Water 2120 and the Failure of Stationarity:

The Albuquerque Bernalillo County Water Utility Authority's 100-Year Water Plan Requires Reassessment

Submitted to the ABCWUA Board of Directors | April 22, 2026 | Prepared by Norm Gaume, P.E. (ret.), President, NM Water Advocates

I. Introduction

About This White Paper

New Mexico Water Advocates (NMWA) is a New Mexico nonprofit dedicated to sound, science-based water policy in New Mexico. The NMWA Board authorized submittal of this white paper to the Chair and board members of the Albuquerque Bernalillo County Water Utility Authority (Authority) at its April 22, 2026, Board meeting. It is offered in the spirit of constructive civic engagement.

The Authority board's new leadership represents an opportunity to take an honest look at the assumptions underlying the Authority's water resources management and planning. We urge the Board to direct the Water Authority's actions to recognize that the current situation 1) is truly dire, 2) is without adequate recognition, and 3) actively threatens Albuquerque, Bernalillo County, and the entire Middle Rio Grande.

The Author's Standing

The author brings direct experience with the supply challenges the Authority now faces. As City of Albuquerque water resources manager in the 1990s, he managed Albuquerque's cooperative, multi-agency program of scientific investigations that concluded Albuquerque could not continue to rely solely on pumping from the Santa Fe Group aquifer underlying the metropolitan area, despite its excellent characteristics. The investigations included drilling nests of monitoring wells throughout the City that have been continuously monitored for almost 30 years, and for which the NM Bureau of Geology provides annual data interpretation to the Authority. The investigations produced the first accurate hydrogeologic understanding of the layered and offset blocks of the Santa Fe Group aquifer system with the Rio Grande running over the top. USGS scientists published a computer model that simulated how the river and aquifer are affected by pumping and each other over time.

Albuquerque's strategy before 1997 **presumed** that the river would passively recharge the aquifer in real time, and that the City's San Juan-Chama Project water and treated

wastewater discharges to the river would keep the river whole. The **investigations provided evidence** the passive strategy would bankrupt and permanently damage the aquifer and cause differential subsidence of the City while San Juan-Chama water flowed past it.

From the 1997 Strategy to Water 2120

The backbone of the 1997 Albuquerque Water Resources Management Strategy, prepared based on that science, was direct consumptive use of the City's SJCP water. The strategy relied on diverting an equal amount of native Rio Grande water for non-consumptive use and return as treated wastewater for others' use downstream — just as irrigators who divert water from the river consume part and return part. This diversion plan was implemented within limits imposed by stakeholder litigation and the river's hydrology.

The Water Authority assumed ownership of the City water and wastewater utilities and all staff and assets in 2003. It modified the 1997 Albuquerque water resources management strategy in 2007. Another update was due in 2017, but the Water Authority instead issued its 100-year water plan, Water 2120, in 2016. It is being updated now without transparency.

What This White Paper Shows

This white paper shows that the Drinking Water Plant's foundational supply assumptions — which are also the foundation of Water 2120 — are invalid. It presents the data, explains what they mean for the region's water future, and calls on the Board to respond with the transparency and urgency the situation requires.

II. Water 2120: What the Plan Assumed

In 2016, the ABCWUA adopted Water 2120, a 100-year water supply plan intended to guide the Authority through the year 2120. The plan is an ambitious and professionally executed document. Its central purpose is to ensure that the Authority can reliably meet the water demands of a growing metropolitan area over the coming century.

Water 2120 rests on a foundational planning assumption: stationarity. In water resources planning, stationarity is the assumption that the hydrologic system — the rivers, snowpack, and aquifers that supply water — will behave in the future much as in the past. Variability is expected, but the long-run averages and the statistical distribution of wet and dry years are assumed to remain stable. Plan for the range of the past, and you have planned for the future.

The plan centers on the Authority's Drinking Water Plant, which diverts San Juan-Chama Project water from the Rio Grande and treats it for direct potable use. When the DWP was planned, the Bureau of Reclamation allocated the SJCP 96,200 acre-feet per year as firm yield — the quantity the project could deliver with reasonable certainty every year. The Authority holds the largest single SJC perpetual contract: 48,200 acre-feet per year, just over half. The DWP was planned and designed around the expectation that this volume would be reliably available in many years interspersed with years when it would not.

Heron Reservoir, the SJCP off-river terminal storage reservoir adjacent to the Rio Chama, was designed to sustain deliveries of SJC water through dry years by storing surplus water during wet ones. With 400,000 acre-feet of capacity, it was intended to be the buffer that made the firm yield promise real. Through much of the 1980s and 1990s, Heron functioned as designed, remaining near or at capacity.

Do the SJC supply conditions of the past decade — and the foreseeable future — still support the stationarity assumption on which Water 2120 is built? The answer is no.

III. What the Data Now Show

A. It Is As Dry As It Has Ever Been

The 17-year period 2009–2025 is, in terms of native Rio Grande basin water yield, as dry as the driest 17-year period recorded since annual Rio Grande Compact water delivery accounting began in 1940. https://nmwateradvocates.org/rio-grande-driest-era-compact-history-otowi/

B. San Juan-Chama Project Deliveries and Reliability Have Collapsed

The San Juan-Chama Project was designed to supplement native Rio Grande flows with transmountain imports from the Colorado River basin. For two decades it did so reliably. That reliability is gone. The yield and reliability depend on snowmelt runoff that is not expected to recover. The 2025 allocation was only 39% of a full supply. This year, with record low snowpack, is worse.

In 2025, the total SJC Project water recorded at the Otowi gage in transit to contractors — including both current-year Heron Reservoir releases and withdrawals of previously banked allocations from Abiquiu Reservoir — was approximately 40,000 acre-feet. This is the lowest gross SJC release on record. The Otowi gage measures Rio Grande total inflows to the Middle Rio Grande region.

The reservoir storage to sustain firm yield deliveries through consecutive dry years is empty. Heron Reservoir ended 2025 at approximately 27,000 acre-feet — 7% of its 400,000 acre-foot capacity, and the lowest end-of-year storage since the reservoir was filled. The San Juan headwater basins have not produced enough new inflow this century to replenish annual drawn downs. Now, the SJC total annual yield reflects the prior winter's snowpack. We may get temporary relief in the years ahead, but the overall situation will inexorably worsen.

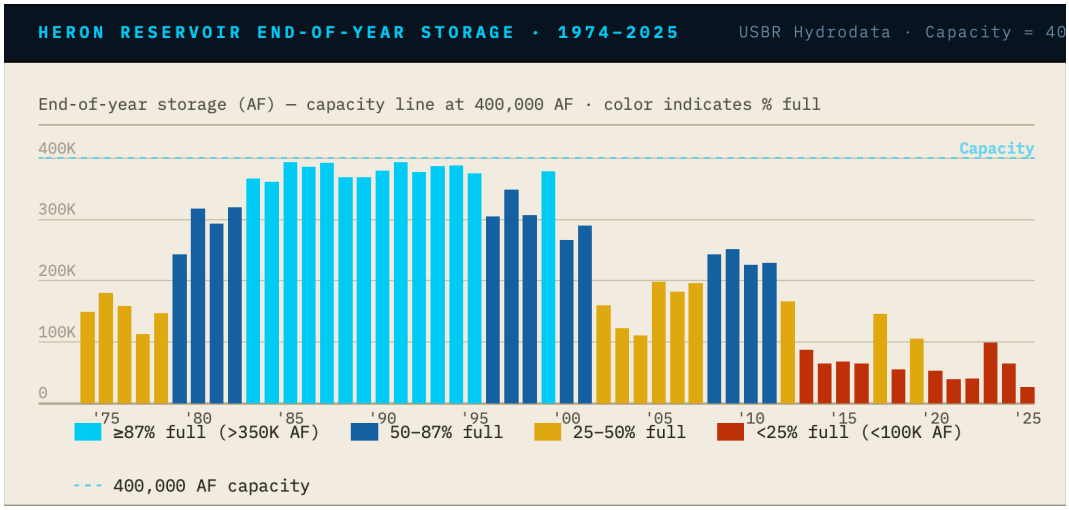

Figure 1: Heron Reservoir End-of-Year Federal Project Storage from Reclamation Hydrodata

C. Groundwater Fills the Gap — and the Aquifer Responds

When the Drinking Water Plant came online in December 2008 and ramped up production through 2010, the effect on the underlying aquifer was immediate and measurable. This was not a surprise — it was the outcome that the 1990s investigations and planning projected. See Figure 2 that illustrates what's described below.

Among the tools used in those investigations was a network of piezometer nests: clusters of dedicated monitoring wells scientifically installed by the US Geological Survey. The first nest was drilled at the Del Sol Dividers, a near East Mesa park, that is in an excellent centralized position to measure the aquifer's response to changes in pumping and recharge. It's as far from well fields as practical in all directions.

The Del Sol Dividers data tell a clear story. Despite significant conservation progress in the years before the DWP came online, the aquifer water level had been dropping steadily, year after year, from 1997 through 2009. The trend reversed dramatically when DWP production ramped up in 2010. By 2020, the water table had recovered approximately 30 feet — direct evidence that replacing groundwater with treated surface water was working as intended.

Then, abruptly, in 2021 and 2022, the Del Sol Dividers water level declined again. The reason: the Rio Grande did not carry enough flow to deliver the Authority's SJC water to the DWP diversion point for a sufficient duration, forcing a return to heavier groundwater pumping. The recovery weakly resumed but 2025 pumping was also high and the decline will continue. The graph below shows these relationships. *See the Attachment for data sources citations.*

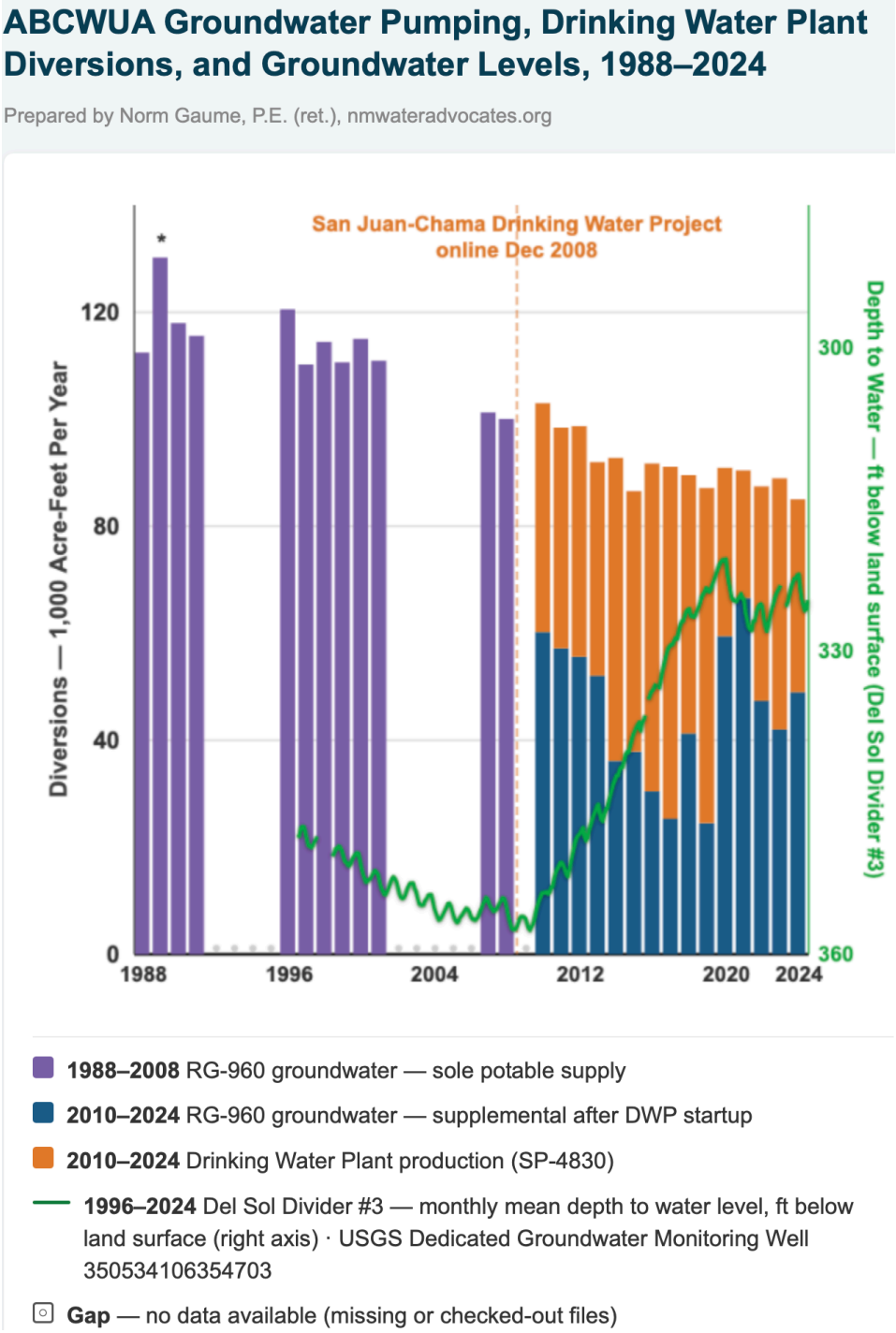

Figure 2: ABCUWA Groundwater Pumping and Aquifer Response

The broader significance is this: before the DWP came online, the State Engineer's hydraulic modeling estimated the Water Authority's cumulative and current pumping imposed a depletive demand of roughly **100 cubic feet per second** on the Rio Grande. DWP operations over 10 years reduced that demand to approximately **72 cubic feet per second** — cutting Albuquerque's effective impact on the river by more than 25%. That gain is now being eroded as DWP production falls and groundwater pumping rises to compensate.

IV. The Stationarity Problem

New Mexico is experiencing aridification. Renewable water supplies have shrunk and will continue to shrink due to the atmospheric physics of a heating planet and the hotter atmosphere's exponentially greater thirst. The working assumption that the water supplies available to the Authority in the future will resemble those of the past — the assumption of stationarity — isn't defensible now.

Stationarity has been formally challenged in the scientific literature for nearly two decades. In a landmark 2008 paper in Science, Milly et al. declared that "stationarity is dead" and called for new approaches to water resources planning that account for nonstationarity in hydrologic systems driven by climate change. Rio Grande basin data confirm that this is the operational reality for the State's and Authority's water managers.

The Authority adopted Water 2120 in 2016. The 100-year water plan needs a transparent revision as an act of responsible governance. Its supply projections were built on historical averages and the assumption that the SJC Project would recover from all droughts to its firm yield. Neither assumption holds.

At the same time, decades of groundwater diversions have drawn down water tables throughout and past the Authority's service area. The volume the aquifer once contained is significantly reduced. The river leaks more as it flows over the top of the aquifer. The Authority must dedicate considerable water rights and return flows, now and in the future, to keep the river whole. The total demand that must be offset is currently about 75 cfs on a continuous basis, or about 54,000 acre-feet per year.

The combination — less reliable supply, a depleted buffer, and the disappearance of wet SJC water behind the Authority's largest water rights holding — means that the effective water supply stress facing the Authority today is substantially greater than any single metric would suggest.

V. Specific Concerns Requiring Board Attention

A. Representations to Prospective High-Water-Use Industry

NM Water Advocates is aware that the Authority has made, or permitted, public representations that it can supply water to new high-water-use industrial development in the region. We raise this with respect, but directly: the Authority's physical supply and the water rights to divert that supply may not be adequate to reliably meet existing demand as our drier, hotter future unfolds.

The State says the Middle Rio Grande is depleting 20,000 acre-feet per year on average that belongs to Lower Rio Grande water users.** New Mexico will violate the Rio Grande Compact in three years if that continues. We collectively must use less water. That's the plain truth.

We ask the Board to direct that no further representations be made regarding the Authority's capacity to serve new high-water-use customers until a rigorous, public assessment has been completed of both the physical supply outlook and the adequacy of the Authority's water rights portfolio under continued dry hydrologic conditions.

B. Drought Stage

The Authority is currently operating under Drought Stage Zero — a policy position that creates cognitive dissonance. Heron Reservoir at 7% of capacity, SJC deliveries at 39% of firm yield, and a resumption of groundwater table decline are not Stage Zero conditions. The designation sends the wrong signal to water users and to the public, regardless of whether the community has met the Authority's conservation targets set long ago. Moreover, this is not drought. It is aridification.

We ask the Board to reassess the current drought stage designation and to reinvigorate the Authority's water conservation communication and outreach. Conservation is not a hardship measure to be reserved for emergencies — it must be a permanent feature of responsible water governance in New Mexico's largest city and most urban county located along a few miles of the overallocated Middle Rio Grande. The emergency is here.

C. Targeting High Water Users and Non-Functional Turf

Broad conservation appeals produce broad but shallow results. The Authority's renewed conservation program will be most effective — and most equitable — if it is directed with precision toward the largest and least defensible uses. We ask the Board to direct staff to identify and actively engage the highest residential, commercial, institutional, and industrial

water users, and to prioritize rate increases and changes in law targeting the irrigation of non-functional turf.

D. Making Cooperation an Explicit Policy and an Expectation

The 1997 Albuquerque Water Resources Management Strategy included policies requiring cooperation with others in the Middle Rio Grande for Rio Grande Compact compliance purposes. Those are not current Authority policies. The Board should consider modernizing and restoring cooperation as a policy and as an institutional citizen of the Middle Rio Grande. It should also expect cooperation from adjacent public and private water utilities as it strives for resilience through adaptation.

VI. Recommendations to the Board

New Mexico Water Advocates respectfully requests the Board take the following actions:

1. **Commission a formal reassessment of Water 2120** in light of current and projected hydrologic conditions, with explicit attention to the failure of stationarity assumptions and the reduced reliability of SJC Project deliveries.
2. **Initiate a transparent, inclusive stakeholder process** to revise the Authority's water supply planning assumptions and develop updated projections grounded in current hydrologic and climate reality.
3. **Suspend public representations** regarding the Authority's capacity to serve new high-water-use industrial customers until a rigorous public assessment of the Authority's physical supplies and water rights adequacy has been completed.
4. **Reassess the current drought stages definitions** and adopt a drought response policy and posture commensurate with the extreme dryness we are experiencing, accompanied by reinvigorated conservation education and outreach.
5. **Direct conservation staff** to prioritize high water users and non-functional turf irrigation as the primary targets of enforcement, incentive, and outreach programs.
6. **Promulgate a Water Authority policy of cooperation and mutual sacrifice** to prevent a Rio Grande Compact violation due to chronic overuse in the Middle Rio Grande. Recognize Rio Grande Compact's Middle Rio Grande depletion limits and dangerous current water debt as a constraint on the Authority's operation. Share the mutual sacrifices that will be required to maintain compliance. Encourage honest cooperation by public and private water utilities and irrigators in the Middle Rio Grande.

VII. Conclusion

The Albuquerque Bernalillo County Water Utility Authority has, over the past three decades, made genuine and significant progress in water stewardship. The conservation achievements of the 1990s and 2000s, and the construction and operation of the Drinking Water Plant, represent substantial investments in the region's water security. That record deserves acknowledgment.

But the hydrologic foundation on which the Authority's current long-range plan rests has shifted. The San Juan-Chama Project last year delivered 39% of its stated firm yield. Heron Reservoir, with its four-year storage capacity, made that yield firm, but has been falling to its current historic low of 7% capacity. The native Rio Grande basin is as dry as it has ever been in the recorded compact era. And the aquifer that was partially recovered and stabilized as the DWP's most important achievement, is again threatened with serious decline.

Water 2120 doesn't acknowledge that a Rio Grande Compact compliance constraint limits total Middle Rio Grande depletions. The forerunner 1997 Albuquerque strategy did. Compact compliance is a serious constraint that has grown to present an imminent threat.

Water 2120 was built for a water future that is no longer the most likely water future. Acknowledging that is a prerequisite to sound planning. The Board has the responsibility and, under its new leadership, the opportunity to lead that acknowledgment openly and to begin the work of building a plan equal to the conditions the region actually faces.

NM Water Advocates respectfully requests Chair Baca provide an opportunity to briefly present this white paper at an upcoming Board meeting and respond to questions. I would also like to discuss the data and interpretations herein with Water Authority staff.

I hereby certify the information herein is accurate and that I have been professionally diligent in analyzing and presenting it.

Respectfully submitted,

/s/

Norm Gaume, P.E. (ret.), license #6969

President, Board of Directors
New Mexico Water Advocates
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Attachment: Sources of Data Used in this Analysis

Data source for the Heron Reservoir End-of-Year Storage values is the Bureau of Reclamation online Hydrodata service.
https://www.usbr.gov/uc/water/hydrodata/reservoir_data/site_map.html

Data sources for the second Water Authority Pumping and water level response graphic include the following. Only the last of the list below was available online.

- 2010–2024: Office of the State Engineer Middle Rio Grande Water Master annual accounting reports for all six ABCWUA diversion permits.
- 1988–2009: Office of the State Engineer RG-960 meter files, reviewed and selectively photographed by the author in the District 2 office, April 17, 2026.
- 2008 value estimated from meter records because December 2008 report was missing. Author added an estimated 6,000 acre-feet diversions to 94,038 acre-feet reported metered cumulative diversions through November 2008.
- Years with no data indicate checked out or missing files or records not available for inspection on April 17, 2026.
- † 2022 corrected Water Master draft.
- ‡ 2023 interim Water Master accounting.
- 1989 peak of 130,190 af: The author was a City of Albuquerque Water Division engineer-manager directly involved in meeting the taxing peak day demands in 1989 and in managing the conservation, water waste enforcement, and direct use of San Juan-Chama Project surface water programs that followed.
- Del Sol Divider #3 depth to water: USGS National Water Information System, monthly arithmetic mean, parameter 72019, site 350534106354703, December 1996–December 2024.

** “Middle Rio Grande Compact Crisis,” video recording of New Mexico Water Advocates workshop with presenters Nat Chakeres, Office of the State Engineer General Counsel, and Hannah Riseley-White, Interstate Stream Commission Director, March 26, 2026.