

Tom Taylor - At-Large (Pres.)
Fred Grunder - Pratt (V Pres.)
John Janssen - Kiowa (Treas.)
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September 19, 2023

Earl Lewis, Chief Engineer
Division of Water Resources
Kansas Department of Agriculture
1320 Research Park Drive
Manhattan, Kansas 66502

Re: Draft Supplement to Technical Report on a Claim of Water Right Impairment, dated July 2016

Dear Mr. Lewis:

Big Bend Groundwater Management No. 5 (the “District”) submits these comments in response to the Chief Engineer’s July 16, 2023 Draft Supplement to the Technical Report on a Claim of Water Right Impairment (“Supplement”). The District provides the following comments on the contents of the Supplement based on the information made available to it when the Supplement was made public on August 11, 2023. K.A.R. 5-4-1(e)(2) expressly allows the District to recommend how to regulate the impairing water rights. **The District requests that the Kansas Department of Agriculture - Division of Water Resources (“KDA-DWR”) hold an additional public notice and comment period to allow review of any order proposed by KDA-DWR to address the impairment findings in the Supplement and Technical Report.** We incorporate by reference in this letter the District’s May 12, 2016 comments on KDA-DWR’s July 15, 2016 Final Report for Water Right File No. 7,571, which are attached hereto.

The District has spent millions finding a feasible solution to the Chief Engineer’s impairment findings for the Quivira National Wildlife Refuge (“Refuge”). For the past several years, the District has been working with the Natural Resources Conservation Service (“NRCS”), the U.S. Fish & Wildlife Service (“FWS”), and other cooperating agencies under a Memorandum of Agreement (copy attached) to develop an augmentation wellfield to deliver water to the Refuge. To that end, the District has circulated a draft Environmental Impact Statement (“EIS”) under the National Environmental Policy Act (“NEPA”) to identify and select a mutually-agreeable alternative to provide the water supply at the Refuge. It is our strong conviction that strict administration should not be pursued while that process continues. Doing so hinders the entire EIS process and threatens to derail it altogether.

1. The Supplement Does Not Contain Adequate Supporting Documentation to Comment On During KDA-DWR’s Notice and Comment Period

KDA-DWR’s Supplement indicates that it extends the impairment analysis in the original Technical Report by incorporating data from 2008-2020, more recent model runs, and historical evaporation data from the National Oceanic Atmospheric Administration. It also takes into account the operational decisions of the FWS. The Supplement goes on to state that KDA-DWR “does not reexamine nor reach a different conclusion that upstream, junior groundwater pumping regularly and significantly impairs the Service’s ability to use its Water Right File No. 7,571” (Supplement, para. 1). The Supplement on public notice, however, provides no supporting documentation. The District submitted an open records request to KDA-DWR for additional information on August 15, 2023. KDA-DWR responded with certain information on September 11, 2023, just eight days before the comment deadline.

The underlying data used by KDA-DWR is essential to perform a meaningful review of the Supplement and KDA-DWR’s ultimate conclusions in the impairment investigation. Given the volume and complexity of the data provided on September 11th and because all supporting documentation has not been made available for review with the Supplement, the District and its consultants are not able to comprehensively review and comment on the information in the Supplement or KDA-DWR’s model analysis and the tabulations and processing of results.

In the interest of meaningful public involvement, the District requests a technical session to discuss the information transferred by KDA-DWR on September 11th similar to the session held by KDA-DWR after the transfer of the information supporting the July 2016 impairment report. A technical session associated with file transfer also occurred when Balleau Groundwater, Inc. (“BGW”) provided a set of preliminary updated model files to KDA-DWR in February 2023 (Supplement, para. 3). At a minimum, we should be given adequate time to review the September 11th files and provide any additional comments as may be appropriate.

2. Water Storage and Water Balance Must Be Taken Into Account to Determine the Extent of Impairment

As previously recognized by KDA-DWR, no water right holder is guaranteed full exercise of its calendar year allocation every year. This instance, involving FWS’ surface right on what has always been an intermittent stream, is no different. The Chief Engineer must analyze both water storage and water balance in the Little Salt Marsh (“LSM”) to properly account the FWS’ water usage and to determine the extent of impairment. Proper accounting and the Certification Memorandum for File No. 7,571 require it.

A fundamental aspect of analyzing water supply and water rights involves accounting for all the components that result in a diversion of water from a system. When water is stored in a surface-water impoundment such as the LSM, two components affect (reduce) flow downstream: evaporation and storage of water. The District agrees with the Chief Engineer’s decision to consider evaporation from the LSM in its impairment analysis (Supplement, para. 9). However, the Chief Engineer must also consider water that is stored in the LSM to fully account for all the components that result in a diversion of water from the system.

Evaporation and water storage are both described in the Certification Memorandum for File No. 7,571 and a follow-up Kansas Board of Agriculture Memorandum providing a technical basis for the components that add up to the quantity of the FWS’ water right (both documents are attached). A summary of those components is shown on Table 1.¹

Table 1. Components of FWS water right quantity.

Component	Refuge Water Right Components (AFY)	
	Certification Memorandum (Feb 8, 1993)	Adjustment (June 18, 1993)
RSC Diversion (reported by FWS)	10,129.7	10,129.7
LSM Storage	2,260.0	1,865.0
LSM Evaporation	2,850.0	2,592.0
Total	15,239.7	14,586.7
% Diversion	66.5%	69.4%
% LSM Storage	14.8%	12.8%
% LSM Evaporation	18.7%	17.8%

Notably, the LSM storage component makes up approximately 12 to 15 percent of the FWS’ water right (Table 1).

The Certification Memorandum for File No. 7,571 selects 1987 to represent the year of maximum available water for Refuge use and states that, according to the FWS, the Refuge was “full all year.” It also clarifies that water storage in the LSM is a component of the FWS’ water right. To fully account the FWS’ water usage, the Chief Engineer must develop a modeling scenario that treats the LSM as full because that is water that is available to the FWS for recreational use. That is, the LSM could be filled during times of spring runoff and stored water could be released in the summer and fall when river flow is less than in early-season runoff.

The FWS’ use of LSM storage in managing its water supply raises an important issue. Namely, if the FWS chooses not to maximize its water supply with LSM operations (contrary to certification of its water right), then is it at the proportional expense of that component of its water right? Under standard water rights accounting principles, the answer would be yes. And that scenario would be considered in the Supplement since it would affect the magnitude of impairment and the associated degree of action needed to remedy it. This scenario is not evaluated in the Supplement, however. The District also notes the Chief Engineer has the authority to require the FWS to adopt and implement conservation plans and practices to ensure the FWS is making use of all water available to it. K.S.A. 82a-733; K.A.R. 5-4-1(c)(4). Such measures would mitigate the alleged impairment.

¹ The District recognizes that the FWS water right described on the Certificate of Appropriation is 14,632 acre-feet per year, which differs somewhat from the values on Table 1.

As noted above, the Chief Engineer must also consider water balance in the LSM to properly account the FWS' water usage and to determine the extent of impairment. BGW is currently updating the model² to reflect the latest information on area aquifer structure, provide a more detailed representation of aquifer structure, better represent aquifer response to water-level changes, and provide a full water balance of the LSM. BGW anticipates completing the updates in the Fall of 2023. Because the model used to develop the Supplement does not take into account these changes, including water balance in the LSM, it lacks a complete assessment of the FWS' actual water use over time. It is notable that on Table 1 the combination of LSM storage and LSM evaporation makes up over 30 percent of the FWS' water right. Lack of a comprehensive account of those components may mischaracterize a significant portion of the FWS' water use.

Finally, the District appreciates the Chief Engineer's acknowledgement that the Refuge has, at times, not diverted water due to its operating practices (e.g., construction, maintenance) (Supplement, para. 8). This translated into a technical approach that defines a case in which the FWS' water right is not impaired when available flow is not diverted. This acknowledgment is a sound approach to water accounting in an assessment of impairment, particularly in a setting where diversions to the Refuge are analyzed within the variability of a monthly time scale. We also appreciate that the Chief Engineer's Supplement considers evaporation from the LSM in its impairment analysis (Supplement, para. 9). Both of these items are critical to resolving the impairment findings and to developing a sustainable solution in the region.

3. Protecting Economic Health Is Statutorily Part of This Process

The Kansas Water Appropriation Act ("KWAA"), K.S.A. 82a-701 et seq., cannot be read without considering economic impacts to the region. The KWAA is intertwined with and works in parallel to the Kansas Groundwater Management District Act ("GMDA"), K.S.A. 82a-1020 et seq., which the District is statutorily obligated to implement. The Groundwater Management Act created groundwater management districts:

"for the prevention of economic deterioration," "for associated endeavors within the state of Kansas through the stabilization of agriculture," and "to secure for Kansas the benefit of its fertile soils and favorable location with respect to national and world markets."

K.S.A. 82a-1020. The KWAA recognizes the District's role in allowing it to make a recommendation for how to regulate the impairing water rights to satisfy the impaired right. K.A.R. 5-4-1(c)(2)(B), (e)(2). To protect against such financial hardship, the District has been working with stakeholders on the development of an augmentation wellfield.

The KWAA and the GMDA must be read together. Any action by KDA-DWR to curtail water in the region through strict administration threatens economic injury to the District and its constituents. Critically, the District implores the Chief Engineer to refrain from ordering strict administration without regard to economic impacts and to work with the District to develop an

² The model files that BGW provided to KDA-DWR in February 2023 were part of a preliminary update to the 2010 GMD5 Model.

environmentally protective and economically feasible solution that prevents economic deterioration in the region.

4. The Communities Located Within the District Will Be Adversely Impacted by Strict Administration

The District includes all or portions of Barton, Edwards, Kiowa, Pawnee, Pratt, Reno, Rice, and Stafford Counties. Over curtailment of water usage in the area will severely impact a region already declining in population by harming the livelihoods of irrigators, local businesses, schools, and residents. Water rights are distinct real property rights that directly impact the economic value of the land in the District and the environmental integrity of the region. Several local government bodies estimate that irrigated cropland in the District brings at least \$190 million of revenue per year into the local economy, a significant portion of which would be lost if the Chief Engineer orders strict administration.

Severe curtailments would also cause a ripple effect in the revenue of businesses that employ people and provide services in agronomy, grain merchandizing and storage, fuel, fertilizer, and agriculture equipment, as well as in non-agriculture related retail, housing, and health care. Enrollment in school districts would drop and possibly threaten the districts' ability to keep the doors open. Land prices would fall, negatively impacting the tax base on which local governments and schools depend. Additionally, pumping cuts would cripple agricultural banking that has collateralized loans based on current land valuations, which would not only threaten existing loans, but would freeze future lending. There is no alternative source of commerce that would replace that revenue.

Finally, access to water is critical to arid areas facing drought and wildfires. The KDA-DWR must consider these factors in developing any future allocation plan and work to the greatest extent possible with the District to mitigate adverse impacts.

5. The Administrative Process Undertaken by the Chief Engineer is Flawed

The KWAA and its implementing regulations, specifically K.S.A. 82a-717a and K.A.R. 5-4-1, do not authorize the KDA-DWR to reopen a previously finalized impairment report and "supplement" it. The agency has exceeded its statutory authority by doing so.

By issuing the Supplement, the KDA-DWR has all but acknowledged the 2016 Final Impairment Report is stale due to the age of data it relies upon (data through 2007). To develop an impairment report that reflects current conditions, the agency must restart the investigation and follow the procedures set forth in K.A.R. 5-4-1(b). The Chief Engineer may need to conduct hydrologic testing or observe points of diversion to understand current conditions. *Id.* at 5-4-1(b)(5). Due process requires the KDA-DWR to provide data acquired during the investigation to the complainant and any other affected persons that request it as the investigation proceeds. *Id.* at 5-4-1(b)(6).

To the District’s knowledge, none of these steps have occurred in preparing the Supplement. If the agency is relying on a new model, it must go through the proper notice and comment process set forth in K.A.R. 5-4-1(b) so affected stakeholders such as the District are not denied due process. Only after the investigation is properly updated and documented in the public record can the Chief Engineer develop a “Supplement” or “Impairment Report” that properly assesses current hydrologic conditions and any impairment to senior rights holders. The District expressly reserves its rights to recommend how to regulate the impairing water rights if the final “Supplement” determines that the impairment is substantially due to direct interference within the District’s boundaries, as is its right under K.A.R. 5-4-1(e)(2).

6. The FWS’ Request to Secure Water May be a Futile Call

Based on KDA-DWR’s recent description of the plan being contemplated, we are concerned that the plan may not deliver water to satisfy the impairment findings. Due to their location within the Rattlesnake Creek subbasin and compared to available data and modeling, merely curtailing junior water rights in order of priority will not resolve the alleged impairment.

Once the Chief Engineer releases a proposed administration plan, the District requests time to analyze it and any accompanying data that informs how the plan was put together. The District expressly reserves its rights to evaluate and comment on the proposed administration plan, including on whether the call is futile based on the how junior rights would be administered.

7. The Chief Engineer’s Final Impairment Report is Flawed Because Water Rights Are Annual, Not Seasonal, Under Kansas Law

The FWS’ Certificate of Appropriation for Beneficial Use of Water for Water Right File No. 7,571 allegedly entitles the agency to 14,632 AF of water “per calendar year.” But former Chief Engineer Barfield’s finding of impairment was premised on a seasonal demand schedule for Rattlesnake Creek surface water set forth in the Refuge’s Comprehensive Conservation Plan.

By adopting the FWS’ seasonal demand schedule in the final impairment report, KDA-DWR has improperly concluded that junior groundwater appropriators in the District must curtail their water use to ensure that the FWS not only receives its annual water right, but also receives that water right at certain times of the year—even if the FWS has allowed water to flow through the Refuge without any attempt to capture or store it.

8. Strict Administration Would Amount to a Uncompensated Taking

If the Chief Engineer issues an order strictly administering junior groundwater rights, affected junior rights-holders will suffer a governmental taking of their property right and are entitled to just compensation. U.S. Const. amend V & XIV; Kan. Const. Bill of Rts. § 18; K.S.A. 26-513. Kansas courts recognize that water rights are property rights subject to state and federal protections from governmental action affecting such property rights without compensation.

...

Moving forward, the District requests that the Chief Engineer clarify the issues and answer the questions raised in these comments to the Supplement prior to finalizing the Supplement. This information is critical to analyzing the Service's impairment claim and to formulate a workable solution.

The District appreciates the opportunity to engage with KDA-DWR on these critical issues and will continue to be an active advocate for the proper management of the local aquifer to ensure that the future generation of Kansans will have a viable water source to provide for their families.

Thank you for considering the District's comments. I can be reached at oferil@gmd5.org with questions or to schedule a meeting.

Sincerely,



Orrin Feril
Manager
Big Bend Groundwater Management District No. 5

Attachments: May 12, 2016 - District's Public Comments
July 25, 2020 - Memorandum of Agreement
Certification Memorandum, File 7571
Kansas State Board of Agriculture Memorandum, dated June 18, 1993, from
Bruce Falk to Larry Sheets, RE: Appropriation of Water File No. 7571

ATTACHMENT 1

Darrell Wood - Edwards (Pres.)
Fred Grunder - Pratt (V Pres.)
John Janssen - Kiowa (Treas.)
Curtis Tobias - Rice (Sec.)
Justin Gatz - Reno
Kent Lamb - Stafford
Phil Martin - Barton
Bob Standish - Pawnee
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May 12, 2016

David Barfield, Chief Engineer
Division of Water Resources
Kansas Department of Agriculture
1320 Research Park Drive
Manhattan, Kansas 66502

Re: Initial Report of the Chief Engineer
Water Right Impairment

Dear Mr. Barfield:

Thank you for the opportunity to provide comments on the Initial Report (the "Report") of the Chief Engineer for the impairment investigation filed by your office on December 2, 2015. The Board of Directors for Big Bend Groundwater Management District #5 (the "District") appreciates the complexity of this investigation and has invested great time and consideration in preparing the following responses to the Report.

The District has, for the past 40 years, worked to fulfill the mission statement outlined in its first management program approved June 6, 1976:

Big Bend Groundwater Management District No. 5 was organized through the efforts of concerned citizens to conserve, promote, and manage groundwater resources so that quality and quantity of that resource will be maintained for present and future needs. The Groundwater Management laws (K.S.A. 82a-1020-1035) establish the right of local landowners and water users to determine their own destiny with respect to the use of groundwater within the basic law of the State of Kansas.

Throughout the District's 40-year history, it has implemented numerous strategies to protect and conserve the Great Bend Prairie aquifer. These strategies have included strict monitoring of water use with water flow meters; well spacing requirements; waste of water enforcement; well movement limitations; and a restrictive safe yield policy. In October 1991, the District implemented a flow meter requirement for "diversion works of all vested rights, appropriation rights and approved applications for permit . . ." on or before January 1, 1993. In 1998, the District was formally closed to new appropriations through a revision to K.A.R. 5-25-4.

As a result of these management objectives, the Great Bend Prairie aquifer has not seen the dramatic water table declines that have occurred in other parts of the state. The District has noted declines in the water table during years in which precipitation was limited, but these declines have proven temporary. Due to the soil types that overlay the District and the relatively shallow depth to water, the aquifer recharges and recovers quickly.

On January 15, 2016, the Kansas Department of Agriculture – Division of Water Resources ("KDA-DWR") staff provided a copy of the entire file (the "Record") for Water Right File No. 7571 to give members of the general public an opportunity to review the process the United States Fish and Wildlife

Service (the "Service") and KDA-DWR followed to register and perfect this water right. The District's review of this process has brought to light several areas of concern that are the subject of the remainder of this letter.

Irregularities in the Certification of Water Right File No. 7571

According to the Record, the Service submitted an application for permit on August 15, 1957. On May 20, 1963, the Service received the permit to appropriate water for beneficial use (the "Permit") from KDA-DWR Chief Engineer R.V. Smrha. In this Permit, the KDA-DWR outlined the Service's deadline to complete construction of diversion works. The time frame in which an applicant must construct diversion works following the approval of an application to appropriate water is set out in K.A.R. 5-8-4.

The Permit further stated a deadline of December 31, 1968, for perfection of the appropriation, or within any authorized extension of time. The Service requested and received extensions of the completion deadline on two separate occasions, pursuant to K.A.R. 5-8-5(b)-(d). According to the Record, the Service received its final extension on March 20, 1974. Pursuant to this extension, the Service had until December 31, 1978, to complete the construction of the diversion works.

The Record includes a letter from KDA-DWR staff, dated December 26, 1978, acknowledging receipt of "Notice and Proof of Completion of Works for Diversion Works" for Water Right File No. 7571. K.A.R. 5-8-6 outlines the process an applicant must follow to perfect a water right. Subsection (a) states that the time period for perfection begins following the deadline for construction of the diversion works. There is no document in the Record indicating that the Service requested or received an extension of the deadline for the completion of diversion works beyond December 31, 1978. Therefore, the perfection period for Water Right File No. 7571 should have begun no later than that date.

Curiously, the Service submitted a letter to KDA-DWR on July 15, 1982, enclosing the Notice and Proof of Completion of Works for Diversion Works for Water Right File No. 7571. KDA-DWR then sent a letter in response noting that this document was unnecessary, as KDA-DWR had acknowledged receipt of this document already in March 1974, effective May 1972. This gap in the record leaves the District to question whether the Service received an extension of its deadline to complete construction of diversion works, and if so, whether any documentation of that extension has survived.

K.A.R. 5-8-6(a) states that a reasonable time to perfect a water right shall be no fewer than four full calendar years following the deadline for construction of the diversion works. Pursuant to K.A.R. 5-8-6(b), if the permit holder's time to construct the diversion works is extended, the perfection period shall also be extended to no fewer than four full calendar years beyond the final deadline to construct the diversion works. As noted earlier, KDA-DWR acknowledged receipt of the Notice and Proof of Completion of Works for Diversion Works document on December 26, 1978. There is no indication within the Record in regard to an extension beyond the minimum of four full calendar years. Therefore, the deadline to perfect Water Right File No. 7571 should be no later than December 31, 1982. Once again, if the Service received an extension on the deadline to perfect its water right through 1987, the record does not contain any documentation of that extension.

Based on the aforementioned irregularities, the District is concerned about the procedure followed to perfect the Service's water right.

The Service's Report of Annual Water Use is Incomplete

The Report repeatedly notes that the appropriated quantity of water for Water Right File No. 7571 is 14,632 acre-feet ("AF") per calendar year.

The Certification Memo (the "Memo") for Water Right File No. 7571 states its reliance on a table titled "Typical Annual Water Use at Quivira Wildlife Refuge." According to the Memo, this table was intended to demonstrate the maximum amount of water the Service might use if sufficient water was available to

fulfill all of the management options in its Annual Water Management Plan. Importantly, the Memo notes that the tabulation does not account for other items, such as several unmanaged areas often flooded to a depth of 2-3 inches; evaporation during winter months; or the drainage of management units. To account for this discrepancy, the Memo explains that the active diversions from the three points for the year of record, 1987, was added to the storage and evaporation from the Little Salt Marsh as shown below:

10,175 AF of active diversions + 1,862 AF storage + 2,595 AF evaporation

Each year, the Service includes water diversions in its water use report, but not the amount that evaporated from the Little Salt Marsh. Because the Service's water right was calculated using a method that factored in this evaporation, the District believes the water right certificate should be amended to note the two methods of accounting for water annually. If no amendment is made, the Service should be found in violation for failing to report the evaporation from the Little Salt Marsh annually.

The Holder of a Water Right Should Not Expect to Fully Exercise It Every Year

As stated previously, the Refuge water right was perfected in 1987. Not coincidentally, that year set the record for maximum daily discharge at the Zenith gage. In fact, it was the eighth wettest year out of 100 years of data. While the District understands the concept of the perfection period and its reliance on the year of maximum diversions, the District wonders whether these diversions are a reflection of stream base flow or simply runoff from storms. In any event, the Record contains multiple letters from the Service to KDA-DWR indicating concerns about water the Service claims would have been available if not for the groundwater pumping conducted by the holders of junior rights within the subbasin.

As a preliminary note, activities outside of the boundaries of Quivira National Wildlife Refuge (the "Refuge") are not within the jurisdiction of the Service. The Chief Engineer for KDA-DWR retains jurisdiction for the use of water throughout the State of Kansas and, in that capacity, granted the Service a permit to construct diversion works and perfected its water right. Then Guy Ellis, a hydrologist with KDA-DWR discussed the nature of that water right in an August 19, 1993, letter to the Service. He stated that "it is quite probable that the natural flows of water to the full extent of the water right will not be available in most years. Management plans for the Refuge area should be based on probable flows of Rattlesnake Creek." In May 1994, the Chief Engineer cautioned the Service again. He explained that:

Even under pristine conditions, most of the streams in Central and Western Kansas are not continuously dependable sources of supply. Particularly in the case of very large water rights, such as the Quivira Refuge right, the water holder should not expect to be able to fully exercise the right each and every year. I should also point out that a certificate states the maximum quantity of water that may be diverted in any year. Because certificates are based on the maximum year of record, no water right holder should expect to need or have available the maximum authorized quantity every year.

This statement suggests that it is appropriate to account for a shortage in supply to the Refuge water right. Nevertheless, the Chief Engineer's Report has allowed the Service to determine its monthly water needs based on the assumption that it will fully exercise its water right every single year. This allowance is in direct conflict with the KDA-DWR's prior statement that no water right holder should expect to need or have available the maximum quantity authorized by the certificate for appropriation on a yearly basis.

Even the Service's own Quivira Management Plan acknowledges that "[f]rom May until September, most units are managed so that they dry out gradually. It is impractical to attempt to maintain all the units during the hot summer months, except when precipitation is unusually high". (Page 285 of the Quivira document.)

Clarification Needed Regarding "Normal" Conditions of the Subbasin

In an April 10, 1996, letter to the Service, the Chief Engineer stated that 41,056 AF of water passed the

USGS streamflow gage near Zenith (Zenith gage) in 1987 at a rate below 300 cfs, but notes that the Service did not divert this water. In light of this statement, the District requests clarification as to Water Right File No. 7571. Does KDA-DWR consider the 41,056 AF of water that passed the Zenith gage in calendar year 1987 below 300 cfs to be normal conditions of the subbasin? More specifically, what component of that amount can be attributed to baseflow versus excess runoff? As the KDA-DWR is aware, land practices throughout the region have changed dramatically over the past 30 years. These changes have minimized—perhaps even eliminated—the vast majority of the runoff coming from fields. In many cases, these land practices were motivated by state or federal incentive programs.

Errors in the Calculation of the Service's Water Use History

In September 1996, the Chief Engineer issued to the Service a document titled "Findings and Order". It required the installation of water flow measurement structures and devices, as well as a monitoring system sufficient to provide continuous, daily data relative to the diversion of natural flows of the Rattlesnake Creek.

The difficulty in designing and implementing an accurate metering system at the Refuge's diversions is acknowledged several times in the Record. As a result, the Service twice requested (on June 8, 2001, and again on January 22, 2003) that the Zenith gage be used as a "means of measuring the volume of water entering the Refuge." The Service requested this method of measuring volume in order to ensure the collection of accurate data that is logged in real time on the USGS website. As noted by the Service, this measurement location would also account for the filling and maintenance of water level in the Little Salt Marsh, in addition to the water diverted by the Service to fill the other water units at the Refuge. In March 2002, KDA-DWR responded with a letter that did not answer the Service's request to use the Zenith gage for measuring total volume entering the Refuge.

The Service was given a deadline of December 31, 1997, to meet these requirements. This order came five years after the District required water flow meter on the "diversion works of all vested rights, appropriation rights and approved applications for permit . . ." Subsequent to this order, the Service filed numerous requests for extensions and waivers from this requirement until it finally installed the necessary equipment in early 2012.

According to the Record, the Service used the Clausen Rule for estimating water use from 1978 through 2012. The District would like to know whether the KDA-DWR has completed a review of the water flow diversion history for Water Right File No. 7571 to validate the water use history—specifically, the accuracy of the water use history in comparison to water availability through the Zenith gage. Furthermore, if the KDA-DWR has completed such a review, the District is interested to learn the nature and extent of that study, as well as its conclusions.

On a related point, Exhibit G within the Record, dated December 21, 1992, details the correct application of the Clausen Rule for measuring flow. This same document notes that there may have been errors in the water use records due to personnel errors. However, after calling into question the accuracy of the Service's record-keeping, the KDA-DWR did not issue any penalties against the Service for failure to maintain an accurate water measuring device. This is another point of concern for the District, whose constituents are also held to strict measuring requirements.

The Effect of the Service's Shifting Management Strategy for the Refuge

In the same September 1996 "Findings and Order", the Chief Engineer also ordered the development of a water conservation plan to avoid waste of water, to minimize unnecessary losses, and to optimize efficient use of water for the Service's authorized purpose. This plan was to encompass the development of an operational plan for the improved conservation and management of water at the Refuge, including a drought contingency plan. Following the grant of several extensions, the Refuge submitted a water conservation plan that the KDA-DWR approved in 2000.

Attachment 5 to the Report describes the seasonal water need estimates for the Refuge as of 2015. This need is estimated based on the Refuge's water use records for the previous 20 years and the Comprehensive Conservation Plan adopted by the Service in 2015. The Service's 2015 water conservation plan differed in several important aspects from the 2000 plan. For instance, the 2000 plan acknowledged that streamflow in the Rattlesnake Creek is variable throughout the year. The Refuge's strategy was to store up as much water as was available in February and then allow drawdown in management units for habitat in late spring (March – May). The majority of the remaining management units would then be allowed to dry out gradually throughout the summer months (May – September).

This strategy outlined in the water conservation plan adopted in 2000 is in conflict with the 2015 water need estimate for the Refuge, which contemplates approximately 60% of the annual appropriation being diverted from the creek into the management units between March and September. In other words, the management demands of the Refuge seem to have shifted away from a cyclical management strategy that works in concert with water availability annually.

The concerning result of the Service's shift in management strategies for the Refuge is apparent when comparing diversions before and after the Service's new operational plan was adopted in 2000. For example, in 1999, Refuge diversions between March 1 and November 1 totaled 2181.10 AF. In 2002, Refuge diversions between March 1 and November 1 totaled 6474.90 AF. The Refuge began both of these periods at 75% full and ended at 75% full. The District is bewildered as to why the Service required almost 300% more diversions in 2002 than was necessary only a few years before.

Casting a wider net and examining Refuge diversions between 1994 and 2013 paints a cloudier picture still. During this time period, the following diversions were reported:

- Nov. – Dec. 1994 and Jan. – Feb. 1995 – total diversions of 901.5
- Nov. – Dec. 2003 and Jan. – Feb. 2004 – total diversions of 1086.7
- Nov. – Dec. 2006 and Jan. – Feb. 2007 – total diversions of 1714.1
- Nov. – Dec. 2012 and Jan. – Feb. 2013 – total diversions of 0.00

Each of these four periods took the Refuge from 1/4 full on November 1 to full on March 1. The District's impression based on these numbers is that 75% of the Refuge's water needs can be met with less than 1714.1 AF of diversions—the highest amount of diversions needed to fill the Refuge in any one of the above years.

Technical Review and Comments by Balleau Groundwater, Inc.

When the Chief Engineer issued the Report on December 2, 2015, the District asked BGI to conduct a thorough technical review of the data collection and analysis presented in the Report. This technical review resulted in the following conclusions.

1. The Chief Engineer's approach to estimating flow in Rattlesnake Creek had junior pumping not occurred is technically sound. We see no apparent issues in the calculations comparing flow in Rattlesnake Creek with the water demand schedule provided by the Service.
2. Although the Chief Engineer's impairment analysis considers the water needed to fully supply the Service's demand schedule for the Refuge, it also recognizes that natural shortage is an occurrence during drought periods and that there are times when the Refuge will experience a water shortage. There are technical methods for assessing how that shortage could occur in administration of the Service's water right. Augmentation amounts would vary accordingly.

The recognition of the natural shortages associated with the diversion of water from the Rattlesnake creek is documented in the August 19, 1993, letter to the Service from the Chief Engineer. According to the September 25, 1996, Findings and Order, the Chief Engineer explained that a water conservation plan was required for the Refuge because "the Rattlesnake

Creek may be insufficient, during times of drought, to provide a supply of water sufficient to meet the needs of all water users dependent upon the creek."

3. The Chief Engineer should indicate whether hydrologic effects from out-of-basin pumping have an implication on his finding of impairment.

The Report as written is unclear on this point. Take, for example, the following statement on Page 37: "Some impacts of pumping from within Rattlesnake Creek basin by rights junior the Refuge Right eventually propagate outside the basin boundaries, so that baseflow impacts that pass through the Zenith gage are somewhat less than this total." The reverse impact of wells located outside the basin is expected to deplete flow from Rattlesnake Creek.

4. The Appendix of the Report details the modelling efforts conducted by KDA-DWR staff during this investigation. Several model scenarios were conducted using various versions of the hydrologic model. Scenario 11 compared the results from both the single-layer and the multi-layer model and indicates a difference in the change to Rattlesnake Creek flow of 2.4 percent. In comparing these two versions of the model for Scenario 1, as described in the Appendix, there is a difference of about 5 percent on the global stream budget. The difference in the magnitude of streamflow is generally 1-6 cfs. This indicates there are some differences between multi- and single-layer models that are sensitive to the magnitude of change in groundwater pumping. Perhaps the single-layer model could be used for scoping-level assessments and then the multi-layer model could be used for final calculations and conclusions.
5. The starting head condition used in the model scenarios is not steady. Beginning the simulations with an initial condition that is not in steady state should be corrected.
6. A comparison of flow at Zenith gage to the seasonal demand schedule developed by the Service for the Refuge indicates a number of times when river flow exceeds Refuge demand. Coordination with the Refuge on managing stored water in Little Salt Marsh may be an approach to facilitate the effectiveness of augmentation pumping. The degree of storage in the Refuge's operations is a question that may affect augmentation.

As noted in the certificate of appropriation for Water Right File No. 7571, dated April 9, 1996, the Refuge is entitled to "a quantity not to exceed 14,632 acre-feet of water per calendar year for recreational use. Such quantity can be subsequently stored and accumulated in marsh areas . . ." The Record shows several references to the need for storage of water in recognition of the fluctuation in natural flows of the Rattlesnake Creek within a calendar year.

7. When comparing the water use history for the Refuge to the historical flow at the Zenith gage, the storage and evaporation from Little Salt Marsh should be added to the reported diversions, as this is the methodology used in certifying Water Right File No. 7571. When conducting this analysis, over the period 1974 through 2013, flow at Zenith gage exceeds the Service's water right in 28 out of 40 years, or 70 percent of the time; however, the reported water diversions (with evaporation added) are generally less than the amount certified. This indicates a possible failure to exercise the full water right. The effectiveness of full exercise of the Refuge water right is a question that may affect augmentation.

Strategies for Augmentation

In 2006, the Kansas Water Office ("KWO") produced a report titled "Stream Flow Augmentation of Rattlesnake Creek." In that report, the KWO calculated average augmentation needs over a three-month demand schedule of 1,146 AF of water (6.3 cfs) from a site near U.S. Highway 281. The augmentation plan described would pump this water into the Rattlesnake Creek channel for delivery to Water Right File No. 7571.

Water Right File No. 7571 is located at the downstream end of an intermittent stream which traverses approximately 35 miles across the District. The majority of the subbasin area has been classified as dry subhumid and is comprised of low bluffs of dune sand. Reliance on this stream as a sole source of water can be difficult, especially in years of limited precipitation such as 2011 and 2012.

Recently, the District conducted preliminary model scenarios to evaluate the impact of augmentation of streamflow from groundwater pumping from locations closer to the Refuge. This model work is still ongoing and is subject to adjustment depending on the water management at the Refuge within a calendar year.

Additionally, utilization of a trigger mechanism similar to those noted in both the Water Conservation Plan for the Refuge and the Program will help to limit the need to augment water in years of significant drought. Utilization of the Palmer Drought Severity Index from the Climate Prediction Center of the National Weather Service is one method to help establish such a trigger mechanism. Finally, augmentation water should never go unused on the current day, thus an adjustment to the target need based on actual performance of Refuge water use is reasonable.

...

Moving forward, the District requests that the Chief Engineer clarify the issues and answer the questions raised in these comments to the Report. This information is critical to analyzing the Service's impairment claim and to formulate a workable solution.

As previously recognized by KDA-DWR, no surface water right holder is guaranteed full exercise of its calendar year allocation every year. The model indicates the Service will receive its annual allocation in the vast majority of calendar years; therefore, there is no impairment.

The District will continue to be an active advocate for the proper management of the local aquifer to ensure that the future generations of Kansans will have a viable water source to provide for their families.

Sincerely,



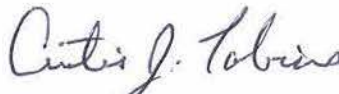
Darrell Wood, President



Fred Grunder, Vice-President



John Janssen, Treasurer



Curtis Tobias, Secretary



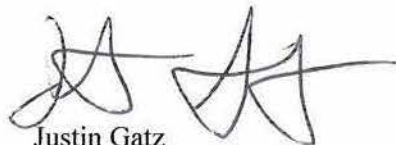
Kent Lamb



Phil Martin



Tom Taylor



Justin Gatz



Bob Standish

ATTACHMENT 2

MEMORANDUM OF AGREEMENT

I. Resolutions

WHEREAS, the U.S. Fish and Wildlife Service (“the Service”) and the Big Bend Groundwater Management District #5 (“the District”) (collectively known as “the Parties”) have met regularly to find a local, voluntary, collaborative solution to resolve the Service’s water impairment complaint related to Water Right File No. 7,571 (“the Complaint”) for the Quivira National Wildlife Refuge (“the Refuge”).

WHEREAS, the Parties agree that after examining relevant data and hydrologic modeling, the development and implementation of an augmentation wellfield, as described herein, will be the primary mechanism in addressing the Service’s Complaint. The Parties also agree that the development of the water rights purchase program, water rights movement program, and a program to incentivize the removal of end guns within the District as described herein, may be pursued by the District to adjust the amount of water augmented for the Refuge by the wellfield.

WHEREAS, it is the intent of the Parties to initiate evaluation of the proposal to develop an augmentation wellfield under the National Environmental Policy Act (NEPA), including a later agreement following this Agreement to include additional details of the projects described herein to address the Service’s impairment complaint related to the Refuge (“Subsequent Agreement”).

WHEREAS, the Parties agree that this Agreement serves as the basis for the Subsequent Agreement that will specify all terms and obligations related to the planning, design and implementation of an augmentation wellfield and the development of the water rights purchase and movement programs described herein. The Parties desire to put the proper assurances in place to allow the planning, design and implementation of an augmentation wellfield and the development of water rights purchase and movement programs until the Subsequent Agreement is executed.

WHEREAS, based on information received from the Service and Kansas Department of Health and Environment, the Parties believe that the groundwater in this area is within the water quality range acceptable to the Refuge. Pending further analysis through NEPA, the Parties preliminarily agree this area has a quantity of water that can be appropriated in a sustainable manner.

WHEREAS, the Parties have worked cooperatively in reaching the terms of this Agreement, with the District sharing with the Service all its available data, studies, reports and calculations collected to address the issues in the Service’s Complaint.

WHEREAS, this Agreement is entered into pursuant to the Fish and Wildlife Act of 1956, 16 U.S.C. § 742a, et seq.; the Fish and Wildlife Coordination Act, 16 U.S.C. 661 et seq., the Migratory Bird Conservation Act, 16 U.S.C. § 715d et seq., and the National Wildlife Refuge System Administration Act, 16 U.S.C. 668dd et seq.

WHEREAS, the execution of this Agreement shall not constitute, nor is it in any way an admission by any Party of any liability, and shall not be used in any other action against any Party as proof of liability.

II. Definitions

“Short-Term Projects” means projects developed that will be implemented and operated under contracts, or through other appropriate means within the first 5 years of this Agreement.

“Long-Term Projects” means projects developed that will be implemented and operated under contracts or through other appropriate means beyond 5 years of this Agreement.

“Management Committee” means the committee to provide input for the successful implementation of this Agreement and the Subsequent Agreement. The committee is anticipated to include lead representatives from the District, Service, as well as ad hoc representatives from the Kansas Department of Agriculture-Division of Water Resources, Kansas Department of Health and Environment, and Water Protection Association for Central Kansas (WaterPACK).

“Technical Committee” means the committee formed to advise and make recommendations to the Management Committee to implement the projects for purposes of this Agreement. This committee will be chosen by the Management Committee and will be composed of members with expertise in groundwater and surface water project development and management.

“Technical Operations Plan” means the plan to be developed by the Parties to outline processes and procedures to implement and operate projects under this Agreement and to be incorporated into the Subsequent Agreement.

III. Stipulations

In consideration of the mutual covenants contained herein and other good and valuable consideration, the adequacy of which is acknowledged, the Parties hereby stipulate as follows:

1. Short Term Projects

a. Rattlesnake Augmentation Wellfield

The District shall design and construct an augmentation wellfield to supplement the streamflow in the Rattlesnake Creek with groundwater pumped from the regional aquifer. Water will be delivered directly to the Rattlesnake Creek channel immediately upstream of the Refuge. Streamflow augmentation will be implemented from the wellfield designed with a delivery capacity of 15 cubic feet per second (“cfs”) under normal conditions to the Rattlesnake Creek stream channel. The District agrees to provide an additional 3 cfs to the Rattlesnake Creek at critical, agreed upon, times each year. The Technical Committee will make recommendations to the Parties regarding whether the additional 3 cfs will be needed each year.

b. Work Plan

Within twelve (12) months of the Effective Date of this Agreement, the District shall submit a work plan for the augmentation wellfield to supplement the streamflow in the Rattlesnake Creek. Such work plan which will contain an implementation schedule, including dates for at least the following milestones:

- i. Project Design
- ii. Engineering Plans and Specifications

iii. Wellfield construction beginning and completion dates

c. Delivery Schedule

The District will work with the Refuge Manager, in coordination with the Technical Committee, to develop a delivery schedule that maximizes the efficiency of delivery to meet augmentation obligations at the Refuge. In months when streamflow in Rattlesnake Creek is sufficient to meet or exceed the requirements for water at the Refuge, as determined by the Technical Committee, the District will have no obligation to deliver streamflow during those months. Accounting for the water delivery will be conducted using newly established telemetry enabled water flowmeters at the delivery point of the stream channel. The Service will install the appropriate type of staff gauge at Little Salt Marsh (“LSM”) to enhance delivery coordination and maintain transparency in monitoring water elevations.

Operational use and scheduling for the streamflow augmented water will be further described in more detail in a technical operations plan, which will be developed by the Parties and incorporated into the Subsequent Agreement.

d. Costs

The District agrees to pay for the cost to develop, construct, operate, and maintain the augmentation wellfield, all pipelines or canals, and points of discharge necessary to ensure water from the wellfield is delivered to the Rattlesnake Creek channel or any other point agreed upon with the Service south of the Refuge.

2. Long-Term Projects

The District will use reasonable efforts to develop a water right purchase program to promote the retirement of water rights from sensitive areas in the Rattlesnake Creek region. The goal of this program is to retire 2,500 acre-feet (“AF”) from areas close to the stream based on the response map published by KDA–DWR on November February 14, 2018 (the “response map”).

The District will also use reasonable efforts to promote the movement of water under K.A.R. 5-25-22 and other programs, such as the Central Kansas Water Bank Association, from sensitive areas in the Rattlesnake Creek region to less-sensitive areas of the District.

If the water right purchase program is unable to retire 2,500 acre-feet (“AF”) from areas close to the stream based on the response map, the District will use reasonable efforts to incentivize end gun removal from center pivot systems within the region. As of January 2015, the District determined that there were 1,032 center pivots with operational end guns.

3. Water Storage Measures

Water management at the Refuge utilizes the LSM in a manner that provides water to all reaches of the Refuge while maintaining adequate water levels for habitat in and around LSM. Once the augmentation wellfield is operational, the Service agrees to store up to an additional 383 AF of water in LSM annually to provide quality water bird habitat following

monthly/seasonal species-habitat requirements as outlined in the Comprehensive Conservation Plan (“CCP”).

4. Monitoring

The Parties intend to develop a monitoring program to ensure the on-going operations of the augmentation wellfield as intended under this Agreement. Such monitoring program will detail the Parties’ monitoring roles and will be incorporated into the Subsequent Agreement. The program will address:

- a. Monitoring water quality and augmentation operations in accordance with water quality requirements of the Kansas Department of Health and Environment, and
- b. Monitoring water quantity and permitting requirements of the Kansas Department of Agriculture – Division of Water Resources.
- c. Monitoring of water storage and release operations at LSM.

5. Request to Secure Water

The Service agrees not to submit a request to secure water pursuant to K.S.A. 82a-706b and K.A.R. 5-4-1 to address its impairment in 2020 and 2021.

6. Assistance in Developing an Augmentation Project

The Parties agree to provide administrative and regulatory assistance and support within their authority to assist in the development and implementation of projects under this Agreement.

7. Modification

The Parties recognize that there are circumstances that are outside the direct control of the District (e.g. ability to obtain water rights, acquisition necessary easements, etc.) and that a modification of this Agreement may be necessary. The Parties also recognize that, after the augmentation wellfield is implemented and operational, additional assessment of hydrologic conditions may necessitate amendments to the long term projects identified in Paragraph 2. The terms of this Agreement, including any timeframe herein, may be modified by written consent of both Parties. No modification of this Agreement shall be valid unless the change is made in writing and is approved by authorized representatives of the Parties, evidenced by the signature of each respective representative.

8. Timeline

The District and Service will use reasonable efforts to meet the following milestones to implement the terms of this Agreement. Parties will notify each other as soon as practicable if any timeframe in this section will not be met and shall modify the timeframe(s) to include the new date(s) pursuant to Paragraph 7.

- i. District applies for Watershed Act grant August 2020

- ii. Funding potentially awarded November 2020
- iii. Environmental Assessment and Feasibility Study completed May 2021
- iv. Decision anticipated August 2021

9. Term and Termination

This Agreement shall remain in effect until replaced by a subsequent agreement or terminated by either Party. Either Party may terminate this Agreement only upon 90 days' notice in writing. In addition to such notice, the Party wishing to terminate shall afford the non-terminating Party a reasonable opportunity to confer before such termination takes effect. Any pending notice to terminate this Agreement will be rescinded by the Party who served the notice once the issues have been resolved.

10. Limitation

Nothing in this MOA shall be construed as obligating the United States, the District or any other public agency, their officers, agents or employees to expend any funds in excess of appropriations authorized by law.

11. Third-Party Challenges or Appeals

Nothing in this MOA may be the basis of any third-party challenges or appeals. Nothing in this MOA creates any rights or causes of action in persons not parties to this MOA.

12. Notices

All official notices shall be sent to the Parties' designated contacts as listed below:

U.S. Fish and Wildlife Service
 Quivira National Wildlife Refuge
 Refuge Manager
 1434 NE 80th Street
 Stafford, KS 67578

U.S. Fish and Wildlife Service
 Chief, Division of Water Resources
 134 Union Boulevard
 Lakewood, CO 80228-1807

Manager
 GMD5
 125 S. Main St.
 Stafford, KS 67578

Lynn Preheim
Stinson LLP
1625 N. Waterfront Pkwy
Suite 300
Wichita, KS 67206

13. No Third-Party Beneficiary

No Party to this Agreement intends for this Agreement to confer any benefit upon any person or entity not a signatory to this Agreement, whether as a third-party beneficiary or otherwise.

14. Headings

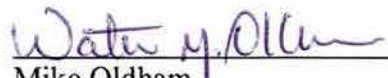
The headings of clauses contained herein are used for convenience and ease of reference. They shall not limit the scope or intent of the clause.

15. Effective Date

This Agreement shall become effective upon the execution by the Parties hereto.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement on the day and year first written above.

 Date: 7-25-20
Darrell Wood
President, Board of Directors
Big Bend Groundwater Management District 5

 Date: 7/25/20
Mike Oldham
Refuge Manager
U.S. Fish and Wildlife Service

ATTACHMENT 3



CERTIFICATION MEMORANDUM, FILE 7571

The certification of application to appropriate water, File 7571 actually began in July of 1991. A tour of the refuge was made in the company of Patrick D. Gonzales, assistant manager of Quivira National Wildlife Refuge. Mr. Gonzales reviewed the basic operations at the refuge and detailed how water was used among the various management units within the refuge proper. Copies of missing water use reports (exhibit A) were obtained from the U.S. Fish and Wildlife Service in Denver. These reports filled in all the missing gaps in the water use history of the refuge. In February of 1992, contact was made with representatives from U.S. Fish and Wildlife Service (USFWS) headquarters. It was learned that a detailed survey of the refuge was to be conducted in the near future. The survey would include cross sections of each management pool in the refuge and more accurately define the total water holding capacity of the entire project. As of February 1, 1993, the survey has been completed, but the information has not been tabulated or made available for review. Since the new survey has not been completed in a timely manner, older information that was originally computed from aerial photos is being used to prepare the certificate. Much of this information was already in the files and additional information was obtained from USFWS itself (exhibit B).

The Water Resources Data of Kansas published yearly by the U.S. Geological Survey was consulted for the years 1963 through 1990. These publications give the streamflow values for permanent gaging stations on the Rattlesnake Creek at Macksville, Kansas and Raymond, Kansas. The Macksville station gives interesting results, but it is over 30 miles upstream from the diversion points authorized by this file. On a stream such as the Rattlesnake that is often gaining base flow in some areas and losing base flow to the aquifer in other areas, depending on the immediate section of the stream being analyzed, a gaging station over 30 miles away is not of much value as it relates to this project. The Raymond, Kansas gage was also analyzed. This gage should have been useful since it is situated at the outflow from Quivira Refuge. What complicates the readings from this gage is that artesian saltwater flows on the north edge of the refuge enter the stream (referred to as Salt Creek at this location) and are recorded at the gaging station. The result is that at times flow is recorded at the gage even when operations at Quivira are using the entire upstream flow of the Rattlesnake Creek. Flood flows, artesian groundwater, and occasionally normal streamflows reach the Raymond gage, unfortunately, it is impossible to distinguish where the recorded flows may have come from.

In May of 1973 a gaging station was put into service at Zenith, Kansas. This gage is approximately 15 miles upstream from the first diversion structure at Quivira Wildlife Refuge. This gage

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STATE BOARD OF AGRICULTURE

has the potential to provide the most pertinent data in regards to the certification of File 7571. Since the Zenith gage was not installed until 1973 there is no actual data for that location during prior years. For that reason Jim Bagley, of the Division of Water Resources, prepared streamflow regression analysis charts (exhibit C). While these charts are definitely an asset in obtaining the total picture of past streamflow and appear to correlate exceptionally well with actual flow records at the other gaging stations, Mr. Bagley warns against depending on the regression analysis too much. On a related note, Marios Sophocleaus states in his KGS open file report 92-10 that 19625 acre feet is the average annual streamflow at the Zenith gage during the years 1981 through 1990.

Hydrographs were prepared (exhibit D) to visually display the monthly and annual flows recorded, in acre feet, at all of the above gaging stations from 1963 to 1990. The 1963 to 1973 flows estimated from regression analysis at the Zenith gage were also plotted. In addition, the annual reported quantity of water used at Quivira was plotted against the streamflow quantities. If nothing else, the hydrographs reveal that the water use reports submitted for Quivira do not exceed the quantity shown to have been provided by the Rattlesnake Creek.

Next, information from the area and capacity information (exhibit B) and the Annual Water Management Plan (exhibit E) were combined into one table. This table is titled "Typical Annual Water Use at Quivira Wildlife Refuge" (exhibit F). The purpose of the tabulation is to demonstrate the maximum amount of water the refuge might use if it had sufficient water available and it was able to fulfill all of the management options listed in its Annual Water Management Plan. The tabulation is actually less than the maximum water needs as it does not include unmanaged areas that are often flooded to a depth of two to three inches; it also does not include evapotranspiration by moist soil plants, seepage, lake evaporation through fall and winter months, or transit losses in canals or within the streambed itself. One other item that is not calculated is the fact that at certain times it may be beneficial to drain one management unit, utilizing the drained water into a second unit in need of water, although in most instances the units are allowed to evaporate naturally. Additionally, large salt flats at the north end of the refuge, and the northern end of the Big Salt Marsh itself, appear to receive a portion of their water supply from the artesian seeps and springs that flow into the refuge from the west.

Certification Memo, File 7571

Exhibit F demonstrates that when considering the permanent management pools only, operated under the guidelines of existing management plans, that the quantity of water reported since 1963 appears not only to have been reasonable, but also possible.

On December 21, 1992 and January 28, 1993, Mr Dave Hilley, Manager of Quivira Wildlife Refuge, was contacted for additional information concerning operations at the refuge. The methods used by the refuge to measure water flows were observed, tested, and recorded in a memorandum labeled exhibit G. This document outlines specifically what instrument is used to measure flows, how it works, how quantities are calculated for annual water use reports, and states the one discrepancy found in the water reporting method. That discrepancy was the fact that the quantity of water stored and evaporated from the Little Salt Marsh was not reflected in the refuge's reporting methods. The information obtained on both visits, combined with previously gathered data, were compiled to form exhibit H, which is a detailed map of each management unit, the canals connecting each unit, control structures used to move water within the refuge, and the diversion points on the Rattlesnake Creek.

SUMMARY

Based on the above information and attached exhibits a certificated of appropriation for file 7571 is proposed as follows:

File 7571 was approved in 1963. During the time period 1963 to 1972 many of the water use reports were estimated and during that time the diversion works were reported to be only 80% complete. An actual water measurement program may not have been in place prior to 1973. In 1973, a year of torrential rainfall, the diversion works and control structures at Quivira were destroyed. It was not until 1978 that the damage was finally repaired. The year 1978 was, therefore, the first year that the diversion works were complete and ready to divert and store water according to management plans. Assuming that the water requirements of the refuge are best represented by years after 1978, the year 1987 has been selected as the year of record. Using 1987 will require that an extension of time to perfect be granted to that year.

During 1987 the U.S. Fish and Wildlife Service reported that 10129.7 acre feet of water was diverted from the Rattlesnake Creek and that the refuge was "full all year." As pointed out above and in exhibit G, the measurements reported do not reflect the amount stored and the subsequent evaporation in the Little

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Certification Memo, File 7571

Salt Marsh. Using an area of 950 acres in the Little Salt Marsh, and a capacity of 2260 acre feet, one would assume 2850 acre feet of evaporation during a calendar year (36 inches of net evaporation). The proposed certified quantity for file 7571 would then be the sum of the acre feet reported in 1987, the amount stored in the Little Salt Marsh, and the amount evaporated from the Little Salt Marsh: 10129.7 acre feet + 2260 acre feet + 2850 acre feet = 15240 acre feet. It is also proposed that all of the 15240 acre feet be shown as direct use and that the "quantity to be accumulated in reservoirs" as stated in the approval be dropped from the certificate.

It is proposed that the rate of diversion be certified as natural flows not needed for prior downstream diversions. The diversion should be limited to a maximum of 300 c.f.s. Flows of 300 cfs can be verified from streamflow records at the Zenith station (see exhibit I).

Finally, the description of the point of diversion noted as "diversion A" is being proposed differently than originally approved. The stream is not located in that ten acre tract. Therefore it is proposed to correct that description when the certificate is issued.

It is the recommendation of the Stafford Field Office that U.S. Fish and Wildlife Service be required upon issuance of this certificate to install a permanent metering system on the Rattlesnake Creek immediately downstream from their last diversion point and that a water conservation plan be prepared for the refuge, both to be completed by December 31, 1995.



FIELD INSPECTION, FILE 7571

LAND TO BE INCLUDED ON CERTIFICATE

The South 80 acres of the SE1/4 of Section 15; the S1/2 of Section 14; the NE1/4, SW1/4, and SE1/4 of Section 29; and all of Sections 13, 21 through 28, and 32 through 36 in Township 21 South, Range 11 West;

and all of Sections 1 through 5, 11 through 14, 23 through 26, and sections 35 and 36 in Township 22 South, Range 11 West;

and all of Sections 1 and 2 in Township 23 South, Range 11 West;

all in Stafford County, Kansas;

Section 18 in Township 21 South, Range 10 West, in Rice County, Kansas;

and Section 30 in Township 22 South, Range 10 West, in Reno County, Kansas.

PLACE OF USE DURING YEAR OF RECORD

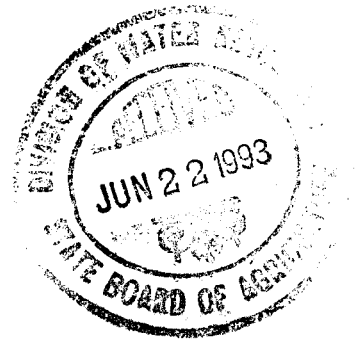
Water was applied to and circulated among the various management units within the place of use described above. Those management units are depicted on the map accompanying this field inspection report.

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ATTACHMENT 4

Kansas State Board of Agriculture
Division of Water Resources
Stafford Field Office
Memorandum



TO: Larry Sheets

DATE: June 18, 1993

FROM: Bruce Falk *MBF*

RE: Appropriation of Water
File No. 7571

On June 17, 1993 a meeting was held at the Stafford Field Office of the Division of Water Resources with U. S. Fish and Wildlife (USFW) Representatives Megan Johnson and Dave Schmidt. The discussions centered on the final rates and quantities that will be proposed for the certification of File No. 7571.

The USFW representatives presented a summary (attached) of an area capacity survey that was completed in February 1993. The results of the survey indicate that the surface area and capacity of the Little Salt Marsh are actually smaller than older information had indicated. The reason may be that older capacities were calculated from the top of the dikes rather than the spillway elevations used in the new survey. Some siltation may have occurred over the years. Based on the new information, the quantity for the proposed certificate was revised as follows:

Quantity reported in 1987 remains the same:	10129.7 acre-feet
Capacity of Little Salt Marsh, filled in 1987, has changed to:	1865.0 acre-feet
Evaporation from surface acres of Little Salt Marsh changed to: 864 acres X 36 inches =	2592.0 acre-feet
Total:	14586.7 acre-feet

The quantity to be diverted and stored can be stated on the certificate as follows:

"...in a quantity not to exceed 14587 acre-feet per calendar year for direct use. Such quantity can subsequently be stored and accumulated for recreational uses within the Quivira National Wildlife Refuge as it existed on December 31, 1987." *

Of course the above quantity statement can be crafted by you to meet the current procedures of the certificate unit. The proposed certificate should be mailed to the owners as described on the certificate worksheet, but please add "Attention: Cheryl Williss" to the address.

MICROFILMED

Larry Sheets
File No. 7571
Memorandum
Page 2

No adverse comments were received from USFW representatives concerning the method used to calculate rates and quantities, or the quantities arrived at. Further review will be required by that agency.

Enc.

* The recently received area capacity tabulations will document the storage capability in 1987 since no changes have occurred from 1987 to the present.

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FIELD OFFICE
DIVISION OF WATER RESOURCES
STAFFORD

MICROFILMED