PMComanchePekNPEm Resource

From: Willingham, Michael
Sent: Wednesday, September 09, 2009 5:14 PM
To: Muir, Jessie; Lopas, Sarah; Zimmerman, Gregory P.; 'McCold, Lance Neil'; Brennan Smith (smithbt@ornl.gov); Tiruneh, Nebiyu; Barnhurst, Daniel
Cc: ComanchePeakCOL Resource
Subject: FW: Texas Administrative Code
Attachments: Title 30 Pt 1 Ch 297 J Rule 297-101.pdf; Title 30 Pt 1 Ch 295 A Rule 295-101.pdf; 2008-11-25 Tx State Water Plan Addendum 1, Approval Region G amendment.pdf; 2008-07 HDR Attachment B.Somervell_County_Luminent_Strategy_Evaluation,4222008.pdf; 2008-07 Revised Somervell County Plan Section.pdf

FYI

From: Donald.Woodlan@luminant.com [mailto:Donald.Woodlan@luminant.com]
Sent: Wednesday, September 09, 2009 4:26 PM
To: Willingham, Michael
Cc: Bruce.Turner@luminant.com
Subject: Texas Administrative Code

Michael,

Attached appear to be the applicable rules (I added the highlights).

Rule 297.101 requires an application for an amendment "and/or … a copy of the contract in accordance with §295.101" and "The contract must be submitted and/or the application approved…." Rule 295.101 explains the information that must be in the contract.

In my own words, Luminant needs to sign a contract with BRA and BRA needs to submit the contract to TCEQ. The contract must be received by TCEQ. Although the commission does not approve the contract, it does confirm that the contract meets all requirements of the code.

It is my understanding that we will sign a contract sometime in the future.

I have also attached the Region G plan amendments and the state plan addendum that approve the water for CPSES 3 and 4.

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Hearing Identifier: ComanchePeak_COL_NonPublic
Email Number: 1029

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From: Willingham, Michael

Created By: Michael.Willingham@nrc.gov

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MESSAGE	1799	9/9/2009 5:14:18 PM
Title 30 Pt 1 Ch 297 J Rule 297-101.pdf	47075	
Title 30 Pt 1 Ch 295 A Rule 295-101.pdf	46774	
2008-11-25 Tx State Water Plan Addendum 1, Approval Region G amendment.pdf	289215	
2008-07 HDR Attachment B.Somervell_County_Luminent_Strategy_Evaluation,4222008.pdf	1270530	
2008-07 Revised Somervell County Plan Section.pdf	79849	

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(a) General. In order for the commission to exercise effective supervision over all uses of state water, each supplier of treated or untreated state water possessing a valid water right shall make application for an amendment based upon the supplier's contractual arrangements with a purchaser and/or shall submit a copy of the contract in accordance with §295.101 of this title (relating to Documents To Be Filed). The contract must be submitted and/or the application approved by the commission before deliveries or diversions under the contract may be made lawfully. If a contract meets the requirements of these sections and is consistent with the authorizations of the base water right, the executive director will place a copy of the contract on file with the commission records and shall so notify the supplier.

(b) Exceptions. The sections of this subchapter shall not apply to the following:

(1) sales of untreated water conveyed by the supplier through a canal, pipeline, or aqueduct for the purpose and for use in the area authorized in the water right;

(2) sales of treated water supplied through a public or private municipal distribution system or through a rural water supply system for the purpose and for use in the area authorized in the water right;

(3) deliveries of treated sewage effluent for the purpose and use authorized and in the area authorized in the water right;

(4) short term (three years or less) sales of untreated water from the perimeter of a reservoir for any purpose authorized in the water right in amounts not exceeding 10 acre-feet per annum; or

(5) sales of untreated water from the Lower and Middle Rio Grande.

Source Note: The provisions of this §297.101 adopted to be effective May 29, 1986, 11 TexReg 2331.

(a) Application forms are available upon request from the executive director, but use of the forms is not required if the necessary information is supplied.

(b) A water supply contract to be submitted to the executive director in accordance with §297.101 of this title (relating to General; Exceptions) shall be accompanied by a vicinity maps showing the diversion point and place of use, and the contractual terms shall include the following:

(1) the cost of water to the purchaser, expressed as a cost per unit of measure;

(2) the effective date and termination date of the contract;

(3) the average quantity of water being furnished on an annual basis or, if the contract is for less than one year, the total quantity being furnished;

(4) the location of the purchaser's diversion point with reference to a corner of an original land survey and/or other survey point, giving both course and distance; and

(5) a statement that the contract's effectiveness is dependent upon the supplier's and/or the purchaser's compliance with this section and Chapter 297, Subchapter J of this title (relating to Water Supply Contracts and Amendments).

(c) If required to file an application for a contractual amendment in accordance with §297.102 of this title (relating to When Application Required), the supplier shall also submit a vicinity map and a copy of the related contract which conform to the requirements of subsection (b) of this section.

(d) If the holder of a contractual permit or amendment wishes to relinquish the contractual permit or amendment and file the contract under these sections, the holder may do so by:

(1) submission of a sworn statement to the executive director which states the contractual permit holder's intent to relinquish the contractual permit and to thereafter file the contract in accordance with these sections; and

(2) submission of a water supply contract which is in compliance with subsection (b) of this section, and §297.103 of this title (relating to Special Requirements for Downstream Sales of Water from a Storage Reservoir). Relinquishment of a contractual permit or amendment is effective upon receipt of a properly executed statement by the contractual permit holder and the filing by the executive director of the substituted water supply contract.

Source Note: The provisions of this §295.101 adopted to be effective May 28, 1986, 11 TexReg 2325.

Water for Texas 2007: Addendum #1:

The following changes have been made to the 2007 State Water Plan as a result of water management strategy substitutions, minor amendments, and major amendments.

This Addendum was approved by the Texas Water Development Board on November 25, 2008

SUMMARY OF CHANGES:

Changes to Appendix 2.1 of the 2007 State Water Plan: Recommended Water Management Strategies and Costs Estimates

Change	Region	ID	Recommended Water Management Strategy	Total Capital Costs	First Decade Estimated Annual Average Unit Cost ($/acre-foot/year)	Water Supply Volume (acre-feet per year)						Year 2060 Estimated Annual Average Unit Cost ($/acre-foot/year)
						2010	2020	2030	2040	2050	2060	
ADDED	**G**	g.40	PHASE I LAKE WHITNEY WATER SUPPLY PROJECT	$42,221,700	$2,554	2,128	2,128	2,128	2,128	2,128	2,128	$2,554
ADDED	**G**	g.41	CITY OF CLEBURNE NEW WEST LOOP REUSE LINE	$7,384,900	$508	1,680	1,680	1,680	1,680	1,680	1,680	$508
REMOVED	**G**	~~g.27~~	~~LAKE PALO PINTO OFF-CHANNEL RESERVOIR~~	~~$19,314,000~~	~~$521~~	~~-~~	~~-~~	~~-~~	~~3,110~~	~~3,110~~	~~3,110~~	~~$521~~
ADDED	**G**	g.27a	TURKEY PEAK RESERVOIR	$46,150,000	$393	-	8,648	8,648	8,648	8,648	8,648	$393
ADDED	**G**	g.36a	SOMERVELL COUNTY WATER SUPPLY PROJECT (SOURCE WATER FROM g.36)	$35,159,900	$1,727	1,800	1,800	1,800	1,800	1,800	1,800	na
ADDED	**G**	g.42	SOMERVELL COUNTY STEAM ELECTRIC SUPPLY FROM BRA (SOURCE WATER FROM g.23)	$103,915,000	$154	-	103,717	103,717	103,717	103,717	103,717	$154
ADDED	**I**	i.20	ADDITIONAL GROUNDWATER WELLS CITYOF DIBOLL	$1,413,133	$223	1,612	1,612	1,612	1,612	1,612	1,612	$223

WATER SUPPLY CHANGE

Change	Region		Updated Estimated Water Supply Volume (acre-feet per year)					
			2010	2020	2030	2040	2050	2060
INCREASED	I	Increased annual groundwater availability for the Yegua-Jackson Aquifer from 4,860 to 6,472 af	6,472	6,472	6,472	6,472	6,472	6,472

WATER DEMAND PROJECTION CHANGE

Change	Region		Projected Water Demand (acre-feet per year)					
			2010	2020	2030	2040	2050	2060
INCREASED	G	Increased Steam-Electric Water Demand Projections for Somervell Co.	23,200	84,817	84,817	84,817	84,817	84,817

Notes: nc = No change
na = Not applicable/available

CHANGES TO VOLUME I: *Water for Texas 2007: Highlights of the 2007 State Water Plan*

Figures:

					UNITS	DECADE					
						2010	2020	2030	2040	2050	2060
Vol I	Page	4 :	Figure 3 : Projected water demand: State	Update to the following:	millions of acre-feet	nc	19.1	nc	20.2	nc	21.7
Vol I	Page	5 :	Figure 5 : Projected needs: State	Update to the following:	millions of acre-feet	nc	nc	6.0	7.0	nc	8.9

Text:

Vol I	Page	2 :	Paragraph 2 : change first sentence to:	The demand for water in Texas is expected to increase by 27 percent, from almost 17 million acre-feet of water in 2000 to 21.7 million acre-feet in 2060.
Vol I	Page	2 :	Paragraph 6 : change first sentence to:	The planning groups also estimated that the capital costs to design, construct, or implement the 4,500 water management strategies and projects would cost about $30.9 billion.
Vol I	Page	5 :	Last paragraph : change last sentence to:	If Texas does not implement new water supply projects or management strategies, then homes, busi-nesses, and agricultural enterprises throughout the state are expected to need an additional 3.7 million acre-feet of water in 2010 and an additional 8.9 million acre-feet in 2060 (Figure 5).
Vol I	Page	7 :	Paragraph 2 : change second sentence to:	Total capital costs, which primarily consist of up-front money needed to design, construct, or implement strategies, are about $30.9 billion.
Vol I	Page	8 :	Paragraph 4 : change first sentence to:	Capital costs for recommended water man-agement strategies in the 2007 State Water Plan are about $30.9 billion.
Vol I	Page	8 :	Paragraph 4 : change second to last sentence to:	These surveys indicate nearly 91 percent of the $30.9 billion in total cost for implementing the 2007 State Water Plan is anticipated to be provided by local project sponsors through traditional financing mechanisms.

CHANGES TO VOLUME II: *Water for Texas 2007*

Tables and Figures:

					UNITS	DECADE					
						2010	2020	2030	2040	2050	2060
Vol II	Page	50 :	Table G.1 : Projected water demand: Steam-electric	Update to the following:	acre-feet	209,351	na	na	na	na	303,961
Vol II	Page	50 :	Table G.1 : Projected water demand: Total	Update to the following:	acre-feet	897,308	na	na	na	na	1,212,590
Vol II	Page	51 :	Figure G.4 : Projected water needs: Region G: Steam-electric	Update to the following:	acre-feet	nc	64,317	69,175	83,097	107,145	126,034
Vol II	Page	53 :	Table G.3 : Projected water needs: Total: Somervell Co.	Update to the following:	acre-feet	nc	na	na	na	na	36,460
Vol II	Page	53 :	Table G.3 : Projected water needs: Total: Region G	Update to the following:	acre-feet	nc	na	na	na	na	383,911
Vol II	Page	53 :	Table G.3 : Projected water needs: Steam-electric: Somervell Co.	Update to the following:	acre-feet	nc	na	na	na	na	36,107
Vol II	Page	53 :	Table G.3 : Projected water needs: Steam-electric: Region G	Update to the following:	acre-feet	nc	na	na	na	na	126,034
Vol II	Page	64 :	Table I.2 : Existing water supplies: Region I: 'Other groundwater'	Update to the following:	acre-feet	18,840	na	na	na	na	18,840
Vol II	Page	122 :	Table 4.2 : Projected water demand: State: Steam-electric	Update to the following:	acre-feet	nc	948,197	1,091,829	1,235,787	1,401,350	1,595,173
Vol II	Page	122 :	Table 4.2 : Projected water demand: State: State Total	Update to the following:	acre-feet	nc	19,072,493	19,628,665	20,166,209	20,820,219	21,678,891
Vol II	Page	123 :	Table 4.3 : Projected water demand: State: Region G	Update to the following:	acre-feet	nc	957,561	1,015,307	1,068,545	1,138,695	1,212,590
Vol II	Page	123 :	Table 4.3 : Projected water demand: State: State Total	Update to the following:	acre-feet	nc	19,072,493	19,628,665	20,166,209	20,820,219	21,678,891

Vol II	Page 236 :	Figure 7.26 : Groundwater Availability: Yegua-Jackson	Update to the following:	acre-feet	26,332	26,332	26,332	26,332	26,332	26,332
Vol II	Page 247 :	Table 9.1 : Water user groups with needs: Region G	Update to the following:	count	102	111	116	125	128	132
Vol II	Page 247 :	Table 9.1 : Water user groups with needs: State Total	Update to the following:	count	873	1,026	1,098	1,135	1,176	1,199
Vol II	Page 248 :	Figure 9.1 : Water supply needs: State: Steam-electric	Update to the following:	acre-feet	nc	195,094	271,909	399,289	519,401	675,191
Vol II	Page 248 :	Figure 9.1 : Water supply needs: State: Total	Update to the following:	acre-feet	nc	4,912,306	5,959,811	6,936,936	7,794,714	8,868,687
Vol II	Page 249 :	Table 9.3 : Water supply needs: State: Region G	Update to the following:	acre-feet	nc	189,620	220,715	262,400	321,525	383,911
Vol II	Page 249 :	Table 9.3 : Water supply needs: State: Total	Update to the following:	acre-feet	nc	4,912,306	5,959,811	6,936,936	7,794,714	8,868,687
Vol II	Page 260 :	Figure 10.2 : Total new supply volumes generated by WMSs: Major reserv	Update to the following:	acre-feet	nc	315,311	655,641	687,036	1,056,666	1,077,666
Vol II	Page 260 :	Figure 10.2 : Total new supply volumes generated by WMSs: Groundwate	Update to the following:	acre-feet	426,041	564,693	623,993	693,283	738,221	800,821
Vol II	Page 260 :	Figure 10.2 : Total new supply volumes generated by WMSs: Reuse	Update to the following:	acre-feet	444,710	789,903	967,273	1,043,113	1,184,121	1,263,259
Vol II	Page 260 :	Figure 10.2 : Total new supply volumes generated by WMSs: Desalination	Update to the following:	acre-feet	86,423	103,650	132,292	162,050	202,994	315,015
Vol II	Page 260 :	Figure 10.2 : Total new supply volumes generated by WMSs: Total	Update to the following:	acre-feet	3,596,694	5,265,107	6,229,810	6,792,444	8,174,175	9,045,169
Vol II	Page 265 :	Table 10.3 New supplies from all recommended WMSs: Region G	Update to the following:	acre-feet						745,378
Vol II	Page 265 :	Table 10.3 New supplies from all recommended WMSs: Region I	Update to the following:	acre-feet						326,368
Vol II	Page 265 :	Table 10.3 New supplies from all recommended WMSs: Total	Update to the following:	acre-feet						9,045,169
Vol II	Page 265 :	Table 10.3 New supplies from surface water: Major Reservoirs: Region	Update to the following:	acre-feet						42,058
Vol II	Page 265 :	Table 10.3 New supplies from surface water WMSs: Total	Update to the following:	acre-feet						1,077,666
Vol II	Page 265 :	Table 10.3 Estimated capital cost: new major reservoirs: Region G	Update to the following:	millions of dollars						$115.90
Vol II	Page 266 :	Table 10.3 Estimated capital cost: new major reservoirs: Total	Update to the following:	millions of dollars						$4,930.89
Vol II	Page 270 :	Table 10.4 New supplies from all recommended WMSs: Region G	Update to the following:	acre-feet						745,378
Vol II	Page 270 :	Table 10.4 New supplies from all recommended WMSs: Region I	Update to the following:	acre-feet						326,368
Vol II	Page 270 :	Table 10.4 New supplies from all recommended WMSs: Total	Update to the following:	acre-feet						9,045,169
Vol II	Page 270 :	Table 10.4 New supplies from groundwater WMSs: Region I	Update to the following:	acre-feet						23,201
Vol II	Page 270 :	Table 10.4 New supplies from groundwater WMSs: Total	Update to the following:	acre-feet						800,821
Vol II	Page 270 :	Table 10.4 Estimated capital cost: new groundwater supplies: Region I	Update to the following:	millions of dollars						$33.77
Vol II	Page 270 :	Table 10.4 Estimated capital cost: new groundwater supplies: Total	Update to the following:	millions of dollars						$2,331.40
Vol II	Page 271 :	Table 10.5 New supplies from all recommended WMSs: Region G	Update to the following:	acre-feet						745,378
Vol II	Page 271 :	Table 10.5 New supplies from all recommended WMSs: Region I	Update to the following:	acre-feet						326,368
Vol II	Page 271 :	Table 10.5 New supplies from all recommended WMSs: Total	Update to the following:	acre-feet						9,045,169
Vol II	Page 271 :	Table 10.5 New supplies from reuse: Region G	Update to the following:	acre-feet						83,408
Vol II	Page 271 :	Table 10.5 New supplies from reuse: Total	Update to the following:	acre-feet						1,263,259
Vol II	Page 271 :	Table 10.5 Estimated capital cost: reuse: Region G	Update to the following:	millions of dollars						$111.06
Vol II	Page 271 :	Table 10.5 Estimated capital cost: reuse: Total	Update to the following:	millions of dollars						$3,972.29
Vol II	Page 273 :	Table 10.6 New supplies from all recommended WMSs: Region G	Update to the following:	acre-feet						745,378
Vol II	Page 273 :	Table 10.6 New supplies from all recommended WMSs: Region I	Update to the following:	acre-feet						326,368
Vol II	Page 273 :	Table 10.6 New supplies from all recommended WMSs: Total	Update to the following:	acre-feet						9,045,169
Vol II	Page 273 :	Table 10.6 New supplies from brackish desalination: Region G	Update to the following:	acre-feet						2,128
Vol II	Page 273 :	Table 10.6 New supplies from brackish desalination: Total	Update to the following:	acre-feet						176,901
Vol II	Page 273 :	Table 10.6 Estimated capital cost: brackish desalination: Region G	Update to the following:	millions of dollars						$42.22
Vol II	Page 273 :	Table 10.6 Estimated capital cost: brackish desalination: Total	Update to the following:	millions of dollars						$1,218.88
Vol II	Page 279 :	Table 11.1 Capital costs for municipal WMSs: Region G	Update to the following:	millions of dollars						$1,148.64
Vol II	Page 279 :	Table 11.1 Capital costs for municipal WMSs: Region I	Update to the following:	millions of dollars						$524.56
Vol II	Page 279 :	Table 11.1 Capital costs for municipal WMSs: Region Total	Update to the following:	millions of dollars						$29,392.53

Text:		
Vol I	Page 2 : Paragraph 3 : change first sentence to:	The demand for water in Texas is expected to increase by 27 percent, from almost 17 million acre-feet of water in 2000 to 21.7 million acre-feet in 2060.
Vol I	Page 2 : Paragraph 7 : change first sentence to:	The planning groups also estimated that the capital costs to design, construct, or implement the 4,500 water management strategies and projects would cost about $30.9 billion.
Vol I	Page 49 : Paragraph 2 : change third sentence to:	By 2060, the total water demands for the region are projected to increase 35 percent, from 897,308 acre-feet in 2010 to 1,212,590 acre-feet (Figure G.3).
Vol I	Page 49 : Plan Highlights : change first bullet to:	Total capital cost $1.3 billion
Vol I	Page 49 : Plan Highlights : change second bullet to:	Three new major reservoirs: Cedar Ridge, Brushy Creek, and Turkey Peak
Vol I	Page 50 : Paragraph 1 : change first full sentence to:	Manufacturing and steam-electric power generation demands are also projected to grow significantly from 2010 to 2060, by 61 percent (from 19,787 acre-feet to 31,942 acre-feet) and 45 percent (from 209,351 acre-feet to 303,961 acre-feet),
Vol I	Page 50 : Paragraph 3 : change fourth sentence to:	By 2060, overall water needs are expected to increase to 383,911 acre-feet per year, with almost half of this need associated with municipal users.
Vol I	Page 52 : Paragraph 1 : change second sentence to:	In all, the strategies would provide 745,378 acre-feet of additional water supply by the year 2060 (Figure G.5) at a total capital cost of $1,291,840,534 (Appendix 2.1).
Vol I	Page 62 : Paragraph 1 : change second sentence to:	Groundwater from the Gulf Coast, Carrizo-Wilcox, and other aquifers accounts for 224,250 acre-feet in 2010, declining to 223,820 acre-feet in 2060.
Vol I	Page 62 : Paragraph 3 : change first sentence to:	Water management strategies recommended for the East Texas Regional Water Plan result in 326,368 acre-feet of additional water supply to meet all projected needs by the year 2060 (Fig-ure I.5) at a total capital cost of $614,847,836 (Appendix 2.1).
Vol I	Page 66 : Bullets : change third bullet to:	Expansion of local groundwater use throughout region would provide 23,201 acre-feet per year—Implementation by: 2010; Capital Cost: $33 million.
Vol I	Page 121 : Last paragraph : change llast sentence to:	Although the population is projected to more than double between 2000 and 2060, water demand in Texas will increase by only 27 per-cent, from almost 17 million acre-feet of water in 2000 to a projected demand of 21.7 million acre-feet of water in 2060 (Table 4.2, Figure 4.4).
Vol I	Page 246 : Paragraph 2 : change second sentence to:	By 2030, this figure rises to nearly 6.0 million acre-feet, and by 2060 it increases to 8.9 million acre-feet. In 2060, slightly more than 85 percent of the state's population is projected to have water needs.
Vol I	Page 265 : Last paragraph : First sentence	Planning groups recommended 15 new major reservoirs that would generate approximately 1.1 million acre-feet per year by 2060 (Table 10.3, Figure 10.3).

Somervell County Steam Electric Supply from the Brazos River Authority

1.0 Description of Option

Luminant Power (formerly Texas Utilities or TXU) operates the Comanche Peak Station, which consists of two nuclear generating units located in Somervell County near Glen Rose, Texas. Water used to cool the two existing units is diverted from Squaw Creek Reservoir, supplemented with diversions from Lake Granbury, which is owned and operated by the Brazos River Authority (BRA). Water is diverted from Lake Granbury into Squaw Creek Reservoir, and circulated through the generating units prior to being discharged back into Squaw Creek Reservoir, and subsequently to the Brazos River via Squaw Creek.

Luminant is planning to build two additional 1,700 MW nuclear generating units at the Comanche Peak site, and intends to cool those units with additional water obtained from the BRA, diverted near the existing location on the southwest shore of Lake Granbury. Water would be pumped through two new pipelines into cooling towers at the new generating units. Blowdown from the cooling towers would be discharged back into Lake Granbury at a location downstream from the intake location. The two new units would operate independent and separate from the two existing units, and will not involve Squaw Creek Reservoir. The addition of the two generating units to Luminant's plans creates an additional Steam-Electric water demand in Somervell County that was not considered in the 2006 Brazos G Regional Water Plan.

Water would be delivered to the units separately through two, new 42-inch diameter pipelines. Similarly, blowdown water from the cooling towers would be returned through two, new 36-inch diameter pipelines. All new pipelines will be placed into or adjacent to the right-of-way for the existing pipelines between Lake Granbury and Squaw Creek Reservoir. The new pipelines would then be routed around the southern extent of Squaw Creek Reservoir to the new generating units on property currently owned by Luminant. The pipelines would be approximately 12 miles long. The approximate routes are shown in Figure 1. The route of the pipeline for discharge of blowdown flows might vary depending on the ultimate discharge location selected.

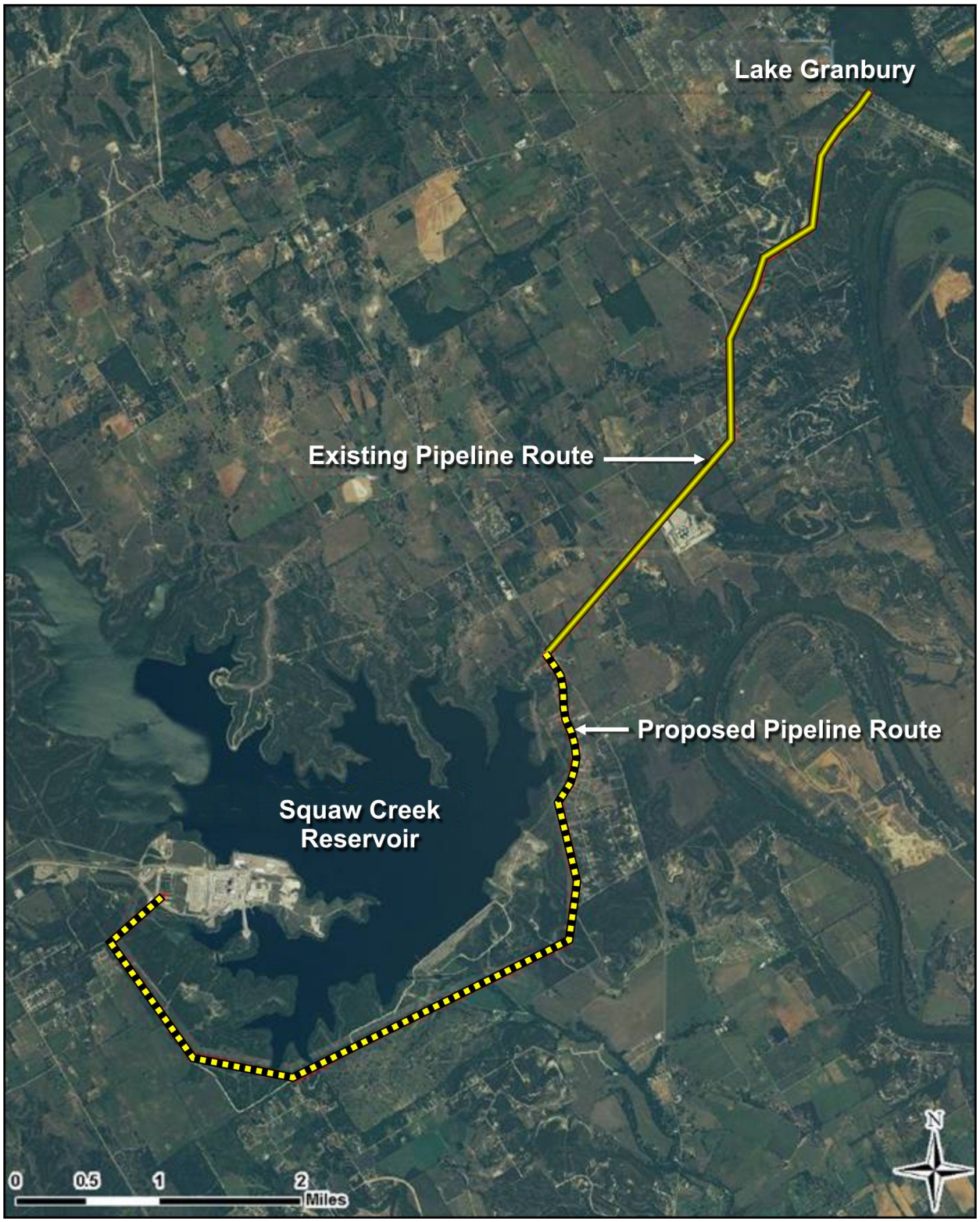

Figure 1. Luminant Pipeline Route.

1.1 Available Yield

Luminant's preliminary engineering has determined that annual diversions totaling 103,717 acre-feet per year (acft/yr) will be needed from Lake Granbury. Luminant currently holds contracts for water supply from the BRA totaling 27,447 acft/yr that have not yet been assigned to any current Luminant facility. Luminant would utilize this existing contractual supply plus an additional 76,270 acft/yr of new contractual water from the BRA. The BRA and Luminant have identified the pending BRA System Operations Permit as the source of supply for this new contractual water.

Analysis regarding the availability of this water supply from the BRA System was determined using the Brazos G WAM. The model utilized a January 1940 through December 1997 hydrologic period of record. Estimates of water availability were derived subject to general assumptions for application of hydrologic models as adopted by the Brazos G Regional Water Planning Group and summarized in the 2006 Brazos G Regional Water Plan. The following modifications to the Brazos G WAM were made to evaluate the supply available to the proposed new diversion from Lake Granbury and to estimate its impacts downstream:

(1) The methodology for modeling the existing Luminant diversion from Lake Granbury to Squaw Creek Reservoir was modified to more accurately depict actual operations. Previously, only the consumptive use was modeled as a diversion from Lake Granbury. This was modified to include diversions from Lake Granbury being discharged into Squaw Creek Reservoir, with actual consumptive use occurring from Squaw Creek Reservoir. Any unused diversions from Lake Granbury are allowed to spill from Squaw Creek Reservoir and contribute to flows downstream on the Brazos River via Squaw Creek.

(2) The diversion location for the unassigned contractual supply (27,447 acft/yr) from the BRA was moved from Possum Kingdom Reservoir to Lake Granbury.

(3) Additional supply to Luminant (76,270 acft/yr) from the pending BRA System Operations Permit was placed at Lake Granbury.

(4) Return flows representing the discharge of cooling tower blowdown into Lake Granbury were added. These are estimated by Luminant to be 42,100 acft/yr.

(5) Four water supply diversions totaling 31,106 acft/yr were included, which would utilize supply from the pending BRA System Operations Permit. These diversions

are included as water management strategies to meet future needs in the 2006 Brazos G Regional Water Plan. Previous analyses of potential supplies available from the BRA System Operations Permit included 10 potential new diversions totaling 65,482 acft/yr in Brazos G. Not all of these 10 diversions were ultimately recommended as water management strategies in the 2006 Plan. Only those four diversions recommended as water management strategies in the 2006 Plan were included in this analysis.

During development of the 2006 Brazos G and Region H Regional Water Plans, the supply from the BRA System to Brazos G and Region H was apportioned as shown in Table 1. The supplies shown in Table 1 are in addition to those supplies for which the BRA had already committed contractually at the time the 2006 plans were developed and may not necessarily reflect current BRA contractual commitments.

Table 1.
Assignment of Uncontracted BRA Supplies Between Brazos G and Region H.

	Region G	***Region H***	***Total***
Uncontracted BRA Supply from Existing Sources	31,955	29,000	60,955
Allens Creek Reservoir Supply	0	99,650	99,650
BRA System Operations Supply	63,510	120,000	183,510
Total Additional Supply from BRA	95,465	248,650	344,115
Note: All values are in acre-feet per year.			

This assignment was negotiated between Brazos G and Region H, and is considered a conservative estimate of supplies that might be available from the BRA System. Actual supplies available to Brazos G and Region H from the BRA System are likely greater, and will depend upon diversion rights granted in the pending BRA System Operations Permit and the diversion locations of future BRA contractual commitments.

For purposes of determining whether sufficient supply is available from the BRA System to meet the additional Luminant diversion from Lake Granbury and what effect, if any, this would have on supplies available to Region H, the model was operated to meet the Brazos G

supply requirements first, with any remaining supply available from the BRA System assigned to a lower basin diversion to represent supplies available to Region H.

Table 2 summarizes these analyses, and compares these analyses to the original Brazos G WAM analysis of the BRA System Operations Permit completed during the development of the 2006 Brazos G Regional Water Plan, and to the supplies assigned to Brazos G and Region H for the 2006 plans.

Table 2.
Summary of Supplies Available to Brazos G and Region H.

Diversions/Returns	*Original Brazos G WAM Analysis*	*Brazos G/Region H Assignment*	*Somervell County Strategy Evaluation*
Brazos G WUG Strategies	65,482	95,465	31,106
New Luminant Diversion	–	–	76,270
Luminant Return	–	–	(42,100)
Total Brazos G Supply	65,482	95,465	65,276
Lower Basin Supply (Region H)	264,000	248,650	258,750

As shown in Table 2, the total supply available to Brazos G from the BRA System when the Luminant strategy is 65,276 acft/yr. This is approximately equal to the supply delineated in the original Brazos G analysis of supplies that might be used to meet ten individual WUG needs. However, the placement of the recommended four WUG diversions in conjunction with the Luminant strategy reduces the efficiency of the BRA System and reduces lower basin (Region H) supplies from 264,000 acft/yr to 258,750 acft/yr. This is still a greater supply than originally apportioned to Region H during development of the 2006 plans.

In summary, there is sufficient supply available from the BRA System to meet the Steam-Electric demands of the proposed Luminant strategy. Based upon actual recommended water management strategies in the 2006 Brazos G Regional Water Plan, the proposed supply to Luminant will not reduce supplies to Region H below what was originally assumed available during development of the 2006 Region H Water Plan.

As the 2006 Brazos G Regional Water Plan already considers this supply from Lake Granbury, there is little to no change in projected Lake Granbury storage or storage in other

reservoirs constituting the BRA System. Figures 2 through 5 illustrate changes in monthly flows resulting from this strategy being implemented in the 2006 Brazos G Regional Water Plan. In the figures, the "Implemented Plan" conditions are projected flows at the subject locations assuming implementation of the 2006 Brazos G Plan. The "Implemented Plan w/Luminant" conditions are projected flows assuming implementation of the 2006 Brazos G Plan with the addition of the Luminant diversion from Lake Granbury.

1.2 Environmental Issues

1.2.1 Existing Environment

The pipeline's project area in Hood and Somervell Counties lies within the Cross Timbers and Prairie Ecological Region encompassing all or portions of 35 counties situated in north-central Texas.[1] This complex transitional area of prairie dissected by parallel timbered strips is located in the central portion of the area between three other ecological regions, the Blackland Prairie immediately to the east, the Edwards Plateau and Llano Uplift to the south and the Rolling Plains to the west. The physiognomy of the region is oak and juniper woods and mixed grass prairie. Much of the native vegetation has been displaced by agriculture and development, and range management techniques, including fire suppression, have contributed to the spread of invasive woody species and grasses. Farming and grazing practices have also reduced the abundance and diversity of wildlife in the region.[2] The climate is characterized as subtropical subhumid, with hot summers and dry winters. Average annual precipitation ranges between 28 and 32 inches.[3]

Hood and Somervell counties are located primarily over the outcrops of the Trinity Aquifer, the only major groundwater resource in the two-county area. The Trinity Aquifer is composed of interbedded sandstone, sand, limestone, and shale of Cretaceous Age. This aquifer consists of the Antlers Formation, the Twin Mountains Formation, the Paluxy Formation and the Glen Rose Formation. The Paluxy Formation and the Glen Rose Formation constitute the majority of the outcropping units along the pipeline right-of-way[4]. The Paluxy Formation is

[1] Gould, F.W., G.O. Hoffman, and C.A. Rechenthin, Vegetational Areas of Texas, Texas A&M University, Texas Agriculture Experiment Station Leaflet No. 492, 1960.
[2] Telfair, R.C., "Texas Wildlife Resources and Land Uses," University of Texas Press, Austin, Texas, 1999.
[3] Larkin, T.J., and G.W. Bomar, "Climatic Atlas of Texas," Texas Department of Water Resources, Austin, Texas, 1983.
[4] Bureau of Economic Geology (BEG). "Geologic Atlas of Texas, Dallas Sheet. The University of Texas. 1972, Revised 1988.

characterized by fine-grained, compact, friable, very fine to medium-grained white quartz sand interbedded with sandy, silty, calcareous, or waxy clay and shale. The saturated thickness of this formation can vary considerably and is an important regional water-yielding source providing water for rural domestic and livestock uses in addition to a municipal and industrial water supply.[5] The Glen Rose Formation is predominately limestone with smaller amounts of shale, sandy shale, clay sandstone, marl, and anhydrite. Typical thickness of the Glen Rose ranges from 40 to 200 feet with an approximate thickness of 1,500 feet.[6, 7] Locally, groundwater usage is exclusively for rural domestic and livestock needs. No minor aquifers underlie the project area.

The physiography of the region includes hard sandstone, mud, and mudstone (undifferentiated), ceramic clay and lignite/coal, terraces, and flood-prone areas. The topography ranges from flat to rolling, and from steeply to moderately sloped, with local shallow depressions in flood-prone areas along waterways.[8] The predominant soil associations in the project area are Tarrant-Purves, Windthorst-Duffau and Frio-Bosque. The Tarrant-Purves association consists of very shallow to shallow, undulating to hilly, upland clayey soils formed in limestone on ridgetops and hillsides. The Windthorst-Duffau association is characterized by deep, gently sloping to sloping, loamy and sandy soils formed in loamy sediments or in stratified clayey, sandy, or weakly cemented sandstone along shallow upland valleys and foot slopes. The Frio-Bosque association contains deep, nearly level, clayey and loamy soils, found on floodplains of streams that form over limestone.[9]

[5] Klemt,W.B., R.D. Perkins and H.J. Alvarez. "Ground-water Resources of Part of Central Texas with Emphasis on the Antlers and Travis Peak Formations, Volume 1. Texas Water Development Board Report 195. 1975.
[6] Baker, B., G. Duffin, R. Flores, and T. Lynch. "Evaluation of Water Resources in Part of North-Central Texas. Texas Water Development Board Report 318. 1990.
[7] Nordstrom, P.L. "Occurrence, Availability, and Chemical Quality of Ground Water in the Cretaceous Aquifers of North-Central Texas, Volume 1. Texas Water Development Board Report 269. 1982.
[8] Kier, R.S., L.E. Garner, and L.F. Brown, Jr., "Land Resources of Texas." Bureau of Economic Geology, University of Texas, Austin, Texas, 1977.
[9] Coburn, W.C. *Soil Survey of Hood and Somervell Counties, Texas*, United States Department of Agriculture, Soil Conservation Service, in cooperation with Texas Agricultural Experiment Station, 1978.

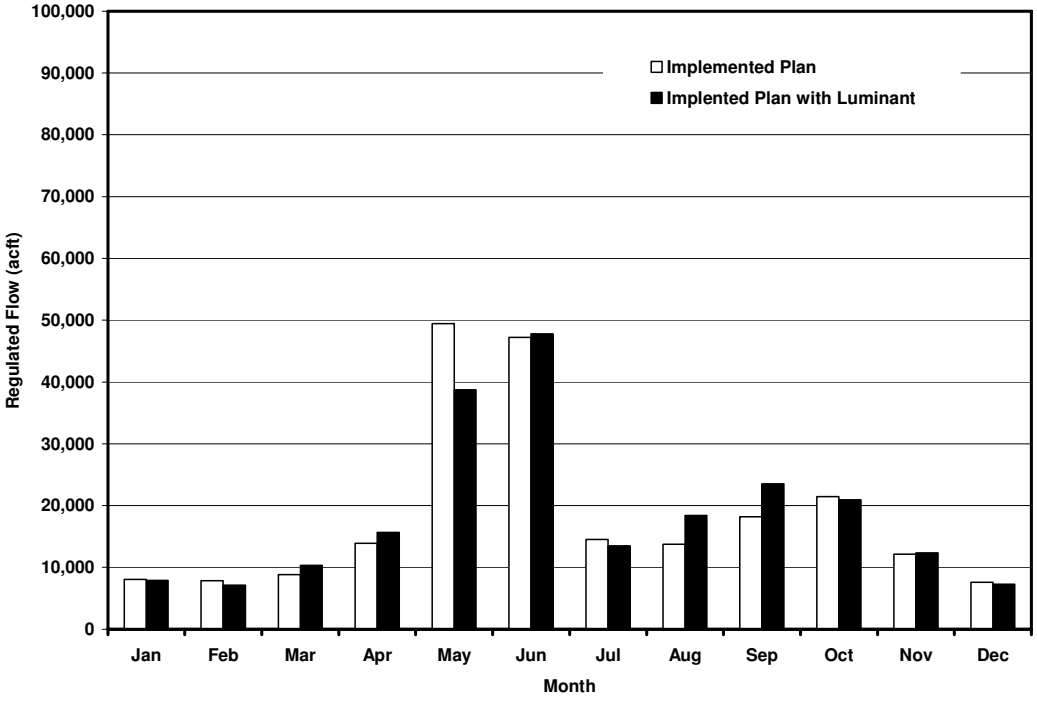

Figure 2. Monthly Median Flows in the Brazos River at Glen Rose.

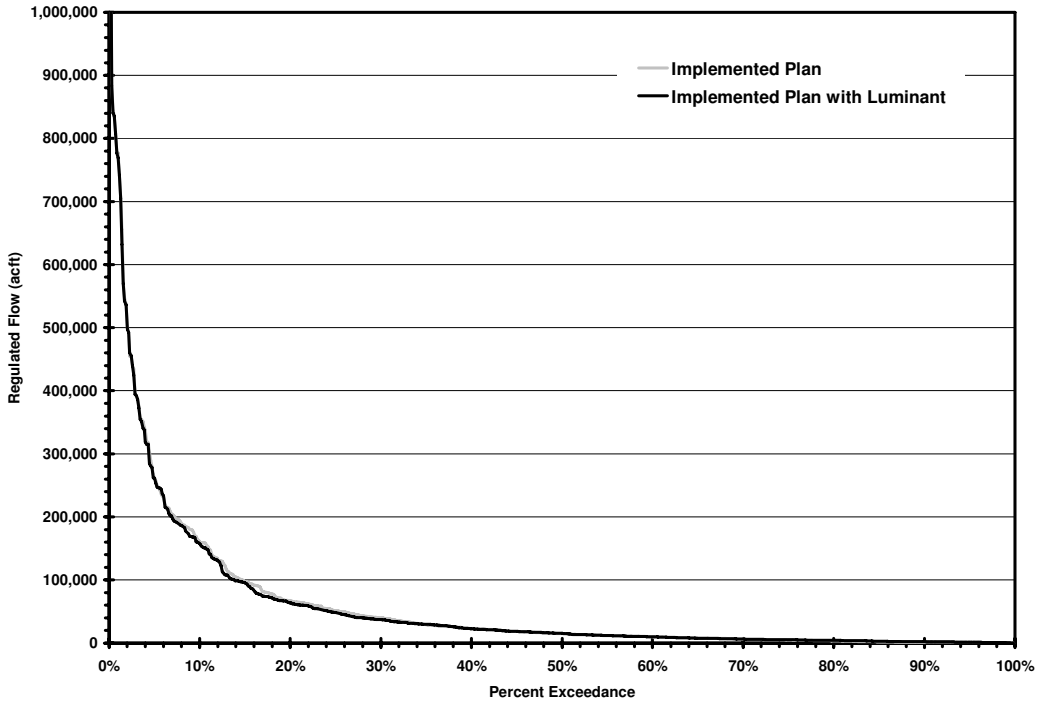

Figure 3. Monthly Flow Frequency in the Brazos River at Glen Rose.

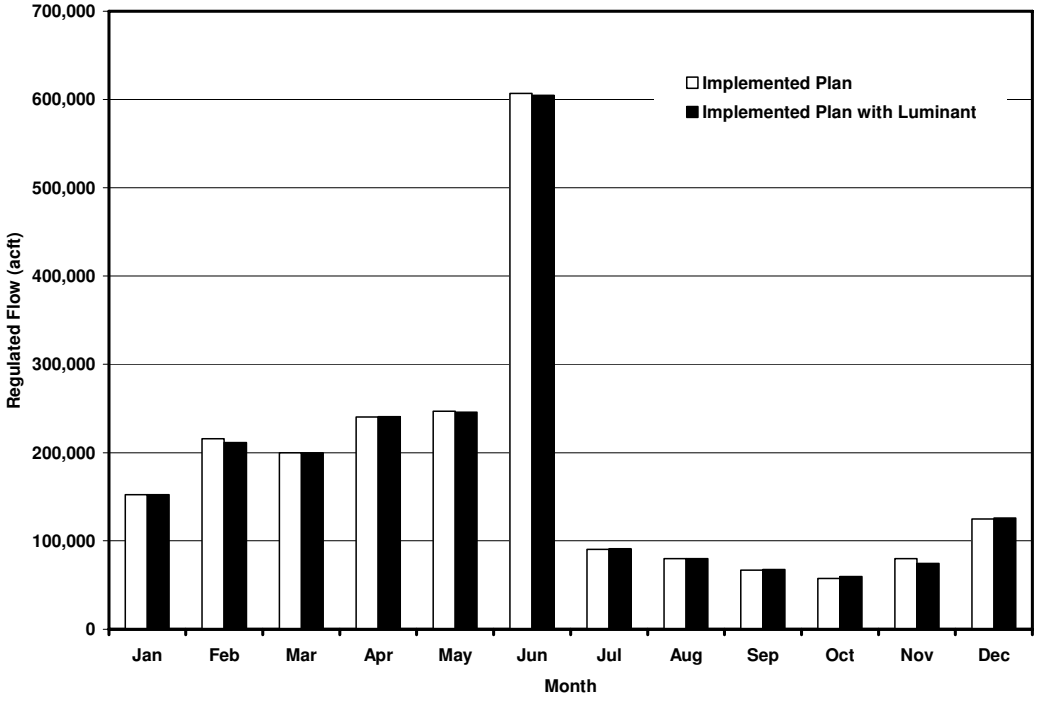

Figure 4. Monthly Median Flows in the Brazos River at Richmond.

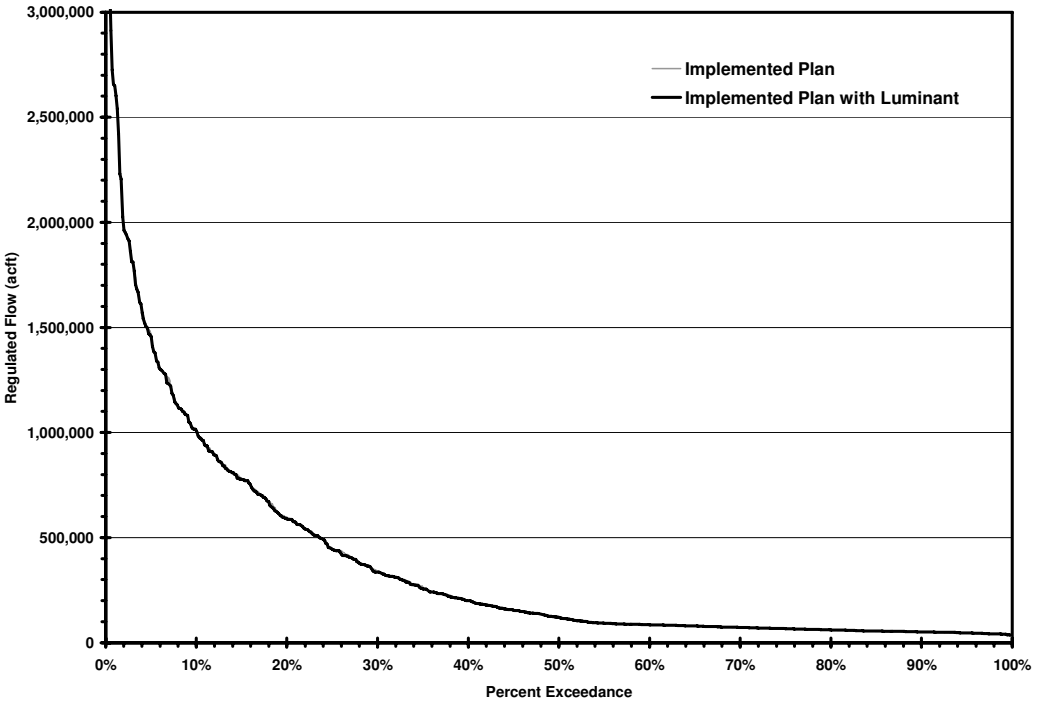

Figure 5. Monthly Flow Frequency in the Brazos River at Richmond.

1.2.1.1 Vegetation Types

Two major vegetation types occur within the general vicinity of the proposed project: Silver Bluestem (*Bothriochloa saccharoides*)–Texas Wintergrass (*Stipa leucotricha*) Grassland and Oaks-Mesquite-Juniper (*Quercus-Prosopis-Juniperus*) Parks/Woods.[10] Variations of these primary types can occur that may involve changes in the composition of woody and herbaceous species and physiognomy according to localized conditions and specific range sites. Silver Bluestem–Texas Wintergrass Grassland could include the following commonly associated plants: little bluestem (*Schizachyrium scoparium*), sideoats grama (*Bouteloua curtipendula*), Texas grama (*Bouteloua rigidiseta*), three-awn (*Aristida* spp.), hairy grama (*Bouteloua hirsuta*), tall dropseed (*Sporobolus cryptandrus*), buffalograss (*Buchloe dactyloides*), windmillgrass, (*Chloris* spp.), hairy tridens (*Tridens pilosum*), tumblegrass (*Schedonnardus paniculatus*), western ragweed (*Ambrosia psilostachya*), broom snakeweed (*Xanthocephalum* spp.), Texas bluebonnet (*Lupinus texensis*), live oak (*Quercus virginiana*), post oak (*Quercus stellata*), and mesquite (*Prosopis glandulosa*). Commonly associated plants of Oaks-Mesquite-Juniper Parks/Woods are post oak, Ashe juniper (*Juniperus ashei*), shin oak (*Quercus sinuata* var. *breviloba*), Texas oak (*Quercus texana*), blackjack oak (*Quercus marilandica*), live oak, cedar elm, agarito (*Berberis trifoliolata*), soapberry (*Sapindus saponaria*), sumac (*Rhus* spp.), hackberry (*Celtis* spp.), Texas pricklypear (*Opuntia lindheimeri*), Mexican persimmon (*Diospyros virginiana*), purple three-awn (*Aristida purpurea*), hairy grama, Texas grama, sideoats grama, curly mesquite (*Hilaria belangeri*), and Texas wintergrass (*Nasella leucotricha*).

1.2.1.2 Wildlife Species and Habitat

A number of vertebrate species would be expected to occur near the project area as indicated by occurrence records for Hood and Somervell counties.[11] These include one species of salamander, 16 species of frogs and toads, seven species of turtles, 11 species of lizards and skinks, and 29 species of snakes. Additionally, 65 species of mammals could occur within the site or surrounding region,[12] as well as an undetermined number of bird species.

[10] McMahan, C.A., R.F. Frye, and K.L. Brown, "The Vegetation Types of Texas," Texas Parks and Wildlife Department, Wildlife Division, Austin, Texas, 1984.
[11] Texas A&M University (TAMU), "County Records for Amphibians and Reptiles," Texas Cooperative Wildlife Collection, 1998.
[12] Davis, W.B., and D.J. Schmidly, "The Mammals of Texas – Online Edition," Texas Tech University, http://www.nsrl.ttu.edu/tmot1/Default.htm, 1997.

The wildlife habitat types of the project area coincide closely with the major plant community types present. The major habitat divisions are forested (upland woodlands and bottomland woodlands), non-forested (savannah, native and improved pastureland, hayfields, forage crops and right-of-ways), aquatic (marshes, ponds, small streams, and major surface-water developments including Lake Granbury and Squaw Creek Reservoir). The upland forested areas are usually dominated by Ashe juniper, cedar elm (*Ulmus crassifolia*), Texas oak, post oak, mesquite and blackjack oak. Some common wildlife species known to occur within this community type include wild turkey (*Meleagris gallopavo*), American robin (*Turdus migratorius*), Carolina chickadee (*Poecile carolinensis*), downy woodpecker (*Picoides pubescens*), turkey vulture (Cathartes aura), blue jay (*Cyanocitta cristata*), northern cardinal (*Cardinalis cardinalis*), and red-bellied woodpecker (*Melanerpes carolinus*). Additional species of potential occurrence include the white-tailed deer, striped skunk (*Mephitis mephitis*), Virginia opossum (*Didelphis virginiana*), eastern fox squirrel (*Sciurus niger*), nine-banded armadillo (*Dasypus novemcinctus*), white-footed mouse (*Peromyscus leucopus*), Texas spiny lizard (*Sceloporus olivaceus*), eastern yellow-bellied racer (*Coluber constrictor*), Texas rat snake (*Elaphe obsoleta*), western diamondback rattlesnake (*Crotalus atrox*), mourning dove (*Zenaida macroura*), tufted titmouse (*Baeolophus bicolor*), rufous-crowned sparrow (*Aimophila ruficeps*), and the painted bunting (*Passerina ciris*).

Bottomland/riparian forested areas occur in topographic lowlands along major streams and along tributaries at higher elevations. Overstory species include cedar elm, Texas sugarberry (*Celtis laevigata*), pecan (*Carya illinoinensis*), walnut (*Juglans* spp.), American elm (*Ulmus americana*), slippery elm (*Ulmus rubra*), eastern cottonwood (*Populus deltoides*), and scattered Ashe juniper. Terrestrial wildlife species typical of this habitat include beaver (*Castor canadensis*), white-tailed deer, northern raccoon (*Procyon lotor*), black vulture (*Coragyps atratus*), American robin, Carolina chickadee, turkey vulture, northern cardinal and red-bellied woodpecker, Virginia opossum, white-footed mouse, wild turkey, eastern screech-owl (*Megascops asio*), yellow-billed cuckoo (*Coccyzus americanus*), pileated woodpecker, Carolina wren (*Thryothorus ludovicianus*), summer tanager (*Piranga rubra*), eastern pewee (*Contopus virens*), Barn owl (*Tyto alba*), fox squirrel, Texas rat snake, woodhouse's toad (*Bufo woodhousei*), eastern gray treefrog (*Hyla versicolor*), and Strecker's chorus frog (*Pseudacris streckeri*).

The savannah community is a type of grassland with an open tree canopy that forms approximately 10 to 50 percent crown cover. Scattered trees that make up the canopy in these stands typically include Ashe juniper, honey mesquite (*Prosopis glandulosa*), cedar elm, post oak and plateau oak (*Quercus fusiformis*). Dominant grasses and weedy herbaceous species include coastal bermudagrass (*Cynodon dactylon*), little bluestem (*Schizachyrium scoparium*), Indian grass (*Sorghastrum nutans*), sideoats grama, Texas grama, Texas wintergrass and hairy grama (*Bouteloua hirsuta*). Faunal species inhabiting the savannah community may include the turkey vulture, northern mockingbird ((*Mimus polyglottos*), dark-eyed junco, American kestrel (*Falco sparverius*), loggerhead shrike (*Lanius ludovicianus*), song sparrow (*Melospiza melodia*), mourning dove, Virginia opossum, eastern cottontail (*Sylvilagus floridanus*), nine-banded armadillo, hispid cotton rat (Sigmodon hispidus), plains harvest mouse (*Reithrodontomys montanus*), ornate box turtle (*Terrapene ornata*), Great Plains skink (*Eumeces obsoleta*), Texas rat snake, western diamondback snake, woodhouses' toad, bobwhite (*Colinus virginianus*) red-tailed hawk (*Buteo jamaicensis*), and eastern meadowlark (*Sturnella magna*).

The pastureland community includes native and improved pastures, hayfields, forage crops, and right-of-ways. Improved or managed pastureland is typically dominated by forage crops including bahiagrass (*Paspalum notatum*) and/or bermudagrass. Periodically kleingrass (*Panicum coloratum*) is planted for hay and as a forage grass. Unimproved pastureland and right-of-way areas consist of a variety of grasses, forbs, and woody species. Common grasses found throughout these habitats include little bluestem, sideoats grama, and Indiangrass. Wildlife species that may inhabit the community pastureland include most of those also occurring in the savannah habitat.

Aquatic habitats within the project area right-of-way consist primarily of stock ponds, unnamed tributaries to the Brazos River, Squaw Creek and its tributaries, Squaw Creek Reservoir and Lake Granbury. Plant species common to this habitat may include rushes (*Scirpus* spp.), sedges (*Carex* spp. and *Cyperus* spp.), spikesedges (*Eleocharis* spp.), and cattails (*Typha* spp.). Aquatic fauna may include the belted kingfisher (*Megaceryle alcyon*), great blue heron (*Ardea herodias*), lesser scaup (*Aythya affinis*), beaver, raccoon, and cricket frogs (*Acris* spp.), Virginia opossum, bullfrog (*Rana catesbeiana*), pied-billed grebe (*Podilymbus podiceps*), blue-winged teal (*Anas discors*), and the American widgeon (*Mareca americana*).

1.2.1.3 Aquatic Habitat

The project area is located within the middle segment of the Brazos River Basin in North-Central Texas. All surface drainage in the vicinity of the proposed pipeline follows a general east and southeast course toward the river. As previously mentioned, the major aquatic environments include reservoirs, intermittent streams and small surface water impoundments (stock ponds). The principal tributaries to the Brazos River that will be crossed by the pipeline include Squaw Creek, Panther Branch and several unnamed drainage systems that have direct communication with the main channel of the Brazos River. Distributions and population densities of aquatic assemblages are limited by the types and quality of habitats available. Aquatic biota in most of the project-area streams and ponds is probably severely restricted because of the lack of permanent water.

1.2.2 Potential Impacts

Luminant is proposing to construct two 36-inch diameter and two 42-inch diameter pipelines. The proposed pipelines will tie into Lake Granbury and terminate at the Comanche Peak Station. The entire proposed pipeline alignment, located on the Acton, Nemo, and Hill City 7.5 minute U.S. Geological Survey (USGS) topographic quadrangle maps, is approximately 63,000 feet long. The majority of the pipeline route between Lake Granbury and the vicinity of Squaw Creek Reservoir will parallel an existing pipeline ROW. Approximately half of the new pipeline, positioned along the south and southwest portion of Squaw Creek Reservoir, will be on Luminant property. The final alignment of the proposed pipeline(s) will be selected to avoid or minimize environmental impacts.

1.2.2.1 Vegetation

The anticipated impact of this project to vegetation resulting from site preparation and construction is the removal of existing woody vegetation from the areas required for the ROW. The greatest amount of vegetation clearing would be required in forested areas, while minimal clearing would be necessary in pasturelands. The only land lost to cultivation will be that occurring within the pipeline corridor easement.

Potential for regulatory wetlands is the greatest along the tributaries crossed by the pipeline route. Field investigations would be required to delineate the full extent of waters of the U.S., including wetlands, within the ROW. The United State Army Corps of Engineers

(USACE), Fort Worth District, has the primary regulatory authority for enforcing Section 404 of the Clean Water Act (CWA) requirements. The USACE would provide a verification of the delineation and make the final jurisdictional determination for waters of the U.S. in the ROW during permit negotiations.

1.2.2.2 Wildlife

The impact of construction of the proposed project on terrestrial wildlife and wildlife habitats would vary depending upon the timing of construction and types of construction techniques used, as well as on the requirements of each species and the habitat present where various project components would be constructed. In general, impact on terrestrial wildlife in the area for the new pipeline would be short term and minimal because no sensitive habitats would be affected (as indicated by Luminant based upon field investigations), and much of the area affected by construction would be allowed to revert to the pre-construction habitat type following construction.

Native wildlife habitat adjacent to the proposed project site has been eliminated by prior construction activities as the current ROW vegetation is a mowed grass field. The maintained grassy areas do not provide sufficient habitat to support diverse wildlife populations.

Due to the disturbed nature of the ROW from prior commercial activity associated with the Comanche Peak Station and because the site is mowed on a regular basis, the number and diversity of mammal, bird, reptile, and amphibian species are low and limited. Some species such as rodents, rabbits, lizards and insects may be affected by the construction due to alteration in habitat and direct contact with construction equipment. Those species common along the ROW are well adapted to life within this area and may move away during construction and return once the pipeline has been covered. However, the long-terms effects will be minimal.

The pipeline site is located in the North American flyway and many neo-tropical migrants pass over this area annually. Development of a construction schedule should be timed to minimize impacts to migratory birds during the major fall and spring migrations.

1.2.2.3 Threatened and Endangered Species

A total of 25 species could potentially occur within the vicinity of the site that are state- or federally-listed as threatened or endangered, candidates for listing, or exhibit sufficient rarity to be listed as a species of concern (Table 3). This group includes three reptiles, ten birds, two

mammals, three mollusks, and two fish species. Four bird species federally-listed as threatened or endangered could occur in the project area. These include the black-capped vireo (*Vireo atricapillus*), golden-cheeked warbler (*Dendroica chrysoparia*), interior least tern (*Sterna antillarum athalassos*), and whooping crane (*Grus americana*). These four birds are all seasonal migrants that could pass through the project area but would not likely be directly affected by the proposed pipeline crossing.

A search of the Texas Wildlife Diversity Database (TXNDD)[13] revealed six documented occurrences of the golden-cheeked warbler, six occurrences of the black-capped vireo, one documented occurrence each for the Brazos water snake (*Nerodia harteri*), Comanche Peak prairie-clover (*Dalea reverchonii*), and Glen Rose yucca (*Yucca necopina*) within the project vicinity as noted on representative 7.5-minute quadrangle maps (Nemo, Granbury, Hill City, Acton) that include the project site. The TXNDD has documented a waterbird colony (i.e., rookery) along Squaw Creek and Panther Branch near the upper end of Squaw Creek Reservoir and northwest of the proposed pipeline ROW. The two plant species of concern currently have no regulatory listing status and it is not anticipated that construction activity would create any adverse impact to these species. Confirmed habitat for the golden-cheeked warbler and the black-capped vireo is found 1 mile southwest of the proposed corridor, however, no impacts to these species are expected. The Brazos water snake is known to reside in the Brazos River in the vicinity of the proposed pipeline but is not likely to be found in the streams along the pipeline route due to lack of suitable habitat.

These data are not a representative inventory of rare resources or sensitive sites. Although based on the best information available to Texas Parks and Wildlife Department (TPWD), these data do not provide a definitive statement as to the presence, absence, or condition of special species, natural communities, or other significant features in the project area. Luminant Power has indicated that on-site evaluations have been conducted to investigate the occurrence of sensitive species or habitats, but the results of those evaluations are not yet available. The results of these evaluations will be described in the proposed facility's Construction and Operation License Application (COLA) to be submitted to the Nuclear Regulatory Commission (NRC).

[13] Texas Parks and Wildlife Department (TPWD), Texas Wildlife Diversity Database, February 28, 2008.

1.2.2.4 Aquatic Environments

The potential impacts of this water management strategy were evaluated at two gage locations on the Brazos River: (1) near Glen Rose downstream of the proposed pipeline and (2) near Richmond in the lower portion of the watershed. Monthly streamflows at these two sites are presented in Figures 2 through 5, and Tables 4 and 5. The anticipated impact of this water management strategy on overall flows would be minor when addressed from the perspective of the existing 2006 plan. In general, flows downstream of Lake Granbury, as measured by the Glen Rose gage, would generally be somewhat less than those without the new Luminant diversion; however, flows would increase in some months. These differences are due to how the BRA system of reservoirs responds in the modeling of the BRA System Operations Plan to meet shifting water needs. There would be little difference in flows at the Richmond gage.

It is not likely that this project, alone, would have a substantial influence on total discharge in the Brazos River or to freshwater inflows to the Brazos River estuary where additional flow inputs would moderate the effects. No impacts on endangered or threatened aquatic fauna are anticipated.

Table 3.
Potentially Occurring Species that are Rare or Federal- and State-Listed at the Luminant Pipeline, Hood and Somervell Counties

Scientific Name	*Common Name*	*Federal/State Status*	*Hood County*	*Somervell County*
Birds				
Falco peregrinus anatum	American Peregrine Falcon	DL/E	Migrant	Migrant
Falco peregrinus tundrius	Arctic Peregrine Falcon	DL/T	Migrant	Migrant
Haliaeetus leucocephalus	Bald Eagle	DL/T	Migrant	Migrant
Vireo atricapillus	Black-capped Vireo	LE/E	Migrant	Migrant
Dendroica chrysoparia	Golden-cheeked Warbler	LE/E	Migrant	Migrant
Ammodramus bairdii	Baird's Sparrow	SOC	Migrant	—
Sterna antillarum athalassos	Interior Least Tern	LE/E	Migrant*	Migrant*
Charadrius montanus	Mountain Plover	SOC	Migrant*	Migrant*
Athene cunicularia hypugaea	Western Burrowing Owl	SOC	Migrant*	Migrant*
Grus americana	Whooping Crane	LE/E	Migrant	Migrant
Fishes				
Notropis oxyrhynchus	Sharpnose Shiner	C/SOC	X	X
Notropis buccula	Smalleye Shiner	C/SOC	X	X
Mammals				
Ursus americanus	Black Bear	T/SA;NL/T	X	—
Canis lupus	Gray Wolf	LE/E	Extirpated	Extirpated
Spilogale putorius interrupta	Plains Spotted Skunk	SOC	X	X
Canis rufus	Red Wolf	LE/E	Extirpated	Extirpated
Mollusks				
Tritogonia verrucosa	Pistolgrip	SOC	X	X
Arcidens confragosus	Rock pocketbook	SOC	X	X
Truncilla macrodon	Texas fawnsfoot	SOC	X	X
Reptiles				
Nerodia harteri	Brazos Water Snake	SOC/T	X	X
Thamnophis sirtalis annectens	Texas Garter Snake	SOC	X	X
Phrynosoma cornutum	Texas Horned Lizard	SOC/T	X	X
Crotalus horridus	Timber/Canebrake rattlesnake	SOC/T	X	X
Plants				
Dalea reverchonii	Comanche Peak Prairie-Clover	SOC	X	—
Yucca necopina	Glen Rose Yucca	SOC	X	X

X = Occurs in county; — = does not occur in county; * Nesting migrant; may nest in the county.

Federal Status: LE-Listed Endangered; LT-Listed Threatened; T/SA- Listed Threatened on Basis of Similarity of Appearance; DL-Delisted Endangered/Threatened; NL-Not Listed; C-Candidate (USFWS has substantial information on biological vulnerability and threats to support proposing to list as endangered or threatened. Data are being gathered on habitat needs and/or critical habitat designations); SOC-Species of Concern (some information exists showing evidence of vulnerability, but is not listed).

State Status: E-Listed as Endangered by the State of Texas; T-Listed as Threatened by the State of Texas; SOC-Species of Concern (some information exists showing evidence of vulnerability, but is not listed)

Sources: Texas Parks and Wildlife Department (TPWD) Annotated County List of Rare Species for Hood and Somervell Counties (2007); TPWD Texas Wildlife Diversity Database (2008), United States Fish and Wildlife Service (USFWS), Federally-listed as Threatened and Endangered Species of Texas, February 5, 2008.

1.2.2.5 Cultural Resources

An archeological survey and results of machine-assisted deep testing were provided by Luminant. This work was accomplished between February 11 and 15, 2008, to identify and assess any cultural resources that might be present within all areas to be impacted by the construction of the proposed pipeline. Field investigations entailed an intensive pedestrian surface survey with the excavation of several shovel test pits in surface soil areas along the segments of alternate routes positioned south of Squaw Creek Reservoir and deep trench assessment using a backhoe in five areas across the flood plain of Squaw Creek below the Squaw Creek Reservoir Dam. Ten areas of archeological interest previously identified during a reconnaissance were revisited for evaluation. These sites were determined to be either sufficiently removed from the proposed corridor area or were of little archeological value. Two new areas of archeological interest were encountered during this survey but were not considered to have substantial archeological significance. The entire project area surveyed has been

Table 4.
Median Monthly Streamflow: Brazos River Gage near Glen Rose

Month	*2006 Brazos G Plan (acft/mo)*	*2006 Plan with Luminant (acft/mo)*	*Difference (acft/mo)*	*Percent Reduction*
January	8,042	7,907	-135	-1.7%
February	7,831	7,132	-699	-8.9%
March	8,842	10,314	1,472	16.6%
April	13,891	15,670	1,779	12.8%
May	49,414	38,737	-10,677	-21.6%
June	47,185	47,792	607	1.3%
July	14,535	13,460	-1,074	-7.4%
August	13,732	18,388	4,656	33.9%
September	18,216	23,495	5,279	29.0%
October	21,460	20,929	-532	-2.5%
November	12,161	12,350	189	1.6%
December	7,584	7,309	-275	-3.6%

Table 5.
Median Monthly Streamflow: Brazos River Gage at Richmond

Month	*2006 Brazos G Plan (acft/mo)*	*2006 Plan with Luminant (acft/mo)*	*Difference (acft/mo)*	*Percent Reduction*
January	152,353	152,461	108	0.1%
February	215,567	211,630	-3,937	-1.8%
March	199,589	199,589	0	0.0%
April	240,376	240,841	465	0.2%
May	246,759	245,815	-944	-0.4%
June	606,834	604,515	-2,319	-0.4%
July	90,396	90,927	531	0.6%
August	79,916	79,782	-134	-0.2%
September	66,929	67,512	584	0.9%
October	57,516	59,533	2,016	3.5%
November	79,934	74,373	-5,561	-7.0%
December	124,910	125,850	941	0.8%

extremely disturbed by previous construction and land clearing activities. Sediments along Squaw Creek exceeded the maximum depth of the proposed waterline set at 6 feet but showed no indications of containing buried archeological deposits.

Additionally, a records search of the Texas Archeological Sites Atlas database was conducted on February 20, 2008 to determine the density of archeological sites documented within a 1,000-feet wide corridor (500 feet on either side of the proposed pipeline route) extending approximately 12 miles from Lake Granbury and ending at the Comanche Peak Station. After a review of the United States Geological Survey (USGS) 7.5-minute topographic quadrangle maps for Acton, Hill City and Nemo, the results reveal that one archeological site has been documented within the 500 feet boundary east of the proposed pipeline crossing in Hood County. Site 41SV55 was recorded in 1974 by Southern Methodist University (SMU) and consisted of a prehistoric scatter of lithics and burned rock that had been disturbed by agricultural plowing and vandalism. The present condition of this site is unknown and the site file located at the Texas Archeological Research Laboratory (TARL) consists of location data only. Several other recorded sites appear to lie within 0.31 miles (0.5 kilometers) of the currently proposed route.

None of the cultural resources directly along the pipeline corridor or within the Area of Potential Effect (APE) have potential for significant or important research value nor do they qualify for inclusion applicable to National Register of Historic Places (NRHP) significance criteria or listing as a State Archeological Landmark (SAL). No further archeological investigations are recommended. However, prior to construction of new pipeline, the project must be coordinated with the Texas Historical Commission (THC) to obtain clearance.

Coordination with the THC is ongoing. Based on survey results, Luminant has indicated that there are no significant findings along the pipe line routes. Cultural resources that occur on public lands or within the APE of publicly funded or permitted projects are governed by the Texas Antiquities Code (Title 9, Chapter 191, Texas Natural Resource Code of 1977), the National Historic Preservation Act (PL96-515), and the Archeological and Historic Preservation Act (PL93-291).

1.2.2.6 Threats to Natural Resources

Threats to natural resources include potentially lower streamflows downstream of Lake Granbury, potentially increased salinity levels (total dissolved solids, TDS) in Lake Granbury, and potentially increased temperatures. Downstream flows will be largely unaffected by the addition of the Luminant diversion.

Blowdown water from the cooling towers that would be returned to Lake Granbury will contain essentially the same mass load of TDS as the water originally diverted, but in greater concentrations due to the forced loss of water during the cooling process. In order to obtain a Texas Pollutant Discharge Elimination System (TPDES) discharge permit from the Texas Commission on Environmental Quality, Luminant will likely be required to treat the blowdown water by removing dissolved solids. For this reason, it is assumed that Luminant will be required to treat the blowdown water sufficiently so as to not create salinity levels in Lake Granbury that would constitute a threat to natural resources. The required treatment to remove dissolved solids is not included in this analysis.

Increased temperature in Lake Granbury could pose a threat to natural resources. The blowdown water to be discharged into Lake Granbury will be hotter than the ambient water temperature. Analyses provided by Luminant indicate that this temperature increase would dissipate quickly, and therefore will not increase the overall water temperature in Lake Granbury.

1.3 Engineering and Costing

Summaries of project costs for the diversion and blowdown pipelines are shown in Tables 6 and 7. The total project is estimated to cost $103.9 million for construction of the intake, pump stations, and transmission pipelines necessary to divert supply from Lake Granbury and return the blowdown water back to the reservoir. The annual project costs are estimated to be $15.98 million; this includes annual debt service, operation and maintenance, and annual payment to the Brazos River Authority for the water supply.

1.4 Implementation Issues

This water supply option has been compared to the plan development criteria, as shown in Table 8, and the option meets each criterion.

Table 6.
Cost Estimate Summary
Somervell County Steam Electric Supply from the Brazos River Authority
(Second Quarter 2002 Prices)
Cooling Tower Supply Pipeline

Item	*Estimated Costs for Facilities*
Capital Costs	
Intake and Pump Station (92.6 MGD)	$22,318,000
Transmission Pipeline (42 in dia., 12 miles)	$25,548,000
Total Capital Cost	**$47,866,000**
Engineering, Legal Costs and Contingencies	$15,476,000
Environmental & Archaeology Studies and Mitigation	$602,000
Land Acquisition and Surveying (121 acres)	$265,000
Interest During Construction (2 years)	$5,137,000
Total Project Cost	**$69,346,000**
Annual Costs	
Debt Service (6 percent, 30 years)	$5,038,000
Operation and Maintenance	
Intake, Pipeline, Pump Station	$813,000
Pumping Energy Costs (59775328 kW-hr @ 0.06 $/kW-hr)	$3,587,000
Purchase of Water (76270 acft/yr @ 45.75 $/acft)	$3,489,000
Total Annual Cost	**$12,927,000**
Available Project Yield (acft/yr)	103,717
Annual Cost of Water ($ per acft)	$125
Annual Cost of Water ($ per 1,000 gallons)	$0.38

Table 7.
Cost Estimate Summary
Somervell County Steam Electric Supply from the Brazos River Authority
(Second Quarter 2002 Prices)
Cooling Tower Blowdown Pipeline

Item	*Estimated Costs for Facilities*
Capital Costs	
Intake and Pump Station (37.6 MGD)	$3,333,000
Transmission Pipeline (36 in dia., 12.6 miles)	$20,469,000
Total Capital Cost	**$23,802,000**
Engineering, Legal Costs and Contingencies	$7,307,000
Environmental & Archaeology Studies and Mitigation	$634,000
Land Acquisition and Surveying (92 acres)	$265,000
Interest During Construction (2 years)	$2,561,000
Total Project Cost	**$34,569,000**
Annual Costs	
Debt Service (6 percent, 30 years)	$2,511,000
Operation and Maintenance	
Intake, Pipeline, Pump Station	$288,000
Pumping Energy Costs (4297887 kW-hr @ 0.06 $/kW-hr)	$258,000
Total Annual Cost	**$3,057,000**
Available Project Yield (acft/yr)	42,100
Annual Cost of Water ($ per acft)	$73
Annual Cost of Water ($ per 1,000 gallons)	$0.22

Note: Costs related to treatment of blowdown water (desalination) are not considered.

Table 8.
Comparison of Somervell County Steam Electric Supply from the Brazos River Authority to Plan Development Criteria

Impact Category	*Comment(s)*
A. Water Supply	
1. Quantity	1. Sufficient to meet needs
2. Reliability	2. High reliability
3. Cost	3. Reasonable
B. Environmental factors	
1. Environmental Water Needs	1. Low impact
2. Habitat	2. Low to moderate impact
3. Cultural Resources	3. Low to moderate impact
4. Bays and Estuaries	4. Low impact
5. Threatened and Endangered Species	5. Low impact
6. Wetlands	6. Low impact
C. Impact on Other State Water Resources	• Low to moderate impact on salinity levels in Lake Granbury, depending on TPDES discharge permit requirements; no effect on navigation
D. Threats to Agriculture and Natural Resources	• Low to none
E. Equitable Comparison of Strategies Deemed Feasible	• Option is considered to meet industrial shortages
F. Requirements for Interbasin Transfers	• Not applicable
G. Third Party Social and Economic Impacts from Voluntary Redistribution	• None

1.4.1 Potential Regulatory Requirements

- Texas Commission on Environmental Quality (TCEQ) System Operations Permit will need to be obtained by the Brazos River Authority;
- U.S. Army Corps of Engineers Permits will be required for discharges of dredge or fill into wetlands and waters of the U.S. for dam construction, and other activities (Section 404 of the Clean Water Act);
- TCEQ-administered Texas Pollutant Discharge Elimination System (TPDES) Storm Water Pollution Prevention Plan;
- TCEQ-administered TPDES discharge permit for return of blowdown water to Lake Granbury;
- General Land Office (GLO) Easement if State-owned land or water is involved; and,
- Texas Parks and Wildlife Department (TPWD) Sand, Shell, Gravel and Marl permit if State-owned streambed is involved.

1.4.2 State and Federal Permits may Require the Following Studies and Plans

- Environmental impact or assessment studies. Luminant indicates that that these studies have been completed, with the final report under preparation;
- Wildlife habitat mitigation plan that may require acquisition and management of additional land;
- Flow releases downstream to maintain aquatic ecosystems;
- Assessment of impacts on Federal- and State-listed endangered and threatened species; and,
- Cultural resources studies to determine resources impacts and appropriate mitigation plan that may include cultural resource recovery and cataloging; requires coordination with the Texas Historical Commission. Luminant indicates that these studies have been completed and contemplate that no further action will be required.

1.4.3 Land Acquisition Issues

- Additional width of easement on land not owned by Luminant may be required.

4C.30 Somervell County Water Supply Plan

Table 4C.30-1 lists each water user group in Somervell County and their corresponding surplus or shortage in years 2030 and 2060. For each water user group with a projected shortage, a water supply plan has been developed and is presented in the following subsections.

Table 4C.30-1.
Somervell County Surplus/(Shortage)

Water User Group	*Surplus/(Shortage)*[1]		*Comment*
	2030 (acft/yr)	*2060 (acft/yr)*	
City of Glen Rose	38	37	Projected surplus
County-Other	(231)	(260)	Projected shortage – see plan below
Manufacturing	(4)	(7)	Projected shortage – see plan below
Steam-Electric	(36,047)	(36,107)	Projected shortage – see plan below
Mining	(94)	(85)	Projected shortage – see plan below
Irrigation	945	953	Projected surplus
Livestock	0	0	Supply equals demand

[1] From Tables C-59 and C-60, Appendix C – Comparison of Water Demands with Water Supplies to Determine Needs.

4C.30.1 The City of Glen Rose

4C.30.1.1 Description of Supply

The City of Glen Rose obtains groundwater from the Trinity Aquifer. No shortage is projected for the City of Glen Rose. However, Glen Rose may obtain supplemental surface water supplies from the Somervell County Water Supply Project.

4C.30.1.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended to supplement existing supplies for the City of Glen Rose:

- Somervell County Water Supply Project – the project will treat raw water from Wheeler Branch Off-Channel Reservoir and transmit the treated water to customers of the Somervell County Water District.

4C.30.1.3 Costs

Costs of the Somervell County Water Supply Project are discussed in Section 4C.30.2.3 below.

Table 4C.30-1.
Recommended Plan Costs by Decade for the City of Glen Rose

Plan Element	*2010*	*2020*	*2030*	*2040*	*2050*	*2060*
Projected Surplus/(Shortage) (acft/yr)	57	46	38	36	36	37
Somervell County Water Supply Project (Phases 1 – 4)*						
Supply From Plan Element (acft/yr)	340	340	340	340	340	340
Annual Cost ($/yr)	$808,188	$808,188	$808,188	$143,974	$143,974	$143,974
Unit Cost ($/acft)	$2,377	$2,377	$2,377	$423	$423	$423
Somervell County Water Supply Project (Phases 5 – 13)*						
Supply From Plan Element (acft/yr)	–	–	260	260	260	260
Annual Cost ($/yr)	–	–	$249,488	$249,488	$249,488	$44,402
Unit Cost ($/acft)	–	–	$960	$960	$960	$171

* Note: This supply is from the Wheeler Branch Reservoir, which has been implemented. The project is for development of treatment and transmission facilities.

4C.30.2 County-Other

4C.30.2.1 Description of Supply

Somervell County-Other obtains its water supply from groundwater from the Trinity Aquifer. Based on the available groundwater supply, Somervell County-Other is projected to have a shortage of 231 acft/yr in the year 2030 and 260 acft/yr in the year 2060.

4C.30.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended to meet the projected shortage of Somervell County-Other:

- Wheeler Branch Off-Channel Reservoir – the project has obtained a water rights permit from the TCEQ and is projected to be completed by 2010
- Somervell County Water Supply Project – the project will treat raw water from Wheeler Branch Off-Channel Reservoir and transmit the treated water to customers of the Somervell County Water District.

- Conservation was also considered; however, the County-Other's per capita use rate is below the selected target rate of 140 gpcd.

4C.30.2.3 Costs

Costs of the Recommended Plan for Somervell County-Other.

a. Wheeler Branch Off-Channel Reservoir:
   - Cost Source: Volume II, Section 4B.13.3
   - Date to be Implemented: before 2010
   - Total Project Cost: $27,195,000
   - Annual Cost: $2,117,000

b. Somervell County Water Supply Project:
   - Cost Source: Somervell County Water District
   - Date to be Implemented: before 2010, with future phases
   - Total Project Cost: $87,226,800 (Phases 1 – 13). (Excluding retail distribution, the cost is $35,159,900.)
   - Annual Cost: $7,659,700 (Phases 1 – 13). (Excluding retail distribution, the annual cost is $3,109,800.)

Table 4C.30-2.
Recommended Plan Costs by Decade for Somervell County-Other

Plan Element	*2010*	*2020*	*2030*	*2040*	*2050*	*2060*
Projected Surplus/(Shortage) (acft/yr)	(133)	(189)	(231)	(251)	(257)	(260)
Wheeler Branch Off-Channel Reservoir						
Supply From Plan Element (acft/yr)	1,800	1,800	1,800	1,800	1,800	1,800
Annual Cost ($/yr)	$2,117,000	$2,117,000	$2,117,000	$2,117,000	$2,117,000	$2,117,000
Unit Cost ($/acft)	$1,176	$1,176	$1,176	$1,176	$1,176	$1,176
Somervell County Water Supply Project (Phases 1 – 4)*						
Supply From Plan Element (acft/yr)	200	200	200	200	200	200
Annual Cost ($/yr)	$475,405	$475,405	$475,405	$84,690	$84,690	$84,690
Unit Cost ($/acft)	$2,377	$2,377	$2,377	$423	$423	$423
Somervell County Water Supply Project (Phases 5 – 13)*						
Supply From Plan Element (acft/yr)	–	–	516	516	516	516
Annual Cost ($/yr)	–	–	$495,138	$495,138	$495,138	$88,120
Unit Cost ($/acft)	–	–	$960	$960	$960	$171

* Note: This supply is from the Wheeler Branch Reservoir, which has been implemented. The project is for development of treatment and transmission facilities.

4C.30.3 Manufacturing

4C.30.3.1 Description of Supply

Somervell County Manufacturing obtains its water supply from groundwater from the Trinity Aquifer. Based on the available groundwater supply, Somervell County Manufacturing is projected to have a shortage of 4 acft/yr in the year 2030 and 7 acft/yr in the year 2060.

4C.30.3.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended to meet the projected shortage of Somervell County Manufacturing:

- Conservation, and
- Purchase water from the City of Glen Rose.

4C.30.3.3 Costs

Costs of the Recommended Plan for Somervell County Manufacturing.

a. Conservation:
   - Date to be Implemented: before 2010
   - Annual Cost: Not determined

b. Water Supply from City of Glen Rose:
   - Cost Source: estimated wholesale treated water rate
   - Date to be Implemented: By year 2010
   - Annual Cost: $16,161 in 2060

   The annual cost was calculated by multiplying the Manufacturing projected supply from this strategy by an estimated wholesale water rate of $162/acft.

Table 4C.30-3.
Recommended Plan Costs by Decade for Somervell County Manufacturing

Plan Element	*2010*	*2020*	*2030*	*2040*	*2050*	*2060*
Projected Surplus/(Shortage) (acft/yr)	(2)	(3)	(4)	(5)	(6)	(7)
Conservation						
Supply From Plan Element (acft/yr)	0	0	1	1	1	1
Annual Cost ($/yr)	—	—	—	—	—	—
Unit Cost ($/acft)	—	—	—	—	—	—
Water Supply from City of Glen Rose						
Supply From Plan Element (acft/yr)	10	10	10	10	10	10
Annual Cost ($/yr)	$16,161	$16,161	$16,161	$16,161	$16,161	$16,161
Unit Cost ($/acft)	$162	$162	$162	$162	$162	$162

4C.30.4 Steam-Electric

4C.30.4.1 Description of Supply

Somervell County Steam-Electric obtains its water supply from Squaw Creek Reservoir and from the Brazos River Authority from Lake Granbury. Somervell County Steam-Electric is projected to have a shortage of 36,047 acft/yr in 2030 and 36,107 acft/yr in 2060. Potable water for plant staff and high-quality process water for boiler feed at the Comanche Peak Steam Electric Station is currently provided from local groundwater. When the Somervell County Water Supply Project is developed, some potable water and process water for the plant will be obtained from the project. Additional future water supplies will come from additional water supply from the Brazos River Authority.

4C.30.4.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended to supplement existing supplies for Somervell County Steam-Electric:

- Somervell County Steam Electric Supply from the Brazos River Authority.
- Somervell County Water Supply Project – the project will treat raw water from Wheeler Branch Off-Channel Reservoir and transmit the treated water to customers of the Somervell County Water District.

- Conservation was also considered; however, the Somervell County Steam-Electric is already exercising substantial conservation.

4C.30.4.3 Costs

Cost of the Recommended Plan for Somervell County Steam-Electric:

a. Water Supply from the Somervell County Steam Electric Supply from the Brazos River Authority:
   - Cost Source: Strategy Evaluation of Proposed Amendment
   - Date to be Implemented: By year 2020
   - Annual Cost: $15,980,000 in 2030

b. Costs of the Somervell County Water Supply Project are discussed in Section 4C.30.2.3 above.

Table 4C.30-4.
Recommended Plan Costs by Decade for Somervell County Steam-Electric

Plan Element	*2010*	*2020*	*2030*	*2040*	*2050*	*2060*
Projected Surplus/(Shortage) (acft/yr)	25,610	(36,027)	(36,047)	(36,067)	(36,087)	(36,107)
Somervell County Steam Electric Supply from the Brazos River Authority						
Supply From Plan Element (acft/yr)	–	103,717	103,717	103,717	103,717	103,717
Annual Cost (million $/yr)	–	$15.98	$15.98	$15.98	$8.44	$8.44
Unit Cost ($/acft)	–	$154	$154	$154	$81	$81
Somervell County Water Supply Project (Phases 1 – 4)*						
Supply From Plan Element (acft/yr)	300	300	300	300	300	300
Annual Cost ($/yr)	$713,107	$713,107	$713,107	$127,036	$127,036	$127,036
Unit Cost ($/acft)	$2,377	$2,377	$2,377	$423	$423	$423
Somervell County Water Supply Project (Phases 5 – 13)*						
Supply From Plan Element (acft/yr)	–	–	184	184	184	184
Annual Cost ($/yr)	–	–	$176,561	$176,561	$176,561	$31,423
Unit Cost ($/acft)	–	–	$960	$960	$960	$171

* Note: This supply is from the Wheeler Branch Reservoir, which has been implemented. The project is for development of treatment and transmission facilities.

4C.30.5 Mining

4C.30.5.1 Description of Supply

Somervell County Mining obtains its water supply from groundwater from the Trinity Aquifer. Based on the available groundwater supply, Somervell County Mining is projected to have a shortage of 94 acft/yr in the year 2030 and 85 acft/yr in the year 2060.

4C.30.5.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended to meet the projected shortage of Somervell County Mining:

- Conservation, and
- Voluntary Redistribution from Steam-Electric.

4C.30.5.3 Costs

Costs of the Recommended Plan for Somervell County Mining.

a. Conservation:
   - Date to be Implemented: before 2010
   - Annual Cost: Not determined

b. Voluntary Redistribution from Steam-Electric:
   - Cost Source: assumed unit cost for raw water transfer between entities
   - Date to be Implemented: before 2010
   - Unit Cost: $75/acft
   - Annual Cost: $11,250

Table 4C.30-4.
Recommended Plan Costs by Decade for Somervell County Mining

Plan Element	*2010*	*2020*	*2030*	*2040*	*2050*	*2060*
Projected Surplus/(Shortage) (acft/yr)	(106)	(98)	(94)	(91)	(88)	(85)
Conservation						
Supply From Plan Element (acft/yr)	9	14	19	19	18	18
Annual Cost ($/yr)	—	—	—	—	—	—
Unit Cost ($/acft)	—	—	—	—	—	—
Voluntary Redistribution from Steam-Electric						
Supply From Plan Element (acft/yr)	150	150	150	150	150	150
Annual Cost ($/yr)	$11,250	$11,250	$11,250	$11,250	$11,250	$11,250
Unit Cost ($/acft)	$75	$75	$75	$75	$75	$75

4C.30.6 Irrigation

Somervell County Irrigation is projected to have a surplus of water through 2060 and no changes in water supply are recommended.

4C.30.7 Livestock

No shortages are projected for Somervell County Livestock and no changes in water supply are recommended.