

Attachment M

Affidavit of David Wheelock

**APPLICATION OF THE
LOWER COLORADO RIVER
AUTHORITY FOR EMERGENCY
AUTHORIZATION**

§
§
§
§

**BEFORE THE
TEXAS COMMISSION ON
ENVIRONMENTAL QUALITY**

AMENDED AFFIDAVIT OF DAVID WHEELOCK

THE STATE OF TEXAS

§
§
§

COUNTY OF TRAVIS

Before me, the undersigned authority, personally appeared David Wheelock, a person known by me to be competent and qualified in all respects to make this affidavit, who being by me first duly sworn, deposed as follows:

1. I am over 21 years of age, of sound mind, and have never been convicted of a felony or crime of moral turpitude. I am fully competent and qualified in all respects to make this affidavit.
2. The facts stated in this affidavit are within my personal knowledge and are true and correct. The tabs attached to this affidavit and referred to herein are incorporated by reference. This amended affidavit reflects changes I have made since my affidavit dated May 14, 2015, which was filed in support of LCRA's Application for Emergency Relief, filed on May 15, 2015, and is intended to replace that affidavit in its entirety.
3. I, David Wheelock, am an individual residing in Travis County, Texas.
4. I have a Bachelor of Science in Civil Engineering from the University of Texas at Austin and a Master of Science in Civil Engineering with a water resources specialty from the University of Texas at Austin. I am a registered Professional Engineer in the State of Texas. A true and correct copy of my resume, detailing my prior work history and education, is attached hereto under Tab 1.
5. I have worked for the Lower Colorado River Authority ("LCRA") for more than four years. At LCRA, I have been responsible for the development and maintenance of various plans and permits directly affecting LCRA's water supply. I currently manage LCRA's water rights portfolio and active permit applications, Water Management Plan amendment process, groundwater development initiatives, and am the designated representative to the Region K Regional Water Planning Group. I am personally familiar with LCRA's raw water system, its water rights, and the TCEQ-approved LCRA Water Management Plan ("WMP"), which governs LCRA's operations of lakes Buchanan and Travis. In my position, I am responsible for understanding LCRA's raw water customer water needs now and in the future. In my position, I have also been involved in evaluating various alternative water supplies for LCRA's firm water customers.

6. My opinions stated herein are based on my over thirty years of experience in water supply development, water supply planning, and regulation of water rights in the state of Texas. I have also relied upon a variety of information provided to me by LCRA staff, which is of a nature typically relied upon in my profession, as described below and for which true and correct copies are attached and incorporated herein:
 - a. Map of LCRA Water Service Area, attached hereto under Tab 2;
 - b. Summary of Water Supply Alternatives, attached hereto under Tab 3, prepared by LCRA staff;
 - c. Excerpts of the 2010 LCRA Water Management Plan;
 - d. Amended Affidavit of Ron Anderson, including attachments;
 - e. Amended Affidavit of Ryan Rowney, including attachments;
 - f. Amended Affidavit of Nora Mullarkey Miller, including attachments; and
 - g. Amended Affidavit of Bob Rose, including attachments.
7. Based on the foregoing review and the reasons stated herein, my expert opinion on the following issues is set forth below:
 - a. LCRA Firm Customer Demands.
 - i. LCRA provides raw water from the firm water supply lakes Buchanan and Travis to over 60 retail and wholesale potable water suppliers that together serve over one million people. *See* Map of LCRA's Service Area, attached here under Tab 2. LCRA's municipal raw water customers include, but are not limited to, the Cities of Austin, Burnet, Cedar Park, Leander, Marble Falls, Pflugerville, Lakeway, Bee Cave, Horseshoe Bay, other Highland Lakes cities, water supply corporations, special districts, and investor-owned utilities. In addition, LCRA provides water to several electric utilities—LCRA, Bastrop Energy Partners, Austin Energy, Gen-Tex Corporation, and South Texas Project Nuclear Operating Company—from the firm water supply of lakes Buchanan and Travis. These electric utilities provide power into the electrical grid in Texas operated by the Electric Reliability Council of Texas ("ERCOT") and provide electricity to customers in Texas. LCRA also provides firm raw water to several industries located downstream of the Highland Lakes, including Oxea Chemical and Underground Services Markham.
 - ii. The maximum historical annual amount of water use by firm water customers from lakes Buchanan and Travis during 2000 through 2011 was about 247,000 acre-feet in 2011. (*See* Amended Affidavit of Ryan Rowney.)

b. Interruptible Stored Water Volume and Current Storage Situation

- i. LCRA's requested relief would continue the suspension of supply of interruptible stored water to the Gulf Coast and Lakeside divisions and Pierce Ranch for the remainder of the 2015 irrigation season. In the absence of such requested relief, based on January 1, 2015 storage levels, under the 2010 WMP LCRA could be required to release quantities of water to make available for diversion up to 175,000 acre-feet of interruptible stored water from lakes Buchanan and Travis.
- ii. The Highland Lakes have recently received beneficial inflows. As of June 1, 2015, Lake Travis had about 879,000 acre-feet of stored water (about 78% full), while Lake Buchanan had only 425,000 acre-feet in storage, or only about 49% full. These storage values are an improvement compared to conditions three months earlier and 12 months earlier. Statewide, significant rainfall has occurred in widespread areas and reservoirs have filled to capacity in some river basins. On a statewide basis, reservoirs are 83% full as of June 1, whereas a year ago they were 66% full. (See <http://www.waterdatafortexas.org/reservoirs/statewide> last visited June 3, 2015) In river basins adjacent to the Colorado River basin, reservoirs in the Brazos River basin are 90% full as of June 1 and the two largest reservoirs have both filled. In the Guadalupe River basin, reservoirs are 100% full. Basin-wide, the Colorado River basin is not nearly in such good shape. Considering storage throughout the basin, reservoirs in our river basin are only 47% full as of June 1 and one year ago they were 29% full. Notable reservoirs in the Colorado River basin and their content percentage as of June 1, 2015 are:
 - a. EV Spence, 5%
 - b. OC Fisher, 13%
 - c. OH Ivie, 15%
 - d. Brady Creek, 30%
 - e. Twin Buttes, 6%

Two bright spots in the Colorado River basin are Lake Brownwood, which has increased to 95% full, and Lake JB Thomas, which is 76% full as of June 1. However, no water supply reservoir in the Colorado River basin has filled – indicating that this drought is not over.

Storage in lakes Buchanan and Travis is not nearly in as good shape as the rest of the state, nor as good as the neighboring river basins. The combined storage of the lakes as of June 1, 2015 is 65%.

- iii. As indicated in the Amended Affidavit of Ryan Rowney, storage conditions can return to very dry conditions even after a flood. In my

opinion, recent storage gains do not justify a return to the the 2010 WMP and releases would be imprudent at this time.

c. Emergency Relief – Only Reasonable Alternative to Protect Firm Supply

- i. LCRA is seeking emergency relief to deviate from provisions of the 2010 WMP related to the supply of interruptible stored water from lakes Buchanan and Travis to the Gulf Coast and Lakeside agricultural divisions and Pierce Ranch.
- ii. LCRA's requested relief would continue the suspension of supply of interruptible stored water to the Gulf Coast and Lakeside divisions and Pierce Ranch for the remainder of the 2015 irrigation season. In the absence of such requested relief, based on January 1, 2015 storage levels, the 2010 WMP provides that LCRA could be required to release quantities of water to make available for diversion up to 175,000 acre-feet of interruptible stored water from lakes Buchanan and Travis. Releasing that volume of interruptible stored water could reverse much of the recent gains the lakes have made.
- iii. There are no reasonably available and feasible practicable alternative water supplies or water management or conservation strategies that could be obtained or implemented at this time that would replace the volume of water that LCRA might otherwise have to release from the lakes if the requested relief is not granted that LCRA is not already pursuing. As demonstrated by the summary of alternatives attached hereto under Tab 3, most of the supplies identified would produce insufficient or uncertain quantities of supply, are constrained by existing contractual commitments, would create other operational issues for customers, and/or are subject to a high level of regulatory uncertainty and lengthy permitting process if not obtained on an emergency basis. In most cases, these alternatives would take years to develop and transport to the area of use.
- iv. For 2012, 2013, 2014 and 2015, LCRA has obtained permits that allowed LCRA to use its downstream Gulf Coast and Lakeside water rights to meet some of the needs of firm water customers downstream of the Highland Lakes, to the extent that those supplies are not being used to meet agricultural needs in the four irrigation operations. However, the amount of demand that can be met using downstream water rights is limited by the availability of run-of-river flows and subject to environmental flow requirements. Under the recent permits, LCRA was able to divert about 7,000, 1,000, and 7,000 acre-feet in 2012, 2013 and 2014 respectively. (See Amended Affidavit of Ryan Rowney.) In addition, in 2011 LCRA obtained a permanent amendment to its Gulf Coast water right (14-5476) that allows use for industrial

purposes. In each of the past three years, about 10,000 acre-feet of industrial demands were met with that amended water right. These authorizations have the potential to conserve water in the Highland Lakes, but as demonstrated by the amounts used in previous years, the amounts are limited when compared to the amount of interruptible stored water that might be released under the 2010 WMP for interruptible agricultural customers.

- v. LCRA is taking action to bring on some additional supplies. In 2013, LCRA obtained groundwater production permits in Bastrop County and, since that time, has installed wells that are meeting most of the demand at the Lost Pines Power Park. These additional supplies, while important, are not of the scale to offset potential shortages under worsening drought conditions

d. Adequacy of Emergency Relief Requested.

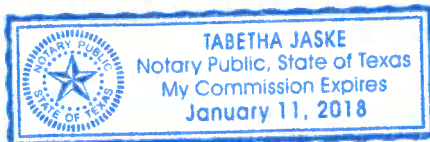
It is my opinion that no additional interruptible stored water should be made available this year beyond the amount already committed to farmers in the Garwood irrigation division (consistent with an existing contract). If additional interruptible stored water is made available, it could reverse the natural gains in combined storage that have occurred very recently and, absent continued wet weather, once again place the water supply at an unacceptable risk. Deviating from the 2010 WMP for the remainder of the 2015 irrigation season, consistent with the emergency relief granted to date, continues to be a highly prudent drought response.

Further affiant sayeth not.



DAVID WHEELOCK, AFFIANT

SWORN TO AND SUBSCRIBED before me on the 14th day of June, 2015.



Notary Public in and for the State of Texas

My Commission Expires: 1-11-2018

David C. Wheelock, PE

Manager, Water Supply and Conservation

Lower Colorado River Authority

David Wheelock is a key member of LCRA’s water resources planning and management team.

He is an experienced water resources engineer and manager in water planning with river authorities and in consulting. He has been in responsible charge of managing wholesale raw water systems, contract administration, hydrologic modeling, water rights modeling, water supply planning, acquisition of water supplies, reservoir management, dam safety and hydroelectric generation development. Mr. Wheelock has participated in the development and implementation of strategic plans, setting direction and goals, advising senior management, and working with local entities, governments, and engineering firms to create solutions to water resource problems.

EXPERIENCE

Manager, Water Supply and Conservation, Lower Colorado River Authority

Austin, TX
2010-2015

From 2010-2011, supervised the Water Resources Planning and Management Department and the Water Conservation Department. As such, he was responsible for the development and maintenance of various plans and permits directly affecting LCRA’s wholesale water supply. He obtained a number of important water right amendments, including changes to senior water rights to better manage the resource.

Currently, Mr. Wheelock is managing LCRA’s water rights portfolio and active permit applications, Water Management Plan amendment process, groundwater development initiatives, and is the designated representative to the Region K Regional Water Planning Group.

Water Services Manager, Brazos River Authority

Waco, TX
2004 - 2010

Supervised the Water Services Department in the day-to-day management of eleven water supply reservoirs to meet contractual commitments and permit requirements. Was responsible for the administration of water supply contracts, compliance with state water right permits, controlling releases for water supply and during flood events, support for water rights applications (i.e. System Operations Permit application), and water supply planning.

Principal Engineer, Brazos River Authority

Waco, TX
2002 - 2004

In-house consultant to the General Manager, Regional Managers, and the Planning & Development Department in performing and implementing the goals of the Authority, as well as support for on-going operations. Provided leadership for planning, permitting, and design functions throughout the Authority’s area of operations; communicating technical aspects of the vision and goals of the Authority; working closely with Authority technical staff; reviewing plans/specifications for new work and rehabilitation of existing projects; and, carrying out duties in accordance with the Authority’s Strategic Plan.

Vice President, HDR Engineering, Inc.

Austin, TX
1993-2002

Project management, marketing, and leadership responsibilities for major water resource planning efforts of river authorities and state government, including: Brazos G Regional Water Planning Area (Texas Water Development Board SB 1 and SB 2 initiatives); Trans-Texas Water Program, including Austin, San Antonio, and Williamson County study areas (LCRA, BRA, SARA, SAWS); Williamson County Water Supply Facilities Plan (BRA); Western Canyon Regional

Water System (GBRA); and, Tarrant County Water Management Plan (TRWD). Other projects include planning and conceptual engineering for the Corpus Christi area (NRA, City of Corpus Christi); project management for rehabilitation of DeCordova Bend Dam flood control gates (Lake Granbury - BRA), rehabilitation of critical components of the flood control gates Morris Sheppard Dam (Possum Kingdom Reservoir - BRA), hydroelectric evaluation and assessment at Morris Sheppard Dam, and resident engineer for outlet works replacement at Red Bluff Dam on the Pecos River (Red Bluff Water District).

Self-Employed Consulting Engineer

Annapolis, MD
1992-1993

Self-employed consulting engineer providing services to construction and government clients. Services included construction management, scheduling, structural design, and estimating for dam rehabilitation and water resource projects.

Chief Engineer, Synergics, Inc.

Annapolis, MD
1990-1992

In responsible charge of technical and management duties for design and construction of dam rehabilitation and hydroelectric projects. .

Vice President, Gebhard Engineers

Austin, TX
1984-1990

Project manager and engineer for a number of water resource projects, including two hydroelectric plants in New Hampshire; waterline projects; feasibility assessment of numerous hydroelectric sites; major wastewater interceptor and tunnel; hydrology studies in New Mexico and Arizona; and, general civil and water resource projects.

Project Manager, Meyer-Lytton-Allen, Inc.

Austin, TX
1983-1984

Responsible for the engineering and construction of a number of land development and commercial development projects in Central Texas, including water and wastewater pumping stations, water pipelines, and stormwater drainage facilities.

Project Engineer, Turner Collie & Braden, Inc.

Austin, TX
1979-1983

Responsible for the design and construction of a variety of municipal water and wastewater treatment projects, including floating water intakes; water transmission pipelines; wastewater treatment plant rehabilitations; well systems; sludge handling and digestion facilities; and regional treated water system; resident project engineer for construction of water and wastewater treatment plants.

EDUCATION and REGISTRATIONS

BSCE, University of Texas at Austin, 1979.

MSCE – Water Resources, University of Texas at Austin, 1986.

Registered Professional Engineer: Texas (#54303); inactive registrations: Arizona; Arkansas; Maryland; New Hampshire; Pennsylvania; Virginia.

PROFESSIONAL ASSOCIATIONS

American Water Works Association – past Chair of Standards Committee on Slide Gates.

American Society of Civil Engineers – past Director – Texas Section.

Member, SB 1094 State-wide Water Conservation Implementation Task Force.

Potential Alternatives to the Emergency Relief Requested by LCRA's Emergency Applications

LCRA has explored several alternative water supplies that might be available to alleviate strain on LCRA's water supply reservoirs, lakes Buchanan and Travis, caused by the persistent drought conditions. These alternatives are generally described below.

None of these alternatives could be obtained in sufficient supply or on a schedule that could serve to eliminate the need for immediate relief that LCRA seeks in its applications.

Moreover, it is important to note that LCRA lacks readily available funding to acquire or implement many of these alternatives, which means that rate increases for firm customers would be required to pay for these supplies at the same time LCRA may be significantly curtailing their access to water from lakes Buchanan and Travis.

- 1. Utilize water from LCRA's Lakes Inks, LBJ, and Marble Falls.** These lakes are not currently authorized for municipal use, so amendments may be required to make full use of these supplies on a more permanent basis – a process that could take several years. If LCRA were to simply stop exercising its right to refill these lakes, but still allow the lakes to be maintained at levels that would not have significant impacts to cities and industries around them, it estimates that perhaps a one-time supply of about 34,000 acre-feet (AF) could be made available. Reduction in storage could also have significant impacts on hydroelectric generation capabilities.
- 2. Conservation incentives and customer buyouts of nonessential uses (irrigation, recreation firm contracts).** LCRA has approximately 11,000 AFY under contract for firm irrigation and recreational use. LCRA may consider providing further financial incentives to these customers to reduce water use, but given the nominal amount of supply that might be made available, such alternatives would not be sufficient to alleviate the need for emergency relief.
- 3. Aggressive municipal conservation.** This would include identifying and addressing water loss areas (i.e., toilets, shower heads, leaking pipes, etc.). In LCRA's experience, this requires solid partnerships with customers, a good method for calculating water savings (which is elusive) and a strong education and enforcement program (which is costly to the customers and requires time to become effective). Benchmarking and experience tells us that to achieve meaningful water savings, it often takes 1-2 years or more. While LCRA will continue to encourage water conservation, this alternative does not eliminate the need for emergency relief requested to avert the very near-term prospect of reducing storage levels beyond a protective level. The estimated cost of this long term program to achieve a 20% demand reduction is \$220,000,000.

- 4. Groundwater.** Many areas within LCRA's water service area have local groundwater conservation districts that regulate the use and permitting of groundwater supplies. Although groundwater appears to be available in many areas, the uncertainty associated with the long-term availability of such groundwater supplies in light of an unsettled regulatory environment renders any significant reliance on groundwater as an alternative supply a relatively high risk option. Within Matagorda County, which is governed by the Coastal Plains Groundwater Conservation District, LCRA estimates that it might be able to obtain agreements to lease up to 10,000 AFY of groundwater from existing wells or drill new wells to serve existing industrial customers in Matagorda County. Further, it might be able to do the same in and around Fayette County for purposes of securing supplies to meet some or all of the existing power plant water demands in that area. Groundwater development in Fayette County is regulated by the Fayette County Groundwater Conservation District. Similarly, LCRA has explored options for obtaining groundwater from the Carrizo-Wilcox aquifer to the east of Austin. Both the Lost Pines and Post Oak Savannah Groundwater Conservation districts have jurisdiction over large parts of the aquifer close to LCRA's service area. In 2013, LCRA obtained groundwater permits in the Lost Pines Groundwater Conservation District for up to 10,000 AFY to use at LCRA's power facilities in Bastrop County. LCRA has installed groundwater wells and is supplying the majority of water demand at the power facilities from groundwater.

It takes approximately 9-12 months to secure written agreements with landowners and often takes several years to obtain new groundwater permits or permit amendments from local groundwater conservation districts; the need for emergency relief is not diminished. Further, to secure and develop any such supplies would take several years and thus would not avert the need for emergency relief.

LCRA has purchased groundwater pumping rights under 5000 acres of land in central Bastrop County. Currently, there is no permit for pumping the groundwater.

- 5. Off-Channel Reservoir.** LCRA has recently completed engineering work on a new reservoir to be built in the lower Colorado River basin. Construction work has been contracted and the groundbreaking for the project occurred in December, 2014. The project will replace some supplies currently met from the Highland Lakes, improve agricultural water reliability and efficiency, and increase LCRA's overall water supply.

The new reservoir in Wharton County will capture water downstream and hold it for beneficial use by downstream industrial and agricultural customers. This is the first project that will allow LCRA to capture and store significant amounts of water downstream that can be used by multiple customers.

The reservoir will be able to hold about 40,000 acre-feet, but could be filled and used multiple times over the course of a year, making it capable of adding 90,000 acre-feet of firm water to the region's supply. The Texas Water Development Board has provided \$255 million for financing the reservoir. The project is scheduled to be on-line in 2017 – which may not be early enough to help with the current drought, and definitely not early enough to help address the situation in the near-term.

- 6. Wastewater reuse program in the Highland Lakes.** Enhanced direct reuse of wastewater around the Highland Lakes could reduce demand by about 5,000 AFY over the next 1-2 years. This amount of savings is not sufficient over the near term to alleviate the need for emergency relief. The estimated cost for an enhanced direct wastewater reuse pilot project for 1,120 acre-feet of supply is \$5,700,000.
- 7. Line or pipe high loss canals utilized by industry.** Determining high loss areas of canals can be a challenge and estimating the amount of water savings difficult. Although LCRA has some very general information about its canal systems, it could not immediately implement a canal lining project that would serve to reduce water usage in such quantities as to avert the need for emergency relief.
- 8. Interbasin transfers or water trucking/rail transport.** Interbasin transfers of water or transport of water by truck or rail from areas with a more plentiful supply is an option that poses no realistic likelihood of alleviating the need for the emergency relief requested. Moreover, there are very few options close to the lower Colorado River basin with much supply to spare. Even if such supply exists, the interbasin transfer permitting process and construction of the necessary infrastructure would significantly limit the ability to bring such supplies on line in a timely manner. The logistics of locating sufficient transporting equipment to meet the levels of demand would be very difficult if not impossible.
- 9. Ocean or Brackish Groundwater Desalination.** Although ample supply is likely available, the time required to permit and construct such facilities is estimated to be 5-10 years. This alternative thus does not eliminate the need for emergency relief. The estimated cost of this alternative is \$177,000,000 for 22,400 acre-feet of supply.