

TWDB Letter
Requesting Briefs

Texas Water Development Board

P.O. Box 13231, 1700 N. Congress Ave.
Austin, TX 78711-3231, www.twdb.texas.gov
Phone (512) 463-7847, Fax (512) 475-2053

Date: August 6, 2015

To: Persons on the Attached Mailing List (by mail and email as indicated)

Re: Potential Interregional Conflict between Regional Water Plans for Regions C & D

On July 21st, 2015, Region D Water Planning Group submitted a letter to the Texas Water Development Board ("TWDB") indicating its position that "the proposed Marvin Nichols Reservoir as described in the Region C IPP for Round 4 will have an unacceptable degree of impact on Region D's water planning area and appears to conflict with the Region D Round 4 IPP." (See Attachment A.)

Through this correspondence, the persons on the attached mailing list are hereby notified that the Board will consider whether an interregional conflict exists during its Board Meeting on **Wednesday, September 9th, 2015, beginning at 9:30 AM** in Room 170, Stephen F. Austin Building, 1700 North Congress Avenue, Austin, Texas. The Board will take oral argument on this matter. The order and time allotments for oral presentation are established as follows: 15 minutes for the Region D Representative(s); 15 minutes for the Region C Representative(s); and 15 minutes for the Executive Administrator. The parties may apportion their respective allotments as they see fit. If a party plans on apportioning time among multiple individuals, a representative of that party should contact Joyce Bourenane, Office of General Counsel at (512) 463-7686 by **5:00 p.m. on Monday, September 7th, 2015** to let her know how the time will be apportioned.

Furthermore, Regions C and D are invited to submit briefs on the issue of whether an interregional conflict exists. In the event that a brief is submitted, it must be received by the Office of General Counsel on or before **5:00 p.m. on Tuesday, August 25th, 2015**. Please send the submittals to the Office of General Counsel by U.S. Mail and Electronic Mail. The mailing address of the Office of General Counsel is: Office of General Counsel, ATTN: Les Trobman, Texas Water Development Board, P.O. Box 13231, Austin, Texas 78711-3231 [les.trobman@twdb.texas.gov]. On the same day a submittal is transmitted to the Office of General Counsel, a copy must also be sent by U.S. Mail and Electronic Mail to all other persons at their address/email address listed on the attached Mailing List. The Executive Administrator will submit a recommendation to the Board, with a copy to the Mailing List on or before **Tuesday, September 1st, 2015**.

If you have any questions regarding this matter, please contact me at 512-463-9105.

Very truly yours,



General Counsel

Attachments

Our Mission	:	Board Members
To provide leadership, information, education, and support for planning, financial assistance, and outreach for the conservation and responsible development of water for Texas	:	Carlos Rubinstein, Chairman Bech Bruun, Member Kathleen Jackson, Member
	:	Kevin Patteson, Executive Administrator

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2015 JUL 23 PM 2:40

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July 21, 2015

Kevin Patteson, Executive Administrator
Texas Water Development Board
PO Box 13231
Austin, TX 78711-3231

Re: Objection by Region D Water Planning Group to the inclusion of Marvin Nichols Reservoir in Round 4

Dear Mr. Patteson:

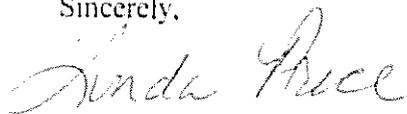
On July 14, 2015, the Region D Water Planning Group authorized me to notify the Texas Water Development Board (TWDB) that Region D has concluded that the proposed Marvin Nichols Reservoir as described in the Region C IPP for Round 4 will have an unacceptable degree of impact on Region D's water planning area and appears to conflict with the Region D Round 4 IPP. Region D's objection is primarily based on information that indicates its inclusion is not protective of the natural and agricultural resources of Region D.

Region D continues to assert that the available information demonstrates that Region C can meet all of its projected needs for the next 50 years without resorting to constructing a new impoundment in the Sulphur River Basin.

Region D encourages the TWDB to aggressively pursue steps that will provide a more thorough vetting of this topic between Region C and D. Region D is prepared to meet and discuss this topic whenever afforded the opportunity by the TWDB.

Please feel free to contact me with any questions you may have. I look forward to working with you.

Sincerely,



Linda Price, Chair of Region D

Region C Brief

REGION C WATER PLANNING GROUP

Senate Bill One Fourth Round of Regional Water Planning - Texas Water Development Board

Board Members

Jody Puckett, Chair
Russell Laughlin, Vice-Chair
Kevin Ward, Secretary
David Bailey
Bill Ceverha
Gary Douglas
James Hotopp
Tom Kula
Thomas LaPoint
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Howard Martin
Jim McCarter
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Robert O. Scott
Gary Spicer
Connie Standridge
Jack Stevens
Dr. Tom Woodward

August 24, 2015

VIA E-MAIL
les.trobman@twdb.texas.gov

Mr. Les Trobman
General Counsel
Texas Water Development Board
1700 North Congress Avenue
Austin, Texas 78701

Re: Potential Interregional Conflict between Regional Water Plans for Regions C & D

Dear Mr. Trobman,

The Region C Water Planning Group (RCWPG) submits this letter brief in response to your solicitation of briefing dated August 6, 2015. The Region D Water Planning Group has alleged by a letter of July 21 that Region C's "proposed Marvin Nichols Reservoir . . . will have an unacceptable degree of impact on Region D's water planning area and appears to conflict with the Region D Round 4 IPP." It further contends that the proposed reservoir "is not protective of the natural and agricultural resources of Region D." Those claims are without merit and do not rise to the level of an interregional conflict between the Region C and D fourth-round IPPs.

Marvin Nichols in the 2015 RCWPG IPP

Region C has elected to include multiple strategies for the development of Marvin Nichols in its 2015 IPP. The Sulphur Basin Supplies strategy (5C.1 Recommended Strategies for Regional Wholesale Water Providers, pp. 5C.1-4 of the RCWPG IPP) is a recommended strategy for the Tarrant Regional Water District (TRWD), the North Texas Municipal Water District (NTMWD) and the Upper Trinity Regional Water District (UTRWD), and an alternate strategy for the Cities of Dallas and Irving. The strategy consists of a combination of water from Marvin Nichols and the reallocation of conservation storage in Wright Patman Lake. The 2015 RCWPG IPP retains the 2011 configuration of Marvin Nichols as an alternate water management strategy for NTMWD, UTRWD, TRWD, and the City of Irving.

NTMWD, TRWD, Dallas, UTRWD, and Irving, along with the Sulphur River Basin Authority, formed a Joint Committee on Program Development (JCPD) in 2001. Since that time, the JCPD Region C entities have provided more than \$5 million to the SRBA to further investigate the development of surface water supplies in the Sulphur River basin. Sulphur basin feasibility studies are underway, conducted by the U.S. Army Corps of Engineers, SRBA and the JCPD. Those studies include multiple potential configurations for Marvin Nichols.

RCWPG has furnished extensive studies on impacts of the recommended and alternate Marvin Nichols strategies

Region D's allegation of an interregional conflict is an attempt by it to use the water planning process to thwart, rather than encourage, the development of adequate water supplies for the State of Texas. The RCWPG and JCPD have studied the impacts of both the 2011 and 2015 Marvin Nichols configurations, and also concurrent reliance by Region C on other supplies available in Region D. In doing so, the RCWPG was mindful of the direction it received from the Board during the resolution of the last claimed conflict in "An Order Concerning the Interregional Conflict between the 2011 North Central Texas Regional Planning Area Regional Water Plan and the 2011 East Texas Regional Planning Area Regional Water Plan in Accordance with Texas Water Code §16.053" issued January 8, 2015 (Order).

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The Board is familiar with the long history of the resolved interregional conflict in connection with the RCWPG's 2011 Regional Water Plan. As a part of the resolution process, the Board ordered the RCWPG to conduct an analysis of the impacts of Marvin Nichols (as then proposed) on the resources of Region D and the State. Region C furnished that report to the Board on October 29, 2014. In support of what is now an alternate strategy, the RCWPG furnished the data it developed as an appendix to its 2015 IPP. See, 2015 RCWPG IPP, Appendix Y, *Analysis and Quantification of the Impacts of the Marvin Nichols Reservoir Water Management Strategy on the Agricultural and Natural Resources of Region D and the State*.

The RCWPG has built upon and continued to study the impacts of Region D-based water supply strategies in the Region C plan. With its 2015 IPP, the RCWPG has furnished the Board with its *Analysis and Quantification of the Impacts of the Marvin Nichols Reservoir Water Management Strategy on Agricultural and Natural Resources with the Top of Conservation Storage at 313.5 Feet above Mean Sea Level*. That report includes an in-depth analysis entitled *Timberland and Agricultural Land Impact Assessment For Selected Water Resource Options in the Sulphur River Basin*. Copies of those documents are attached hereto. Those studies demonstrate that the development of the revised Marvin Nichols project is consistent with the long-term protection of the state's water resources, agricultural resources and natural resources.

Based on the RCWPG's extensive studies and the Board's resolution of the prior conflict, no interregional conflict exists with respect to either the recommended or alternate Marvin Nichols strategies, as described below.

No substantial adverse effect on Region D

The RCWPG has furnished extensive data regarding the impacts of both the recommended and alternate strategy implementations of Marvin Nichols, and no conflict exists with respect to either strategy. With respect to the alternate strategy, the Board resolved the conflict by directing that Marvin Nichols be included in the 2011 RCWPG Regional Water Plan and the State Water Plan, and stated that upon that inclusion, "no outstanding interregional conflicts [existed] related to the 2011 Region C RWP." Order page 8, Conclusion of Law 6. The effects of the alternate strategy Marvin Nichols have been studied extensively, and have not changed since January of this year. Likewise, no conflict exists with respect to the draft 2016 IPP's recommended Marvin Nichols strategy. As described, Region C has furnished with its IPP its *Analysis and Quantification of the Impacts of the Marvin Nichols Reservoir Water Management Strategy on Agricultural and Natural Resources with the Top of Conservation Storage at 313.5 Feet above Mean Sea Level*, including its *Timberland and Agricultural Land Impact Assessment For Selected Water Resource Options in the Sulphur River Basin*. Those documents confirm no greater impacts to Region D under the recommended strategy than those associated with the now alternate strategy for Marvin Nichols.

In general, in determining whether the recommended or alternate Marvin Nichols strategies are in conflict with Region D's IPP, the Board should differentiate between short and long-term effects on Region D. It should also consider long-term benefits to that region based on proposed Region C water management strategies. Long-term benefits may, in fact, totally offset temporary effects on economic, agricultural, and natural resources. Disrupted agricultural activities may potentially be relocated and pursued at prior or greater levels of intensity. Short-term economic effects in one sector may be offset entirely by long-term development of other businesses and industries. The Board should determine the presence or absence of an interregional conflict based upon the reasonably foreseeable, long-term and net effects on a host region's economic, agricultural and natural resources.

Ward Timber does not mandate a finding of interregional conflict

A finding of an interregional conflict on the facts presented is not required by *Texas Water Development Board v. Ward Timber, LTD, et al.*, 411 S.W.3rd 554 (Tex. App.—Eastland 2013, no pet.) (*Ward Timber*). The analyses furnished by the RCWPG of Marvin Nichols's impacts on Region D distinguish the current conflict claim from the one previously alleged by Region D. In *Ward Timber*, the Court observed that "Region D [] examined the impacts [of Marvin Nichols]" in its Regional Water Plan, and "Region C [] decided to evaluate the impacts of the Marvin Nichols Reservoir in the future as part of its planning process." *Id.* at 573. Region C has now done so and has submitted extensive analyses on that subject as a part of its fourth-round IPP.

Unlike last planning cycle, the Board has significant data before it, presented by both Regions C and D, upon which it may determine the presence or absence of an interregional conflict. In addition, the Board may look back to its findings

Mr. Les Trobman
General Counsel, TWDB
August 24, 2015
Page 3

and conclusions reached in resolving the prior conflict for guidance as to whether Region D has alleged a valid conflict in this instance. In its order, the Board correctly observed that the development of Marvin Nichols "could act as a catalyst for economic development and growth" in Region D, and that new reservoirs [] stimulate the economy through new recreational business and local improvements." Order page 5, Finding of Fact 31. Likewise, the Board found that the RCWPG's 2011 Regional Water Plan, which included the now alternate Marvin Nichols strategy, was "consistent with the long-term protection of the state's agricultural and natural resources." Order page 8, Conclusion of Law 11. Those findings apply with even greater force to the RCWPG's fourth-round IPP recommended Marvin Nichols strategy.

Conclusion

The Board has previously reviewed and resolved a conflict outlined in the Order in favor of the 2011 Region C Water Plan Marvin Nichols strategy. As recommended in the 2015 Region C IPP, the proposed Marvin Nichols strategy does not have a substantial adverse effect on the natural and agricultural resources in Region D. The Board has sufficient information before it to find that the currently proposed Region C water management strategies in Region D do not have a substantial adverse effect, and accordingly should find no conflict between the plans.

Respectfully submitted,



Jody Puckett, Chair
Region C Water Planning Group

Attachments

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Region C
Quantitative Analysis



Innovative approaches
Practical results
Outstanding service

**Analysis and Quantification of the Impacts of the
Marvin Nichols Reservoir Water Management
Strategy on Agricultural and Natural Resources
with the Top of Conservation Storage at 313.5 Feet
above Mean Sea Level**

Prepared for:

Region C Water Planning Group

For Submittal to:

Texas Water Development Board

Prepared by:

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NTD11336

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Analysis and Quantification of the Impacts of the Marvin Nichols Reservoir Water Management Strategy on Agricultural and Natural Resources with the Top of Conservation Storage at 313.5 Feet above Mean Sea Level

1. Introduction

The requirement for quantification of impacts on agricultural and natural resources is in Texas Water Development Board (the Board) rules, reflected in Texas Administrative Code §§357.34(d)(3)(B) and 357.34(d)(3)(C):

“357.34(d) Evaluations of potentially feasible water management strategies shall include the following analyses:… (3) A quantitative reporting of:

…
(B) Environmental factors including effects on environmental water needs, wildlife habitat, cultural resources, and effect of upstream development on bays, estuaries, and arms of the Gulf of Mexico. Evaluations of effects on environmental flows will include consideration of the Commission's adopted environmental flow standards under 30 TAC Chapter 298 (relating to Environmental Flow Standards for Surface Water). If environmental flow standards have not been established, then environmental information from existing site-specific studies, or in the absence of such information, state environmental planning criteria adopted by the Board for inclusion in the state water plan after coordinating with staff of the Commission and the Texas Parks and Wildlife Department to ensure that water management strategies are adjusted to provide for environmental water needs including instream flows and bays and estuaries inflows.

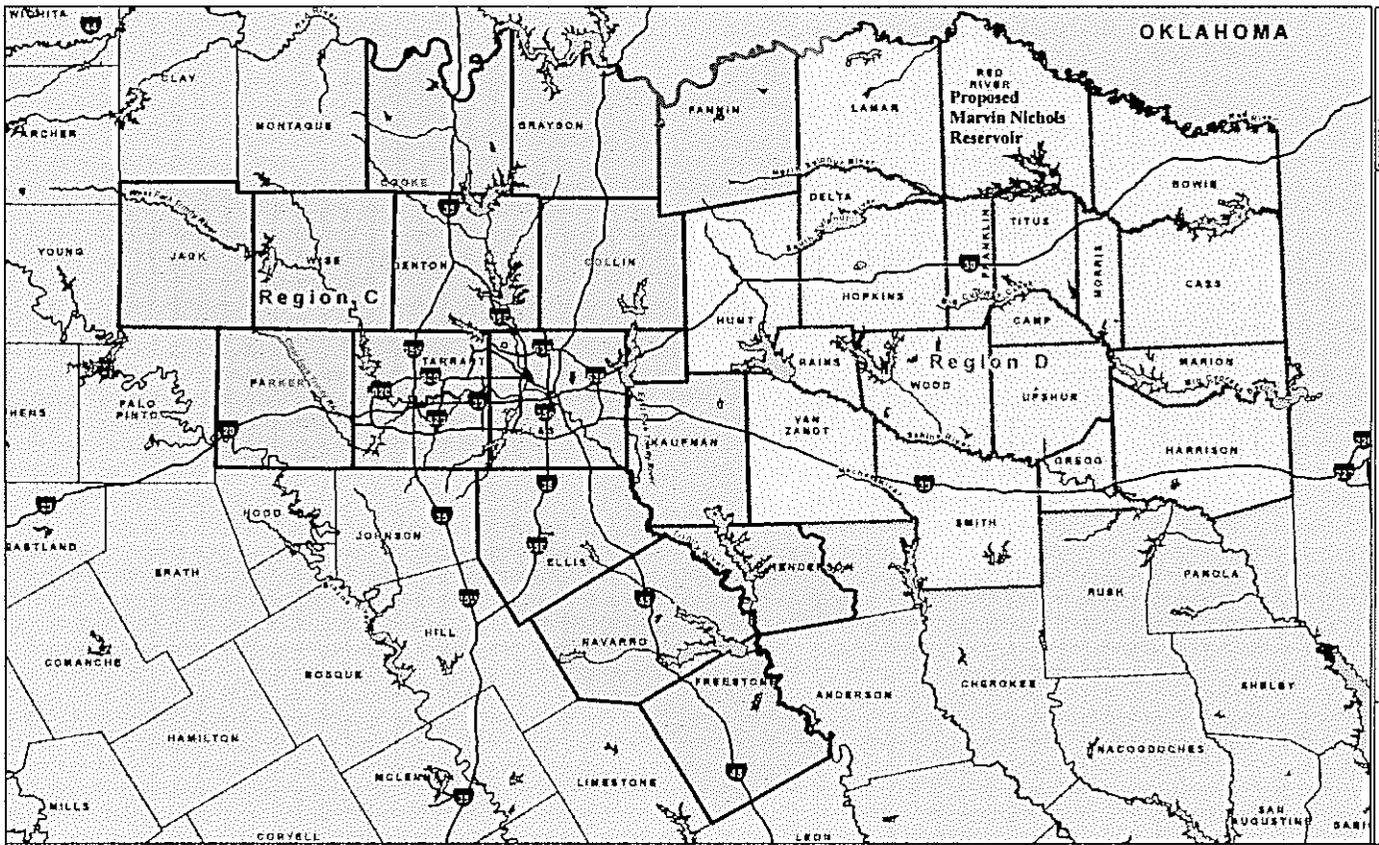
(C) Impacts to agricultural resources.”

The information in this report is intended to supplement the *2016 Region C Water Plan*¹ on the impact of the Marvin Nichols Reservoir with the top of conservation storage at 313.5 feet above mean sea level (313.5 feet-msl), with emphasis on the quantification of impacts on agricultural and natural resources. The recommended water management strategy in the *2016 Region C Water Plan*¹, referred to as the Sulphur Basin Supplies, includes the construction of Marvin Nichols reservoir at conservation pool elevation 313.5 feet-msl and the reallocation of Wright Patman to elevation 232.5 feet-msl. The Wright Patman portion of the Sulphur Basin Supplies

¹ Superscripted numbers refer to the list of references in Appendix A.

strategy is not analyzed in this report. That analysis is contained in the *2016 Region C Water Plan*¹. The location of the proposed Marvin Nichols Reservoir is shown in Figure 1.

Section 2 of this report provides the analysis and quantification of the impacts of Marvin Nichols Reservoir on natural resources. Section 3 provides the analysis and quantification of the impacts of the project on agricultural resources. Section 4 discusses potential mitigation requirements for the project and how they might affect impacts on natural and agricultural resources. The Appendices include supporting material.



- Proposed Marvin Nichols Reservoir Site (1313.5 ft. msl)
- Existing Reservoir
- Rivers
- Region C
- Region D



DATE	07/21/11
BY	KL/STL
PROJECT	REGION C WATER PLANNING GROUP
CLIENT	OKLAHOMA WATER RESOURCES AUTHORITY
SCALE	AS SHOWN
REVISIONS	

**REGION C WATER PLANNING GROUP
MARVIN NICHOLS QUANTITATIVE ANALYSIS REPORT**

LOCATION MAP FOR REGION C REGION D AND THE PROPOSED MARVIN NICHOLS RESERVOIR

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Figure 1

2. Analysis and Quantification of the Impacts on Natural Resources

2.1 Requirements of Texas Water Code and Texas Water Development Board Rules

The requirements for quantitative reporting on the impacts of water management strategies on natural resources are included in the Board rules in Texas Administrative Code §357. Specifically §357.34(d)(3)(B), requires that the quantitative reporting address impacts on certain specific aspects of natural resources including:

- Environmental water needs
- Wildlife habitat
- Cultural resources
- Effect on bays, estuaries, and arms of the Gulf of Mexico

A quantitative reporting of impacts on each of these areas is provided below, as is additional information on impacts on threatened and endangered species.

2.2 Available Data for Impacts on Natural Resources

Data on impacts of the proposed Marvin Nichols Reservoir on environmental flow needs is taken from the hydrologic analyses of the reservoir conducted for the *2016 Region C Water Plan*.¹ Data on impacts on other natural resources is taken from the *Environmental Evaluation Interim Report – Sulphur River Basin – Comparative Assessment*.² The environmental evaluation is a recent report developed for the U.S. Army Corps of Engineers as part of an on-going basin-wide assessment of the Sulphur River Basin. It was completed in June 2013. The report includes environmental analyses of Marvin Nichols Reservoir and other potential water supply projects in the Sulphur Basin at numerous conservation storage elevations.

2.3 Impacts on Environmental Water Needs

Texas Administrative Code §357.34(d)(3)(B) includes specific requirements for the evaluation of environmental water needs:

“Evaluations of effects on environmental flows will include consideration of the Commission’s adopted environmental flow standards under 30 TAC Chapter 298 (relating to Environmental Flow Standards for Surface Water). If environmental flow standards have not been established, then environmental information from existing site-specific studies, or in the absence of such information, state environmental planning criteria adopted by the Board for inclusion in the state water plan after coordinating with staff of the Commission and the Texas Parks and Wildlife Department to ensure that water management strategies are adjusted to provide for environmental water needs including instream flows and bays and estuaries inflows.”

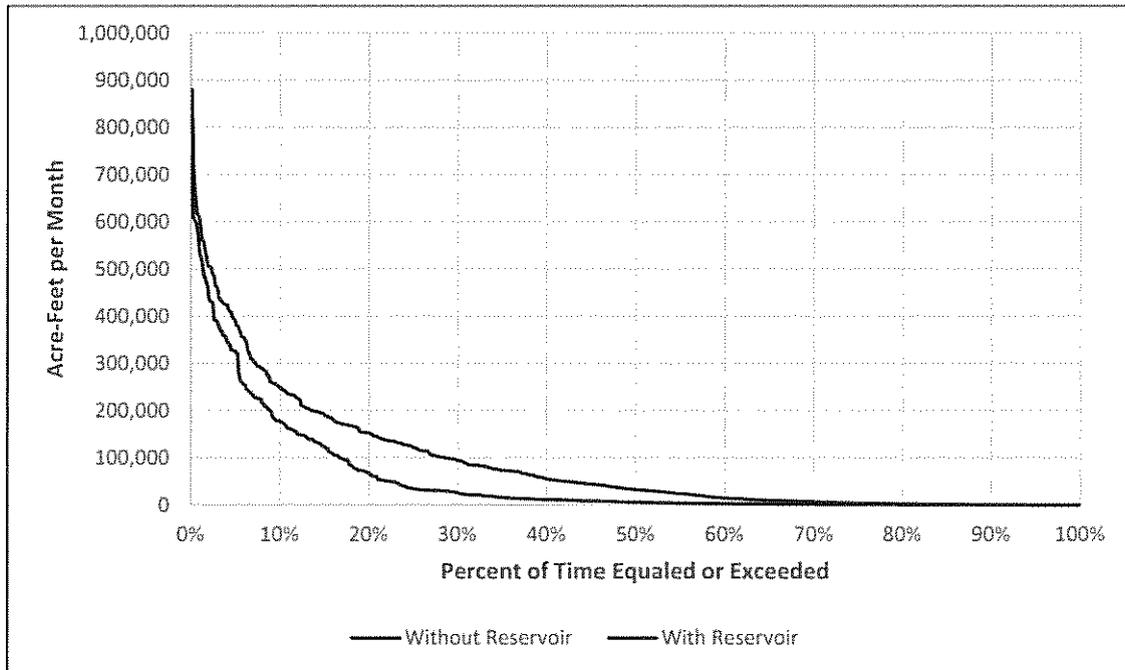
The Texas Commission on Environmental Quality (TCEQ) has not yet adopted environmental flow standards under 30 TAC Chapter 298 for the Sulphur Basin, and environmental instream flow information from existing site-specific studies is not available for the proposed Marvin Nichols Reservoir. As required by TWDB rules, the operation of the proposed reservoir was evaluated using state environmental planning criteria adopted by the Board for inclusion in the state water plan. Table 1 and Figure 2 summarize the flow-frequency relationship for the Sulphur River immediately below the proposed Marvin Nichols Reservoir with and without the reservoir. It is likely that the detailed studies required for reservoir permitting will result in different streamflow bypass requirements and different impacts on downstream flows. The results in Table 1 and Figure 2 reflect current TWDB requirements.



Table 1
Monthly Flow-Frequency Relationship with and without Marvin Nichols Reservoir

% of Months Flow is Exceeded	Flow in CFS	
	Without Marvin Nichols	With Marvin Nichols
5%	390,034	325,886
10%	249,152	178,350
20%	153,067	68,230
30%	94,801	26,716
40%	55,302	11,994
50%	33,526	6,387
60%	15,178	3,215
70%	7,489	1,562
80%	2,850	1,011
90%	900	327
95%	444	123

Figure 2
Flow-Frequency Relationship of Sulphur River at Marvin Nichols Dam Site with and without the Reservoir



2.4 Impacts on Wildlife Habitat

The primary impact of the proposed Marvin Nichols Reservoir on wildlife habitat would be the inundation of habitat by the reservoir. This impact was evaluated as part of the *Environmental Evaluation Interim Report – Sulphur River Basin – Comparative Assessment*,² prepared for the U.S. Army Corps of Engineers as part of an on-going basin-wide assessment of the Sulphur River Basin. The *Environmental Evaluation Interim Report* used the existing Texas Parks and Wildlife Ecological Systems Classification data set, which was developed by analysis of color infra-red and multi-spectral satellite imagery. The data set was considered to be the most recent, readily available data on land cover types in the Sulphur River Basin. The cover types determined from the Ecological Systems Data set were grouped into larger categories based on EPA’s Level One National Land Cover Data classifications. U.S. Fish and Wildlife Service National Wetlands Inventory data were used to further refine the classifications. The approach used in the *Environmental Evaluation Interim Report – Sulphur River Basin – Comparative Assessment*² is described in greater detail in Sections 2.1 and 2.2 of that report.

Table 2 shows the acreage of each cover type within the footprint of the proposed Marvin Nichols Reservoir. For comparison, the area of each cover type in all of Region D is also included. (Cover areas in Region D were developed for this study using the database developed in the *Environmental Evaluation Interim Report – Sulphur River Basin – Comparative Assessment*.²)

Table 2
Quantitative Reporting on Impacts on Wildlife Habitat

Cover Type	Area (Acres)		Marvin Nichols Reservoir Area as a Percent of Region D
	Marvin Nichols Reservoir	Region D	
Barren	<1	8,437	0.0%
Bottomland Hardwood Forest	6,894	417,265	1.7%
Forested Wetland	17,697	414,573	4.3%
Grassland/Oilfield	9,767	2,843,656	0.3%
Herbaceous Wetland	931	32,011	2.9%
Open Water	139	211,761	0.1%
Row Crops	408	314,184	0.1%
Shrub/Wetland	1,271	16,445	7.7%
Shrubland	232	47,485	0.5%
Upland Forest	4,342	2,869,079	0.2%
Urban	40	158,878	0.0%
Total	41,722	7,333,774	0.6%

Table 2 presents the impact of the proposed Marvin Nichols Reservoir on wildlife habitat in terms of the acreage of different types of habitat inundated by the reservoir. The reservoir will affect 4.3 percent of the forested wetlands, 1.7 percent of the bottomland hardwood forests, and 0.2 percent of the upland forests in Region D. Bottomland hardwood forests and forested wetlands are often lumped together and referred to as “bottomland hardwoods”, and they are considered to be particularly important as wildlife habitat. The total of these two land types in the proposed Marvin Nichols Reservoir (24,591 acres) represents 3.0 percent of the total of those two land types in all of Region D (831,838 acres). The 24,591 acres of bottomland hardwoods that would be inundated by the proposed reservoir represents about 0.4 percent of the estimated 5,973,000 acres³ of all bottomland hardwoods in Texas. As a part of permitting for the project, there will be more detailed assessments of the quality of the wildlife habitat that would be affected by the project, which will aid in the development of mitigation plans.



2.5 Impacts on Cultural Resources

The impacts of Marvin Nichols Reservoir on cultural resources would result from the inundation of cultural resource sites. The *Environmental Evaluation Interim Report – Sulphur River Basin – Comparative Assessment*² collected the following data on potential cultural resource impacts from Marvin Nichols Reservoir site and other proposed reservoir sites in the Sulphur River Basin:

- Number of known cultural resources
- Presence of known human remains/burials
- Acres of zones of archaeological potential
- Percentage of reservoir footprint with previous cultural resource surveys
- Surveyed site density

Table 3 is a quantitative reporting of known cultural resources in the Marvin Nichols Reservoir footprint. Table 4 is a quantitative reporting of other measures of potential impacts on cultural resources. The data in both tables is taken from *Environmental Evaluation Interim Report – Sulphur River Basin – Comparative Assessment*².

Table 3
Quantitative Reporting of Impacts on Cultural Resources – Known Cultural Resources

Likely Eligibility of Sites for the National Register of Historic Properties (NRHP)	Historic	Pre-historic	Caddo	Multi-Component	Prehistoric Multi-Component	Total
Likely Eligible	0	10	5	0	1	16
Possibly Eligible - Fair Chance	0	1	2	0	0	3
Possibly Eligible - Poor Chance	0	3	1	0	0	4
Not Likely Eligible	0	12	1	2	0	15

Table 4
Quantitative Reporting of Impacts on Cultural Resources – Other Factors

Measurement of Impact on Cultural Resources	Value for Measurement
Ratio of High Value Sites to Low Value Sites	1
Number of Known Cemeteries	1 (57 graves)
Acres with High Potential for Archaeological Sites	32,345
Percentage of Project Area Previously Surveyed for Cultural Resources	2.0%
Number of Acres Surveyed per Site Found in Survey	90.1

In general, impacts on cultural resources are mitigated through coordination with the Corps of Engineers and the Texas State Historical Commission during permitting. Coordination with Indian tribes on archeological issues would also be a part of the permitting process. Mitigation is accomplished by investigating and recording archaeological sites and proper relocation of cemeteries. This process of archaeological mitigation adds to project costs, and it has been considered in costs developed for the proposed Marvin Nichols Reservoir.

2.6 Impacts on Bays, Estuaries and Arms of the Gulf of Mexico

The proposed Marvin Nichols Reservoir would generally reduce flows discharging to bays, estuaries and arms of the Gulf of Mexico. The Sulphur River, on which the Marvin Nichols Reservoir would be located, is a tributary of the Red River, which does not flow to any bay, estuary or arm of the Gulf of Mexico in Texas. According to the U.S. Geological Survey, the Red River discharges to the Atchafalaya River, which flows to the Gulf of Mexico in Louisiana^{4,5}. Natural discharges from the Atchafalaya to the Gulf of Mexico average 58,000 cubic feet per second, or 42 million acre-feet per year^{4,5}. In addition, human diversions of flood flows from the Mississippi River to the Atchafalaya River add about 167,000 cfs, or 121 million acre-feet per year, to the discharge of the Atchafalaya^{4,5}, making a total discharge of 163 million acre-feet per year.

Assuming full use of Marvin Nichols Reservoir and no return flows, the project would reduce flows by about 425,000 acre-feet per year. This would reduce the discharge from the

Atchafalaya River to the Gulf of Mexico in Louisiana by about 0.3%. It should be noted that reducing the discharge from the Atchafalaya is moving toward natural conditions, offsetting a very small part of the flows added to the Atchafalaya by human diversion from the Mississippi River. The impact of Marvin Nichols Reservoir on bays, estuaries and arms of the Gulf of Mexico would be negligible.

2.7 Impacts on Threatened and Endangered Species

The Texas Water Development Board rules do not require reporting on potential impacts to threatened and endangered species. However, data on potential impacts to endangered and threatened species are available in the *Environmental Evaluation Interim Report – Sulphur River Basin – Comparative Assessment*² and are presented here. The U.S. Fish and Wildlife Service maintains lists of federally endangered and threatened species by county. The Texas Parks and Wildlife Department maintains a separate Texas, or State, list of endangered and threatened species by county. Table 5 summarizes State and Federally listed threatened and endangered species in the counties in which Marvin Nichols Reservoir would be located. Chapter 3 of the *Environmental Evaluation Interim Report – Sulphur River Basin – Comparative Assessment*² presents additional information on the development of the data in Table 5.

Of the Federally listed species, there are three potential species that are listed in the counties where Marvin Nichols would be located, but none of these species are expected to be impacted by the reservoir. There are a total of 20 threatened or endangered State-listed species within these counties, but only three threatened species have moderate potential to be impacted by the reservoir, and none have high potential. Because there are three State-listed threatened species potentially present in the counties in which Marvin Nichols Reservoir would be located, additional studies may be required to assess the impact on these species, if any, as reservoir development continues.



Table 5
Quantitative Reporting of Potential Impacts on Endangered and Threatened Species

Classification of Endangered and Threatened Species	Potential for Impact Due to Marvin Nichols Reservoir	Number Present in Counties Where Marvin Nichols Reservoir Would be Located
Federal Endangered Species	No Potential to Low Potential	2
	Moderate Potential	0
	High Potential	0
Federal Threatened Species	No Potential to Low Potential	1
	Moderate Potential	0
	High Potential	0
Texas Endangered Species	No Potential to Low Potential	2
	Moderate Potential	0
	High Potential	0
Texas Threatened Species	No Potential to Low Potential	15
	Moderate Potential	3
	High Potential	0

According to the *Environmental Evaluation Interim Report – Sulphur River Basin – Comparative Assessment*, “The Texas Endangered Species Act does not protect wildlife species from indirect or incidental take (e.g., destruction of habitat, unfavorable management practices, etc.). The TPWD has a Memorandum of Understanding with every state agency to conduct a thorough environmental review of state initiated and funded projects, such as highways, reservoirs, land acquisition, and building construction, to determine their potential impact on state endangered or threatened species.”²

3. Analysis and Quantification of the Impacts on Agricultural Resources

3.1 Requirements of Texas Water Code and Texas Water Development Board Rules

The requirements for quantitative reporting on the impacts of water management strategies on agricultural resources are included in the Board rules in Texas Administrative Code §357. Specifically, §357.34(d)(3)(C) requires that the quantitative reporting address impacts on agricultural resources. The rules do not include any more detailed description of what quantitative reporting is required. To respond to this requirement, this report provides the following quantitative reporting on the impacts of the proposed Marvin Nichols Reservoir on agricultural resources:

- Inundation of land potentially useful as agricultural resources
- Impacts on timberland and timber harvests
- Inundation of prime farmlands

3.2 Available Data for Impacts on Agricultural Resources

Data on impacts to land cover types potentially useful as agricultural resources is based on a land classification schema developed for the draft *Timberland and Agricultural Land Impact Assessment for Selected Water Resource Options in the Sulphur River Basin*⁷. Details on the methodologies used to estimate the impacts can be found in that report, which is included as Appendix B. The land classification schema was based on county appraisal district information and is comprised of the following categories:

- Hardwood,
- Mined pine and hardwood,
- Pine,
- Rangeland,
- Tilled cropland (irrigated cropland),
- Wildlife reserve, and
- Waste (“unusable” land)



Several of the categories were further divided based on merchantable value, but those subcategories were not used to summarize the data and are not described here.

3.3 Impacts Due to Inundation of Land Potentially Useful as Agricultural Resources

The development of land cover type information for the proposed Marvin Nichols Reservoir is discussed in Section 2.4. However, the draft *Timberland and Agricultural Land Impact Assessment for Selected Water Resource Options in the Sulphur River Basin*⁷ develops different land classifications than those discussed in Section 2.4. Because that study specifically assesses impacts on timberland and agricultural land, the impacts as determined using the land classifications in that study are reported here. Table 6 includes information on the area of these land cover types that would be inundated by the Marvin Nichols Reservoir as reported in the draft *Timberland and Agricultural Land Impact Assessment for Selected Water Resource Options in the Sulphur River Basin*⁷.

Table 6
Quantitative Reporting on Impacts on Agricultural Resources -
Land Potentially Useful for Agriculture (in Acres)

County	Impacted Area	Forest	Range/Crop	WPA – Range	WPA – Forest	Waste
Red River	29,675.50	18,369.28	11,306.22	0.00	0.00	0.00
Titus	10,004.36	5,134.62	1,321.54	445.23	3,019.39	83.57
Franklin	1,628.22	1,565.62	62.60	0.00	0.00	0.00
Total	41,308.07	25,069.51	12,690.37	445.23	3,019.39	83.57

Notes:

The total Impacted Area in this table differs from the total project area in Table 2 by 0.75 percent because of slight differences in the sources of the geospatial data used to calculate acreages of land type.

WPA = Wetland Preservation Area

The most significant impacts to agricultural resources in the project area are on resources that could potentially be useful to the silviculture industry. These impacts are discussed further (in terms of impacts on timberland and timber sales) in Section 3.4 below.

Table 7 is a summary of the estimated total value of timber and agricultural resources impacted by Marvin Nichols. The values are from the draft *Timberland and Agricultural Land Impact Assessment for Selected Water Resource Options in the Sulphur River Basin*⁷. Per the



aforementioned report, the timber values are based on “stumpage” (\$ per ton) and estimated volume (density) in tons per acre. The estimated values are based on the assumption that the timber is prudently managed for sale using conventional management practices as exercised by knowledgeable timberland owners. The broad assumption was that all timber is considered “in the market” and that it could be harvested under normal conditions using usual and customary practices. No adjustments were made for minimum merchantable harvest acreage, accessibility, timber market fluctuations, and the amount of affected timber considered “in the market”.

Per the draft *Timberland and Agricultural Land Impact Assessment for Selected Water Resource Options in the Sulphur River Basin*⁷, the valuation of agricultural land impacts are based on the “lease value” approach typically used by all county appraisal districts. The lease values used for estimating values for areas of impacted agricultural lands was based on selections from the publication “Texas Rural Land Value Trends 2013” (referenced in the *Timberland and Agricultural Assessment*⁷) as published by the Texas Chapter of the American Society of Farm Managers and Rural Appraisers, Inc. There being no readily available guidance or methodology for this type of valuation, the method used was to estimate economic impact based on three times the selected rental /lease value (equivalent to three years of rental/lease).

Table 7
Total Estimated Market Impact of Marvin Nichols Reservoir on Agricultural Resources

County	Total	Timberland	Range/Crop	WPA – Range	WPA – Timber
Red River	\$12,122,136	\$11,594,247	\$527,888	\$0	\$0
Titus	\$4,272,083	\$2,751,878	\$128,089	\$33,392	\$1,358,724
Franklin	\$1,522,086	\$1,512,564	\$9,522	\$0	\$0
Total	\$17,916,305	\$15,858,689	\$665,499	\$33,392	\$1,358,724

Notes: WPA = Wetland Preservation Area



3.4 Impacts on Timberland and Timber Harvests

Agricultural use of the land that would be inundated by the proposed Marvin Nichols Reservoir includes the production of timber. Information on land classified as timberland (hardwood, pine, and mixed pine/hardwood) that would be inundated by the proposed reservoir was based on data presented in the draft *Timberland and Agricultural Land Impact Assessment for Selected Water Resource Options in the Sulphur River Basin*⁷ prepared for the Sulphur River Basin Authority. The footprint of the proposed Marvin Nichols Reservoir is located in Red River, Titus and Franklin Counties. The proposed Marvin Nichols Reservoir will inundate about 25,000 acres of timberland (Table 8). Table 8 provides data on timberland in Marvin Nichols Reservoir as determined in the draft *Timberland and Agricultural Land Impact Assessment for Selected Water Resource Options in the Sulphur River Basin*⁷. It is important to recognize that this study⁷ made no assessment of how much of this timberland was already in production or could feasibly be put into production. Many factors affect the feasibility of timberland for production, including but not limited to accessibility, quality of timber, drought conditions, distance from milling facilities, and overall profitability.

Table 8
Timberland in Marvin Nichols Reservoir (in Acres)

Class	Red River	Titus	Franklin	Total
Hardwood	16,399.74	4,282.50	1,565.62	22,247.85
Mixed (Pine and Hardwood)	1,965.06	693.24	0.00	2,658.30
Pine	4.48	158.88	0.00	163.36
Total	18,369.28	5,134.62	1,565.62	25,069.51

It should also be noted that the approximately 22,200 acres of hardwood and approximately 2,700 acres of mixed timberland (which includes hardwood) presented in Table 8 above represent much of the 24,591 acres of land called out as “bottomland hardwoods” discussed in Section 2.4 - Impacts on Wildlife Habitat. The inundation of this bottomland hardwoods area with the construction of Marvin Nichols will impact the wildlife habitat, but if the land is not inundated and instead harvested as timberland, there would also be impacts to the wildlife habitat. In other words, the impacts to the wildlife habitat exist if Marvin Nichols is



constructed, but also exist, to some degree, if Marvin Nichols is not constructed and the timberland is harvested.

3.5 Impacts Due to Inundation of Prime Farmland

The U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) maintains data on prime farmland, which is defined as “land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses.”⁶ Prime farmland is not necessarily currently in agricultural use, but it must be available for agricultural use. For example, prime farmland soils underlying an urban area would not be counted as prime farmland because they are not available for agricultural use. Table 9 shows the acreage of prime farmland that would be inundated by the proposed Marvin Nichols Reservoir compared to prime farmland area in Region D and Texas. Marvin Nichols Reservoir would inundate 0.18 percent of the prime farmland in Region D and 0.01 percent of the prime farmland in Texas.

Table 9
Quantitative Reporting on Impacts on Agricultural Resources – Prime Farmland

Cover Type	Area (Acres)			Marvin Nichols Reservoir Area as a Percent of Area in:	
	Marvin Nichols Reservoir	Region D	Texas	Region D	Texas
Prime Farmland	3,445	1,949,929	35,087,200	0.18%	0.01%

4. Mitigation and the Effect of Mitigation on Impacts to Natural and Agricultural Resources

Developers of a new reservoir project are often required to provide mitigation for the impacts on natural resources in the form of land set aside, protected from development, and managed to enhance ecological value. Mitigation is generally only required for specific types of resources that would be impacted such as waters of the U.S. and the state, including wetlands. The developer of a project gets mitigation credit for improving the environmental functions of the land used for mitigation. The usual approach is to purchase degraded areas with limited environmental value and improve them through restoration, enhancement and careful management to achieve desired compensatory results at minimum cost.

Table 10 gives information on historical mitigation requirements for Texas reservoirs. Two additional reservoirs, Lower Bois d'Arc Creek Reservoir and Lake Ralph Hall, are currently in the permitting process, and mitigation requirements have not yet been finalized. Significant land has been acquired for mitigation for Lower Bois d'Arc Creek Reservoir, and the transaction was on a willing buyer-willing seller basis, with no condemnation of land.

Mitigation offsets the impacts of a project on natural resources by improving the ecological functions of other land. Mitigation would be expected to offset the impacts of the proposed Marvin Nichols Reservoir on natural resources. On the other hand, mitigation to protect natural resources may increase the impact on agricultural resources if the land acquired for mitigation is currently in agricultural use. (Because of the management of mitigation land to enhance ecological values, farming is unlikely to be allowed. Other agricultural uses, like timbering, would probably also be impossible or face significant controls and restrictions.)

Mitigation requirements for new reservoirs are generally determined during the permitting process, and the requirements for the proposed Marvin Nichols Reservoir are not yet known. Estimates of mitigation requirements have been developed as part of cost estimates for the project.⁸ The mitigation acreage required is estimated as twice the acreage of waters of the United States, other than non-stream open waters, that are impacted by the project. For the proposed Marvin Nichols Reservoir, the acreage of potential waters of the U.S., other than non-stream open waters, was estimated to be approximately 20,000 acres. The mitigation



requirement is estimated to be twice that amount, or approximately 40,000 acres. This is consistent with historical mitigation requirements for reservoirs in Texas. In the case of Marvin Nichols Reservoir, the land acquired for mitigation would probably include a large percentage of forested wetlands, which makes up most of the acreage of waters of the U.S. that would be affected by the reservoir. It should be emphasized that this is only an estimate. Actual mitigation requirements and location will be developed as permitting for the proposed reservoir proceeds. As discussed above, mitigation is intended to offset impacts on natural resources but may increase impacts to agricultural resources.

Table 10
Mitigation Requirements for Texas Reservoirs

Project	Date Impounded	Conservation Pool Area (Acres)	Required Mitigation Area (Acres)	Mitigation Ratio	Comments
Alan Henry	1993	2,884	3,000	1.04 to 1	Mitigation Downstream
Applewhite	Not completed (permitted in 1989)	2,500	2,500	1.0 to 1	Planned mitigation downstream
Chapman	1991	19,200	35,500	1.85 to 1	Mitigation next to reservoir and downstream
Gilmer	1997	1,010	1,557	1.54 to 1	
Joe Pool	1986	7,470	0	None	
Mitchell County	1993	1,463	0	None	
O.H. Ivie	1990	19,149	5,990	0.31 to 1	Mitigation next to reservoir
Palo Duro	1989	2,413	0	None	
Ray Roberts	1986	29,350	0	None	
Richland-Chambers	1987	44,752	13,700	0.31 to 1	Mitigation Downstream

Appendix A
List of References

List of References

1. Freese and Nichols, Inc., Alan Plummer Associates, Inc., CP&Y, Inc., and Cooksey Communications, Inc. *2016 Region C Water Plan*. November 2015.
2. Freese and Nichols, Inc. *Environmental Evaluation Interim Report - Sulphur River Basin - Comparative Assessment*. 2013.
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5. U.S. Census Bureau: *Statistical Abstract of the United States: 2012*, Table 365, Washington, D.C.
6. U.S. Department of Agriculture Natural Resources Conservation Service and Iowa State University Center for Survey Statistics and Methodology: *Summary Report: 2010 National Resources Inventory*, September 2013.
http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1167354.pdf
7. Sulphur Basin Group, PLLC. *Timberland and Agricultural Land Impact Assessment For Selected Water Resource Options in the Sulphur River Basin*. 2015.
8. Freese and Nichols, Inc., and MTG Engineers and Surveyors. *Sulphur River Basin Feasibility Study - Cost Rollup Report*. Rep. N.p.: Sulphur Basin Group, n.d. Print.

Appendix B

**Timberland and Agricultural Land Impact Assessment
For Selected Water Resource Options
in the Sulphur River Basin**



Timberland and Agricultural Land Impact Assessment
For Selected Water Resource Options in the
Sulphur River Basin

Prepared for:



The Sulphur River Basin Authority (SRBA)

FINAL DRAFT
July 29, 2015

Prepared by:

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Executive Summary

During the winter of 2015, the Sulphur Basin Group (SBG) conducted a series of analyses intended to estimate the impact of potential pool raise and reservoir construction projects at Wright Patman Lake and the Marvin Nichols 1A damsite within the Sulphur River Basin Texas on timber and other agricultural production at those sites. This assessment included an estimation of the impacted land area, volume/value of timberlands, and value of agricultural lands impacted within the following project boundaries:

- Wright Patman Lake: Between elevation 242.5' NGVD and 227.5' NGVD
- Marvin Nichols Reservoir: Below elevation 313.5' NGVD

The upper limit of each reservoir was chosen as a result of analyses performed during the period 2011-2014 by a variety of parties which suggest that those elevations represent the approximate scale of each reservoir component necessary, in combination, to deliver the target yield for a Sulphur River Basin supply strategy. In the case of Wright Patman Lake, elevation 227.5' is a proxy for the existing level of inundation of the reservoir. This elevation was developed in a prior study and is derived from the average of the actual water surface elevation of the lake on a daily basis from February 2006 to February 2013. The difference between 227.5' elevation and 242.5' represents the area that would be newly impacted by implementation of a reallocation project. Both government-owned and privately held parcels are found between these two elevations at Wright Patman Lake.

Initial Review

As initial input for the analysis, SBG contacted three major timber users in the region to discuss the current distribution of their timber sources, both inside and outside the Sulphur River Basin. These timber users included the International Paper Texarkana Mill (Domino, Texas), the Domtar Ashdown Mill (Ashdown, Arkansas), and the West Fraser New Boston Mill (New Boston, Texas.) Only West Fraser provided the requested data, with the provision that the "*...information cannot be shared with any competitors, consultants or appear in any publication, journal or public information identifying West Fraser as the source of this information.*" Due to the requested confidentiality, the data provided by West Fraser was not directly used in the analysis. Both International Paper and Domtar declined to provide data, citing matters of business confidentiality and, instead, recommended a document produced by the Texas A&M Forest Service entitled "Harvest Trends 2013," dated September 2014. They indicated that data contained in that document was representative of the region. Key excerpts from that document are presented in Tables ES-1 and ES-2 below:

Table ES-1 Harvest Volume

County	Volume Harvested (cubic feet)				Total	
	Pine		Hardwood			
Bowie	7,977,449	23.3%	6,612,207	26.5%	14,589,656	24.7%
Cass	18,477,965	54.0%	9,310,599	37.3%	27,788,564	47.0%
Franklin	326,276	1.0%	1,144,085	4.6%	1,470,361	2.5%
Morris	1,896,567	5.5%	1,160,139	4.7%	3,056,706	5.2%
Red River	4,509,199	13.2%	5,140,016	20.6%	9,649,215	16.3%
Titus	1,001,683	2.9%	1,566,883	6.3%	2,568,566	4.3%
Total	34,189,139	100.0%	24,933,929	100.0%	59,123,068	100.0%

Table ES-2 Harvest Value

County	Harvest Value (thousand dollars)			
	Stumpage		Delivered	
Bowie	6,181	26.6%	16,175	25.3%
Cass	10,845	46.6%	29,629	46.4%
Franklin	539	2.3%	1,616	2.5%
Morris	1,078	4.6%	3,182	5.0%
Red River	3,546	15.2%	10,366	16.2%
Titus	1,077	4.6%	2,891	4.5%
Total	23,266	100.0%	63,859	100.0%

As indicated by these tables, within the six-county region, Bowie and Cass Counties account for the following portions of the total timber harvests in the six-county area:

- 63.8% of harvested hardwood timber;
- 77.3% of harvested pine timber;
- 73.2% of stumpage-based harvest value; and
- 71.7% of delivery-based harvest value.

Absent more specific data from the timber users, more detailed information could not be derived from this approach.

Selected Water Resource Options in the Sulphur River Basin

County Appraisal District Approach

SBG then turned to the various County Appraisal Districts to evaluate whether appraisal information could be used to estimate the quantity and value of timber and agricultural resources on privately-held parcels at the Marvin Nichols project and within the Wright Patman flood pool. Information was obtained for Bowie, Cass, Titus, Franklin, and Red River counties; based on map review, all impacts in Morris County occur on government-owned property or are confined to within the Sulphur River channel, so no CAD information was needed from Morris County. A quick review of the CAD data suggested that it would not be a good basis for assessing timber value of individual parcels as the appraisals are primarily used for determination of “agricultural valuation” for tax purposes rather than estimating true market value. In many cases, the CAD values reflected as little as 10% of the estimated market value. As a result, alternate methods for estimating value were developed.

However, the CAD data proved useful in estimating the quantity of timber and agricultural lands within each project footprint. Parcel boundaries were cross-walked with the GIS shape files representing the appropriate contour elevations to develop an Impacted Parcel database. Land use for each parcel was individually assigned through review of digital aerial photographs as guided by the classification(s) identified in the CAD data. Parcels containing more than one classification were parsed based on digital measurement of the aerial photographs. Where inconsistencies were noted between the Appraisal District information and the photographs, classification was primarily derived from the photographs and adjacent parcel characterization. This process allowed SBG to estimate the acreage of various classifications of timberlands and rangeland within the footprint of each project.

GIS shape files depicting the boundaries of fee-owned land within the Wright Patman flood pool were provided to SBG by the Corps of Engineers. Where the Corps’ shape files conflicted with the CAD parcel boundaries, the Corps shape files were assumed to be correct and were adjusted only to ensure that all lands within the project boundaries at Patman were captured in the Impacted Parcel spreadsheet as either government-owned or privately-owned and that there were no gaps. General land use for each project boundary derived from this process is shown in Table ES-3 below.

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 Selected Water Resource Options in the Sulphur River Basin



**Table ES-3
 General Land Use Classification**

	Wright Patman Lake	Marvin Nichols Site
Project Area Size	37,800 acres	41,722 acres
Classification by percentage		
Hardwood	59.43%	53.86%
Mixed	28.34%	6.44%
Pine	5.44%	0.40%
Range	2.69%	30.69%

The land classification schema used by the Corps did not match the classification approach used by the various appraisal districts. Over the course of several meetings with Corps staff, professional forestry staff assisting on the project, and the Bowie County Appraisal District, a common schema was developed and each data base, including the Corps', was cross-walked to the common format. The common schema is comprised of 21 categories as follows:

- Hardwood (H)(categories 1-4, with 1 being the highest and 4 having little to no merchantable value)
- Mixed pine and hardwood (M1-M4)
- Pine (P1-P4)
- Rangeland (R1-R4)
- Tilled cropland (TD) – one category only
- Wildlife Reserve (Conservation Easement) further subdivided as:
 - WLDF-U (unclassified)
 - WLDF-R (rangeland)
 - WLDF-T (timber)
- Waste - a category used only by Titus CAD representing “unusable” land

Total acres of each classification within the project boundary for Wright Patman Lake and Marvin Nichols are shown in Tables ES-4 and ES-5, respectively.

Table ES-4
 Extent of Impacted Acres by Classification at Wright Patman Lake
 (acres)

WRIGHT PATMAN LAKE – ITEMIZED MARKET AREA IMPACT (ACRES)				
CLASS	BOWIE	CASS	GOVERNMENT	TOTAL
H1	1,166.96	68.66	16,034.13	17,269.75
H2	400.70	91.93	2,747.27	3,239.90
H3	297.33	91.19	1,476.74	1,865.27
H4	0.00	66.82	0.00	66.82
M1	8.30	301.15	9,073.82	9,383.27
M2	115.78	200.12	144.35	460.25
M3	329.40	75.51	395.43	800.34
M4	0.00	56.88	0.00	56.88
P1	11.24	27.82	1,956.55	1,995.60
P2	22.89	0.00	0.00	22.89
P3	34.68	0.00	0.00	34.68
P4	0.00	0.00	0.00	0.00
R1	68.38	238.82	0.00	307.20
R2	469.67	0.00	0.00	469.67
R4	1.76	0.00	0.00	1.76
TD	187.31	48.15	0.00	235.46
WLDF-U	0.00	0.00	0.00	0.00
WLDF_R	0.00	143.87	0.00	143.87
WLDF-T	0.00	0.00	0.00	0.00
Waste	0.00	0.00	1,410.94	1,410.94
TOTAL	3,114.40	1,410.92	33,239.23	37,764.55

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 Selected Water Resource Options in the Sulphur River Basin



Table ES-5
Extent of Impacted Acres by Classification at Marvin Nichols Site
 (acres)

MARVIN NICHOLS RESERVOIR – ITEMIZED MARKET AREA IMPACT (ACRES)				
CLASS	RED RIVER	TITUS	FRANKLIN	TOTAL
H1	759.10	476.26	823.97	2,059.33
H2	12,328.83	1,891.82	26.66	14,247.31
H3	3,300.79	871.31	714.98	4,887.08
H4	11.02	1,043.11	0.00	1,054.13
M1	61.16	0.00	0.00	61.16
M2	943.98	75.19	0.00	1,019.17
M3	948.11	1.89	0.00	950.00
M4	11.81	616.15	0.00	627.97
P1	0.00	0.00	0.00	0.00
P2	4.48	136.47	0.00	140.95
P3	0.00	0.00	0.00	0.00
P4	0.00	22.42	0.00	22.42
R1	121.81	111.34	49.67	282.82
R2	0.00	526.96	0.00	526.96
R3	0.00	468.89	0.00	468.89
R4	11,169.61	214.36	12.94	11,396.90
TD	14.80	0.00	0.00	14.80
WLDF-U	0.00	0.00	0.00	0.00
WLDF_R	0.00	445.23	0.00	445.23
WLDF-T	0.00	3,019.39	0.00	3,019.39
Waste	0.00	83.57	0.00	83.57
TOTAL	29,675.50	10,004.36	1,628.22	41,308.07

Timber Availability

In order to estimate the impacts to the regional timber industry of inundating the lands identified above, SBG needed to identify what portion of the lands identified above were actually in the commercial market. A number of factors affect this. For example, not all the lands identified above are located in areas that can be accessed on a commercial basis, nor are all the parcels identified above large enough to be viable for commercial timber activities. Landowners may choose to withhold their resources for the timber market for a variety of reasons, and some of those decisions are reflected in institutional arrangements such as the wildlife reserve programs identified above. Likewise, the government makes its determinations about timber sales on the basis of a variety of considerations, of which cash flow is only a minor part. Data provided by the Corps suggests that they harvest about 4% of the total pine volume annually and about 0.5% of the hardwood volume. Further complicating the assessment is the fact that variables important in determining whether or not timber is “in the market” will change over

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time and are potentially very sensitive to decisions about future water resources development within the Sulphur basin.

Ultimately, decisions about whether or not timber is “in the market” were determined to be highly subjective and fraught with the potential to introduce bias into the impact analysis. Accordingly, SBG proceeded on the basis that all timber present within the project boundary for both projects was, or could be, “in the market” and represents a potential impact.

Valuation Process

As previously noted, the CAD data substantially informed the assessment of the quantity of timber and agricultural lands affected but was not deemed to be sufficiently reliable to form the basis of estimating the value of resources affected. To assist with this process, SBG employed additional resources.

For agricultural land impacts (range, pasture or crop lands) on privately owned parcels, the valuation process was based on the “lease value” approach typically in use by all CADs and other agencies. (Note that agricultural lands at Wright Patman were not assessed due to lack of data.) The lease/rental values used for estimating value impact for areas of impacted agricultural lands were based on selections from the Texas Chapter of the American Society of Farm Managers and Rural Appraisers, Inc. (ASFMRA) publication “Texas Rural Land Value Trends 2013”. There being no readily available guidance or methodology for this type of valuation, the method used was to estimate economic impact based on three times the selected rental/lease value (equivalent to three years of rental/lease).

With respect to timber valuation, both qualitative and quantitative techniques were used. Wright Patman Lake is located within the main pine and hardwood belt in Texas while the Marvin Nichols site is located on the western edge of the pine and hardwood belt. Based on the preponderance of regional timber mills in the eastern part of the region rather than the western part of the region, and also based on data in the previously-cited TAMU report, expectations were that timber quality and value would decline the farther west the timber was located.

To estimate the density and value of each timber classification, at each project location, SBG teamed Kingwood Forestry Services (KFS), a firm having extensive experience in the Sulphur River Basin. KFS visually inspected selected sites to observe general forest conditions and timber quality and to estimate volumes. On the government-owned property, the sites inspected represented 94% of the classification types. Privately-held property was inspected where public access was available; this work was augmented with inspection of aerial imagery to assess parcel similarities. In general, inspection of

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impacted timber validated the initial assumption. As a rule, the timber around Wright Patman lake appears to be taller and of better quality, while much of the timber for Marvin Nichols is of poorer quality. Not as much of the impacted timber acreage at the Marvin Nichols site could be inspected from publicly-accessible locations and this observation is subject to additional field survey at some future time.

Based on the visual inspections, the amount of timber, on a per acre basis, was estimated for each classification type for both projects. These estimates are shown in Tables ES-6 and ES-7.

Table ES-6
Timber Assessment by Classification Type – Wright Patman Lake
(Tons)

WRIGHT PATMAN LAKE – ITEMIZED TIMBER VOLUME ASSESSMENT (TONS)				
CLASS	BOWIE	CASS	GOVERNMENT	TOTAL
H1 - HST	35,009	2,060	360,768	397,836
H1-HPW	46,679	2,746	481,024	530,449
H2- HST	6,011	1,379	41,209	48,598
H2 - HPW	18,032	4,137	123,627	145,795
H3 - HPW	8,920	2,736	44,302	55,958
H4-HPW	0	1,002	0	1,002
M1-HST	83	3,012	90,738	93,833
M1 - HPW	332	12,046	362,953	375,331
M1-PST	166	6,023	181,476	187,665
M1-PPW	41	1,506	45,369	46,916
M2-HPW	1,737	3,002	2,165	6,904
M2-PST	2,894	5,003	3,609	11,506
M2-PPW	579	1,001	722	2,301
M3-HPW	4,941	1,133	5,931	12,005
M3-PPW	3,294	755	3,954	8,003
M4 - HPW	0	569	0	569
M4 - PPW	0	569	0	569
P1 - HST *	56	139	9,783	9,978
P1 - HPW *	169	417	29,348	29,934
P1 - PST	1,011	2,504	176,089	179,604
P1 - PPW	169	417	29,348	29,934
P2 - HST *	114	0	0	114
P2 - HPW *	343	0	0	343
P2 - PST	1,145	0	0	1,145
P2-PPW	687	0	0	687
P3-HPW	347	0	0	347
P3-PPW	2,081	0	0	2,081
TOTALS	134,838	52,154	1,992,417	2,179,409

* Pine classifications have some hardwood that is accounted

Table ES-7
Timber Assessment by Classification Type – Marvin Nichols Site
(Tons)

MARVIN NICHOLS RESERVOIR – TIMBER VOLUME ASSESSMENT (TONS)				
CLASS	RED RIVER	TITUS	FRANKLIN	TOTAL
H1-HST	22,773	14,288	24,719	61,780
H1-HPW	18,978	11,906	20,599	51,483
H2-HST	61,644	9,459	133	71,237
H2-HPW	369,865	56,755	800	427,419
H3-HPW	99,024	26,139	21,449	146,612
H4-HPW	110	10,431	0	10,541
M1-HST	612	0	0	612
M1-HPW	1,223	0	0	1,223
M1-PST	1,223	0	0	1,223
M1-PPW	306	0	0	306
M2-HST	4,720	376	0	5,096
M2-HPW	28,319	2,256	0	30,575
M2-PST	4,720	376	0	5,096
M2-PPW	9,440	752	0	10,192
M3-HPW	28,443	57	0	28,500
M4-HPW	118	6,162	0	6,280
M4-PPW	59	3,081	0	3,140
P2-HPW *	45	1,365	0	1,409
P2-PST	112	3,412	0	3,524
P2-PPW	134	4,094	0	4,228
P4-PPW	0	560	0	560
TOTALS	651,868	151,468	67,701	871,037

* Pine classifications have some hardwood that is accounted

Value per acre was estimated for each land cover classifications based on “Stumpage” (\$/ton) and estimated density in tons per acre. The timber density values differ for each project site based on the inspection effort. The resulting “value per acre estimates” within the Wright Patman Lake Reallocation and Marvin Nichols Reservoir project areas are provided in Table ES-8 and ES-9, respectively. On the basis of these land cover unit values, a summary of the overall estimated value of hardwood and pine sawtimber and pulpwood within the Wright Patman Lake Reallocation and Marvin Nichols Reservoir project areas is provided in Table ES-10.

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Table ES-8

Value per Acre by Classification Type – Wright Patman Lake

WRIGHT PATMAN LAKE					
STUMPAGE (\$/TON)	\$ 35.00	\$ 15.00	\$ 30.00	\$ 8.00	VALUE
PRODUCT	HST (TONS/AC)	HPW (TONS/AC)	PST (TONS/AC)	PPW (TONS/AC)	(\$/ACRE)
CATEGORY					
H1	30	40			\$1,650.00
H2	15	45			\$1,200.00
H3		30			\$ 450.00
H4		15			\$ 225.00
M1	10	40	20	5	\$1,590.00
M2		15	25	5	\$1,015.00
M3		15		10	\$ 305.00
M4		10	10		\$ 230.00
P1	5	15	90	15	\$3,220.00
P2	5	15	50	30	\$2,140.00
P3		10		60	\$ 630.00
P4		5		25	\$ 275.00

ES-9

Value per Acre by Classification Type – Marvin Nichols Site

MARVIN NICHOLS RESERVOIR					
STUMPAGE (\$/TON)	\$ 35.00	\$ 15.00	\$ 30.00	\$ 8.00	VALUE
PRODUCT	HST	HPW	PST	PPW	(\$/ACRE)
CATEGORY					
H1	30	25			\$1,425.00
H2	5	30			\$ 625.00
H3		30			\$ 450.00
H4		10			\$ 150.00
M1	10	20	20	5	\$1,290.00
M2	5	30	5	10	\$ 855.00
M3		30			\$ 450.00
M4		10		5	\$ 190.00
P1		5	50	10	\$1,655.00
P2		10	25	30	\$1,140.00
P3		10		50	\$ 550.00
P4		5		25	\$ 200.00

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**Table ES-10
 Estimated Timber by Project**

	HST	HPW	PST	PPW	TOTAL
Wright Patman Lake	\$19,262,603	\$17,379,554	\$11,397,617	\$723,932	\$48,763,706
Marvin Nichols Site	\$4,855,341	\$10,560,657	\$295,283	\$147,409	\$15,858,689

Summary and Conclusions

Approximately 35,200 acres of timberlands at Wright Patman would be impacted by a pool raise to the 242.5' elevation. Of these, 31,800 acres (90%) are in government ownership. Approximately 26,200 acres of timber lands at the Marvin Nichols site would be impacted by construction of the reservoir to the 313.5' elevation. All of the Marvin Nichols acreage is in private ownership. Based on the analyses described above, the total value of both timber and agricultural resources for each project is shown, by County in Tables ES-11 and ES-12.

**Table ES-11
 Total Market Impact Summary – Wright Patman Lake**

PARCELS	TOTALS	TIMBERLAND	RANGE/CROP	WPA-RANGE	WPA-TIMBER
BOWIE	\$2,955,549	\$2,878,320	\$77,229	\$0	\$0
CASS	\$4,432,503	\$1,087,311	\$3,345,192	\$0	\$0
GOVERNMENT	\$45,432,998	\$44,798,075	\$0	\$0	\$634,924
TOTAL	\$52,821,051	\$48,763,706	\$3,422,421	\$0	\$634,924

**Table ES-12
 Total Market Impact Summary – Marvin Nichols Site**

PARCELS	TOTALS	TIMBERLAND	RANGE/CROP	WPA-RANGE	WPA-TIMBER
RED RIVER	\$12,122,136	\$11,594,247	\$527,888	\$0	\$0
TITUS	\$4,272,083	\$2,751,878	\$128,089	\$33,392	\$1,358,724
FRANKLIN	\$1,522,086	\$1,512,564	\$9,522	\$0	\$0
TOTAL	\$17,916,305	\$15,858,689	\$665,499	\$33,392	\$1,358,724

1 Introduction

Under a Master Agreement and further authorized by Work Order Number One, both executed and authorized on January 20, 2015, the Sulphur Basin Group PLLC (SBG) was authorized and tasked by the Sulphur River Basin Authority (SRBA) with identification of potential impacts to timber production and other important agricultural activities within the limits of a proposed Wright Patman Lake Reallocation (WPLR) and Marvin Nichols Reservoir (MNR) project. This assessment is to include an estimation of the impacted land area, volume/value of timberlands, and value of agricultural lands within study boundaries defined as follows:

- WPLR: Boundary limits are between elevation 242.5 feet-NGVD and 227.5 ft-NGVD; and
- Marvin Nichols Reservoir: Boundary limit is elevation 313.5 ft-NGVD.

The upper limit of each reservoir was chosen as a result of analyses performed during the period 2011-2014 by a variety of parties and suggested that those elevations represented the approximate scale of each reservoir component necessary, in combination, to deliver the target yield for a Sulphur River Basin Supply strategy. In the case of Wright Patman Lake, elevation 227.5 is a proxy for the existing level of inundation of the reservoir. This elevation was developed in a prior study and was derived from the average of the actual water surface elevation of the lake on a daily basis from February 2006 to February 2013. The difference between 227.5' elevation and 242.5' represents the area that would be newly impacted by implementation of a reallocation project. Both government-owned and privately held parcels are found between these two elevations at Wright Patman Lake.

In order to fully understand and assess these impacts, the general tasks included the SBG accomplishing the following:

- Research County Appraisal District (CAD) parcel appraisal information to develop a database for each parcel appraised for agricultural land or timberland uses and extract classification and appraisal information, generally following methods that approximate the accepted State of Texas format for type (Pine, Hardwood, or Mixed), age (variations of Mature, Intermediate, New), agricultural lands, and other relevant information;
- Meet with the Corps of Engineers to identify the location, amount, and value for timber harvesting or agricultural production conducted by the Federal Government for fee-owned lands at Wright Patman Lake;
- Assess the impact to the regional markets by removal of inundated land, categorized by land cover (timberland & agricultural range, pasture or crops) using CAD records and other available information, as well as studies and individuals/organizations with experience in these markets, developing a geo-referenced parcel map for the footprint of the WPLR & MNR study areas; and
- Meet with up to three major timber users in the region to discuss the current distribution of their timber sources, both inside and outside of the Sulphur River Basin.

2 Collection of Available Data

The data collection process was accomplished separately for (1) Privately owned parcels using 2014 CAD appraisal data and GIS representations of the parcel locations/configurations and (2) Government-owned parcels using land cover classifications and parcel locations/configurations as provided by the U.S. Army Corps of Engineers – Fort Worth District. Further, evaluation of both private and government-owned parcels required digital aerial imagery that was “of record” and photographed on or about the same date for consistency of comparisons, resulting in selection of the National Agriculture Imagery Program (NAIP) 2012 for “leaf on” imagery. This imagery data was obtained from <http://tnris.org/data-download/#/statewide>. Best available 2012 “leaf off” imagery was also needed and was obtained from the Ark-Tex Council of Governments (ATCOG) 911 System.

In general, the data collection process for privately owned parcels included the following:

- Obtain GIS Parcel Shape files for Bowie, Cass, Titus, Franklin & Red River Counties (Note: Morris County Data was omitted due to all impacts being within either government-owned parcels or within the banks of the Sulphur River) files from either:
 - CADs;
 - Texas GIS Data Website (<https://www.texasgisdata.com/> - a non-governmental private business); and
 - OGIInfo.com, LLC (www.OGIInfo.com - a non-governmental private business).
- Obtain CAD “appraisal data cards” or method by which to download such data online, as well as the associated “classification system” for timber, range/pasture and other, including such information as:
 - Parcel ID Number;
 - Owner Name and Interest;
 - Owner Address;
 - Legal Description (short) and Acreage of Record; and
 - 2014 Parcel Appraisal Information

In obtaining CAD data, numerous interviews, meetings, and work sessions were conducted with the Bowie CAD, who served as a liaison to other CADs in the region and helped facilitate data collection.

It should be noted that the 2014 CAD appraisal information, as relates to timberland and agricultural land, does not necessarily provide a good reflection of “true market value” as the appraisals are primarily used for determination of “agricultural valuation” for property tax purposes. Because of this limitation, additional assessment/valuation methods were used to estimate the value determined herein. These methods are discussed later in this report.

It should further be noted that GIS Parcel shape files obtained from Texas GIS Data Website and OGI files had some missing parcel ownership data, making it difficult to match CAD records in some instance. Given the goal of accounting for all impacts to all resources in the study areas, the use of such parcels required additional methods analyses that are also hereafter explained.

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For government-owned parcels within the WPLR study area, the following shape files were obtained from the Corps of Engineers – Fort Worth District:

- Parcel Acquisition Areas for acquisition types including:
 - Fee-owned; and
 - Easement (flowage).
- Land Cover Areas addressing boundaries, areas and classifications including:
 - Ecological class;
 - Common name;
 - Land cover class;
 - Division – Class – Sub-class; and
 - Mapping system class.

These data files were obtained under a confidentiality agreement (See Appendix A) that allows for reporting of assessments and conclusions in this report. Teleconferences and meetings were also held with Corps of Engineers, Fort Worth District and Wright Patman Lake personnel regarding obtaining the needed data and applicability/methods for the intended analyses. All assessment efforts for government-owned parcels were restricted to timberland impacts.

All of the above data was imported to ArcMap (ArcGIS 10.3), wherein all GIS analysis was conducted. All data was further converted, if required, to:

Projection: State Plane Coordinate System
Zone: Texas North Central (FIPS 4202)
Datum: NAD83
Planar Units: Feet (U.S. Survey)

3 Parcel Area Impact

Both the WPLR and MNR water resource options will impact timberland and agricultural land. The processes used to assess impacts to timberland and agricultural land, whether private or government-owned, are covered herein with summaries of findings.

The process for determining impacts to privately owned parcels is summarized as follows:

- The Project boundaries which were intersected with parcel maps to generate GIS impacted parcel database were:
 - WPLR Boundaries: 242.5 ft-NGVD shapefile, government-owned parcel shapefile and CAD parcel shapefiles, shown as Figure 1.
 - MNR Boundary: 313.5 ft-NGVD shapefile and CAD Parcels, shown as Figure 2.
- The resulting impacted parcels map for privately owned parcels within the WPLR Study Area is shown as Figure 3 and for the MNR Study Area is shown as Figure 4.
- A map of Government-owned Parcels and Easements is shown as Figure 5.
- The impacted parcel database for privately owned parcels was exported to a spreadsheet, and ordered by Parcel Identification Number;
- Parcel based evaluation of impacted properties was conducted based on 2014 CAD record data and 2012 Aerial Data, with a general approach as follows:
 - Identify appraisal information by the associated parcel identification number, confirming approximate parcel size;
 - Conflicting Parcels:
 - If the GIS Parcel was significantly larger or smaller than the “legal acreage,” this was listed but not corrected in favor of being sure that coverage of all of the study area was attributed;
 - Where there was conflict between government-owned and CAD Parcel data, the government-owned was assumed correct, given the presumed greater degree of reliability for this dataset;
 - Where ownership inconsistencies or absences were found, either in the GIS database or in the CAD provided information, such parcel impacts were accounted as “no ownership,” and assigned a Parcel ID for assessment tracking purposes (used $1 \times 10^6 + \text{Object ID}$); and
 - The goal was to always insure that all impacts within the study area were assigned to a parcel.
 - Identify the parcel in GIS and compare CAD appraisal values for land cover classifications with the 2012 aerials;
 - Digitally measure the areas of the various classifications, guided by the classifications used in the appraisals;



Figure 3 - WFLR Impacted Private Parcel



Figure 4. MNR Impacted Private Parcels



Figure 5 – Government-Owned Parcels & Easements

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- When appraisal areas or classifications were clearly inconsistent with aerial data, and the parcel showed timberland or agricultural land that was not listed by the appraisal, land cover was reclassified with the digitally measured quantity and downgraded value class for the timber or agriculture, based on adjacent appraisal classifications wherever possible;
- The confirmed or reclassified area quantities were recorded for each land cover classification;
- Quality control measures included:
 - 2012 Aerial based digitized comparison with 2% of the parcels;
 - Having quantities confirmed by staff not involved in the original work for approximately 2% of the parcels;
 - Accomplishing “overlap” checks along the entire length of common parcel lines between CAD Parcels and, where applicable, Government-owned parcels; and
 - A summary of the quality control effort is contained in a brief report as Appendix B.
- Parcel impact results for privately owned parcels were incorporated into a spreadsheet and GIS database, as follows:
 - View data and update the GIS Database with corrected information;
 - For specific timberland and agricultural land data, the data card information minimally contained the following:
 - GIS Area of the Parcel;
 - GIS Area of the Impacted portion of the Parcel based on intersection; and
 - GIS Classification of Impact Areas & Summations:
 - Hardwood, minimally 3 classes;
 - Pine, Minimally 3 classes;
 - Mixed, Minimally 3 classes;
 - Range (pasture) or Cropland with some types of class designation; and
 - Other Classifications.
- Appendix C contains tables of observed and recorded detailed impacts to private parcels.

In order to insure a proper and consistent evaluation of the government-owned timberlands, SBG teamed with Kingwood Forestry Services (KFS), a firm with extensive experience in the Sulphur River Basin. After several meetings between local Corps of Engineers timber management personnel, SBG and KFS representatives, the timberland classification process jointly established by local Corps of Engineers timber management personnel and the SBG Team for the government-owned parcels is summarized as follows:

- Intersect GIS shape files for government-owned (fee ownership) parcels and land cover classifications with the 242.5 ft-NGVD upper limits outline and the 227.5 ft-NGVD lower limits outline to generate an Affected Landcover Parcel Database, provided as Figure 6;

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- Affected Landcover Parcel Database was exported to a spreadsheet, ordered by a data field entitled “Common Name;”
- Assessment of Affected Landcover Parcels was accomplished as follows:
 - Used “Affected Landcover” shapefile and merged all unique “Landcover” categories.
 - This resulted in 34 unique categories, from .22 acres to 13,711 acres.
 - Used “Affected Landcover Ecological” shapefile and merged all unique “Ecological” categories.
 - This resulted in 11 unique categories, from .76 acres to 16,278 acres.
 - Used “Affected Landcover Common Name” shapefile and merged all unique “Common Name” categories.
 - This resulted in 39 unique categories, from .22 acres to 13,711 acres.
 - After evaluating Government provided shape files, it was decided to merge shapes based on the “Common Name” field.
 - Merged shapes, after aerial interpretation, into their unique Common Name for consistent stand cover types.
 - Not all stands are consistently stocked and some stand types are incorrect in the database. Initial inspections estimated that the largest stands have as much as 25% of swamp/water/buttonbush type of cover that will contribute no merchantable value. Other stands are similar or have more variation, as much as 50% difference. However, most of these differences occur on small acreage stands, so statistically, the impact is minor.
 - Viewed most major acreages in each “Common Name” and ranked them relative to all other Common Names in this shapefile. Rankings were given similar to CAD land classifications and are as follows;
 - Pine (P)
 - Mixed pine and hardwood (M)
 - Hardwood (H)
 - Value of stands from 1-4 with 1 being highest and 4 having VERY little merchantable value.
 - Analyzed the relative usable acreage based on ten 35 acre sample plots to help determine how much acreage is in swamp/open water/brush on the largest stand on Government lands. Found as much as 25% in non-timber acreage.
 - Additional coordination with Corps of Engineers
 - Provided the above evaluation to the Corps of Engineers;
 - Laid out inspection sites on USACE and private tracts in Bowie, Cass and Red River Counties. (i.e. to compare H1 Bowie Co to H1 Red River County)
 - Visited with Corps to gain access and find best representative volume locations on Corps property.
 - Conducted field inspections on Corps land, Bowie, Cass, Red River, Titus and Franklin Counties by truck, ATV and boat of the major stand types of significant size and most value potential.

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- Took field notes of volumes by general product category (HST, HPW, PST, PPW). Pictures of the most representative sites for various stands were taken to illustrate these volumes pictorially.
- Field notes of volume estimates per acre for various products were put into Excel to indicate volumes that will later be used to translate to a value.
- Developed tables for indicated timber volume and value by each timber classification in each county for Wright Patman and Marvin Nichols based on field observations and estimates.
- Confirmed this process with Corps of Engineers and got their agreement with this process.
- Field notes, tables and reports of the work by KFS, as summarized above, are contained in Appendix D.

The parcel area impacts within the WPLR and MNR study areas are summarized in Table 1 and Table 2, respectively. In both of these tables, a “checksum” is shown to compare the sum of the impacted GIS parcel shape areas to the total areas of each respective Study Area. In the WPLR study area, the checksum was within 0.1% of agreement so no explanation of the difference was researched. In the MNR study area, the checksum was within 1% and the difference was found to be associated with the Sulphur River, over which none of the CADs showed parcel association. In both instances the relatively low fraction of difference was also considered statistically insignificant.

Itemized parcel area impacts in these same study areas are provided in Table 3 and Table 4, respectively. In Table 3 and Table 4, the “Class” column is the CAD land cover classification system. “H” is predominantly hardwood, “M” is mixed pine and hardwood with neither being the predominant type, “P” is predominantly pine, “R” is range, “WLDF” is a wildlife classification, “TD” is tilled, and “Waste” is unusable land. These classifications were taken from the various CADs but were not consistently used throughout all CADs.

The numbers and letters next to the classification labels were generally used by CADs to indicate a quality designation from within the lands of that CAD. “1” was generally the highest category and refers to mature timber, “2” is considered intermediate timber, “3” is considered regeneration or young growth and “4” is considered to be the poorest category and generally means pre-merchantable, cutover or poorly established timber. The “U” was used to address unclassified (whether range or timber), “R” was used for range and the “T” was used for timbered, in modifying the WLDF classification, respectively.

Several of the CADs based classification on soil types and, in one instance, Classification P4 in Titus and Red River County, this was contrary to the numbering system, above. However; due to the relatively small quantity of pine timber in this particular classification, this difference considered statistically insignificant and therefore was ignored.

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Table 1 - WPLR Parcel Area Impact Summary (Acres)

PARCELS	IMPACTED AREA	FOREST	RANGE/CROP	WPA-RANGE	WPA-FOREST	WASTE
BOWIE	3,114.40	2,387.28	727.12	0.00	0.00	0.00
CASS	1,410.92	980.08	286.97	143.87	0.00	0.00
GOVERNMENT	33,239.23	31,828.29	0.00	0.00	1,410.94	0.00
TOTAL	37,764.55	35,195.65	1,014.09	143.87	1,410.94	0.00
CHECKSUM	35.86					
STUDY AREA	37,800.41					

Table 2 - MNR Parcel Area Impact Summary (Acres)

PARCELS	IMPACTED AREA	FOREST	RANGE/CROP	WPA-RANGE	WPA-FOREST	WASTE
RED RIVER	29,675.50	18,369.28	11,306.22	0.00	0.00	0.00
TITUS	10,004.36	5,134.62	1,321.54	445.23	3,019.39	83.57
FRANKLIN	1,628.22	1,565.62	62.60	0.00	0.00	0.00
TOTAL	41,308.07	25,069.51	12,690.37	445.23	3,019.39	83.57
CHECKSUM	414.31					
STUDY AREA	41,722.39					

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Table 3 - WPLR Itemized Parcel Area Impact (Acres)

CLASS	BOWIE	CASS	GOVERNMENT	TOTAL
H1	1,166.96	68.66	16,034.13	17,269.75
H2	400.70	91.93	2,747.27	3,239.90
H3	297.33	91.19	1,476.74	1,865.27
H4	0.00	66.82	0.00	66.82
M1	8.30	301.15	9,073.82	9,383.27
M2	115.78	200.12	144.35	460.25
M3	329.40	75.51	395.43	800.34
M4	0.00	56.88	0.00	56.88
P1	11.24	27.82	1,956.55	1,995.60
P2	22.89	0.00	0.00	22.89
P3	34.68	0.00	0.00	34.68
P4	0.00	0.00	0.00	0.00
R1	68.38	238.82	0.00	307.20
R2	469.67	0.00	0.00	469.67
R3	1.76	0.00	0.00	1.76
R4	187.31	48.15	0.00	235.46
TD	0.00	0.00	0.00	0.00
WLDF-U	0.00	143.87	0.00	143.87
WLDF_R	0.00	0.00	0.00	0.00
WLDF-T	0.00	0.00	1,410.94	1,410.94
Waste	0.00	0.00	0.00	0.00
TOTAL	3,114.40	1,410.92	33,239.23	37,764.55

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Table 4 - MNR Itemized Parcel Area Impact (Acres)

CLASS	RED RIVER	TITUS	FRANKLIN	TOTAL
H1	759.10	476.26	823.97	2,059.33
H2	12,328.83	1,891.82	26.66	14,247.31
H3	3,300.79	871.31	714.98	4,887.08
H4	11.02	1,043.11	0.00	1,054.13
M1	61.16	0.00	0.00	61.16
M2	943.98	75.19	0.00	1,019.17
M3	948.11	1.89	0.00	950.00
M4	11.81	616.15	0.00	627.97
P1	0.00	0.00	0.00	0.00
P2	4.48	136.47	0.00	140.95
P3	0.00	0.00	0.00	0.00
P4	0.00	22.42	0.00	22.42
R1	121.81	111.34	49.67	282.82
R2	0.00	526.96	0.00	526.96
R3	0.00	468.89	0.00	468.89
R4	11,169.61	214.36	12.94	11,396.90
TD	14.80	0.00	0.00	14.80
WLDF-U	0.00	0.00	0.00	0.00
WLDF_R	0.00	445.23	0.00	445.23
WLDF-T	0.00	3,019.39	0.00	3,019.39
Waste	0.00	83.57	0.00	83.57
TOTAL	29,675.50	10,004.36	1,628.22	41,308.07

4 Market Volume and Value Impact

For agricultural land impacts (range, pasture or crop lands) on privately owned parcels, the valuation process was based on the “lease value” approach typically in use by all CADs and other agencies. The lease/rental values used for estimating value for areas of impacted agricultural lands was based on selections from the publication “Texas Rural Land Value Trends 2013” as published by the Texas Chapter of the American Society of Farm Managers and Rural Appraisers, Inc. (ASFMRA). There being no readily available guidance or methodology for this type of valuation, the method used was to estimate economic impact based on three times the selected rental/lease value (equivalent to three years of rental/lease). It should also be again noted that the Corps of Engineers GIS database predominately addressed timberland classifications, with no indication of any market activity associated with pasture, range or croplands, therefore no analysis of volume or value was performed on government-owned lands regarding these classifications. Any impacts from the Wright Patman reallocation on pasture, range, or croplands on Government property are accordingly under-represented in this analysis.

SBG also teamed with KFS to insure a proper and consistent estimate of timberland volume and valuation for all private and government-owned impacted parcels within the study areas. Market volume impacts, as related herein, only apply to timberland impacts and are actually the professional opinion of the professional foresters of KFS, based on their extensive experience in this region. Similarly, value impacts for timberland are based on the volume estimates and market rates observed and recommended by KFS.

The field notes, reports and limitations of work by KFS are provided in Appendix D. A summary of the process for estimating timberland volumes and valuations used by KFS is as follows:

- Preparation, Methodology and Quality Control
 - Timber classification
 - Corps property-Met the Corps representative to discuss classification structure, provided/agreed to the classifications based on their knowledge and experience;
 - The classifications are not accurate, but based on the data available, the Corps of Engineers and SBG agreed to use a system similar to the CAD classification system for consistency; and
 - County private tracts- Utilized timber classification data from each CAD.
 - Inspection of timber classification sites
 - On the government property, selected sites were visited that appeared to represent approximately 94% of the acreage;
 - On the private parcels, publically available sites were selected and visited; and

- Many sites were not publically accessible, so aerial imagery was used to compare similarity to other sites that were able to be visited and adjusted accordingly.
- Timber volume estimates.
 - On-the-ground inspections were conducted to observe general forest conditions, quality and estimate volumes;
 - On the government property, approximately 94% of the stands classifications were inspected;
 - Volume estimates were based on ocular estimates from experience with timber inventory work and timber harvests of similar quality timber in the market area; and
 - Two KFS employees jointly inspected several different stand types to ensure quality control.
- Timber value estimates.
 - Timber values were derived from a combination of the following:
 - KFS's experience in the market selling similar quality timber (In 2014, KFS sold over 60 timber sales representing over 7,000 acres and approximately 420,000 tons of timber;
 - Knowledge of other timber sales from buyers and sellers;
 - Conversations with local timber buyers and mills;
 - Adjustments for quality of timber observed; and
 - Adjustments for merchantability of the timber for summer-time access only in light of the understanding that:
 - Current markets do not accurately reflect pulpwood values due to the inability to access the timber;
 - Therefore, values are based on historical timber sale experience for similar summer-time accessible timber; and
 - Sawtimber markets have remained steady and are expected to stay that way, so no adjustment was made.
- Field Inspection Process:
 - Wherever possible, pre-selected and accessible examples of the GIS classifications for private and government-owned land cover parcels were inspected;
 - Field inspections were conducted on government-owned land in Bowie and Cass Counties and on privately owned land in Bowie, Cass, Red River, Titus and Franklin Counties;
 - Inspections were conducted from within a vehicle (truck, ATV and/or boat) for each of the major stand types of significant size and most value potential;
 - Based on KFS's extensive expertise in such estimates and valuations, field notes were recorded regarding field volume estimates by general product categories (1) Hardwood

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- Sawtimber (HST), Hardwood Pulpwood (HPW); Pine Sawtimber (PST), and Pine Pulpwood (PPW);
- Pictures of the most representative sites for various stands were taken to illustrate these volumes; and
- KFS's Field Notes, Observations & Report are included as Appendix D.
- Volume Estimates
 - Volume estimates were based on field inspection and the corresponding stand categories;
 - Field note volume estimates per acre for various products were input into an Excel spreadsheet for analysis and selection of volumes which were translated to value estimates; and
 - Tables were developed for indicated timber volume and value for each timber classification in each county for Wright Patman Lake and Marvin Nichols Reservoir study areas.

The market volume within the WPLR and MNR study areas are summarized in Table 5 and Table 6, respectively. Itemized market volume and value impacts in these same study areas are provided in Table 7 and Table 8, respectively.

Table 5 - WPLR Market Volume Impact Summary (Tons)

PRODUCT	HST	HPW	PST	PPW
ESTIMATED TONS	550,360	1,158,637	379,921	90,491

Table 6 - MNR Market Volume Impact Summary (Tons)

PRODUCT	HST	HPW	PST	PPW
ESTIMATED TONS	138,724	704,044	9,843	18,426

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Table 7 - WPLR Itemized Market Volume Impact (Tons)

CLASS	BOWIE	CASS	GOVERNMENT	TOTAL
H1 - HST	35,009	2,060	360,768	397,836
H1-HPW	46,679	2,746	481,024	530,449
H2- HST	6,011	1,379	41,209	48,598
H2 - HPW	18,032	4,137	123,627	145,795
H3 - HPW	8,920	2,736	44,302	55,958
H4-HPW	0	1,002	0	1,002
M1-HST	83	3,012	90,738	93,833
M1 - HPW	332	12,046	362,953	375,331
M1-PST	166	6,023	181,476	187,665
M1-PPW	41	1,506	45,369	46,916
M2-HPW	1,737	3,002	2,165	6,904
M2-PST	2,894	5,003	3,609	11,506
M2-PPW	579	1,001	722	2,301
M3-HPW	4,941	1,133	5,931	12,005
M3-PPW	3,294	755	3,954	8,003
M4 - HPW	0	569	0	569
M4 - PPW	0	569	0	569
P1 - HST	56	139	9,783	9,978
P1 - HPW	169	417	29,348	29,934
P1 - PST	1,011	2,504	176,089	179,604
P1 - PPW	169	417	29,348	29,934
P2 - HST	114	0	0	114
P2 - HPW	343	0	0	343
P2 - PST	1,145	0	0	1,145
P2-PPW	687	0	0	687
P3-HPW	347	0	0	347
P3-PPW	2,081	0	0	2,081
TOTALS	131,724	52,154	1,992,417	2,179,409

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Table 8 - MNR Itemized Market Volume Impact (Tons)

CLASS	RED RIVER	TITUS	FRANKLIN	TOTAL
H1-HST	22,773	14,288	24,719	61,780
H1-HPW	18,978	11,906	20,599	51,483
H2-HST	61,644	9,459	133	71,237
H2-HPW	369,865	56,755	800	427,419
H3-HPW	99,024	26,139	21,449	146,612
H4-HPW	110	10,431	0	10,541
M1-HST	612	0	0	612
M1-HPW	1,223	0	0	1,223
M1-PST	1,223	0	0	1,223
M1-PPW	306	0	0	306
M2-HST	4,720	376	0	5,096
M2-HPW	28,319	2,256	0	30,575
M2-PST	4,720	376	0	5,096
M2-PPW	9,440	752	0	10,192
M3-HPW	28,443	57	0	28,500
M4-HPW	118	6,162	0	6,280
M4-PPW	59	3,081	0	3,140
P2-HPW	45	1,365	0	1,409
P2-PST	112	3,412	0	3,524
P2-PPW	134	4,094	0	4,228
P4-PPW	0	560	0	560
TOTALS	651,868	151,468	67,701	871,037

For value estimates, adjustments were made for merchantability of the timber for summer-time access only. It should be noted that current markets do not accurately reflect pulpwood values due to the inability to access the timber because of wet weather. Therefore, values are based on historical timber sale experience for similar summer-time accessible timber. Sawtimber markets have remained steady and are expected to stay that way, so no adjustment was made. As with any inventory estimate, actual volumes will be somewhat different from estimated volumes. The uncertainty of the estimates is increased as a result of the parcels which could not be viewed due to lack of access.

The estimated values are based upon the assumption that the subject timber is prudently managed for sale using conventional management practices as exercised by knowledgeable timberland owners. Imprudent management or timber marketing practices may result in a substantial reduction in value

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without offsetting cash realizations. Further, this value estimate was not based on a requested minimum or maximum valuation, or a specific valuation.

Based on all of the aforementioned qualifiers and limitations, an estimated value per acre was performed for various land cover classifications in the Wright Patman Lake and Marvin Nichols Reservoir study areas, based on "Stumpage" (\$/ton) and estimated volume (density) in tons per acre. It will be noted that the volume (density) values differ between the project areas as a result of the inspection. This difference is consistent with what is known to be typical of the respective locations.. The resulting land cover area value per acre estimates within the Wright Patman Lake Reallocation and Marvin Nichols Reservoir study areas are provided in Table 9 and Table 10, respectively.

On the basis of these land cover unit values, a summary of the overall estimated value of hardwood and pine sawtimber and pulpwood within the Wright Patman Lake Reallocation and Marvin Nichols Reservoir study areas is provided in Table 11 and Table 12, respectively.

Table 9 - WPLR Land Cover Category Value Per Acre

WRIGHT PATMAN LAKE - DENSITIES & UNIT VALUES					
STUMPAGE (\$/TON)	\$35.00	\$15.00	\$30.00	\$8.00	VALUE
PRODUCT	HST (TONS/AC)	HPW (TONS/AC)	PST (TONS/AC)	PPW (TONS/AC)	(\$/ACRE)
CATEGORY					
H1	30	40			1,650.00
H2	15	45			1,200.00
H3		30			450.00
H4		15			225.00
M1	10	40	20	5	1,590.00
M2		15	25	5	1,015.00
M3		15		10	305.00
M4		10		10	230.00
P1	5	15	90	15	3,220.00
P2	5	15	50	30	2,140.00
P3		10		60	630.00
P4		5		25	275.00

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Table 10 - MNR Land Cover Category Value Per Acre

MARVIN NICHOLS RESERVOIR - DENSITIES & UNIT VALUES					
STUMPAGE (\$/TON)	\$35.00	\$15.00	\$30.00	\$8.00	TOTAL
PRODUCT	HST	HPW	PST	PPW	(\$/ACRE)
CATEGORY					
H1	30	25			1,425.00
H2	5	30			625.00
H3		30			450.00
H4		10			150.00
M1	10	20	20	5	1,290.00
M2	5	30	5	10	855.00
M3		30			450.00
M4		10		5	190.00
P1		5	50	10	1,655.00
P2		10	25	30	1,140.00
P3		10		50	550.00
P4				25	200.00

Table 11 - WPLR Overall Estimated Value

VALUE	HST	HPW	PST	PPW	TOTAL
ESTIMATED VALUE	\$19,262,603	\$17,379,554	\$11,397,617	\$723,932	\$48,763,706

Table 12 - MNR – Overall Estimated Value

PRODUCT	HST	HPW	PST	PPW	TOTAL
ESTIMATED VALUE	\$4,855,341	\$10,560,657	\$295,283	\$147,409	\$15,858,689

Itemized timber market values in these same study areas are provided in Table 13 and Table 14, respectively.

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Table 13 - WPLR Itemized Timber Market Values

CLASS	BOWIE	CASS	GOVERNMENT	TOTAL
H1	\$1,925,489	\$113,285	\$19,842,230	\$21,881,005
H2	\$480,845	\$110,311	\$3,296,720	\$3,887,876
H3	\$133,799	\$41,036	\$664,534	\$839,370
H4	\$0	\$15,036	\$0	\$15,036
M1	\$13,190	\$478,829	\$14,427,380	\$14,919,400
M2	\$117,513	\$203,126	\$146,514	\$467,153
M3	\$100,466	\$23,031	\$120,606	\$244,102
M4	\$0	\$13,082	\$0	\$13,082
P1	\$36,177	\$89,575	\$6,300,089	\$6,425,842
P2	\$48,991	\$0	\$0	\$48,991
P3	\$21,849	\$0	\$0	\$21,849
P4	\$0	\$0	\$0	\$0
R1	\$12,308	\$2,939,368	\$0	\$2,951,676
R2	\$56,360	\$0	\$0	\$56,360
R3	\$132	\$0	\$0	\$132
R4	\$8,429	\$405,824	\$0	\$414,253
TD	\$0	\$0	\$0	\$0
WLDF-U	\$0	\$0	\$0	\$0
WLDF_R	\$0	\$0	\$0	\$0
WLDF-T	\$0	\$0	\$634,924	\$634,924
Waste	\$0	\$0	\$0	\$0
Total	\$2,955,549	\$4,432,503	\$45,432,998	\$52,821,051

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Table 14 – MNR Itemized Timber Market Values

CLASS	RED RIVER	TITUS	FRANKLIN	TOTAL
H1	\$1,081,724	\$678,669	\$1,174,158	\$2,934,550
H2	\$7,705,517	\$1,182,387	\$16,664	\$8,904,568
H3	\$1,485,354	\$392,088	\$321,742	\$2,199,184
H4	\$1,653	\$156,467	\$0	\$158,120
M1	\$78,898	\$0	\$0	\$78,898
M2	\$807,101	\$64,290	\$0	\$871,392
M3	\$426,650	\$851	\$0	\$427,501
M4	\$2,245	\$117,069	\$0	\$119,313
P1	\$0	\$0	\$0	\$0
P2	\$5,106	\$155,574	\$0	\$160,680
P3	\$0	\$0	\$0	\$0
P4	\$0	\$4,483	\$0	\$4,483
R1	\$21,925	\$20,041	\$8,940	\$50,907
R2	\$0	\$63,235	\$0	\$63,235
R3	\$0	\$35,167	\$0	\$35,167
R4	\$502,632	\$9,646	\$582	\$512,861
TD	\$3,330	\$0	\$0	\$3,330
WLDF-U	\$0	\$0	\$0	\$0
WLDF_R	\$0	\$33,392	\$0	\$33,392
WLDF-T	\$0	\$1,358,724	\$0	\$1,358,724
Waste	\$0	\$0	\$0	\$0
Total	\$12,122,136	\$4,272,083	\$1,522,086	\$17,916,305

The result of this process indicated a more realistic estimated value of the impacted timber than using the CAD values. Using the CAD appraised values would have resulted in underestimating timber values significantly. While there are certainly accuracy limitations with this process, it has a more realistic range than the values provided by the CAD values. This is illustrated in Table 15 which compares CAD values to those estimated by KFS and based on ASFMRA.



Table 15 - Appraisal Value Comparison

CLASS	BOWIE	CASS	AVERAGE	VALUE USED	RED RIVER	TITUS	FRANKLIN	AVERAGE	VALUE USED
H1	\$129.63	\$134.50	\$132.07	\$1,650.00	\$130.00	\$116.38	\$99.40	\$115.26	\$1,425.00
H2	\$63.75	\$69.13	\$66.44	\$1,200.00	\$65.00	\$47.88	\$73.64	\$62.17	\$625.00
H3	\$44.00	\$48.88	\$46.44	\$450.00	\$46.00	\$36.28	\$48.96	\$43.75	\$450.00
H4	\$21.38	\$26.13	\$23.76	\$225.00	\$24.00	\$15.71	\$35.34	\$25.02	\$150.00
M1	\$260.63	\$265.38	\$263.01	\$1,590.00	\$260.00	\$262.34	\$638.40	\$386.91	\$1,290.00
M2	\$168.13	\$173.25	\$170.69	\$1,015.00	\$169.00	\$165.97	\$455.87	\$263.61	\$855.00
M3	\$94.13	\$99.13	\$96.63	\$305.00	\$95.00	\$81.17	\$278.38	\$151.52	\$450.00
M4	\$74.25	\$78.75	\$76.50	\$230.00	\$76.00	\$74.33	\$167.13	\$105.82	\$190.00
P1	\$300.88	\$307.00	\$303.94	\$3,220.00	\$299.00	\$321.45	\$1,071.86	\$564.10	\$1,655.00
P2	\$179.50	\$185.38	\$182.44	\$2,140.00	\$178.00	\$194.76	\$769.60	\$380.79	\$1,140.00
P3	\$119.50	\$125.25	\$122.38	\$630.00	\$120.00	\$95.01	\$477.30	\$230.77	\$550.00
P4	\$153.63	\$157.88	\$155.76	\$275.00	\$155.00	\$160.47	\$295.66	\$203.71	\$200.00
R1 *	\$129.63	\$98.32	\$113.98	\$180.00	\$131.00	\$115.62	\$100.10	\$115.57	\$180.00
R2 *	\$63.75	\$0.00	\$31.88	\$120.00	\$117.00	\$95.18	\$0.00	\$70.73	\$120.00
R3 *	\$44.00	\$0.00	\$22.00	\$75.00	\$78.00	\$79.25	\$0.00	\$52.42	\$75.00
R4 *	\$21.38	\$68.00	\$44.69	\$45.00	\$31.00	\$31.37	\$70.18	\$44.18	\$45.00

* 3 years @ Rental Range per "TEXAS rural land value trends 2013" - ASFMRA Texas Chapter (table below)

Northeast Texas				
Land Use or Class	Year Range	Acres/Tract	Rental Range	Acres/Tract
Timberland	2007-2008	200-500	\$10-15	200-500
Timberland	2009-2010	200-500	\$10-15	200-500
Timberland	2011-2012	200-500	\$10-15	200-500
Timberland	2013-2014	200-500	\$10-15	200-500

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This report did not adjust for several factors that will likely have an impact on the value and merchantability of timber. The broad assumption of this report is that all timber is considered “in the market” and that it could be harvested under normal conditions using usual and customary practices. Due to scope and data limitations, no adjustments were made for the following factors:

- Minimum merchantable harvest acreage - For landowners with timber on less than approximately 10 acres, this small amount of timber is not typically considered merchantable due to the excessive cost to harvest that reduces the value of the timber. The exception to this is if an adjacent, ongoing timber harvest is occurring that might allow the small timber acreage to be harvested.
- Accessibility - Much of the timber to be harvested is in seasonally flooded areas. This is depicted in a few of the pictures taken around Wright Patman where the lake level was as 232 feet. Accessing and harvesting timber would have to be done during dry or drought conditions due to the many small streams and creeks that would need to be crossed to access much of the timber. Again, timber values should be less than reported due to resultant increased harvest costs.
- Timber market fluctuations - Markets are fluid and change with supply and demand. For example, expectations in 2016 are for a significant reduction in hardwood pulpwood consumption in the market areas, so it reasonable to assume future hardwood pulpwood markets will decline dramatically from the recent historical price range. Other products vary over time and since history is our only gauge to anticipate future markets, there are clearly limitations on the timber market values.
- Amount of affected timber considered “in the market” - The assumption in this report is that all timber is “in the market”. Based on observations throughout this study, on private owned lands, much more of the timber is considered “in the market” than on government lands. Typically, private landowners will promptly harvest timber when it becomes financially prudent to do so, whereas the government delays these harvests based on other considerations. As a result, government lands generally have a much higher percentage of higher value timber than on private lands, and that the timber on private lands is more typically and promptly harvested whereas a considerable amount of timber on government land is allowed to die naturally.

The conclusion to be drawn from these points is that all government-owned and privately owned timber is assumed to be “in the market” and the amount of timber and value of timber is considered an un-adjusted figure. Additional data collection would be required to better estimate the volume and value impact of these two lakes, but this methodology provides a beginning point with which to work.

5 Timber Resource User Impact

The work scope for this item required consultation with up to three major timber users in the region to discuss the current distribution of their timber sources, both inside and outside of the Sulphur River Basin. The timber users selected for contact and information regarding same are:

- International Paper – Texarkana Mill, 9978 FM 3129, Domino, TX 75572
 - Construction of the Texarkana Mill began in 1969 and the mill came on line in November 1972.
 - The mill was initiated to supply coated bleached board and liquid packaging board to International Paper’s converting divisions and bleached pine pulp to produce disposable diaper pulp.
 - Today, produces bleached board for packaging, hot and cold drink cupstock and folding cartons.

- Domtar - Ashdown Mill, 285 Hwy 71 South, Ashdown, AR 71822
 - Original mill opened in 1968.
 - Second paper machine added in 1975.
 - Third paper machine and new pulp line added in 1979.
 - Fourth paper machine and new pulp line added in 1991.
 - Became part of Domtar Inc. in 2001.

- West Fraser – New Boston Lumber Mill, Highway 82 East, P.O. Box 578, New Boston, TX 75570
 - SIC Code 2421, Sawmills and Planing Mills.
 - NAICS Code 2191201, Cut Stock, Resawing Lumber & Planing.
 - Business Category: Lumber (Rough, Sawed or Planed).

Attempts were made to meet and/or obtain timber resource distribution data from these three users. Only West Fraser provided the requested data, with the provision that the “...information cannot be shared with any competitors, consultants or appear in any publication, journal or public information identifying West Fraser as the source of this information.” Both International Paper – Texarkana Mill and Domtar – Ashdown Mill declined to provide data, citing matters of business confidentiality and, instead, recommended a document produced by the Texas A&M Forest Service entitled “Harvest Trends 2013,” dated September 2014. They indicated that data contained in Table 1 of this document was representative of the region. Due to the confidentiality requirement of West Fraser, even this data could not be published or even referenced by percentages within the Sulphur River Basin.

With no data from the local timber interests, all that is available is this overview of volumes and harvest values of both pine and hardwood timber from the counties within the study areas for the year 2013, based on the aforementioned “Harvest Trends 2013,” the results of which are presented in the tables, below:

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Table 16 - Analysis of "Harvest Trends 2013" Excerpts (Table 1)

County	Volume Harvested (cubic feet)					
	Pine		Hardwood		Total	
Bowie	7,977,449	23.3%	6,612,207	26.5%	14,589,656	24.7%
Cass	18,477,965	54.0%	9,310,599	37.3%	27,788,564	47.0%
Franklin	326,276	1.0%	1,144,085	4.6%	1,470,361	2.5%
Morris	1,896,567	5.5%	1,160,139	4.7%	3,056,706	5.2%
Red River	4,509,199	13.2%	5,140,016	20.6%	9,649,215	16.3%
Titus	1,001,683	2.9%	1,566,883	6.3%	2,568,566	4.3%
Total	34,189,139	100.0%	24,933,929	100.0%	59,123,068	100.0%

County	Harvest Value (thousand dollars)			
	Stumpage		Delivered	
Bowie	6,181	26.6%	16,175	25.3%
Cass	10,845	46.6%	29,629	46.4%
Franklin	539	2.3%	1,616	2.5%
Morris	1,078	4.6%	3,182	5.0%
Red River	3,546	15.2%	10,366	16.2%
Titus	1,077	4.6%	2,891	4.5%
Total	23,266	100.0%	63,859	100.0%

The following observations can be made based on this data:

- The predominate harvesting of pine and hardwood timber within the two areas of study fall within Bowie and Cass Counties, comprising the majority of the Wright Patman Lake Reallocation study area; AND
- Bowie and Cass County accounted for:
 - 77.3% of harvested hardwood timber;
 - 71.7% of harvested pine timber;
 - 73.2% of stumpage based harvest value; and
 - 71.7% of delivery based harvest value.

Based on "Harvest Trends 2013" and the above table excerpts, It can be concluded that in 2013, timber from within the Wright Patman Reallocation study area likely had a much higher volume and value than that within the Marvin Nichols Reservoir study area. This lines up fairly well with what was observed in

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the market volume portion of this report, above. Though specific information cannot be reported, this conclusion is generally supported by the data received from West Fraser, as well.

6 Conclusions

6.1 Market Value Conclusions

The estimated market value impact to timberland and agricultural land is summarized in the following Tables 17 and 18:

Table 17 - WPLR Total Timberland & Agricultural Market Value Impact Summary

PARCELS	TOTALS	TIMBERLAND	RANGE/CROP	WPA-RANGE	WPA-TIMBER
BOWIE	\$2,955,549	\$2,878,320	\$77,229	\$0	\$0
CASS	\$4,432,503	\$1,087,311	\$3,345,192	\$0	\$0
GOVERNMENT	\$45,432,998	\$44,798,075	\$0	\$0	\$634,924
TOTAL	\$52,821,051	\$48,763,706	\$3,422,421	\$0	\$634,924

Table 18 - MNR Total Timberland & Agricultural Market Value Impact Summary

PARCELS	TOTALS	TIMBERLAND	RANGE/CROP	WPA-RANGE	WPA-TIMBER
RED RIVER	\$12,122,136	\$11,594,247	\$527,888	\$0	\$0
TITUS	\$4,272,083	\$2,751,878	\$128,089	\$33,392	\$1,358,724
FRANKLIN	\$1,522,086	\$1,512,564	\$9,522	\$0	\$0
TOTAL	\$17,916,305	\$15,858,689	\$665,499	\$33,392	\$1,358,724

Based on these two tables, the impact to timber within the WPLR (\$48,763,706) would be on the order of over three times the value of timber within the MNR (\$15,858,689). As previously stated, these are unadjusted figures and assume all of the timber would be considered "in the market".

The total Impacted forested acreage is approximately 35,200 acres within the WLPR with the majority of the acreage, approximately 31,800 acres, is on government lands. Approximately 26,200 forested acres within the MNR is impacted from private ownership.

6.2 User Impact Additional Conclusions

In section "5.0 Timber Resource User Impact," above, the Texas A&M Forest Service publication, "Harvest Trends 2013," was used as the basis of observations on impacts on the timber users that depended upon the resources of Bowie, Cass, Red River, Titus and Franklin Counties. Using the quantities of estimated hardwood and pine sawtimber and pulpwood in tons, the following Table 19 summarizes a similar impact analysis for the combined WPLR and MNR study areas:

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Table 19 - Resource Impact Analysis/Comparison

CATEGORY	HST	HPW	PST	PPW
BOWIE	\$ 41,273	\$ 81,498	\$ 5,216	\$ 6,851
CASS	\$ 6,589	\$ 27,788	\$ 13,530	\$ 4,248
GOVERNMENT	\$ 502,498	\$ 1,049,351	\$ 361,175	\$ 79,393
WPL TOTAL	\$ 550,360	\$ 1,158,637	\$ 379,921	\$ 90,492
RED RIVER	\$ 89,749	\$ 546,125	\$ 6,055	\$ 9,939
TITUS	\$ 24,123	\$ 115,070	\$ 3,788	\$ 8,487
FRANKLIN	\$ 24,852	\$ 42,849	\$ -	\$ -
MNR TOTAL	\$ 138,724	\$ 704,044	\$ 9,843	\$ 18,426
COMBINED TOTAL	\$ 689,084	\$ 1,862,681	\$ 389,764	\$ 108,918
WPL %-age Combined	80%	62%	97%	83%
MNR %-age Combined	20%	38%	3%	17%

With the addition of the government-owned land from this analysis it can easily be observed that the hardwood and pine sawtimber and pulpwood within the WPLR study area accounts for the majority of the volume within the two study areas.

6.3 Qualitative Comparison of Timberland in the WPL & MNR Study Areas

The WPLR is located within the main pine and hardwood belt in Texas. The MNR is located on the western edge of the pine and hardwood belt. Fewer mills are found farther west in north Texas towards Dallas. The implication of this is that timber quality and value declines the farther west the timber is. Mills will be found where there is a viable source of quality and sustainable wood products that can be harvested economically.

Inspections of impacted timber indicated this is the case. Generally the timber around Wright Patman lake appears to be taller and of better quality, while much of the timber for the MNR is of poorer quality. There was a large block of acreage that could not be seen from public roads in Red River County, so a better inspection could alter this qualitative opinion.

6.4 Shortcomings of Analysis Methods

The two primary limitations of this analysis are the accuracy of the land classification data, as well as the values assigned to these classifications. While not without error, use of this approach to augment County Appraisal District estimates is superior to sole reliance on the appraisal district information.

APPENDICES

Appendix A – Confidentiality Agreement

Confidentiality Agreement

This Confidentiality Agreement ("Agreement") is made and entered into by and between U.S. Army Corps of Engineers ("Government") and Murray, Thomas & Griffin, Inc. ("MTG").

Recitals:

I. GOVERNMENT and MTG desire to discuss a possible business relationship relating to Government GIS data relating to vegetative cover and Government ownership of real property at Wright-Patman Lake for the Sulphur River Basin Authority ("SRBA") study (the "Project") and GOVERNMENT may find it desirable or necessary to provide certain confidential information to MTG for work related to this Project.

II. GOVERNMENT is willing to provide such confidential information pursuant to the terms of this Agreement.

NOW, THEREFORE, in consideration of the mutual covenants contained herein, the parties agree as follows:

Section 1. Definitions.

1.1. "Confidential Information" means any information that is disclosed by GOVERNMENT or its Representatives to the MTG or its Representatives in connection with the Project, whether before or after the date hereof and irrespective of the format in which the information is provided. "Confidential Information" includes any Evaluation Material and Mapping prepared by MTG. "Confidential Information" does not include information which:

(a) is, or subsequent to disclosure becomes, part of the public domain through no fault of the MTG;

(b) is lawfully disclosed to the MTG by a third party without any confidentiality obligation to GOVERNMENT;

(c) was in the possession of the MTG prior to disclosure by GOVERNMENT;

(d) is lawfully and independently developed by the MTG without use of the Confidential Information disclosed by GOVERNMENT and such independent development can be demonstrated through documentation.

1.2. "Evaluation Material" means notes, reports or other documents or materials which reflect, interpret, evaluate, include or are derived from the Confidential Information.

1.3. "Representatives" means a party's employees, officers, directors, attorneys, accountants and agents, and its affiliates and the employees, officers, directors, attorneys, accountants and agents thereof.

Section 2. Confidentiality. Except as provided in Section 5, MTG hereby agrees that the Confidential Information will be kept strictly confidential during the term of this Agreement. MTG also agrees that without the prior written consent of GOVERNMENT, the Confidential Information will not be disclosed by the MTG, in whole or in part, to any other person except as provided herein. MTG shall use the same care in protecting the Confidential Information as it uses to protect its own confidential information, provided that MTG shall not use less than reasonable efforts to protect the Confidential Information. The MTG may only disclose Confidential Information to those Representatives whose access is necessary and who have agreed to hold the Confidential Information in confidence by terms no less restrictive than those set forth herein. MTG agrees to be responsible for any unauthorized disclosures by its Representatives. Notwithstanding the above, MTG can disclose such confidential information as need to the SRBA.

Section 3. Ownership and Use of Confidential Information. All Confidential Information shall remain the property of GOVERNMENT and its assigns. No license or other rights under any patents, trademarks, copyrights or other proprietary rights is granted or implied by the disclosure of the Confidential Information. MTG shall not use the Confidential Information for any purpose other than for the study and evaluations relating to the Project.

Section 4. Disposition of Confidential Information. The MTG, upon written request from GOVERNMENT, shall promptly return or destroy all Confidential Information in its possession. If requested by GOVERNMENT, the MTG shall provide GOVERNMENT with a certificate that all Confidential Information has been returned or destroyed. The return or destruction of the Confidential Information shall not extinguish any rights or obligations hereunder with respect to the Confidential information.

Section 5. Legally Required Disclosures. If MTG is legally compelled to disclose any of the Confidential Information, MTG shall promptly notify GOVERNMENT of the disclosure. In such cases, MTG shall reasonably cooperate with GOVERNMENT to obtain a protective order or other reasonable assurance that the Confidential Information will be accorded confidential treatment. If MTG is nonetheless legally required to disclose the Confidential Information, then MTG may disclose the information without liability hereunder provided that the party may only furnish that portion of the Confidential Information which is legally required or necessary.

Section 6. Term. The confidentiality obligations of this Agreement shall expire five (5) years from the final date all deliverables are provided to the GOVERNMENT.

Section 7. No Warranties; Limitation of Liability. GOVERNMENT makes no representations or warranties as to the reliability, accuracy or completeness of the Confidential Information. GOVERNMENT shall not be subject to any liability to the MTG based on the MTG's use of the Confidential Information. In no event shall GOVERNMENT be liable to MTG for any incidental, indirect, special, punitive or consequential damages (including without limitation damages for lost profits).

Section 8. Remedies. MTG acknowledges that improper or unauthorized use or disclosure of Confidential Information could cause irreparable harm to GOVERNMENT and that monetary damages would not be an adequate remedy for a breach of this Agreement. In the event of any breach or threatened breach of this Agreement, GOVERNMENT shall be entitled to pursue injunctive and other equitable relief, and MTG agrees to waive any requirement for the

posting of a bond in connection with such remedy and any defense that GOVERNMENT may have an adequate remedy at law. Such injunctive and equitable relief shall not be deemed to be the exclusive remedy for a breach of this Agreement, but shall be in addition to all other available remedies.

Section 9. Relationship of Parties. The GOVERNMENT shall have no obligation to commence or continue discussions or negotiations, to exchange any Confidential Information, to reach or execute any agreement with the MTG, to refrain from engaging at any time in any business whatsoever, or to refrain from entering into or continuing any discussions, negotiations or agreements at any time with any third party, until each party executes a definitive agreement. Until such definitive agreement is executed, neither party shall have any liability to the other party with respect to the Project except as set forth in this Agreement. Neither party shall have any liability to the other party in the event that, for any reason whatsoever, no such definitive agreement is executed.

Section 10. Public Disclosure. Except as may be required by law, MTG shall not make any press release or other public disclosure regarding this Agreement, the Project or the negotiations concerning the Project Agreement without the prior written consent of GOVERNMENT.

Section 11. General.

11.1. **Governing Law.** This Agreement shall be construed and enforced in accordance with applicable Federal laws.

11.2. **Entire Agreement.** This Agreement constitutes the entire Agreement between the parties, supersedes any prior understandings or representations relating to the confidential treatment of the Confidential Information, and shall not be modified except by a written agreement signed by both parties.

11.3. **Assignability.** This Agreement may not be assigned by MTG.

11.4. **Severability.** All provisions of this Agreement are severable, and the unenforceability of any of the provisions of this Agreement shall not affect the validity or enforceability of the remaining provisions of this Agreement.

11.5. **No Waiver.** Failure of either party to insist upon strict performance of any of the terms and conditions shall not be deemed to be a waiver of those terms and conditions.

11.6. **Counterparts and Faxed Signatures.** This Agreement may be executed in counterparts, and in the absence of an original signature, faxed signatures will be considered the equivalent of an original signature.

11.7. Notices. Notices shall be in writing and shall be sent to the addresses listed below, either by personal delivery, by the U.S. Mail, overnight mail, fax or other similar means. All notices shall be effective upon receipt.

The parties have signed this Agreement effective as of the later signature date set forth below.

By: 

Print Name: Bob Murray

Title: President

Date: 7/20/2015

MTG Address:

5930 Summerhill Rd
TEXARKANA, TX 75503

Notice to the GOVERNMENT:

U.S. Army Corps of Engineers
819 Taylor Street
Room 2A-06
Fort Worth, TX 76102

Attn: Lucas Cecil

Appendix B – QA/QC Report

Timberland and Agricultural Impact Assessment For Selected Water Resource Options in the Sulphur River Basin

Quality Assurance & Quality Control Report

The procedure outlined below generally conforms to the written QA/QC document submitted before the work was undertaken, adjusted for how the work was ultimately accomplished.

❖ Area Assessment

- Wright Patman Lake Reallocation Study Area
 - Cass County
 - In GIS, panned the entire length of the intersect between Cass County parcels and Corps parcels;
 - Corrected numerous overlap areas with Corps properties not caught in original assessment due to state prior to receipt of Corps parcel shape files;
 - Out of 117 total parcels, quality assurance/control efforts included conducting random samples for verification of process and answers on Parcels 4120, 12416, 16172, 25914, and 57845 (4.2%);
 - All values were confirmed.
 - Bowie County
 - In GIS, panned the entire length of the intersect between Bowie County parcels and Corps parcels and corrected several overlap areas with Corps properties not caught in original assessment due to state prior to receipt of Corps parcel shape files;
 - Out of 136 total parcels, quality assurance/control efforts included conducting random samples for verification of process and answers on Parcels 01800001900, 07980011206, 10300000500, 16460024002, and 20880000100 (3.7%);
 - All values were confirmed.
 - Government-Owned Parcels
 - In GIS, panned the entire length of the intersection between 227.5 elevation and 242.5 elevation based on Government provided GIS data in Bowie and Cass Counties.
 - Merged individual stand shapefiles into similar CAD land classification system by utilizing current imagery and the government provided shapefile data. The category selected from the tabular data from the government was the “Common Name” categories.
 - A meeting was held with the government to agree to the land classifications.

- Marvin Nichols Reservoir Study Area
 - General - Panned the entire common county lines of Red River, Titus & Franklin Counties within the study area (occurs at the Sulphur River) and found a consistent average of approximately 90 feet of gap between same. This more than accounts for the differential between total area of impacted parcels and that of the study area.
 - Red River County - Out of 390 total parcels, quality assurance/control efforts included conducting random samples for verification of process and answers on Parcels 1301, 2332, 3961, 3994, 7470, 11795, 11797, and 12411 (2%). All values were confirmed with the exception of Parcel 2332, in which a correction was made. As a result, Parcel 2367 was added to the sampling and, with confirmation, quality assurance/control was accomplished.
 - Titus County - Out of 119 total parcels, quality assurance/control efforts included conducting random samples for verification of process and answers on Parcels 655, 2428, 8780, 8888, and 9826 (4.2%). All values were confirmed.
 - Franklin County - Out of 37 total parcels, quality assurance/control efforts included conducting random samples for verification of process and answers on Parcels 613, 3580, and 3327 (8.1%). All values were confirmed.

- ❖ Market Value Assessment - Process for assigning market value and volume estimates on Private Owned and Government Owned Parcels is as follows:
 - On-the-ground inspections were conducted to observe general forest conditions, quality and estimate volumes from most of the publically accessible sites.
 - On the Corps property, we were able to calculate that approximately 94% of the stands classifications were inspected.
 - Volume estimates were based on ocular estimates comparing experience with timber inventory, timber harvests and timber appraisals of similar quality timber in the market area.
 - Two KFS employees jointly inspected several different stand types to ensure quality control.
 - Timber values were derived from a combination of
 - KFS experience in the market selling similar quality timber,
 - In 2014, KFS sold over 60 timber sales representing over 7,000 acres and approximately 420,000 tons of timber
 - knowledge of other timber sales from buyers and sellers,
 - conversations with local timber buyers and mills,
 - adjustments for quality of timber observed,
 - adjustments were made for merchantability of the timber for summer-time access only.

- Current markets do not accurately reflect pulpwood values due to the inability to access the timber. Values are based on historical timber sale experience for similar summer-time accessible timber.
- Sawtimber markets have remained relatively steady and are expected to stay that way, so no adjustment was made.

❖ Conclusion: Quality assurance was effective in finding minor errors and corrections.

Appendix C - Detailed Impacts for Private Parcels

Bowie County Appraisal District

Note: Blue shaded rows were used in QA/QC efforts.

Cass County Appraisal District

Notes:

- Blue shaded rows were used in QA/QC efforts.
- Yellow shaded rows are assigned property IDs to address ownership inconsistencies or absences.

CASS COUNTY APPRAISAL DISTRICT - TIMBERLAND & AGRICULTURAL LAND DETAIL DATA SHEET (ACRES)															
PROP. ID	TOTAL IMP	ATH1	ATH2	ATH3	ATH4	ATH5	ATH6	ATH7	ATH8	ATH9	ATH10	ATH11	ATH12	ATH13	ATH14
16161	62.0679							41.1824							
16163	88.7406			88.7406											
16171	0.4173									0.4173					
16172	108.4335			70.0790										4.0500	22.3045
16453	0.1144			0.1144											
16598	0.0063									0.0063					
16620	8.8835			8.8835											
16604	11.5577							11.5577							
16675	2.1282							2.1282							
17175	14.7416							14.7416							
17176	7.9920							7.9920							
17741	9.6670									9.6670					
17746	7.3149														7.3149
17753	96.4539														96.4539
17755	0.4407			0.4407											
17756	0.0075			0.0075											
17758	0.0000														0.0000
17759	61.1879														61.1879
21181	0.0881							0.0881							
21970	0.0000														
22487	0.2925									0.2925					
22544	10.1919							10.1919							
22711	10.7819													10.7819	
22810	12.5427													12.5427	
22917	10.8286									10.8286					
22918	0.0000														0.0000
24512	2.1709					2.1709									
25912	15.0602							7.9160						7.1442	
25913	1.3963									1.3963					
25914	1.8703									1.8703					
26749	0.0000														0.0000
27091	0.2280									0.2280					
28810	0.0479							0.0479							
31790	1.7761							1.7761							
33171	10.0767									10.0767					
33691	4.1913							4.1913							
34233	1.6564													1.6564	
34119	2.7796													2.7796	
34174	4.0873													4.0873	
34197	5.4755													5.4755	
34290	16.1883													16.1883	
34291	4.0058									4.0058					
34543	8.0563													8.0563	
34551	10.3044									10.3044					

Red River County Appraisal District

Notes:

- Blue shaded rows were used in QA/QC efforts.
- Yellow shaded rows are assigned property IDs to address ownership inconsistencies or absences.

RED RIVER COUNTY APPRAISAL DISTRICT - TIMBERLAND & AGRICULTURAL LAND DETAIL DATA SHEET (ACRES)																	
Prop. ID	Tract No.	T1W	T2S	T3R	T4R	T5E	T6E	T7E	T8E	T9E	T10E	T11E	T12E	RF	Acres	1/2	1/4
1081	2.1504														14.9014		
1124	128.2177														89.9500		
1143	5.0011																
1146	6.6212																
1418	4.4086														1.4080		
19261	87.4817														87.4817		
1928	6.5281																
1971	31.2902														6.9120		
1974	128.1740														15.5707		
1978	159.2836														138.1740		
1984	0.1086														71.9620		
1986	86.2547															0.1086	
1990	2.2096														28.9080		
1991	292.2120																
1992	157.6280														61.8270		
1994	187.8080														95.7670		
1995	71.6778														15.9840		
1999	6.2447														71.6778		
4026	70.7245														17.7540		
4027	63.6030																
4028	189.0800																
4136	42.2800														22.1840		
4181	96.8488														10.8432		
4774	47.2651																14.6100
4809	108.4930														56.4700		
4818	145.9030														2.8750		
4819	240.9428														9.8720		
4818	178.2020																
4829	64.5983																
4838	23.6736																
5228	55.2499														23.8714		
5229	46.8985														71.8280		
5234	18.0209																
5360	69.6791														26.0506		
5561	21.2141														14.1507		
12661	43.4284														71.5141		
13778	170.2216														128.5180		
1679	41.0247														47.2647		
1679	94.9018														94.9018		
1679	154.8580														155.9980		
1679	133.9800														106.2000		
1679	129.6820																
1643	80.8481														82.1442		
1644	78.7181																
1723	1.6784														1.6784		
1723	15.8182														6.0171		
1723	8.5229														8.5229		
1734	1.2687														1.2687		

HEDYVILLE COUNTY APPROPRIATE SUBCOMMITTEE - HANDBOOK & AGRICULTURAL LAND DETAIL DATA SHEET (ACRES)																
Prop. No.	Total Area	TH	TNE	TH	TH	TH	TH	TH	TH	TH						
169701	9,4237		9,4237													
169711	4,6505		4,6505													
169777	49,5604		49,5604													
169781	51,5465		51,5465													
169779	31,4158		31,4158													
169801	50,3984		50,3984							50,3984						
169821	40,4101		40,4101													
169822	3,9688		3,9688							3,9688						
169831	35,4990		35,4990							35,4990						
169823	40,9568		40,9568													
169833	32,4118		32,4118							32,4118						
169875	14,0257		14,0257							14,0257						
169885	37,4242		37,4242							37,4242						
169887	41,0991		41,0991											41,0991		
169901	48,0904		48,0904													
169911	41,8273		41,8273							41,8273						
169921	11,0447		11,0447							11,0447						
169933	25,3968		25,3968							25,3968						
169934	49,5152		49,5152													
169935	51,9802		51,9802							51,9802						
169941	39,8078		39,8078													
169937	14,7000		14,7000							14,7000						
169938	0,1935		0,1935							0,1935						
170001	34,7505		34,7505													
170011	19,8211		19,8211							19,8211						
170021	22,0225		22,0225							22,0225						
170031	32,5380		32,5380							32,5380						
170032	19,4698		19,4698							19,4698						
170033	35,3181		35,3181							35,3181						
170034	34,8153		34,8153							34,8153						
170035	48,2930		48,2930							48,2930						
17004	39,6734		39,6734													
17007	2,1732		2,1732							2,1732						
17008	58,0779		58,0779							58,0779						
17009	60,1113		60,1113							60,1113						
17010	60,5699		60,5699							60,5699						
17011	59,8642		59,8642							59,8642						
17012	60,0000		60,0000							60,0000						
17013	60,0000		60,0000							60,0000						
17014	60,0000		60,0000							60,0000						
17015	60,0000		60,0000							60,0000						
17016	60,0000		60,0000							60,0000						
17017	60,0000		60,0000							60,0000						
17018	60,0000		60,0000							60,0000						
17019	60,0000		60,0000							60,0000						
17020	60,0000		60,0000							60,0000						
17021	60,0000		60,0000							60,0000						
17022	60,0000		60,0000							60,0000						
17023	60,0000		60,0000							60,0000						
17024	60,0000		60,0000							60,0000						
17025	60,0000		60,0000							60,0000						
17026	60,0000		60,0000							60,0000						
17027	60,0000		60,0000							60,0000						
17028	60,0000		60,0000							60,0000						
17029	60,0000		60,0000							60,0000						
17030	60,0000		60,0000							60,0000						
17031	60,0000		60,0000							60,0000						
17032	60,0000		60,0000							60,0000						
17033	60,0000		60,0000							60,0000						
17034	60,0000		60,0000							60,0000						
17035	60,0000		60,0000							60,0000						
17036	60,0000		60,0000							60,0000						
17037	60,0000		60,0000							60,0000						
17038	60,0000		60,0000							60,0000						
17039	60,0000		60,0000							60,0000						
17040	60,0000		60,0000							60,0000						
17041	60,0000		60,0000							60,0000						
17042	60,0000		60,0000							60,0000						
17043	60,0000		60,0000							60,0000						
17044	60,0000		60,0000							60,0000						
17045	60,0000		60,0000							60,0000						
17046	60,0000		60,0000							60,0000						
17047	60,0000		60,0000							60,0000						
17048	60,0000		60,0000							60,0000						
17049	60,0000		60,0000							60,0000						
17050	60,0000		60,0000							60,0000						
17051	60,0000		60,0000							60,0000						
17052	60,0000		60,0000							60,0000						
17053	60,0000		60,0000							60,0000						
17054	60,0000		60,0000							60,0000						
17055	60,0000		60,0000							60,0000						
17056	60,0000		60,0000							60,0000						
17057	60,0000		60,0000							60,0000						
17058	60,0000		60,0000							60,0000						
17059	60,0000		60,0000							60,0000						
17060	60,0000		60,0000							60,0000						
17061	60,0000		60,0000							60,0000						
17062	60,0000		60,0000							60,0000						
17063	60,0000		60,0000							60,0000						
17064	60,0000		60,0000							60,0000						
17065	60,0000		60,0000							60,0000						
17066	60,0000		60,0000							60,0000						
17067	60,0000		60,0000							60,0000						
17068	60,0000		60,0000							60,0000						
17069	60,0000		60,0000							60,0000						
17070	60,0000		60,0000							60,0000						
17071	60,0000		60,0000							60,0000						
17072	60,0000		60,0000							60,0000						
17073	60,0000		60,0000							60,0000						
17074	60,0000		60,0000							60,0000						
17075	60,0000		60,0000							60,0000						
17076	60,0000		60,0000							60,0000						
17077	60,0000		60,0000							60,0000						
17078	60,0000		60,0000							60,0000						
17079	60,0000		60,0000							60,0000						
17080	60,0000		60,0000							60,0000						
17081	60,0000		60,0000							60,0000						
17082	60,0000		60,0000							60,0000						
17083	60,0000		60,0000							60,0000						
17084	60,0000		60,0000							60,0000						
17085	60,0000		60,0000							60,0000						
17086	60,0000		60,0000							60,0000						
17087	60,0000		60,0000							60,0000						
17088	60,0000		60,0000							60,0000						
17089	60,0000		60,0000							60,0000						
17090	60,0000		60,0000							60,0000						
17091	60,0000		60,0000							60,0000						
17092	60,0000		60,0000							60,0000						
17093	60,0000		60,0000							60,0000						

Titus County Appraisal District

Notes:

- Blue shaded rows were used in QA/QC efforts.
- Yellow shaded rows are assigned property IDs to address ownership inconsistencies or absences.

Franklin County Appraisal District

Notes:

- Blue shaded rows were used in QA/QC efforts.
- Yellow shaded rows are assigned property IDs to address ownership inconsistencies or absences.

FRANKLIN COUNTY APPRAISAL DISTRICT - URBAN/RESIDENTIAL & AGRICULTURAL LAND DETAIL DATA SHEET (A-FREQ)																	
Page No.	TOT IMP	ATH1	ATH2	ATH3	ATH4	ATH5	ATH6	ATH7	ATH8	ATH9	ATH10	ATH11	ATH12	ATH13	ATH14	ATH15	ATH16
1059001	25.6923		25.6923														
650	11.6707			11.6707													
651	94.2552			94.2552													
1449	14.8302			14.8302													
1450	7.0784			7.0784													
1711	10.8029			10.8029													
1712	8.4447			8.4447													
2328	16.1735	16.1735															
2330	164.1730	164.1730															
2331	14.0749			14.0749													
2461	17.2271			17.2271													
2751	15.1720			15.1720													
3327	14.6646			14.6646													
4328	8.4090			8.4090													
4450	0.7750			0.7750													
4576	13.4710			13.4710													
4261	0.0227			0.0227													
5117	4.1523			4.1523													
5765	47.7252			47.7252													
6311	741.9370			741.9370													
6721	25.9028			25.9028													
6722	7.7713			7.7713													
6729	10.8190			10.8190													
7252	1.9420			1.9420													
7372	14.8507			14.8507													
7382	106.5574			106.5574													
7711	91.4953			91.4953													
7849	1.9961			1.9961													
9774	11.8476			11.8476													
9813	4.4833			4.4833													
9901	9.7211			9.7211													
9981	111.9070			111.9070													
10581	38.1395			38.1395													
10583	13.7124			13.7124													
10723	58.5211			58.5211													
TOTAL	1074.9177	124.7161	24.8412	714.6243	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	49.8477	11.8157	0.0000	0.0000

COUNTY APPRAISAL DISTRICT CLASSIFICATIONS

Bowie CAD Timber Productivity Values 2014

Forest Type	Productivity Value
P1	\$300.88
P2	\$179.50
P3	\$119.50
P4	\$153.63
M1	\$260.63
M2	\$168.13
M3	\$94.13
M4	\$74.25
H1	\$129.63
H2	\$63.75
H3	\$44.00
H4	\$21.38

Open Space Rangeland Values 2014

R1	\$120.00
R2	\$87.00
R3	\$68.00
R4	\$42.00

* "Y" or "E" after any classification means it is floods or is under easement. Productivity values does not change

**2014 CASS COUNTY APPRAISAL DISTRICT
PRODUCTIVITY VALUES**

LAND CLASS	COST	SOIL CLASS	DESCRIPTION
APIMP1-4	\$ 98.32		IMPROVED PASTURES
APNAT1-4	\$ 68.00		NATIVE PASTURES
AWDLF1-4	\$ 98.32		WILDLIFE MANAGEMENT
ATH1	\$ 134.50	1	HARDWOOD
ATH1A	\$ 67.25	1	HARDWOOD/AMZ/CWHZ/SMZ
ATH1B	\$ 67.25	1	HARDWOOD REGENERATED
ATH2	\$ 69.13	2	HARDWOOD
ATH2A	\$ 34.57	2	HARDWOOD AMZ/CWHZ/SMZ
ATH2B	\$ 34.57	2	HARDWOOD REGENERATED
ATH3	\$ 48.88	3	HARDWOOD
ATH3A	\$ 24.44	3	HARDWOOD/AMZ/CWHZ/SMZ
ATH3B	\$ 24.44	3	HARDWOOD REGENERATED
ATH3C	\$ 98.32	ALL	IMP PASTURE/PLANTED HARDWOOD
ATH3D	\$ 68.00	ALL	NATIVE PASTURE/PLANTED HARDWOOD
ATH4	\$ 28.13	4	HARDWOOD
ATH4A	\$ 13.07	4	HARDWOOD AMZ/CWHZ/SMZ
ATH4B	\$ 13.07	4	HARDWOOD REGENERATED
ATM1	\$ 265.38	1	MIXED TIMBER
ATM1A	\$ 132.69	1	MIXED/AMZ/CWHZ/SMZ
ATM1B	\$ 132.69	1	MIXED REGENERATED
ATM1C	\$ 98.32	1	IMP PASTURE/MIXED
ATM1D	\$ 68.00	1	NATIVE PASTURE/MIXED
ATM2	\$ 173.25	2	MIXED TIMBER
ATM2A	\$ 86.63	2	MIXED AMZ/CWHZ/SMZ
ATM2B	\$ 86.63	2	MIXED REGENERATED
ATM2C	\$ 98.32	2	IMP PASTURE/MIXED
ATM2D	\$ 68.00	2	NATIVE PASTURE/MIXED
ATM3	\$ 99.13	3	MIXED TIMBER
ATM3A	\$ 49.57	3	MIXED AMZ/CWHZ/SMZ
ATM3B	\$ 49.57	3	MIXED REGENERATED
ATM3C	\$ 98.32	3	IMP PASTURE/MIXED
ATM3D	\$ 68.00	3	NATIVE PASTURE/MIXED
ATM4	\$ 78.75	4	MIXED TIMBER
ATM4A	\$ 39.38	4	MIXED AMZ/CWHZ/SMZ
ATM4B	\$ 39.38	4	MIXED REGENERATED
ATM4C	\$ 98.32	4	IMP PASTURE/MIXED
ATM4D	\$ 68.00	4	NATIVE PASTURE/MIXED
ATP1	\$ 307.00	1	PLANTED PINE TIMBER
ATP1A	\$ 153.50	1	PINE/AMZ/CWHZ/SMZ
ATP1B	\$ 153.50	1	PINE REGENERATED
ATP1C	\$ 98.32	1	IMP PASTURE/ PLANTED PINE
ATP1D	\$ 68.00	1	NATIVE PASTURE/ PLANTED PINE
ATP2	\$ 185.38	2	PLANTED PINE TIMBER
ATP2A	\$ 92.69	2	PINE/AMZ/CWHZ/SMZ
ATP2B	\$ 92.69	2	PINE REGENERATED
ATP2C	\$ 98.32	2	IMP PASTURE /PLANTED PINE
ATP2D	\$ 68.00	2	NATIVE PASTURE /PLANTED PINE
ATP3	\$ 125.25	3	PLANTED PINE TIMBER
ATP3A	\$ 62.63	3	PINE/AMZ/CWHZ/SMZ
ATP3B	\$ 62.63	3	PINE REGENERATED
ATP3C	\$ 98.32	3	IMP PASTURE/ PLANTED PINE
ATP3D	\$ 68.00	3	NATIVE PASTURE /PLANTED PINE
APT4	\$ 157.88	4	PLANTED PINE TIMBER
APT4A	\$ 78.94	4	PINE/AMZ/CWHZ/SMZ
APT4B	\$ 78.94	4	PINE REGENERATED
ATP4C	\$ 98.32	4	IMP PASTURE/ PLANTED PINE
ATP4D	\$ 68.00	4	NAT PASTURE/ PLANTED PINE

2014 TITUS COUNTY AGRICULTURAL CLASSIFICATION SCHEDULE

2/20/2015

AG CODE DESCRIPTION AG VALUE

CROPLAND

Column1	Column2	Column3
AF1	SOIL TYPE I	166.3
AF2	SOIL TYPE I	139.65
AF3	SOIL TYPE III	86.85
AF4	SOIL TYPE IV	52.20
AM	WASTELAND-MINIMUM USE	31.37

PASTURE (RP)

AP1	IMPROVED PASTURELAND	115.62
AP2	NATIVE PASTURELAND	95.18
AP3	NASTIVE PASTURELAND 2ND GRADE	79.25
AP4	SCRUB PASTURELAND	62.30

PINE TREES (RTP)

ATP1	SOIL TYPE I	321.45
ATP2	SOIL TYPE II	194.76
ATP3	SOIL TYPE III	95.01
ATP4	SOIL TYPE IV	160.47

MIXED TIMBER (RTM)

ATM1	SOIL TYPE I	262.34
ATM2	SOIL TYPE II	165.97
ATM3	SOIL TYPE III	81.17
ATM4	SOIL TYPE IV	74.33

HARWOOD TIMBER (RTH)

ATH1	SOIL TYPE I	116.38
ATH2	SOIL TYPE II	47.88
ATH3	SOIL TYPE III	36.28
ATH4	SOIL TYPE IV	15.71

WILDLIFE

WAP1	SOIL TYPE I	115.62
WAP2	SOIL TYPE II	95.18
WAP3	SOIL TYPE III	79.25
WAP4	SOIL TYPE IV	62.29
WATH2	SOIL TYPE II	47.88
WATH3	SOIL TYPE III	81.75
WATH4	SOIL TYPE IV	15.71

AG Class:	M - *
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	BRNW - Barren Wasteland
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	14.00	0

AG Class:	RB1Y - Brush Pasture Flood
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	NATP - Native Pasture
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	46.00	0

AG Class:	RB11 - Brush Pasture Soil Class 1
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	NATP - Native Pasture
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	84.00	0

AG Class:	RB12 - brush/wood pas soil type 2
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	NATP - Native Pasture
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	63.00	0

AG Class:	RB13 - Brush Pasture Soil Class 3
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	NATP - Native Pasture
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	44.00	0

AG Class:	RB14 - Brush Pasture Soil Class 4
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	NATP - Native Pasture
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	31.00	0

AG Class:	RN1Y - Improved Pasture Flood
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	IMPR - Improved Pasture
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	74.00	0

AG Class:	RN11 - Improved Pasture Soil Class 1
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	IMPR - Improved Pasture
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	131.00	0

AG Class:	RN12 - Improved Pasture Soil Class 2
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	IMPR - Improved Pasture
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	99.00	0

AG Class:	RN13 - Improved Pasture Soil Class 3
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	IMPR - Improved Pasture
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	68.00	0

AG Class:	RN24 - Native Pasture Soil Class 4
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	NATP - Native Pasture
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	37.00	0

AG Class:	ST41A - *
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	BRNW - Barren Wasteland
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	14.00	0

AG Class:	ST41B - *
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	IMPR - Improved Pasture
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	117.00	0

AG Class:	ST42A - *
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	IMPR - Improved Pasture
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	117.00	0

AG Class:	ST42C - *
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	NATP - Native Pasture
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	60.00	0

AG Class:	ST43F - *
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	DLCP - Dry Cropland
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	214.00	0

AG Class:	ST44B - *
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	NATP - Native Pasture
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	50.00	0

AG Class:	ST44D - *
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	NATP - Native Pasture
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	81.00	0

AG Class:	ST45A - *
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	IMPR - Improved Pasture
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	117.00	0

AG Class:	ST46B - *
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	NATP - Native Pasture
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	81.00	0

AG Class:	ST45G - *
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	M2PR - Timber Mixed II
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	184.00	0

AG Class:	TD11 - Irrigated Cropland Soil Class 1
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	IRCP - Irrigated Cropland
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	345.00	0

AG Class:	TD12 - Irrigated Cropland Soil Type 2
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	IRCP - Irrigated Cropland
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	261.00	0

AG Class:	TD13 - Irrigated Cropland Soil Type 3
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	IRCP - Irrigated Cropland
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	180.00	0

AG Class:	TD14 - Irrigated Cropland Soil Type 4
Size Type:	ACRE - Acreage
Allow Override Unit Value:	No
Allow Override Flat Value:	No
PTD Usage Code:	IRCP - Irrigated Cropland
Schedule Method:	UPPR - Upper Boundary

Size	Unit Value	Flat Value
99,999,999	126.00	0

Franklin County Appraisal District

Franklin County

Dist	Year	Land Area	Frm	Land Area	To	Ag Class	Ag Cost	Land Type	Land Class Desc
2014		0		9999999		APIMP1	100.9	IMPR	Improved Pasture
2014		0		9999999		APNAT1	70.18	NATP	Native Pasture
2014		0		9999999		APWAT1	60	OTHR	xxxx
2014		0		9999999		ATH1	99.4	H1PR	Hardwood
2014		0		9999999		ATH2	73.64	H2PR	Hardwood
2014		0		9999999		ATH3	48.96	H3PR	Hardwood
2014		0		9999999		ATH4	35.34	H4PR	Hardwood
2014		0		9999999		ATM1	638.4	M1PR	Mixed
2014		0		9999999		ATM2	455.67	M2PR	Mixed
2014		0		9999999		ATM3	278.38	M3PR	Mixed
2014		0		9999999		ATM4	167.13	M4PR	Mixed
2014		0		9999999		ATP1	1071.86	P1PR	Pine
2014		0		9999999		ATP2	769.6	P2PR	Pine
2014		0		9999999		ATP3	477.3	P3PR	Pine
2014		0		9999999		ATP4	295.66	P4PR	Pine
2014		0		9999999		AWM1	99.4	WDLF	Wildlife under either AG or Timber
2014		0		9999999		AWM2	100.9	WDLF	Wildlife under either AG or Timber
2014		0		9999999		AWM3	167.13	WDLF	Wildlife under either AG or Timber
2014		0		9999999		AWM4	295.66	WDLF	Wildlife under either AG or Timber

Appendix D KFS - Field Notes & Reports

KINGWOOD IMPACT ASSESSMENT NOTES

Notes on the timberland assessment process on government and private lands by Kingwood Forestry Services, Inc. (KFS) are as follows:

1. After evaluating government provided shape files, it was decided to merge shapes based on the "Common Name" field.
 - a. Merged shapes after aerial interpretation into their unique Common Name for consistent stand cover types.
 - b. Not all stands are consistently stocked and some stand types are incorrect in the database. Initial inspections estimated that the largest stands have as much as 25% of swamp/water/buttonbush type of cover that will contribute no merchantable value. Other stands are similar or have more variation, as much as 50% difference. However, most of these differences occur on small acreage stands, so statistically, the impact is minor.
 - c. Viewed most major acreages in each "Common Name" and ranked them relative to all other Common Names in this shapefile. Rankings were given similar to CAD land classifications and are as follows;
 - i. Pine (P)
 - ii. Mixed pine and hardwood (M)
 - iii. Hardwood (H)
 - iv. Value of stands from 1-4 with 1 being highest and 4 having VERY little merchantable value.
 - d. Analyzed the relative usable acreage based on ten 35 acre sample plots to help determine how much acreage is in swamp/open water/brush on the largest stand on Government lands. Found as much as 25% in non-timber acreage.
2. Provided data to MTG and Corps.
3. Conducted conference call to determine if any KFS categorizations needed to be adjusted. A few mixed stands were upgraded to M1 per Government personnel input. The large stand we were in agreement with on the reduction of the timber volume by 25%.
4. Laid out inspection sites on USACE and private tracts in Bowie, Cass and Red River Counties. (i.e. to compare H1 Bowie Co to H1 Red River County)
5. Visited with Corps to gain access and find best representative volume locations on Corps property.
6. Conducted field inspections on government and private land in Bowie, Cass, Red River, Titus and Franklin Counties by truck, ATV and boat of the major stand types of significant size and most value potential.

7. Took field notes of volumes by general product category (HST, HPW, PST, and PPW).
8. Pictures of the most representative sites for various stands were taken to illustrate these volumes pictorially and are contained hereafter.
9. Field notes of volume estimates per acre for various products were put into Excel to indicate volumes that will later be used to translate to a value.
10. Developed tables for indicated timber volume and value by each timber classification in each county for Wright Patman and Marvin Nichols based on field observations and estimates.
11. Disclaimers
 - a. KFS has not conducted land surveys of the subject properties and cannot attest to either the accuracy of the property lines or the total acreage. The tract acreages and locations were provided to Kingwood Forestry by MTG and the Government. In the event that actual acreages are different than the provided acreages, then a reassessment would be required.
 - b. As with any inventory estimate, actual volumes will be somewhat different from estimated volumes. This situation is further emphasized due to parcels that could not be viewed through this process and the fact this was an ocular based assessment.
 - c. The values appraised herein are based upon the assumption that the subject timber is prudently managed for sale using conventional management practices as exercised by knowledgeable timberland owners. Imprudent management or timber marketing practices may result in a substantial reduction in value without offsetting cash realizations.
 - d. Use of any part of this report out of context or apart from the whole is potentially misleading and therefore is prohibited by Kingwood Forestry Services, Inc.
 - e. KFS has not conducted a Phase I environmental study of the subjects and makes no judgments in respect to possible environmental hazards or contaminants. There are no environmental problems on the subject properties known to or observed by Kingwood. For this report, it is assumed that no environmental hazards or contaminants exist on the subject properties.
 - f. KFS, Inc. takes no responsibility for matters legal in nature, which may exist in connection with the properties such as senior contractual obligations, tax issues, etc.
 - g. The liability of KFS and employees is limited to the fee collected. There is no accountability, obligation, or liability to any third party. Kingwood assumes no responsibility for any cost incurred to discover or correct any deficiencies present in the properties.
 - h. The valuation assessment was not based on a requested minimum or maximum valuation, or a specific valuation.
 - i. KFS has no present or prospective interest in the properties that are the subject of this report, and we have no personal interest or bias with respect to the parties involved.
 - j. Employment in and compensation for this assessment was not contingent upon the reporting of a predetermined value or direction in value that favors the cause of the

client, the amount of the value estimate, the attainment of a stipulated result, or the occurrence of a subsequent event.

KFS PHOTOS



Typical view of H1 land classification on Corp. of Engineers property.



Typical view of H1 land classification on Corp. of Engineers property.



Typical view of III land classification on Corp. of Engineers property.



Typical view of III land classification on Corp. of Engineers property.





Typical view of H1 land classification on Corp. of Engineers property.



Typical view of H2 land classification on Corp. of Engineers property.





Typical view of H2 land classification on Corp. of Engineers property.



Typical view of H2 land classification on Corp. of Engineers property.



Typical view of H3 land classification on Corp. of Engineers property.



Typical view of H3 land classification on Corp. of Engineers property with Wright Patman at 232 foot lake level.



Typical view of P1 land classification on Corp. of Engineers property.

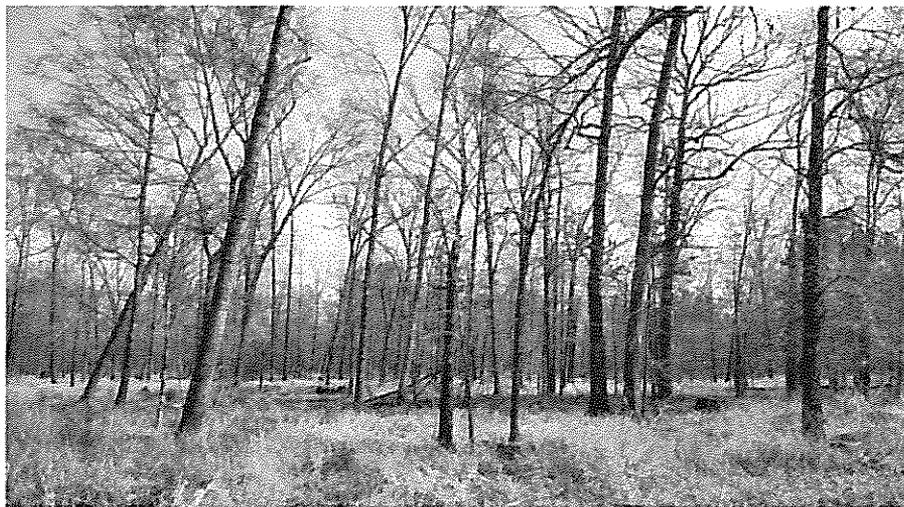


Typical view of P1 land classification on Corp. of Engineers property.





Typical view of P1 land classification on Corp. of Engineers property.



Typical view of M1 land classification on Corp. of Engineers property.



Typical view of M1 land classification on Corp. of Engineers property.



Typical view of M1 land classification on Corp. of Engineers property.



Typical view of MI land classification on Corp. of Engineers property.



Typical view of HI land classification of private property in Bowie and Cass Counties, Texas.





Typical view of H1 land classification of private property in Bowie and Cass Counties, Texas.



Typical view of H2 land classification of private property in Bowie and Cass Counties, Texas.



Typical view of H3 land classification of private property in Bowie and Cass Counties, Texas.



Typical view of M2 land classification of private property in Bowie and Cass Counties, Texas.



Typical view of M2 land classification of private property in Bowie and Cass Counties, Texas.



Typical view of H11 land classification of private property in Titus and Franklin Counties, Texas.





Typical view of H1 land classification of private property in Titus County, Texas.



Typical view of H2 land classification of private property in Red River and Franklin Counties, Texas.





Typical view of M1 land classification of private property in Red River County, Texas.

Region D Brief

Linda Price, Chair
Region D Water Planning Group
P.O. Box 360
Linden, Texas 75563

August 25, 2015

Office of General Counsel
Attn: Les Trobman
Texas Water Development Board
P.O. Box 13231
Austin, Texas 78711-3231
les.trobman@twdb.texas.gov

Dear Mr. Trobman:

This letter is in response to your notice sent August 6, 2015 regarding the potential interregional conflict between the Regional Water Plans for Region C and Region D. Your notice advised that a Board Meeting will be held on September 9, 2015 wherein a Region D Representative, a Region C Representative, and the Executive Administrator will each be allotted 15 minutes each to present their position on this matter. The notice further provided that each Region was invited to submit briefs on the issue with the briefs due by August 25, 2015. While Region D looks forward to the opportunity to present its position to the Board on September 9, a formal brief by Region D cannot be prepared in the time allotted for submission for the reasons set forth herein. I have, on behalf of Region D, included in this letter a summary of Region D's position on this issue.

LACK OF FUNDING AND ADEQUATE TIME

As stated above, the Notice from TWDB was sent out on August 6, 2015 requesting that the Briefs be submitted by August 25, allowing the Regions only 19 days to submit the Brief. As you know, the Regional Water Planning Group members volunteer their time in the interest of serving their Regions and the State of Texas in the water planning process. In the case of Region D, we are not in a position to review all the materials, research all of the legal and technical issues, and prepare a formal brief to be submitted on this issue without expert and professional assistance. No funding has been allocated to the Regions for the preparation of the Briefs, thereby requiring the Regions to either retain a third party to prepare the Brief pro bono or obtain third party funding for the Brief within this short time period. Neither alternative has been possible for Region D.

At the time the Notice was sent out on August 6, Region D's next scheduled meeting had been previously set for August 26, 2015, a day after the deadline for the submission of the Brief. Due to scheduling conflicts and notice requirements, it was extremely improbable, if not entirely impossible, for Region D to have a Board Meeting to authorize any actions or response to the Notice by the August 25 deadline. In addition, due to the lack of funding

provided by TWDB, it would also have been impossible for Region D to retain anyone to prepare the Brief even if adequate time had been allowed.

The request by TWDB for the brief to be submitted within the time allotted without any funding provided makes it impossible for Region D to submit a formal brief on this issue.

SUMMARY OF REGION D'S POSITION

It is Region D's position that the inclusion of Marvin Nichols Reservoir as a recommended water management strategy in the Region C IPP creates an interregional conflict with the Region D IPP. The Region D IPP clearly states Region D's position that the inclusion of Marvin Nichols Reservoir as a water management strategy will have substantial adverse impacts on Region D. Region C's IPP, while acknowledging some of those adverse impacts, lacks adequate information on many of those impacts while including Marvin Nichols Reservoir (in conjunction with obtaining water from Lake Wright Patman) as a recommended water planning strategy in its IPP.

Region D's position on Marvin Nichols Reservoir is detailed in its IPP on pages 6-39 through 6-50. Included in its discussion are substantial adverse impacts to agricultural resources, timber industry, farming, ranching and other related industries, natural resources and environmental factors. The IPP reviews and cites all known studies of the impacts of the proposed Marvin Nichols Reservoir and concludes that due to the substantial negative impacts on Region D, Marvin Nichols Reservoir should not be included in any regional water plan or the State Water Plan as a water management strategy.

Region D is now aware that the Marvin Nichols Reservoir, as proposed in the Region C IPP, is slightly different from the project proposed in Region C's previous plan. However, the objections to the previous proposal remain viable and valid objections to the new proposal. Region D stresses that this proposal was made with a lack of disclosure to Region D of the new proposal and that Region C failed to provide adequate information on possible impacts of the new proposal in its IPP.

Page 5B.9 of Region C's IPP reflects that the proposed Marvin Nichols Reservoir will inundate an estimated 41,722 acres and raising the pool level of Wright Patman will inundate an additional 9,429 acres. While acknowledging that this new "Sulphur Basin Supply" strategy will have significant environmental impacts, flood Priority 1 bottomland hardwoods, and require mitigation for those impacts, the Region C IPP fails to identify, analyze, and quantify those impacts other than to state studies will be undertaken to address these issues.

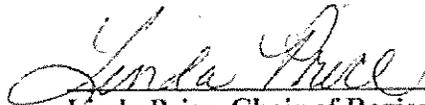
In its Table 5B.2, which lists impacts of Feasible Strategies for Region C, the Sulphur Basin Supply strategy (along with the alternative strategies that include a Marvin Nichols Reservoir) is listed as having the most impacts to environmental factors, agricultural/rural impacts, other natural resources, and third party impacts of the options listed. The Region C IPP states on Page 6.15 that a quantitative analysis of the new configuration of Marvin

Nichols Reservoir is not included in its IPP. Despite the acknowledgement of the negative impacts and the failure to provide required analysis, Region C has included the Sulphur Basin Supply strategy, which includes the Marvin Nichols Reservoir, as a recommended water management strategy.

Region D's position is that under any rational definition of interregional conflict and certainly under case law as it presently exists, the inclusion of Marvin Nichols Reservoir as a recommended water planning strategy in Region C's IPP creates an interregional conflict with Region D's IPP. Region D requests that the TWDB determine that an interregional conflict exists and begin the process of resolving that conflict in accordance with state law, its rules and regulations.

I have submitted a copy of this letter by U.S. Mail and Electronic Mail to you and the persons listed below.

Thank you.


Linda Price, Chair of Region D

cc: Walt Sears, General Manager
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Response of EA
Due Sept. 1st

Texas Water Development Board

P.O. Box 13231, 1700 N. Congress Ave.
Austin, TX 78711-3231, www.twdb.texas.gov
Phone (512) 463-7847, Fax (512) 475-2053

TO: Board Members

THROUGH: Kevin Patteson, Executive Administrator *KP*

FROM: Joe Reynolds, Assistant General Counsel *JR*
Alexis Lorick, Assistant General Counsel *all*

DATE: September 1, 2015

SUBJECT: Potential Interregional Conflict between Regional Water Plans for Planning Regions C and D

ACTION REQUESTED

Find that an interregional conflict exists between the Region D and Region C 2016 Initially Prepared Regional Water Plans and authorize steps necessary to address the conflict.

BACKGROUND

The General Counsel (General Counsel) of the Texas Water Development Board (TWDB or Board) by letter dated August 6, 2015 requested briefs from Regions C and D as to “whether an interregional conflict exists,” due August 25, 2015. This memorandum is the Executive Administrator’s response to the briefs submitted by the Regions.

On July 10, 2015, the Executive Administrator’s staff asked the 16 regional water planning groups (RWPG) to notify him in writing of any “project or issues” raised in another RWPG’s Initially Prepared Plan (IPP) that would have “an unacceptable degree of impact” on its planning area. The Region D RWPG sent a letter in response to that request to the Executive Administrator on July 21, 2015 stating that a water management strategy described in the Region C 2016 IPP would have “an unacceptable degree of impact” on Region D’s water planning area, “conflict[ing] with the Region D Round 4 IPP.”

LEGAL ISSUES

What is the process for raising an interregional conflict?

Not attempting to resolve real concerns between the Regions C and D RWPGs during the preliminary regional water planning phase ignores both the ruling of the 11th Court of Appeals

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support for planning, financial assistance, and :
outreach for the conservation and responsible :
development of water for Texas : Kevin Patteson, Executive Administrator

in the *Ward Timber* case¹ and the Board's January 8, 2015 Order (the January Order), issued in response to *Ward Timber*, that resolved the previous interregional conflict between these RWPGs.² However, any resolution of these concerns must balance the assertions raised by the respective RWPGs against the Board's resolution of the prior interregional conflict between the same RWPGs concerning the same water management strategy along with the existing legal framework that defines the jurisdiction and authority of the TWDB. The TWDB is a state agency, for which the conservation of limited local and governmental resources requires that it limit its consideration of this potential conflict to those issues that are new, and were not adjudicated by the Board in the January Order.

Section 357.50 of the TWDB's regional planning rules³ outlines the actions that RWPGs must take to raise the issue of an interregional conflict. RWPGs must submit in a timely manner to the Executive Administrator information on any known interregional conflict between the RWPGs. Region D's Initially Prepared Plan (IPP) submitted in April, 2015, and the July 21, 2015 letter from Ms. Linda Price, chair of the Region D RWPG, comply with this requirement of timely notification.

The initial legal issue here is that Region D alleges an interregional conflict "appears to" exist between the Region D and Region C IPPs, but the rules in 31 TAC § 357.62 speak to the resolution of an interregional conflict in *adopted* RWPGs.⁴ Under current TWDB rules, there is no process for the resolution of an apparent interregional conflict between two RWPGs' IPPs. Based on TWDB rules, no interregional conflict between the two RWPGs could be addressed until their respective RWPGs have adopted their RWPGs. But, as stated previously, this argument ignores the holding in *Ward Timber* and the Board's Order directing the Executive Administrator, among other things, to identify any opportunities for facilitating resolution of potential conflicts early in the planning process.

Does an Interregional Conflict Exist?

Region D's IPP and its Brief to the General Counsel dated August 25th, 2015

Regions C and D were invited by the General Counsel to submit briefs by August 25th 2015, as to whether an interregional conflict existed between the regions' respective IPPs. Region D provided a summary of its position, asserting that the inclusion of the Marvin Nichols Reservoir strategy in the Region C IPP presents an interregional conflict, and supported its assertion with arguments raised in the Region D IPP.⁵ Portions of Region D's IPP provide facts not considered before upon which the Executive Administrator may find that an interregional conflict exists between Region D and C's IPPs.

¹ *Texas Water Development Board vs. Ward Timber, Ltd.*, 411 S.W.3d 554 (Tex. App.—Eastland 2013, no pet.) (*Ward Timber*).

² Texas Water Development Board, Order concerning the interregional conflict between the 2011 North Central Texas Regional Planning Area Regional Water Plan and the 2011 North East Texas Regional Planning Area Regional Water Plan in accordance with Texas Water Code § 16.053, January 8, 2015.

³ 31 Tex. Admin. Code § 357.50(f), related to adoption, submittal, and approval of regional water plans.

⁴ 31 Tex. Admin. Code § 357.62(a).

⁵ Region D 2016 Initially Prepared Plan, 6-39—6-50.

In its 2016 IPP, Region D expressed its objection to the Marvin Nichols Reservoir, stating: “[T]he inclusion of the Marvin Nichols I Reservoir, or any similarly located reservoir, is inconsistent with the long-term protection of the State’s water resources, agricultural resources, and natural resources, and those of Region D.”⁶ Region D’s objection is based on: 1) “[i]nformation made available by Region C to Region D,” and 2) facts and responses from the 2011 Region D Plan.⁷ Region D claims that the proposed Marvin Nichols I Reservoir is inconsistent with the long-term protection of the State’s resources because it would: (1) change the pattern flow of the Sulphur River; (2) require mitigation in Region D, and; (3) destroy resources in Region D, including but not limited to, bottomland hardwood, farming, ranching, and other related industries.⁸ These objections may offer guidance for mediating the conflict.

Were the assertions raised by Region D in its 2016 IPP the sole basis for its claim of an apparent conflict, then the Executive Administrator would recommend the Board find that no conflict exists. The Executive Administrator acknowledges that Region D asserts “under any rational definition” of interregional conflict and “case law” one would conclude that the inclusion of the Marvin Nichols Reservoir creates an interregional conflict. But that ignores the fact that Region D supports its conclusion with substantially the same evidence reviewed previously by the Board in the Order. The Board addressed and resolved many of the underlying factual concerns which led to the original interregional conflict raised by Region D. Because the Board resolved that conflict as directed to by the Court in *Ward Timber*, considering the same issues again violates the principles of conserving resources and precluding issues between the same parties decided previously.⁹ Therefore, to the extent the Board, in its January 8th Order, has already resolved the previous interregional conflict between the two RWPGs based on Region D’s statements in its current IPP, the Executive Administrator asserts that the Board is precluded from revisiting the same issues concerning the Marvin Nichols strategy in addressing this conflict.

While Region D contends that the Marvin Nichols strategy, or really any similarly-sited reservoir, is inconsistent with the long-term protection of the State’s resources, the RWPG in its IPP offers that the “reallocation of flood pool storage in Wright Patman Reservoir,” also in the Sulphur River Basin, may be a “feasible alternative” to meeting future water needs for Region C.¹⁰ It also acknowledges that the results of the Sulphur River Basin Study relating to reallocation in Wright Patman may be informative regarding additional alternatives.¹¹

Region C IPP and its Brief to the General Counsel, dated August 25, 2015

Region C proposes a different configuration for the Marvin Nichols strategy in its 2016 IPP than was adjudicated by the Court in *Ward Timber* and the Board in the 2011 State Water

⁶ North East Texas Regional Water Plan 6-1.

⁷ 6-40.

⁸ 6-41-45; 6-46.

⁹ Using the SBRA study from 2014; Region D refers to, “in the TWDB’s conflict resolution process between Region C and Region D,” 6-41.

¹⁰ 6-47.

¹¹ 6-49.

Plan. The new configuration involves a smaller footprint for Marvin Nichols linked to reallocation of storage at Wright Patman Lake. Region C labels this the “Sulphur Basin Supplies” strategy and provides a detailed report analyzing and quantifying impacts of the Sulphur Basin Supplies strategy.¹² This analysis follows the outline of the one presented by Region C in response to the Board’s August 2014 Interim Order, but provides adjusted data for the revised strategy.

Region C asserts in its brief that no conflict exists, because the studies attached to its IPP indicate that no greater impacts exist under the Sulphur Basin Supplies strategy than those associated with the Marvin Nichols strategy considered in 2014. Region C further claims that the studies demonstrate the revised strategy is consistent with long-term protection of water, agricultural, and natural resources.

Region C suggests that the Board determine the presence or absence of an interregional conflict based on the reasonably foreseeable, long-term, and net effects of a strategy on a host region’s economic, agricultural, and natural resources. This suggestion may offer guidance for mediating the conflict that appears to exist under the two regional IPPs.

CONCLUSION

The Executive Administrator finds sufficient bases to conclude that an interregional conflict exists. Waiting to address the real concerns between the two Regions may cause the Board to violate the Court’s ruling in *Ward Timber* and the Board’s January 2015 Order. After careful review of the Region C and Region D IPPs and the briefs submitted by the Regions, the Executive Administrator finds that the IPPs include common ground for mediation between the RWPGs related to the potential feasibility of a Marvin Nichols/Wright Patman reallocation strategy as contemplated by Region C in its IPP.¹³ In addition, the bases for mediation involve new information provided by each Region in their respective 2016 IPPs.

Finally, The Executive Administrator finds that the Center for Public Policy Dispute Resolution is an independent, not-for-profit organization that is well suited to provide mediation services to resolve such conflicts and should be used in this instance.

RECOMMENDATION

The Executive Administrator recommends that the Board find an interregional conflict exists between the Region D and Region C IPPs consistent with the holding of the Court in *Ward Timber* and the Board Order. The Executive Administrator further recommends:

1. that mediation of the conflict be limited to Region C’s combined Marvin Nichols Reservoir and Wright Patman reallocation strategy as laid out in Region C’s 2016 Initially Prepared Plan and its Appendix Y, and the potential for achieving an acceptable level of impact in response to Region D’s letter of July 21 and August 25th Brief;

¹² Appendix Y to the Region C 2016 Initially Prepared Plan (included in its response).

¹³ Both IPPs refer to more recent studies and, in particular, to the recent Sulphur River Basin Study, which contains the alternatives that Region D discusses and Region C recommends.

2. that the Board authorize the Executive Administrator to negotiate and execute a contract with the Center for Public Policy Dispute Resolution by September 18, 2015 to begin by Monday, October 5th, 2015, in order to mediate the conflict between Region C and Region D;
3. that the Board instruct the Region C and Region D regional planning groups to designate and authorize representatives to participate in the mediation;
4. that the Board instruct the Region C and Region D regional planning groups to provide the Executive Administrator with the names of their representatives participating in mediation by September 30, 2015;
5. that the Board instruct the Executive Administrator to designate staff to participate in the mediation as appropriate; and
6. that the Board instruct the Executive Administrator to report back to the Board at a regularly scheduled Board meeting in November with a status report.