

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NEW MEXICO

UNITED STATES OF AMERICA, for Itself)	
and as Trustee for the Zuni Indian Tribe, Navajo)	
Nation and Ramah Band of Navajos)	No. 01cv00072-MV/WPL
and)	
STATE OF NEW MEXICO, ex rel. STATE))	
ENGINEER,)	ZUNI RIVER BASIN
Plaintiffs,)	ADJUDICATION
)	
and)	
ZUNI INDIAN TRIBE and NAVAJO NATION,)	
Plaintiffs-in-Intervention)	
)	
)	Subfile No. ZRB-2-0098
v.)	
)	
A & R PRODUCTIONS, et al.,)	

VERIFIED STATEMENT OF SCOTT TURNBULL

1. My name is Scott Turnbull. I am an Associate Engineer with Natural Resources Consulting Engineers, Inc. (“NRCE”) in Fort Collins, Colorado. I have a Bachelor’s of Science in Civil Engineering from Colorado State University and am a Professional Engineer licensed in the State of Colorado. Since January of 2008, I have conducted technical analysis on behalf of the United States concerning matters associated with the hydrographic survey of the Zuni River Basin and the Zuni River Basin Adjudication.
2. As an employee of NRCE, the engineering consulting firm contracted by the United States to perform the hydrographic survey of the Zuni River Basin and to support any technical analysis necessary associated with the Zuni River Basin Adjudication, I perform field visits to document and verify water features within and throughout the Basin. I also compute water quantities associated with these features based upon

available information and by applying accepted engineering methodology.

3. I have reviewed Attachment A which is attached to the *United States' and State of New Mexico's Cross-Motion for Summary Judgment* (August 18, 2015). Attachment A is an accurate description of the water rights (priority, quantity, and historic beneficial use) offered to Defendants JAY Land Ltd. Co. and Yates Ranch Property LLP ("Defendants") by Plaintiffs the United States of America ("United States") and the State of New Mexico (collectively "Plaintiffs") in the proposed Consent Order associated with the 21 wells that remain in dispute and that exist on real property owned by the Defendants in the Zuni River Basin of New Mexico (commonly referred to as "Atarque Ranch").
4. I have reviewed all material available concerning Atarque Ranch. The material in my review included notes, photographs, and geospatial data collected by NRCE engineers in 2004 and generated during visits to Atarque Ranch. The material included in my review also included all material generated and collected since 2004 by NRCE as a result of past investigations as well as maps, land ownership records, and aerial photography of Atarque Ranch.
5. I have also reviewed the documents disclosed by Atarque Ranch through discovery including Atarque Ranch discovery responses, the expert report prepared by Mr. Don Alam (dated December 4, 2014), and the expert report prepared by Mr. Darrell Brown (dated January 14, 2015).

The United States' Estimate of Historic Livestock Use

6. Based on information gathered by NRCE and my general observations of the Basin,

virtually all of the open land of the Basin was historically used to raise livestock, more specifically cattle. The historic use of Atarque Ranch appears to have been to raise livestock as well.

7. Cibola County Assessor property information, received by NRCE in January 2009, indicates that 97,427 acres are owned by the Defendants within the Basin.
8. The Hydrographic Survey of Atarque Ranch found 26 wells with associated historical water use; as mentioned above, the water rights of 21 of these wells remain in dispute. The uses identified during the survey included 24 wells used for watering of livestock and 2 wells used for solely domestic purposes. 3 of the 26 wells had a combined livestock and domestic use.
9. The Hydrographic Survey of Atarque Ranch found 97 man-made impoundments constructed on the ranch for livestock watering purposes.
10. In the Hydrographic Survey for Sub-area 9 and 10, NRCE previously describe how the water right associated with historic livestock raising was determined:

Livestock – The duty of water for stock wells is the estimated water use of livestock that could be or is actually sustained by the area served by the well. The water use of cattle was calculated based on the information prepared by State of New Mexico. The area of land in which the well is located was determined from property ownership maps and database obtained from Cibola Assessors office. Carrying capacity is based on the number of "animal units" that can be sustained on an area of land, with one cow or five sheep equivalent to one unit. The land carrying capacity, which is the number of animals that a habitat maintains in a healthy, vigorous condition, was assumed to be 15 animal units per section, or the count provided by the owner, whenever applicable. The 15 animal units per section estimate is based on information from the New Mexico Department of Agriculture. The water consumption of an animal unit is estimated at an average of 10 gallons/day (488 feet per year or 0.0112 acre-feet per year) (Wilson and Lucero, 1997). An efficiency factor of 0.5 was assumed to account for consumptive and other losses.

11. I have calculated the maximum number of number of livestock (cattle) that might have

been reasonably grazed on Atarque Ranch on an annual basis. At its core, this annual livestock grazing capacity accounted for all forage that could be reasonably expected to grow on Atarque Ranch; whether such forage is grazed by cattle or wildlife is irrelevant to the forage calculation. For the 97,427 acres of land owned by Atarque Ranch, the estimated carrying capacity at 15 animal units¹ per section is 2,283 cattle. Once the annual grazing capacity was established, I identified the annual water needs of livestock; this determination was based on annual livestock water consumption (*i.e.* drinking) and an efficiency factor for reasonable, incidental losses such as evaporation, wildlife consumption, and spillage. As described above, one cow or steer, the equivalent of an animal unit, was assumed, to have an average per day water consumption need of 10 gallons and with the efficiency factor, the daily water needs for an animal unit was calculated to be 20 gallons per day. Once the livestock carrying capacity and livestock water needs were determined for Atarque Ranch, the livestock water consumptive need for the ranch was calculated to be 51.146 acre-feet per year (“AFY”).

12. Using soils data and rangeland forage production estimates from the U.S. Department of Agriculture Natural Resources Conservation Service (USDA/NRCS) I have computed the total normal year annual forage on Atarque Ranch as approximately 469,200 pounds per 640 acre section. Furthermore, by following guidelines established in *An Approach for Setting the Stocking Rate* (Holechek, 1988), I have computed the total forage available to animals for long-term grazing to be approximately 107,000 pounds per section.

¹ As described in the Hydrographic Survey, an “animal unit” or AU is a unit of measure by which the forage needs of any range animal might be equated.

13. Defendants have provided pumping records for contested well 10B-2-W04 (“Highway Well”) from January 2006 through May of 2012. Based on these records, the maximum volume of water pumped from this well during the metering period is 28.91 AF in the year 2006. I understand that this well supplements livestock water via pipelines to 12 pastures throughout Atarque Ranch. To account for this, the water quantity for the 15 wells in these pastures was modified by reducing the quantity by 1.739AFY per well and reassigning the entire 28.91 AF to the Highway Well. The result accounts for the 28.91 AFY of total use from the Highway Well as reflected in the pumping records provided by the Defendants.
14. Defendants’ have provided a single cattle inventory of Atarque Ranch for years 1991 to 2006. I have attached a copy of this cattle inventory to this affidavit as Exhibit 1. The reported total cattle counts for any year range from a low of 531 cattle reported on July 1, 2005 to a high of 1,380 reported on January 1, 1996. This document provided by Atarque Ranch also states the average total cattle inventory over the record period is 1,024.
15. I have reviewed the expert report prepare by Mr. Darrell Brown. I have also reviewed each of the studies and technical references that Mr. Brown identifies as support for his conclusions in his expert report. In Mr. Brown’s report, he opines on a possible maximum range of water consumption for cattle of between 25-60 gallons per cow/calf unit per day. Mr. Brown’s possible maximum range of water consumption is supported by no study he has performed and is unsupported by the studies on which he purportedly relies.

Natural Springs and Depressions

16. Engineers from NRCE visited four springs on Atarque Ranch in 2004: 10A-4-SPR01, 10A-4-SPR02, 10A-4-SPR03, and 9C-4-SPR02. From my review of the field notes and photographs collected during these visits, I found no indication that the springs have been improved. These four springs appear to correspond to water right claims asserted by Defendants for Canyon Springs, Jaralosa Springs (two springs) and Los Alamos Springs. Subfile Answer at 71 and 72. Furthermore, in addition to the above mentioned springs, the Defendants' asserted in their Subfile Answer an additional five unnamed springs not included in the Hydrographic Survey (Subfile Answer at 72 - 73). These water right claims to the five unnamed springs were later withdrawn by Defendants as stated on page xv of Mr. Don Alam's report.
17. In their Subfile Answer, Defendants claimed several impoundments that did not appear in the Hydrographic Survey. Subfile Answer at 73 – 76. I have reviewed 2005 DOQQ aerial imagery associated with these additional impoundments. The two impoundments described in paragraphs 1 and 7 appear to be man-made. The impoundment described in paragraph 11 is included as a portion of 10B-2-SP20. The remaining 10 impoundments do not have any man-made features apparent (e.g. berm, excavation, constructed works, etc.) and appear to be simply natural, unimproved depressions in the landscape that collect runoff when available after precipitation events.

Evaporation

18. I have reviewed the assertions of undisputed fact made in Defendants' *Memorandum in Support of Motion for Summary Judgment* (Doc. 3059-1). I have also reviewed the

assertions made by Mr. Darrell Brown in his affidavit attached to the memorandum as Exhibit 7. I dispute Defendants' assertions of undisputed fact and Mr. Brown's affidavit as follows.

19. Defendants and Mr. Brown assert that the pan evaporation for the Atarque Ranch area amounts to "5 feet per year" evaporation. However, this estimate does not reflect true evaporation, which is less, because it does not take annual precipitation into account. In order to determine the *net* annual evaporation, it is necessary to reduce the total evaporation by the amount of annual precipitation that area receives. Furthermore, the rate of evaporation varies greatly depending on the size and setting of a water vessel (e.g., earthen impoundments, steel stock tanks, etc.). Common engineering practice is to reduce the pan evaporation by applying a "pan coefficient" to relate pan evaporation measurements to actual evaporation. Mr. Brown's evaporation estimate takes neither factor into account.
20. In addition, Defendants and Mr. Brown assert that water evaporation, leaks, and losses are an uncontrollable consequence of raising livestock. Defendants and Mr. Brown also assert that all stock watering facilities on Atarque Ranch must be kept full regardless whether any livestock are utilizing any watering facilities. However, evaporation, leaks, and losses can be reduced and controlled by taking such practical steps as scheduled maintenance, trough covers, and flow control floats, valves, and mechanisms. Further, through manual means or automatic devices that control or limit water supply, livestock can be watered based on livestock needs.
21. I have reviewed the 21 livestock wells that remain in dispute between Plaintiffs and Defendants on 2005 DOQQ aerial imagery. Of these 21 wells, 19 appear to be operated

by a windmill pump; these pumps typically operated whenever the wind blows with sufficient force. Each of the 21 contested wells appears to have an uncovered circular drinking trough made of metal and/or concrete in close proximity to the well. Using the measuring tool in ArcGIS software package, I estimate the diameter of each of these troughs at approximately 35 feet. Also, seven of these 21 contested wells also appear to have an additional smaller drinking trough of approximately 15 feet diameter. I compute the combined surface area of all 28 troughs as 21,441 ft². Even using the “5 feet per year” pan evaporation asserted by Mr. Brown, I compute the total annual volume of evaporated water from these troughs as 2.461 AFY.


Atarque Lake

22. I have reviewed material concerning the impoundment referred to as Atarque Lake and claimed in the Subfile Answer at 73. In their Summary Judgment Motion, Defendants rely on the U.S. Geological Survey (USGS) 7.5-minute topographic map of the Atarque Lake quadrangle, dated 1972. I have examined this map and the USGS symbology related to this map. I have also examined recent images of Atarque Lake from 1936 to the present. I have attached to this affidavit as Exhibit 2 a color copy of the 1972 USGS map that is of better quality than the copy attached to Defendants’ Summary Judgment Motion.
23. The 1972 USGS map of Atarque Lake was developed using aerial imagery from 1971 as described within the map’s title block.
24. The topographic map symbology indicates Atarque Lake as a dry lake bed with an indefinite or unsurveyed shoreline. This map also reflects that an unimproved road

crosses the Atarque Lake lakebed. This road continues to exist today and is visible on recent imagery from the U.S. Geological Survey Digital Ortho Quarter Quads (DOQQ) dated 1996 and 2005 and from the U.S. Department of Agriculture's National Agriculture Imagery Program (NAIP) dated June 2014. Also visible on these images is a livestock fence crossing the lakebed along the Range 18W-19W section line. I have attached to this affidavit as Exhibit 3 a copy of the imagery from 1996, 2005, and 2014.


25. I have reviewed historical aerial imagery of the Atarque dam site spanning years 1936 to the present. The dam is visibly intact on the photographs dated November 15, 1936 and March 27, 1954. The dam appears breached in the photograph dated June 16, 1971, which is the next available year of imagery after 1954. Likewise, the dam appears breached in all subsequent imagery of the area.

26. Attached to this Affidavit as Exhibit 4 are photographs of the destroyed Atarque Lake dam site taken by NRCE engineers during a visit in November 2007. As shown in the attached photographs, the dam is completely destroyed.



Scott Turnbull
Associate Engineer
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Subscribed and sworn before me this 18 day of August, 2015.



Notary Public
12.19.17

My Commission Expires

CLAIRE BURNETT
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID # 20134078998
MY COMMISSION EXPIRES DECEMBER 19, 2017