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 and STATE OF NEW MEXICO, ex rel. STATE ENGINEER, Plaintiffs,	)	
and ZUNI INDIAN TRIBE and NAVAJO NATION, Plaintiffs-in-Intervention	)	No. 01cv00072-MV/WPL **Subfile No.** ZRB-2-0014
v.	)	ZUNI RIVER BASIN ADJUDICATION
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 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 B which was attached to the *United States' and State of New Mexico's Response to Edward J. Bawolek and Suzan J. Bawolek Motion Requesting Partial Summary Judgment* (December 15, 2014). Attachment B is an accurate description of the water rights offered to Edward J. Bawolek and Suzan J. Bawolek (hereafter "Bawoleks") by Plaintiffs in the propose Consent Order concerning the well designated at 10C-4-W14 (hereafter referred to as "well W14").
4. I have reviewed all material available concerning the Bawoleks' property. The material in my review included notes, photographs, and geospatial data collected by NRCE engineers in 2004 and generated during visits to the Bawoleks' property. The material included in my review also included all material generated by NRCE as a result of past investigations as well as maps, land ownership records, and aerial photography of the property. I have also reviewed the report prepared for the Bawoleks by Mr. Douglas Boggess (dated June 30, 2014).
5. Well W14 is located on the Bawoleks' property. Based on historic documents collected by NRCE, well W14 appears to have been drilled at least by December 31, 1939.
6. In July of 2013, I visited the Bawoleks' property to survey additional impoundments, and, escorted by Dr. Bawolek, I viewed improvements made to wells since NRCE's previous field visit (e.g. installed windmills, water meters, drinking troughs, etc.). Additionally, Dr. Bawolek showed to me the remains of a drip irrigation system (no longer functional) as well as the house and the three ruins also discussed in the expert report by Mr. Boggess.

7. Well W14 appears to be connected to 5 earthen impoundments[1] by pipe. There is also pipe in the well W14 vicinity that appears to connect with a drip irrigation system in a neighboring section and I have determined that it is likely that well W14 was the source of water for the drip irrigation system.

8. Based on information gathered by NRCE, virtually all of the open land of the Zuni River Basin was historically used to raise livestock, more specifically cattle. The historic use of the Bawoleks' property appears to have been to raise livestock as well..

9. 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 feet3 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.

10. I have determined the maximum number of number of livestock (cattle) that might have been reasonably grazed on the Bawolek's property on an annual basis. At its core, this annual livestock grazing capacity accounted for all forage that could be reasonably

[1] "Earthen impoundments" are otherwise known as "stock ponds" and will be referred to as such throughout the remainder of this affidavit. Generally speaking, stock ponds are constructed by creating an earthen berm across any surface water drainage such as a wash or an arroyo. In the Zuni River Basin, as in much of the arid regions of New Mexico, it is a well-established and common practice for ranchers to impound surface water to make the little surface water created from precipitation events (e.g., rain and snow) available to livestock for a longer period of time.

wildlife is irrelevant to the forage calculation. 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 steer, the equivalent of an "animal unit," was assumed, to have an average per day water consumption need of 10 gallons per day 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 the Bawoleks' property, the livestock water consumptive need for Bawoleks' property was calculated to be 1.008 AFY. Plaintiffs divided the resulting annual consumptive livestock water quantity by the number of wells found on the Bawoleks' property. For Bawoleks property, six wells were identified having a livestock use and therefore to each well was assigned 0.168 AFY, including well W14, as the water right for the historic beneficial use associated with raising livestock.

11. Plaintiffs have been willing to recognize a single domestic use water right associated with well W14. Well W14 lies in very close proximity to a habitable, but unoccupied house (as mentioned above). For dwellings reasonably associated with a well, such as the one next to W14, Plaintiffs have long been willing to stipulate without further proof to a water right quantity of 0.7 AFY (or 625 gallons per day). The rationale supporting the use of 0.7 AFY is as follows. Based on a review of technical reports authored by the New Mexico Office of the State Engineer, a typical estimate of indoor domestic water use (cooking, cleaning, toilets, washing machine, dishwasher, showers, etc.) is approximately 70 gallons per person per day. Assuming an additional 50% allowance (35

gpcd) for outdoor and incidental uses (equipment washing, dust control, small gardens, etc.), 0.7 AFY (625 gallons per day) is sufficient for a full-time occupied household of over five individuals. This water quantity has been found to be adequate to meet the domestic needs of self-supplied domestic users in the Zuni River Basin.

12. Though not functional, Plaintiffs have been willing to recognize a water right associated with the drip irrigation found on Bawoleks' property. Based on information gathered, I have determined that the system likely consists of up to 200 drip emitter sites and was in some manner connected to and served by well W14. Based on the irrigation needs for a shrub-type plant of a size reasonably irrigated by a single drip emitter growing in the New Mexican climate, I have calculated that the total consumptive use of probable shrub-type plants irrigated by this system is 0.22 AFY.
13. Ultimately, based on the information described in the paragraphs above, I calculated that the total quantity of the water historically used associated with well W14 is 1.088 AFY.
14. Well W14 was also identified as a point for diversion to the following five stock ponds: 10C-4-SP20 through 10C-4-SP24. See Attachment B referenced above. However, the quantity of water associated with the water right for well W14 is not increased because of the presence of these stockponds as the consumptive need for stock on the Bawoleks' property has already been addressed and quantified to be 1.008 AFY. Instead, the quantity of water associated with the water right for well W14 is limited to that amount which could be identified as having been historically and beneficially used from well W14 which I calculate to be 1.088 AFY.
15. I have reviewed the Bawoleks' *Motion Requesting Partial Summary Judgment* (Doc. 3006) and *Memorandum in Support of Their Motion Requesting Partial Summary*

Judgment (Doc. 3006-1). As mentioned above, I have also reviewed the expert report of Douglass H. M. Boggess (June 30, 2014). With respect to the ruined dwellings identified by the Bawoleks and Mr. D. Boggess as "Ruin 1," "Ruin 2," and "Ruin 3," I have reviewed and measured their distances to well W14 using GIS software. I have determined that the straight-line distance between each of these ruin sites and well W14 is 2.2 miles, 0.68 miles, and 0.86 miles, respectively. Of course, this calculation of straight-line distance does not take into account topography. No piping has been identified connecting any of the ruins to well W14. With Respect to the unoccupied house identified by the Bawoleks and Mr. Boggess as "House 1," I have reviewed and measured the distance to well W14 using GIS software as well. I have determined that the straight-line distance between this house and well W14 160 feet.

Scott Turnbull
Associate Engineer
Natural Resources Consulting Engineers, Inc.
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Subscribed and sworn before me this 15 day of December 2014.

Notary Public

CARIN TATUM
Notary Public
State of Colorado
My Commission Expires August 25, 2015

8/25/2015
My Commission Expires