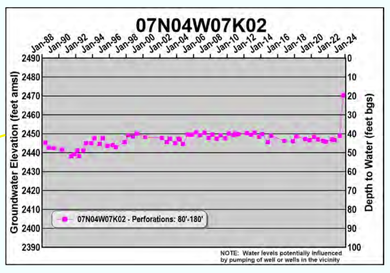

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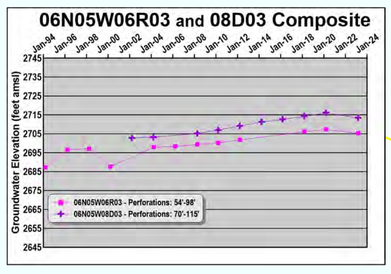

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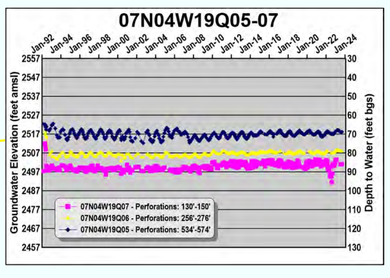

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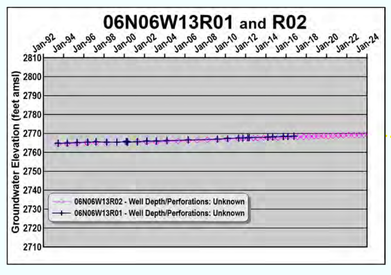

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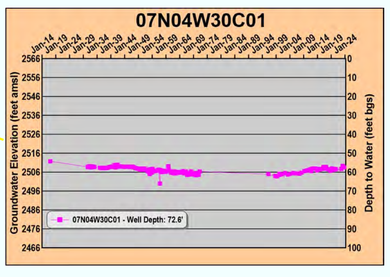

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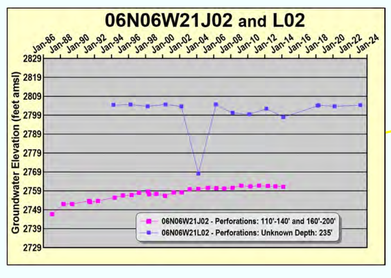

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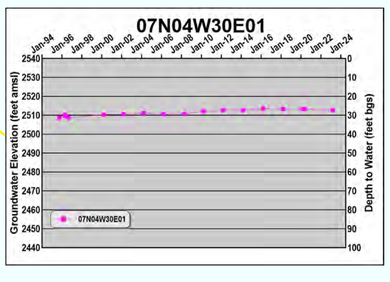

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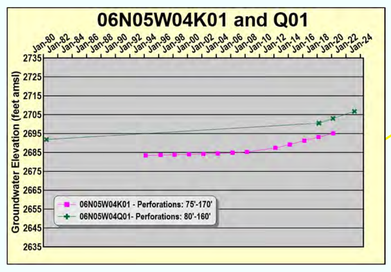

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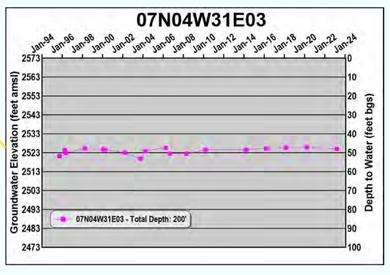

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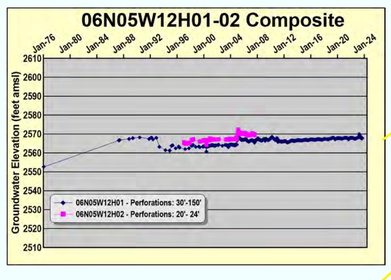
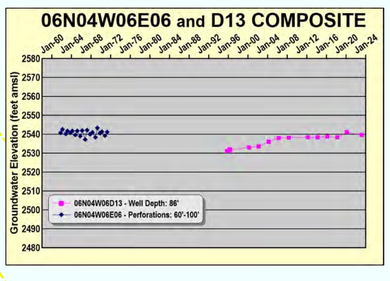
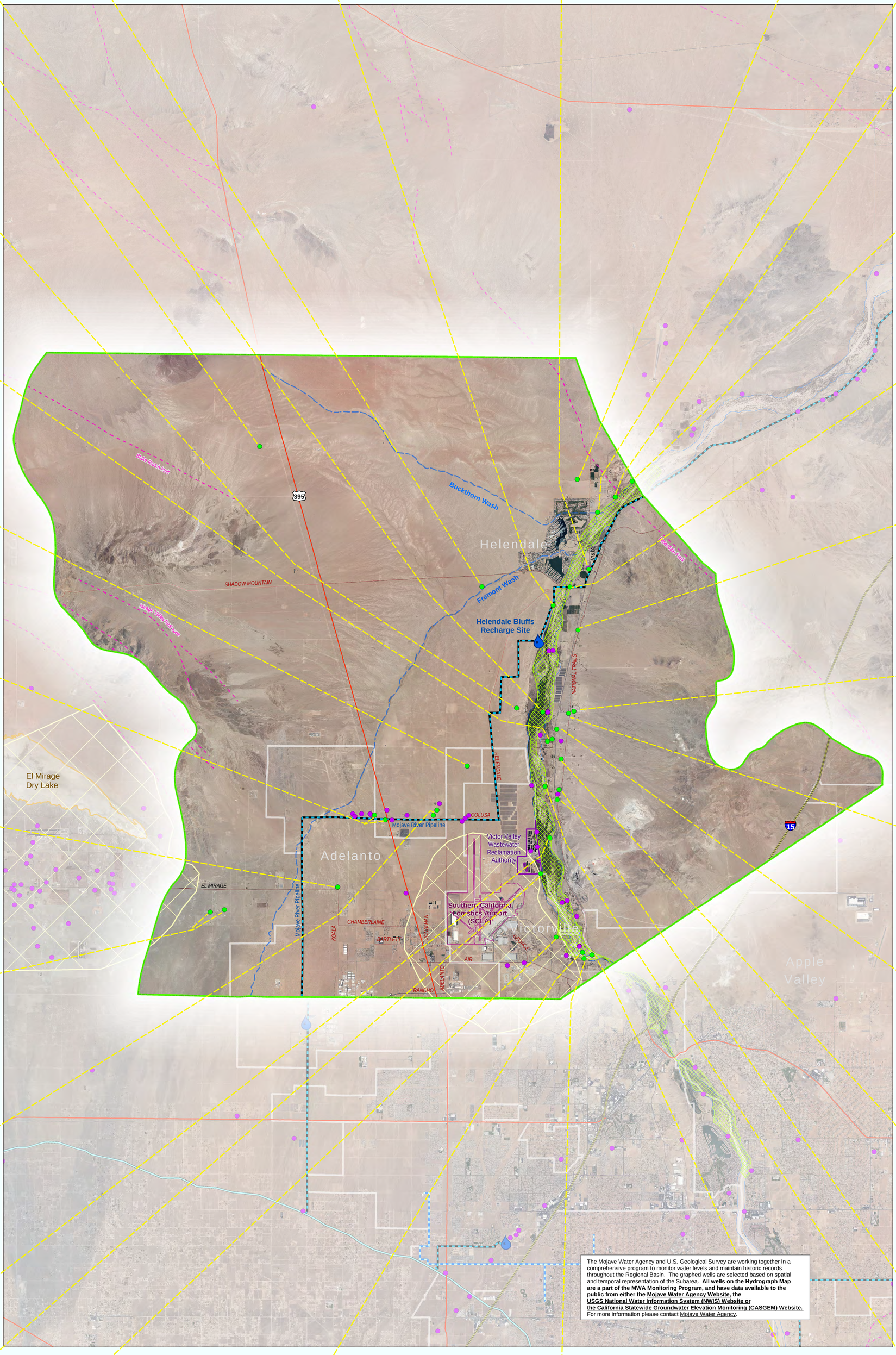


06N04W06E06 and D13 COMPOSITE





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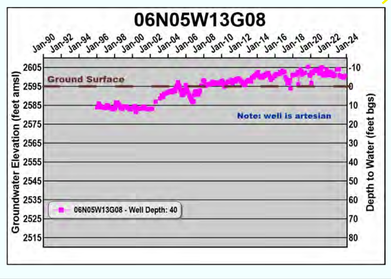

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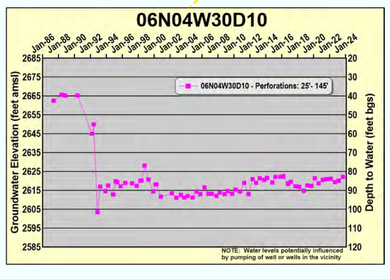

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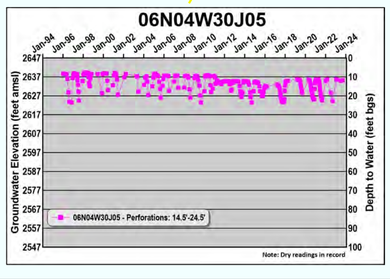

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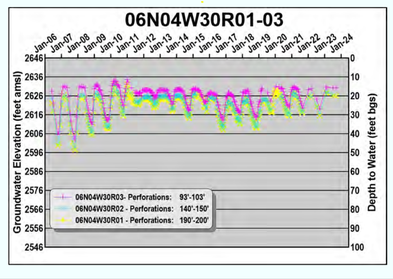

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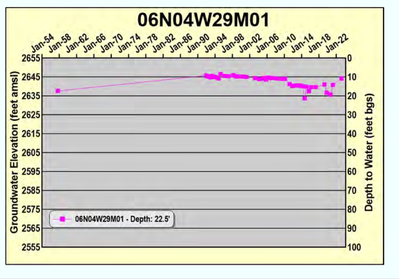

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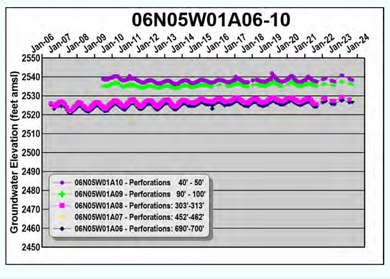


Mojave Water Agency

Data Sources:
MWA, US Census
USGS/NWIS,
DWR Bulletin 84 1967
Date: January 2024
Mojave Water Agency
Water Resources Department

- Graphed Wells
- MWA Monitoring Program Wells
- MWA Potable Pipeline
- MWA Recharge Pipeline
- CA Geologic Faults (CGS, USGS)
- USGS Perched Water Table

Alto Subarea Transition Zone Hydrographs 2024

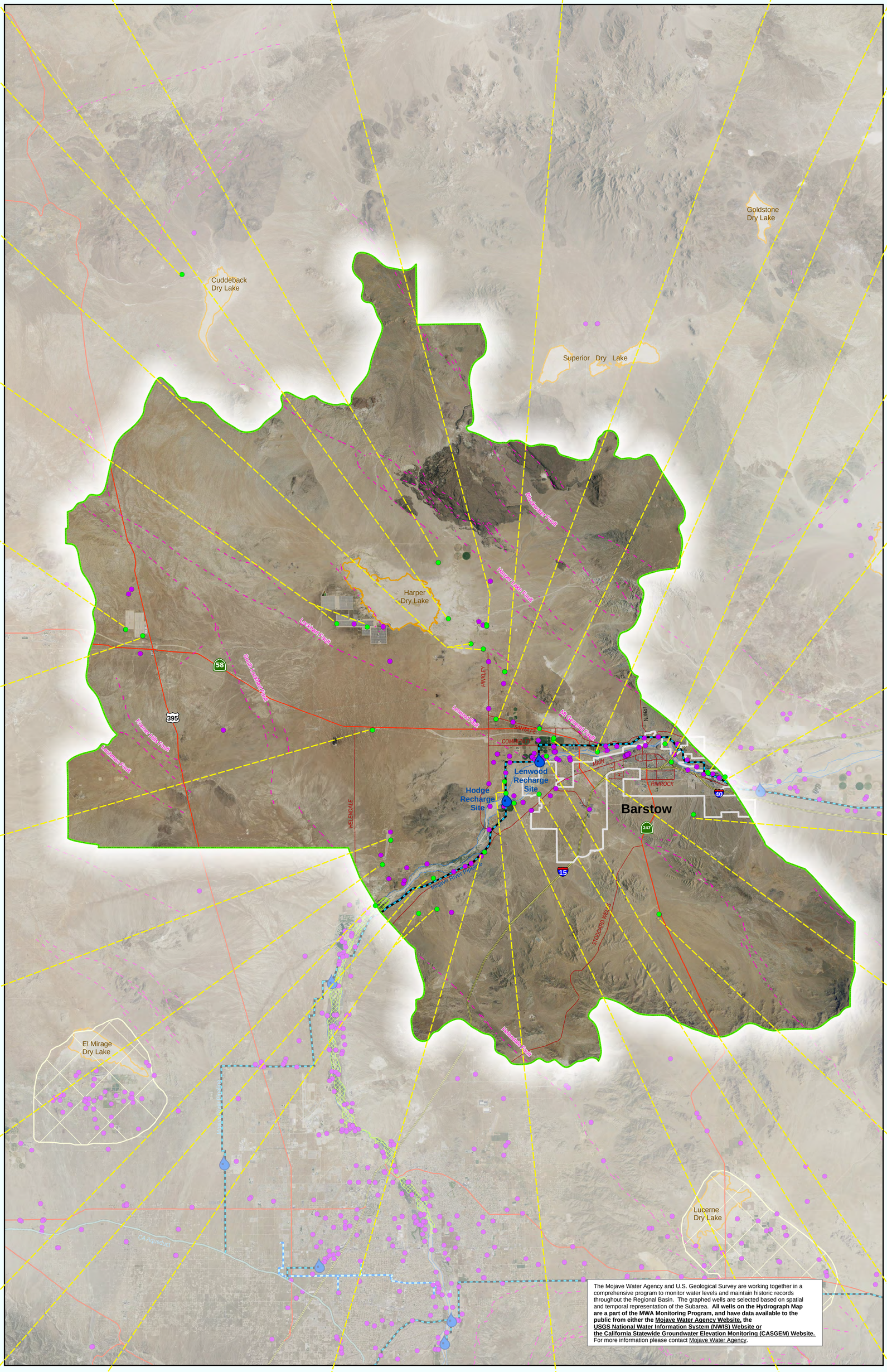
- Recent record
- Long-term record (begins ~1950 to ~ 1980)
- Very long-term record (begins ~1920)

0 0.5 1 2
Miles

N

EXHIBIT B

Centro Subarea Hydrographs 2024



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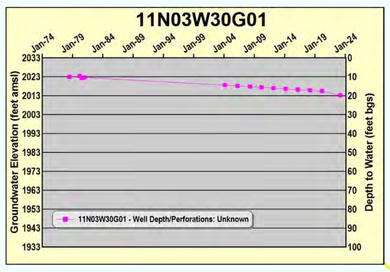

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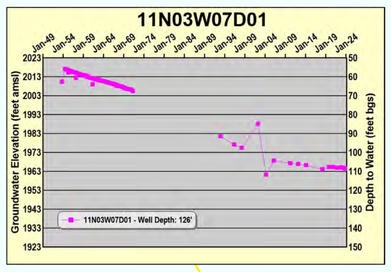

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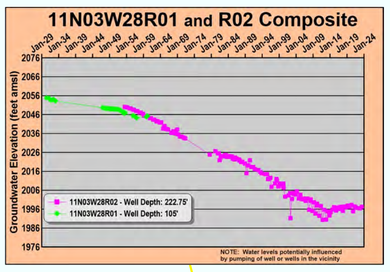

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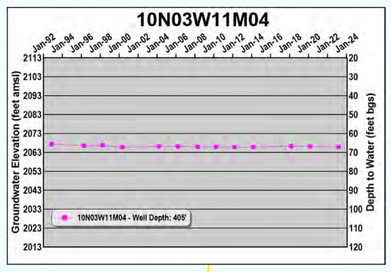

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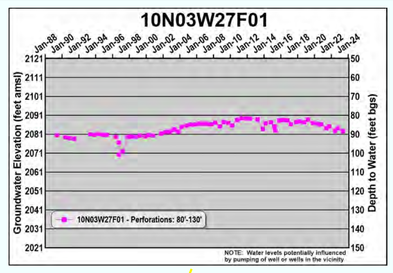

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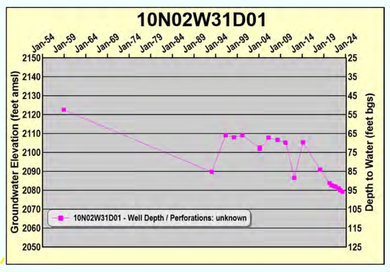

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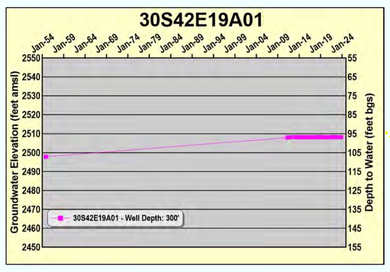

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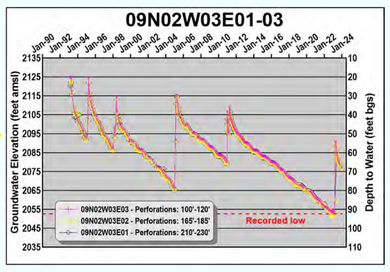

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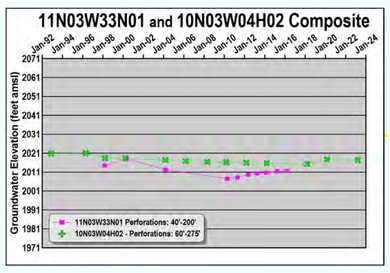

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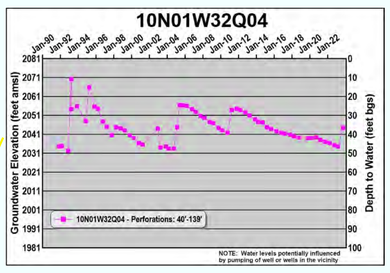

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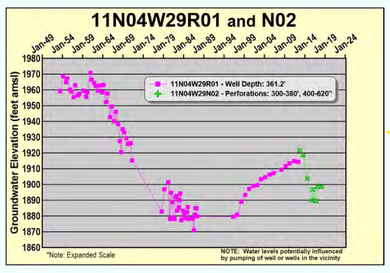

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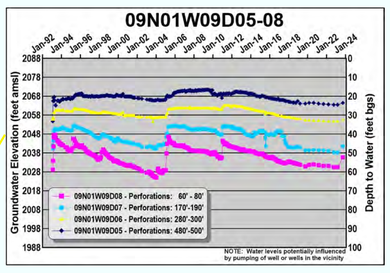

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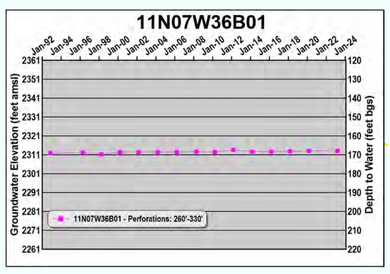

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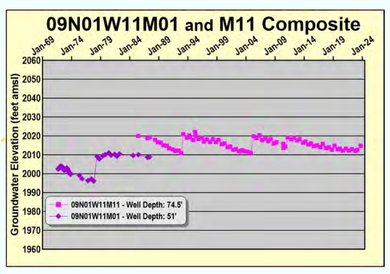

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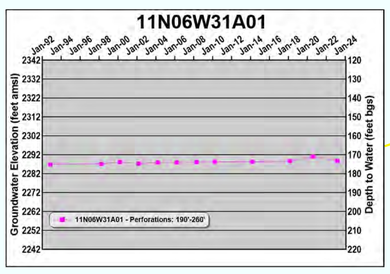
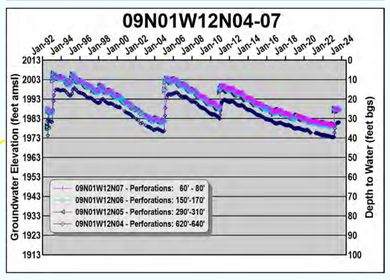


09N01W12N04-07



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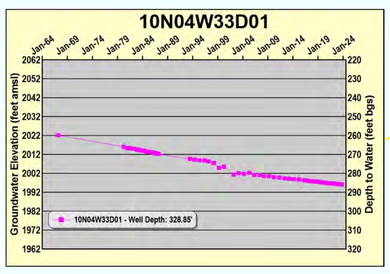

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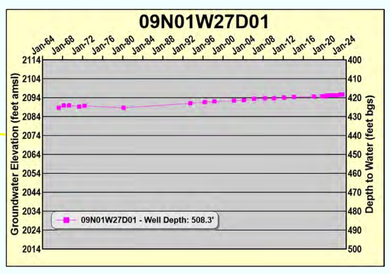

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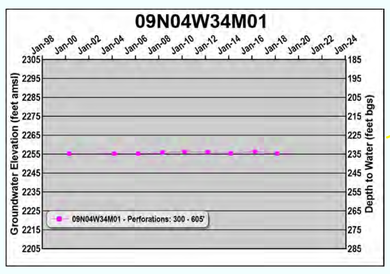

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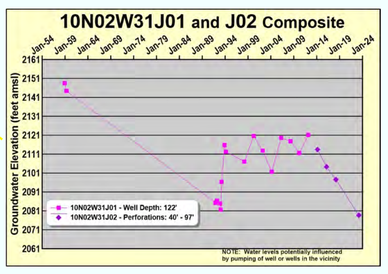

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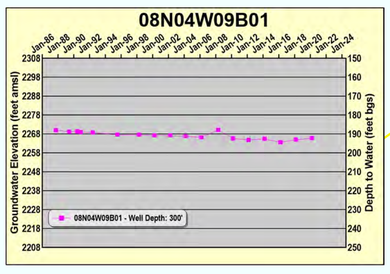

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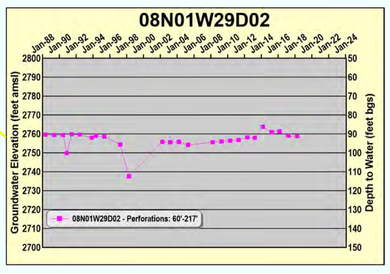
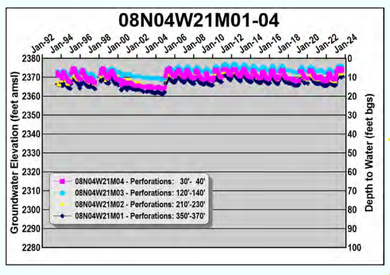


08N04W21M01-04



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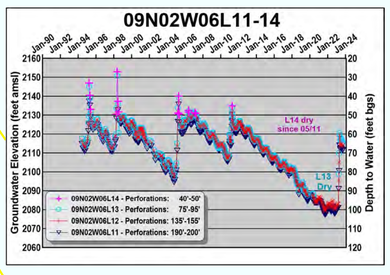
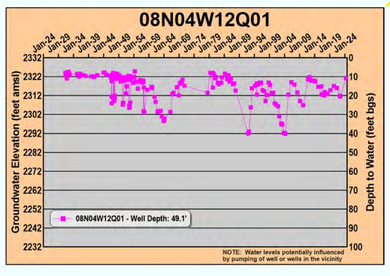


The Mojave Water Agency and U.S. Geological Survey are working together in a comprehensive program to monitor water levels and maintain historic records throughout the Regional Basin. The graphed wells are selected based on spatial and temporal representation of the Subarea. **All wells on the Hydrograph Map are a part of the MWA Monitoring Program, and have data available to the public from either the Mojave Water Agency Website, the USGS National Water Information System (NWIS) Website or the California Statewide Groundwater Elevation Monitoring (CASGEM) Website.** For more information please contact Mojave Water Agency.

08N04W12Q01



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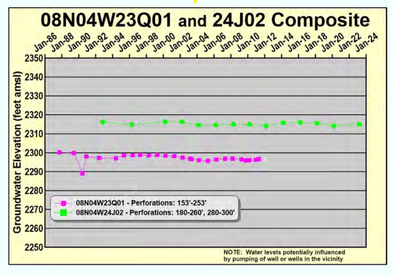

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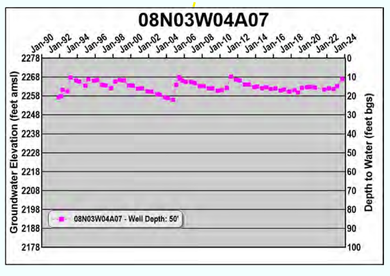
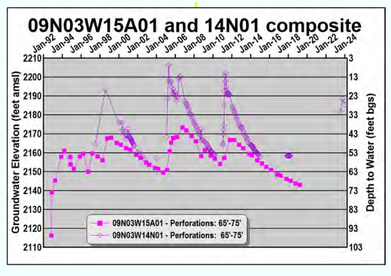
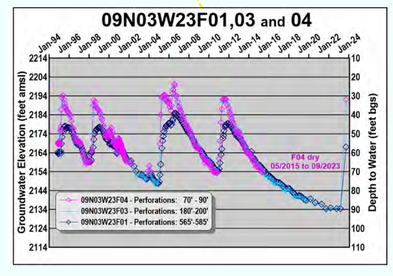


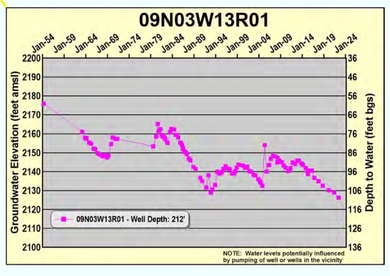
09N03W15A01 and 14N01 composite



09N03W23F01,03 and 04



09N03W13R01



Mojave Water Agency

Data Sources:
MWA, US Census
USGS/NWIS,
DWR Bulletin 84 1967
Date: January 2024
Mojave Water Agency
Water Resources Department

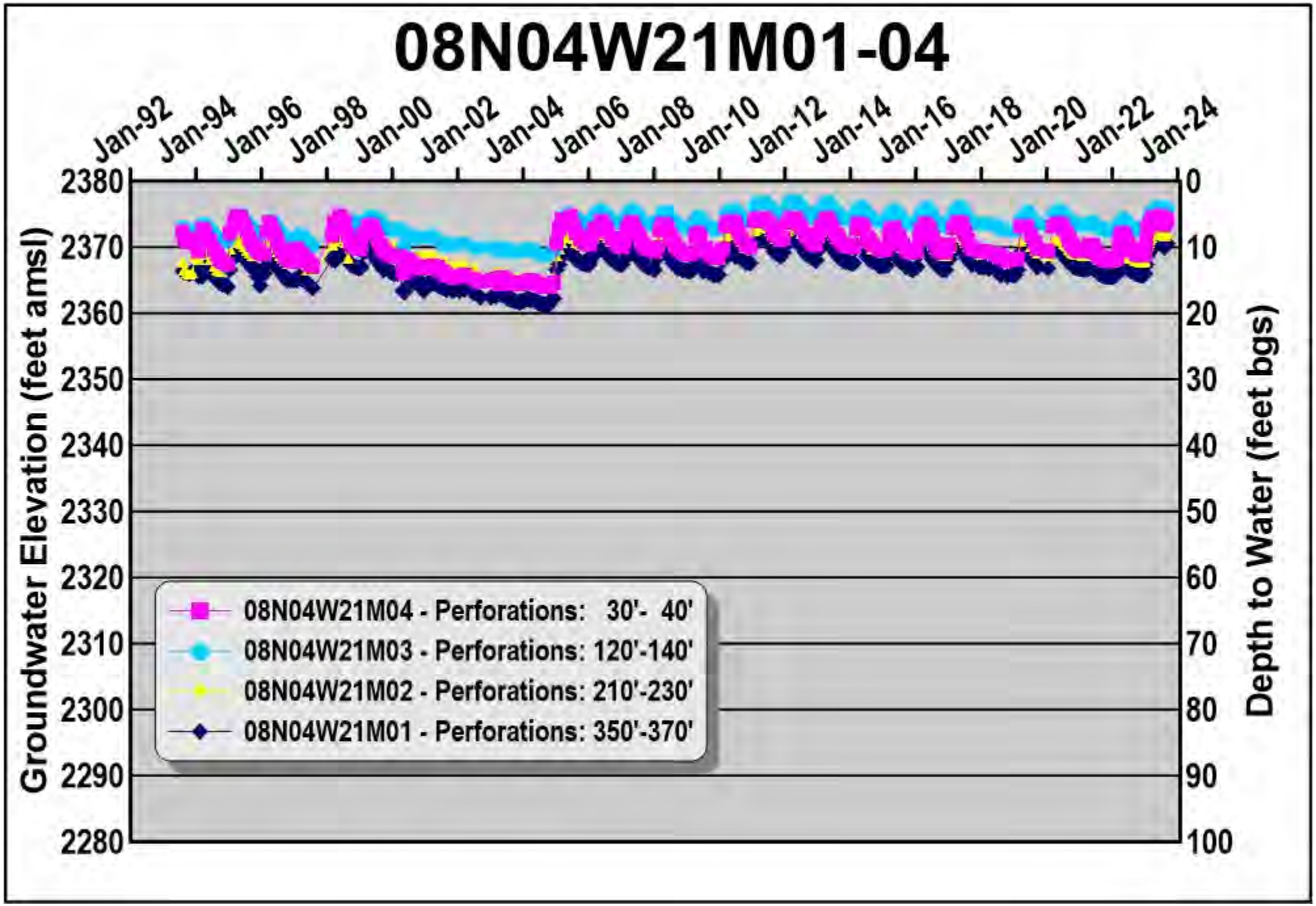
- Graphed Wells
- MWA Monitoring Program Wells
- CA Geologic Faults (CGS, USGS)
- Exhibit H Riparian Habitat Area
- MWA Recharge Site
- MWA Potable Pipeline
- MWA Recharge Pipeline
- USGS Perched Water Table

- Recent record
- Long-term record (begins ~1950 to ~ 1980)
- Very long-term record (begins ~1920)

0 1 2 4
Miles

N

EXHIBIT C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Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
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Jan-10
Jan-12
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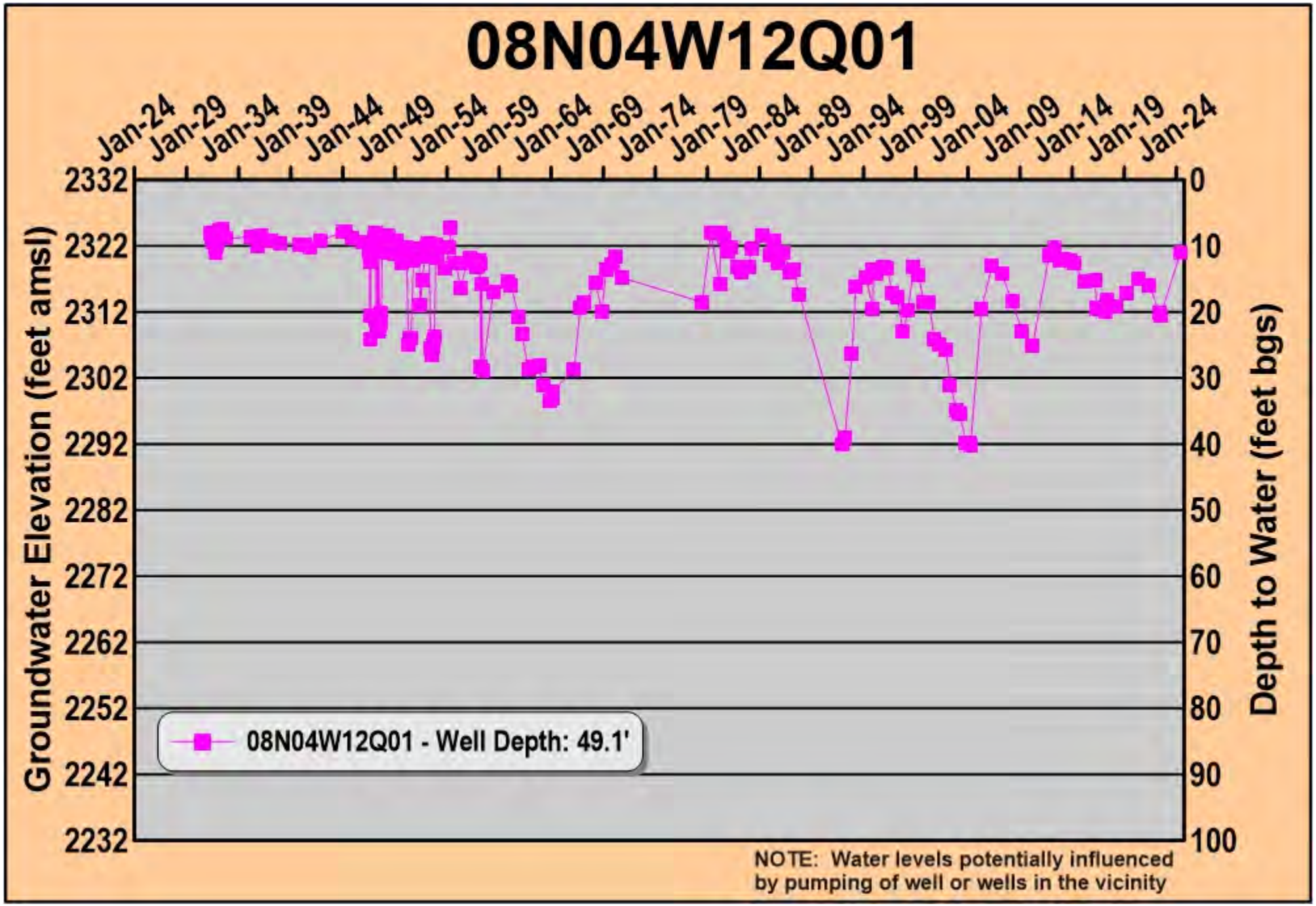
Jan-16
Jan-18
Jan-20
Jan-22
Jan-24
2380
2370
2360
2350
2340
2330
2320
2310
2300
2290
2280
0
10
20
30
40
50
60
70
80
90
100
Groundwater Elevation (feet amsl)
Depth to Water (feet bgs)
08N04W21M04 - Perforations: 30'- 40'
08N04W21M03 - Perforations: 120'-140'
08N04W21M02 - Perforations: 210'-230'
08N04W21M01 - Perforations: 350'-370'

EXHIBIT D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Jan-24
Jan-29
Jan-34
Jan-39
Jan-44
Jan-49
Jan-54
Jan-59
Jan-64
Jan-69
Jan-74
Jan-79
Jan-84
Jan-89
Jan-94
Jan-99
Jan-04
Jan-09
Jan-14
Jan-19
Jan-24
Groundwater Elevation (feet amsl)
2332
2322
2312
2302
2292
2282
2272
2262
2252
2242
2232
Depth to Water (feet bgs)
0
10
20
30
40
50
60
70
80
90
100
08N04W12Q01 - Well Depth: 49.1'
NOTE: Water levels potentially influenced by pumping of well or wells in the vicinity

EXHIBIT E

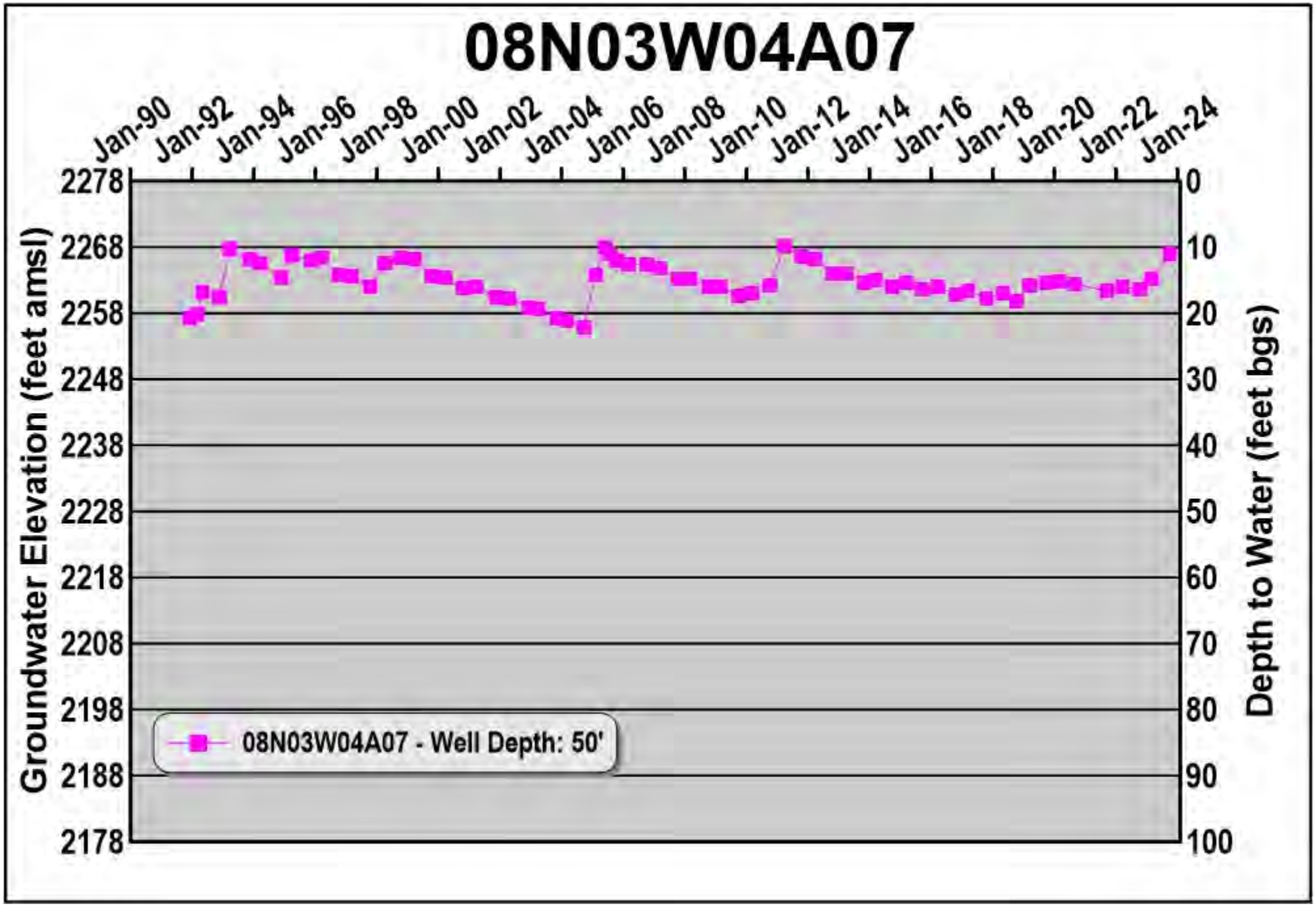
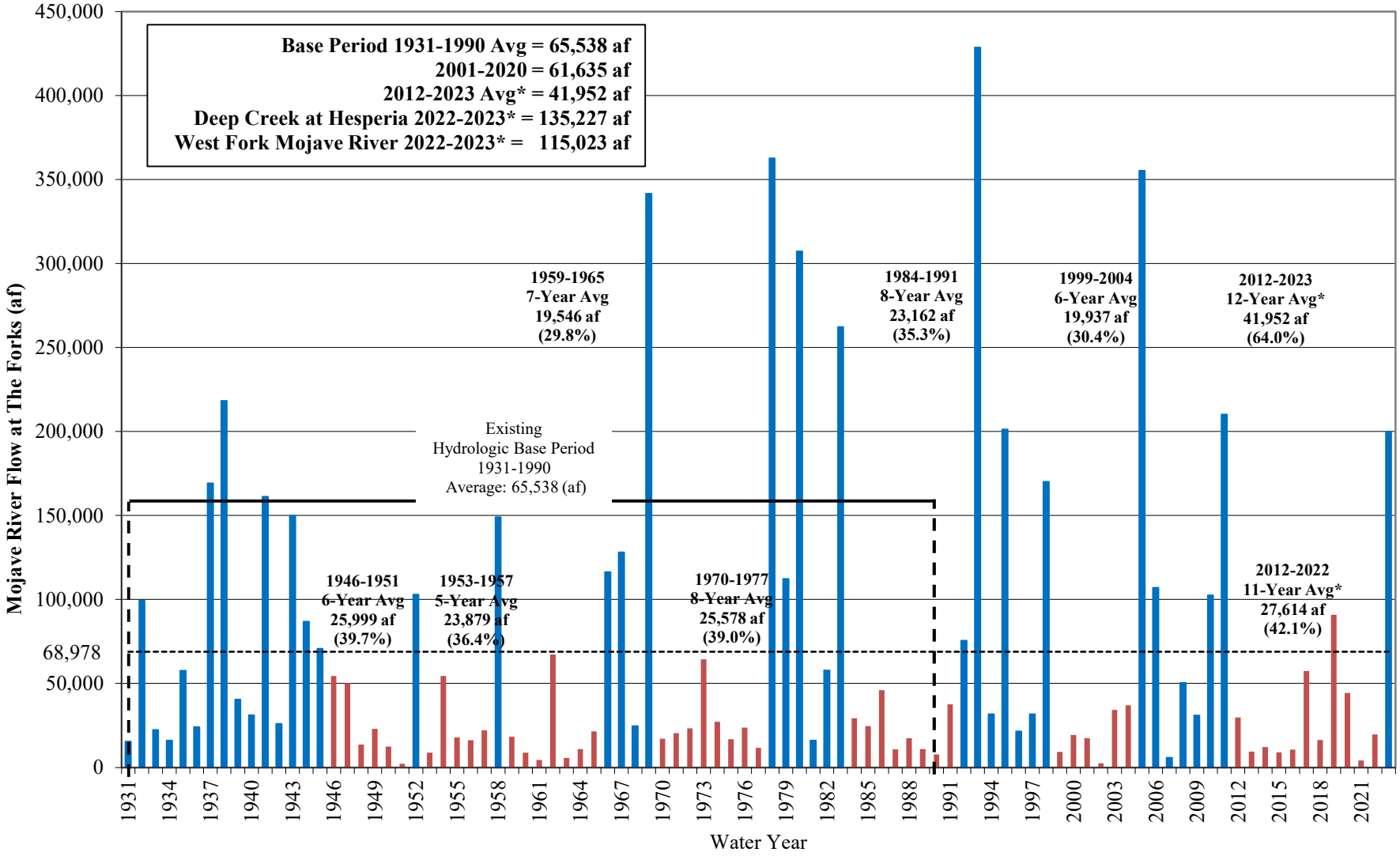

08N03W04A07
Jan-90
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Jan-22
Jan-24
2278
2268
2258
2248
2238
2228
2218
2208
2198
2188
2178
Groundwater Elevation (feet amsl)
0
10
20
30
40
50
60
70
80
90
100
Depth to Water (feet bgs)
08N03W04A07 - Well Depth: 50'

EXHIBIT 2

* Preliminary data, subject to revision.

Mojave River Flow at The Forks
Water Years 1931 - 2023



Note: Discharge of Mojave River at The Forks from the addition of values as reported from USGS stations at West Fork Mojave River Near Hesperia, CA (10261000), and Deep Creek Near Hesperia, CA (10260500) from 1931-1971, the greater of 10260500 and Mojave River Below Forks Reservoir Near Hesperia, CA (10261100) from 1972-1974, and the addition of West Fork Mojave River Above Mojave River Forks Reservoir Near Hesperia, CA (10260950) and 10260500 from 1975-Present.

EXHIBIT 3

DRAFT

Transition Zone Water Balance

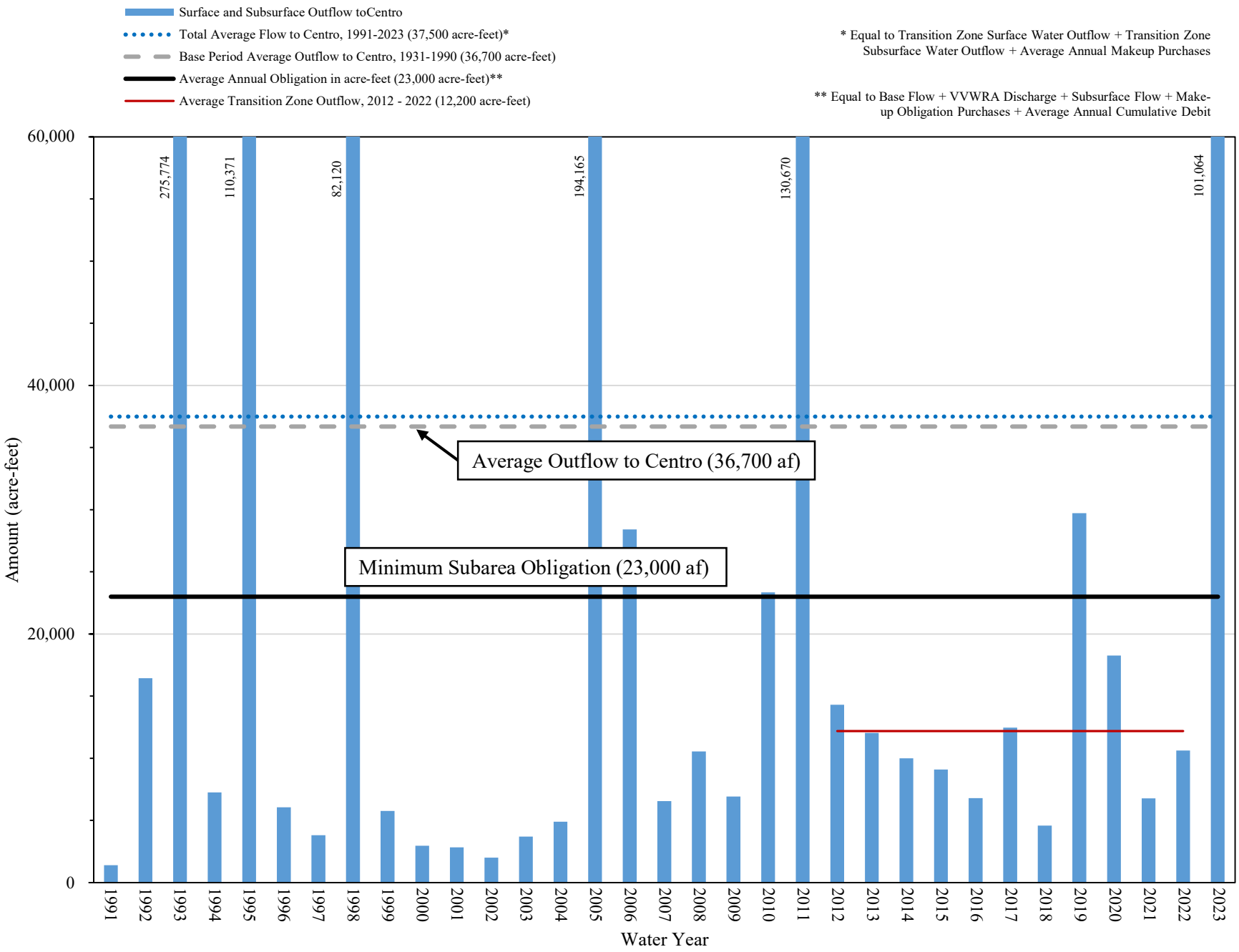


EXHIBIT 4

Monitoring Method by Percentage of Production
Transition Zone Producers

Water Year	Flowmeter	Pump Test[1] (Electrical Records)	Natural Gas Records	Estimates	Load Count by Truck	No Use, Property Sold 2020, BAP separated.	Total Production (AF)
2023	90.1%	9.8%	0.01%	0.04%	0.04%	0.00%	11,221
2022	89.9%	10.1%	0.01%	0.03%	0.03%	0.00%	12,040
2021	87.9%	12.0%	0.01%	0.03%	0.03%	0.00%	11,804
2020	88.6%	11.3%	0.01%	0.04%	0.04%	0.00%	11,223
2019	89.2%	10.7%	0.01%	0.04%	0.04%	0.00%	10,789
2018	89.3%	10.7%	0.01%	0.03%	0.03%	0.00%	11,484
2017	90.7%	9.2%	0.01%	0.04%	0.04%	0.00%	10,129
2016	96.3%	3.6%	0.02%	0.04%	0.04%	0.00%	9,515
2015	99.1%	0.3%	0.02%	0.25%	0.04%	0.36%	9,139
2014	99.3%	0.4%	0.02%	0.22%	0.04%	0.00%	10,522
2013	99.2%	0.7%	0.04%	0.04%	0.02%	0.00%	10,287
2012	99.1%	0.7%	0.04%	0.04%	0.04%	0.01%	10,242

Information derived from data maintained in Watermaster producer records.

Notes:

1) Water production reported by producers with flow meters.

2) Single agricultural producers, non-stipulating party, Cardoza Appellent measures and reports consistent with Watermaster rules

EXHIBIT 5

Centro Subarea
Estimated Water Balance
(2012-2022)

Inflow	**Flow (AF)**	**Notes**
Recharge	12,238	(1)
Return Flow	4,623	
Total Inflow:	**16,861**	
Outflow		
Baja Subsurface	1,462	(2)
Baja Surface	19	(3)
Phreatophytes	3,000	(4)
Production	20,046	(5)
Total Outflow:	**24,527**	
Difference	**(7,666)**	

Notes:

1. Derived from Figure 3-10 Watermaster Annual Report.
2. USGS Stamos 2001, page 87.
3. USGS stream flow at Barstow from 2012 to 2022.
4. USGS Lines and Bilhorn 1996.
5. Average verified production by Watermaster for 2012-2022 and includ

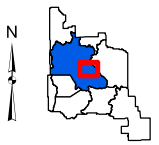
EXHIBIT 6

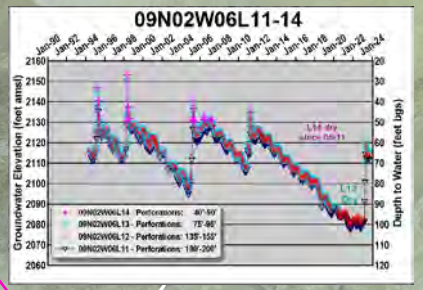
MOJAVE BASIN AREA WATERMASTER

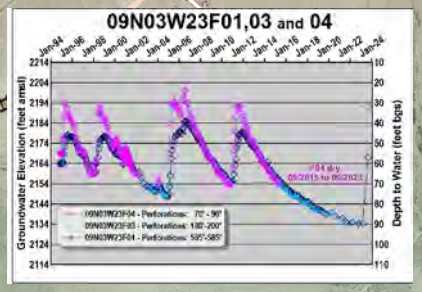
2022-23 Water Year Production
Hinkley and Barstow

Date of CIR Photo: June 2023

0 3,750 7,500 15,000 Feet







2022-23 Water Year Production

CA Geologic Survey Faults

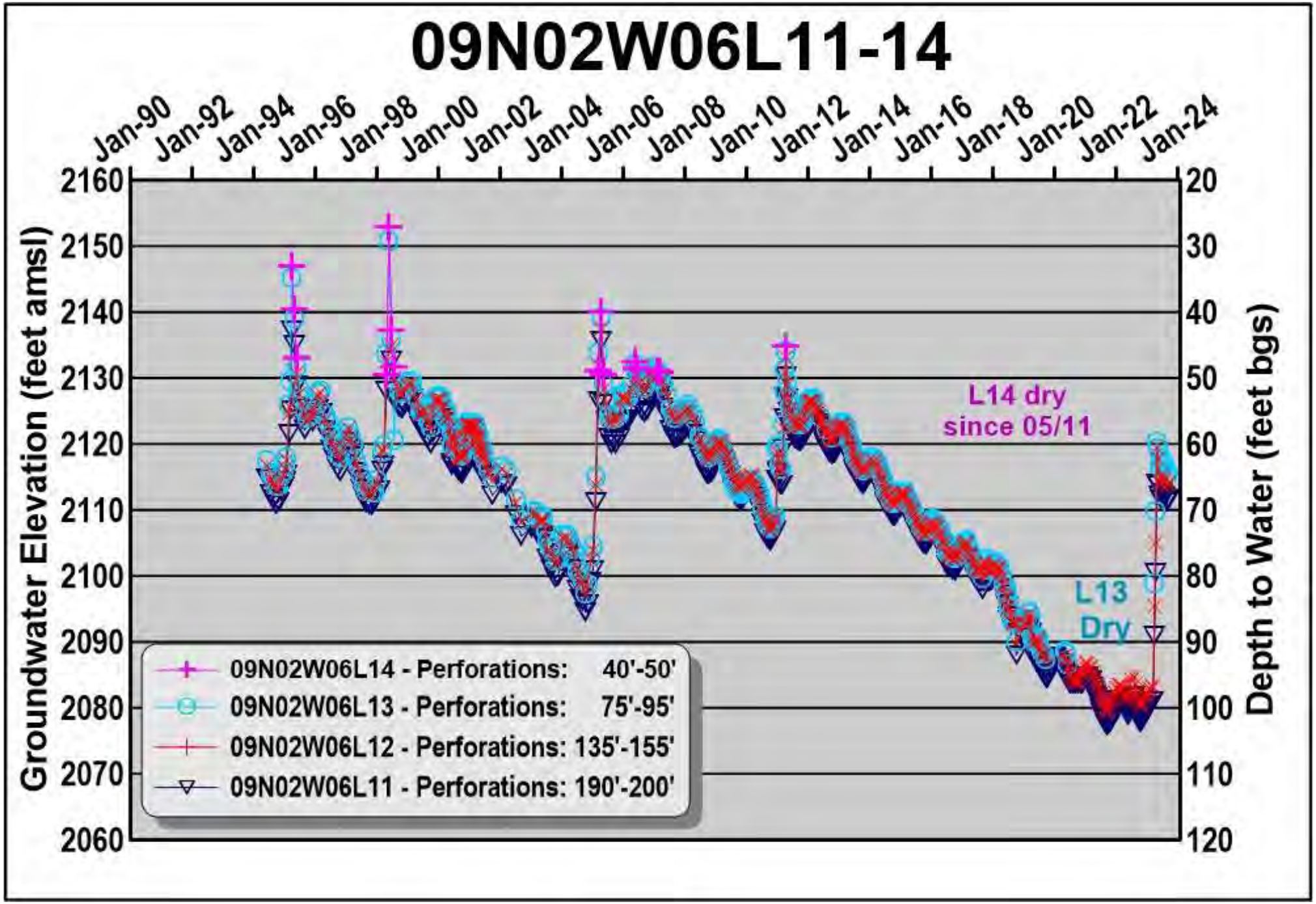
5,416 AF	Golden State Water Wells
741 AF	Hector Huerta Water Wells
2,352 AF	Vernola Trust Water Wells
2,236 AF	Pacific Gas & Electric Water Wells
578 AF	Ruisch Trust Water Wells
589 AF	Ruisch, et al. Water Well
302 AF	Harmsen Family Trust Water Wells

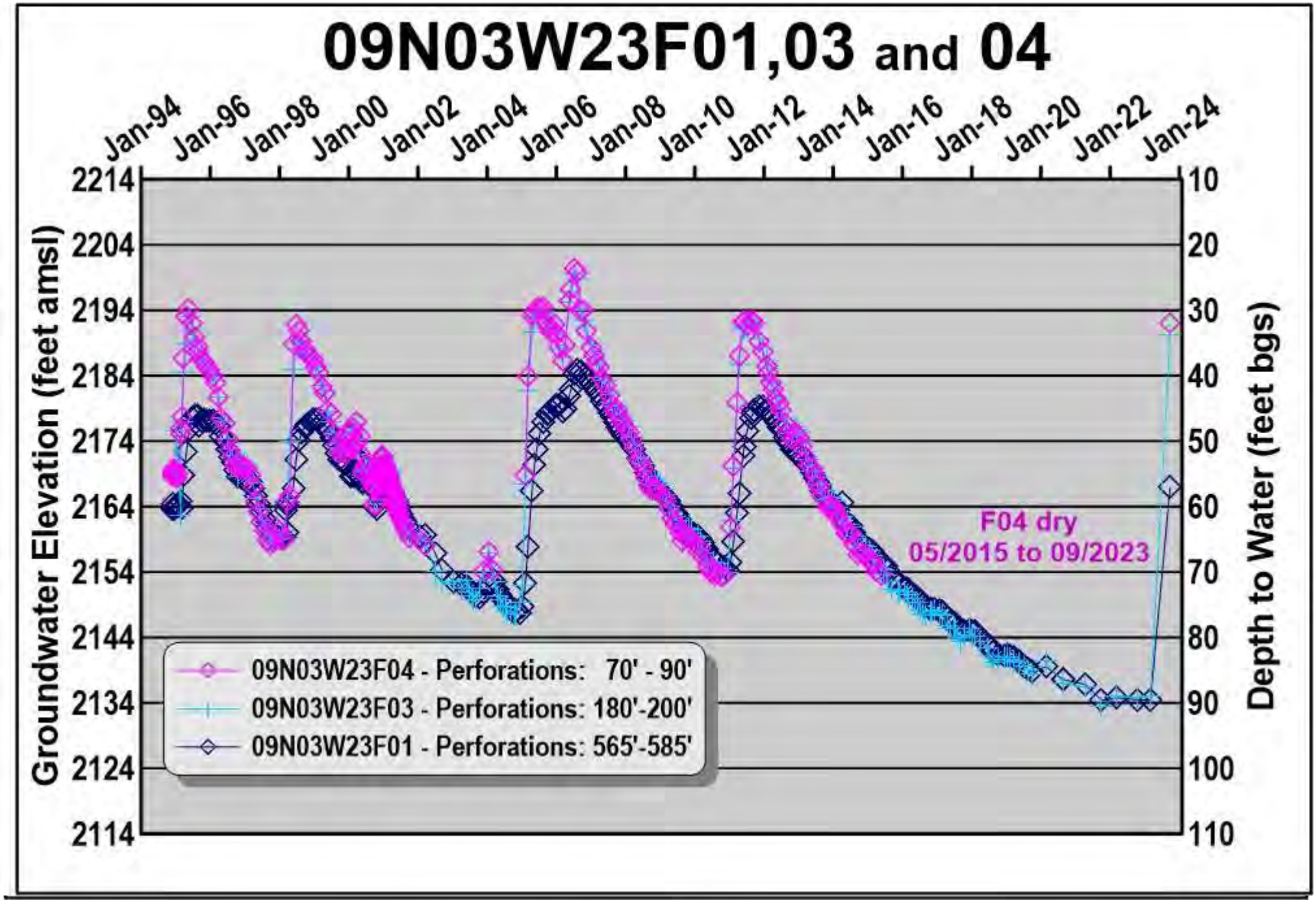
Verified Production in Indicated Areas

Water Year	Hodge to Barstow (AF)	Centro Subarea (AF)	Percentage of Total Centro Production
2016-17	13,580	17,905	76%
2017-18	14,134	19,112	74%
2018-19	13,926	18,231	76%
2019-20	12,723	16,756	76%
2020-21	14,169	18,132	78%
2021-22	12,784	15,422	83%
2022-23	12,214	14,840	82%
Total	93,530	120,398	78%

Water Sold to Hinkley Producers

Water Year	Acre-Feet
2009-10	1,500
2010-11	2,000
2011-12	1,800
2012-13	2,100
2013-14	2,300
2014-15	2,400
2015-16	2,400
2016-17	2,400
2017-18	2,400
2018-19	2,400
2019-20	2,400
2020-21	2,400
2021-22	2,400
2022-23	2,400
Total	31,300


09N02W06L11-14
Jan-90
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Jan-22
Jan-24
2160
2150
2140
2130
2120
2110
2100
2090
2080
2070
2060
Groundwater Elevation (feet amsl)
20
30
40
50
60
70
80
90
100
110
120
Depth to Water (feet bgs)
L14 dry
since 05/11
L13
Dry
09N02W06L14 - Perforations: 40'-50'
09N02W06L13 - Perforations: 75'-95'
09N02W06L12 - Perforations: 135'-155'
09N02W06L11 - Perforations: 190'-200'


09N03W23F01,03 and 04
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
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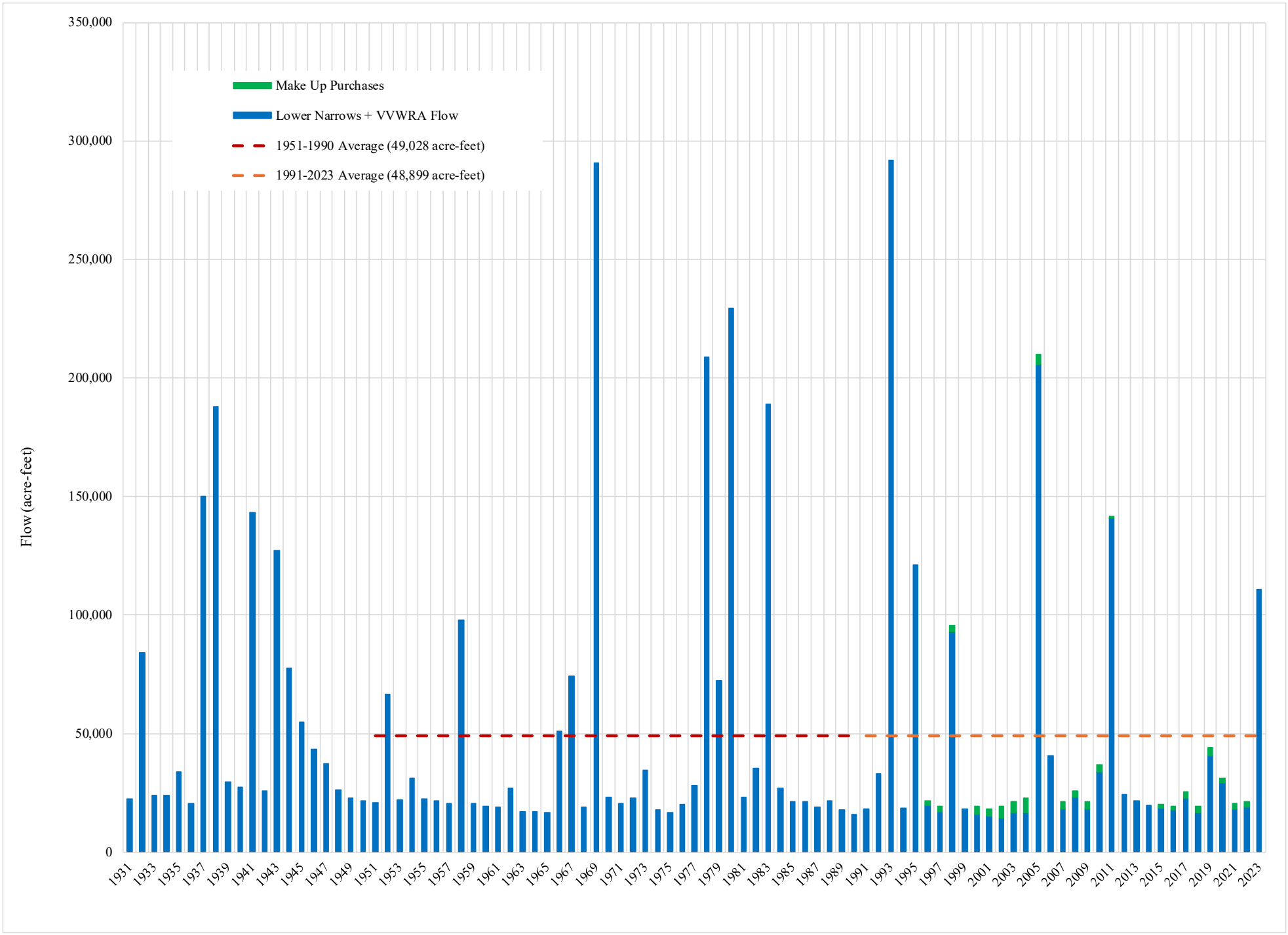
Jan-18
Jan-20
Jan-22
Jan-24
2214
2204
2194
2184
2174
2164
2154
2144
2134
2124
2114
10
20
30
40
50
60
70
80
90
100
110
Groundwater Elevation (feet amsl)
Depth to Water (feet bgs)
F04 dry
05/2015 to 09/2023
09N03W23F04 - Perforations: 70' - 90'
09N03W23F03 - Perforations: 180'-200'
09N03W23F01 - Perforations: 565'-585'

EXHIBIT 7

Streamflow at Lower Narrows + VVWRA Discharges to the Transition Zone (Includes Make-Up Obligation Purchases



Note: Based on USGS Stream gage records, VVWRA discharges, and Make-Up Obligation Purchases.

EXHIBIT 8

MOJAVE BASIN AREA WATERMASTER

SUMMARY REPORT

SUBSURFACE FLOW BETWEEN SUBAREAS

ROBERT C. WAGNER, P.E.
WATERMASTER ENGINEER
FEBRUARY 22, 2006

Introduction

The Judgment After Trial dated January 10, 1996 (Judgment) recognized that additional information would need to be obtained in order to establish certain physical characteristics of the Mojave Basin Area. A specific finding at trial concerned the hydrologic interrelationship between the five Subareas comprising the Mojave Basin Area (Figure 1). One component of the relationship is the subsurface flow between Subareas which is used to determine the annual obligations that one Subarea owes to another.

The estimates of the subsurface flow between Subareas made at the time of trial were based on the best information available. Mojave Water Agency (MWA) was directed to undertake studies including establishing monitoring wells for the purpose of estimating the actual subsurface flow, and for future monitoring. Watermaster was directed to report back to the Court within 10 years with a recommendation for monitoring the subsurface flow in the future, and to determine whether or not a revision to the historic estimate was needed.

Background

MWA began installing monitoring wells in various locations as early as 1993 for the purpose of understanding the hydrology of the Mojave Basin Area, and to comply with various parts of the Judgment. As of December 2005, MWA has installed over 100 wells and spent in excess of $3,000,000 on monitoring well installation and over $4,000,000 on various studies related to groundwater recharge and groundwater movement. These studies include a numerical groundwater model prepared by USGS, age dating of water, a comprehensive investigation of the Transition Zone, Este Subarea, numerous USGS reports and others.

MWA recently prepared four studies to investigate the subsurface flow between the Subareas. The purpose of the studies was to collect data, identify data gaps, determine historic groundwater gradients, existing gradients and evaluate changes over time. This report to Watermaster, summarizes the findings from the MWA studies, and provides a recommendation for establishing the estimated flow between Subareas as required by the Judgment. The estimates established by the Judgment of subsurface flow are shown on Figure 2.

Methodology

Generally, the only anthropogenic factor that can affect the subsurface flow between Subareas is pumping, since the lowering of the hydraulic head in the aquifer by man made influences will affect the quantity and direction of groundwater flow. The Judgment envisioned that we would determine the amount of water that historically flowed between the Subareas and ensure that this flow was maintained in the future. The best way accomplish this goal is to establish the historic groundwater gradient across a Subarea boundary and to maintain the gradient. Within certain limits, if the gradient remains unchanged, so will the flow across a given boundary. Consequently it

is not critical to actually know what the subsurface flow historically was; rather it is necessary only to know that the flow has not changed. This is accomplished by computing and comparing the historic gradient to the present one at a given location.

The flow estimates for each Subarea can be estimated by Darcy's Law from the equation:

$$Q = KiA$$

where:

Q = discharge in ft^3/day (groundwater flow across the boundary)
K = hydraulic conductivity in ft/day (hydraulic properties)
i = gradient or slope in ft/ft
A = cross sectional area in ft^2

Historic and present day water level data was collected for various wells considered to be representative of the generalized groundwater conditions on either side of a Subarea boundary. The data was evaluated and groundwater contours were developed in order to determine the gradient. The hydraulic properties of the aquifer were estimated from various sources including previous studies and investigations, well drillers logs and pump test data, as available. The geometry of the basin area at each boundary was approximated to obtain a cross sectional area. The flow Q, is determined by the given equation.

The actual flow at each Subarea boundary is difficult to calculate with great certainty due to the complexities of the geology of the basin, the magnitude of the cross sectional area, and relative unknowns like the thickness of the water bearing sediments and the hydraulic conductivity of the various aquifer units. However, reasonably reliable water level data is available, so a comparison of past and present conditions affecting the flow at the Subareas boundaries can be made.

Discussion - Flow Between Subareas

There are five boundaries where there exists a Subarea obligation pursuant to the Judgment (Figure 2). The following discussion evaluates each of the obligations and the estimated historic and current discharge.

Alto - Centro

The subsurface flow obligation from Alto to Centro is 2,000 acre-feet per year (1935-1960) which was based on the estimate made by Department of Water Resources, Bulletin 84, 1967. The estimate contained in Bulletin 84 represented the subsurface flow between the Upper and Middle basins; this is now considered the boundary between the Transition Zone (Alto) and Centro. Most of the subsurface flow contribution from Alto to Centro occurs along the Transition Zone boundary with Centro within the upper part of the aquifer.

Groundwater contours and a groundwater gradient were determined across the Alto to Centro boundary, based on 153 data points for 1958 (Figure 3). While it is generally accepted that overdraft commenced in the 1950's, data prior to 1958 is not readily obtainable. As of 1958, the estimated gradient was 0.0035 feet per foot, or 3.5 feet of elevation drop for every 1,000 feet of horizontal travel (about 18.5 feet per mile), meaning there was groundwater flow in the direction of Alto to Centro.

The groundwater gradient determined for 1998 did not change from 1958, meaning that there had been little change in the average subsurface flow between Alto and Centro (Figure 4). Whatever the subsurface flow was in 1958 it was unchanged in 1998.

Further analysis showed an increase (steeper) in the gradient from 1998 to 2004, but it is not known whether or not the change was related to dry weather conditions or to man made influences like pumping. It is more likely that the changes seen in this six year period were the result of nature as pumping generally declined in Centro during the past 10 years. We also expect that after the storms of 2005, that water levels will have recovered to the previous level and the gradient will again be as it was in 1998.

USGS (Stamos et al, 2001) estimated the flow across the Transition Zone boundary to be 1566 acre-feet for the sixty year base period 1931-1990. The USGS work involved the development of a numerical groundwater model which evaluated all of the components of water inflow and outflow and attempted to match up predicted water levels with actual measurements. Given the uncertainty in the measurements, data, and estimated inputs, the predicted value is reasonably close to the historic estimate of 2,000 acre-feet. More importantly, the gradient analysis showed that the gradient was unchanged over a forty year period, 1958-1998 indicating a stable relationship at the Subarea boundary. Consequently, there is not a reason to recommend a change in the estimated subsurface flow from Alto to Centro.

Este - Alto

The subsurface flow from Este to Alto was estimated to be 200 acre-feet per year at the time of trial. USGS (Stamos et al, 2001) estimated the discharge from Este to Alto to be 995 acre-feet during the 1931-1990 period. Webb (2000) estimated the discharge to be about 850 acre-feet. DWR (Bulletin 84, 1967) estimated 100 acre-feet per year. MWA (Napoli-Laton-Eckhart 2006) has estimated a possible range based on a variety of sources, but very limited data, that the flow could be less than 100 acre-feet and up to about 7,000 acre-feet per year. The MWA study indicates that the actual amount is likely at the lower end of the range.

An analysis of Watermaster records and water levels wells in Alto near the Alto–Este boundary indicate that the upper range is probably not more than about 1,000 acre-feet.

Este is divided along the Helendale fault, with Fifteen Mile Valley to the southwest and Lucerne Valley to the Northeast. Water level data suggests that the subsurface flow from Este to Alto is from Fifteen Mile Valley and not Lucerne. Water levels in Fifteen Mile Valley appear to be stable suggesting that inflow and outflow are about equal.

There is insufficient data to properly evaluate the historic flow from Este to Alto, but it would appear that the flow is in excess of the 200 acre-feet per that is indicated in the Judgment.

The best information we have suggests that the gradient in this area is unchanged and consequently the average subsurface flow, whatever it is, also remains unchanged over a 47 year period (Figures 5 and 6). The actual value is probably closer to 1,000 acre-feet per year which is consistent with the USGS (2001) and Webb (2000) estimates and falls within the reasonable range of flow as estimated by the 2006 MWA study. However given that the amount is relatively small the area in question is very large and more importantly, based on the 2006 MWA investigation, the gradient is unchanged, We are not recommending that the subsurface flow estimate in the Judgment be changed from the current estimate of 200 acre-feet per year.

Centro - Baja

The subsurface flow obligation from Centro is Baja is 1,200 acre-feet per year based on estimates made at the time of trial by various researchers and unpublished reports. Department of Water Resources, Bulletin 84, 1967, estimated the subsurface discharge between the Middle and Lower Basins to be 2,000 acre-feet, but the boundary for that study was at Barstow, several miles upstream from the Centro-Baja boundary. Webb (2000) concluded that 1,200 acre-feet per year was a reasonable estimate.

USGS (Stamos et al 2001) estimated the average flow to be 1,462 acre-feet for the sixty year period 1931-1990, similar to the previous estimates. The groundwater gradient in this area has changed slightly from 0.0045 ft/ft in 1960 (23.75 ft per mile) to 0.0050 ft/ft in 2004 (26.4 feet per mile) (Figures 7 and 8). The change is a result of declining water levels in Baja as water levels in Centro along the boundary have been relatively stable. Importantly, the gradient is unchanged since 1993. Consequently, we are not recommending a change in the estimated flow from Centro to Baja, which is to remain at 1,200 acre-feet.

Oeste - Alto

The subsurface flow from Oeste to Alto is indicated in the Judgment to be 800 acre-feet. USGS (Stamos 2001) and Webb (2000) estimated this value to be 1,162 acre-feet and 350 acre-feet respectively. The boundary line between Alto and Oeste covers a large distance and the actual boundary can not be readily identified in the subsurface. There is only sparse water level data in the area of the boundary to evaluate historic conditions. The available data for current conditions is also limited. The water supply conditions of Oeste are also not well understood. Preliminary evaluation of the available data suggests that there is insufficient information to make a recommendation. The data we have collected suggests that the subsurface relationship between Oeste and Alto has not changed significantly, but the data is inconclusive.

MWA is currently investigating the water supply conditions in Oeste and preparing a comprehensive evaluation of the hydrogeology. That effort will help support Watermaster recommendations for water management in Oeste and is expected to be mostly completed by November of 2006. Consequently, we would recommend that Watermaster make no determination about the Oeste to Alto subsurface flow until we have compiled more data; for now, the subsurface flow will remain 800 acre-feet as

indicated in the Judgment. We will report back to Watermaster in the Fall of 2006 and to the Court in Spring of 2007.

Baja - Afton

There is an obligation of 400 acre-feet from the Baja Subarea to Afton based on as estimate of the long term average base flow measured at the USGS gage at Afton. The gage is located several miles downstream of the Baja Subarea and MWA administrative boundary. While the gage data shows a continuous reduction in base discharge, it is not clear how Watermaster would implement a program to satisfy a base flow obligation at Afton.

Unlike the Alto-Centro surface base flow obligation which is quantifiable and measurable at the USGS gage at Lower Narrows, the base flow from Baja across the Agency boundary has no surface expression. It would be almost impossible to determine and measure on an annual basis. It is further unclear how Watermaster would provide make up water and to whom. In order to comply Watermaster would have to cause a pipeline to be built that delivered supplemental water to an arbitrary point in the desert. The benefits of delivering such supplemental water are unknown. We recommend that Watermaster ask the Court to relieve Baja of the obligation of maintaining base flow of 400 acre-feet at Afton.

Conclusion

The methodology for determining changes in the subsurface flow between Subareas, as set forth above is also an acceptable method for evaluating future changes. By continuing to monitor the groundwater gradient at the Subarea we will be able to determine when a change in the subsurface flow has occurred. A detail presentation of the methodology as well as the data relied upon for this analysis is contained in three documents prepared by MWA and California State University Fullerton called, Groundwater Flow Between Subareas Report (Final Drafts, February 2006) Alto-Centro; Centro-Baja; Este-Alto. A forth document on the Oeste-Alto boundary will be prepared as a final draft in Fall 2006. These documents are available online at www.mojavewater.org, and on CD-ROM by contacting Valerie Wiegenstein, Watermaster Services Manager, or Lance Eckhart, Senior Hydrogeologist.

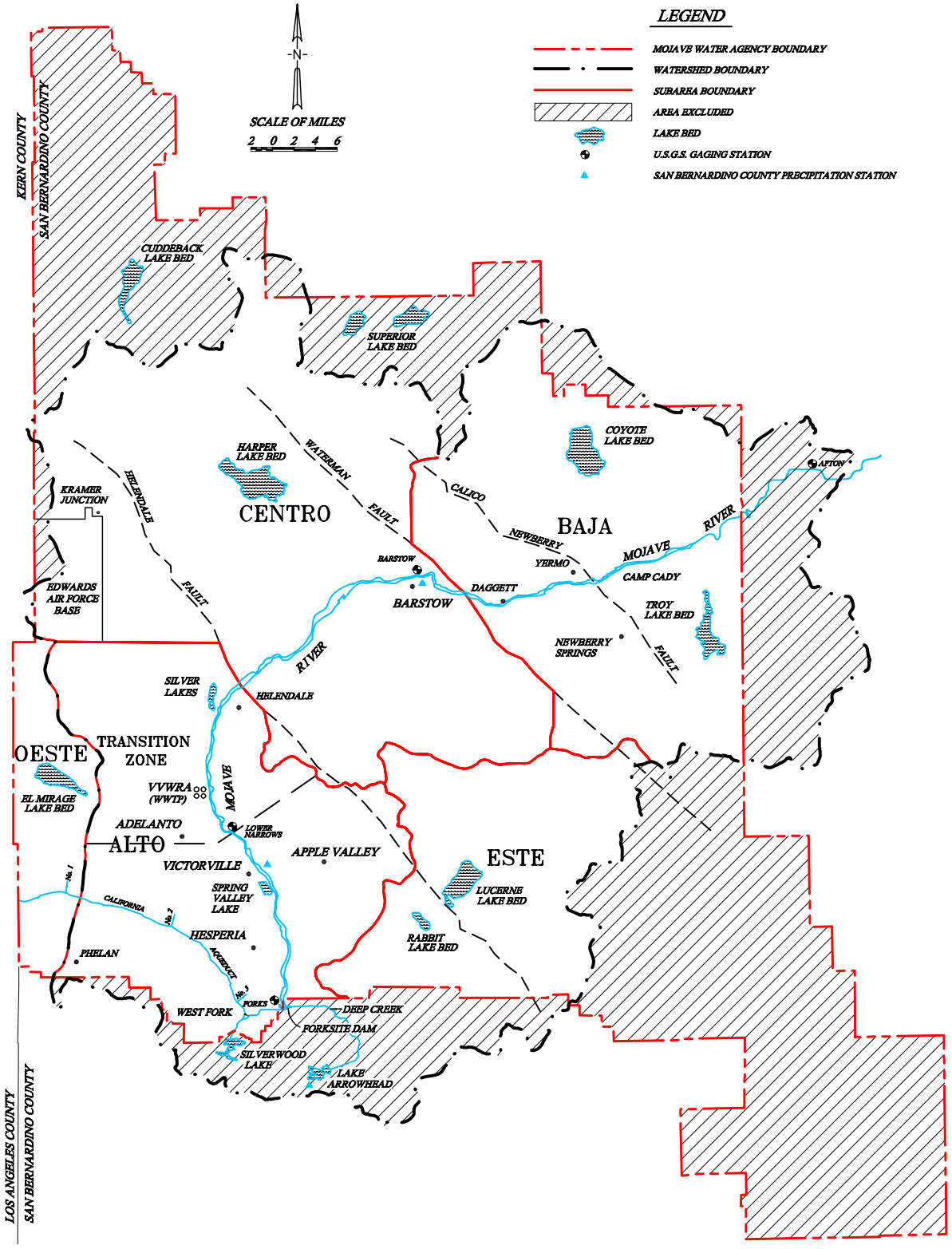
We should also note that additional investigations to determine the actual amount of subsurface flow between Subareas would require a significant expenditure of funds and would not lead to a significantly better determination. We have estimated that a minimum of eight to ten additional monitoring wells would be needed to help improve our understanding of the amount of flow that is occurring. The additional monitoring wells would cost somewhere in the range of 3-5 million dollars for design and installation. We do not feel that such expenditure is warranted.

The recommended subsurface flow amounts for each Subarea boundary are shown on Figure 9. Further, we recommend that the amount shown, continue to be assumed to have satisfied any indicated subsurface obligation on an annual basis.

FIGURE 1

MAP OF

MOJAVE BASIN AREA



MOJAVE BASIN AREA

1/95

FIGURE 2

CHART SHOWING

CURRENT
SUBSURFACE FLOW BETWEEN SUBAREAS

Current Subsurface Flow Obligations Between Subareas

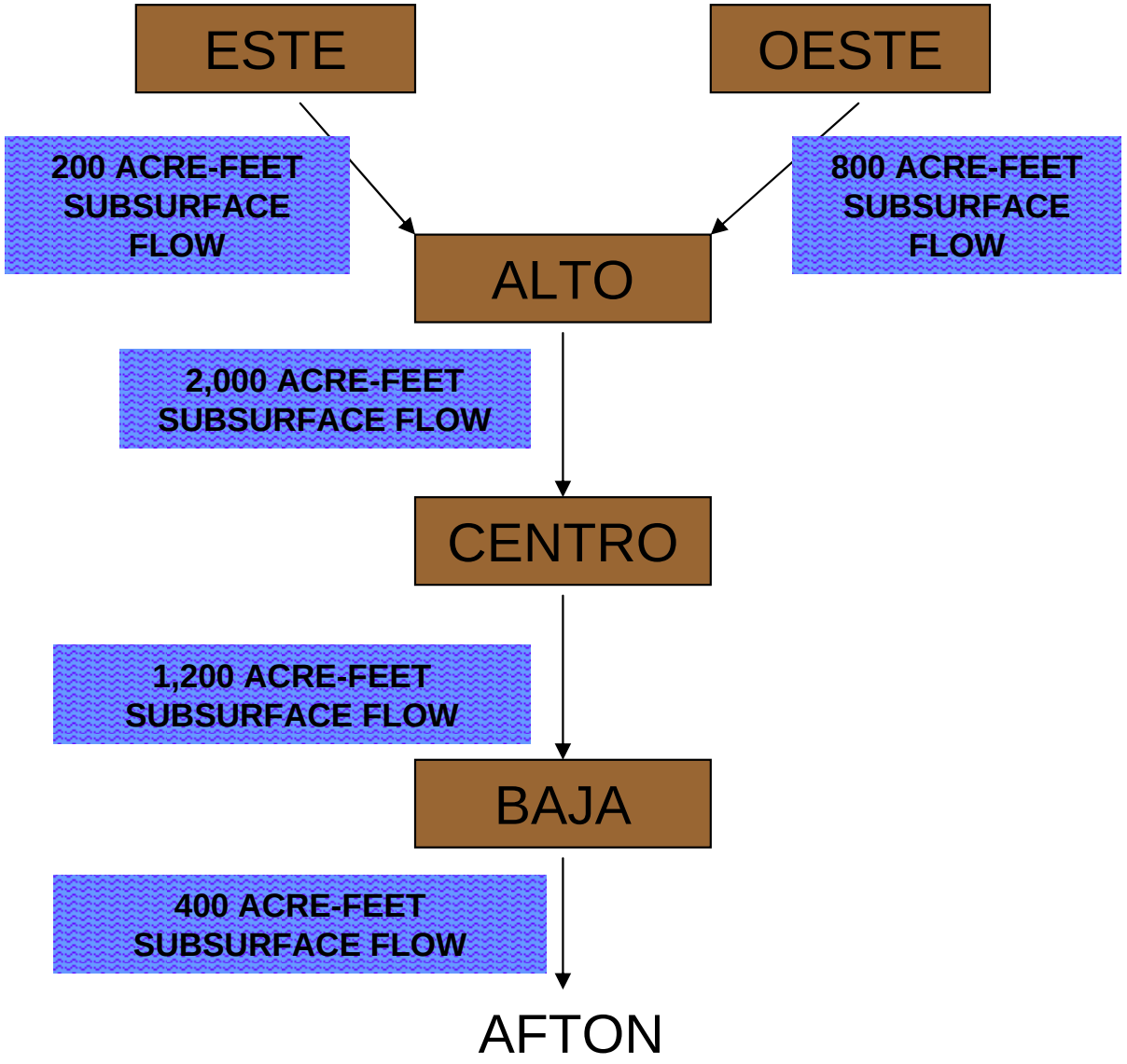


FIGURE 3

1958 GROUNDWATER GRADIENT

ALTO TO CENTRO

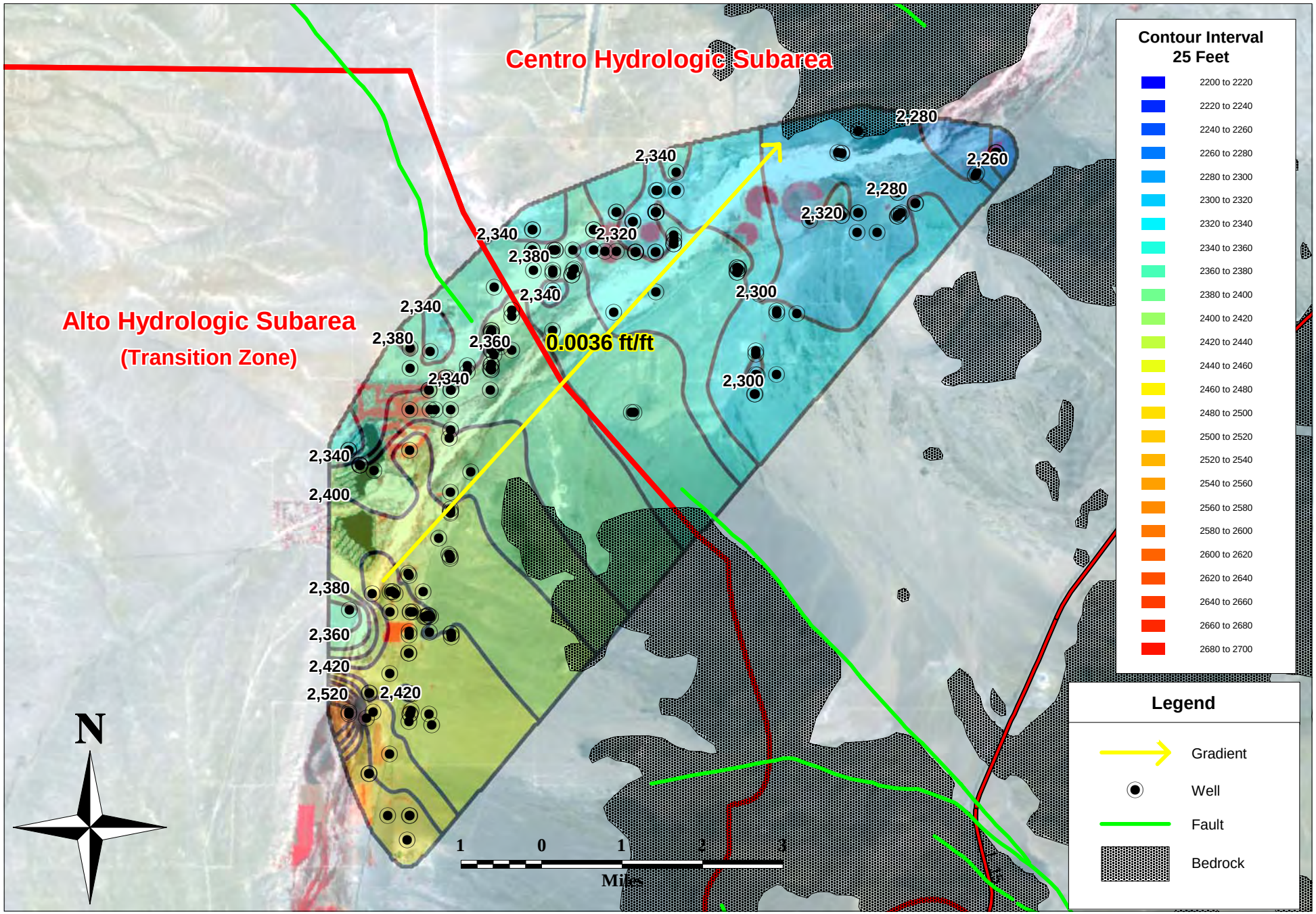


Figure 3: 1958 Groundwater Gradient – Alto to Centro

FIGURE 4

1998 GROUNDWATER GRADIENT

ALTO TO CENTRO

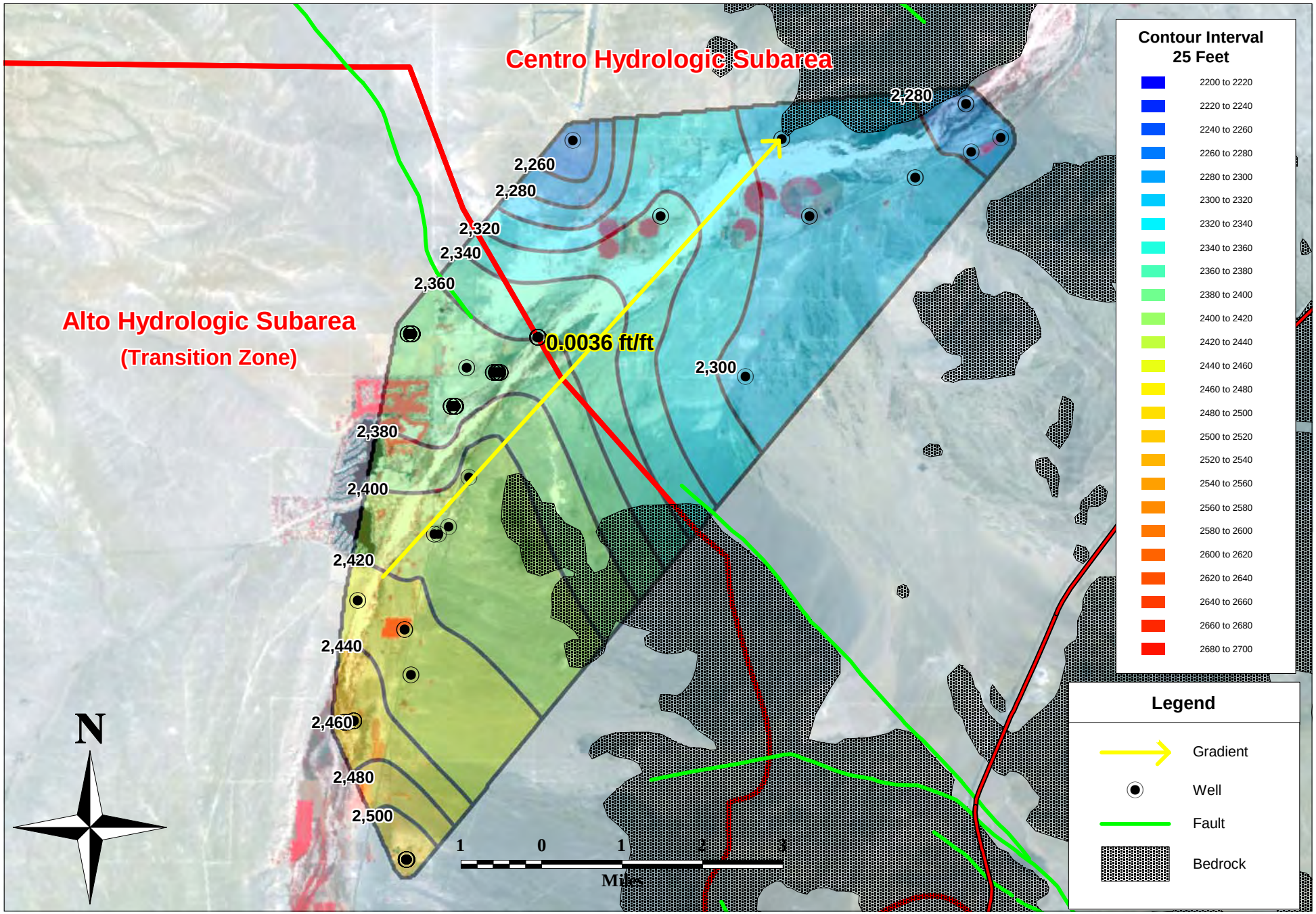


Figure 4: 1998 Groundwater Gradient – Alto to Centro

FIGURE 5

WINTER 1957 GROUNDWATER GRADIENT

ESTE TO ALTO

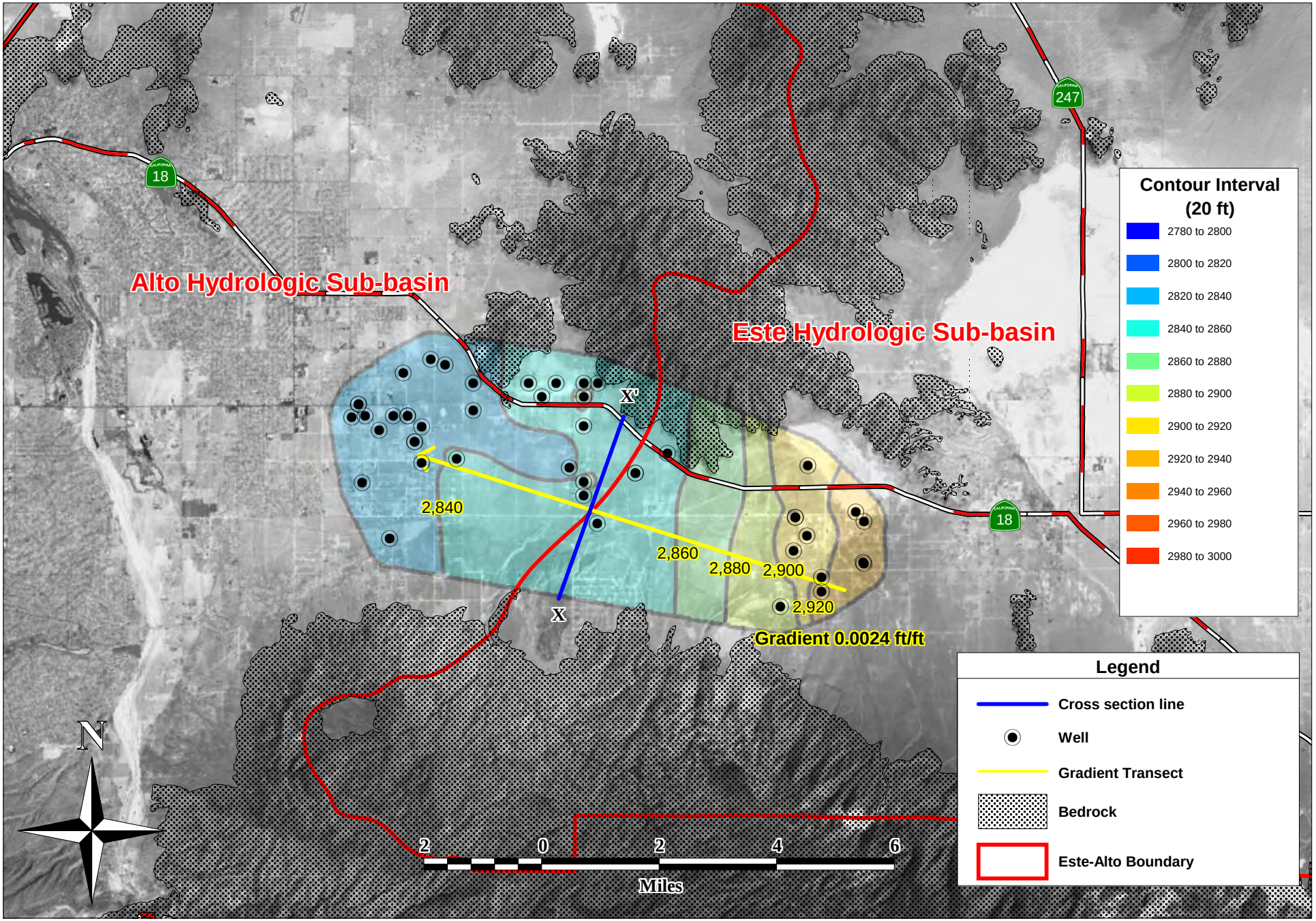


Figure 5: Winter 1957 Groundwater Gradient – Este to Alto

FIGURE 6

SPRING 2004 GROUNDWATER GRADIENT

ESTE TO ALTO

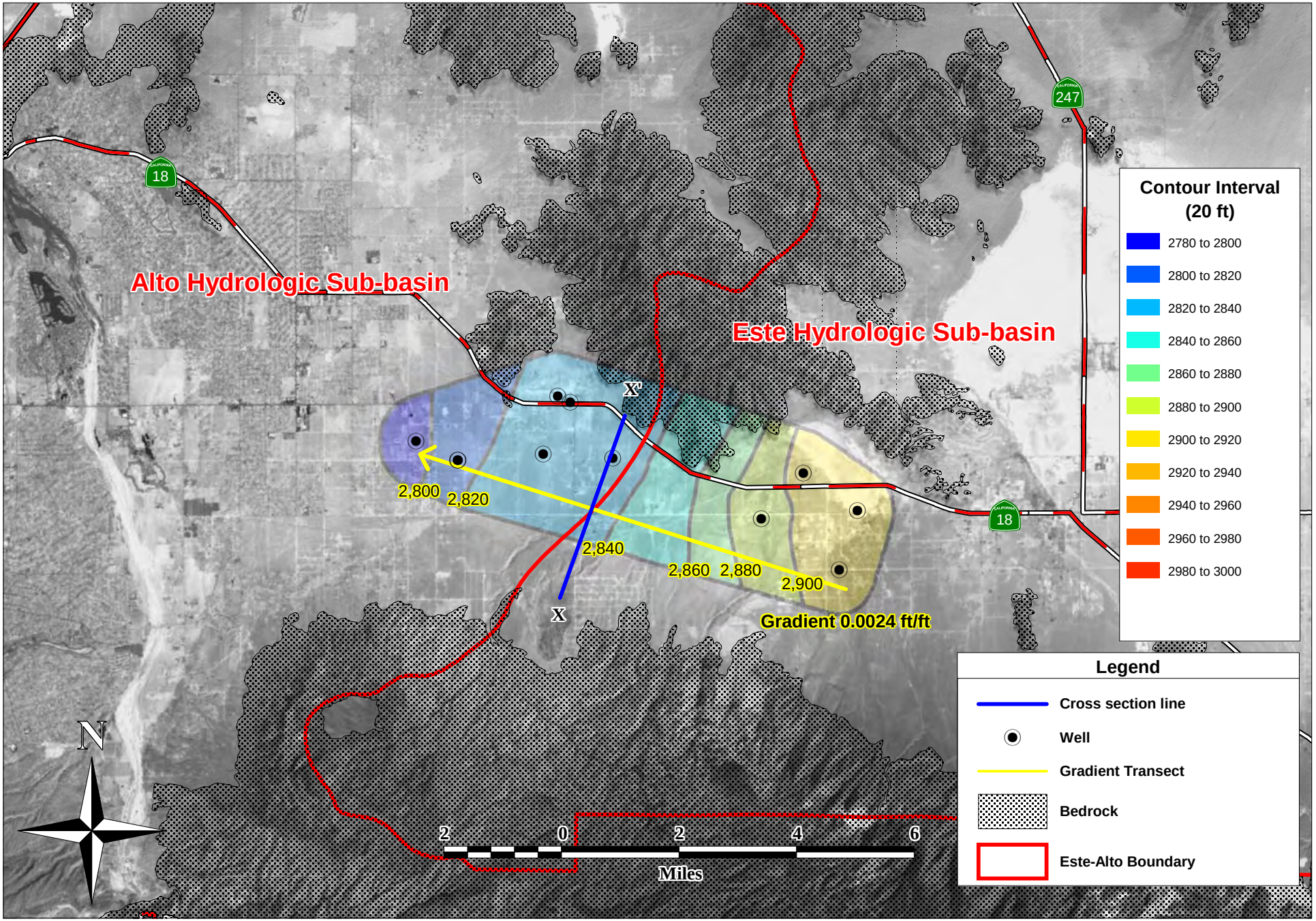


Figure 6: Spring 2004 Groundwater Gradient - Este to Alto

FIGURE 7

1960 GROUNDWATER GRADIENT

CENTRO TO BAJA

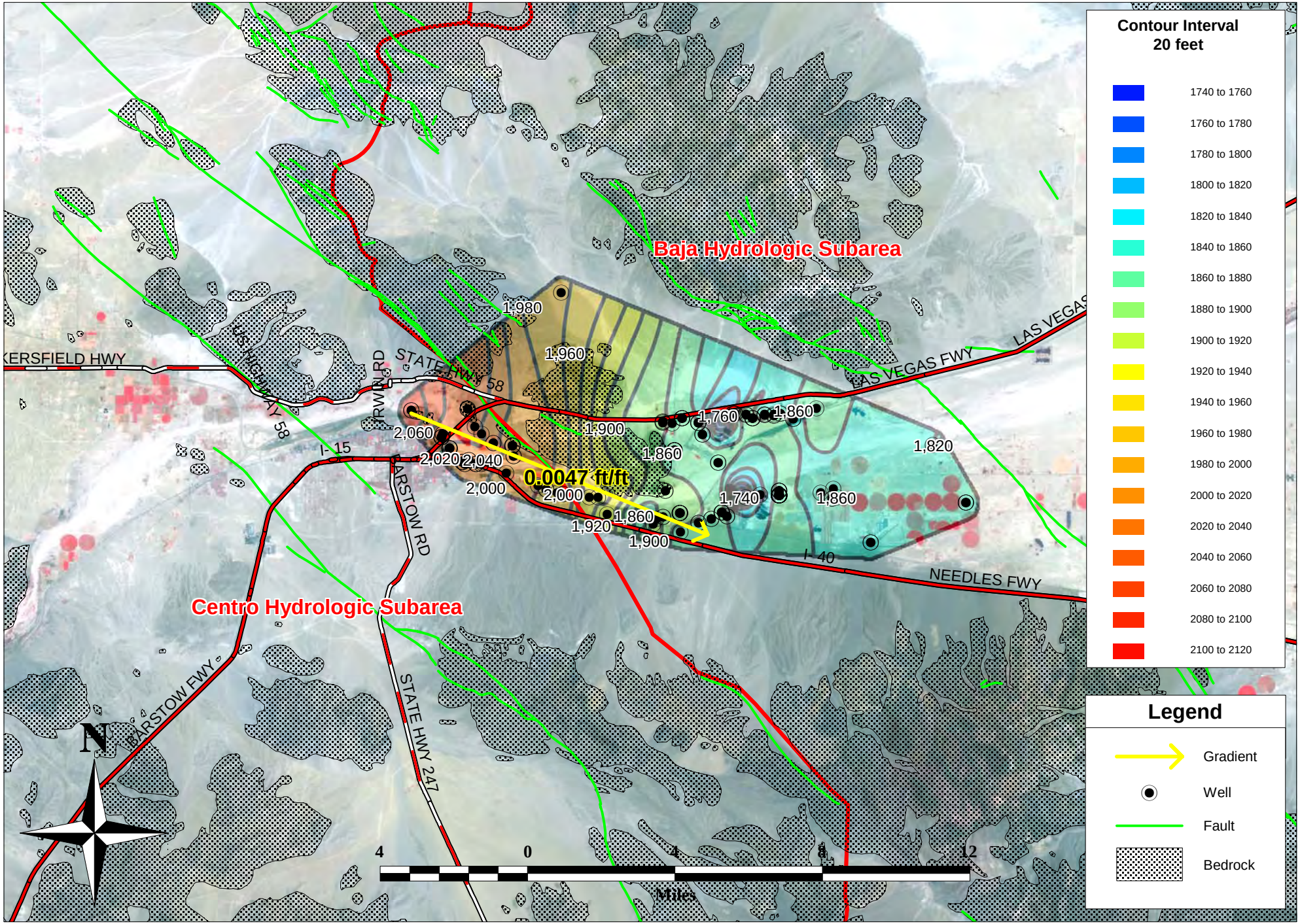


Figure 7: 1960 Groundwater Gradient - Centro to Baja

FIGURE 8

2004 GROUNDWATER GRADIENT

CENTRO TO BAJA

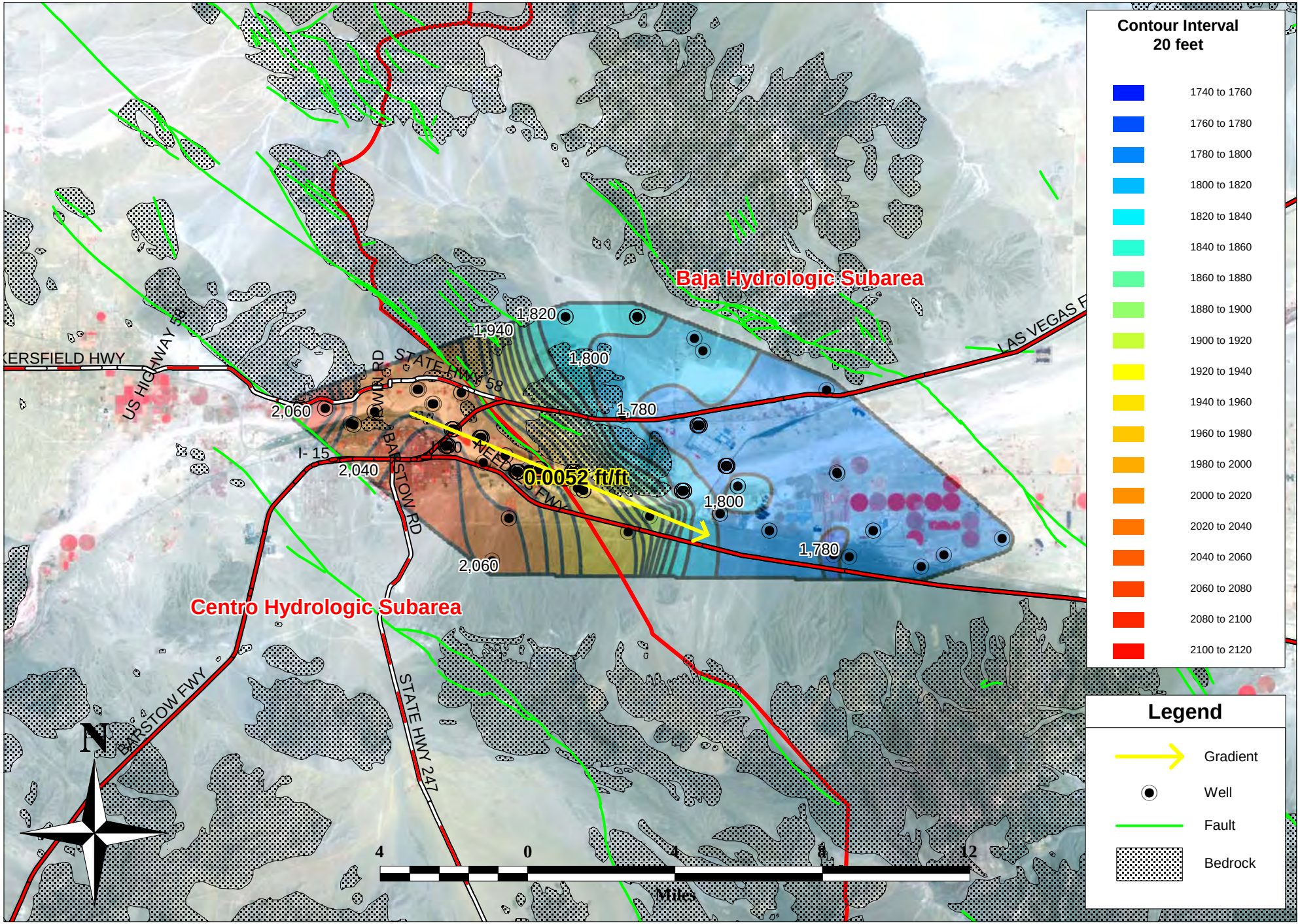


Figure 8: 2004 Groundwater Gradient - Centro to Baja

FIGURE 9

CHART SHOWING

RECOMMENDED
SUBSURFACE FLOW BETWEEN SUBAREAS

Recommended Subsurface Flow Obligations Between Subareas

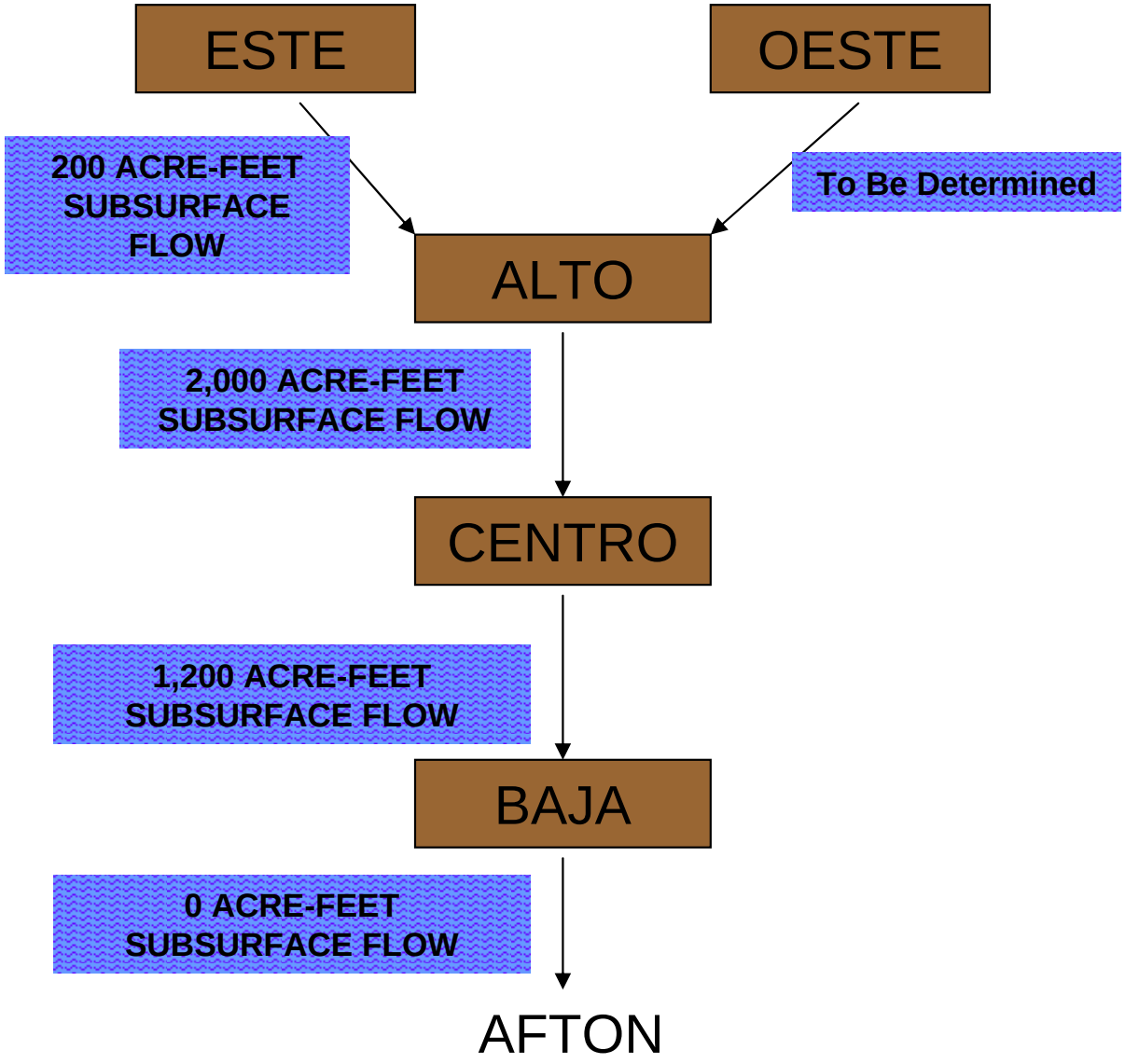


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EXHIBIT 9

MOJAVE BASIN AREA
WATERMASTER

ADOPTED BOARD ACTIONS

February 22, 2006
4:30 p.m.

1. **INVOCATION** – Director Bishop rendered the invocation.

2. **CALL TO ORDER, PLEDGE OF ALLEGIANCE AND ROLL CALL -**

Chairman Page called the meeting to order at 4:31 pm.

ROLL CALL

Watermaster Board:	Chairman Page – Present Vice-Chairman Cox – Present Director Bishop – Present Director Fortyune – Present Director Hall – Present Director Lowry – Present Director Ventura– Present
MWA Staff Present:	Kirby Brill, Executive Officer Norman Caouette, Assistant Executive Officer Valerie Wiegenstein, Watermaster Services Manager Lance Eckhart, Senior Hydrogeologist Jeffrey Ruesch, Senior Watermaster Technician Robert Boytor, Watermaster Technician II Joanne Lowrance, Watermaster Secretary
Others Present:	Bill Brunick, Legal Counsel Robert Wagner, Watermaster Engineer Nine visitors

3. **APPROVAL OF AGENDA**

MO #0632 ***ACTION:*** *Motion made, seconded and the agenda approved as submitted.*

4. **PUBLIC PARTICIPATION** – There were no public comments at this time.

WORKSHOP

5. **SUBSURFACE FLOWS BETWEEN SUBAREAS**

A report titled, *"Mojave Basin Area Watermaster Summary Report Subsurface Flow Between Subareas"* by Robert C. Wagner, dated February 22, 2006, was distributed.

Mr. Caouette began with an introduction on this issue.

Mr. Wagner and Mr. Eckhart provided information by way of a Powerpoint presentation.

Mr. Tom Bilhorn representing the California Department of Fish and Game stressed the importance of considering gradient and elevation when calculating data. He stated that he does agree with the data presented by Mr. Wagner. Mr. Bilhorn expressed concern with impact to the area below Baja. He referred to Mr. Wagner's recommendation to drop the requirement of 400 acre-feet and suggested rewording to the effect of "at present, it is uneconomical to install a monitoring system. We are unaware according to the data available of any problems and therefore do not recommend any changes". He feels that the 400 acre-feet should continue to be used to calculate the basin overdraft.
Ms. Jennette Hayhurst with the City of Barstow spoke in support of considering the 400 acre-feet of subsurface flow from Baja.
ACTION: *Informational purposes only. No action taken.*

CONSENT CALENDAR

6. ACTIONS OF THE REGULAR MEETING OF JANUARY 25, 2006

7. BILLS FOR PAYMENT

8. FINANCIAL STATEMENTS THROUGH JANUARY, 2006

9. PERMANENT TRANSFERS OF BASE ANNUAL PRODUCTION RIGHT

A. MOONYOUNG & OKHEA LEE TO STEPHEN AND LORI THOMAS (49 ACRE-FEET, BAJA SUBAREA, AMOUNT PAID, INCLUDED IN SALE OF PROPERTY)

B. JOHN VAN LEEUWEN TO HIGH DESERT ASSOCIATES, INC. (400 ACRE-FEET, CENTRO SUBAREA, AMOUNT PAID, $1,030 PER ACRE-FOOT)

MO #0633 ***ACTION:*** *Motion made, seconded and the items on the Consent Calendar unanimously approved by the Board.*

PUBLIC HEARINGS

10. PUBLIC HEARING TO RECEIVE COMMENTS ON DRAFT APPENDIX B FOR WATER YEAR 2004-05

Introduction by Mr. Caouette.
Chairman Page opened the Public Hearing at 5:21 pm.
There being no comments from the public on this item, the Public Hearing closed at 5:22 pm.
ACTION: *No action at this time.*

11. PUBLIC HEARING TO RECEIVE COMMENTS ON THE DRAFT BUDGET AND ASSESSMENT RATES FOR WATER YEAR 2006-07

Mr. Caouette presented this item for consideration.
Chairman Page opened the Public Hearing at 5:23 pm.
There being no comments from the public on this item, the Public Hearing closed at 5:23 pm.

MO #0634 ***ACTION:*** *Motion made seconded and the Board approved staff's recommendation to set a public hearing and notice parties of the intent to adopt the draft Budget and Assessment Rates for Water Year 2006-07 at the regularly scheduled meeting on March 22, 2006.*

12. PUBLIC HEARING ON THE PROPOSED RECOMMENDATION FOR FREE PRODUCTION ALLOWANCE FOR WATER YEAR 2006-07

Introduction by Mr. Caouette and review of recommendations by Mr. Wagner.
Chairman Page opened the Public Hearing at 5:25 pm.
There being no comments from the public on this item, the Public Hearing closed at 5:25 pm.

MO #0635 ***ACTION:*** *Motion made seconded and the Board approved staff's recommendation to set a public hearing and notice all parties of the intent to adopt the proposed Free Production Allowance for Water Year 2006-07 at the regularly scheduled meeting on March 22, 2006.*

NEW BUSINESS

13. AUTHORIZE LEGAL COUNSEL TO REQUEST THAT THE COURT ELIMINATE THE ALTO UNIDENTIFIED POOL

Mr. Caouette reviewed the background and recommendation for this item.

MO #0636 ***ACTION:*** *Motion made seconded and the Board unanimously authorized legal counsel to request that the Court remove the Alto unidentified pool from further consideration for distribution of Base Annual Production in the Alto Subarea.*

REPORTS

14. EXECUTIVE OFFICER REPORTS.

A. DRAFT WATERMASTER ANNUAL REPORT FOR WATER YEAR 2004-05

The Draft Twelfth Annual Report was distributed at this meeting.

B. TABLE AND GRAPH SHOWING THE STATUS OF THE MOJAVE WATER AGENCY'S GROUNDWATER STORAGE ACCOUNTS BY SUBAREA AND TYPE OF WATER

C. LIQUIDITY REPORT

The reports included with the agenda package were reviewed by Ms. Wiegenstein.

Mr. Bilhorn responded to a request from Director Lowry that Biological fees could not be expended outside the boundaries of the Transition Zone/Upper Narrows due to restraints of Exhibit H.

15. ENGINEER REPORTS

A. GRAPH SHOWING HISTORIC ANNUAL BASE FLOW AT THE LOWER NARROWS GAGE AND DIRECT MEASUREMENTS BY USGS

Mr. Wagner reviewed the USGS measurements of base flow at the Lower Narrows.

B. OTHER REPORTS – None.

16. LEGAL REPORTS. – No legal reports.

17. DIRECTORS REPORTS – No reports.

OTHER BUSINESS

18. DISCUSSION ITEMS FOR NEXT OR FUTURE AGENDAS – None.

19. CLOSED SESSION. – None.

20. ADJOURNMENT – Chairman Page adjourned the meeting at 5:38 pm.

Approved:

Joanne Lowrance, Secretary

March 22, 2006

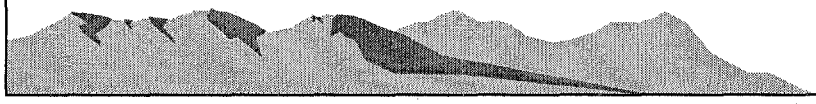
Attachments on-file:

Item No. 5 – PowerPoint presentation, "Report of Subsurface Flow Between Subareas"
– *"Mojave Basin Area Watermaster Summary Report Subsurface Flow Between Subareas"* by Robert C. Wagner, dated February 22, 2006
Item No. 9 – Signed documentation
Item No. 10 – Signed documentation
Item No. 11 – Signed documentation
Item No. 12 – Signed documentation
– PowerPoint presentation, "FPA Recommendation for Water Year 2006-07"
Item No. 13 – Signed documentation
Item No. 14A– *"Draft Twelfth Annual Report of the Mojave Basin Area Watermaster Water Year 2004-05"*
Sign-in sheets

**Audio recording of this meeting available upon request.*

Report on Subsurface Flow Between Subareas

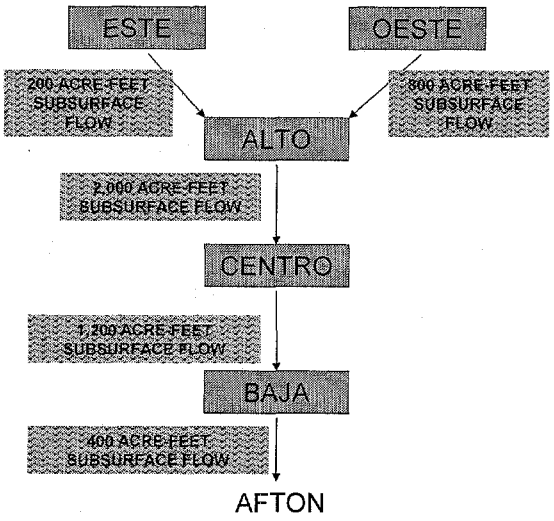
Mojave Basin Area Watermaster
Workshop February 22, 2006
Robert C. Wagner, Watermaster Engineer
Lance Eckhart, MWA Senior Hydrogeologist



Requirements of the Judgment

- Judgment Established Subarea Subsurface Flow Obligations
- Required MWA to install monitoring wells
- Required MWA to Re-evaluate Estimates after 10 years
- Recommend Changes if Needed
- Monitor Conditions in the Future

Current Subsurface Flow Between Subareas



Study Methodology

- Determine historical gradient between Subareas
- Estimate hydraulic conductivity of aquifer
- Determine cross section geometry
- Use Darcy equation to determine subsurface flow
- Determine existing gradient for comparison

Darcy's Law

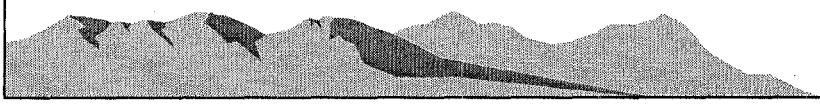
Q = KiA

Q = Flow

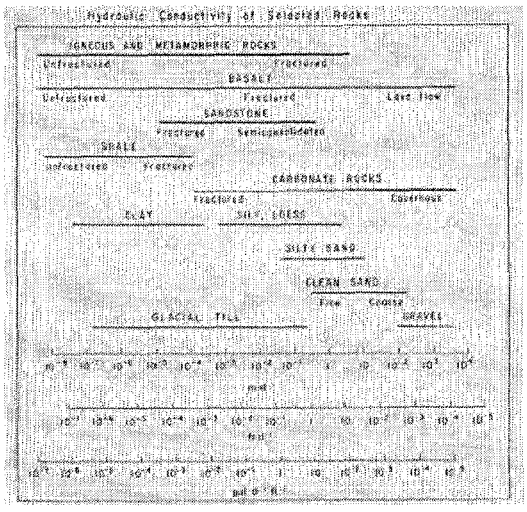
K = Hydraulic Conductivity

i = Groundwater Gradient

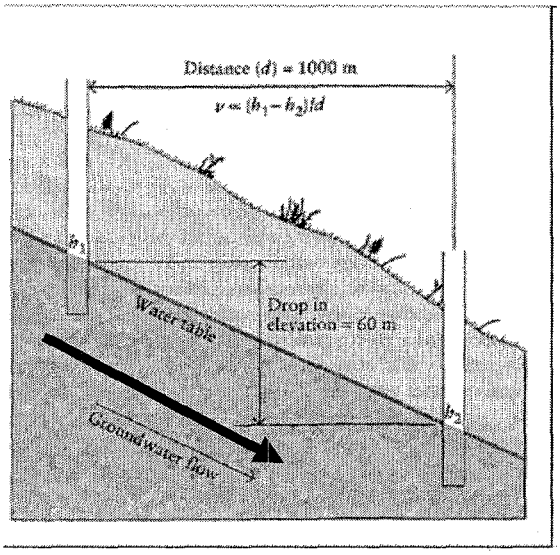
A = Cross Sectional Area of Aquifer



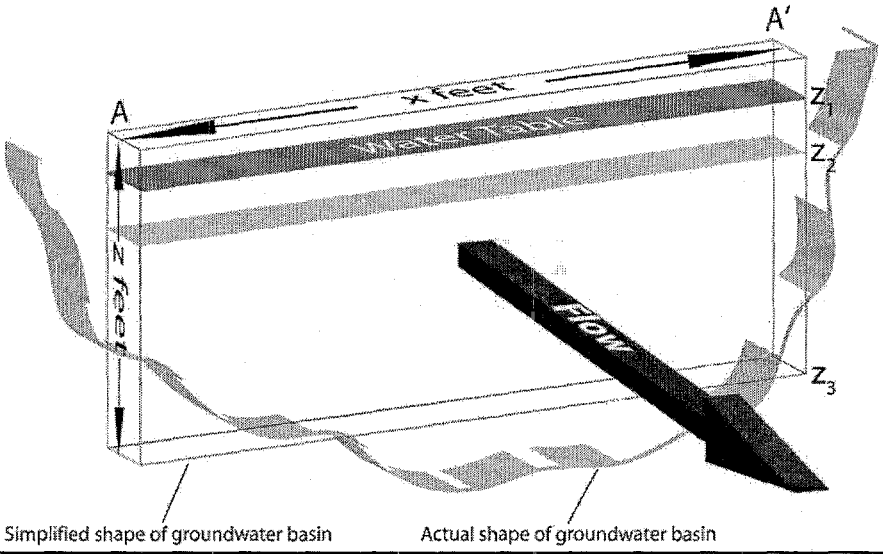
Hydraulic Conductivity (K)



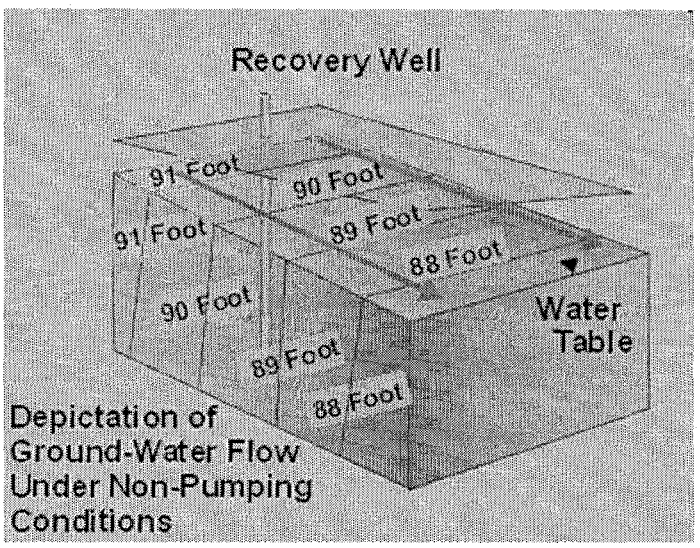
Hydraulic Gradient (i)



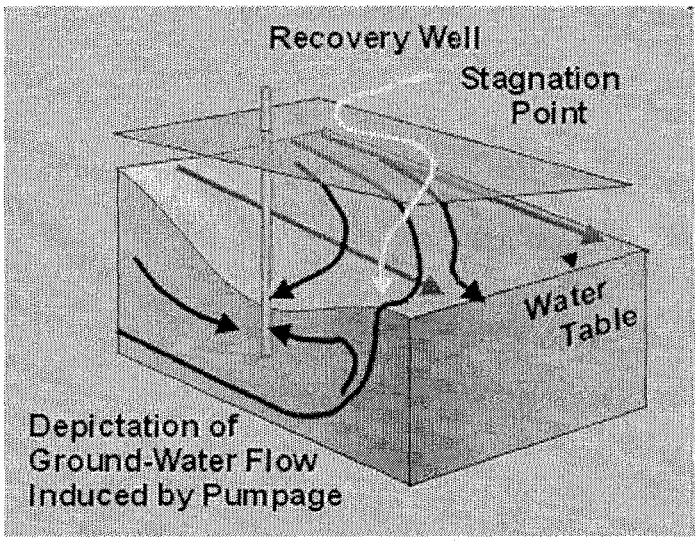
$Q = KiA$



Hydraulic Gradient (i)



Hydraulic Gradient (i)

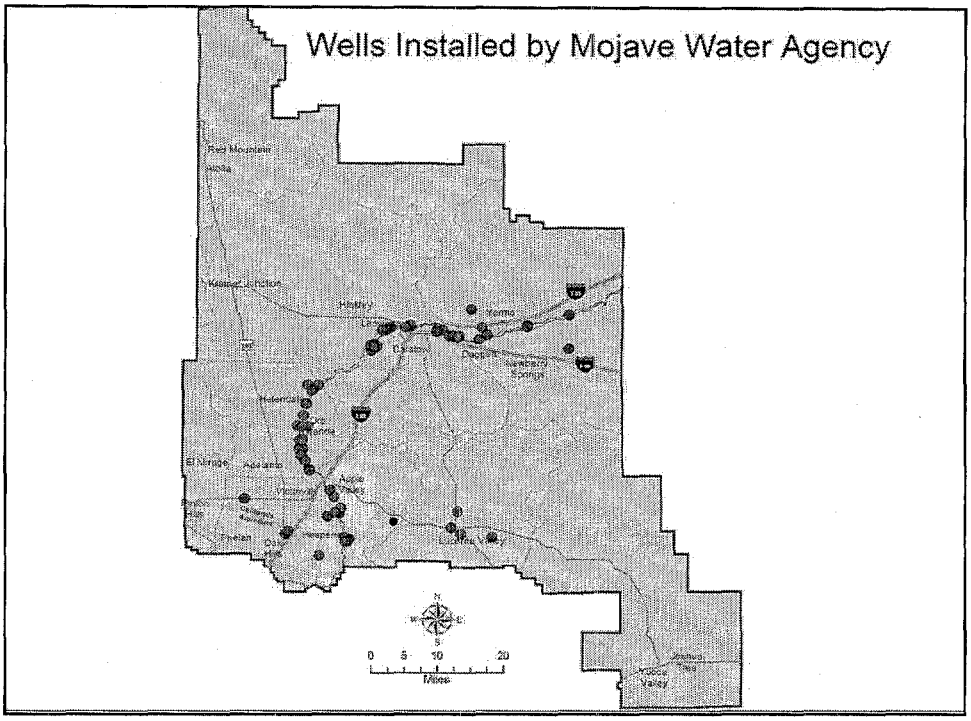


Recent Activities (1990 to Current)

- Installed over 100 monitoring wells
- Have monitored over 960 separate wells
- Collected over 27,000 individual water level records
- Have completed multiple studies to understand the hydraulic properties of the region

Recent Activities (1990 to Current)

- Mojave River Basin Groundwater Model - 2001
- Consumptive Water Use Study and Update of Production Save Yield Calculations – 2000
- Transition Zone Study – 2003
- Este Study – 2005
- ***Regional Contour Maps – 1992, 1994, 1996, 1998, 2000, 2002, 2004***
- Helendale Fault Investigation – 2003
- Gravity Survey Investigations 1990, 2005
- Groundwater and Surface Water Relations Along the Mojave River – 1995
- Riparian Zone and Hydrogeology Investigation – 1999
- Riparian Vegetation and Water Use - 1996
- Hydrologic Analysis of the Mojave River/Alto – 1999
- Age Dating and Groundwater Movement – 2003
- Evolution of the Mojave River – 2000
- Afton Flow Study - 1993



What We Worked With

- Comprehensive Water Level Data Set
  - USGS
  - DWR
  - MWA
- Previous Studies in the Study Areas
- Water Level (K) and Hydraulic Gradient (i) Comparisons
  - Historic ~1950's
  - Pre-Judgment to early Judgment (data allowing) ~mid-1990's
  - Current conditions ~2004

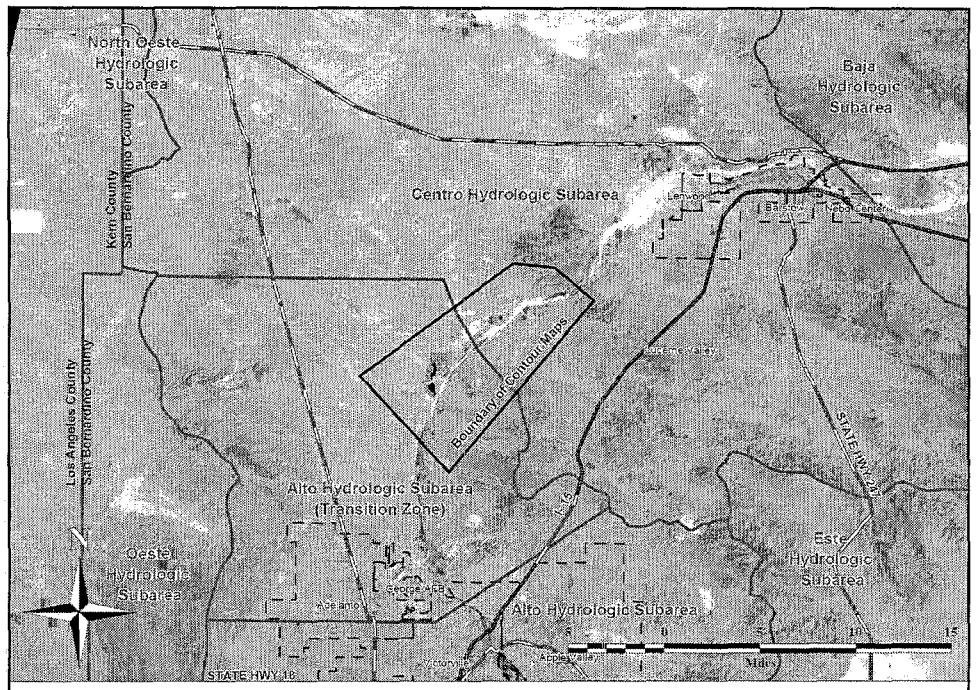


Figure 1: Location map of study area.

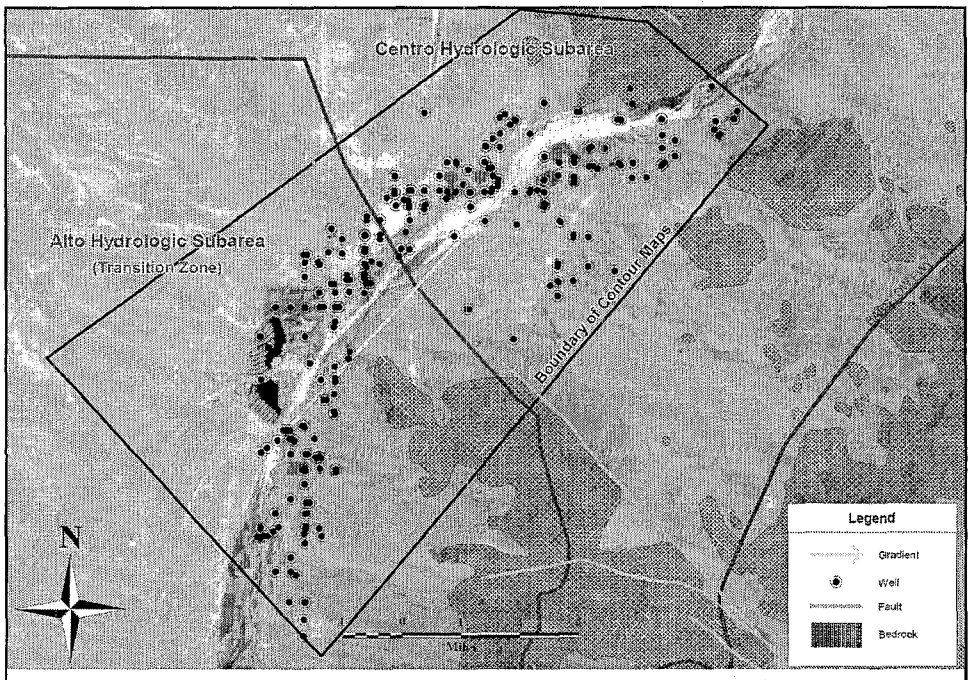


Figure 2: Location map of wells used in this study.

How We Calculated Gradient (i)

- **Utilized Three Methods**
  - Hand Generated Contour
  - Computer Generated Contour
  - Statistical Analyses

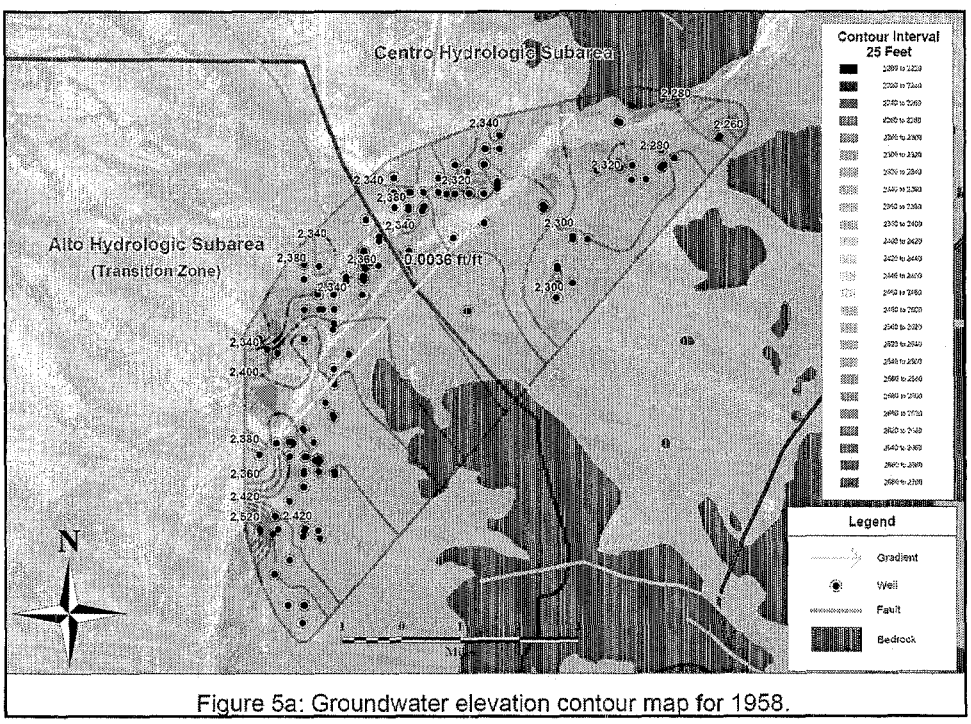


Figure 5a: Groundwater elevation contour map for 1958.

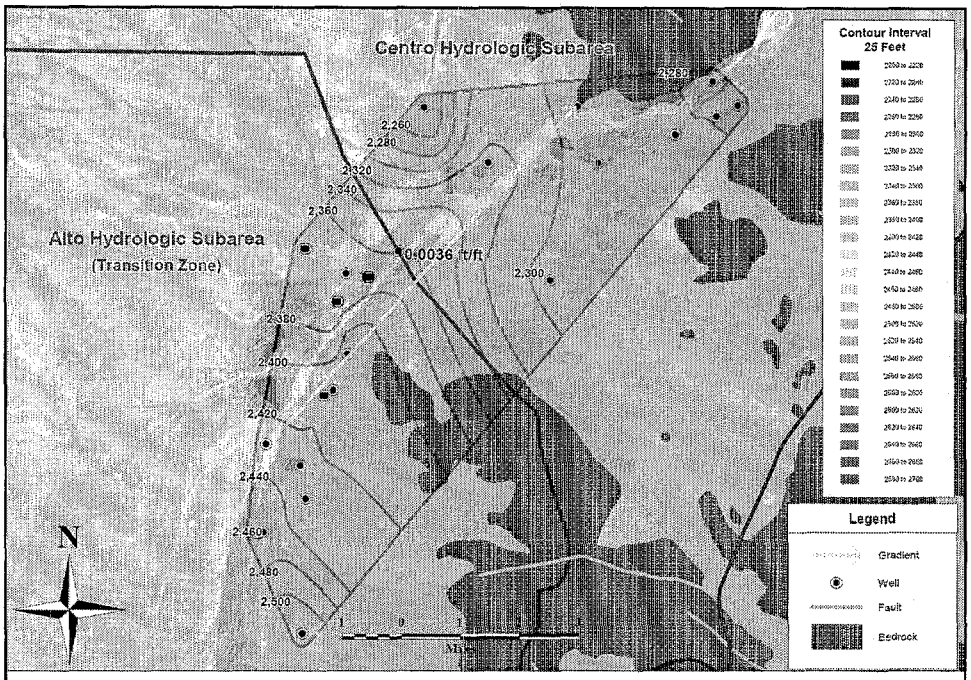


Figure 5b: Groundwater elevation contour map for 1998.

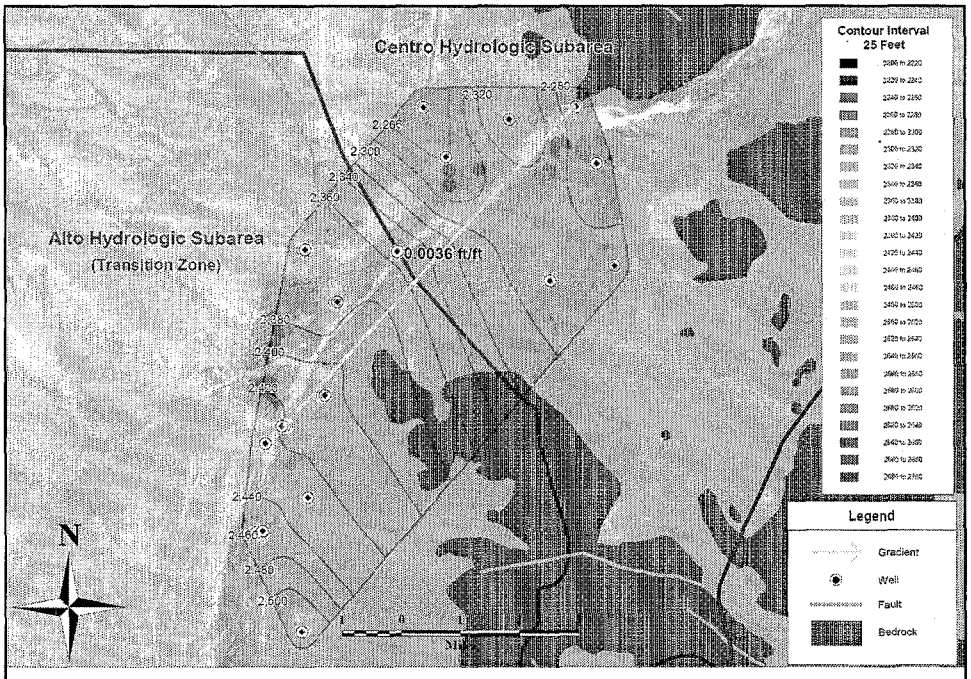
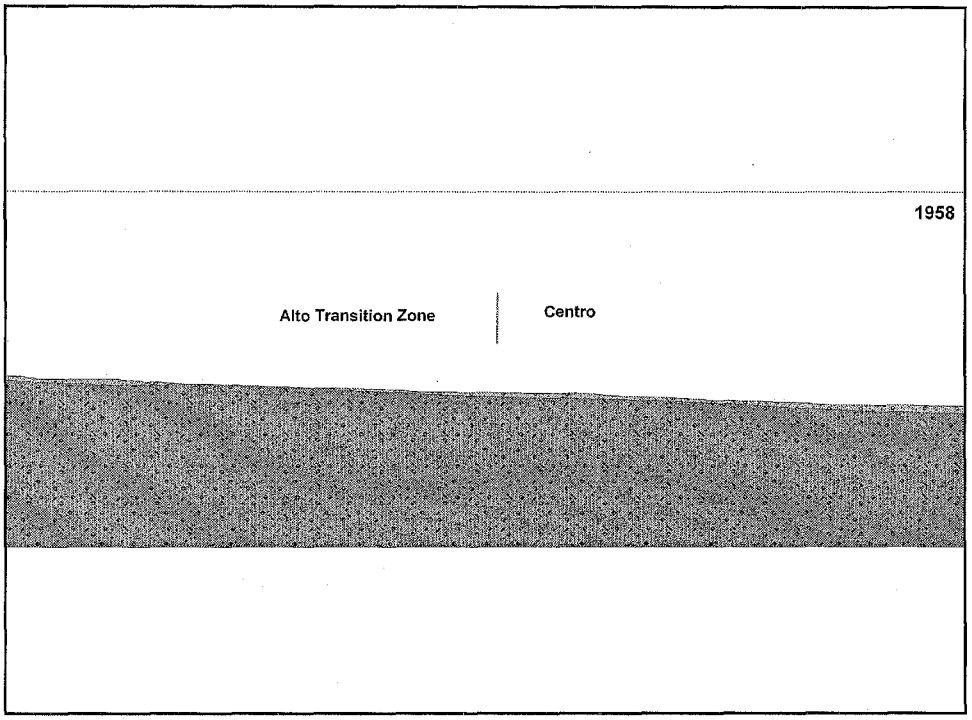
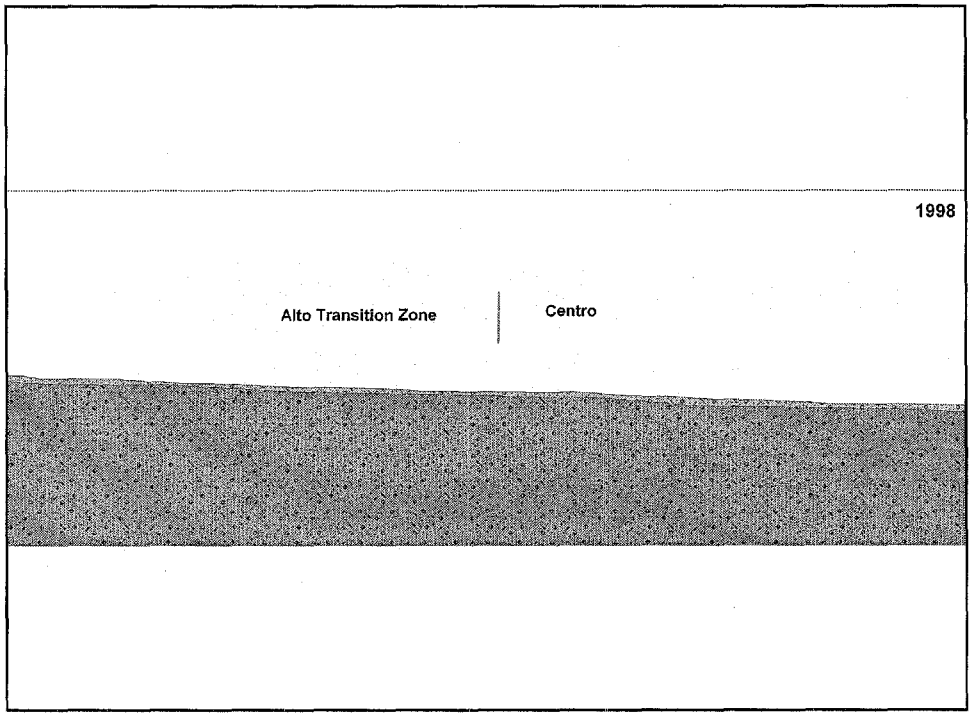
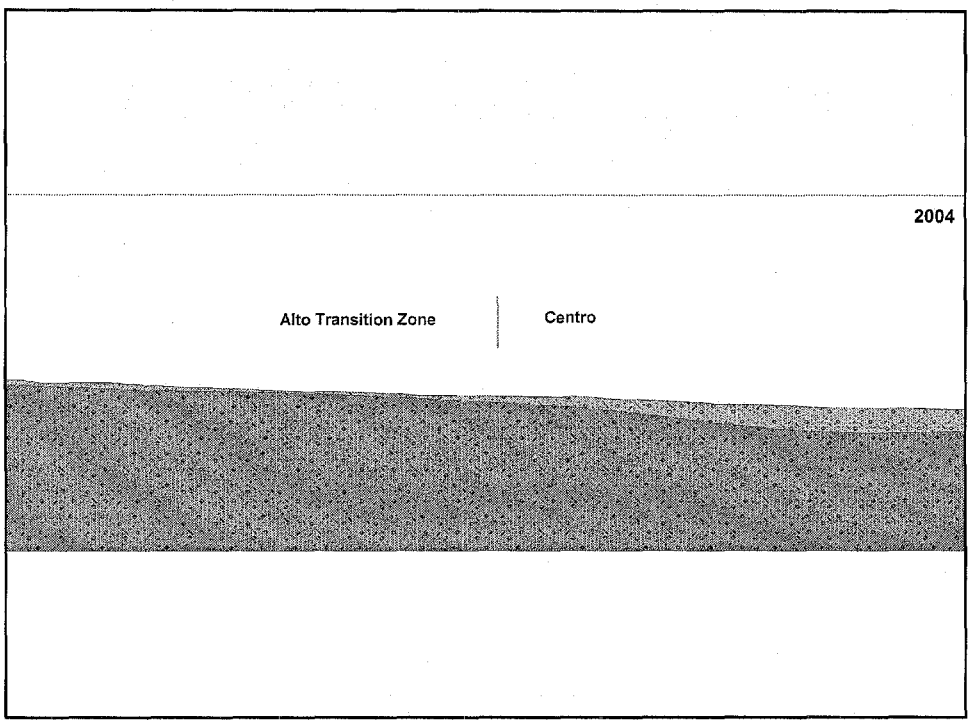
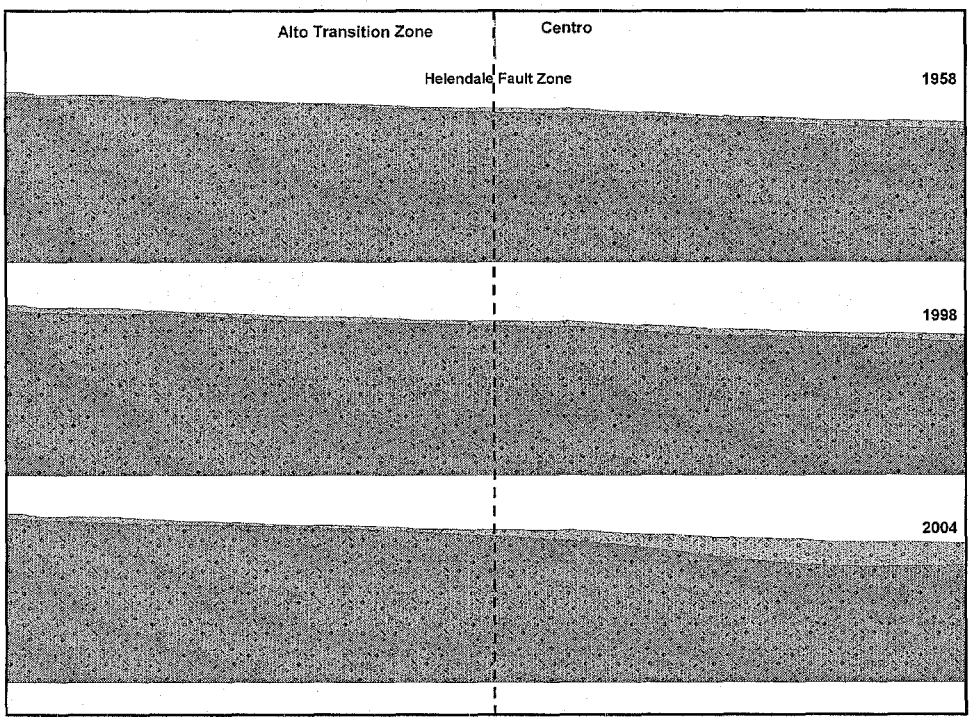


Figure 5c: Groundwater elevation contour map for 2004.


1958
Alto Transition Zone
Centro


1998
Alto Transition Zone
Centro


2004
Alto Transition Zone
Centro


Alto Transition Zone
Centro
Helendale Fault Zone
1958
1998
2004

Hydraulic Conductivity Values (K)
&
Aquifer Thickness Values

Source	Hydraulic Conductivity (K) (ft/day)	Aquifer Thickness (ft)	Notes on source
Multiple Sources	0.003	NA	General References
Stamos, et. al., 2003	4 - 23	150+	USGS Water-Resources Investigation Report 03-4069
Hardt, 1971	9 - 18	200	Transmissivity of 13,000 – 27,000 gpd/ft; Hydraulic Conductivity based on a depth of 200 feet.
Stamos, et. al., 2001	250	200+	USGS Water-Resources Investigations Report 01-4002; Estimated Transmissivity values for layer 1 are greater than 50,000 ft^2/day
URS, 2003		200	Based on geophysics and well logs.
Well Logs	NA	200	Deepest wells
Multiple Sources	300	NA	General References

Table 1: Source and Information on Varying Hydraulic Conductivity Values.

Subflow Ranges

Discharge (Q) (acre-ft/year)		Hydraulic Conductivity (K) (ft/day)			
		0.003	23	250	300
Thickness (b) (ft)	100	<0.1	540 – 730	6,000 – 7,900	7,000 – 9,500
	200	<0.2	1,100 – 1,500	12,000 – 16,000	14,000 – 19,000
	300	<0.3	1,600 – 2,200	18,000 – 24,000	21,000 – 28,000

Table 9: Range of yearly discharge values (acre-ft/year).

Methodology Conclusions

- Gradients were calculated using 3 separate methods
- Gradients have generally not changed since the Judgment
- Methods used are acceptable for future monitoring
- Future analyses will be supported by the ***Basin Conceptual Model/Key Well Program***

Discussion of each flow obligation

- Este to Alto
- Alto to Centro
- Oeste Alto
- Centro to Baja
- Baja to Afton

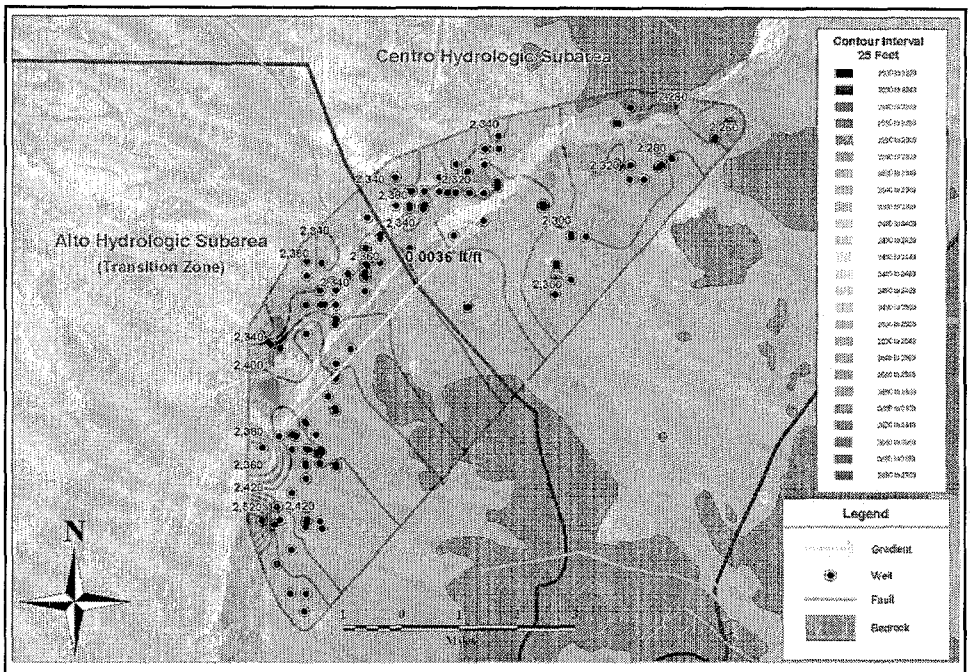


Figure 3: 1958 Groundwater Gradient – Alto to Centro

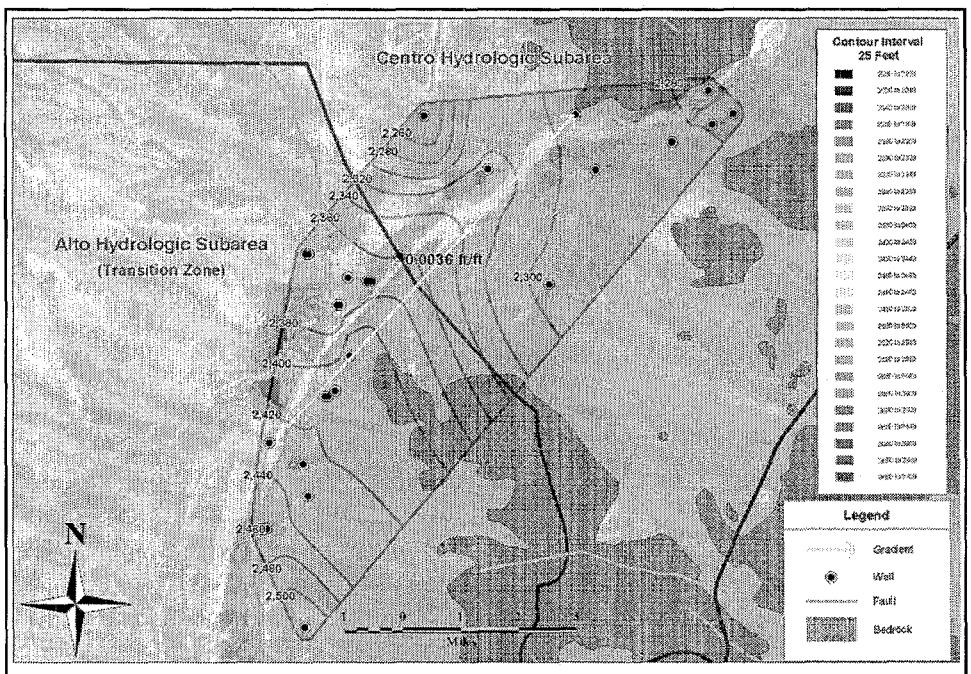


Figure 4: 1998 Groundwater Gradient – Alto to Centro

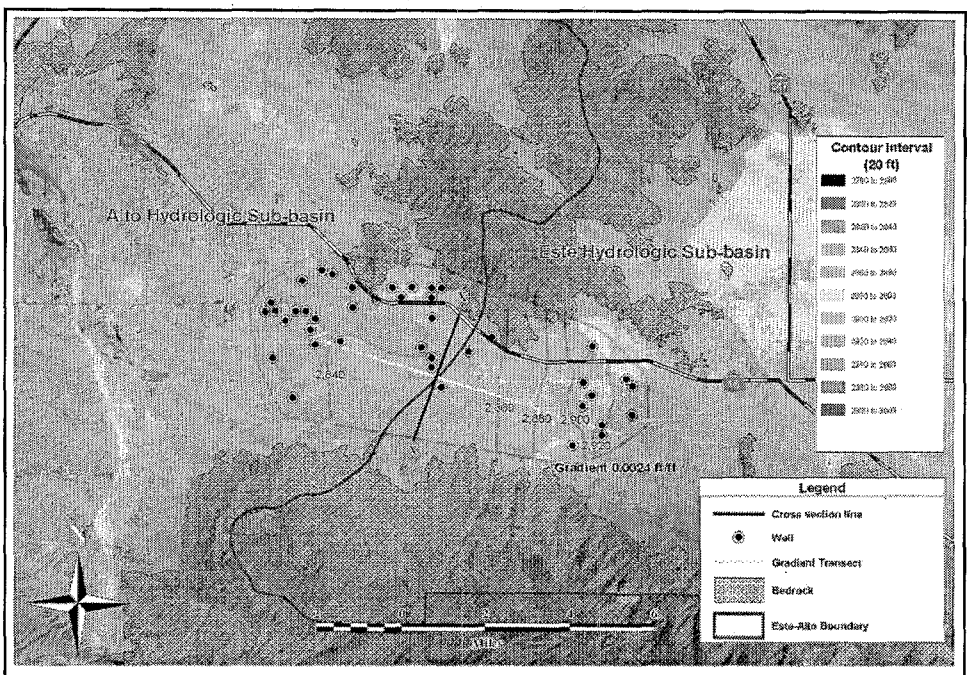


Figure 5: Winter 1957 Groundwater Gradient – Este to Alto

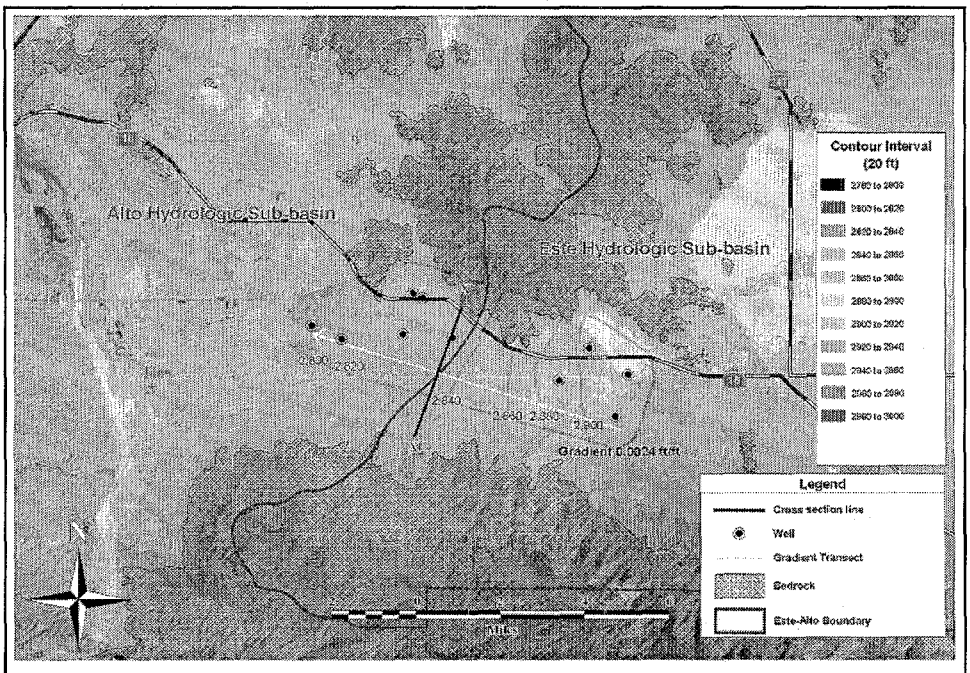


Figure 6: Spring 2004 Groundwater Gradient - Este to Alto

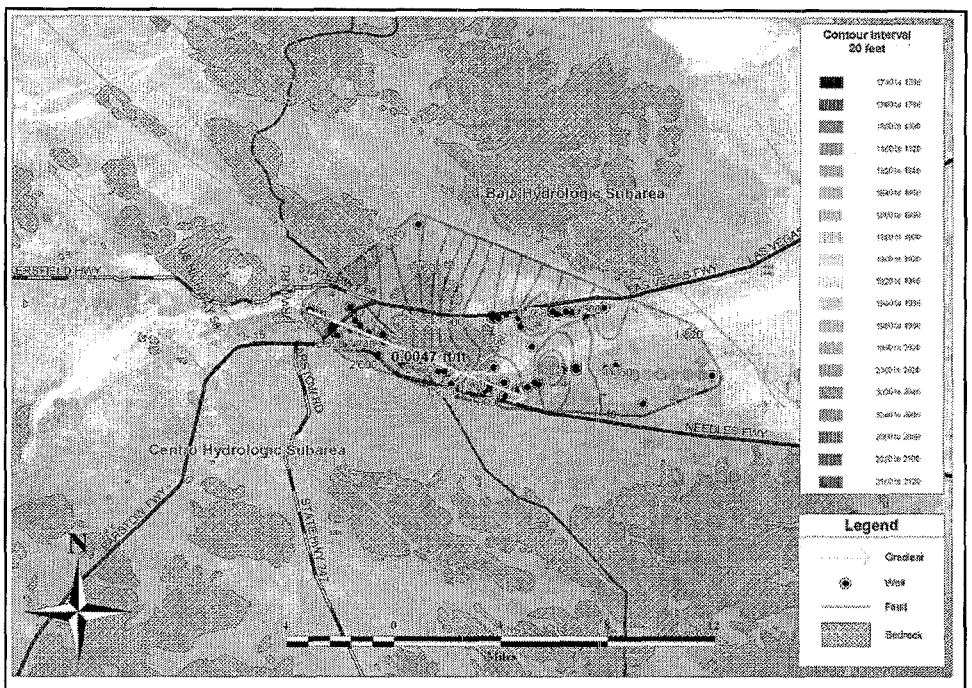


Figure 7: 1960 Groundwater Gradient - Centro to Baja

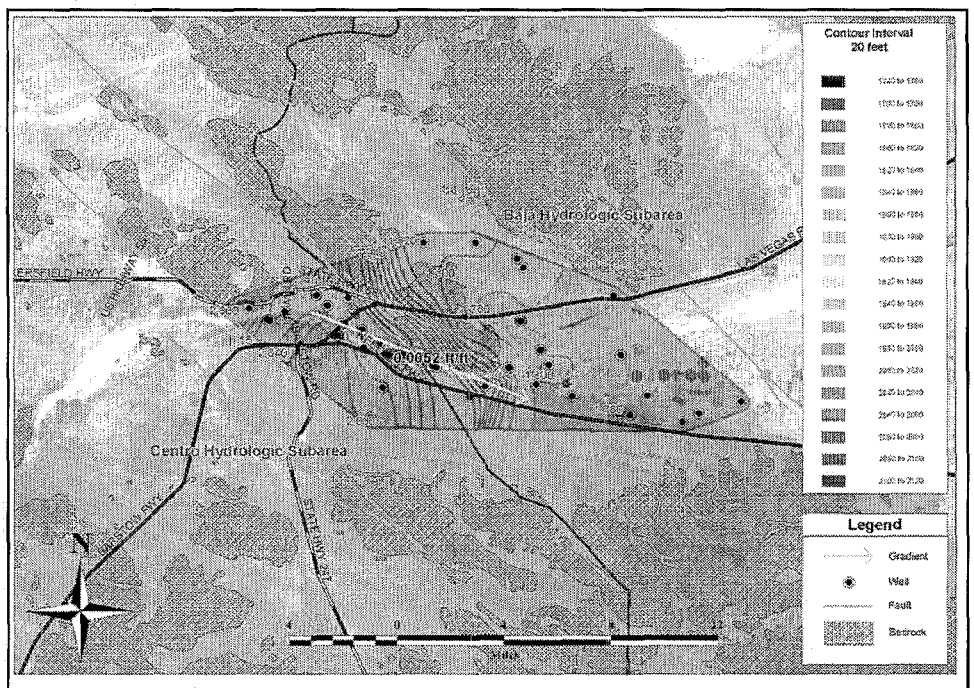


Figure 8: 2004 Groundwater Gradient - Centro to Baja

Did we learn anything that would change our understanding of the Subsurface flow?

No: The past and present groundwater gradient is unchanged at the boundary between:

- Alto and to Centro
- Este and Alto
- Centro and Baja

What is the relationship between an unchanged gradient and the subsurface flow?

- The stable groundwater gradient indicates stability in the amount of subsurface flow
- Although we may not be able to "accurately" determine the amount of flow, we can determine if it has changed
- By monitoring the gradient, we can monitor the relationship between the Subareas as required by the Judgment

Did we learn anything else that would change our understanding of the Subsurface flow?

Yes: We have insufficient data to evaluate Oeste to Alto and Baja to Afton.

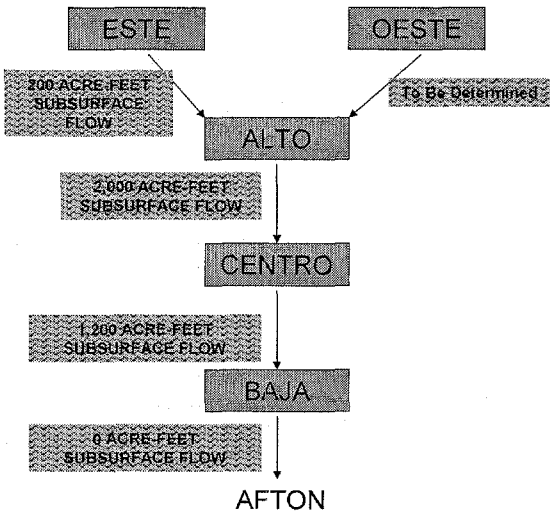
Oeste to Alto

- We are investigating the hydrogeology of Oeste and expect to have more information at the end of 2006
- We will report back with a recommendation at that time

Baja to Afton

- There is virtually no information available to evaluate this subsurface flow obligation
- There is a high cost of obtaining information
- MWA would likely need to build a pipeline to a point outside of its boundary to satisfy the obligation in the Judgment
- The cost would be borne by Baja residents
- The benefits would be minimal

Recommended Subsurface Flow Between Subareas



ATTENDANCE
MOJAVE BASIN AREA WATERMASTER
REGULAR MEETING

Date: February 22, 2006
Time: 4:30 p.m.
Meeting Place: Mojave Water Agency Board Room

DIRECTORS:

Div. #1 _____ Kimberly Cox

Div. #2 _____ Jim Ventura

Div. #3 _____ Richard D. Hall

Div. #4 _____ Mike Page

Div. #5 _____ Art Bishop

Div. #6 _____ Beverly Lowry

Div. #7 _____ Dick Fortyune

MWA STAFF:

1. _____
2. _____
3. _____
4. Robert Boytoo
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

CONSULTANTS:

1. _____
2. Bob Wayne
3. _____
4. _____

MEETING SIGN-IN SHEET

MOJAVE BASIN AREA WATERMASTER MEETING

FEBRUARY 22, 2006
4:30 P.M.

MOJAVE WATER AGENCY BOARD ROOM
22450 HEADQUARTERS DRIVE
APPLE VALLEY CA 92307

The signing, registering, or completion of this document is voluntary. All persons may attend this meeting regardless of whether they sign, register, or complete this document.

NAME	REPRESENTING	ADDRESS	EMAIL
Tom Bilhorn	DFG		
Wayne Soppeland	Centro		
Jarl Gaarenstroom	11		
JW Mann	MRCWD		
Terry Catlin	GSWC		
Jesse Ramirez	GSWC		
Marilyn Lasiai	GSWC		
Joe Mathein	SB SDD		
Tonya Moore	DFG		

EXHIBIT 10

MOJAVE BASIN AREA
WATERMASTER

ADOPTED BOARD ACTIONS

March 22, 2006
4:30 p.m.

1. **INVOCATION** – Director Bishop rendered the invocation.

2. **CALL TO ORDER, PLEDGE OF ALLEGIANCE AND ROLL CALL -**

Chairman Page called the meeting to order at 4:30 pm.

ROLL CALL

Watermaster Board:	Chairman Page – Present Vice-Chairman Cox – Present Director Bishop – Present Director Fortyune – Present Director Hall – Present Director Lowry – Present Director Ventura– Present
MWA Staff Present:	Kirby Brill, Executive Officer Norman Caouette, Assistant Executive Officer Valerie Wiegenstein, Watermaster Services Manager Jeffrey Ruesch, Senior Watermaster Technician Robert Boytor, Watermaster Technician II Joanne Lowrance, Watermaster Secretary
Others Present:	Bill Brunick, Legal Counsel Robert Wagner, Watermaster Engineer Six visitors

3. **APPROVAL OF AGENDA**

MO#0637 ***ACTION:*** *Motion made, seconded and the agenda approved as submitted.*

4. **PUBLIC PARTICIPATION** – There were no public comments at this time.

CONSENT CALENDAR

5. **ACTIONS OF THE REGULAR MEETING OF FEBRUARY 22, 2006**

6. **BILLS FOR PAYMENT**

7. **FINANCIAL STATEMENTS THROUGH FEBRUARY, 2006**

8. **PERMANENT TRANSFERS OF BASE ANNUAL PRODUCTION RIGHT**
   A. **KEN LUTH TO UDDERLY GOLD FARMS, LLC**
      (27 ACRE-FEET, ALTO SUBAREA, AMOUNT PAID, INCLUDED IN SALE OF PROPERTY)
   B. **GREGORY M. & LISA A. MORCK TO DORA LAND, INC.**
      (15 ACRE-FEET, ALTO SUBAREA, AMOUNT PAID, $2,500 PER ACRE-FOOT)
   C. **ROBIN & JUDITH MITCHELL TO ELAINE TRAHAN**
      (36 ACRE-FEET, ALTO SUBAREA, AMOUNT PAID, INCLUDED IN SALE OF PROPERTY)
   D. **ELAINE TRAHAN TO TRAHAN, ET AL.**
      (36 ACRE-FEET, ALTO SUBAREA, AMOUNT PAID, INCLUDED IN SALE OF PROPERTY)
   E. **JOETTE JONES TO AQUA CAPITAL MANAGEMENT, LLC**
      (30 ACRE-FEET, CENTRO SUBAREA, AMOUNT PAID, $1,030 PER ACRE-FOOT)
   F. **THOMAS A. & PATRICIA C. PURCIO TO BRYAN C. HAAS & MARY H. HINKLE**
      (80 ACRE-FEET, BAJA SUBAREA, AMOUNT PAID, INLCLUDED IN THE SALE OF PROPERTY)
   G. **RAYMOND WARD TO PORTER G. & ANITA E. SMITH**
      (25 ACRE-FEET, BAJA SUBAREA, AMOUNT PAID, INCLUDED IN SALE OF PROPERTY)
   H. **ANDY MALIN & PAULA SOLOMON TO JAMES N. JACKSON, JR. REVOCABLE TRUST**
      (54 ACRE-FEET, BAJA SUBAREA, AMOUNT PAID, INCLUDED IN SALE OF PROPERTY)
   I. **DAVID P. BALL TO BANK OF AMERICA (FORECLOSURE)**
      (81 ACRE-FEET, BAJA SUBAREA)
   J. **BANK OF AMERICA TO QUIGG AND COMPANY, INC.**
      (81 ACRE-FEET, BAJA SUBAREA, AMOUNT PAID, INCLUDED IN SALE OF PROPERTY)

MO#0638 ***ACTION:*** *Motion made, seconded and the items on the Consent Calendar unanimously approved by the Board.*

PUBLIC HEARINGS

9. **PUBLIC HEARING TO RECEIVE COMMENTS AND RECOMMENDATIONS TO THE DRAFT WATERMASTER ANNUAL REPORT FOR WATER YEAR 2004-05**

Mr. Brill and Ms. Wiegenstein introduced this item.
Chairman Page opened the Public Hearing at 4:33 pm.
There being no comments from the public on this item, the Public Hearing closed at 4:33 pm.

MO#0639 ***ACTION:*** *Motion made, seconded and the Watermaster Board unanimously accepted the Twelfth Annual report and authorized staff to file the report with the Court by April 1, 2006.*

10. PUBLIC HEARING TO ADOPT THE DRAFT BUDGET AND ASSESSMENT RATES FOR WATER YEAR 2006-07

Ms. Wiegenstein presented this item for consideration.
Chairman Page opened the Public Hearing at 4:35 pm.
There being no comments from the public on this item, the Public Hearing closed at 4:35 pm.

MO#0640 ***ACTION:*** *Motion made seconded and the Watermaster Board adopted the proposed Budget and Assessment Rates for Water Year 2006-07 as follows:*

Estimated Administrative Budget		$ 478,538.00
Administrative Assessment Rate		$3.10 per acre-foot of Production
Biological Assessment Rate		$0.68 per acre-foot of Production
Makeup Water Assessment Rate		$ 354.00 per acre-foot
Replacement Water Assessment Rate	Alto	$ 277.00 per acre-foot
	Baja	$ 371.00 per acre-foot
	Centro	$ 356.00 per acre-foot
	Este	$ 277.00 per acre-foot
	Oeste	$ 277.00 per acre-foot

11. PUBLIC HEARING TO ADOPT THE PROPOSED RECOMMENDATION FOR FREE PRODUCTION ALLOWANCE FOR WATER YEAR 2006-07

This item was introduction by Mr. Caouette and Mr. Wagner reviewed the recommendation.
Chairman Page opened the Public Hearing at 4:37 pm.
There being no comments from the public on this item, the Public Hearing closed at 4:37 pm.

MO#0641 ***ACTION:*** *Motion made seconded and the Watermaster Board adopted the proposed Free Production Allowances and authorized legal counsel to request a hearing with the Court to consider the proposed Free Production Allowances for Water Year 2006-07 as follows:*

Subarea	***FPA Recommendation***
Este[1]	*80% of Base Annual Production*
Oeste	*80% of Base Annual Production*
Alto – Agriculture	*80% of Base Annual Production*
Alto – Municipal & Industrial	*60% of Base Annual Production*
Centro	*80% of Base Annual Production*

Baja[2]	*70% of Base Annual Production* ***or*** *75% of Base Annual Production pursuant to the Court Order dated December 29, 2005*

Mr. Brunick clarified that although the Judgment requires Rampdown based on the numbers, the recommendation complies with what Court has determined in the past.

NEW BUSINESS

12. CONSIDER ADOPTION OF THE RECOMMENDED SUBSURFACE FLOW BETWEEN SUBAREAS

Mr. Wagner presented this item for consideration.

Subareas	Judgment Obligations	Proposed Obligations
Este to Alto	200 acre-feet	200 acre-feet
Oeste to Alto	800 acre-feet	To be determined
Alto to Centro	2,000 acre-feet	2,000 acre-feet
Centro to Baja	1,200 acre-feet	1,200 acre-feet
Baja to Afton	400 acre-feet	0 acre-feet

MO#0642 ***ACTION:*** *Motion made seconded and the Watermaster Board unanimously adopted the recommended subsurface flow obligations and authorized legal counsel to report to the Court the findings.*

REPORTS

13. EXECUTIVE OFFICER REPORTS.

A. PERCENTAGE OF PRODUCERS REPORTING FOR THE FIRST QUARTER OF THE 2005-06 WATER YEAR

B. ACTIVITY SUMMARY OF QUARTERLY REPORTING AND STATUS OF ASSESSMENTS INVOICED

C. TABLE AND GRAPH SHOWING THE STATUS OF THE MOJAVE WATER AGENCY'S GROUNDWATER STORAGE ACCOUNTS BY SUBAREA AND TYPE OF WATER

D. LIQUIDITY REPORT

The reports included with the agenda package were reviewed by Ms. Wiegenstein.

14. Engineer Reports.

A. GRAPH SHOWING HISTORIC ANNUAL BASE FLOW AT THE LOWER NARROWS GAGE AND DIRECT MEASUREMENTS BY USGS

Mr. Wagner reviewed the report included in the agenda package.

B. OTHER REPORTS – None.

15. LEGAL REPORTS. – No legal reports.

16. DIRECTORS REPORTS –
Director Bishop commended Watermaster staff on successfully achieving 90% reporting.
Director Hall complemented Mr. Wagner, Mr. Brunick, and staff for efforts in meeting court-mandated deadlines.
Director Lowry commented on World Water Day.

OTHER BUSINESS

17. DISCUSSION ITEMS FOR NEXT OR FUTURE AGENDAS – None noted.

18. CLOSED SESSION. – Mr. Brunick indicated no need for closed session.

19. ADJOURNMENT – Chairman Page adjourned the meeting at 4:49 pm.

Approved: Jeanne Lowrance, Secretary

May 24, 2006

Attachments on-file:
Item No. 8 – Signed documentation
Item No. 9 – Signed documentation
Item No. 10 – Signed documentation
Item No. 11 – Signed documentation
Item No. 12 – Signed documentation
Sign-in sheets

**Audio recording of this meeting available upon request.*

MEETING SIGN-IN SHEET

MOJAVE BASIN AREA WATERMASTER MEETING

MARCH 22, 2006
4:30 P.M.

MOJAVE WATER AGENCY BOARD ROOM
22450 HEADQUARTERS DRIVE
APPLE VALLEY CA 92307

The signing, registering, or completion of this document is voluntary. All persons may attend this meeting regardless of whether they sign, register, or complete this document.

NAME	REPRESENTING	ADDRESS	EMAIL
Normand Nicholas	Esta		
Jim Gallagher	Golden State Water Co.	2143 Convention Center Way, Ste. 110 Ontario, CA 91764	
MARLYN LESLEY	GOLDEN STATE WATER CO		
JW Mannon	MRCWD		

ATTENDANCE
MOJAVE BASIN AREA WATERMASTER
REGULAR MEETING

Date: March 22, 2006
Time: 4:30 p.m.
Meeting Place: Mojave Water Agency Board Room

DIRECTORS:

Div. #1 _____ Kimberly Cox

Div. #2 _____ Jim Ventura

Div. #3 _____ Richard D. Hall

Div. #4 _____ Mike Page

Div. #5 _____ Art Bishop

Div. #6 _____ Beverly Lowry

Div. #7 _____ Dick Fortyune

MWA STAFF:

1. _____
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12. _____

CONSULTANTS:

1. _____
2. _____
3. _____
4. _____

MOJAVE BASIN AREA WATERMASTER

FOR
CITY OF BARSTOW, ET AL, VS. CITY OF ADELANTO, ET AL,
CASE NO. 208568 - RIVERSIDE COUNTY SUPERIOR COURT

MEMORANDUM

Date: March 22, 2006

To: Watermaster

From: Kirby Brill, Executive Officer

Re: Permanent Transfers of Base Annual Production Right

The following permanent water transfers are proposed for processing at the March 22, 2006 Watermaster meeting.

A. Ken Luth to Udderly Gold Farms, LLC

27 acre-feet, including 21 acre-feet of Carryover Right, in the Alto Subarea
Selling Price: Included in Sale of Property

This is a transfer of BAP pursuant to the Rules and Regulations.

B. Gregory M. & Lisa A. Morck to Dora Land, Inc.

15 acre-feet, including 12 acre-feet of Carryover Right, in the Alto Subarea
Selling Price: $2,500 per acre-foot

This is a transfer of BAP pursuant to the Rules and Regulations.

C. Robin & Judith Mitchell to Elaine Trahan

36 acre-feet, including 29 acre-feet of Carryover Right, in the Alto Subarea
Selling Price: Included in Sale of Property

This is a transfer of BAP pursuant to the Rules and Regulations.

D. Elaine Trahan to Trahan, et al.

36 acre-feet, including 29 acre-feet of Carryover Right, in the Alto Subarea
Selling Price: Included in Sale of Property

This is a transfer of BAP pursuant to the Rules and Regulations.

E. Joette Jones to Aqua Capital Management, LLC

30 acre-feet, including 24 acre-feet of Carryover Right, in the Centro Subarea
Selling Price: $1,030 per acre-foot

This is a transfer of BAP pursuant to the Rules and Regulations. Joette Jones will have 32 acre-feet of BAP remaining if this transfer is accepted by Watermaster.

22450 Headquarters Drive • Apple Valley, California 92307-4304
(760) 946-7000 • 1-800-254-4242 • FAX (760) 240-4523 • E-Mail: Watermaster@mojavewater.org

F. Thomas A. & Patricia C. Purcio to Bryan C. Haas & Mary H. Hinkle

80 acre-feet, including 64 acre-feet of Carryover Right, in the Baja Subarea
Selling Price: Included in Sale of Property

This is a transfer of BAP pursuant to the Rules and Regulations.

G. Raymond Ward to Porter G. & Anita E. Smith

25 acre-feet in the Baja Subarea
Selling Price: Included in Sale of Property

This is a transfer of BAP pursuant to the Rules and Regulations. Raymond Ward will have 105 acre-feet of BAP remaining if this transfer is accepted by Watermaster.

H. Andy Malin & Paula Solomon to James N. Jackson, Jr. Revocable Trust

54 acre-feet, including 44 acre-feet of Carryover Right, in the Baja Subarea
Selling Price: Included in Sale of Property

This is a transfer of BAP pursuant to the Rules and Regulations.

I. David P. Ball to Bank of America (Foreclosure)

81 acre-feet, including 65 acre-feet of Carryover Right, in the Baja Subarea
Selling Price: N/A

This is a transfer of BAP pursuant to the Rules and Regulations.

J. Bank of America to Quigg and Company, Inc.

81 acre-feet, including 65 acre-feet of Carryover Right, in the Baja Subarea
Selling Price: Included in Sale of Property

This is a transfer of BAP pursuant to the Rules and Regulations.

Action:

Staff recommends that the Watermaster accept for filing the permanent transfers of Base Annual Production Right listed above, based on the finding that they are consistent with the Watermaster Rules and Regulations.

Watermaster Action: Approved Staff's recommendation.
Conditions: None.
Date: March 22, 2006
Executive Officer: Ken Bell

MOJAVE BASIN AREA WATERMASTER

FOR
CITY OF BARSTOW, ET AL, VS. CITY OF ADELANTO, ET AL,
CASE NO. 208568 - RIVERSIDE COUNTY SUPERIOR COURT

MEMORANDUM

Date: March 22, 2006

To: Watermaster

From: Kirby Brill, Executive Officer

Re: Public hearing to receive comments and recommendations on the draft Watermaster Annual Report for Water Year 2004-05

A draft of Appendix B of the Annual Report showing verified water production and Replacement and Makeup Water Obligations and Assessments for the 2004-05 Water Year was mailed to all producers on January 31, 2006. The Watermaster held a public hearing on February 22, 2006 to receive comments on Appendix B.

A draft of the Twelfth Annual Report was presented to the Watermaster on February 22, 2006. A notice was mailed to all producers on February 23, 2006 indicating that the Annual Report was available for review and that the Watermaster would hold a public hearing to receive comments and recommendations for changes to the report on March 22, 2006.

Comments were received from Mr. Tom Ferruzzo (attached) regarding Chapter 5 text pertaining to the Baja Subarea proposed Free Production Allowance. Staff's response to Mr. Ferruzzo's concerns is attached.

Action:

Staff recommends that the Watermaster conduct a public hearing to receive comments and recommendations for changes to the Annual Report, accept the Annual Report as final and authorize staff to file the Annual Report with the Court no later than April 1, 2006.

Watermaster Action:	Approved Staff's recommendation.
Conditions:	None.
Date:	March 22, 2006
Executive Officer:	

22450 Headquarters Drive • Apple Valley, California 92307-4304
(760) 946-7000 • 1-800-254-4242 • FAX (760) 240-4523 • E-Mail: Watermaster@mojavewater.org

MOJAVE BASIN AREA WATERMASTER

FOR
CITY OF BARSTOW, ET AL, VS. CITY OF ADELANTO, ET AL,
CASE NO. 208568 - RIVERSIDE COUNTY SUPERIOR COURT

MEMORANDUM

Date: March 22, 2006

To: Watermaster

From: Kirby Brill, Executive Officer

Re: Public hearing to adopt the proposed Administrative Budget and Assessment Rates for Water Year 2006-07

Attached is a copy of the draft Administrative Budget and Assessment Rates for Water Year 2006-07, which was sent to all producers on January 31, 2006. The Watermaster held a public hearing on February 22, 2006 to receive comments on the proposed Budget and Assessment Rates.

A notice was mailed to all producers on February 23, 2006 indicating that the Administrative Budget and Assessment Rates would be adopted at the March 22, 2006 Watermaster meeting.

Action:

Staff recommends that the Watermaster conduct a public hearing and adopt the following Administrative Budget and Assessment Rates to be effective during Water Year 2006-07.

Estimated Administrative Budget	$ 478,538.00	
Administrative Assessment Rate	$ 3.10 per acre-foot of Production	
Biological Assessment Rate	$ 0.68 per acre-foot of Production	
Makeup Water Assessment Rate		$ 354.00 per acre-foot
Replacement Water Assessment Rate	Alto	$ 277.00 per acre-foot
	Baja	$ 371.00 per acre-foot
	Centro	$ 356.00 per acre-foot
	Este	$ 277.00 per acre-foot
	Oeste	$ 277.00 per acre-foot

Watermaster Action: Approved Staff's Recommendation.
Conditions: None.
Date: March 22, 2006
Executive Officer: Kirby Brill

22450 Headquarters Drive • Apple Valley, California 92307-4304
(760) 946-7000 • 1-800-254-4242 • FAX (760) 240-4523 • E-Mail: Watermaster@mojavewater.org

MOJAVE BASIN AREA WATERMASTER

FOR
CITY OF BARSTOW, ET AL, VS. CITY OF ADELANTO, ET AL,
CASE NO. 208568 - RIVERSIDE COUNTY SUPERIOR COURT

MEMORANDUM

Date: March 22, 2006

To: Watermaster

From: Kirby Brill, Executive Officer

Re: Public hearing to adopt the proposed recommendation for Free Production Allowance for Water Year 2006-07

Pursuant to paragraph 24 (o) of the Judgment the Watermaster is required to make a recommendation to the Court for adjusting the Free Production Allowance (Rampdown) of each Subarea, if necessary.

Pursuant to Exhibit D of the Judgment, Watermaster notified all parties of its recommendation for FPA by February 1, 2006, held a public hearing to receive comments as to its proposal on February 22, 2006 and notified all parties a second time on February 23, 2006 of the public hearing for adoption of FPA on March 22, 2006.

Watermaster is recommending FPA be set as follows for Water Year 2006-07:

Subarea	FPA Recommendation
Este[1]	80% of Base Annual Production
Oeste	80% of Base Annual Production
Alto – Agriculture	80% of Base Annual Production
Alto – Municipal & Industrial	60% of Base Annual Production
Centro	80% of Base Annual Production
Baja[2]	70% of Base Annual Production ***or*** 75% of Base Annual Production pursuant to the Court Order dated December 29, 2005

1 FPA o be set at 80% of Base Annual Production for the 2006-07 Water Year. The Este Subarea may be subject to future Rampdown to 65% immediately if water use conditions change.

2 The Baja Subarea Advisory Committee submitted a proposal to the Court for an alternative to the Rampdown mandated by the Judgment which includes a recommendation to set FPA at 75% (starting in 2005-06) of Base Annual Production for ten years pursuant to certain restrictions. The Baja SAC proposal was ordered by the Court on December 29, 2005 and a copy was mailed to all Baja parties on January 5, 2006.

22450 Headquarters Drive • Apple Valley, California 92307-4304
(760) 946-7000 • 1-800-254-4242 • FAX (760) 240-4523 • E-Mail: Watermaster@mojavewater.org

Action:

Staff recommends that the Watermaster conduct a public hearing, adopt the proposed Free Production Allowances and direct legal counsel to request a hearing with the Court to consider the proposed Free Production Allowances for Water Year 2006-07 detailed above.

Watermaster Action:	Approved Staff's recommendation.
Conditions:	None.
Date:	March 22, 2006
Executive Officer:	

MOJAVE BASIN AREA WATERMASTER

FOR
CITY OF BARSTOW, ET AL, VS. CITY OF ADELANTO, ET AL,
CASE NO. 208568 - RIVERSIDE COUNTY SUPERIOR COURT

MEMORANDUM

Date: March 22, 2006

To: Watermaster

From: Kirby Brill, Executive Officer

Re: Consider Adoption of the recommended Subsurface Flow Between Subareas

---

The Judgment After Trial requires that Watermaster prepare a report and recommendation for revising the estimated subsurface flow obligations specified in the Judgment. The existing subsurface flow obligations were established based on the best information that was available at the time of trial. Watermaster prepared a report setting forth a methodology to determine whether or not there had been a change in the subsurface flow amount, and to monitor flow conditions as required by the Judgment.

Staff presented a workshop on February 22, 2006 regarding the estimated subsurface flow between Subareas and circulated a notice to parties with the recommended subsurface flow obligations. The report concluded that the estimates of subsurface flow in the Judgment should be unchanged, except for Oeste and Baja. For Oeste, we are recommending that no recommendation regarding subsurface flow be made, until ongoing hydrologic studies in Oeste are completed.

During the workshop comments were made by representatives from City of Barstow and the Department of Fish and Game questioning the recommendation as it pertains to Baja. The concern was that we were recommending that the subsurface flow from Baja to Afton be reduced to zero. This is not the case. We are recommending that Watermaster be relieved of the obligation to determine the subsurface flow, and that the Baja residents be relieved of the obligation to provide "Make up" water to Afton.

The obligation as it is embodied in the Judgment is a subsurface obligation from Baja to a point downstream of the MWA administrative boundary. It is simply not feasible or cost effective to provide water to such a point, nor is it apparent whether or not there would be any beneficiary. Further, the downstream interests at Afton and beyond receive water from large storm events, which will not be affected by the recommendation.

22450 Headquarters Drive • Apple Valley, California 92307-4304
(760) 946-7000 • 1-800-254-4242 • FAX (760) 240-4523 • E-Mail: Watermaster@mojavewater.org

The summary report on subsurface flow was presented to Watermaster at the Workshop and made available for public review and comment. No written comments were received. We recommend the following obligations be approved:

Subareas	Judgment Obligations	Proposed Obligations
Este to Alto	200 acre-feet	200 acre-feet
Oeste to Alto	800 acre-feet	To be determined
Alto to Centro	2,000 acre-feet	2,000 acre-feet
Centro to Baja	1,200 acre-feet	1,200 acre-feet
Baja to Afton	400 acre-feet	0 acre-feet

Action:

Staff recommends that the Watermaster adopt the recommended subsurface flow obligations and authorize legal counsel to report to the Court the findings.

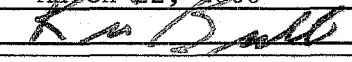
Watermaster Action: Approved Staff's recommendation.
Conditions: None.
Date: March 22, 2006
Executive Officer: 

EXHIBIT B

E. Michael Kaiser
Judge
Riverside Superior Court

Date: January 3, 1996

To: ALL COUNSEL

From: E. MICHAEL KAISER

Subject: ATTACHED AMENDED STATEMENT OF DECISION

The only amendment is on page 26, paragraph 7.

CLERK'S CERTIFICATE OF MAILING
(Original copy, duly executed, must be attached to original document at time of filing)
(Unsigned copy must accompany document being mailed)

208568

I ARTHUR A. SIMS, Clerk of the Superior Court of California, for the County of Riverside, do hereby certify that I am not a party to the within action or proceeding; that on the _____ day of January, 1996, I served a copy of the paper to which this certificate is attached, to wit:

AMENDED STATEMENT OF DECISION

accompanied by an unsigned copy of this certificate, by depositing said copy enclosed in a sealed envelope with postage thereon fully prepaid, in the United States post office mail box at the City of Riverside, California, addressed as follows:

SEE ATTACHED MAILING LIST

Dated:_____ ARTHUR A. SIMS, Clerk

By_____, Deputy

1013a CCP
331.1 (8/82) CLERK'S CERTIFICATE OF MAILING

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R. Zaiden Corrado, APC
By: Robert Corrado
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Montebello, CA 90640

CONSOLIDATED SUPERIOR/MUNICIPAL COURTS
MINUTES RIVERSIDE COUNTY

Case No.: 208568 Date: 1/2/96 Dept.: 4
Case Name: CITY OF BARSTOW V CITY OF ADELANTO
Counsel: See attached mailing list

Court Rptr: none
Proceeding: AMENDED STATEMENT OF DECISION

PROCEDURAL HISTORY

The original complaint was filed in this action by the City of Barstow and the Southern California Water Company on May 30, 1990. The complaint alleges that the cumulative water production up-stream of Barstow has overdrafted the Mojave River System to the detriment of plaintiffs. The complaint requests that the defendants guarantee an average annual flow of 30,000 acre-feet to the Barstow area. The complaint also requests a writ of mandate against the Mojave Water Agency ("MWA") to compel it to perform its duties and to import water from the State Water Project. The defendants served with a summons and complaint have either answered, been given open extensions to answer, been dismissed, or had defaults entered against them.

On July 26, 1991, MWA filed its first amended cross-complaint in the case. The MWA first amended cross-complaint names substantially all water producers within the boundaries of the Mojave River Watershed, including parties downstream of Barstow. The MWA cross-complaint requests a declaration that the available native water supply is inadequate to meet the demands of the combined parties and a determination of the water rights of whatever nature within the MWA boundaries and the Mojave River Watershed.

On July 3, 1991, Arc Las Flores Limited Partnership ("Arc Las Flores") filed a cross-complaint for declaratory relief seeking a declaration that the overlying and riparian rights of Arc Las Flores be determined to be prior and paramount to any rights of the plaintiffs or other appropriators. The cross-complaint names the City of Barstow and the Southern California Water Company, as well as "Doe" defendants.

A cross-complaint was filed by the City of Adelanto.

KAISER ,Judge

BURNS(ss) ,Clerk

recharge from periodic storm flows which is one of the principal sources of recharge for downgradient subareas without interference from upstream diversions. It will also benefit riparian vegetation in the lower subareas. [RT 510:4-511:0]

F. IDENTIFICATION OF SUBAREAS, SUBAREA

1. It is fair and equitable to maintain certain flow requirements between subareas as part of the physical solution. Flows to downstream subareas will be maintained either by supplemental water through the river and conveyance facilities, by purchase of transferred water by the watermaster, or by reductions in consumptive use. [RT 892:9-18; 910:14-18; 911:3-913:14]

2. The flow requirements between subareas are as follows: a) Este to Alto 200 acre-feet average annual subsurface flow as estimated in Bulletin 84; b) Oeste to Alto 800 acre-feet average annual subsurface flow as estimated in Bulletin 84; c) Alto to Centro 21,000 acre-feet average annual surface flow as measured at the lower narrows (and maintained by an immediate replacement water obligation in the transition zone to form a water bridge down to the Helendale Fault) plus a 2,000 acre-feet average annual subsurface flow as estimated in Bulletin 84; d) Centro to Baja 1,200 acre-feet average annual subsurface flow as estimated in Bulletin 84; e) Baja to the Mojave Basin 400 acre-feet average annual subsurface flow as estimated in Bulletin 84; f) these estimates and other subsurface estimates will need to be up-dated by the use of monitoring wells which will determine the water table slope at the boundaries. [RT 128:27-130:14]

The transition zone has a fairly stable water level. It is necessary to maintain that water level so that the surface flows passing the Lower Narrows and the subsurface inflow into the transition zone will reach the Helendale Fault, and hence downstream subareas; the flows at the Helendale Fault will in the future be measured using monitoring wells to insure that water levels are maintained within the transition zone. [RT 320:9-321:9]

G. ASSESSMENTS

1. The assessments imposed by the stipulated judgment are fair and equitable. It is not appropriate to require the Mojave Water Agency (MWA) to impose an ad valorem tax as part of the Physical Solution. Such a tax is not within the scope of the judgment, and is within the political prerogative of MWA.

2. Assessments apply to all production regardless of the type of use.

EXHIBIT C

Mojave Water Agency

BOARD OF DIRECTORS

APPROVED ACTIONS – REGULAR MEETING

April 28, 2022

**Please note that all requirements of the Brown Act requiring the physical presence of the Board or staff have been waived per original Executive Order N-29-20 and any amendments or modifications thereto.*

1. **Invocation** – Deronda Smith gave the invocation.

2. **Call to Order and Pledge of Allegiance**

The meeting was called to order at 9:30 a.m.

Present: President Jeanette Hayhurst, Vice President Mike Page, Secretary Michael Limbaugh, Treasurer Kimberly Cox, Director Jim Ventura Limbaugh, and Director Rick Roelle, Director Ken Anderson

Absent:

Staff: General Manager Allison Febbo, General Manager of Special Projects Kathy Cortner, Interim Assistant General Manager Yvonne Cox, Principal Hydrogeologist Tony Winkel and Executive Assistant La Trici Jones

Absent:

Consultants/ Guest Speakers: Bill Brunick, Legal Counsel

There were approximately 57 participants in-person and via teleconference.

3. **Approval of Agenda**

President Hayhurst stated that item 8 was removed from the agenda, there will be no legal report and items 11 and 12 will go before item 10 so the last item on the agenda will be acknowledgement of Kathy Cortner's retirement.

Action #9140: Director Cox made a motion to approve the agenda. Director Ventura seconded the motion, which was approved by a 7-0 vote.

PUBLIC PARTICIPATION

4. **Public Comment** – None

WORKSHOP

5. Centro Groundwater Review

Mr. Winkel reviewed a detailed PowerPoint presentation on the water needs of the Centro area.

CONSENT CALENDAR

6. Adopt Board Actions from Regular Meeting Dated April 14, 2022 and Special Meeting Dated April 26, 2022

7. Approve "Category B" Payments

Action #9141: Director Page made a motion to approve the consent calendar. Director Cox seconded the motion, which was approved by a 7-0 vote.

NEW BUSINESS

8. Consider Authorization for the Purchase of One Heavy Duty Service Truck for the Operations and Maintenance Department

This item was removed from the agenda.

9. Consider Authorization to import up to 5 TAF of State Water project Water for recharge to the Centro Subarea as an Emergency Drought Response Pilot Program

Mr. Winkel reviewed a detailed PowerPoint presentation.

Discussion ensued.

Public comment was provided by: Tina Souza, Doug Matthews, Mark Franey, Otis Calef Mark and Judy Zimmerman and Perry Dahlstrom.

Action #9142: President Hayhurst made a motion to approve the import of up to 5,000 acre-feet of State Water Project water for recharge in Centro Subarea as an emergency drought response pilot program. Director Cox seconded the motion, which was approved by a 7-0 vote.

10. Consider Adoption of a Resolution Acknowledging the Retirement of Kathy Cortner, General Manager; Mojave Water Agency

Action #9143: Director Page made a motion to adopt a Resolution acknowledging the retirement of Kathy Cortner. Director Ventura on behalf of all the Board seconded the motion, which was approved by a 7-0 vote.

REPORTS

11. Managers Reports – General Manager Febbo welcomed two new Hydrogeologist to the Agency

12. Legal Report – None

13. Director's Reports – All of the Directors provided their sentiment and well-wishes for Kathy Cortner.

OTHER BUSINESS

14. Discussion Items for Next or Future Agendas – None

CLOSED SESSION

15. CONFERENCE WITH LEGAL COUNSEL – EXISTING LITIGATION: Government Code Section 54956.9(A): City of Barstow, et al. v. City of Adelanto, et al., Case No. 208568 and Potential Litigation

ADJOURNMENT

16. Adjournment

Action #9144: President Hayhurst adjourned the meeting at 11:21 A.M. in honor of Kathy Cortner

Approved: _____
Michael Limbaugh, Secretary

Date: May 12, 2022

Attachments on File:

Item #5 PowerPoint Presentation – Centro Groundwater Review

Item #9 Staff Report and PowerPoint Presentation – Authorizing to Import up to 5TAF of SWP Water for recharge to the Centro Subarea as an emergency drought response pilot program

Signed Documentation
Sign-In Sheets

Mojave Water Agency

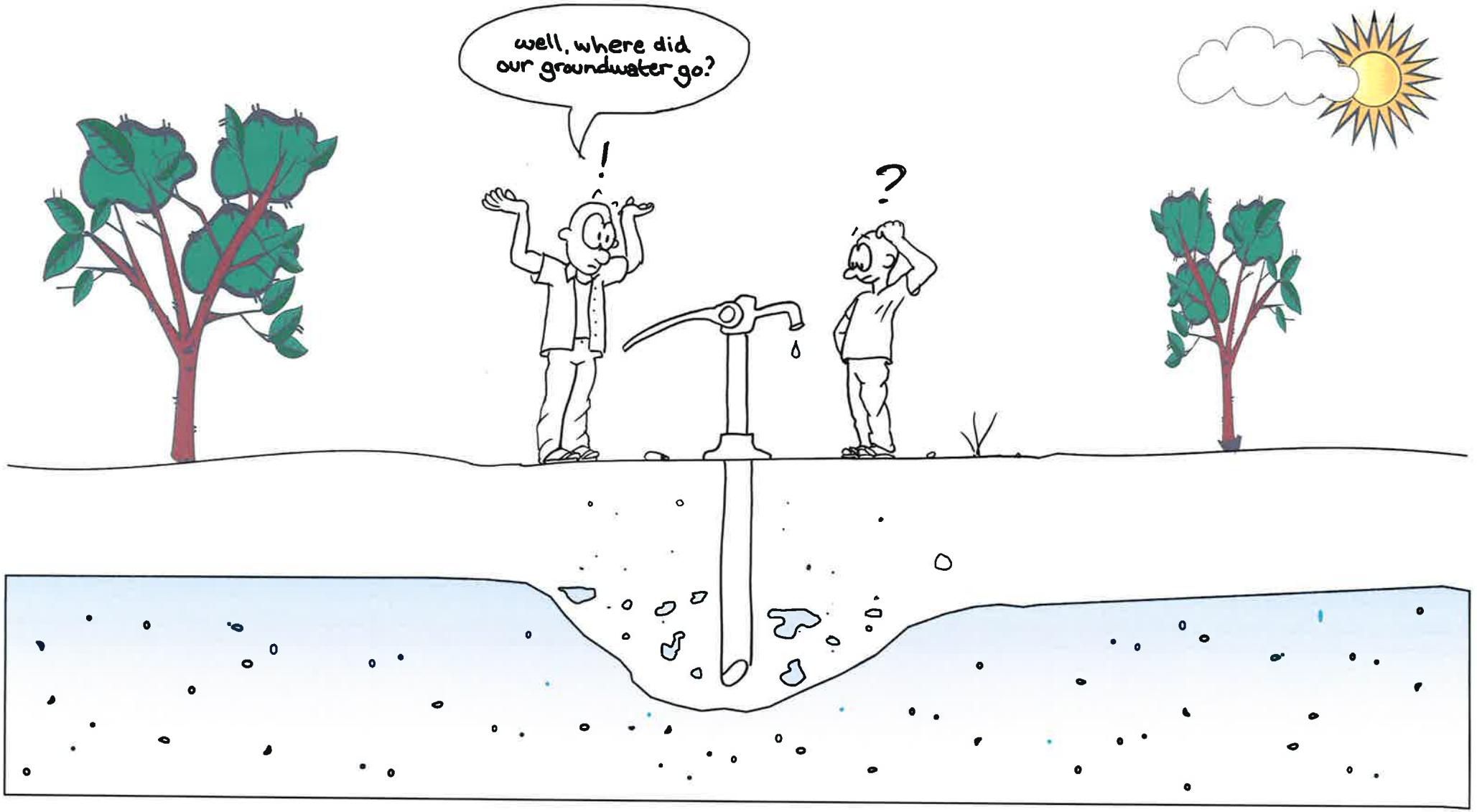
Centro Groundwater

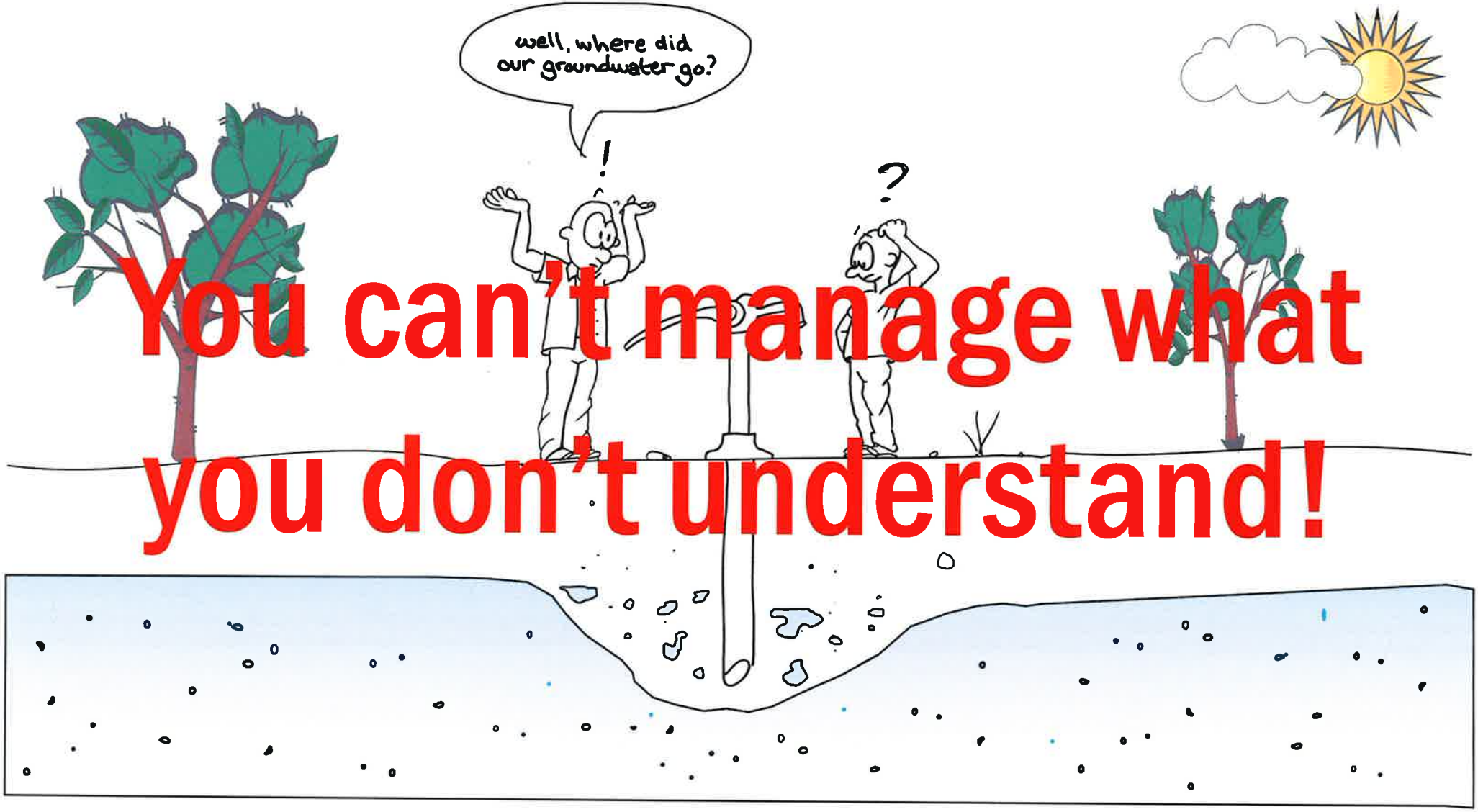
Board of Directors

April 28, 2022

Tony Winkel, Principal Hydrogeologist

Together, we're securing water for today & tomorrow...


well, where did our groundwater go?
!
?



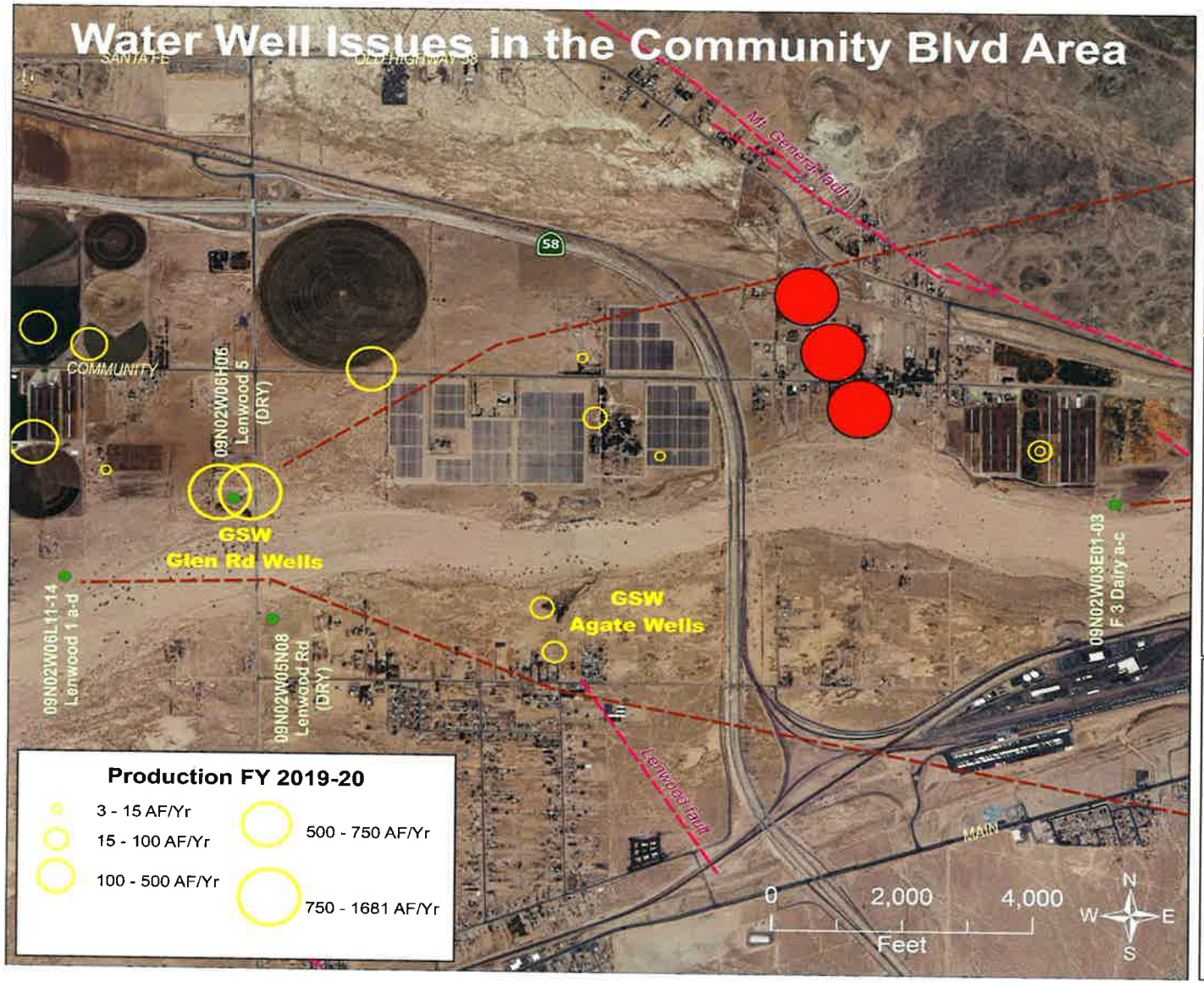
You can't manage what you don't understand!

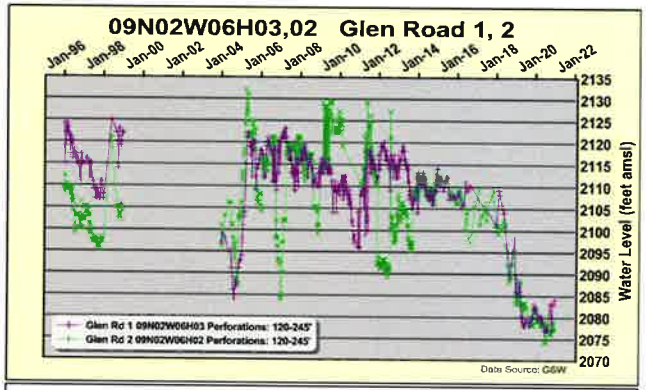
Background

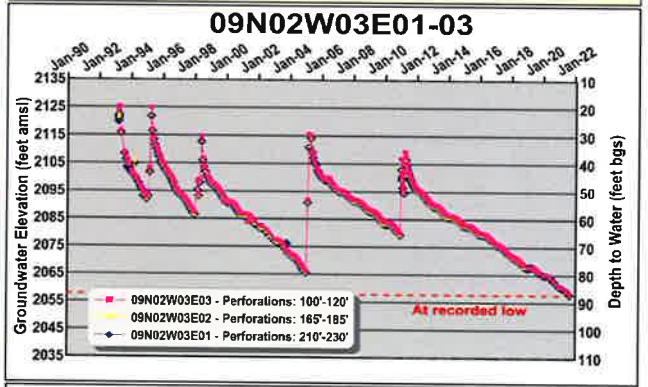
- In response to request from Director Hayhurst on Sep 23, 2021
- Reports of Dry Domestic Wells
- GSW Comments to the Board

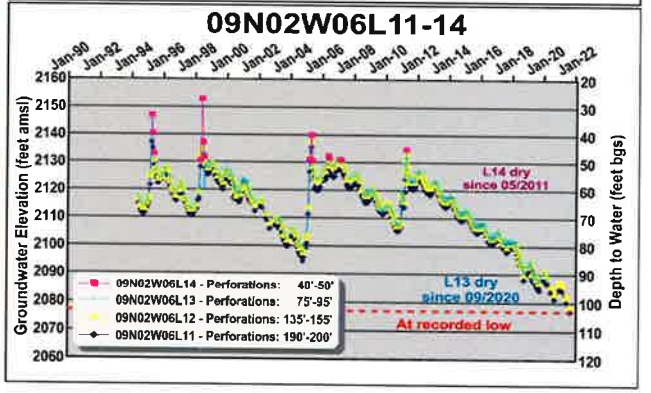
Areas of Analysis

- Water levels in monitoring and production wells
- Historically low water levels in monitoring wells
- Minimal producer dry well investigation
- Studying relevant regional scientific reports (USGS, KJ/T, etc.)
- Precipitation and storm event behavior
- Current climate studies
- Depth to bedrock
- General Centro Subarea basin health by area analysis
- Surface flow at USGS gages by year
- Production, production location, and production type
- Well construction (production and domestic)
- Faults and barriers with water level analysis to confirm locations
- Water level surfaces by year
- Flow between Alto TZ and Centro Subareas
- Golden State Water's concerns

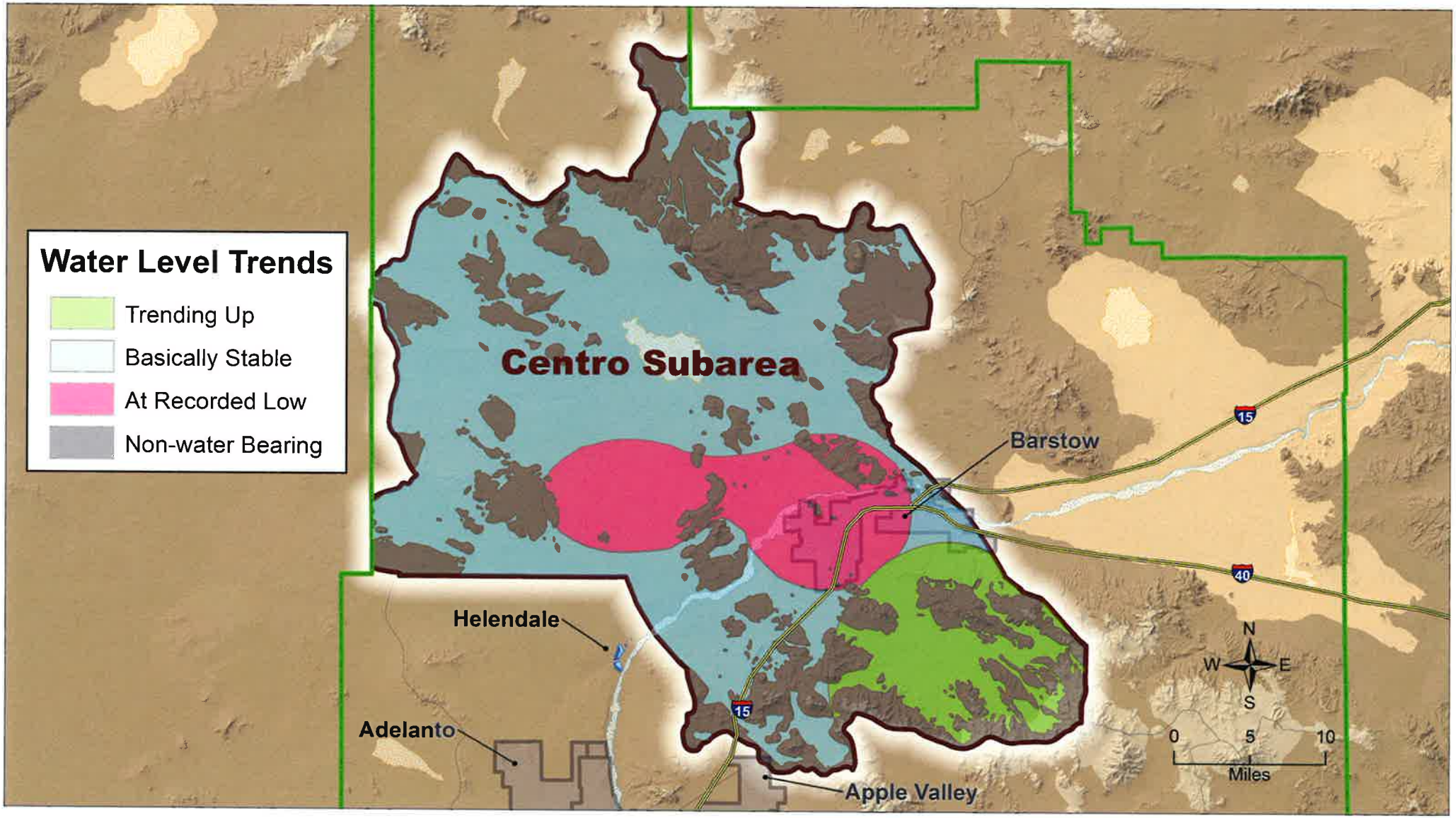

Water Well Issues in the Community Blvd Area
SANTA FE
OLD HIGHWAY 58
Mt. General fault
58
COMMUNITY
09N02W06H06
Lenwood 5
(DRY)
GSW
Glen Rd Wells
09N02W06L11-14
Lenwood 1 a-d
09N02W05N08
Lenwood Rd
(DRY)
GSW
Agate Wells
09N02W03E01-03
F 3 Dairy a-c
Lenwood fault
MAIN
Production FY 2019-20
3 - 15 AF/Yr
15 - 100 AF/Yr
100 - 500 AF/Yr
500 - 750 AF/Yr
750 - 1681 AF/Yr
0
2,000
4,000
Feet
N
W
E
S

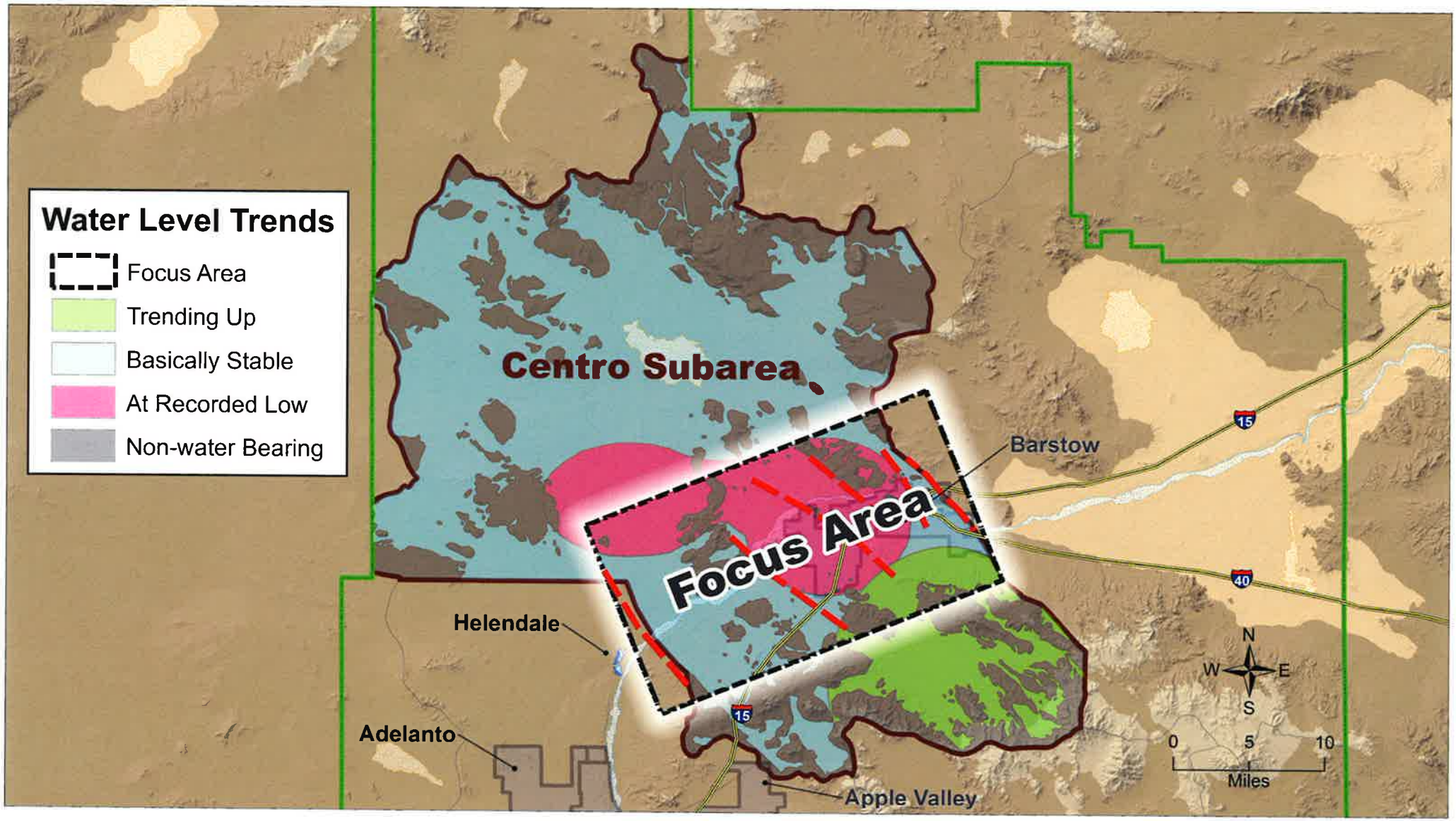

09N02W06H03,02 Glen Road 1, 2
Water Level (feet amsl)
Glen Rd 1 09N02W06H03 Perforations: 120-245'
Glen Rd 2 09N02W06H02 Perforations: 120-245'
Data Source: GSW


09N02W03E01-03
Groundwater Elevation (feet amsl)
Depth to Water (feet bgs)
09N02W03E03 - Perforations: 100'-120'
09N02W03E02 - Perforations: 165'-185'
09N02W03E01 - Perforations: 210'-230'
At recorded low


09N02W06L11-14
Groundwater Elevation (feet amsl)
Depth to Water (feet bgs)
L14 dry
since 05/2011
L13 dry
since 09/2020
09N02W06L14 - Perforations: 40'-50'
09N02W06L13 - Perforations: 75'-95'
09N02W06L12 - Perforations: 135'-155'
09N02W06L11 - Perforations: 190'-200'
At recorded low

DROUGHT


Water Level Trends
Trending Up
Basically Stable
At Recorded Low
Non-water Bearing
Centro Subarea
Barstow
Helendale
Adelanto
Apple Valley
15
40
N
W
E
S
0
5
10
Miles


Water Level Trends
Focus Area
Trending Up
Basically Stable
At Recorded Low
Non-water Bearing
Centro Subarea
Focus Area
Barstow
Helendale
Adelanto
Apple Valley
15
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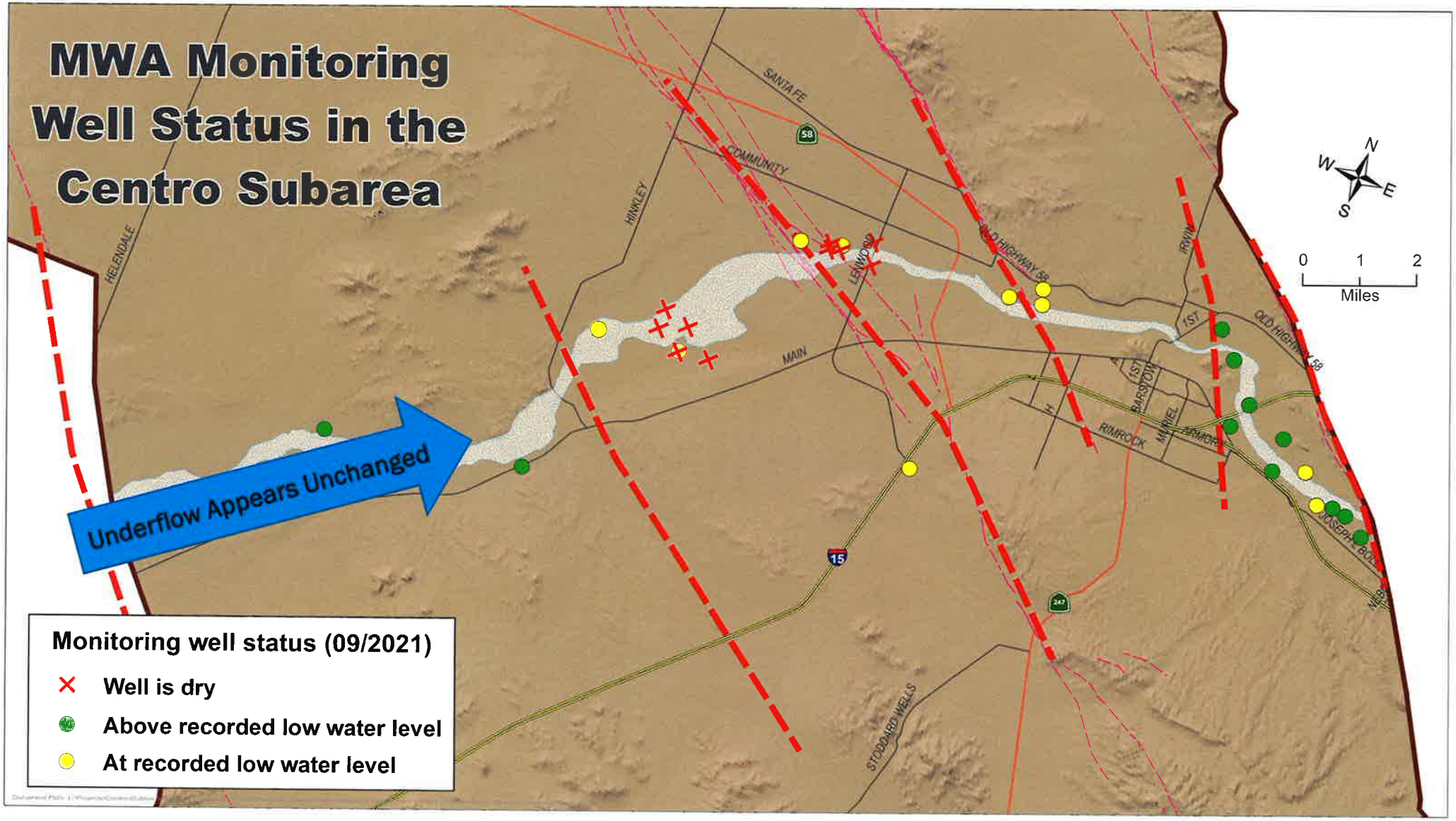
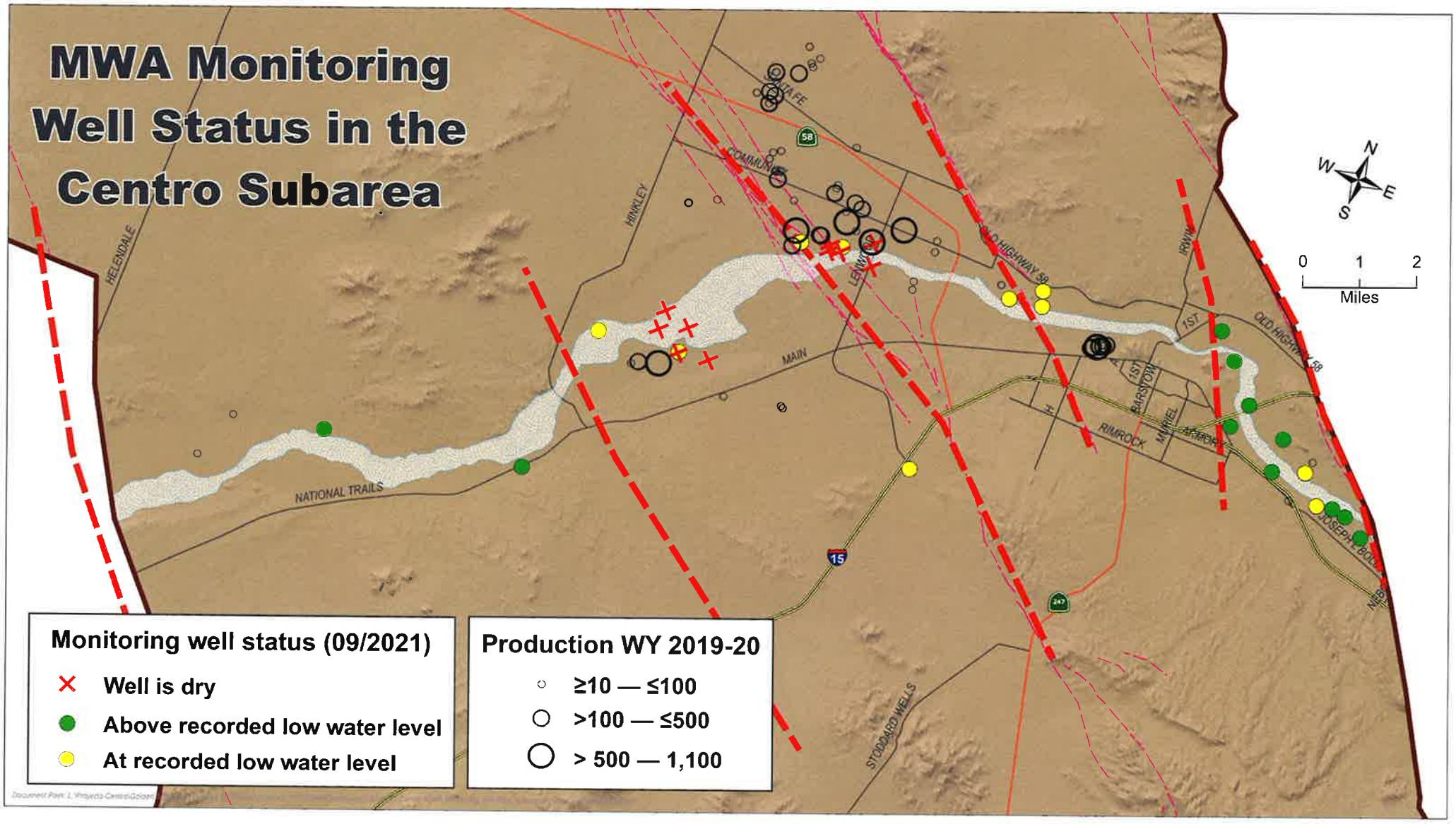
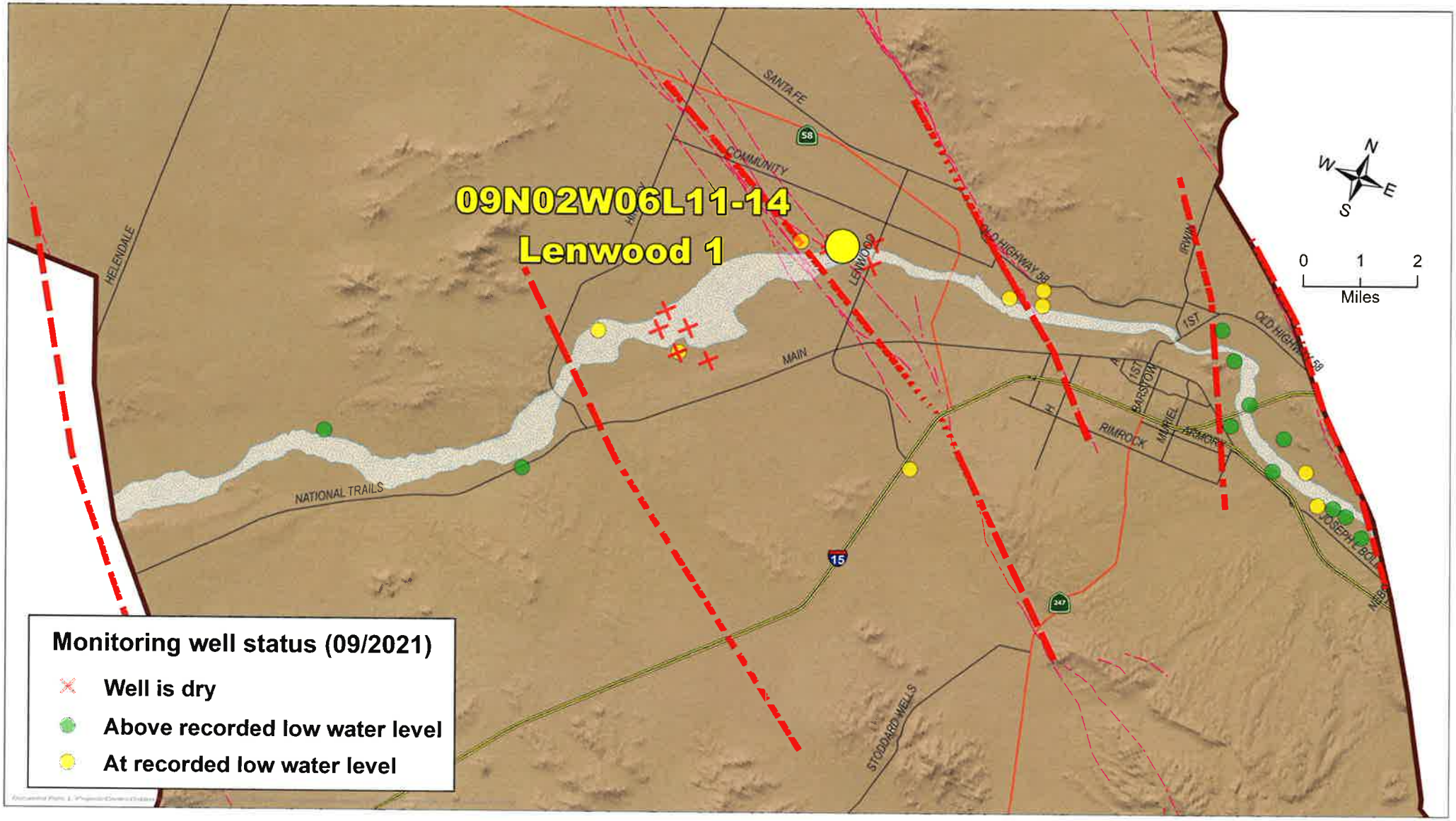
Miles


MWA Monitoring Well Status in the Centro Subarea
SANTA FE
COMMUNITY
HINKLEY
HELENDALE
LENWOOD
OLD HIGHWAY 58
IRWIN
1ST
MAIN
BARSTOW
RIMROCK
MARIEL
ARMORY
JOSEPH BOU
STODDARD WELLS
Underflow Appears Unchanged
N
W
E
S
0
1
2
Miles
Monitoring well status (09/2021)
Well is dry
Above recorded low water level
At recorded low water level


MWA Monitoring Well Status in the Centro Subarea
HELENDALE
HINKLEY
SANTA FE
COMMUNITY
LENWOOD
OLD HIGHWAY 58
IRWIN
1ST
MAIN
BARSTOW
MURIEL
RIMROCK
NATIONAL TRAILS
STODDARD WELLS
JOSEPH BOU
N
W
E
S
0 1 2
Miles
Monitoring well status (09/2021)
Well is dry
Above recorded low water level
At recorded low water level
Production WY 2019-20
≥10 — ≤100
>100 — ≤500
> 500 — 1,100


09N02W06L11-14
Lenwood 1
SANTA FE
COMMUNITY
HELENDALE
LENWOOD
OLD HIGHWAY 58
IRWIN
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NATIONAL TRAILS
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Monitoring well status (09/2021)
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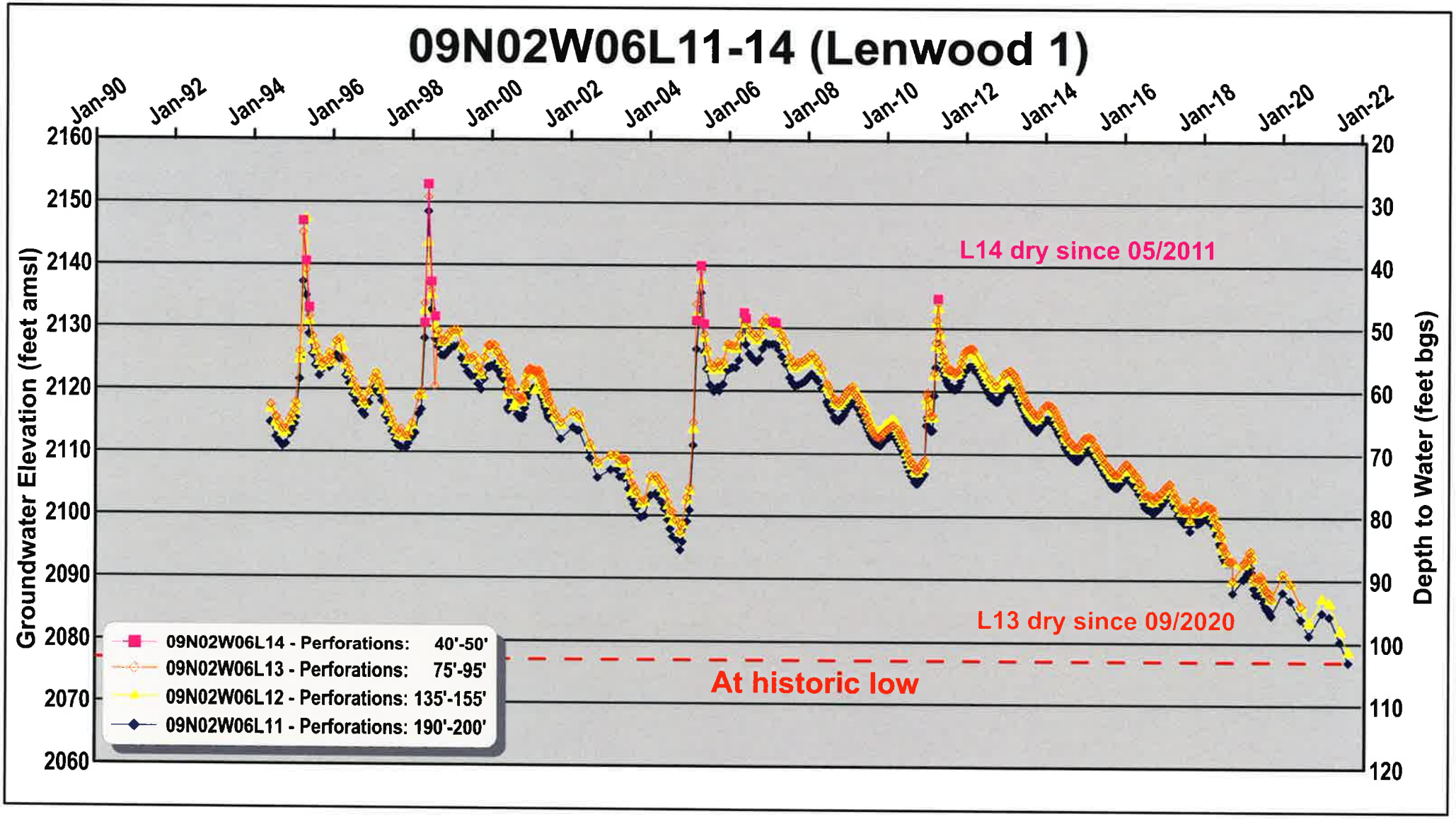
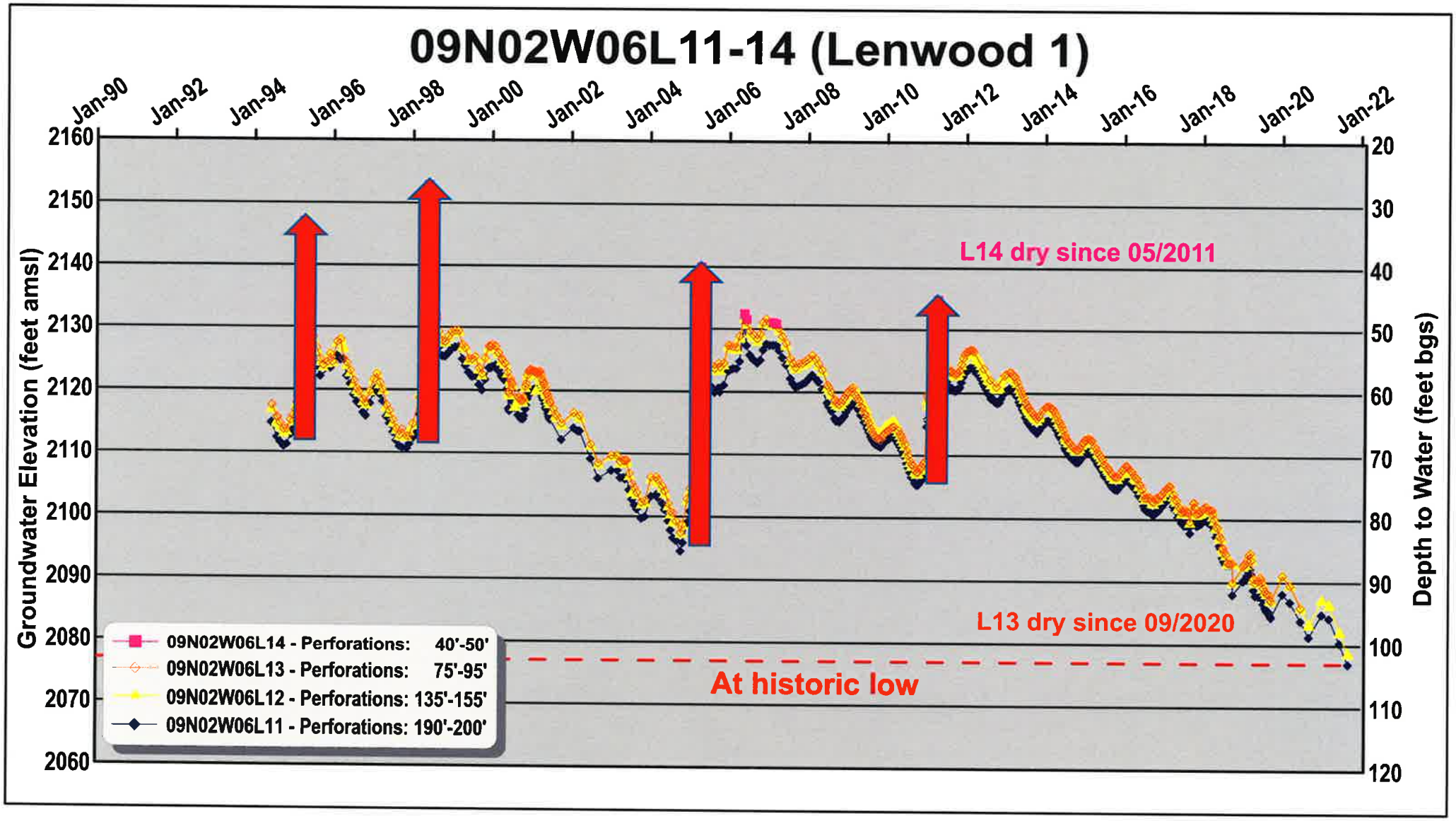
At recorded low water level


09N02W06L11-14 (Lenwood 1)
Jan-90
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Jan-22
Groundwater Elevation (feet amsl)
2160
2150
2140
2130
2120
2110
2100
2090
2080
2070
2060
Depth to Water (feet bgs)
20
30
40
50
60
70
80
90
100
110
120
L14 dry since 05/2011
L13 dry since 09/2020
At historic low
09N02W06L14 - Perforations: 40'-50'
09N02W06L13 - Perforations: 75'-95'
09N02W06L12 - Perforations: 135'-155'
09N02W06L11 - Perforations: 190'-200'


09N02W06L11-14 (Lenwood 1)
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Jan-22
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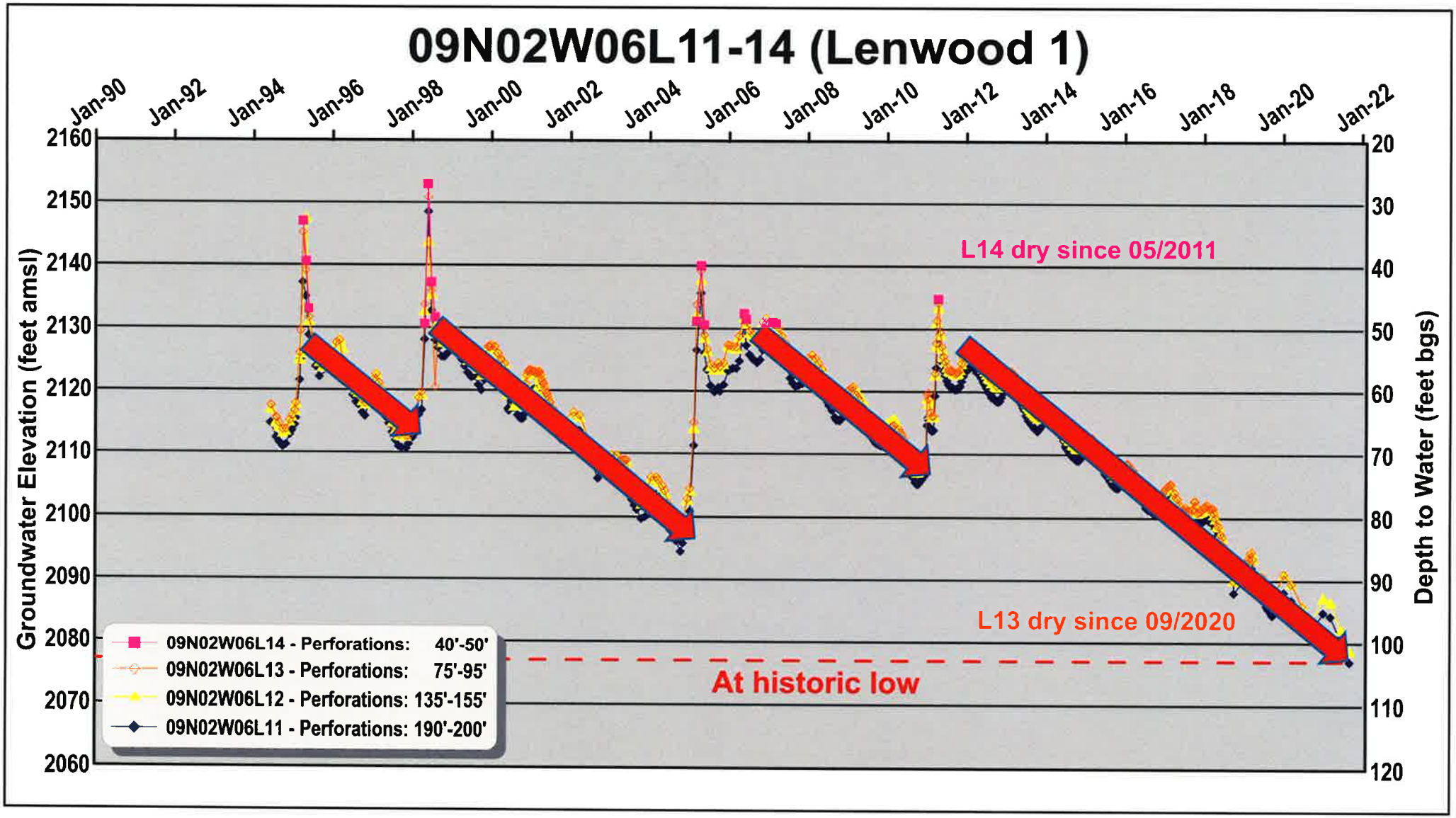
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Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Jan-22
Groundwater Elevation (feet amsl)
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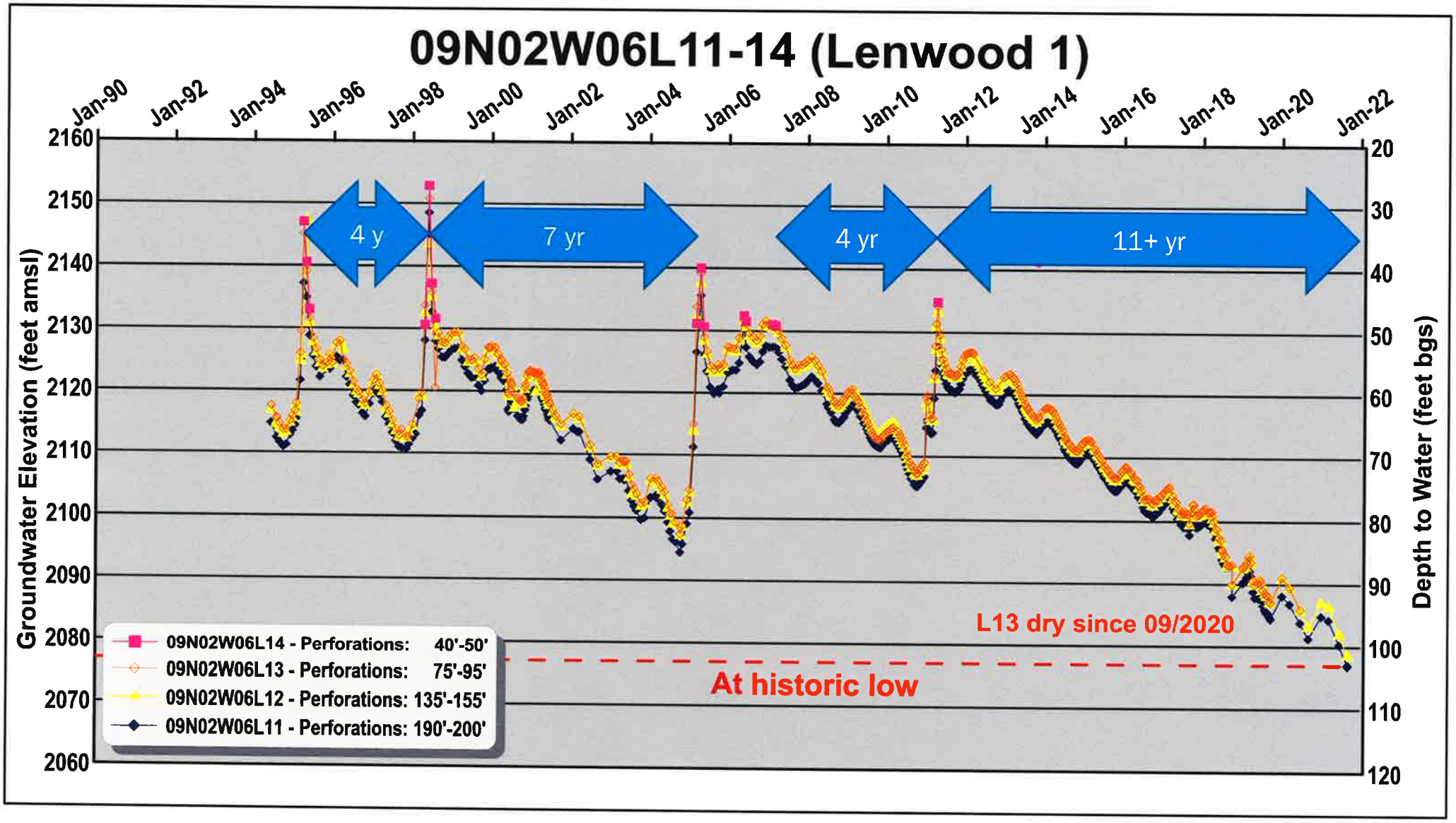
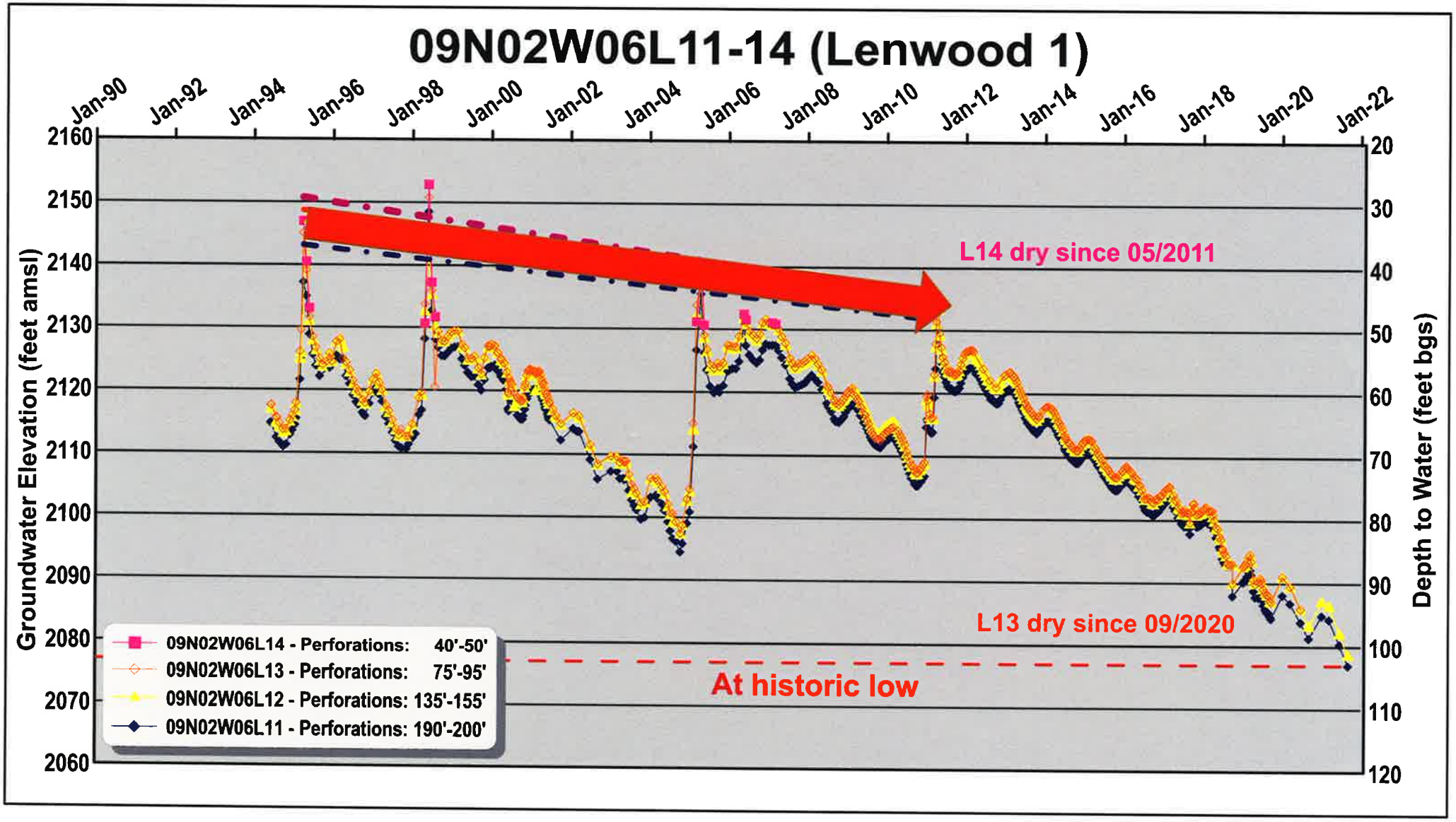
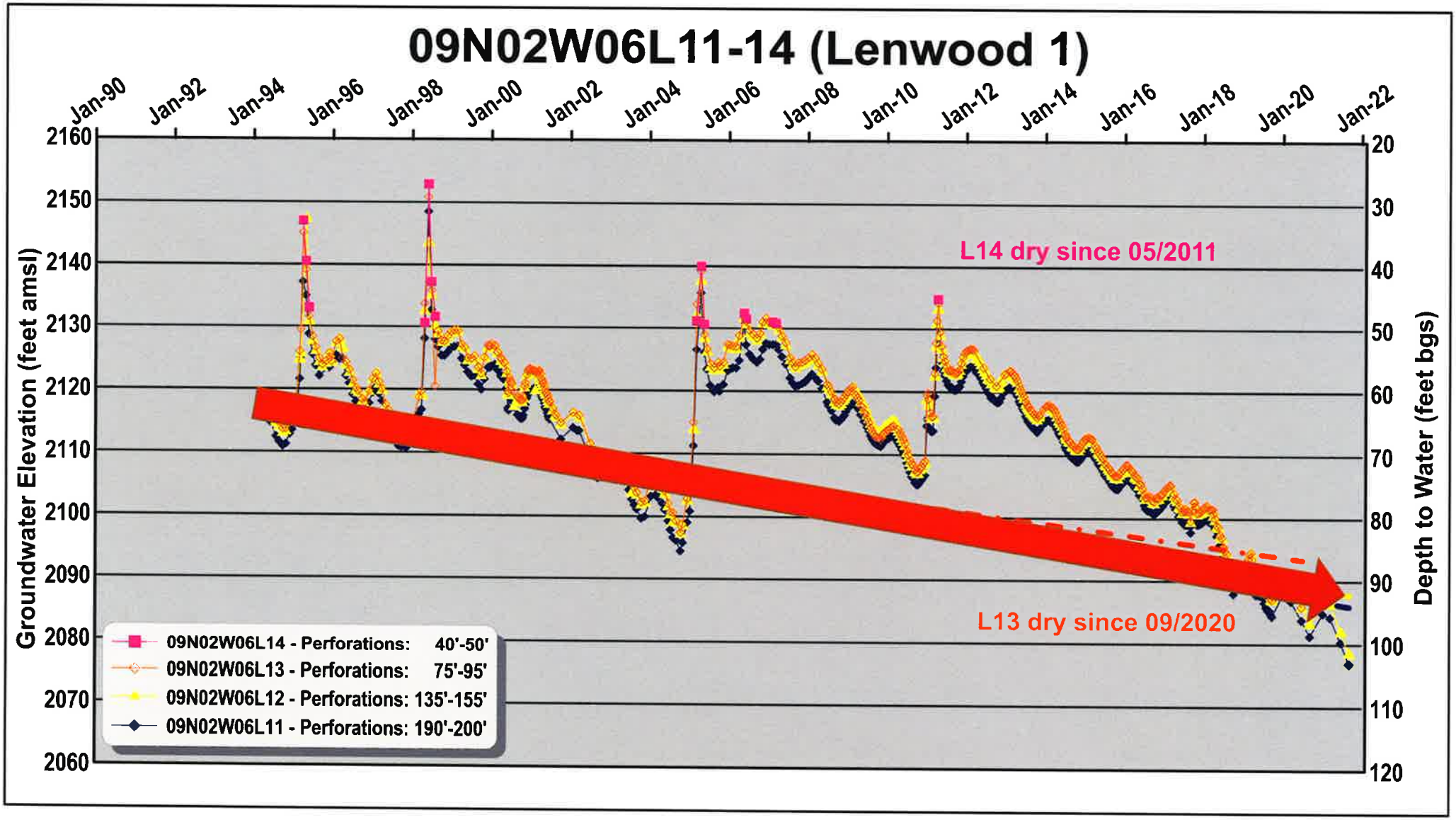
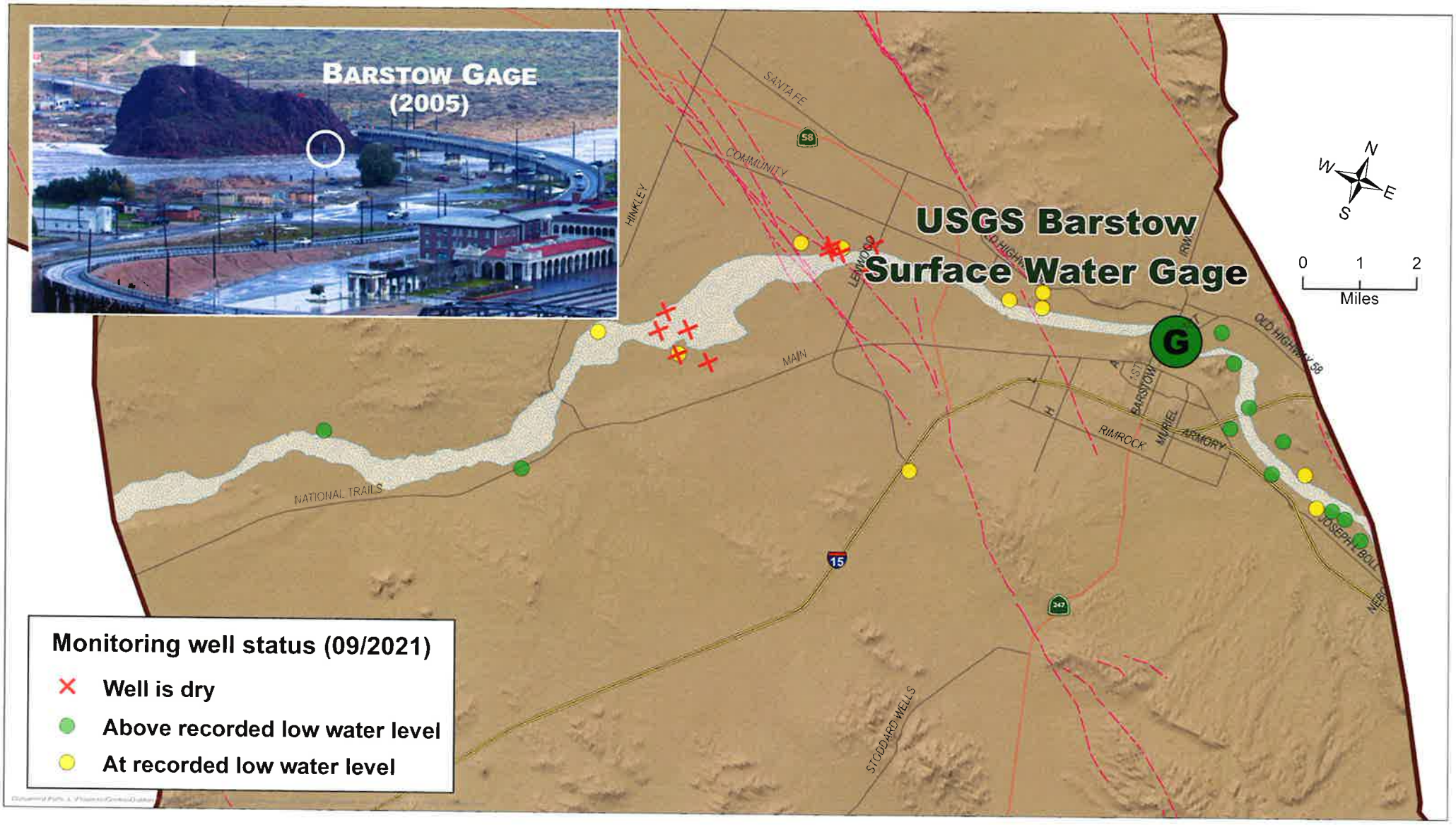
2150
2140
2130
2120
2110
2100
2090
2080
2070
2060
Depth to Water (feet bgs)
20
30
40
50
60
70
80
90
100
110
120
L14 dry since 05/2011
L13 dry since 09/2020
At historic low
09N02W06L14 - Perforations: 40'-50'
09N02W06L13 - Perforations: 75'-95'
09N02W06L12 - Perforations: 135'-155'
09N02W06L11 - Perforations: 190'-200'

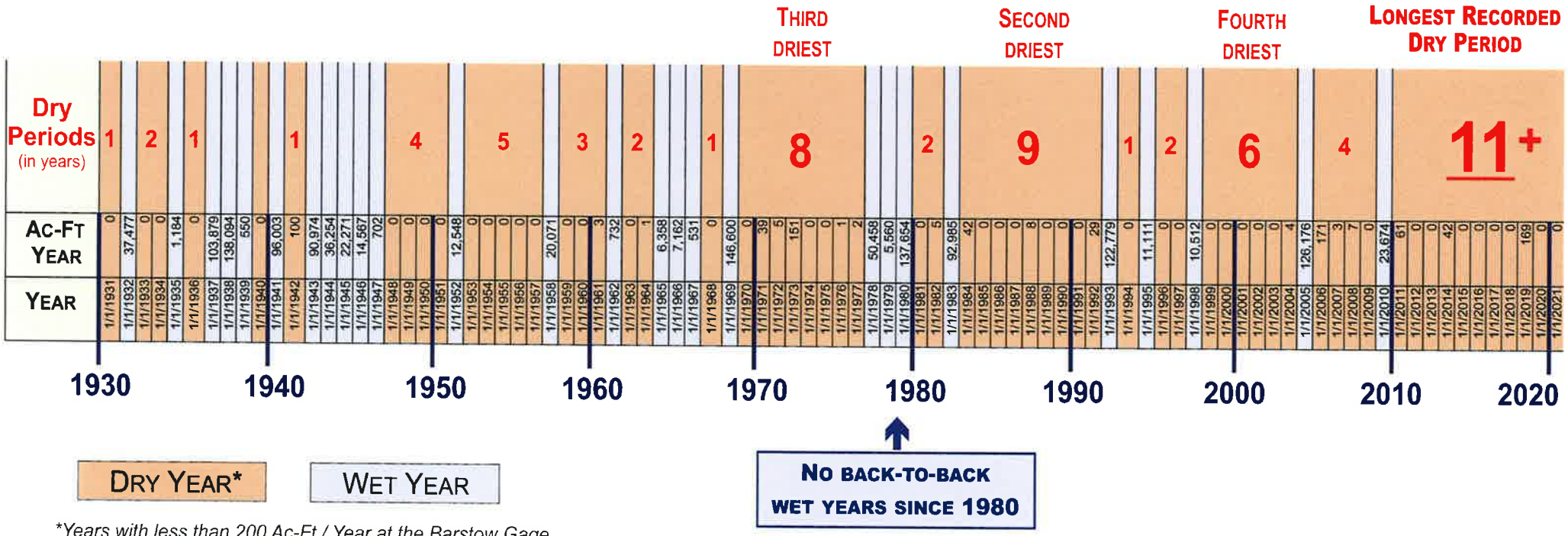

09N02W06L11-14 (Lenwood 1)
Jan-90
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Jan-22
2160
2150
2140
2130
2120
2110
2100
2090
2080
2070
2060
20
30
40
50
60
70
80
90
100
110
120
Groundwater Elevation (feet amsl)
Depth to Water (feet bgs)
4 y
7 yr
4 yr
11+ yr
L13 dry since 09/2020
At historic low
09N02W06L14 - Perforations: 40'-50'
09N02W06L13 - Perforations: 75'-95'
09N02W06L12 - Perforations: 135'-155'
09N02W06L11 - Perforations: 190'-200'


09N02W06L11-14 (Lenwood 1)
Jan-90
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Jan-22
2160
2150
2140
2130
2120
2110
2100
2090
2080
2070
2060
Groundwater Elevation (feet amsl)
20
30
40
50
60
70
80
90
100
110
120
Depth to Water (feet bgs)
L14 dry since 05/2011
L13 dry since 09/2020
At historic low
09N02W06L14 - Perforations: 40'-50'
09N02W06L13 - Perforations: 75'-95'
09N02W06L12 - Perforations: 135'-155'
09N02W06L11 - Perforations: 190'-200'


09N02W06L11-14 (Lenwood 1)
Jan-90
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Jan-22
2160
2150
2140
2130
2120
2110
2100
2090
2080
2070
2060
Groundwater Elevation (feet amsl)
20
30
40
50
60
70
80
90
100
110
120
Depth to Water (feet bgs)
L14 dry since 05/2011
L13 dry since 09/2020
09N02W06L14 - Perforations: 40'-50'
09N02W06L13 - Perforations: 75'-95'
09N02W06L12 - Perforations: 135'-155'
09N02W06L11 - Perforations: 190'-200'


BARSTOW GAGE
(2005)
USGS Barstow
Surface Water Gage
SANTA FE
COMMUNITY
HINKLEY
MAIN
NATIONAL TRAILS
RIMROCK
MURIEL
ARMORY
STODDARD WELLS
OLD HIGHWAY 58
N
W
E
S
0
1
2
Miles
Monitoring well status (09/2021)
Well is dry
Above recorded low water level
At recorded low water level

DRY PERIODS* AT THE USGS BARSTOW SURFACE WATER GAGE
1931 TO 2021



*Years with less than 200 Ac-Ft / Year at the Barstow Gage

nature climate change

BRIEF COMMUNICATION

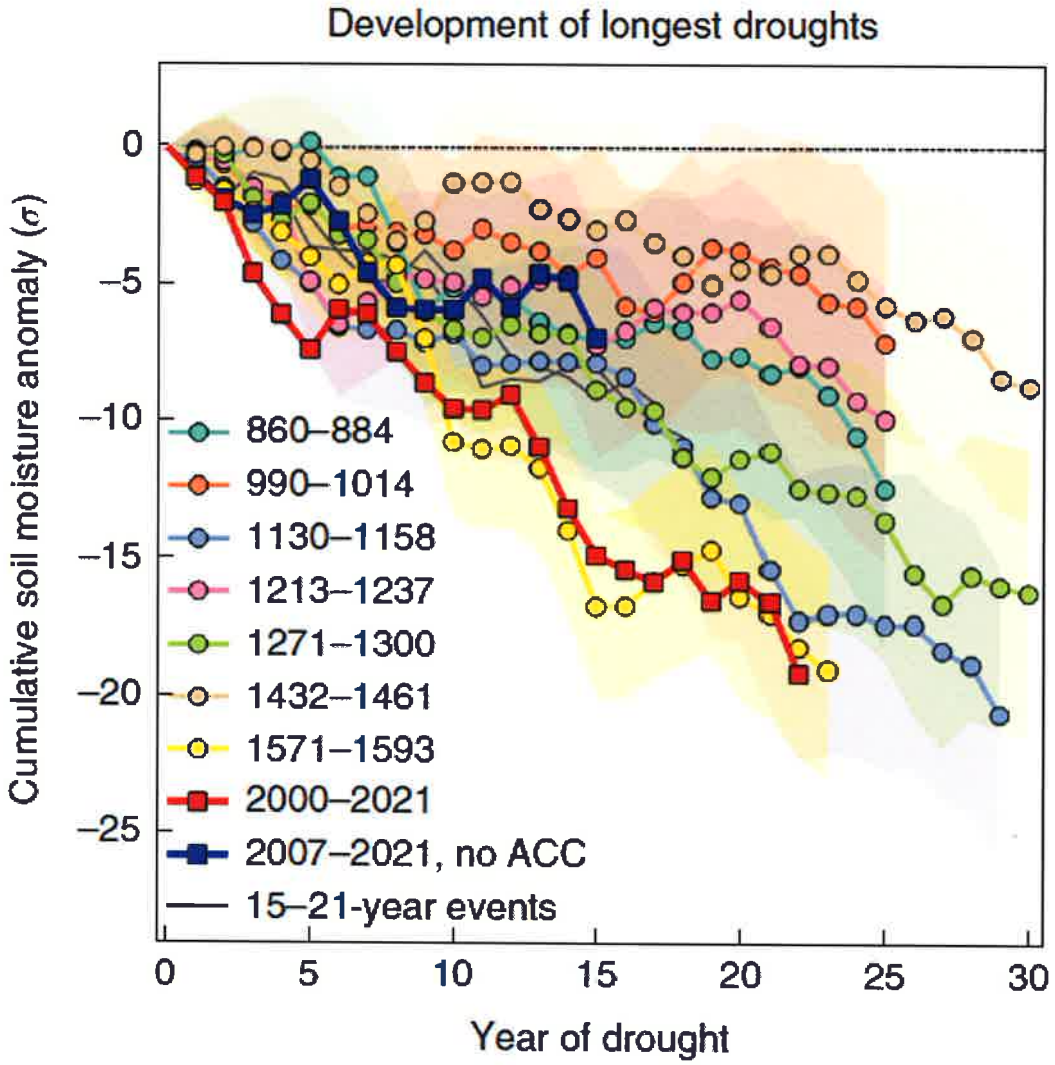
https://doi.org/10.1038/s41558-022-01290-z

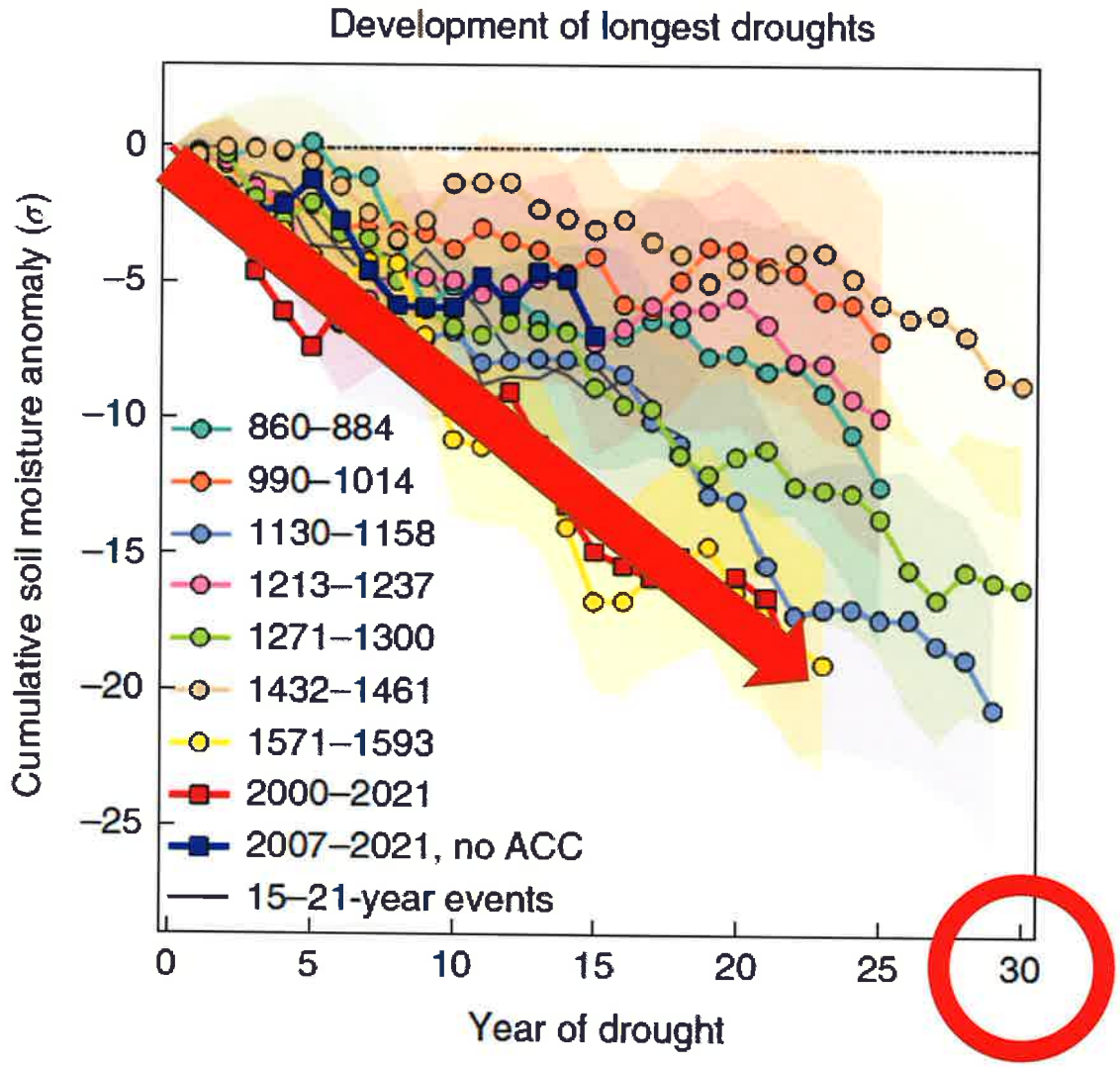
Check for updates

Rapid intensification of the emerging southwestern North American megadrought in 2020–2021

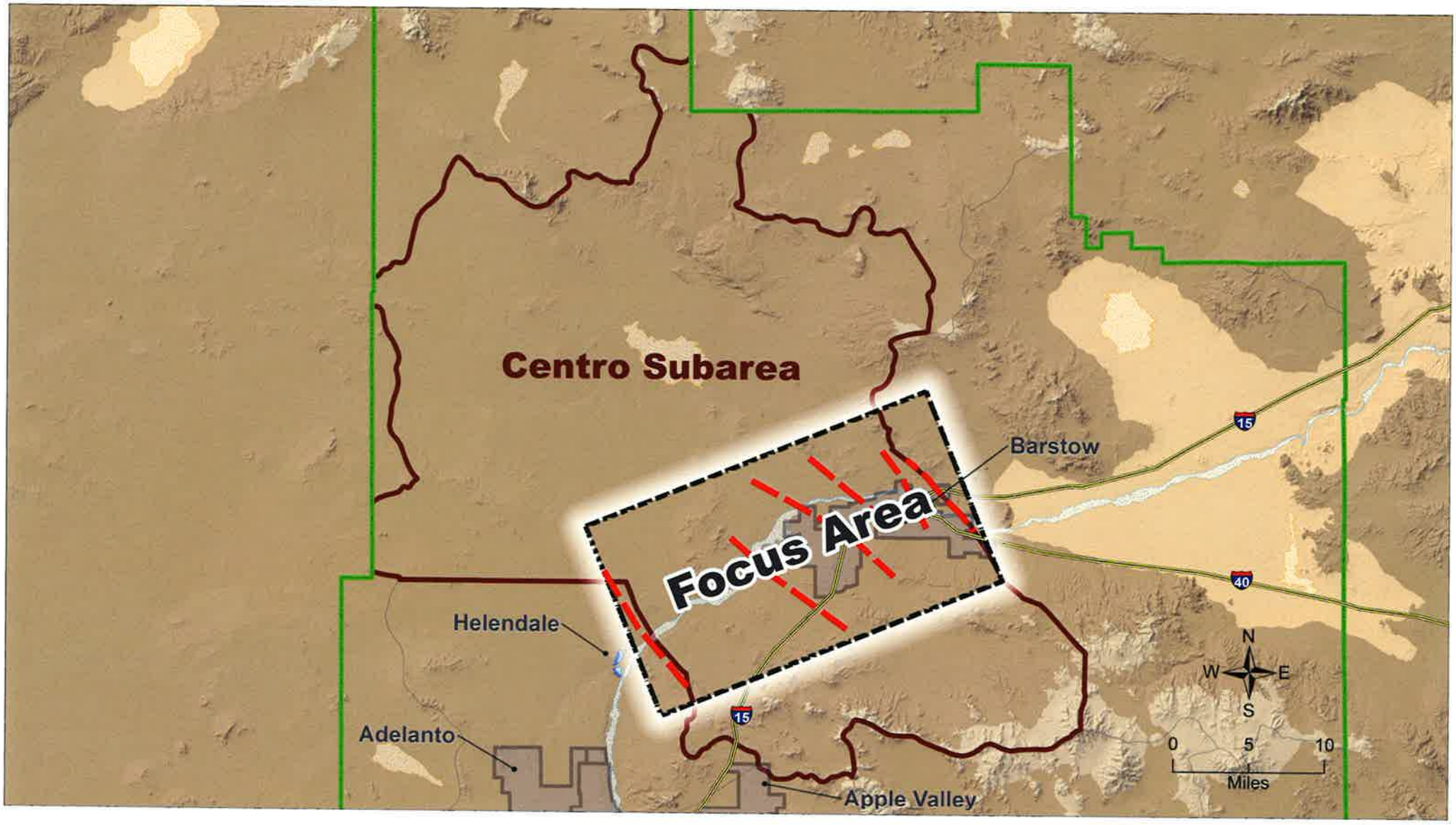
A. Park Williams[1,2] ✉, Benjamin I. Cook[2,3] and Jason E. Smerdon[2]

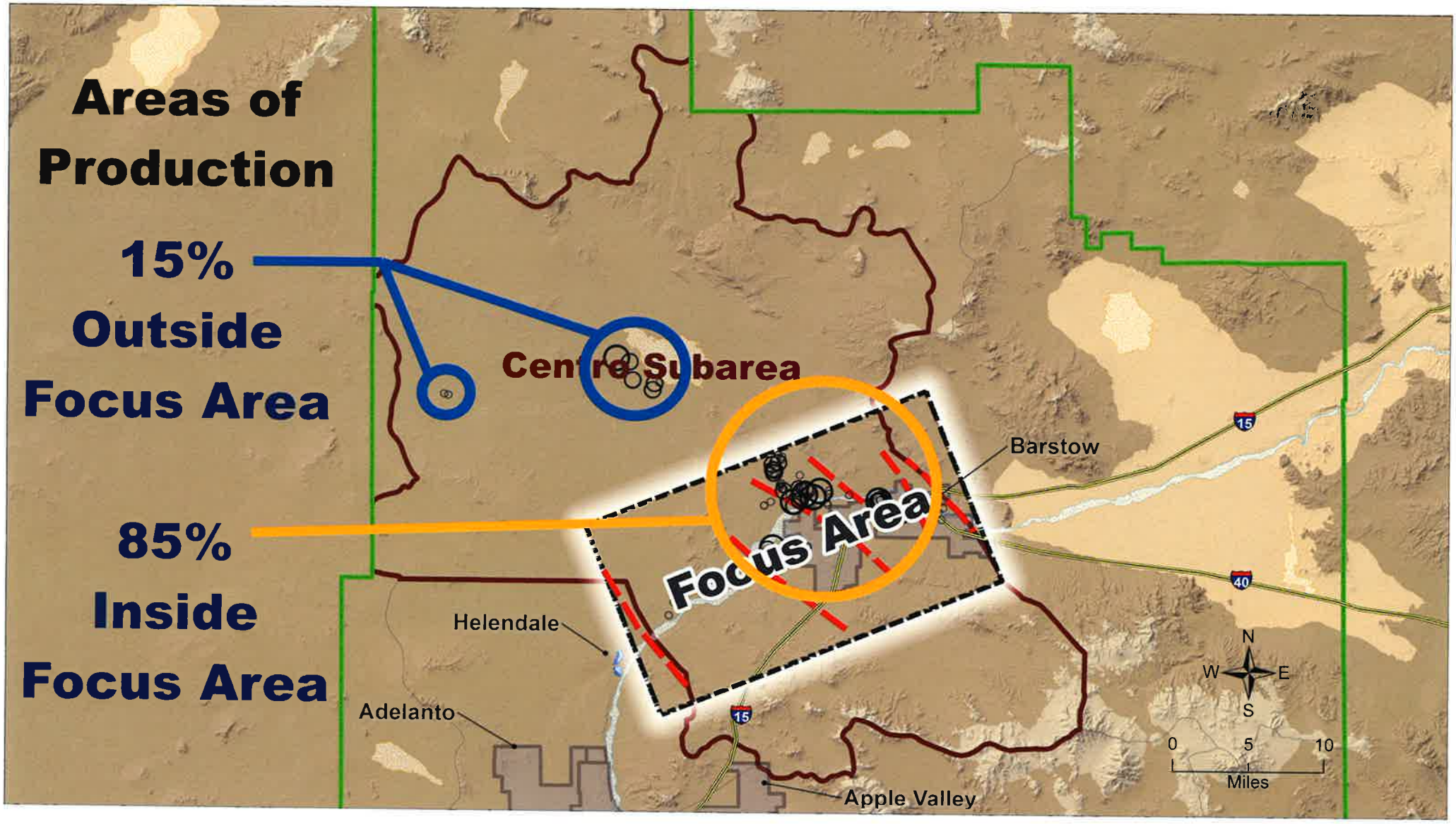
"Multidecade Megadroughts"


Development of longest droughts
Cumulative soil moisture anomaly (σ)
0
−5
−10
−15
−20
−25
860–884
990–1014
1130–1158
1213–1237
1271–1300
1432–1461
1571–1593
2000–2021
2007–2021, no ACC
15–21-year events
0
5
10
15
20
25
30
Year of drought

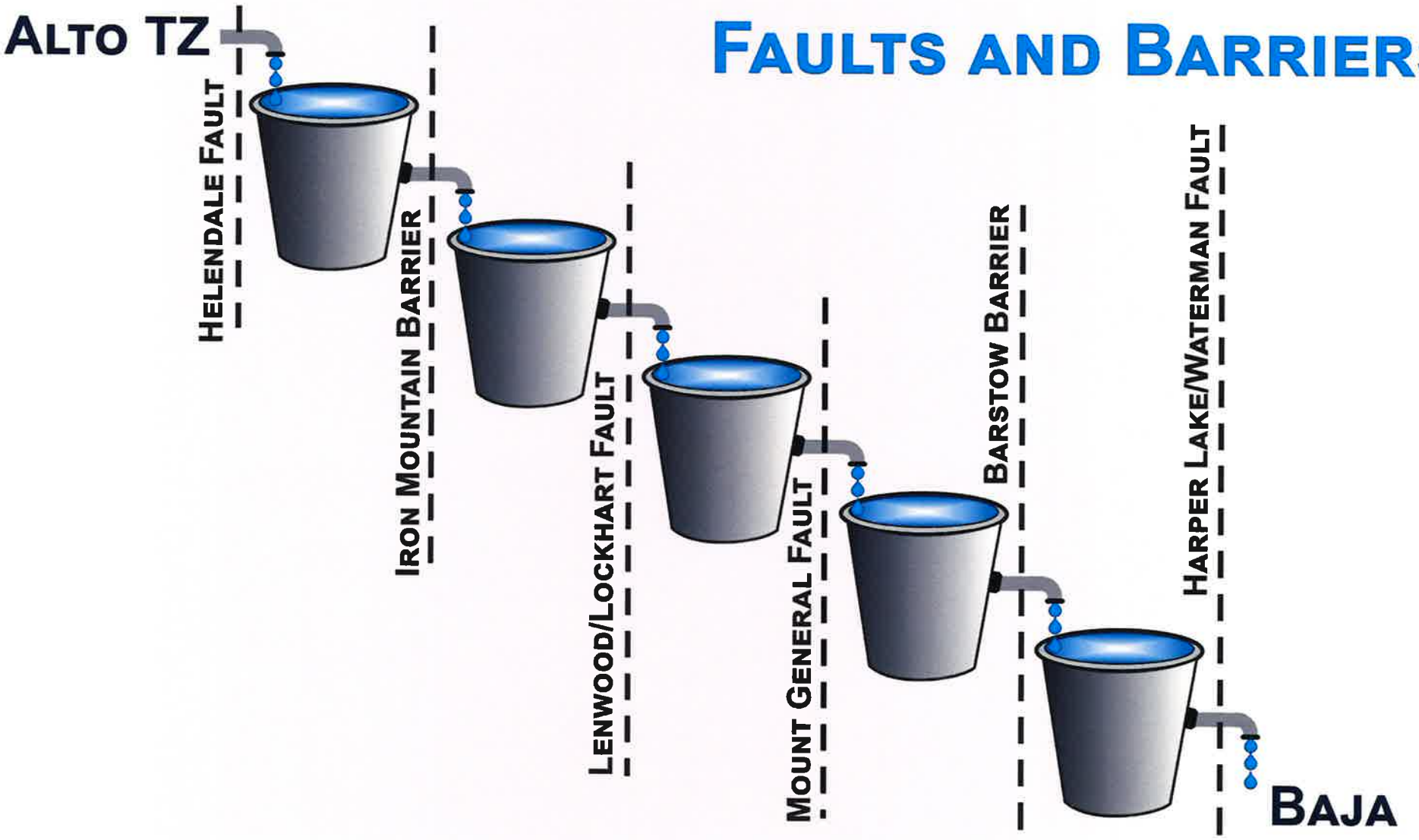

Development of longest droughts
Cumulative soil moisture anomaly (σ)
0
−5
−10
−15
−20
−25
0
5
10
15
20
25
30
Year of drought
860–884
990–1014
1130–1158
1213–1237
1271–1300
1432–1461
1571–1593
2000–2021
2007–2021, no ACC
15–21-year events

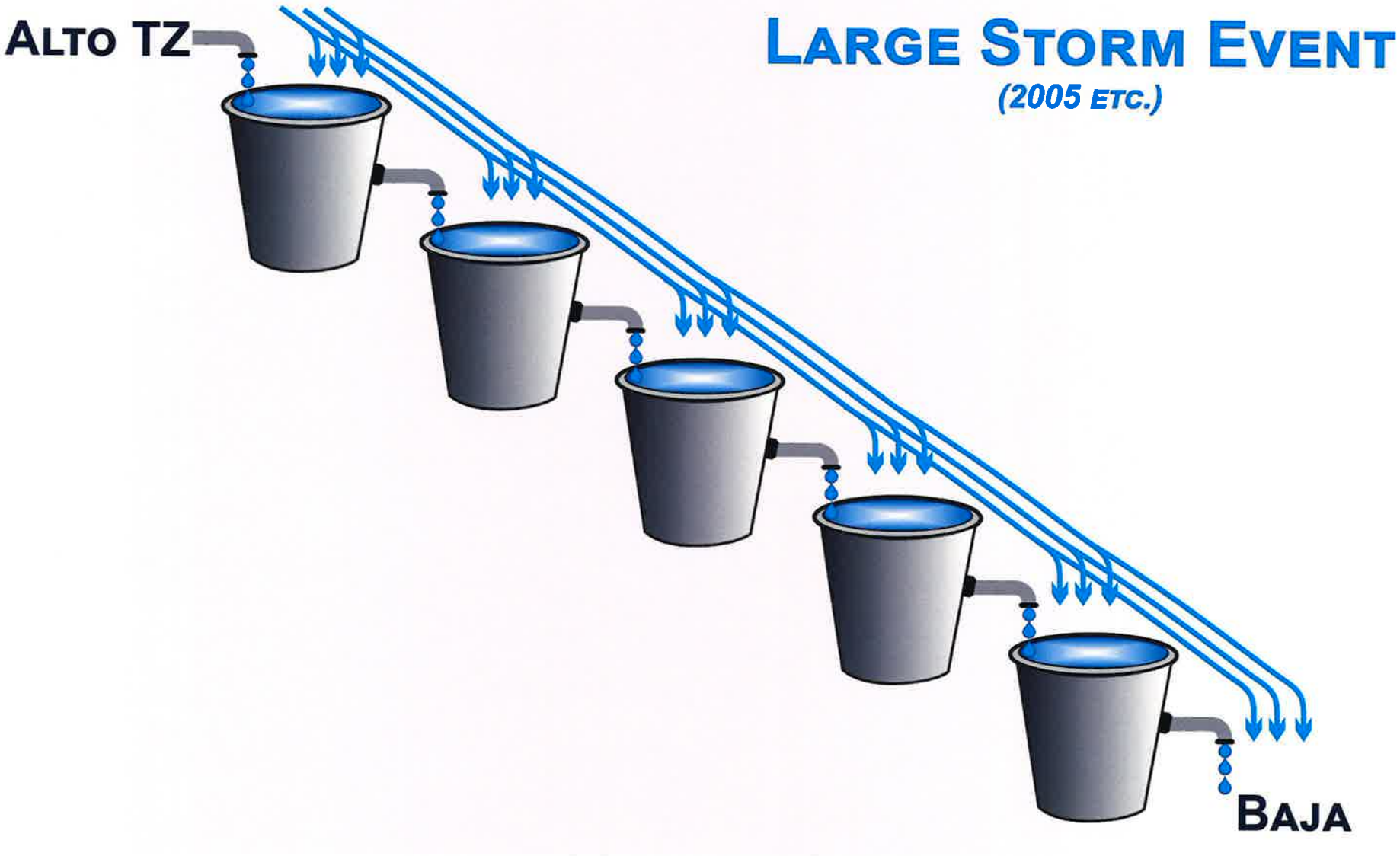
CONCENTRATED PUMPING

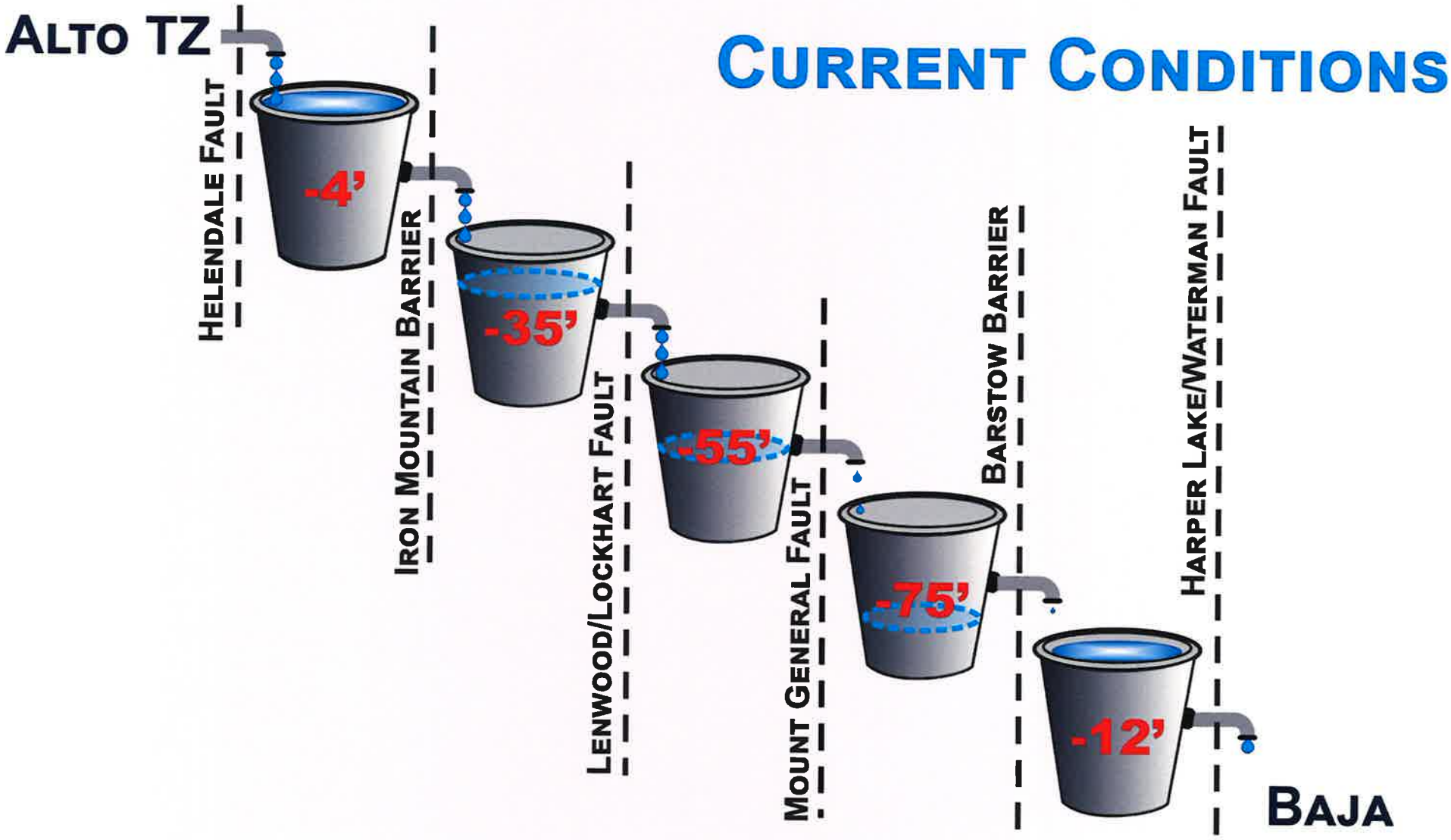

Centro Subarea
Focus Area
Barstow
Helendale
Adelanto
Apple Valley
15
40
N
W
E
S
0
5
10
Miles

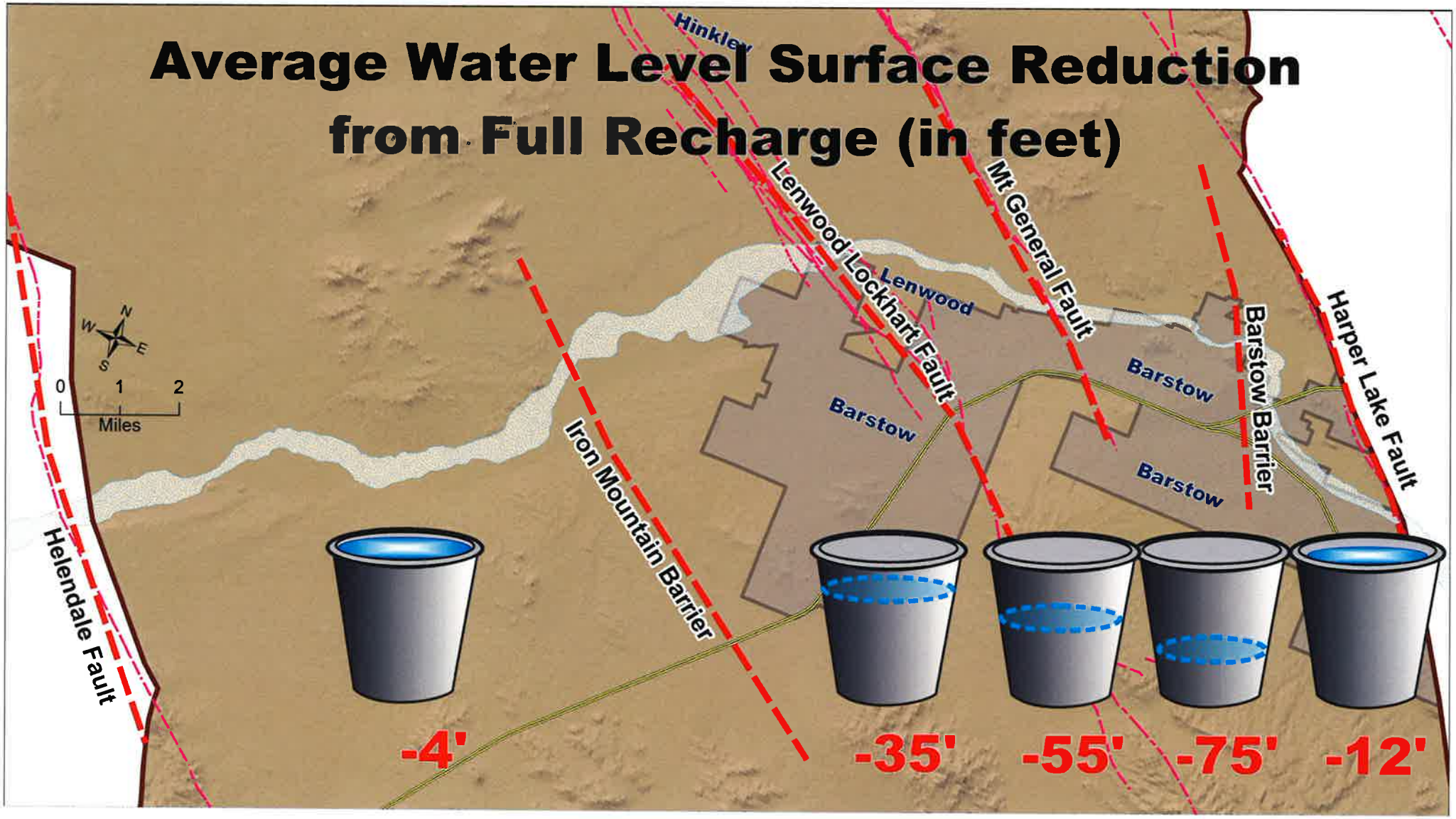

Areas of Production
15% Outside Focus Area
85% Inside Focus Area
Centro Subarea
Focus Area
Barstow
Helendale
Adelanto
Apple Valley
15
40
N
W
E
S
0
5
10
Miles

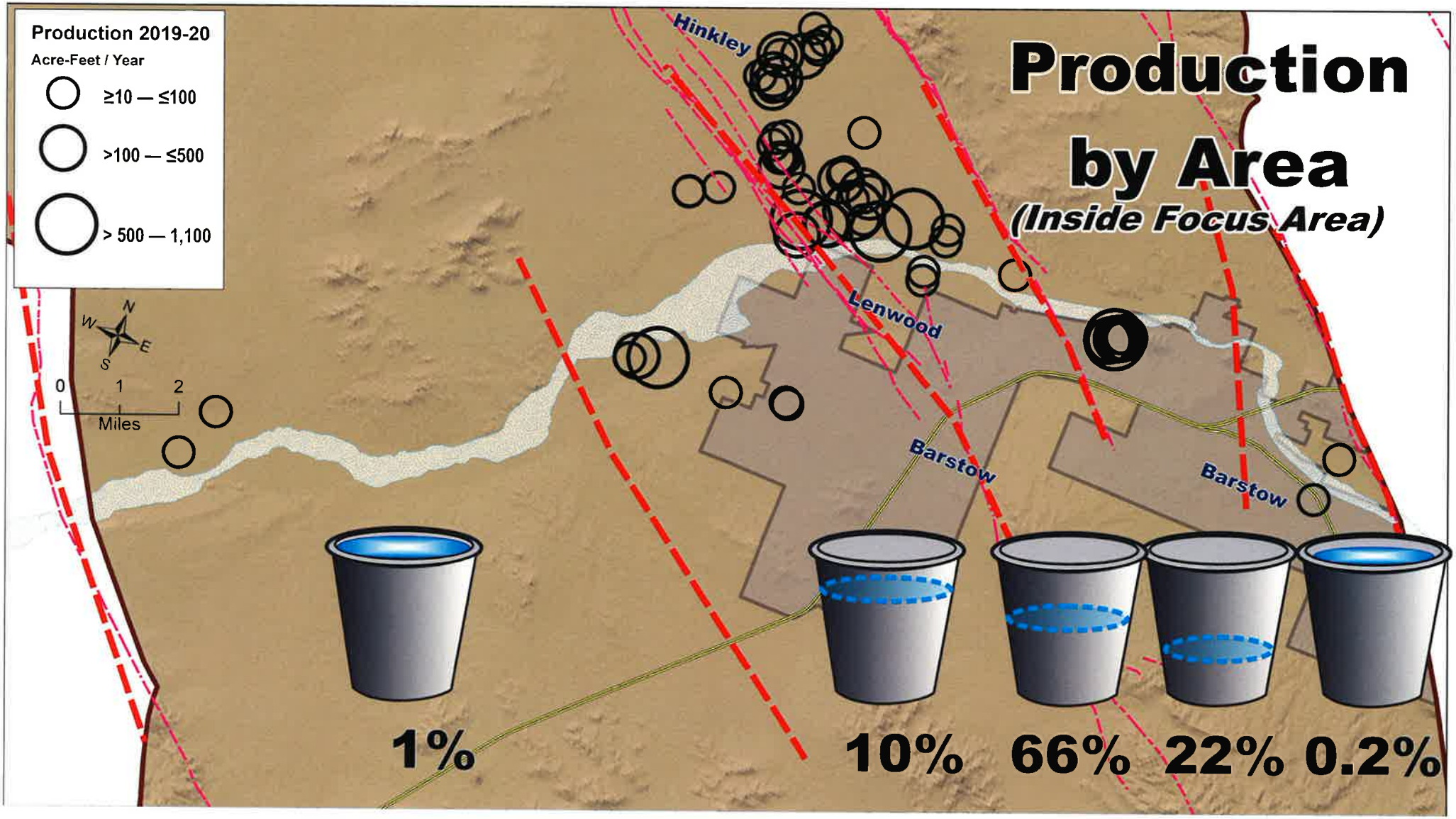
Faults and Barriers

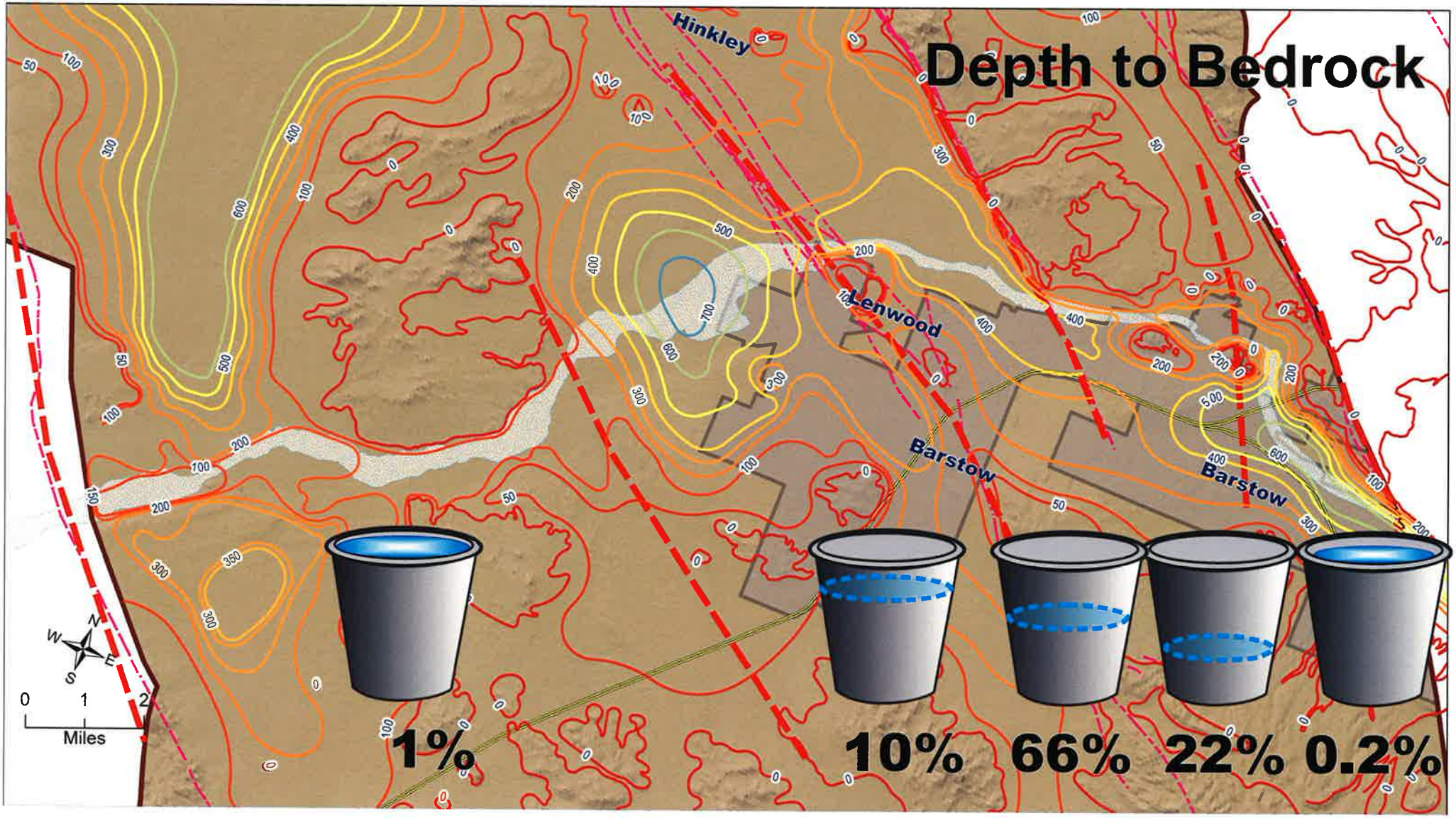


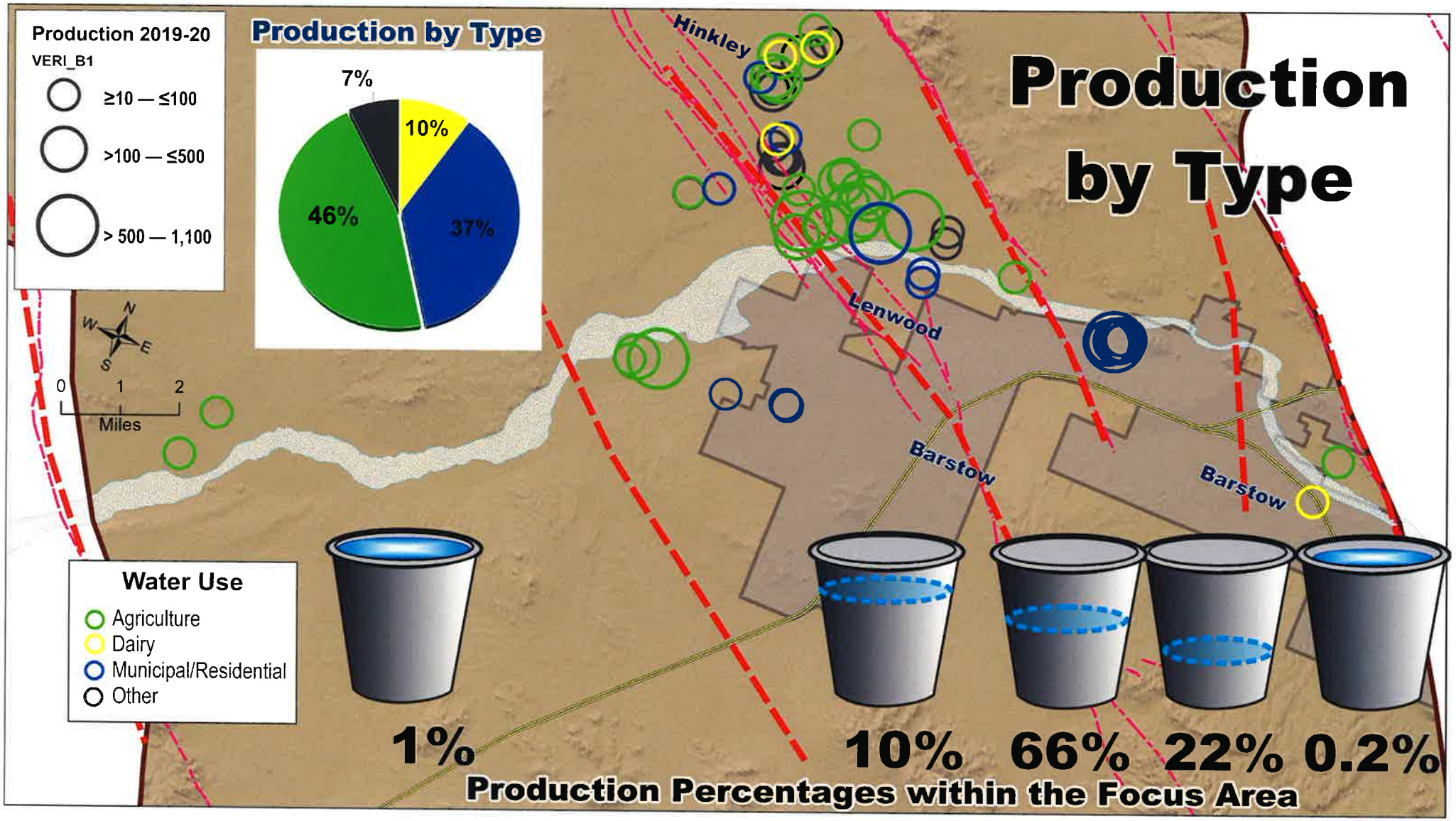

ALTO TZ
LARGE STORM EVENT
(2005 ETC.)
BAJA

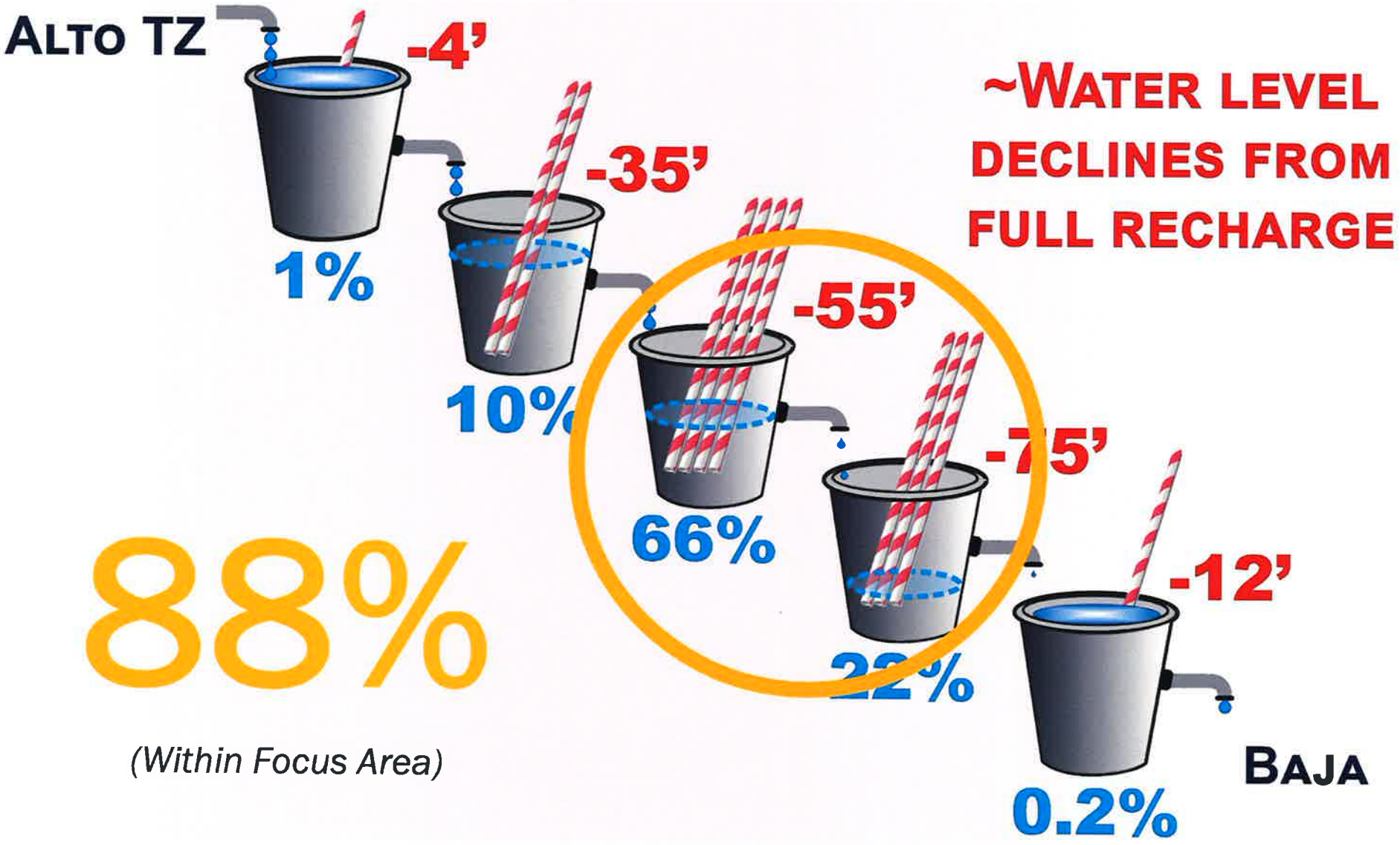

ALTO TZ
CURRENT CONDITIONS
HELENDALE FAULT
IRON MOUNTAIN BARRIER
LENWOOD/LOCKHART FAULT
MOUNT GENERAL FAULT
BARSTOW BARRIER
HARPER LAKE/WATERMAN FAULT
-4'
-35'
-55'
-75'
-12'
BAJA


Average Water Level Surface Reduction
from Full Recharge (in feet)
Hinkley
Lenwood Lockhart Fault
Mt General Fault
Barstow Barrier
Harper Lake Fault
Lenwood
Barstow
Barstow
Barstow
Iron Mountain Barrier
Helendale Fault
N
W
E
S
0
1
2
Miles
-4'
-35'
-55'
-75'
-12'


Production 2019-20
Acre-Feet / Year
≥10 — ≤100
>100 — ≤500
> 500 — 1,100
N
W
E
S
0
1
2
Miles
Hinkley
Lenwood
Barstow
Barstow
Production
by Area
(Inside Focus Area)
1%
10%
66%
22%
0.2%


Depth to Bedrock
Hinkley
Lenwood
Barstow
Barstow
N
W
E
S
0
1
2
Miles
1%
10%
66%
22%
0.2%


Production 2019-20
VERI_B1
≥10 — ≤100
>100 — ≤500
> 500 — 1,100
Production by Type
7%
10%
46%
37%
Hinkley
Lenwood
Barstow
Barstow
Production by Type
N
W
E
S
0
1
2
Miles
Water Use
Agriculture
Dairy
Municipal/Residential
Other
1%
10%
66%
22%
0.2%
Production Percentages within the Focus Area


ALTO TZ
-4'
1%
-35'
10%
-55'
66%
-75'
22%
-12'
0.2%
BAJA
~WATER LEVEL DECLINES FROM FULL RECHARGE
88%
(Within Focus Area)

SUMMARY

Summary

- Drought
  - longest on record
- Concentrated Pumping
  - 88% of “focus area” pumping
  - This exacerbates local water level decline
- Healthy “bookends” water levels

Questions?

Special thanks to Brian Hammer

Mojave Water Agency

DATE: April 28, 2022

TO: Board of Directors

FROM: Allison Febbo, General Manager

BY: Tony Winkel, Principal Hydrogeologist

SUBJECT: CONSIDER IMPORT OF UP TO 5,000 ACRE-FEET OF STATE WATER PROJECT WATER FOR RECHARGE IN CENTRO SUBAREA AS AN EMERGENCY DROUGHT RESPONSE PILOT PROGRAM

RECOMMENDATION

Staff recommends the Board of Directors approve the import of up to 5,000 acre-feet of State Water Project water for recharge in Centro Subarea as an emergency drought response pilot program.

EXECUTIVE SUMMARY

Extended drought within the Mojave Water Agency (MWA; Agency) service area has resulted in low groundwater levels in certain areas of high groundwater production. In particular, wells within the Centro Subarea near Lenwood have experienced record low groundwater levels as a result of the local drought. In recognition of the prolonged drought conditions, the MWA Board of Directors directed staff to develop a drought response plan to address the effects of prolonged drought on water levels within the MWA service area. As part of the development of the drought response plan, the Agency will evaluate the effect of delivery of targeted recharge, of imported SWP water on groundwater levels. Recharge of imported SWP water to the Lenwood area would provide an opportunity to take emergency measures in response to low water levels in the Centro Subarea, while also serving as a pilot program to evaluate basin response to imported water as part of a drought protection program. With consideration to available SWP water supplies and current conditions, staff recomends that the Board of Directors consider the import of up to 5,000 acre-feet (AF) of State Water Project (SWP) water for recharge in the Centro Subarea.

PREVIOUS CONSIDERATION BY COMMITTEE/BOARD OF DIRECTORS

None.

BACKGROUND/ANALYSIS

On April 1, 2022, in recognition of the prolonged drought conditions within our service area, the MWA Board of Directors directed staff to "study and develop a drought protection program after conducting workshops in the Mojave Water Agency service

Area and analyze the economic resources required to implement such a program." As part of the effort to study and develop a drought protection program, staff intends to evaluate the effectiveness of using targeted recharge of imported SWP water to address water level concerns related prolonged drought conditions. The evaluation will include analysis and modeling of our groundwater basins and their response to targeted recharge.

Currently, the Lenwood area of the Centro Subarea is experiencing the lowest groundwater level on record. Extended drought conditions and concentrated pumping of groundwater resources in the area have contributed to low water levels. Implementing a pilot program using targeted recharge in the Centro Subarea combined with monitoring, will provide important information for the development of the drought response program, while also providing some level of emergency drought relief for the area.

Previous artificial recharge events from 1,000 to 2,000 AFY at the MWA Lenwood Recharge Facility have demonstrated a positive impact on groundwater levels. MWA staff anticipates that importing and recharging up to 5,000 AF of SWP water at the Lenwood Facility will have a positive impact on local groundwater levels of between 10 and 20 feet. Due to the current dry conditions at Barstow, which have persisted for over 11 years (based on significant surface water flow events measured at the Barstow stream gage), it is likely that the anticipated 10 to 20 foot impact on groundwater levels will trend toward the lower end of the estimate. Monitoring as part of this pilot program will help inform a predictive model, which would be required for a more precise projection of basin response.

Operational constraints of the Mojave River Pipeline and the Lenwood Recharge Facilty limits recharge capacity to a maximum of 10 CFS. At this rate, a delivery of 5,000 AF of recharge water will likely take more than 8 months to complete.

After consideration of reliability reserves, MWA currently has about 11.7 TAF of SWP water supply available this year. Approximately 2.7 TAF will be imported for direct delivery demands within the service. If up to 5,000 AF is imported for recharge into the Lenwood area under this proposed action, approximately 4 TAF of SWP water supply will remain available this year.

FISCAL IMPACT

The estimated fiscal impact is $2,040,000, using a unit DWR variable rate of $408 per AF delivered out of Reach 22B from the April water deliveries charge invoice.

ATTACHMENTS

None.

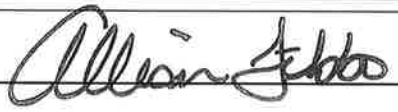
ACTION

Motion to approve the import of up to 5,000 acre-feet of State Water Project water for recharge in Centro Subarea as an emergency drought response pilot program.

Board Action: Staff's recommendation approved

Conditions: None

Date: April 28, 2022

General Manager: 

Mojave Water Agency

Recharge to Centro

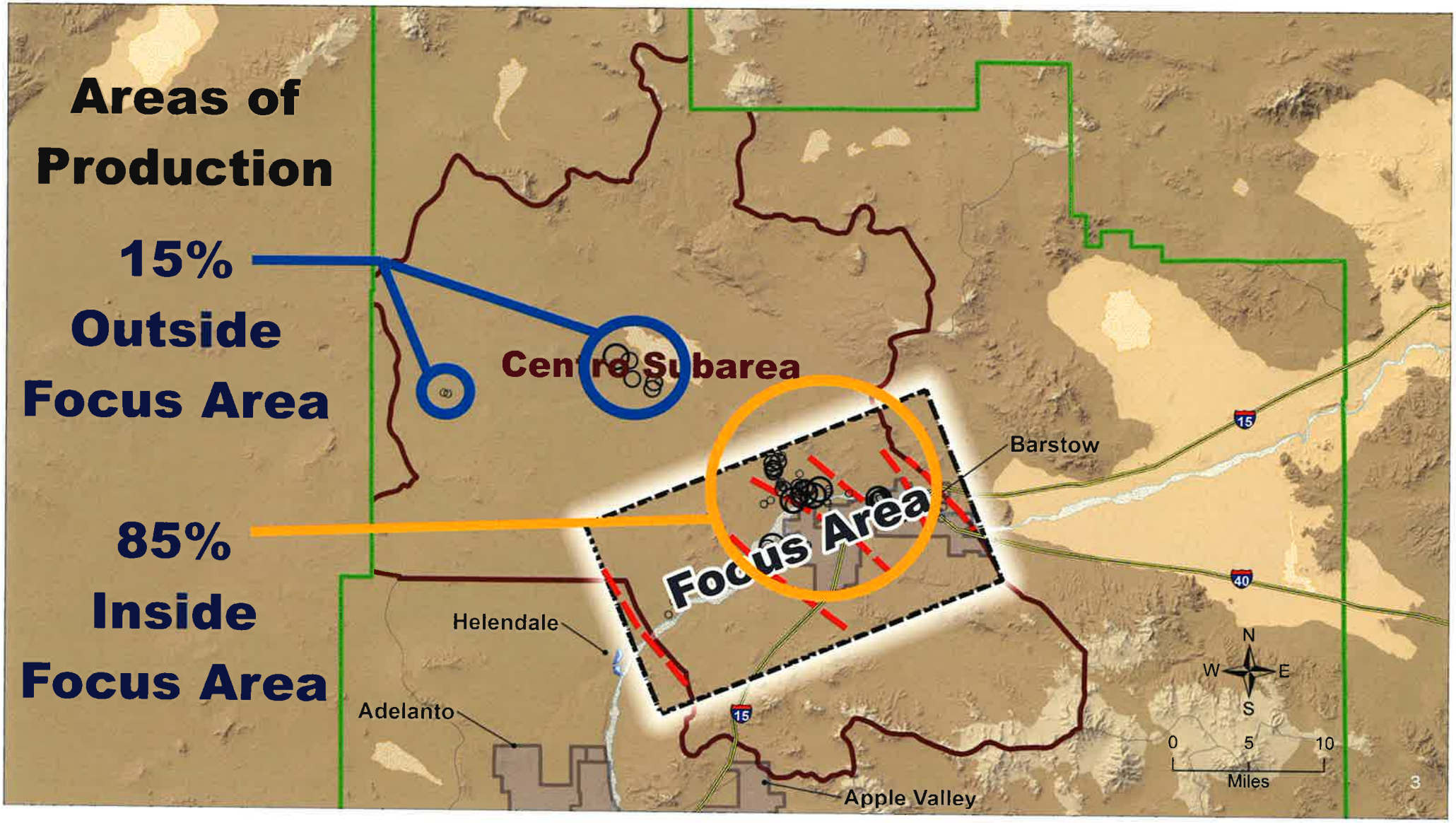
Board of Directors
April 28, 2022

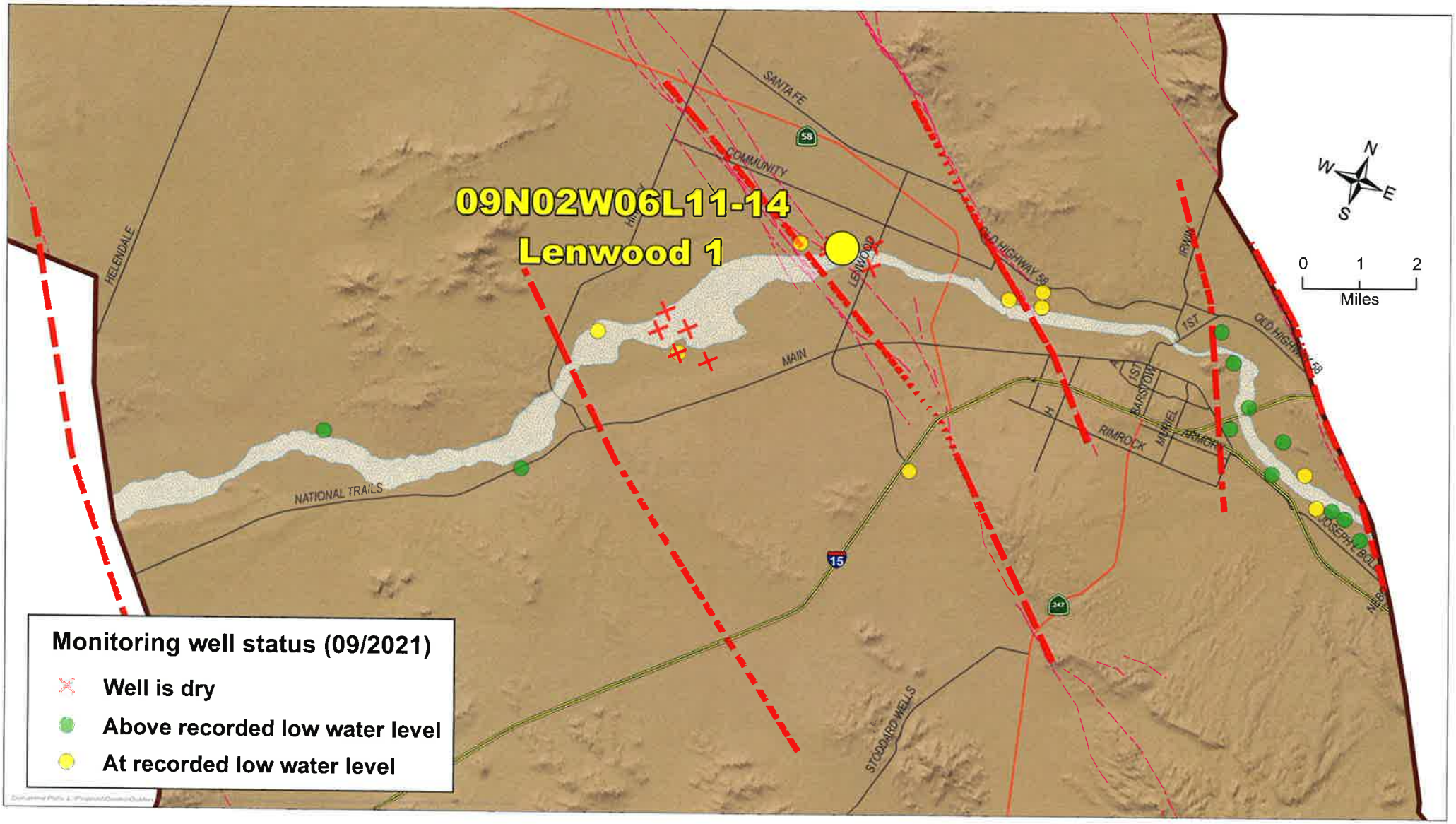
Tony Winkel, Principal Hydrogeologist

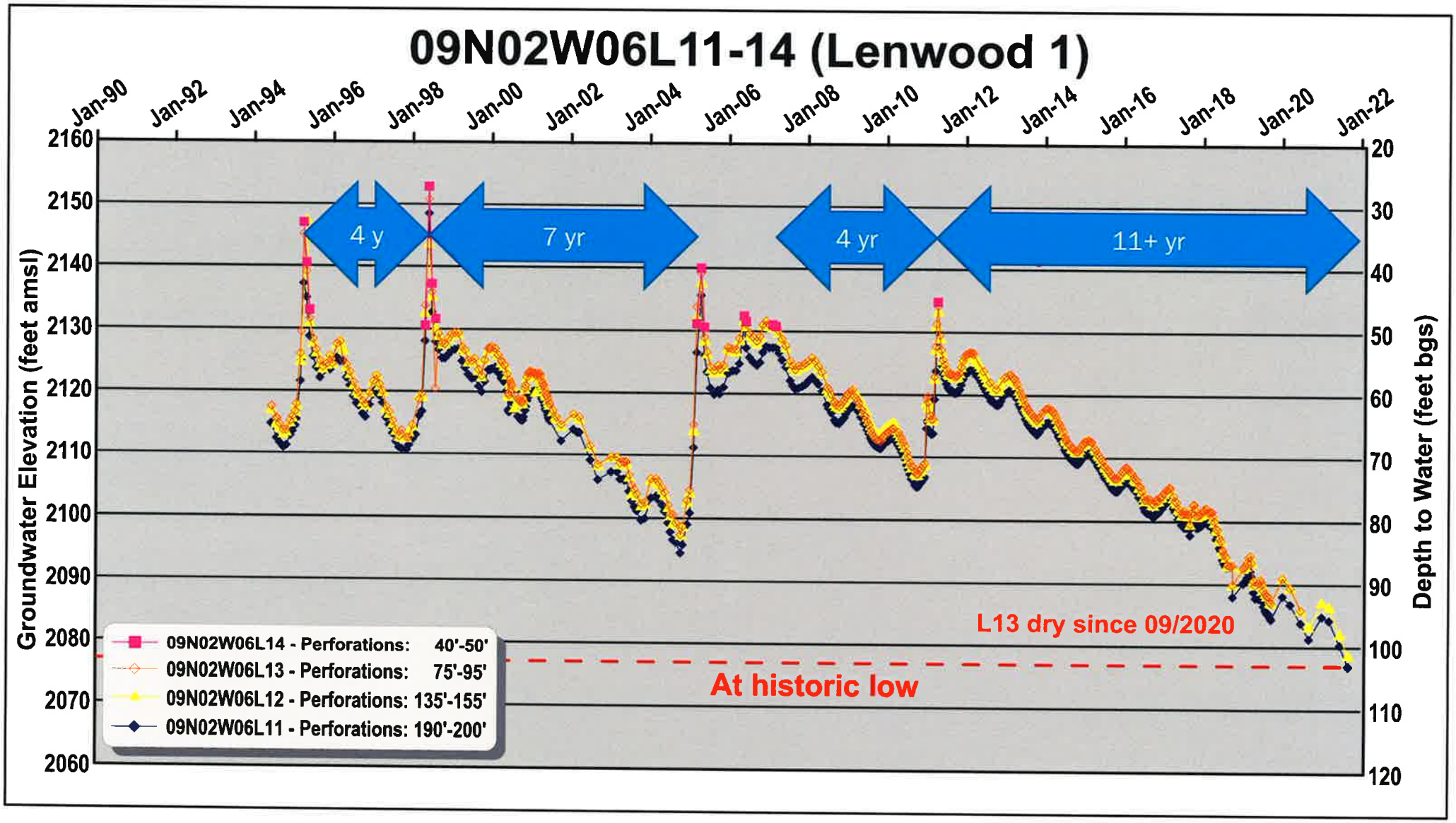
Together, we're securing water for today & tomorrow...

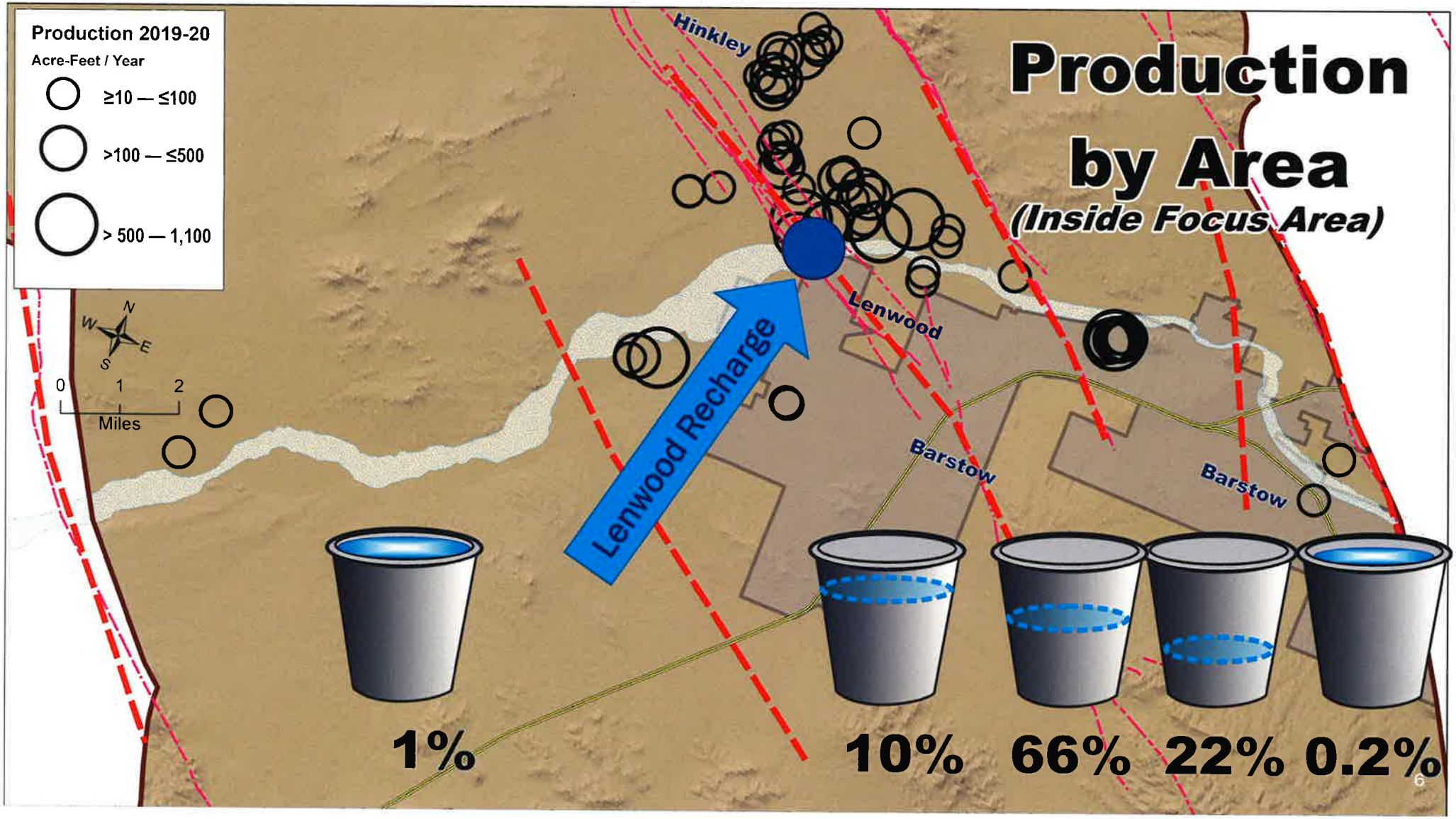
Overview

- Very Brief Review
  - Centro Groundwater Conditions
  - Impacts of 5,000 AF of Recharge
- SWP Water Conditions
  - Allocation and San Luis
- Drought Protection and Pilot Program
- Staff Recommendation


Areas of Production
15% Outside Focus Area
85% Inside Focus Area
Centro Subarea
Focus Area
Barstow
Helendale
Adelanto
Apple Valley
15
40
N
W
E
S
0
5
10
Miles
3


09N02W06L11-14
Lenwood 1
SANTA FE
COMMUNITY
HELENDALE
LENWOOD
OLD HIGHWAY 58
IRWIN
1ST
MAIN
NATIONAL TRAILS
RIMROCK
MARIEL
ARMOR
BARSTOW
STODDARD WELLS
JOSEPH A. BOU
15
247
58
N
W
E
S
0
1
2
Miles
Monitoring well status (09/2021)
Well is dry
Above recorded low water level
At recorded low water level


09N02W06L11-14 (Lenwood 1)
Jan-90
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Jan-22
2160
2150
2140
2130
2120
2110
2100
2090
2080
2070
2060
20
30
40
50
60
70
80
90
100
110
120
Groundwater Elevation (feet amsl)
Depth to Water (feet bgs)
4 y
7 yr
4 yr
11+ yr
L13 dry since 09/2020
At historic low
09N02W06L14 - Perforations: 40'-50'
09N02W06L13 - Perforations: 75'-95'
09N02W06L12 - Perforations: 135'-155'
09N02W06L11 - Perforations: 190'-200'


Production 2019-20
Acre-Feet / Year
≥10 — ≤100
>100 — ≤500
> 500 — 1,100
N
W
E
S
0
1
2
Miles
Hinkley
Lenwood
Barstow
Barstow
Lenwood Recharge
Production
by Area
(Inside Focus Area)
1%
10%
66%
22%
0.2%

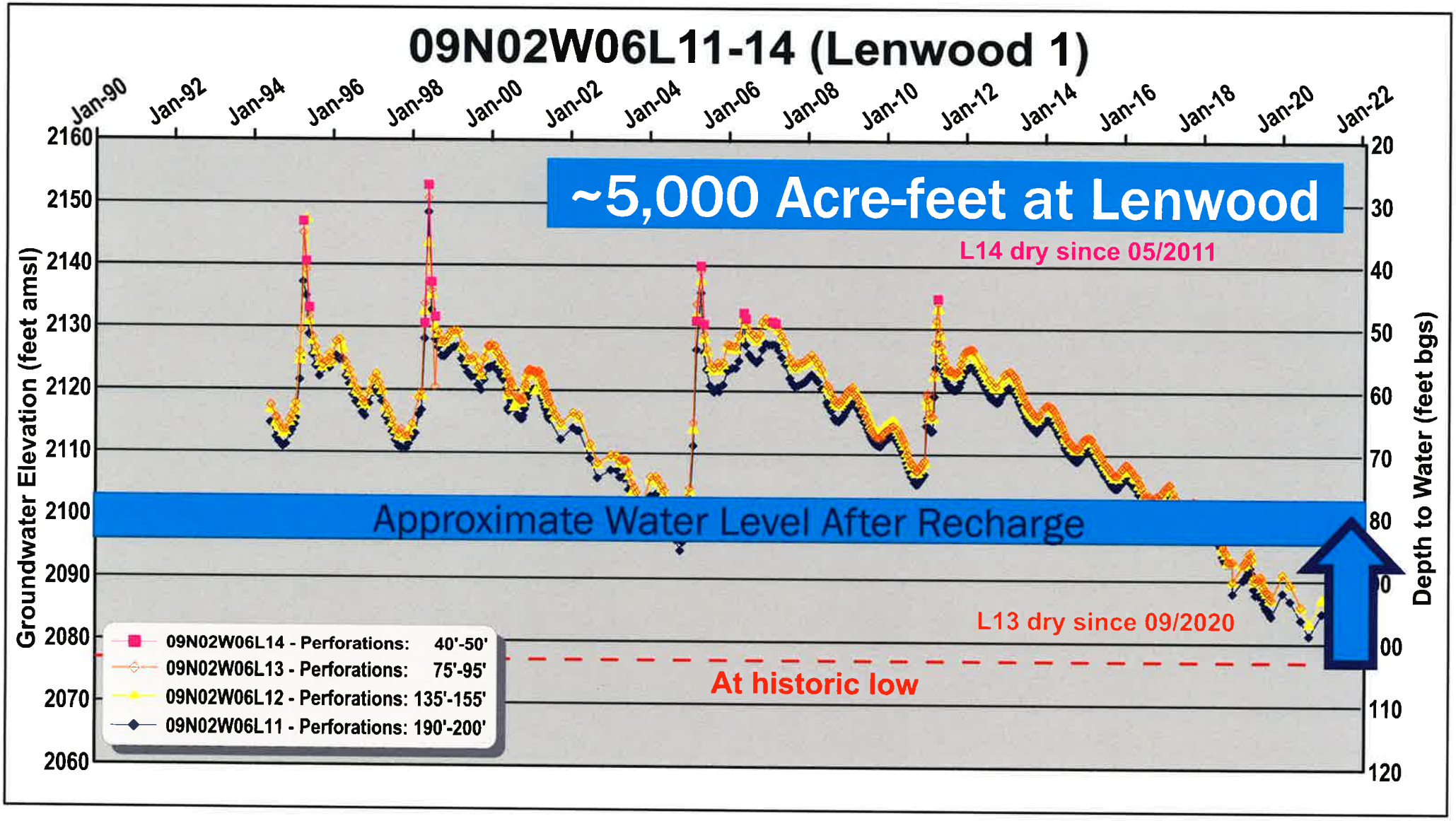
Lenwood Recharge

Recharge 5,000 AF at Lenwood

Pilot Program to Evaluate Centro Recharge

- ~10-20 ft. increase in water levels
  - Based on 3 previous non-storm-year recharge events ('06, '07, '17)
  - Likely lower rather the higher of the projected range due to 11+ years of preceding drought
- Operational Considerations
  - ~10 CFS "drum strainer" capacity
  - 8+ month delivery interval

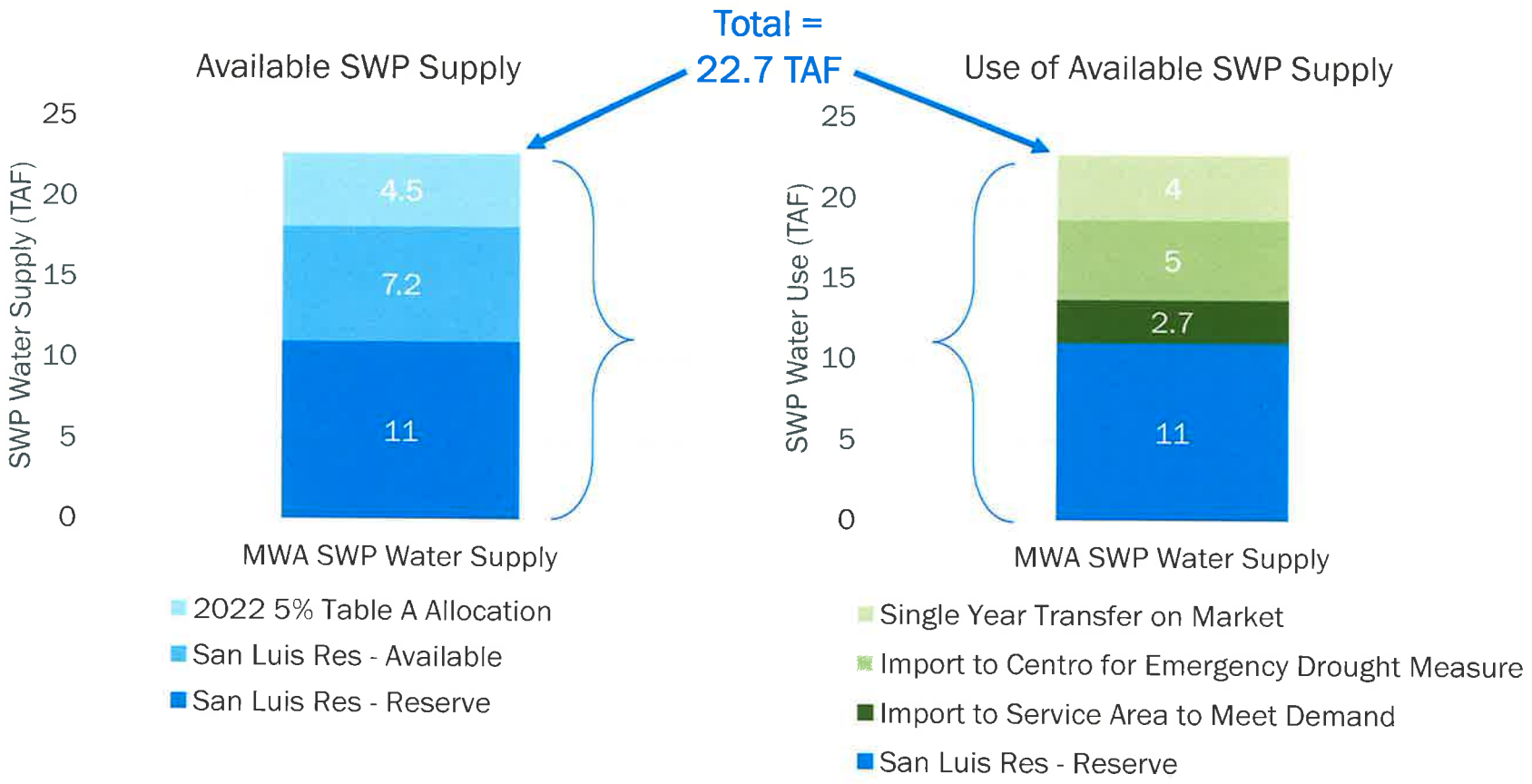
(DISCLAIMER: This projection should really be MODELED!)


09N02W06L11-14 (Lenwood 1)
~5,000 Acre-feet at Lenwood
L14 dry since 05/2011
Approximate Water Level After Recharge
L13 dry since 09/2020
At historic low
Groundwater Elevation (feet amsl)
Depth to Water (feet bgs)
Jan-90
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Jan-22
2160
2150
2140
2130
2120
2110
2100
2090
2080
2070
2060
20
30
40
50
60
70
80
00
110
120
09N02W06L14 - Perforations: 40'-50'
09N02W06L13 - Perforations: 75'-95'
09N02W06L12 - Perforations: 135'-155'
09N02W06L11 - Perforations: 190'-200'

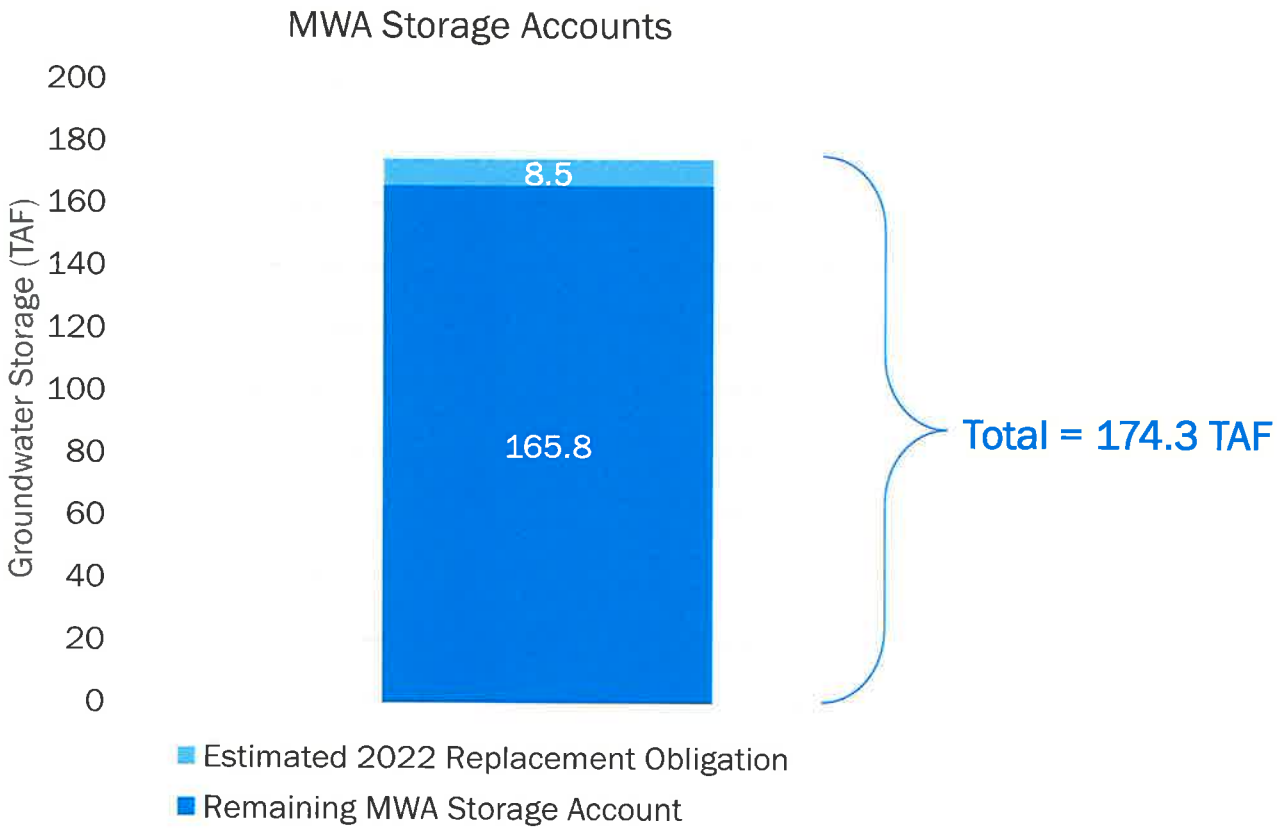
SWP Water Conditions

- 2022 Table A Allocation
  - @ 5%: 4,500 AF
- Local Demands Met By SWP Supply:
  - 2,700 AF
  - Remaining SWP Supply = 9 AF
- San Luis Reservoir (SLR) Balance
  - This Year: 18,200 AF
  - MWA policy reliability storage SLR: 11,000 AF

MWA SWP Water Supply and Proposed Use



Pumping from Pre-stored Water Storage Accounts



Drought Response

- Immediate Need
  - Record low water levels in some areas of Centro Subarea
- Drought Protection Program
  - April 1, 2022: MWA Board directed staff to develop program
  - Recognizing extended drought period since a significant recharge event
- Pilot Program
  - Opportunity to evaluate basin response to recharge
  - Inform development of Drought Protection Program

Financials of 5,000 AF

- Import Costs
  - $2,040,000 *(~$408/AF)*
- Market Value
  - $10,000,000 *(~$2,000/AF)*
- "Buy Low / Sell High"
  - $10M in a wet year could import ~43,500 AF of MWA's Table A (~$230/AF)
  - Almost NINE (9) times as much water!

Staff Recommendation

Staff recommends the Board of Directors approve the import of up to 5,000 acre-feet of State Water Project water for recharge in Centro Subarea as an Emergency Drought Response Pilot Program.

Questions?

Mojave Water Agency

Agenda Item # 9 Date: 4-28-22

REQUEST TO SPEAK

X **In Favor of Staff Recommendation**

_____ **In Opposition to Staff Recommendation**

_____ **Other** _____

DOUG MATHEWS

Name *Please print*

Address **City** **Zip**

CITY OF VICTORVILLE / VICTORVILLE WATER DIST.

Organization, if any

All Presentations are subject to a limit of 5 minutes, and no action can be taken on subjects that are not on the agenda.

Please present this slip to the Clerk

(Chairperson will call you to the microphone)

Mojave Water Agency

Agenda Item # 9 Date: 28 APR 2022

REQUEST TO SPEAK

X In Favor of Staff Recommendation

_____ In Opposition to Staff Recommendation

_____ Other _____

MARK K FRANEY (FRANEY)

Name *Please print*

36261 RAILROAD RD. BARSTOW RURAL (HVTT) 92311

Address City Zip

_____

Organization, if any

All Presentations are subject to a limit of 5 minutes, and no action can be taken on subjects that are not on the agenda.

Please present this slip to the Clerk

(Chairperson will call you to the microphone)

Public Comment #9

April 28,2022

Otis Calef
PO Box 1120
Barstow, CA 92312
otiscalef@gmail.com
(805) 708-5009

Mojave Water Agency Board of Directors

Item #9

Directors:

I am strongly in favor of the proposal before you to store water underground in the Lenwood Basin. I live along the north bank of the Mojave River, just off of Old Hwy. 58, at 27589 Waterman St.

The many large, old trees that have recently died in my neighborhood is strong evidence that the basin is severely depleted and provides an excellent location for storage.

Respectfully yours,

OWC

Public Comment #9

La Trici Jones

From: judyzimm4@gmail.com
Sent: Thursday, April 28, 2022 8:45 AM
To: La Trici Jones
Subject: --EXTERNAL-- ITEM #9

[EXTERNAL EMAIL]

Mojave Water Agency Board of Directors

Item #9 on Agenda today (April 28, 2022)

I am in favor of the proposal #5 to store water underground in the Lenwood Basin. A yes vote will help us continue a quality of life, we have had for the past 40 years. My address is 26466 Community Blvd. Barstow, Ca 92311.

Thank you,
Mark and Judy Zimmerman

Public Comment

Dalila Lozano

#9

From: La Trici Jones
Sent: Thursday, April 28, 2022 9:58 AM
To: Dalila Lozano
Subject: FW: --EXTERNAL-- Item-9 Recharge to Centro

Please print this page and bring to me. Thank you

From: Dahlstrom, Perry <Pldahlstrom@gswater.com>
Sent: Thursday, April 28, 2022 9:34 AM
To: La Trici Jones <ljones@mojavewater.org>
Subject: --EXTERNAL-- Item-9 Recharge to Centro

[EXTERNAL EMAIL]
Hello La Trici,

Can you please read the follow statement – into the record when comments are open on Item 9.

"Golden State Water Company supports MWA's action of delivering 5TAF (5 thousand acre feet) to the Lenwood recharge basin. We are very hopeful that it will provide a beneficial impact to all in the Centro area."

Thank you,

Perry Dahlstrom
General Manager

Mountain Desert District
13608 Hitt Road
Apple Valley, CA 92308

Office: (760) 515-8320
Mobile: (760) 455-3975

Golden State Water Company
A Subsidiary of American States Water Company

MEETING SIGN-IN SHEET

MOJAVE WATER AGENCY
BOARD OF DIRECTORS MEETING
April 28, 2022
9:30 A.M.

Mojave Water Agency
13846 Conference Center Drive
Apple Valley, CA 92307

The signing, registering, or completion of this document is voluntary. All persons may attend this meeting regardless of whether they sign, register, or complete this document.

NAME	REPRESENTING	ADDRESS	EMAIL
Bob Stadam	HDCWD		
Don MATHEWS	COV / VWD		

MOJAVE WATER AGENCY

MEETING OF THE BOARD OF DIRECTORS
ATTENDANCE ROSTER

DATE: April 28, 2022
TIME: 9:30 a.m.
MEETING PLACE: Mojave Water Agency Board Room

DIRECTORS:

Division #1 _____ Kimberly Cox

Division #2 _____ Jim Ventura

Division #3 Online Ken Anderson

Division #4 _____ Michael L. Page

Division #5 Online Rick Roelle

Division #6 _____ Jeanette Hayhurst

Division #7 Online Michael Limbaugh

MWA STAFF:

1. Allison Stubbo
2. Kathy Cortner
3. Tony Winkel
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

CONSULTANTS:

1. _____
2. _____
3. _____
4. _____

PROOF OF SERVICE

STATE OF CALIFORNIA }
COUNTY OF SAN BERNARDINO}

I am employed in the County of the San Bernardino, State of California. I am over the age of 18 and not a party to the within action; my business address is 13846 Conference Center Drive, Apple Valley, California 92307.

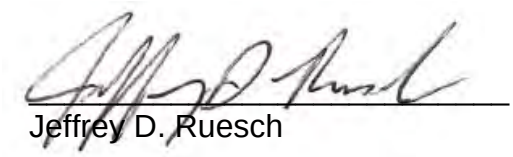
On October 9, 2024, the document(s) described below were served pursuant to the Mojave Basin Area Watermaster's Rules and Regulations paragraph 8.B.2 which provides for service by electronic mail upon election by the Party or paragraph 10.D, which provides that Watermaster shall mail a postcard describing each document being served, to each Party or its designee according to the official service list, a copy of which is attached hereto, and which shall be maintained by the Mojave Basin Area Watermaster pursuant to Paragraph 37 of the Judgment. Served documents will be posted to and maintained on the Mojave Water Agency's internet website for printing and/or download by Parties wishing to do so.

Document(s) filed with the court and served herein are described as follows:

WATERMASTER'S AMENDED OPPOSITION TO GOLDEN STATE WATER COMPANY'S MOTION TO ENFORCE JUDGMENT; DECLARATION OF ROBERT C. WAGNER

_X_ (STATE) I declare under penalty of perjury under the laws of the State of California that the above is true and correct.

Executed on October 9, 2024 at Apple Valley, California.



Jeffrey D. Ruesch

Mojave Basin Area Watermaster Service List as of October 09, 2024

Attn: Roberto Munoz
35250 Yermo, LLC
11273 Palms Blvd., Ste. D.
Los Angeles, CA 90066-2122

Attn: John McCallum
Abshire, David V.
PO Box # 2059
Lucerne Valley, CA 92356-2059

Attn: Jessie Florez
Adelanto, City Of
11600 Air Expressway
Adelanto, CA 92301-1914

(adesdevon@gmail.com)
Ades, John and Devon (via email)

Attn: Pedro Dumaua
(pdumaua@ducommun.com)
Aerochem, Inc. (via email)
4001 El Mirage Rd.
Adelanto, CA 92301-9489

Attn: Lori Clifton (lclifton@robar.com)
Agcon, Inc. (via email)
17671 Bear Valley Road
Hesperia, CA 92345-4902

Attn: Chun Soo and Wha Ja Ahn
(chunsooahn@naver.com)
Ahn Revocable Living Trust (via email)
P. O. Box 45
Apple Valley, CA 92307-0001

Attn: Simon Ahn (ssahn58@gmail.com)
Ahn Revocable Trust (via email)
29775 Hunter Road
Murrieta, CA 92563-6710

Attn: Chun Soo Ahn
(davidahnmd@gmail.com,
chunsooahn@naver.com;
davidahn0511@gmail.com)
Ahn, Chun Soo and David (via email)
P. O. Box 45
Apple Valley, CA 92307-0001

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Ahn, Chun Soo and Wha Ja (via email)
P. O. Box 45
Apple Valley, CA 92307-0001

Ake, Charles J. and Marjorie M.
2301 Muriel Drive, Apt. 67
Barstow, CA 92311-6757

Attn: Paul Tsai (paul@ezzlife.com)
America United Development, LLC (via email)
19625 Shelyn Drive
Rowland Heights, CA 91748-3246

Attn: Ana Chavez
American States Water Company
160 Via Verde, Ste. 100
San Dimas, CA 91773-5121

Anderson, Ross C. and Betty J.
13853 Oakmont Dr.
Victorville, CA 92395-4832

Attn: Daniel B. Smith (avfcwd@gmail.com)
Apple Valley Foothill County Water District (via email)
22545 Del Oro Road
Apple Valley, CA 92308-8206

Attn: Matthew Patterson
Apple Valley Heights County Water District
P. O. Box 938
Apple Valley, CA 92308-0938

Attn: Matthew Schulenberg
Apple Valley Unified School District
12555 Navajo Road
Apple Valley, CA 92308-7256

Attn: Emely and Joe Saltmeris
Apple Valley View Mutual Water Company
P. O. Box 3680
Apple Valley, CA 92307-0072

Attn: Tina Kuhns
Apple Valley, Town Of
14955 Dale Evans Parkway
Apple Valley, CA 92307-3061

(ArchibekFarms@gmail.com;
Sandi.Archibek@gmail.com)
Archibek, Eric (via email)
41717 Silver Valley Road
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Avila, Angel and Evalia
1523 S. Visalia
Compton, CA 90220-3946

Attn: Sheré R. Bailey
(LegalPeopleService@gmail.com)
Bailey 2007 Living Revocable Trust, Sheré R. (via email)
10428 National Blvd
Los Angeles, CA 90034-4664

Attn: Daniel Shaw (barhwater@gmail.com)
Bar H Mutual Water Company (via email)
P. O. Box 844
Lucerne Valley, CA 92356-0844

Barber, James B.
43774 Cottonwood Road
Newberry Springs, CA 92365

Attn: John Munoz
(barlenwater@hotmail.com;)
Bar-Len Mutual Water Company (via email)
P. O. Box 77
Barstow, CA 92312-0077

Attn: Curtis Palmer
Baron, Susan and Palmer, Curtis
141 Road 2390
Aztec, NM 87410-9322

Attn: Jennifer Riley (hriley@barstowca.org)
Barstow, City of (via email)
220 East Mountain View Street -Suite A
Barstow, CA 92311

Mojave Basin Area Watermaster Service List as of October 09, 2024

Bartels, Gwendolyn J.
156 W 100 N
Jerome, ID 83338-5256

Attn: Barbara Davisson
Bass Trust, Newton T.
14924 Chamber Lane
Apple Valley, CA 92307-4912

Attn: Remo E. Bastianon
Bastianon Revocable Trust
9484 Iroquois Rd.
Apple Valley, CA 92308-9151

Attn: Mike Beinschroth (Beinschroth@gmail.com)
Beinschroth Family Trust (via email)
18794 Sentenac Road
Apple Valley, CA 92307-5342

Beinschroth, Andy Eric
6719 Deep Creek Road
Apple Valley, CA 92308-8711

Attn: Chuck Bell (Chuckb193@outlook.com; Chuckb193@outlook.com)
Bell, Charles H. Trust dated March 7, 2014 (via email)
P. O. Box 193
Lucerne Valley, CA 92356-0193

Best, Byron L.
21461 Camino Trebol
Lake Forest, CA 92630-2011

Attn: Deborah Stephenson (stephenson@dmsnaturalresources.com; Jason.Murray@bnsf.com; Blaine.Bilderback@bnsf.com)
BNSF Railway Company (via email)
602 S. Ferguson Avenue, Suite 2
Bozeman, MT 59718-

Attn: Deborah Stephenson (stephenson@dmsnaturalresources.com)
BNSF Railway Company (via email)
602 S. Ferguson Avenue, Suite 2
Bozeman, MT 59718-6483

Borja, Leonil T. and Tital L.
20784 Iris Canyon Road
Riverside, CA 92508-

Box, Geary S. and Laura
P. O. Box 402564
Hesperia, CA 92340-2564

Attn: Marvin Brommer
Brommer House Trust
9435 Strathmore Lane
Riverside, CA 92509-0941

Attn: Valeria Brown
Brown Family Trust Dated August 11, 1999
26776 Vista Road
Helendale, CA 92342-9789

Brown, Jennifer
10001 Choiceana Ave.
Hesperia, CA 92345

Bruneau, Karen
19575 Bear Valley Rd.
Apple Valley, CA 92308-5104

Attn: Ian Bryant (irim@aol.com)
Bryant Family Trust dated May 9, 2007 (via email)
15434 Sequoia Avenue - Office
Hesperia, CA 92345-1667

(bubierbear@msn.com)
Bubier, Diane Gail (via email)
46263 Bedford Rd.
Newberry Springs, CA 92365-9819

Attn: Noah Furie
Budget Finance Company
PO BOX 641339
Los Angeles, CA 90064-6339

Bunnell, Dick
8589 Volga River Circle
Fountain Valley, CA 92708-5536

(kjbco@yahoo.com)
Bush, Kevin (via email)
7768 Sterling Ave.
San Bernardino, CA 92410-4741

Attn: Kristie Wright (Kristie.Wright@associa.us)
Calico Lakes Homeowners Association (via email)
11860 Pierce Street, Suite 100
Riverside, CA 92505-5178

Attn: William DeCoursey (michael.lemke@dot.ca.gov; William.Decoursey@dot.ca.gov)
California Department Of Transportation (via email)
175 W. Cluster
San Bernardino, CA 92408-1310

Attn: Robert W. Bowcock
CalMat Company
405 N. Indian Hill Blvd.
Claremont, CA 91711-4614

Attn: Catalina Fernandez-Moores (celias@calportland.com)
CalPortland Company - Agriculture (via email)
P. O. Box 146
Oro Grande, CA 92368-0146

Attn: Catalina Fernandez-Moores (cfernandez@calportland.com)
CalPortland Company - Oro Grande Plant (via email)
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Attn: Tony Camanga
Camanga, Tony and Marietta
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Carrollton, TX 75007-2033

Attn: Myron Campbell II
Campbell, M. A. and Dianne
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Carson, CA 90746-2716

Mojave Basin Area Watermaster Service List as of October 09, 2024

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Attn: Denise Parra
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CDFW - Camp Cady (via email)
4775 Bird Farm Road
Chino Hills, CA 91709-3175

Attn: Beahta Davis
CDFW - Mojave Narrows Regional Park
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San Bernardino, CA 92408-3241

Attn: Paco Cabral (paco.cabral@wildlife.ca.gov; askregion6@wildlife.ca.gov; aaron.johnson@wildlife.ca.gov)
CDFW - Mojave River Fish Hatchery (via email)
12550 Jacaranda Avenue
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Attn: Environmental (valorie.moore@cemex.com)
Cemex, Inc. (via email)
16888 North E. Street
Victorville, CA 92394-2999

Attn: Jennifer Cutler
Center Water Company
P. O. Box 616
Lucerne Valley, CA 92356-0616

Attn: Nancy Ryman
Chamisal Mutual Water Company
P. O. Box 1444
Adelanto, CA 92301-2779

Attn: Carl Pugh (talk2betty@aol.com; cpugh3@aol.com)
Cheyenne Lake, Inc. (via email)
44658 Valley Center Rd.
Newberry Springs, CA 92365-

Attn: Micahel Chisram
Chisram, et al.
414 S. Lincoln Ave.
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Choi, Yong Il and Joung Ae
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(joan.chong7@gmail.com; joancksp@hotmail.com)
Chong, Joan (via email)
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Christison, Joel
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Attn: Hwa-Yong Chung
Chung, et al.
11446 Midway Ave.
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Clark, Arthur
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Blue Jay, CA 92317-4513

Attn: Manoucher Sarbaz
Club View Partners
9903 Santa Monica Blvd., PMB #541
Beverly Hills, CA 90212-1671

Attn: Jaehwan Lee
Come Mission, Inc.
9965 Baker Road
Lucerne Valley, CA 92365-8490

Conner, William H.
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Agua Dulce, CA 91390-4577

Contratto, Ersula
13504 Choco Road
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Attn: George Starke
Corbridge, Linda S.
8743 Vivero St
Rancho Cucamonga, CA 91730-

Cross, Sharon I.
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Lucerne Valley, CA 92356

Attn: Jay Hooper (jayho123@gmail.com)
Crown Cambria, LLC (via email)
9860 Gidley St.
El Monte, CA 91731-1110

Attn: Alessia Morris
Crystal Lakes Property Owners Association
P. O. Box 351
Yermo, CA 92398-0351

(dacostadean@gmail.com)
DaCosta, Dean Edward (via email)
32307 Foothill Road
Lucerne Valley, CA 92356-8526

Attn: Shanna Mitchell (daggettcsd@aol.com; daggettcsd@outlook.com; daggettwater427@gmail.com)
Daggett Community Services District (via email)
P. O. Box 308
Daggett, CA 92327-0308

Attn: Steve and Dana Rivett
Daggett Ranch, LLC
P. O. Box 112
Daggett, CA 92327-0112

Attn: James Kelly (James.Kelly@clearwayenergy.com)
Daggett Solar Power 3 LLC (via email)
5780 Fleet Street, Suite 130
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Mojave Basin Area Watermaster Service List as of October 09, 2024

(ron@dadcopowerandlights.com)
Dahlquist, George R. (via email)
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Sun Valley, CA 91352-

Darr, James S.
40716 Highway 395
Boron, CA 93516

Attn: Alan L. De Jong
De Jong Family Trust
46561 Fairview Road
Newberry Springs, CA 92365-9230

Attn: Randy Wagner
Dennison, Quentin D. - Clegg, Frizell and Joke
44579 Temescal Street
Newberry Springs, CA 92365

Attn: Marie McDaniel
Desert Dawn Mutual Water Company
P. O. Box 392
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Attn: Penny Zaritsky (pennyzaritsky2000@yahoo.com)
Desert Girlz LLC (via email)
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Attn: Denise Courtney
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Attn: Debby Wyatt
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Apple Valley, CA 92307-5525

Attn: Judith Dolch-Partridge, Trustee
Dolch Living Trust Robert and Judith
4181 Kramer Lane
Bellingham, WA 98226-7145

Donaldson, Jerry and Beverly
16736 B Road
Delta, CO 81416-8501

Attn: Virginia Shaw
Dora Land, Inc.
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Apple Valley, CA 92307-0026

Attn: David Dorrance
Dorrance, David W. and Tamela L.
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Wimberley, TX 78676-5060

Attn: David Looper
Douglass, Tina
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Dowell, Leonard
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Evenson, Edwin H. and Joycelaine C.
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Attn: David Dittenmore (d2dittemore@bop.gov; rslayman@bop.gov)
Federal Bureau of Prisons, Victorville (via email)
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Adelanto, CA 92301-5400

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(afc30@yahoo.com)
Fernandez, Arturo (via email)
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Rancho Santa Margarita, CA 92688-2627

Ferro, Dennis and Norma
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Jacksonville Beach, FL 32250-3512

(ropingmom3@yahoo.com)
Finch, Jenifer (via email)
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Attn: Alex and Jerrica Liu (alexliu1950@gmail.com; alexroseanneliu@yahoo.com)
First CPA LLC (via email)
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Attn: Mike Fischer (carlsfischer@hotmail.com; fischer@fischercompanies.com)
Fischer Revocable Living Trust (via email)
1372 West 26th St.
San Bernardino, CA 92405-3029

Attn: Paul Johnson
Fisher Trust, Jerome R.
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Van Nuys, CA 91405-1423

Attn: Daisy Cruz
Foothill Estates MHP, LLC
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(cfrates@renewablegroup.com)
Frates, D. Cole (via email)
113 S La Brea Ave., 3rd Floor
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Attn: Deborah A. Friend
Friend, Joseph and Deborah
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Barstow, CA 92312-0253

Attn: Mark Asay (bettybrock@ironwood.org; waltbrock@ironwood.org)
Fundamental Christian Endeavors, Inc. (via email)
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Newberry Springs, CA 92365

Gabrych, Eugene
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Mojave Basin Area Watermaster Service List as of October 09, 2024

Gabrych, Eugene
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Fallbrook, CA 92028-8816

Gaeta, Miguel and Maria
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Attn: Jay Storer
Gaeta, Trinidad
10551 Dallas Avenue
Lucerne Valley, CA 92356

Garcia, Daniel
223 Rabbit Trail
Lake Jackson, TX 77566-3728

Attn: Sang Hwal Kim
Gardena Mission Church, Inc.
P. O. Box 304
Lucerne Valley, CA 92356-0304

Garg, Om P.
358 Chorus
Irvine, CA 92618-1414

Attn: Brent Peterson
Gayjikian, Samuel and Hazel
34534 Granite Road
Lucerne Valley, CA 92356-

Attn: Jeffrey Edwards
(jedwards@fbremediation.com)
GenOn California South, LP (via email)
P. O. Box 337
Daggett, CA 92327-0337

(Nereida.Gonzalez@gswater.com,
ana.chavez@gswater.com)
Golden State Water Company (via email)
160 Via Verde, Ste. 100
San Dimas, CA 91773-5121

Attn: Nereida Gonzalez
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Nereida.Gonzalez@gswater.com)
Golden State Water Company (via email)
160 Via Verde, Ste. 100
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Attn: Scot Gasper
Gordon Acres Water Company
P. O. Box 1035
Lucerne Valley, CA 92356-1035

Gray, George F. and Betty E.
975 Bryant
Calimesa, CA 92320-1301

Attn: Brian E. Bolin
Green Acres Estates
P. O. Box 29
Apple Valley, CA 92307-0001

Attn: Eric Archibek
Green Hay Packers LLC
41717 Silver Valley Road
Newberry Springs, CA 92365-9517

Attn: Nick Grill (terawatt@juno.com)
Grill, Nicholas P. and Millie D. (via email)
35350 Mountain View Rd
Hinkley, CA 92347-9613

Gubler, Hans
P. O. Box 3100
Landers, CA 92285

Attn: Tamara J Skoglund
(TamaraMcKenzie@aol.com)
Gulbranson, Merlin (via email)
511 Minnesota Ave W
Gilbert, MN 55741-

Gutierrez, Jose and Gloria
24116 Santa Fe
Hinkley, CA 92347

Attn: Bryan C. Haas and Mary H. Hinkle
(resrvc4you@aol.com)
Haas, Bryan C. and Hinkle, Mary H. (via
email)
14730 Tigertail Road
Apple Valley, CA 92307-5249

(hackbarthoffice@gmail.com)
Hackbarth, Edward E. (via email)
12221 Poplar Street, Unit #3
Hesperia, CA, CA 92344-9287

Attn: Doug and Cheryl Hamilton
Hamilton Family Trust
19945 Round Up Way
Apple Valley, CA 92308-8338

Attn: William Handrinos
Handrinos, Nicole A.
1140 Parkdale Rd.
Adelanto, CA 92301-9308

Hang, Phu Quang
645 S. Shasta Street
West Covina, CA 91791-2818

Attn: Donald F. Hanify
Hanify, Michael D., dba - White Bear Ranch
PO BOX 1021
Yermo, CA 92398-1021

Attn: Matt Wood
(Matthew.wood@martinmarietta.com)
Hanson Aggregates WRP, Inc. (via email)
P. O. Box 1115
Corona, CA 92878-1115

Attn: Mary Jane Hareson
Hareson, Nicholas and Mary
1737 Anza Avenue
Vista, CA 92084-3236

Attn: Kenny Harmsen (harmsencow@aol.com)
Harmsen Family Trust (via email)
23920 Community Blvd.
Hinkley, CA 92347-9721

Harter, Joe and Sue
10902 Swan Lake Road
Klamath Falls, OR 97603-9676

(harveyl.92356@gmail.com)
Harvey, Lisa M. (via email)
P. O. Box 1187
Lucerne Valley, CA 92356-

Haskins, James J.
11352 Hesperia Road, #2
Hesperia, CA 92345-2165

Mojave Basin Area Watermaster Service List as of October 09, 2024

Hass, Pauline L.
P. O. Box 273
Newberry Springs, CA 92365-

Attn: Craig Carlson (kcox@helendalecsd.org; ccarlson@helendalecsd.org)
Helendale Community Services District (via email)
P. O. Box 359
Helendale, CA 92342-0359

Attn: Joshua Maze
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P. O. Box 249
Helendale, CA 92342-0249

Attn: Jeff Gallistel
Hendley, Rick and Barbara
P. O. Box 972
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Hensley, Mark P.
35523 Mountain View Rd
Hinkley, CA 92347-9613

Attn: Jeremy McDonald (jmcdonald@cityofhesperia.us)
Hesperia - Golf Course, City of (via email)
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Hesperia, CA 92345-3493

Attn: Janie Martines (janiemartines@gmail.com)
Hesperia Venture I, LLC (via email)
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Attn: Jeremy McDonald (jmcdonald@cityofhesperia.us)
Hesperia Water District (via email)
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Attn: Jeremy McDonald (tsouza@cityofhesperia.us)
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Attn: Anne Roark
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Lucerne Valley, CA 92356-0749

Ho, Ting-Seng and Ah-Git
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Bakersfield, CA 93390-0001

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Covina, CA 91722-0432

Attn: Sandra D. Hood
Hood Family Trust
2142 W Paseo Del Mar
San Pedro, CA 90732-4557

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Newberry Springs, CA 92365-9258

Attn: Ester Hubbard
Hubbard, Ester and Mizuno, Arlean
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Mojave Basin Area Watermaster Service List as of October 09, 2024

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Jackson, Ray Revocable Trust No. 45801
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Attn: Audrey Goller
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Attn: Gary A. Ledford
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Jess Ranch Water Company (via email)
906 Old Ranch Road
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Attn: Cynthia Mahoney
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Attn: Paul Johnson
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Johnson, Paul - Industrial (via email)
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Apple Valley, CA 92308-8330

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Dammeron Valley, UT 84783-5211

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Johnston, Harriet and Johnston, Lawrence W.
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Hesperia, CA 92340-1472

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Attn: Ray Gagné
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Attn: Lee Logsdon
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Mojave Basin Area Watermaster Service List as of October 09, 2024

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Mojave Basin Area Watermaster Service List as of October 09, 2024

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Attn: Jodi Howard
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Mojave Basin Area Watermaster Service List as of October 09, 2024

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Norris Trust, Mary Ann
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Lucerne Valley, CA 92356-8261

Attn: Kenton Eatherton (keatherton@verizon.net)
NSSLC, Inc. (via email)
9876 Moon River Circle
Fountain Valley, CA 92708-7312

Nuñez, Luis Segundo
9154 Golden Seal Court
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Attn: Pearl or Gail Nunn
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Attn: Jeff Gaastra (jeffgaastra@gmail.com; andy@seesmachine.com; bbswift4044@cox.net)
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Attn: Craig Maetzold (craig.maetzold@omya.com)
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Attn: John P. Oostdam
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Mojave Basin Area Watermaster Service List as of October 09, 2024

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Attn: Jafar Rashid (jr123realestate@gmail.com)
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Attn: Sara Fortuna (sarajfortuna@gmail.com; fourteengkids@aol.com)
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Attn: Rod Sexton
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Mojave Basin Area Watermaster Service List as of October 09, 2024

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