

January 15, 2010

Mr. Donald Woodlan
Manager, Nuclear Regulatory Affairs
Luminant Generation Company, LLC
P.O. Box 1002
Glen Rose, Texas 76043

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION REGARDING THE
ENVIRONMENTAL REVIEW OF THE COMBINED LICENSE APPLICATION
FOR COMANCHE PEAK NUCLEAR POWER PLANT, UNITS 3 AND 4

Dear Mr. Woodlan:

This letter transmits the Nuclear Regulatory Commission (NRC) and U.S. Army Corps of Engineer (USACE) staff's request for additional information (RAI) concerning Luminant Generation Company, LLC's (Luminant) combined license application for proposed reactors at the Comanche Peak Nuclear Power Plant Site. This letter supplements the NRC's RAI requests in our letters dated June 26, 2009 and August 3, 2009.

Consistent with the NRC's review schedule, please provide your responses to the NRC RAIs (Enclosure 1) and USACE RAIs (Enclosure 2) within 30 days of receipt. Your responses should be provided under oath or affirmation in accordance with 10 CFR 52.75. If you are not able to provide complete responses to the RAIs within the 30-day timeframe, please provide a schedule for which Luminant intends to respond. Failure to provide complete responses within the timeframe allotted may result in the NRC modifying the environmental review schedule for this application. In addition, RAI responses that include new and significant changes or additions to information that you have already submitted could impact the review schedule.

If you have any questions, I can be reached at (301) 415-3924 or via e-mail to michael.willingham@nrc.gov.

Sincerely,

/RA/

Michael Willingham, Project Manager
Environmental Projects Branch 1
Division of Site and Environmental Reviews
Office of New Reactors

Docket Nos. 52-034 and 52-035

Enclosure: As stated

cc: See next page

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DATE	12/07/09	11/24/09	12/04/09	1/15/10

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LETTER TO D. WOODLAN FROM M. WILLINGHAM DATED

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION REGARDING THE ENVIRONMENTAL REVIEW OF THE COMBINED LICENSE APPLICATION FOR COMANCHE PEAK NUCLEAR POWER PLANT, UNITS 3 AND 4

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**U.S. Nuclear Regulatory Commission
Supplemental Requests for Additional Information (RAIs)
Comanche Peak Nuclear Power Plant, Units 3 and 4
Combined License Application**

<i>Item Number</i>	<i>Regulatory Basis</i>	<i>RAI Summary</i>	<i>Full Text (Supporting Information)</i>
General (GEN)			
GEN-07	ER 3.4 [ESRP 3.4; 10 CFR 52.17(a)(1), 10 CFR 50.34]	<p>Provide an updated version of ER figure 3.4-1 which shows a schematic representation of the proposed Comanche Peak Nuclear Power Plant (CPNPP) cooling system water use during normal operation. Specifically, the figure should include:</p> <ul style="list-style-type: none"> • All cooling loads; • The cooling tower basin; • The Blowdown Treatment Facility (BDTF) and all other cooling water treatment systems; • Any and all water uses, in addition to cooling water, that add water to or withdraw water from the cooling water system. <p>It is unclear whether the ultimate heat sink (UHS) and circulating water system (CWS) share the same cooling towers and basins. Clarify the flow of water from the CWS and UHS to the cooling tower(s) and basin(s). If the UHS cooling towers are separate from the CWS cooling towers, revise figure 3.1-1, as well, to show the location of the UHS cooling towers.</p> <p>Provide an updated version Figure 3.3-1 Water Balance for normal full-power operations. The figure should show all elements of the system, including components missing from the current version such as the cooling tower basin and BDTF. Accurately represent the relationship between</p>	<p>The staff requires additional information in Figure 3.4-1, "Simplified Water Use Diagram," in order to complete its review. The ER does not distinguish between the UHS cooling tower basin and the CWS cooling tower basin.</p> <p>The steam condenser and BDTF are not shown in the figure.</p> <p>Figure 3.1-1 of the ER does not indicate the location of the UHS cooling towers. However, it does provide the location of new units cooling towers and circ water pumphouse.</p>

Item Number	Regulatory Basis	RAI Summary	Full Text (Supporting Information)
		<p>components so that it is clear which components are shared, such as the cooling tower basin, and which serve only an individual unit. Include inputs and discharges to the water system for Units 1 & 2. For minor and intermittent water uses and discharges, provide sufficient information about rates and timing to allow the staff to estimate annual flows.</p>	
<p>GEN-08</p>	<p>ER 3.7.2 [ESRP 2.2.2, 3.7.2, 4.1.2, and 5.1.2; 10 CFR 51 Appendix A(7); Applicable Federal, State, regional, local and affected Native American Tribal standards, guidelines, and requirements; NRC Regulatory Guide 4.7, Rev 2 and Chapter 2.1 of NRC</p>	<p>In order for the staff to complete its review of cumulative impacts associated with new and existing transmission lines additional information is need in regards to the DeCordova transmission line. Provide the following information:</p> <ul style="list-style-type: none"> • Describe the route/alignment and cumulative width of the <u>existing</u> 185-kV and 345-kV DeCordova rights-of-way (ROWs). • Figure 1.1-5 and 3.7-4 indicate that the proposed ROW would either be adjacent to the existing ROWs or it would be built along a completely new ROW. Describe the cumulative width (i.e., the combined width of the three ROWs) and route/alignment if the new transmission line were built adjacent to the current ROWs. • Provide an explanation and environmental implications for the differences between the MVA rating of the DeCordova circuit and other transmission line circuit MVA rating. 	<p>The proposed DeCordova transmission right-of-way (ROW) has several characteristics different than the other proposed ROWs. Section 2.2.2 of the ER states that the DeCordova transmission line will run between the existing DeCordova Switching Station and the Plant Switching Station. Figure 3.7-1 shows that there two existing transmission line circuits running from the Plant Switching Station and the DeCordova Switching Station in a 230 ft wide ROW. The existing ROWs appear to be adjacent to each other forming an especially wide ROW. While the route of the new DeCordova ROW has not been determined, ER Figure 1.1-5 shows it adjacent to the existing ROWs. In order to understand the cumulative impacts of the three closely located ROWs, the staff needs information about the existing ROWs as well in addition to the proposed new ROW.</p> <p>The DeCordova circuit would also have different engineering features than the other proposed transmission lines but the reasons for the differences are not explained by Section 3.7 of the ER. The staff needs to understand the environmental implications of these differences.</p> <p>Section 3.7.3.1, Basic Design Parameters, states that the DeCordova circuit will have a thermal rating</p>

Item Number	Regulatory Basis	RAI Summary	Full Text (Supporting Information)
	Regulatory Guide 4.2, Rev 2.		of 1969 MVA rating while the other transmission lines circuits have a 1631 MVA rating. The staff needs to understand the basis for the differences between the DeCordova transmission lines and others that will support the plant.
GEN-09	ER 3.6 [ESRP 3.3.2, 3.6.2, 4.2, and 5.2]	<p>Provide a detailed explanation of the proposed sanitary wastewater system with a diagram illustrating the connections between the components, and explain the connections with the system for Units 1 and 2 and how it will be utilized.</p> <p>Provide estimates of the quantities of dewatered sludge expected to be produced by the Unit 3 and 4 system during operations and during construction, and provide the annual quantities of dewatered sludge to be produced by the Unit 1 and 2 system during the same periods.</p> <p>Lime and ferric chloride are proposed to be used as conditioners for filter press operation. Provide estimates of the quantities (mass) of each chemical to be added to the waste. Explain whether or not these quantities are included in the quantities of dewatered sludges reported per the above request.</p> <p>Explain in detail the relationship between the Unit 1 and 2 sanitary wastewater system and the Unit 3 and 4 sanitary wastewater system. For instance, does the Unit 3 and 4 system utilize the Unit 1 and 2 system filter press, or is it only for “excess sludge”?</p> <p>The ER notes that sludges are to be disposed of in a class 1 landfill. Identify the class 1 landfill that is used for disposal of Units 1 and 2 sludges and/or the class I landfills in the vicinity that are suitable for disposal of this waste.</p> <p>In addition, the description of the sanitary wastewater system is not described in sufficient detail to allow the staff</p>	Section 3.6.2 of the ER states that some facilities of the Unit 1 and 2 sanitary wastewater treatment system (SWWTS) will be utilized by the Unit 3 and 4 sanitary wastewater system, but the relationship is not completely clear.

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		to perform an independent assessment of potential environmental impacts. The NRC staff need to understand the outputs of the SWWTS in relation to the inputs. Provide a detailed explanation that reports the magnitude of all inputs and outputs of the SWWTS.	
GEN-10	ER 3.9.3.4 [ESRP 3.6.3; 40 CFR 122; 40 CFR 147; Relevant Federal, State, local, regional, and Native American tribal regulations]	<p>Additional information is needed regarding the discussion in Section 3.9.3.4 of the ER in order for the staff to describe the construction process adequately to perform an independent assessment of potential construction impacts.</p> <p>Provide estimates of the sources and quantities of materials supplied to the construction site for establishing the utility services and for providing the services during construction. Describe the types of wastes disposed of in establishing and providing construction utilities, and provide estimates of the quantities of each. Describe the disposal of these wastes. Explain which wastes will be burned and which will be or sent to landfills. Identify and quantify any other materials that will not be disposed of by burning or landfill, and explain how they will be disposed of.</p>	<p>ER Section 3.9.3.4 identifies temporary utilities that would be employed, but does not provide enough detail to assess the impacts of providing them to the construction site.</p> <p>The ER describes temporary utilities as including “aboveground and underground infrastructure for power, communications, potable water, wastewater and waste treatment facilities, fire protection, and construction gas and air systems.” It further states that, “the temporary utilities would support the entire construction site and associated activities, including construction offices, warehouses, storage and laydown areas, fabrication and maintenance shops, the power block, the batch plant facility, measuring and testing equipment, and intake and discharge areas. A project of this magnitude involves a large quantity of materials and energy consumption, as well as the generation of a large amount of waste.</p>
GEN-11	ER 3.9.3.7 [ESRP 3.6.3; ESRP 4.1.1; ESRP 4.4.1; 40 CFR 122; 40 CFR 147; Clean Air Act of 1970; 40 CFR 50-90; Relevant	<p>Additional information is needed regarding the discussion in Section 3.9.3.7 of the ER in order for the staff to describe the construction process adequately to perform an independent assessment of potential construction impacts.</p> <p>Provide the quantities of materials that will be burned or chipped as described in Sections 4.3.1.1 of the ER.</p> <p>In Chapter 4 of the ER provide the following:</p> <ul style="list-style-type: none"> • For the option of burning vegetation, provide an assessment of the air quality effects of burning the 	ER Section 3.9.3.7 reports that vegetation removed from the site, but provides no information about how it would be removed. ER Section 4.3.1.1 reports that vegetation would be removed by “burning, chipping, or spreading the wood chips.” In as much as the decision to burn or chip has not been made, provide an estimate the quantity of wood waste that would be disposed of.

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	Federal, State, local, regional, and Native American tribal regulations]	<p>waste wood.</p> <ul style="list-style-type: none"> For the chipping option, provide an assessment of the land use and ecological effects of spreading the wood chips. 	
GEN-12	ER 3.9.3.10 [ESRP 3.4.2, 3.6.3, 4.1.2, and 4.3.1; 40 CFR 122; 40 CFR 147; Relevant Federal, State, local, regional, and Native American tribal regulations; Clean Water Act; Regulatory Guide 4.2, Rev 2]	<p>ER Section 3.9.3.10 lists activities related to intake/discharge coffer dams and piling installation, but does not provide information about the magnitude of the activities or their duration.</p> <p>Regarding the intake and discharge structures, provide estimates of the duration of proposed construction activities, the areas affected as it relates to the intake structure and laydown areas, the quantities of construction materials consumed, the quantities of dredged material that would be disposed of, and discuss the potential fate of dredge materials based on its waste classification.</p> <p>Provide a figure that shows the exterior dimensions of the intake structure with reference to the existing intake and other man-made structures in the immediate vicinity, and displays both the areas that would be disturbed during construction and areas permanently committed to the intake.</p>	Section 3.9.3.10 of the ER states that, “Excavation and dredging of the intake structure, the pump house erection, and the installation of mechanical, piping, and electrical systems would follow the sheet pile installation, bracing system, and dewatering, and would continue through site preparation into plant construction. Excavated and dredged material would be transported to a designated area.” No other information was provided in this section.
GEN-13	ER 3.7.5 [ESRP 2.2.2, 3.7, 4.1.2; 4.4.2]	Provide a description of the process of constructing transmission line towers. At a minimum, provide typical values for the duration of construction activities at the site, the number of construction workforce involved, the number of loads of materials transported to the construction site, the number of acres disturbed by construction excluding access roads, and the number of acres revegetated after	<p>The ER does not specify the amount of time that construction will occur, the number of laborers in the construction workforce, the number of loads that will be transported to the construction site, and the number of acres that will be revegetated after construction.</p> <p>Section 3.7.5 of the ER specifies that “the</p>

Item Number	Regulatory Basis	RAI Summary	Full Text (Supporting Information)
		<p>construction.</p> <p>Provide the information above on a per mile of transmission line basis.</p>	<p>construction of access roads shall be minimized and that necessary access roads shall be constructed in a manner which prevents damage or erosion to the ROW and/or adjacent property. In addition, the standard requires that use of existing cleared areas shall be maximized for both work areas and construction access requirements.” The staff need to know the number of acres that will be disturbed excluding the access roads to quantify the impacts associated with the ROW.</p> <p>Section 2.2.2 provides guidance to the staff to obtain information regarding the total area to be disturbed by transmission line construction. Section 4.4.2 of the ESRP provides guidance to the staff to obtain information concerning the construction labor force requirements and duration of the construction activity,</p>
GEN-14	ER 3.6.3.1 [ESRP 3.6.3; 40 CFR 50]	Provide the annual emissions of reportable pollutants under the Clean Air Act which could be discharged from the auxiliary boilers. Revise ER Table 3.6-6 to include regulated criteria pollutants.	Table 3.6-6 of the ER provides auxiliary boiler emissions for CO ₂ , H ₂ O, N ₂ , O ₂ , and SO ₂ . The Clean Air Act requires EPA to set National Ambient Air Quality Standards for six common air pollutants. These commonly found air pollutants are also known as "criteria pollutants". The criteria pollutants include SO ₂ , PM ₁₀ , PM _{2.5} , CO, Ozone, NOX, The scope of the staff's review includes identification and quantification of miscellaneous emissions and effluents in sufficient detail to permit subsequent staff analysis and assessments of potential environmental impacts with respect to criteria pollutants. Table 3.6-6 provides the annual emissions from the auxiliary boilers. However, most of the criteria pollutants expected to be listed are not provided in the table (i.e., carbon monoxide, nitrogen oxide, particulate matter, and ozone).

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			<p>Additionally, there should be reportable quantities of SO₂ emissions since there is 500 ppm of sulfur in the fuel as provided in Table 3.6-2 of the ER.</p>
GEN-15	ER Chapter 2	<p>Provide electronic copies of latest revisions to the references listed below:</p> <ul style="list-style-type: none"> • The Document, “Construction Environmental Controls Plan”, as cited in Section 3.9.1.1 of the ER; • Area Plan BDTF GAS-05-11-100-007 Rev. A; • Blowdown Treatment Process Diagram BDT-21-11-130-001 Rev. A; and • Blowdown Treatment Facility Equipment Layout BDT-11-13-400-002 Rev A. <p><i>Note: Because the copy of the report is not completely legible, the numbers listed in this item may not be exactly correct.</i></p>	<p>These references from the ER and/or Electronic Reading Room need to be obtained for citation and reference in the EIS.</p>
Water Quality and Use, Hydrology, and Geohydrology (HYD)			
HYD-25	<p>ER 2.3.2 [ESRP 2.3.2, 4.2.2 and 5.2.2; 10 CFR 51.70(b)] Federal, State, regional, local, and Native American tribal water</p>	<p>In order for the NRC staff to complete the review of water uses that could affect or be affected by the construction and operation of the proposed project the NRC staff requests the following information:</p> <ul style="list-style-type: none"> • Provide information on the water rights that the Applicant holds or expects to obtain to authorize withdrawals to supply existing Units 1 and 2 and proposed Units 3 and 4, including the permitting or adjudicating agency(ies), appropriation date, priority status, type of permit/claim (regular, seasonal, term, or emergency), water volume, withdrawal/diversion 	<p>In letter dated October 8, 2009, Luminant indicated that water would “be sourced primarily from the BRA System Operating Permit (SOP) which will be “junior” in time priority to many older water rights in the Brazos River Basin”. However, the information in the letter did not provide a clear understanding of how water use as a result of construction and operations would affect or be affected by other water users.</p> <p>ESRP 2.3.2, 4.2.2, and 5.2.2 provides guidance for the NRC staff to obtain a quantitative description of</p>

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	<p>laws and water rights.</p>	<p>location, permit term (if any), and any other specifications (for example, whether the entire water right can be exercised any time during the year or is subject to daily or monthly withdrawal limits) associated with each water rights permit/claim.</p> <ul style="list-style-type: none"> • Provide information on other water rights in the Brazos River system that could affect or be affected by the Applicant’s exercise of its water rights. Specifically, indicate how many acre-feet of water rights are ahead of the Applicant’s rights in priority (i.e., more senior users), how many acre-feet are behind the Applicant in priority (i.e., less senior users), and how the set of more senior users and the set of less senior users break out in terms of their purposes and uses for the water (municipal, agricultural irrigation, etc.). • Provide information on how and when water rights priorities could be modified in a time when water availability is constrained. What provisions are there in the state water law that might allow the Applicant to move ahead of another water-rights holder or allow another user to move ahead of the Applicant? • Provide historical information on all time periods when restrictions have been placed on exercise of water rights in the Brazos River system since the modern water rights adjudication system has been in place (approximately 1986), including for each such period the dates when rights were suspended and the classes of water rights holders whose rights were suspended. 	<p>present and known future surface-water uses (diversions, consumptions, and returns) that are within the hydrological system in which the plant is located and that may affect plant water availability or be affected by plant water use, and identification and locations of surface-water and groundwater users (including aquatic ecosystems), water-use areas that could be affected by hydrologic alterations resulting from plant operation, a summary of statutory and other legal restrictions relating to plant water use and water consumption, comparisons of water quantity available to other water users with existing and known future water rights and allocations, predicted impacts to water users or water-use categories, and baseline water-quality data for surface-water and groundwater sources used for and impacted by plant operation.</p>

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HYD-26	ER 2.3.1.3.6, 4.2, and 5.2 40 CFR 423 40 CFR 122 Federal, State, regional, local, and Native American tribal water laws and water rights. [ESRP Sections 2.3, 4.2, and 5.2]	In order for the NRC staff to complete its review of surface water impacts relating to the Wheeler Branch Reservoir (WBR) that could affect or be affected by the construction and operation of the proposed project the NRC staff requests the following information: <ul style="list-style-type: none"> • Provide maps of sufficient detail to show the relationship of the WBR to the CPNPP site and City of Glen Rose; • Provide a quantitative and qualitative description of the WBR; • Provide variations in inflows, outflows, water surface elevations, and storage volumes and retention time; • Summary of statutory and other legal restrictions relating to water use or specific water-body restrictions on water use imposed by Federal or State regulations; • For the Paluxy River, which feeds WBR, provide the following information: mean flow, peak and minimum flows, and 7Q10 values as determined by USGS; follow rates of discharges from the WBR dam; and an analysis of how proposed CPNPP withdrawals from WBR would affect water quantity and aquatic habitat in the reservoir and the Paluxy River, both at normal flow and during low-flow periods; • Provide clarification on the quantity of water that would be used from the WBR based on the Somervell County Water Supply Project phases noted in the June 2006 amendment to the Brazos River Region G Water Plan. 	<p>The CPNPP Units 3 and 4 COL application ER submitted by Luminant described the WBR as “an off-channel storage reservoir of the Paluxy River, located approximately 2 mi south of the CPNPP site. The reservoir was constructed to provide water supply to the City of Glen Rose, other smaller Somervell County communities, and some private users in Somervell County. The reservoir is filled by diverted water from the Paluxy River and runoff from the Wheeler Branch drainage area. The reservoir has a conservation storage capacity of 4118 ac-ft and plans indicate a yield of up to 2000 ac-ft/yr from the reservoir for municipal, industrial, and irrigation use within Somervell County Water District (Freese 2007). Wheeler Branch Reservoir is expected to be the source of potable and service water (other than cooling water) for the CPNPP site”. At the time that Luminant’s ER was developed, the Wheeler Branch Reservoir, constructed by the Somervell County Water District (SCWD), had not been completed and water rights allocation had not been decided.</p> <p>In letter dated October 8, 2009, Luminant provided additional information indicating that the SCWD had complete the construction of the reservoir and associated raw water supply facilities and is currently in the design phase for a water treatment plant and transmission system. The letter also stated that the SCWD plans to construct a pipeline from the reservoir to the southwest corner of the CPNPP property, near the plant entrance at FM 56, from which point CPNPP will provide piping to tie points.</p> <p>Luminant also provided the June 2006 amendment</p>

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			<p>to the Brazos River Region G Water Plan indicating that Luminant would be purchasing water from the SCWD to provide potable water for the plant and process water.</p> <p>In letter dated October 8, 2009, Luminant indicated that the CPNPP is expected to use up to 484 ac-ft of water per year (300 gpm) through the year 2060. However, the June 2006 amendment to the Brazos River Region G Water Plan (cited in the response) allocates 300 ac-ft/yr to the applicant until circa 2030 and an additional 184 ac-ft/yr from 2030 through 2060.</p>
HYD-27	<p>ER 3.3 and 3.6 Federal, State, regional, local, and Native American tribal water laws and water rights. [ESRP 3.3.1, 3.3.6 and 3.6]</p>	<p>Provide clarification on the water requirements for facility operation, as listed in Table 3.3-1, Figure 3-3.1, and the text of the ER. Clarify apparent inconsistencies and revise Table 3.3-1 as appropriate.</p> <p>To assist the staff in its review, for each of the water requirements listed, indicate whether the value is per unit, or for Units 3 and 4 combined, or for the entire CPNPP site. (For example, it is currently unclear whether there are one or two fire water systems for Units 3 and 4, or one or two raw water treatment systems. It is also unclear whether there will be one potable water system for each unit, one potable water system for the combination of Units 3 and 4, or a single potable water system for the entire site.)</p> <p>If any value given for “normal flow” in Table 3.3-1 or Section 3.4.1 does not represent a continuous withdrawal, indicate the expected frequency and duration of the withdrawal requirement. Also, (1) clarify whether construction water use would continue during operation and (2) supply the missing information in row 9 of the table on sheet 2 of Figure 3.3-1.</p>	<p>During detailed review of data in the ER, staff identified apparent inconsistencies in reported values for water requirements and is seeking to resolve inconsistencies and avoid misinterpretations of the application. In Table 3.3-1, requirements are identified as “per unit,” but comparison with Figure 3.3-1 and ER text suggests that some values may be for Units 3 and 4 combined or possibly for the whole CPNPP site. Specifically:</p> <ul style="list-style-type: none"> • Table 3.3-1 in the original ER listed 550 gpm as the per-unit normal flow for the raw water system (both average and maximum flow), including fire water. In ER Rev 1 this is given as 1100 gpm. If this is a per-unit value, the total requirement would be 1100 gpm (or 2200 gpm in Rev 1). For comparison: <ul style="list-style-type: none"> ○ Figure 3.3-1 lists (sheet 2, line 9) raw water requirements of 550 gpm (“normal ... for U3/4 Ops.”) and 1100-1250 gpm for maximum power operation (“for Units 3 & 4”);

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			<ul style="list-style-type: none"> ○ The “Makeup Water System” subsection in Section 3.4.1.4 indicates that to feed the raw water storage tanks for Units 3 and 4, 1100 gpm would be withdrawn from Lake Granbury and 0 to 250 gpm would be obtained from Wheeler Branch Reservoir; ○ Figure 3.3-1 indicates (sheet 2, line 7) that at normal flow 320 gpm would come from Lake Granbury and 230 gpm from Wheeler Branch Reservoir for the raw water system, and for maximum power operations Lake Granbury would supply 320-1100 gpm, while Wheeler Branch Reservoir (sheet 2, line 8) would supply 0 to 300 gpm at full power operation. <p>It is not clear whether the raw water requirement of 550 gpm is per unit (for a total of 1100 gpm) or 550 gpm for the two units combined or possibly 1100 gpm per unit (for a total of 2200 gpm). Also, in row 9 of the table on sheet 2 of Figure 3.3-1, something is missing (it appears that text was truncated due to a fixed row height).</p> <ul style="list-style-type: none"> ● If all of the per-unit “normal flow” values listed in Table 3.3-1 (i.e., 31200 plus 274 plus 1100 plus 50) are added together and multiplied by two (for two units), the sum is 65,248, which does not match the total water requirement of 65,400 gpm given in Section 3.4.1.4 (ER Rev.1). The total Lake Granbury water requirement given in Section 3.4.1.4 also cannot be derived from the water requirements given there, which are 31,474 gpm per unit plus 1,100 gpm. ● Figure 3.3-1 (sheet 2, line 9) indicates a 20%

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			<p>water loss in demineralization for the raw water system, but only 50 gpm is indicated as going to the evaporation pond as wastewater (for comparison, 20% of 550 gpm would be 110 gpm). It is not clear whether this estimated water loss is due just to the demineralization step or whether it also includes water losses from pretreatment of Lake Granbury water, and it is not clear where in the water balance the rest of the water loss (beyond 50 gpm) is accounted for.</p> <ul style="list-style-type: none"> • Table 3.3-1 lists the per-unit normal and maximum flow requirement for potable water as 30 gpm, with a maximum of 50 gpm. However, Section 3.4.1.4 lists 50 gpm as the requirement for daily potable water use “for the entire site,” and Figure 3.3-1 (sheet 3, row 19) shows 50 gpm as the potable water system requirement for maximum power operation of “Unit 3 & 4”. • Figure 3.3-1 (sheet 3, row 22) lists total sanitary wastewater effluent of 100,000 gpd, apparently including both 70,000 gpd from potable-water toilets/urinals and 30,000 gpd from nonpotable-water construction toilets/urinals. This suggests that construction water use would continue during operation, which seems unlikely. • Figure 3.3-1 (sheet 2, row 7) indicates that normal flow from WBR for the raw water system would be 230 gpm. When combined with the estimated 50 gpm for potable water, the total withdrawal from WBR is 280 gpm, which is about 450 ac-ft per year, and thus is more than the 300 ac-ft/yr to which the Applicant has obtained water rights. Is this “normal” flow not a continuous

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			<p>withdrawal rate, or is there some other explanation for this discrepancy?</p>
<p>HYD-28</p>	<p>ER 4.2 Federal, State, regional, local, and Native American tribal water laws and water rights. [ESRP 4.2.2]</p>	<p>The NRC staff is seeking to resolve apparent inconsistencies in the ER (and to avoid misinterpretations of the application). Section 4.2.1.3 provides daily water consumption for construction related activities in gallons per minute (gpm). However, this does not provide an accurate description of the quantity of water that will be used during construction on a daily or yearly basis. The staff request the following information:</p> <ul style="list-style-type: none"> • Provide the estimate daily consumption of water from the Wheeler Branch Reservoir for construction activities. • Provide the estimated daily consumption of water from Squaw Creek Reservoir during construction. 	<p>During detailed review of data in the ER, staff noted that the water requirements for construction that are given in units of gpm are not equivalent to the values given elsewhere in units of gpd, suggesting that the hourly rate of water use does not occur over a full 24-hour day. Specifically:</p> <ul style="list-style-type: none"> • Section 4.2.1.3 of the ER states that Construction activities for the proposed project’s facilities are to require an estimated average of 300 gpm and a maximum of 1300 gpm from the Somervell County Water District’s Wheeler Branch Reservoir or Lake Granbury. The 300 gpm average would equate to 432,000 gpd if the average applies to a 24-hour day, but elsewhere (in Section 4.4.2.3 of the ER Rev.1) the ER gives Wheeler Branch Reservoir water requirements as 190,560 gpd, suggesting that the average applies to less than a 24-hour day. • Section 4.2.1.3 of the ER states that an average of 22 gpm would be withdrawn from Squaw Creek Reservoir during construction, for dust suppression and other uses. If this rate applies 24 hours per day for the entire year, water use would total 35 ac-ft/yr, but it might be less if the average rate applies to a shorter period (such as daylight hours only).
<p>HYD-29</p>	<p>ER 3.3.2, 3.4, and 5.2 Federal, State,</p>	<p>Provide reference citations for the “Texas Commission on Environmental Quality (TCEQ) Criteria for Specific Metals in Water for Protection of Aquatic Life”, “Human Health Criteria in Water”, and “Screening levels for nutrient parameters” listed in spreadsheets supplied in Luminant</p>	<p>Staff noted a lack of reference citations and other explanatory information related to the regulatory criteria cited in Applicant’s responses to RAI HYD-09, site audit information item HYD-31, and other BDTF effluent data supplied by the applicant. Staff</p>

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	regional, local, and Native American tribal water laws and water rights. [ESRP 3.3.1, 3.3.2, 3.4, 3.6, 5.2, and 5.3]	letter dated April 27, 2009 in response to RAI HYD-09. Provide an explanation of the basis for selecting these criteria for comparison with projected effluent concentrations.	is seeking to avoid misinterpreting or misrepresenting the Applicant-supplied information. In spreadsheets supplied by the Applicant in letter dated April 27, 2009, effluent concentrations are compared not only to the Texas Surface Water Quality Standard for Lake Granbury and the TPDES Permit limits for Units 1 and 2, but also to Texas Commission on Environmental Quality (TCEQ) Criteria for Specific Metals in Water for Protection of Aquatic Life, Human Health Criteria in Water, and Screening levels for nutrient parameters. No reference citations for these criteria were provided and the reasons for selecting these criteria (some of which are very stringent) are not explained.
Terrestrial Ecology (TE)			
TE-20	ER 2.4 and 5 Fish and Wildlife Coordination Act; Endangered Species Act, as amended [ESRP 5.3.3.2 and 5.6.1]	Provide a description of the shoreline vegetation communities, and extent of each community type, along Lake Granbury and Possum Kingdom Reservoir. State what impacts are expected on these communities, and why, from the withdrawal of water to operate Units 3 and 4.	Information was requested during the Site Audit on impacts to shoreline vegetation and habitat at Lake Granbury from water to be used for cooling of proposed Units 3 and 4. The Applicant answered that lake levels were controlled by the BRA and there would be no change in water levels that could affect shoreline habitat, the staff needs additional information regarding whether the lake levels may fluctuate due to project water consumption and that seasonal variability would be expected. In a subsequent conference call with the Applicant, staff was directed to the response to SOC-27 which contained information that water levels in the lake would drop only 0.1 foot per day due to cooling water consumption and that therefore shoreline vegetation would not be affected. Further examination of the response to SOC-27 showed

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			<p>that during extreme drought, the lake could be 4-ft lower due to water use by Units 3 and 4. The Applicant later provided supplemental written information to SOC-27 stating that shoreline habitat along Lake Granbury tends to be steep and rocky, and highly developed; that vegetation is limited either by development or rock habitat; that because the banks are steep and the depth of Lake Granbury increases quickly, lowering the water levels will not create expanses of exposed soil; and that therefore, temporary lake level fluctuations are not anticipated to affect the limited available shoreline habitat.</p> <p>More information is needed to adequately describe the effect to shoreline plants or wildlife; therefore, a description of the shoreline vegetation communities and extent of each community type is requested. Without knowing what types of communities are present, no conclusions can be drawn regarding the potential effects upon terrestrial ecology due to an additional 4-ft drop in lake levels during drought conditions. Similar information is also requested for Possum Kingdom Reservoir due to the potential for drawdown during the operation of Units 3 and 4.</p>
TE-21	ER 5.3 Endangered Species Act; Fish and Wildlife Coordination Act [ESRP 5.1.1, 5.3.3.2; 5.6.1]	Potential terrestrial ecological and land-use impacts of the proposed BDTF, given that it could employ an evaporative spray system, might be similar to the proposed cooling towers with respect to salt drift, fogging, and icing. Consequently, the level of analysis to be conducted with respect to salt drift, fogging, and icing for the BDTF should be similar to that provided for the cooling towers. Therefore, provide an analysis of impacts for the BDTF similar to that provided in Section 5.3 of the ER. Specifically, the level of detail necessary (according to the	In response to RAI GEN-03 in letter dated September 16 th , 2009, Luminant stated that evaporation will be enhanced in the BDTF by using a misting or spray system. If evaporative spray (or other mechanical means of enhancing pond evaporation) is used, there could be salt deposition to the surrounding land and vegetation just as there could be with the proposed cooling towers. This would make fogging, icing, and damage to vegetation all issues to be addressed in the same

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		<p>ERSP Sections 5.1.1 and 5.3.3.2) includes with respect to salt, icing, and fogging:</p> <ul style="list-style-type: none"> • Isopleths of salt deposition at ground levels on a seasonal basis. Isopleths should extend to values at least as low as 1 kg/ha/mo • A list and description of the important terrestrial species and habitats that may be affected by the BDTF • Descriptions of natural and managed plant communities on the site and within offsite isopleths above 20 kg/ha/yr, including information on sensitivity of these communities to salt drift and deposition • Annual precipitation and its dissolved solid concentration within the drift field • Prediction of increased frequency and distribution of fog and icing 	<p>fashion that they have been addressed for the proposed cooling towers. Therefore, the same type of information that is in the ER addressing these issues (e.g., tables of deposition with distance) for the proposed cooling towers should be provided for the operation of the BDTF’s evaporation ponds.</p> <p>Information provided by the Applicant in the response states that salt drift can be minimized and monitored by employing certain devices, such as wind speed sensors, to stop misting machines when wind speeds increase to levels that may cause salt drift beyond the pond areas. Further, the Applicant states that salt fencing can be placed around the pond to minimize salt drift. In letter dated July 27th, 2009, the Applicant provided information suggesting that annual salt accumulation in the ponds of the BDTF will be on the order of tens of millions of pounds.</p> <p>If even a small proportion of the salt leaves as drift, the consequences to vegetation could be significant. Additional information is needed to make a full assessment of potential impacts from salt drift.</p>
Socioeconomics and Environmental Justice (SOC)			
SOC-32	ER 2.5.2.5, 4.4.2.6, 5.8.2.3.4 [ESRP 2.5.2, 4.4.1, 5.8.1, and 5.8.2; Reg Guide 4.2]	<p>Provide the following information on recreation and property values:</p> <ul style="list-style-type: none"> • The approximate number of boat ramps and fixed boat docks and piers (public and private) on Lake Granbury and Possum Kingdom Lake. • The range of water level elevations on Lake Granbury and Possum Kingdom Lake at which the existing boat 	<p>Staff needs information to assess the potential socioeconomic impacts of changes in Brazos River system water management induced by withdrawal of makeup water for Units 3 and 4. The Applicant did not provide this information in its ER. Information is requested both for Lake Granbury and for Possum Kingdom Lake.</p> <p>ESRP 5.8.1 provides guidance to the staff to identify</p>

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		<p>ramps and fixed boat docks and piers (public and private) would become inaccessible for recreational use (i.e., “high and dry”).</p> <ul style="list-style-type: none"> The extent to which the water levels of Lake Granbury and Possum Kingdom Lake would be affected by the extraction of cooling water from Lake Granbury and how that would affect recreational and residential uses and property values along the shorelines of both lakes. <p>Provide information about the distribution of people, buildings, roads, and recreational facilities that are vulnerable to impact by plant operation.</p>	<p>the potential operational impacts on these elements and predict the extent and magnitude of the impacts. If adverse impacts can be predicted, the staff must conduct a more detailed analysis and, where practical, make quantitative estimates of the magnitude of the impacts.</p> <p>As defined in ESRP 5.8.2, the scope of the staff’s review includes the social and economic impacts that result from operation of the plant and from requirements of the operating staff. Categories of impacts resulting from operation of the station include social or economic consequences of water-use or land-use impacts. The ESRP provides guidance to the staff to address those environmental factors most likely to be impacted by operation of the proposed plant are described in sufficient detail to permit assessment of the predicted impacts.</p>
SOC-33	<p>ER 2.5.4, 4.4.3, 5.8.3</p> <p>[ESRP 2.5.4, 4.4.3, 5.8.3; 59 CFR 7629-7633; Executive Order 12898]</p>	<p>Provide the following information on water quantity and quality as it relates to environmental justice:</p> <ul style="list-style-type: none"> The impacts of construction of CPNPP Units 3 and 4 on water quantity and quality in the Brazos River downstream of the CPNPP site. How many miles downstream would the impacts extend? The impacts of operating CPNPP Units 3 and 4 on water quantity and quality in the Brazos River downstream of the CPNPP site. How many miles downstream would the impacts extend? Identify any minority or low-income populations along the Brazos River within 50 miles downstream of the CPNPP site that could be affected by impacts to water quantity and quality during construction or operations. 	<p>Staff needs information to assess the potential environmental justice impacts of changes in Brazos River system water management induced by withdrawal of makeup water for Units 3 and 4. The Applicant did not provide this information in its ER, and staff has not requested it in subsequent RAIs.</p> <p>As defined in ESRP 5.8.3, the scope of the staff’s review includes consideration of the methods that are used to identify and quantify impacts on minority and low-income populations, the location and significance of any environmental impacts during operations on populations that are particularly sensitive, and any additional information pertaining to mitigation.</p> <p>The data requested by the staff should adequately</p>

Item Number	Regulatory Basis	RAI Summary	Full Text (Supporting Information)
		<p>This should include populations that depend on the Brazos River for subsistence activities, as well as populations with special health concerns.</p> <ul style="list-style-type: none"> To the extent that impacts to water quantity and quality in the Brazos River would extend beyond 50 miles downstream of the CPNPP site, any minority or low-income populations that could be affected during construction or operations. This should include populations that depend on the Brazos River for subsistence activities, as well as populations with special health concerns. 	<p>consider the unique lifestyles and practices of minority and low-income communities (for example, subsistence activities or dependence on specific water supplies) that could result in disproportionate impacts from plant operations and site operations.</p> <p>Information is needed on:</p> <ul style="list-style-type: none"> Any pathways where any environmental impact during routine operations and reasonably anticipated accidents may interact with cultural or economic facts that may result in disproportionate environmental impacts on minority and low-income populations. Any assessment (qualitative or quantitative, as appropriate) of the degree to which each minority or low-income population is disproportionately receiving adverse human health or environmental (including socioeconomic) impacts during routine operations and reasonably anticipated accidents as compared with the entire geographic area. Any assessment (qualitative or quantitative, as appropriate) of the significance or potential significance of such environmental impacts on each minority and low-income population. <p>ESRP 5.8.3 provides guidance to the staff to:</p> <ul style="list-style-type: none"> Obtain descriptions of the minority and low-income populations that could be disproportionately impacted by proposed project operations and the mechanisms (including socioeconomic) by which disproportionate harm could occur. Determine which impacts are likely to be of concern and, therefore, what environmental impact areas should be discussed.

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			<ul style="list-style-type: none"> • Analyze the potential impacts on minority and low-income populations, including: <ul style="list-style-type: none"> ○ Briefly describe pathways by which any environmental impact during operations may interact with cultural or economic facts that may result in disproportionate environmental impacts on minority and low-income populations. ○ Assess (qualitative or quantitative, as appropriate) the degree to which each minority or low-income population would disproportionately experience adverse human health or environmental impacts during operations as compared to the entire geographic area ○ Assess (qualitative or quantitative, as appropriate) the significance or potential significance of such environmental impacts on each minority and low-income population. <p>Regulatory guidance for this issue also comes from:</p> <ul style="list-style-type: none"> • Council on Environmental Quality. Environmental Justice: Guidance Under the National Environmental Policy Act. December 10, 1997. • U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation. Procedural Guidance for Preparing Environmental Assessments and Considering Environmental Issues. NRR Office Letter No. 906, Revision 1. Washington, D.C. 1996. • U.S. Nuclear Regulatory Commission, Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and

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			Licensing Actions. 69 FR 52040 (August 24, 2004)
Health Physics, Non-Accident Radiological Dose, Public Health, and Noise (HP)			
HP-04	ER 4.8 and 5 [ESRP 5.3.4; 40 CFR 141.70; NUREG-1437]	Provide information regarding the potential for the BDTF evaporation ponds to increase the growth of thermophilic microorganisms, including etiological agents. An assessment of potential human health effects associated with the BDTF evaporation ponds is needed.	Section 5.3.4.1 of the ER lists thermophilic microorganisms such as <i>Salmonella</i> spp., <i>Pseudomonas aeruginosa</i> , thermophilic fungi, bacteria such as <i>Legionella</i> spp., and free-living amoeba such as <i>Naegleria fowleri</i> and <i>Acanthamoeba</i> spp. as they apply to the discharges into Lake Granbury. However, the ER does not address these organisms with respect to the BDTF. These microorganisms could result in potentially serious human health concerns, particularly at high exposure levels.
Alternative Sites and Alternative Plant Systems (ALT)			
ALT-03	ER 9.4.2 [ESRP 9.2.3; 40 CFR 1502.14; 10 CFR 51.71(a); 10 CFR 51.75(d); 10 CFR 51, Appendix A; 10 CFR 52.81]	Provide what future project and flexibility requirements were considered when comparing the proposed BDTF system and alternative BDTF system designs and scenarios.	In letter dated December 18, 2009, Luminant stated that the proposed BDTF system “is the most flexible and robust and the operation of the system can be altered to meet projected future requirements”.
		Provide more details regarding the redundant features of the closed-cycle system and compare the redundant features to those that may be necessary for the proposed BDTF system. Provide details of the impacts associated with the redundant features for the proposed BDTF and the closed-cycle system alternative. Include the impacts to ecology, land use, etc. Compare the impact of the proposed BDTF system waste disposal with the impacts associated with the closed-cycle system alternative option 1 and option 7.	In letter dated December 18, 2009, Luminant states that the proposed BDTF system is designed to allow for continuous operation. The closed cycle system discussed in the letter as an alternative to the proposed BDTF system states that continuous operation of the BDTF would be necessary and redundancy will need to be considered.
		Provide an estimate of the volume of solid waste that would need to be disposed of in alternative option 5.	In letter dated December 18, 2009, Luminant states that alternative “option 5c suggests blowdown be

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			stored and evaporated from a 25 million gallon evaporation pond by increasing the depth of the current size pond”.
		Provide the size and expected volume of the proposed BDTF system treatment pond for comparison with alternative option 5c treatment pond.	In letter date December 18, 2009, Luminant stated that alternative option 5 will cause higher concentrations of impurities in the cooling tower plume, but does not mention how much solid waste may be generated.
		Provide a discussion on how the deep well injection option would compare to the proposed BDTF system under the proposed 2.4 cycles of concentration.	Alternative option 5c, deep well injection, was evaluated as having little ecological effect but dismissed due to increases of impurities in the cooling tower plume. However, this discussion was based on 5 cycles of concentration.

**U.S. Army Corps of Engineers
Supplemental Requests for Additional Information (RAIs)
Comanche Peak Nuclear Power Plant, Units 3 and 4
Combined License Application**

<i>Item Number</i>	<i>Regulatory Basis</i>	<i>RAI Summary</i>	<i>Full Text (Supporting Information)</i>
Aquatic Ecology (AE)			
AE-05	ER 2.4.1, 2.4.2, and 4.3.2 [ESRP 2.4.2, 3.7, 4.1.2, 4.3.2; 10 CFR 51.71(d); 33 USC 1344 (Section 404)]	Provide descriptions of any streams that would be crossed by the proposed pipelines between Lake Granbury and CPNPP Units 3 and 4, including their ecological and hydrological characteristics. Provide an estimate of the number of linear feet of streams that would be affected by the construction of Units 3 and 4 pipelines, as well as transmission lines. These data should be provided for each right-of-way (ROW).	ER Figures 1.1-4, 2.3-30, and 2.3-31 collectively appear to show two or three streams that are tributaries of the Brazos River below Lake Granbury that may be crossed by the new pipelines for blowdown and cooling water. These streams are not described in ER Sections 2.3.1 (Hydrology) or 2.4.1 (Aquatic Ecology), and potential impacts from construction are not discussed in Section 4.3.2. If streams are crossed by the pipeline ROW, these descriptions need to be provided. The U.S. Army Corps of Engineers (USACE) is a Cooperating Agency in the preparation of this environmental review. The requested information is needed by USACE in support of its regulatory and permitting responsibilities under Section 404 of the Clean Water Act (33 USC 1344).