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Draft

Environmental Impact Statement for the Combined Licenses (COLs) for Comanche Peak Nuclear
Power Plant Units 3 and 4

August 2010



NUREG-1943, Vol. 2

**Environmental Impact Statement
for Combined Licenses (COLs) for
Comanche Peak Nuclear Power Plant
Units 3 and 4**

Draft Report for Comment

**U.S. Nuclear Regulatory Commission
Office of New Reactors
Washington, DC 20555-0001**

**U.S. Army Corps of Engineers
U.S. Army Engineer District, Fort Worth
Fort Worth, TX 76102-6199**



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Abstract

1 This environmental impact statement (EIS) has been prepared to satisfy the requirements of the
2 National Environmental Policy Act of 1969, as amended (NEPA). This EIS has been prepared
3 in response to an application submitted to the U.S. Nuclear Regulatory Commission (NRC) by
4 Luminant Generation Company LLC (Luminant), acting for itself and as agent for Nuclear
5 Project Company LLC (subsequently renamed Comanche Peak Nuclear Power Company LLC),
6 for combined construction permits and operating licenses (combined licenses or COLs). The
7 proposed actions related to the Luminant application are (1) NRC issuance of COLs for two new
8 nuclear power reactor units (Units 3 and 4) at the Comanche Peak Nuclear Power Plant
9 (CPNPP) site in Hood and Somervell Counties, Texas, and (2) U.S. Army Corps of Engineers
10 (Corps) issuance of a permit to perform certain construction activities on the site. The Corps is
11 participating with the NRC in preparing this EIS as a cooperating agency and participates
12 collaboratively on the review team.

13 This EIS includes the analysis by the NRC and Corps staff that considers and weighs the
14 environmental impacts of building and operating two new nuclear units at the CPNPP site and at
15 alternative sites, and mitigation measures available for reducing or avoiding adverse impacts.

16 The EIS includes the evaluation of the proposed action's impacts to waters of the United States
17 pursuant to Section 404 of the Federal Water Pollution Control Act (Clean Water Act) and
18 Section 10 of the Rivers and Harbors Appropriation Act of 1899. The Corps will conduct a
19 public interest review in accordance with the guidelines promulgated by the U.S. Environmental
20 Protection Agency under authority of Section 404(b) of the Clean Water Act. The public interest
21 review, which will be addressed in the Corps' permit decision document, will include an
22 alternatives analysis to determine the Least Environmentally Damaging Practicable Alternative.

23 After considering the environmental aspects of the proposed action, the NRC staffs' preliminary
24 recommendation to the Commission is that the COLs be issued as requested. This
25 recommendation is based on (1) the application, including the Environmental Report (ER)
26 submitted by Luminant and Luminant's responses to the NRC and Corps staffs' requests for
27 additional information (RAIs); (2) consultation with Federal, State, Tribal, and local agencies; (3)
28 the NRC and Corps staffs' independent review; (4) the NRC and Corps staffs' consideration of
29 comments related to the environmental review that were received during the public scoping
30 process; and (5) the assessments summarized in this EIS, including the potential mitigation
31 measures identified in the ER and this EIS. The Corps permit decision will be made following
32 issuance of the final EIS, and the Corps will issue its Record of Decision based, in part, on this
33 EIS.

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Executive Summary

1 By letter dated September 19, 2008, the U.S. Nuclear Regulatory Commission (NRC) received
2 an application from Luminant Generation Company LLC (Luminant), acting for itself and as
3 agent for Nuclear Project Company LLC (subsequently renamed Comanche Peak Nuclear
4 Power Company LLC), for combined construction permits and operating licenses (combined
5 licenses or COLs) for two new nuclear reactor power units (the proposed Units 3 and 4) at the
6 Comanche Peak Nuclear Power Plant (CPNPP) site, which is located in Hood and Somervell
7 Counties, Texas. The NRC staff's evaluation is based on Luminant's November 2009 revision
8 to the application, responses to requests for additional information (RAIs), and supplemental
9 letters.

10 The proposed actions related to the CPNPP Unit 3 and 4 application are (1) NRC issuance of
11 COLs for two new nuclear power reactor units at the CPNPP site and (2) U.S. Army Corps of
12 Engineers (Corps) issuance of a permit pursuant to Section 404 of the Federal Water Pollution
13 Control Act (Clean Water Act) and Section 10 of the Rivers and Harbors Act to perform certain
14 construction activities on the site. The Corps is participating as a cooperating agency with the
15 NRC in preparing this environmental impact statement (EIS) and participates collaboratively on
16 the review team. The reactor specified in the application is a Mitsubishi Heavy Industries, Ltd.
17 (MHI), U.S. Advanced Pressurized-Water Reactor (US-APWR) design (hereafter referred to as
18 US-APWR in this EIS).

19 Section 102 of the National Environmental Policy Act of 1969, as amended (NEPA)
20 (42 USC 4321 et seq.) directs that an EIS be prepared for major Federal actions that
21 significantly affect the quality of the human environment. The NRC has implemented Section
22 102 of NEPA in Title 10 of the Code of Federal Regulations (CFR) Part 51. Further, in 10 CFR
23 51.20, the NRC has determined that the issuance of a COL under 10 CFR Part 52 is an action
24 that requires an EIS.

25 The purpose of Luminant's requested NRC action is to obtain COLs to construct and operate
26 two new baseload nuclear power units. These licenses are necessary but not sufficient for
27 construction and operation of the units. A COL applicant must obtain and maintain the
28 necessary permits from other Federal, State, Tribal, and local agencies and permitting
29 authorities. Therefore, the purpose of the NRC's environmental review of Luminant's
30 application is to determine the impacts on the human environment if two new nuclear power
31 units of the proposed US-APWR design are constructed and operated at the CPNPP site. The
32 purpose of Luminant's requested Corps action is to obtain a permit to perform regulated
33 activities that would have an effect on waters of the United States.

34 Upon acceptance of the Luminant application, the NRC began the environmental review
35 process described in 10 CFR Part 51 by publishing in the *Federal Register* (FR) a Notice of
36 Intent (73 FR 9604) to prepare an EIS and to conduct scoping. On January 6, 2009, the NRC
37 held two scoping meetings in Glen Rose, Texas, to obtain public input on the scope of the
38 environmental review. The staff reviewed the comments received during the scoping process
39 and contacted Federal, State, Tribal, regional, and local agencies to solicit comments.

40 To gather information and to become familiar with the sites and their environs, the NRC, its
41 contractors [the Oak Ridge National Laboratory (ORNL) and Information Systems Laboratories,
42 Inc. (ISL)], and the Corps visited the CPNPP site in February 2009 to examine the ecological
43 resources of the site and to conduct an environmental site audit. The NRC and its contractors
44 also visited three alternative sites (the Coastal site, the Pineland site, and the Tradinghouse
45 site) in Texas in February 2009. During the site visits, the NRC staff and its contractors met
46 with Luminant staff, public officials, and the public.

1 Included in this EIS are (1) the results of the joint NRC/Corps review team's analyses, which
2 consider and weigh the environmental effects of the proposed actions; (2) potential mitigation
3 measures for reducing or avoiding adverse effects; (3) the environmental impacts of alternatives
4 to the proposed action; and (4) the NRC staff's preliminary recommendation regarding the
5 proposed action.

6 To guide its assessment of the environmental impacts of a proposed action or alternative
7 actions, the NRC has established a standard of significance for impacts based on Council on
8 Environmental Quality guidance (40 CFR 1508.27). Table B-1 of 10 CFR Part 51, Subpart A,
9 Appendix B, provides the following definitions of the three significance levels – SMALL,
10 MODERATE, and LARGE:

11 SMALL – Environmental effects are not detectable or are so minor that they will neither
12 destabilize nor noticeably alter any important attribute of the resource.

13 MODERATE – Environmental effects are sufficient to alter noticeably, but not to destabilize,
14 important attributes of the resource.

15 LARGE – Environmental effects are clearly noticeable and are sufficient to destabilize
16 important attributes of the resource.

17 In preparing this EIS, the review team reviewed the application, including the Environmental
18 Report (ER) submitted by Luminant; consulted with Federal, State, Tribal, and local agencies;
19 and followed the guidance set forth in NUREG-1555, *Environmental Standard Review Plan*. In
20 addition, the NRC staff considered the public comments related to the environmental review
21 received during the scoping process. Comments within the scope of the environmental review
22 are included in Appendix D of this EIS.

23 The NRC staff's preliminary recommendation to the Commission related to the environmental
24 aspects of the proposed action is that the COLs be issued as requested. This recommendation
25 is based on (1) the application, including the ER submitted by Luminant and Luminant's
26 supplemental letters and responses to the review team's RAIs; (2) consultation with other
27 Federal, State, Tribal, and local agencies; (3) the review team's independent review; (4) the
28 review team's consideration of public scoping comments; and (5) the assessments summarized
29 in this EIS, including the potential mitigation measures identified in the ER and this EIS. The
30 Corps permit decision will be made following issuance of the final EIS, and the Corps will issue
31 its Record of Decision (ROD) based, in part, on this EIS.

32 A 75-day comment period will begin on the date of publication in the FR of the U.S.
33 Environmental Protection Agency Notice of Availability of the filing of the draft EIS to allow
34 members of the public and agencies to comment on the results of the environmental review.
35 During that period, the NRC and Corps staff will conduct a public meeting near the CPNPP site
36 to describe the results of the environmental review, respond to questions, and accept public
37 comments. After the comment period, the review team will consider all the comments received.
38 The final EIS will include these comments and the review team's responses.

39 The NRC staff's evaluation of the site safety and emergency preparedness aspects of the
40 proposed action will be addressed in the NRC's Safety Evaluation Report, currently anticipated
41 to be published in December 2011. The reactor specified in the application is the MHI US-
42 APWR design, which is currently undergoing a design certification review. The NRC staff's
43 evaluation of the design certification and final rulemaking is currently anticipated to be
44 completed in September 2011.

Abbreviations/Acronyms

1	µg	micrograms
2	µS	microsiemens
3	X/Q	dispersion values
4	°C	degree(s) Celsius
5	°F	degree(s) Fahrenheit
6	A/B	auxiliary building
7	AADT	Annual Average Daily Traffic
8	ABWR	Advanced Boiling Water Reactor
9	ac	acre(s)
10	AC	alternating current
11	ACHP	Advisory Council on Historic Preservation
12	AD	Attainment Demonstration
13	AEC	Atomic Energy Commission
14	AEP	Archaeology and Ethnography Program
15	ALARA	as low as reasonably achievable
16	AML	abandoned mine land
17	AMUD	Acton Municipal Utility District
18	AN	ammonia nitrogen
19	APE	Area of Potential Effect
20	APLIC	Avian Powerline Interaction Committee
21	ASLB	Atomic Safety and Licensing Board
22	AWEA	American Wind Energy Association
23	BA	Biological Assessment
24	BDTF	Blowdown Treatment Facility
25	BEA	Bureau of Economic Analysis
26	BEIR	Biological Effects of Ionizing Radiation
27	BLS	U.S. Bureau of Labor Statistics
28	BMP	best management practice
29	BOD	biochemical oxygen demand
30	Bq	Becquerel(s)
31	BRA	Brazos River Authority
32	BRM	Brazos River mile
33	Btu	British thermal unit(s)
34	BUL	balancing up load
35	BWR	boiling-water reactor
36	C/V	containment vessel
37	CAA	Clean Air Act
38	CBC	Christmas Bird Count
39	CBOD	carbonaceous biochemical oxygen demand
40	CCD	Census County Division
41	CCWS	component cooling water system

1	CDC	Center for Disease Control and Prevention
2	CDF	core damage frequency
3	CDP	census-designated place
4	CDR	Capacity, Demand, and Resources Report
5	CEQ	Council on Environmental Quality
6	CFR	Code of Federal Regulations
7	cfs	cubic feet per second (water flow)
8	cfu	colony forming units
9	Ci	Curie(s)
10	CLNGT	Calhoun Liquefied Natural Gas Terminal
11	cm	centimeters
12	cm ²	centimeter(s) squared
13	CMP	Coastal Management Program
14	CMZ	Coastal Management Zone
15	CO	carbon monoxide
16	CO ₂	carbon dioxide
17	COL	combined license
18	Corps	U.S. Army Corps of Engineers
19	CP	construction permit
20	CPCN	Certificate of Public Convenience and Necessity
21	CPNPP	Comanche Peak Nuclear Power Plant
22	CPS	Energy City Public Service Board of San Antonio, Texas
23	CPUE	catch per unit effort
24	CR	County Road (CR 360, CR 392)
25	CREZ	Competitive Renewable Energy Zones
26	CS	containment spray
27	CVCS	Chemical and Volume Control System
28	CVDT	containment vessel reactor coolant drain tank
29	CWA	Clean Water Act
30	CWIS	circulating water intake structure
31	CWS	circulating water system
32	d	day
33	D/Q	annual normalized total surface deposition rates
34	DA	Department of the Army
35	dba	decibel(s) (acoustic)
36	DBA	Design Basis Accident
37	DBH	diameter at breast height
38	DC	direct current
39	DCD	Design Control Document
40	DDT	dichlorodiphenyltrichloroethane
41	DFPS	Department of Family Protective Services
42	DFW	Dallas–Fort Worth
43	DHV	design hourly volume
44	DNL	day-night average sound levels
45	DO	dissolved oxygen

1	DOE	U.S. Department of Energy
2	DOT	U.S. Department of Transportation
3	DSM	demand side management
4	DSWG	Demand Side Working Group
5	DWS	demineralized water system
6	EAB	Exclusion Area Boundary
7	ECP	essential cooling pond
8	EFH	Energy Future Holdings Corporation
9	EFH	essential fish habitat
10	EIA	Energy Information Administration
11	EIS	environmental impact statement
12	ELCC	effective load carrying capacity
13	ELF	extremely low frequency
14	EMF	electromagnetic field
15	EPA	U.S. Environmental Protection Agency
16	ER	Environmental Report
17	ERCOT	Electric Reliability Council of Texas
18	ESA	U.S. Endangered Species Act of 1973, as amended
19	ESP	early site permit
20	ESRP	Environmental Standard Review Plan
21	ESWS	essential service water system
22	FAA	Federal Aviation Administration
23	FAC	free available chlorine
24	FC	fecal coliform
25	FDA	final design approval
26	FERC	Federal Energy Regulatory Commission
27	FES	Final Environmental Statement
28	FM	Farm-to-Market Road
29	FPS	fire protection system
30	FR	Federal Register
31	FRA	Federal Railroad Administration
32	FSAR	Final Safety Analysis Report
33	ft	foot or feet
34	ft ²	square feet
35	ft ³	cubic feet
36	FWS	U.S. Fish and Wildlife Service
37	gal	gallon(s)
38	GAM	general area monitoring
39	GATF	Generation Adequacy Task Force
40	GBq	gigabecquerel
41	GBRA	Guadalupe-Blanco River Authority
42	GCC	global climate change
43	GCD	Groundwater Conservation District
44	GCRP	Global Change Research Program

1	GE	General Electric
2	GED	Global Energy Decisions, Inc.
3	GEIS	generic environmental impact statement
4	GEIS-DECOM	GEIS-Decommissioning of Nuclear Facilities (NUREG-0586)
5	GHG	greenhouse gas
6	GIT	Georgia Institute of Technology
7	GIWW	Gulf Intracoastal Waterway
8	gpd	gallon(s) per day
9	gpm	gallon(s) per minute
10	GPS	global positioning system
11	GTG	gas turbine generator
12	GWMS	Gaseous Waste Management System
13	ha	hectare(s)
14	HCLPF	high confidence of low probability of failures
15	HCP	Ham Creek Park
16	hr	hour(s)
17	HT	holdup tank
18	HUD	U.S. Department of Housing and Urban Development
19	HVAC	heating, ventilation, and air conditioning
20	Hz	hertz
21	IA	Interconnection Agreement
22	IAEA	International Atomic Energy Agency
23	ICRP	International Commission on Radiological Protection
24	IGCC	integrated gasification combined cycle
25	in.	inch(es)
26	INL	Idaho National Laboratory
27	IOU	investor owned utility
28	ISD	Independent School District
29	ISFSI	Independent Spent Fuel Storage Installation
30	ISL	Information Systems Laboratories, Inc.
31	ISO	independent system operator
32	JPPP	E.S. Joslin Power Plant Project
33	KC	Keystone Center
34	km	kilometer(s)
35	km ²	square kilometer(s)
36	kV	kilovolt(s)
37	kWh	kilowatt-hour(s)
38	L	liter(s)
39	LaaR	load acting as resource
40	lb	pound(s)
41	LC ₅₀	concentration lethal to 50% of the sample population
42	LCRA	Lower Colorado River Authority

1	LCRWPG	Lower Colorado Regional Water Planning Group
2	Ldn	day-night average sound level
3	LEDPA	least environmentally damaging practicable alternative
4	lin ft	linear foot (feet)
5	LLMW	low-level mixed waste
6	LLW	low-level radioactive waste
7	LOCA	loss of coolant accident
8	LOS	Level of Service
9	LPSD	low power shutdown
10	LPZ	low population zone
11	LRF	large release frequency
12	LST	local standard time
13	LTSF	Long-Term Storage Facility
14	LVW	low volume waste
15	LWA	Limited Work Authorization
16	LWMS	liquid waste management system
17	LWR	light-water reactor
18	m	meter(s)
19	m ²	square meter(s)
20	m ³	cubic meter(s)
21	mA	milliampere
22	MBq	megabecquerel
23	MCCI	molten corium-to-concrete interaction
24	mcf	million cubic feet
25	mCi	millicurie
26	MCR	main cooling reservoir
27	MDC	main drainage channel
28	MDCT	mechanical draft cooling tower
29	MEI	maximally exposed individual
30	mG	milligauss
31	mg	milligram(s)
32	MGD	million gallon(s) per day
33	MHI	Mitsubishi Heavy Industries, Ltd.
34	MHz	megahertz
35	mi	mile(s)
36	mi ²	square mile(s)
37	min	minute
38	MIT	Massachusetts Institute of Technology
39	mL	milliliter(s)
40	MMS	Minerals Management Service
41	MNES	Mitsubishi Nuclear Energy Systems
42	mo	month
43	MOU	Memorandum of Understanding
44	MOX	mixed oxide (fuel)
45	mph	mile(s) per hour

1	mpn	most probable number
2	mR	milliroentgen
3	mrad	millirad(s)
4	mrem	millirem(s)
5	MSA	Metropolitan Statistical Area
6	MSL	above mean sea level
7	mSv	millisievert(s)
8	MT	metric ton(s) (or tonne[s])
9	MTU	metric ton(s) of uranium
10	MW	megawatt(s)
11	MW(e)	megawatt(s) electrical
12	MW(t)	megawatt(s) thermal
13	MWd	megawatt-day(s)
14	MW-h	megawatt-hour(s)
15	MWS	makeup water system
16	N	nitrogen
17	NAAQS	National Ambient Air Quality Standard
18	NCA	Noise Control Act
19	NCI	National Cancer Institute
20	NCRP	National Council on Radiation Protection & Measurements
21	NEPA	National Environmental Policy Act of 1969, as amended
22	NERC	North American Electric Reliability Corporation
23	NESC	National Electric Safety Code
24	NESWS	nonessential service water system
25	NGO	nongovernmental organization
26	NHPA	National Historic Preservation Act of 1966, as amended through 2000
27	NIEHS	National Institute of Environmental Health Sciences
28	NMM	navigation mile marker
29	NO ₂	nitrite
30	NO ₃	nitrate
31	NOAA	National Oceanic and Atmospheric Administration
32	NO _x	nitrogen oxide(s)
33	NPDES	National Pollutant Discharge Elimination System
34	NRC	U.S. Nuclear Regulatory Commission
35	NRHP	National Register of Historic Places
36	NWPCC	Northwest Power and Conservation Council
37	O&M	operations and maintenance
38	ODCM	offsite dose calculation manual
39	OECD	Organization for Economic Cooperation and Development
40	OPO4	orthophosphate
41	ORNL	Oak Ridge National Laboratory
42	OSF	Onsite Staging Facility
43	OSHA	Occupational Safety and Health Administration

1	P	phosphorous
2	PAM	primary amoebic meningoencephalitis
3	PBS&J	Post, Buckley, Schuh & Jernigan, Inc.
4	pCi	picocuries
5	PGC	Power Generation Company
6	PGMA	Priority Groundwater Management Plan
7	PIR	Public Interest Review
8	PKL	Possum Kingdom Lake
9	PM	particulate matter
10	PM ₁₀	particulate matter with a diameter of 10 microns or less
11	PM _{2.5}	particulate matter with a diameter of 2.5 microns or less
12	PNNL	Pacific Northwest National Laboratory
13	ppm	parts per million
14	ppt	parts per thousand
15	PRA	probabilistic risk assessment
16	PSD	prevention of significant deterioration
17	PSWS	potable and sanitary water system
18	PUCT	Public Utility Commission of Texas
19	PURA	Public Utilities Regulatory Act
20	PWR	pressurized-water reactor(s)
21	Q	flow
22	QSE	qualified scheduling entity
23	R/B	reactor building
24	RAI	Request for Additional Information
25	RCDT	reactor coolant drain tank
26	RCRA	Resource Conservation and Recovery Act of 1976, as amended
27	RCW	Reactor Building Cooling Water
28	rem	Roentgen equivalent man (a special unit of radiation dose)
29	REMP	radiological environmental monitoring program
30	REP	retail electric provider
31	RFP	Reasonable Further Progress
32	RHR	residual heat removal
33	RIMS	Regional Input-Output Model System
34	RLE	review level earthquake
35	RMPF	Reservoir Makeup Pumping Facility
36	RMR	reliability must run
37	ROD	Record of Decision
38	ROI	region of interest
39	ROW	right(s)-of-way
40	rpm	revolutions per minute
41	RRY	reference reactor year
42	RSICC	Radiation Safety Information Computational Center
43	RSW	Reactor Service Water
44	RV	recreational vehicle

1	RWST	refueling water storage tank
2	Ryr	reactor-year
3	s	second(s)
4	SACTI	Seasonal and Annual Cooling Tower Impacts Prediction Code
5	SAMA	severe accident mitigation alternative
6	SAMDA	severe accident mitigation design alternative
7	SAWS	San Antonio Water System
8	SB	Senate Bill
9	SCR	Squaw Creek Reservoir
10	SCWD	Somervell County Water District
11	SER	Safety Evaluation Report
12	SES	Steam Electric Station
13	SFSI	Spent Fuel Storage Installation
14	SG	steam generator
15	SGBD	Steam Generator Blowdown
16	SGIA	signed generation permit agreement
17	SGTR	steam generator tube rupture
18	SH	state highway
19	SHPO	State Historic Preservation Office
20	SIP	State Implementation Plan
21	SMA	Seismic Margin Analysis
22	SNDC	summer net dependable capability
23	SO ₂	sulfur dioxide
24	SOP	System Operation Permit
25	SO _x	sulfur oxide
26	SPP	Southwest Power Pool
27	SSC	structure, system, or component
28	STP	South Texas Project Electric Generating Station
29	STPNOC	STP Nuclear Operating Company
30	SWATS	Surface Water and Treatment System
31	SWMS	Solid Waste Management System
32	SWPPP	Stormwater Pollution Prevention Plan
33	SWWTS	sanitary wastewater treatment system
34	T&D	transmission and distribution
35	TAC	Texas Administrative Code
36	TBEG	Texas Bureau of Economic Geology
37	TBq	terabecquerel(s)
38	TCC	Texas Central Company
39	TCEQ	Texas Commission on Environmental Quality
40	TCS	turbine component cooling water system
41	TCWP	Texas Coastal Watershed Program
42	TDS	total dissolved solids
43	TDSHS	Texas Department of State Health Services
44	TEDE	total effective dose equivalent

1	Temp	temperature
2	THC	Texas Historical Commission
3	THPO	Tribal Historic Preservation Office
4	TIS	Texas Interconnected System
5	TLD	thermoluminescent dosimeter
6	TMDL	total maximum daily load
7	TPDES	Texas Pollutant Discharge Elimination System
8	TPWD	Texas Parks and Wildlife Department
9	TPWP	Texas Prairie Wetlands Project
10	tpy	tons per year
11	TRC	total residual chlorine
12	TSDC	Texas State Data Center
13	TSS	total suspended solids
14	TSWQS	Texas Surface Water Quality Standard
15	TUGC	Texas Utilities Generating Company
16	TW	terawatt
17	TWC	Texas Water Code
18	TWDB	Texas Water Development Board
19	TW-h	terawatt-hour(s)
20	TX	Texas
21	TxDOT	Texas Department of Transportation
22	TXNDD	Texas Natural Diversity Database
23	UC	University of Chicago
24	U ₃ O ₈	tr uranium octaoxide (“yellowcake”)
25	UF ₆	uranium hexafluoride
26	UFC	uranium fuel cycle
27	UHS	ultimate heat sink
28	UO ₂	uranium oxide
29	USACE	U.S. Army Corps of Engineers (Corps)
30	US-APWR	U.S. Advanced Pressurized Water Reactor
31	USCB	U.S. Census Bureau
32	USFWS	U.S. Fish and Wildlife Service
33	USGCRP	U.S. Global Change Research Program National Assessment
34	USGS	U.S. Geological Survey
35	VCNS	Victoria County Nuclear Station
36	VCT	volume control tank
37	VFD	Volunteer Fire Department
38	VOC	volatile organic compound
39	WBR	Wheeler Branch Reservoir
40	WDA	Workforce Development Area
41	WHO	World Health Organization
42	WMA	Wildlife Management Area
43	WWS	wastewater system

1	yd	yard(s)
2	yd ³	cubic yard(s)
3	yr	year(s)

Appendix A

Contributors to the Environmental Impact Statement

Appendix A

Contributors to the Environmental Impact Statement

1 The overall responsibility for the preparation of this environmental impact statement was
 2 assigned to the Office of New Reactors, U.S. Nuclear Regulatory Commission (NRC). The
 3 statement was prepared by members of the Offices of New Reactors with assistance from other
 4 NRC organizations, the U.S. Army Corps of Engineers, the Oak Ridge National Laboratory, and
 5 the Information Sciences Laboratory.

Name	Affiliation	Function or Expertise
NUCLEAR REGULATORY COMMISSION		
Michael Willingham	Office of New Reactors	Environmental Project Manager
Donald Palmrose	Office of New Reactors	Senior Project Manager
Alicia Williamson	Office of New Reactors	Project Manager/Support
John Fringer	Office of New Reactors	Project Manager
Jack Cushing	Office of New Reactors	Senior Project Manager/Advisor
Mark Notich	Office of New Reactors	Assistant Project Manager/Advisor
Gregory Hatchett	Office of New Reactors	DSER/RAP1 Branch Chief
Gwen Hawkins	Office of New Reactors	Project Management Support
Michelle Moser	Office of New Reactors	Project Manager/Advisor
Nebiyu Tiruneh	Office of New Reactors	Surface Water Hydrology
Daniel Barnhurst	Office of New Reactors	Groundwater Hydrology; Geology
Harriet Nash	Office of New Reactors	Aquatic Ecology
Peyton Doub	Office of New Reactors	Terrestrial Ecology; Land Use
Dan Mussatti	Office of New Reactors	Socioeconomics; Environmental Justice; Benefit-Cost Analysis; Need for Power Alternatives
Barry Zalcman	Office of New Reactors	Health Physics; Human Health; Cultural Resources; Nonradiological Waste
Rich Emch	Office of New Reactors	Health Physics (Operations)
Richard Clement	Office of New Reactors	Health Physics (Construction)
Ron LaVera	Office of New Reactors	Meteorology and Air Quality
Kevin Quinlan	Office of Nuclear Material Safety and Safeguards	Uranium Fuel Cycle; Radiological Waste
Stan Echols	Office of Nuclear Material Safety and Safeguards	Accidents
Edward Fuller	Office of New Reactors	Accidents
Michelle Hart	Office of New Reactors	Transportation
Kevin Witt	Office of Nuclear Material Safety and Safeguards	Transportation
Jessica Glenn	Office of Nuclear Material Safety and Safeguards	Transportation
Allen Fetter	Office of Federal and State Materials and Environmental Management Programs	Decommissioning

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Name	Affiliation	Function or Expertise
Jim Shepherd	Office of Federal and State Materials and Environmental Management Programs	Decommissioning
U.S. ARMY CORPS OF ENGINEERS		
David Madden	Regulatory Branch, Forth Worth District	Section 404; Wetlands
OAK RIDGE NATIONAL LABORATORY (ORNL)^a		
Gregory Zimmerman	Environmental Sciences Division	Team Leader
Barry Shumpert	Environmental Sciences Division	Land Use
Brennan Smith	Environmental Sciences Division	Hydrology
Ellen Smith	Environmental Sciences Division	Hydrology
Glenn Cada	Environmental Sciences Division	Hydrology/Water Quality
David Watson	Environmental Sciences Division	Hydrology /Geohydrology
Harry Quarles, III	Environmental Sciences Division	Terrestrial Ecology
James Saulsbury	Environmental Sciences Division	Socioeconomics; Environmental Justice
Keith Eckerman	Environmental Sciences Division	Health Physics; Human Health
Kathy Gant	Environmental Sciences Division	Health Physics; Human Health
Scott Ludwig	Global Nuclear Security Technology Division	Transportation
Kent Williams ^b	Nuclear Science & Technology Division	Uranium Fuel Cycle; Radiological Waste
Fred Peretz	Nuclear Science & Technology Division	Uranium Fuel Cycle; Radiological Waste; Decommissioning
David Bjornstad	Environmental Sciences Division	Benefit-Cost Analysis; Need for Power
Walter Koncinski	Creative Media Organization	Technical Editing
Priscilla Henson	Creative Media Organization	Technical Editing
INFORMATION SYSTEMS LABORATORIES, INC. (ISL)^c		
Terry Gitnick	ISL	Project Manager
Steve Dillard	ISL/AECOM ^d	Aquatic Ecology
Steve Duda	ISL/AECOM ^d	Aquatic Ecology
Matt Goodwin	ISL/AECOM ^d	Cultural Resources
Susan Provenzano	ISL/AECOM ^d	Cultural Resources
Robert Dover	ISL/AECOM ^d	Meteorology/Air Quality; Alternatives
Ed Kaczmarczyk	ISL/AECOM ^d	Meteorology/Air Quality
Bruce Mrowca	ISL	Accidents
James Meyer	ISL	Accidents
Roberta Hurley	ISL/AECOM ^d	Alternatives
Kevin Taylor	ISL/AECOM ^d	Alternatives
<p>a Oak Ridge National Laboratory is operated for the U.S. Department of Energy by UT-Battelle LLC.</p> <p>b Retired from Oak Ridge National Laboratory.</p> <p>c Information Systems Laboratories (ISL) is a private-sector company performing services under contract to NRC.</p> <p>d AECOM is a private-sector subcontractor to ISL.</p>		

Appendix B

Organizations Contacted

Appendix B

Organizations Contacted

1 The following Federal, State, regional, Tribal, and local organizations were contacted during the
2 course of the U.S. Nuclear Regulatory Commission staff's independent review of potential
3 environmental impacts from the construction and operation of two new nuclear units (Units 3
4 and 4) at the Comanche Peak Nuclear Power Plant site in Hood and Somervell Counties,
5 Texas.

6 Advisory Council on Historic Preservation, Washington, D.C.

7 Apache Tribe of Oklahoma, Anadarko, Oklahoma

8 Toni Ballew, Director, Hood County United Way, Granbury, Texas

9 Caddo Nation of Oklahoma, Binger, Oklahoma

10 Cheyenne and Arapaho Tribes of Oklahoma, Concho, Oklahoma

11 City of Glen Rose, Texas, Betty Gosdin, Chair of City Planning and Zoning Commission

12 City of Granbury, Texas, David Southern, Mayor

13 City of Granbury, Texas, Harold Sandel, City Manager

14 City of Granbury, Texas, Ron Berryman, Assistant City Manager

15 City of Granbury, Texas, Lee Daniels, Chair of City Planning and Zoning Commission

16 Luis Crespo, Pastor, Maranatha Lighthouse Church, Glen Rose, Texas

17 Delaware Tribe of Oklahoma, Bartlesville, Oklahoma

18 The Delaware Nation, Delaware Tribe of Western Oklahoma, Anadarko, Oklahoma

19 Hood County, Texas, Andy Rash, County Judge

20 Hood County, Texas, Mike Sympson, County Commissioner

21 Kickapoo Traditional Tribe of Texas, Eagle Pass, Texas

22 National Marine Fisheries Service, St. Petersburg, Florida

23 Oncor Electric Delivery Company LLC, Dallas, Texas

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- 1 Somervell County, Texas, Walter Maynard, County Judge
- 2 Somervell County, Texas, Mike Ford, County Commissioner
- 3 Somervell County, Texas, Susanne Reynolds, Emergency Management
- 4 Texas Parks and Wildlife Department, Wildlife Habitat Assessment Program, Austin, Texas
- 5 Texas State Historic Preservation Officer, Austin, Texas
- 6 U.S. Army Corps of Engineers, Fort Worth District, Fort Worth, Texas
- 7 U.S. Fish and Wildlife Service, Houston, Texas
- 8 Wichita and Affiliated Tribes, Anadarko, Oklahoma
- 9 Norma Wright, Volunteer, Hood County food pantry and other local charitable organizations,
10 Granbury, Texas

Appendix C

Chronology of the Nuclear Regulatory Commission and the U.S. Army Corps of Engineers Staff Environmental Review Correspondence Related to Luminant Generation Company, LLC, Application for Combined Licenses at the Comanche Peak Nuclear Power Plant Site

Appendix C

Chronology of the Nuclear Regulatory Commission and the U.S. Army Corps of Engineers Staff Environmental Review Correspondence Related to Luminant Generation Company, LLC, Application for Combined Licenses at the Comanche Peak Nuclear Power Plant Site

1 This appendix contains a chronological listing of correspondence between the U.S. Nuclear
2 Regulatory Commission (NRC) and Luminant Generation Company LLC (Luminant), and other
3 correspondence related to the NRC staff's environmental review, under Title 10 of the Code of
4 Federal Regulations (CFR) Part 51, for Luminant's application for combined licenses (COLs) at
5 the Comanche Peak Nuclear Power Plant (CPNPP) in Somervell and Hood Counties, Texas.
6 Additionally, correspondence related to the U.S. Army Corps of Engineers (USACE or Corps)
7 environmental review of Luminant's application for two new units at the CPNPP site is also
8 included. All documents, with the exception of those containing proprietary information, are
9 available at the Commission's Public Document Room, at One White Flint North, 11555
10 Rockville Pike (first floor), Rockville, Maryland, and are available electronically from the Public
11 Electronic Reading Room found on the internet at the following web address:
12 <http://www.nrc.gov/reading-rm.html>. From this site, the public can gain access to the NRC's
13 Agencywide Document Access and Management System (ADAMS), which provides text and
14 image files of NRC's public documents in the component of ADAMS. The ADAMS accession
15 numbers for each document are included below.

16 September 19, 2008 Letter from Mr. Mitch Lucas, Vice President, Luminant Generation
17 Company LLC (Luminant), to the U.S. Nuclear Regulatory Commission
18 (NRC), transmitting Combined License Application for Comanche Peak
19 Nuclear Power Plant, Units 3 and 4 (Accession No. ML082680250).

20 November 3, 2008 Federal Register Notice of Receipt and Availability of Application of
21 Combined License for Luminant Generation Company LLC (73 FR
22 66276) (Accession No. ML083010072).

23 November 3, 2008 Letter from Stephen Raul Monarque, NRC, to Mr. Don Woodlan,
24 Manager, Luminant, transmitting Acknowledgement of Receipt of the
25 Combined License Application for Comanche Peak Nuclear Power Plant,

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1 Units 3 and 4, and Associated Federal Register Notice (Accession No.
2 ML082420365).

3 December 2, 2008 Federal Register Notice of Acceptance for Docketing of an Application for
4 Combined License for Comanche Peak Nuclear Power Plant, Units 3 and
5 4 (73 FR 75141) (Accession No. ML083390640).

6 December 2, 2008 Letter from Stephen Raul Monarque, NRC, to Mr. Mitch Lucas, Luminant,
7 transmitting Acceptance Review for the Comanche Peak Nuclear Power
8 Plant, Units 3 and 4 Combined License Application and Associated
9 Federal Register Notice (Accession No. ML082420435).

10 December 9, 2008 Letter from Michael Willingham, NRC, to Ms. Peggy Oldham transmitting
11 Maintenance of Reference Materials at the Somervell County Library
12 Related to the Environmental Review of the Luminant Generation
13 Company LLC Combined License Application at the Comanche peak
14 Nuclear Power Plant Site (Accession No. ML083390652).

15 December 9, 2008 Letter from Michael Willingham, NRC, to Ms. Sheri McAllister transmitting
16 Maintenance of Reference Materials at the Hood County Library Related
17 to the Environmental Review of the Luminant Generation Company LLC
18 Combined License Application at the Comanche peak Nuclear Power
19 Plant Site (Accession No. ML083390662).

20 December 18, 2008 Letter from Mr. Mitch Lucas, Luminant, to Michael Willingham, NRC,
21 transmitting Comanche Peak, Units 3 and 4, Reassessment of
22 Proprietary Information (Accession No. ML083590296).

23 December 12, 2008 Federal Register Notice of Intent to Prepare an Environmental Impact
24 Statement and Conduct Scoping Process for the Comanche peak Nuclear
25 Power Plant, Units 3 and 4 Combined License Application (73 FR 77076)
26 (Accession No. ML090690659).

27 December 22, 2008 Memorandum to William Burton, NRC, from Michael Willingham, NRC,
28 transmitting Notice of Public Meeting to Discuss Environmental Scoping
29 Process for the Comanche Peak Nuclear Power Plant Combined License
30 Application for Units 3 and 4 (TAC No. RF2683) (Accession No.
31 ML083530985).

32 December 23, 2008 Letter from William Burton, NRC, to Mr. Lawrence Oaks, Executive
33 Director, Texas State Historic Preservation Officer, transmitting
34 Notification and Request for Consultation and Participation in the Scoping
35 Process for the Comanche Peak Nuclear Power Plant, Units 3 and 4
36 Combined License Application Review (Accession No. ML083400507).

- 1 December 23, 2008 Letter from William Burton, NRC, to Ms. Kathy Boydston, Texas parks
2 and Wildlife Department, transmitting Request for Participation in the
3 Scoping Process and the List of State Listed Protected Species for the
4 Environmental Review for the Comanche Peak Nuclear Power Plant,
5 Units 3 and 4 Combined License Application (Accession No.
6 ML083400514).
- 7 December 23, 2008 Letter from William Burton, NRC, to Mr. Don Klima, Director, Office of
8 Federal Agency Programs, Advisory Council on Historic Preservation,
9 transmitting Request for Participation in the Scoping Process for the
10 Comanche peak Nuclear Power Plant, Units 3 and 4 Combined License
11 Application Review (Accession No. ML083410002).
- 12 December 23, 2008 Letter from William Burton, NRC, to Mr. Tom Cloud, U.S. Fish and Wildlife
13 Service, transmitting Request for Consultation and Participation in the
14 Environmental Scoping Process and a List of Protected Species within
15 the Area Under Evaluation for the Comanche peak Nuclear power Plant,
16 Units 3 and 4 Combined License Application Review (Accession No.
17 ML083450242).
- 18 December 23, 2008 Letter from William Burton, NRC, to Mr. David Bernhart, National Marine
19 Fisheries Service, transmitting Request for Participation on the
20 Environmental Scoping Process and a List of Protected Species and
21 Habitat within the Area under Evaluation for Comanche Peak Units 3 and
22 4 Combined License Application Review (Accession No. ML083450284).
- 23 December 23, 2008 Letter from William Burton, NRC, to Governor Scott Miller, Absentee
24 Shawnee Tribe Headquarters, transmitting Notification and Request for
25 Consultation and Participation in the Scoping Process for the
26 Environmental Review of the Comanche Peak Nuclear Plant, Units 3 and
27 4 Combined License Application (Accession No. ML083460276).
- 28 December 23, 2008 Letter from William Burton, NRC, to Chairman Ronnie Lupe, White
29 Mountain Apache Tribe, transmitting Notification and Request for
30 Consultation and Participation in the Scoping Process for the
31 Environmental Review of the Comanche Peak Nuclear Power Plant, Units
32 3 and 4 Combined License Application (Accession No. ML083460284).
- 33 December 23, 2008 Letter from William Burton, NRC, to Bryant Celestine, Alabama-Coushatta
34 Tribe of Texas, transmitting Notification and Request for Consultation and
35 Participation in the Scoping Process for the Environmental Review of the
36 Comanche Peak Nuclear Power Plant, Units 3 and 4 Combined License
37 Application (Accession No. ML083460323).

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- 1 December 23, 2008 Letter From William Burton, NRC, to Chairman Alonzo Chalepah, Apache
2 Tribe of Oklahoma, transmitting Notification and Request for Consultation
3 and Participation in the Scoping Process for the Environmental Review of
4 the Comanche Peak Nuclear Power Plant, Units 3 and 4 Combined
5 License Application (Accession No. ML083460347).
- 6 December 23, 2008 Letter from William Burton, NRC, to Chairwoman LaRue Parker, Caddo
7 Nation of Oklahoma, transmitting Notification and Request for
8 Consultation and Participation in the Scoping Process for the
9 Environmental Review of the Comanche Peak Nuclear Power Plant,
10 Units 3 and 4 Combined License Application (Accession No.
11 ML083460378).
- 12 December 23, 2008 Letter from William Burton, NRC, to Governor Darrell Flyingman,
13 Cheyenne and Arapaho Tribes of Oklahoma, transmitting Notification and
14 Request for Consultation and Participation in the Scoping Process for the
15 Environmental Review of the Comanche Peak Nuclear Power Plant,
16 Units 3 and 4 Combined License Application (Accession No.
17 ML083460400).
- 18 December 23, 2008 Letter from William Burton, NCR, to Chairman Wallace Coffey, Comanche
19 Nation, transmitting Notification and Request for Consultation and
20 Participation in the Scoping Process for the Environmental Review of the
21 Comanche Peak Nuclear Power Plant, Units 3 and 4 Combined License
22 Application (Accession No. ML083460416).
- 23 December 23, 2008 Letter from William Burton, NRC, to President Kerry Holton, Delaware
24 Tribe of Western Oklahoma, transmitting Notification and Request for
25 Consultation and Participation in the Scoping Process for the
26 Environmental Review of the Comanche Peak Nuclear Power Plant,
27 Units 3 and 4 Combined License Application (Accession No.
28 ML083460442).
- 29 December 23, 2008 Letter from William Burton, NRC, to Chief Jerry Douglas, Delaware Tribe
30 of Oklahoma, transmitting Notification and Request for Consultation and
31 Participation in the Scoping Process for the Environmental Review of the
32 Comanche Peak Nuclear Power Plant, Units 3 and 4 Combined License
33 Application (Accession No. ML083460483).
- 34 December 23, 2008 Letter from William Burton, NRC, to Chairman Jeff Houser, Fort Sill
35 Apache Tribe of Oklahoma, transmitting Notification and Request for
36 Consultation and Participation in the Scoping Process for the
37 Environmental Review of the Comanche Peak Nuclear Power Plant,
38 Units 3 and 4 Combined License Application (Accession No.
39 ML083460509).

1 December 23, 2008 Letter from William Burton, NRC, to Director Lorene Willis, Jicarilla
2 Apache Nation, transmitting Notification and Request for Consultation and
3 Participation in the Scoping Process for the Environmental Review of the
4 Comanche Peak Nuclear Power Plant, Units 3 and 4 Combined License
5 Application (Accession No. ML083460546).

6 December 23, 2008 Letter from William Burton, NRC, to Chairman Juan Garza, Jr., Kickapoo
7 Traditional Tribe of Texas, transmitting Notification and Request for
8 Consultation and Participation in the Scoping Process for the
9 Environmental Review of the Comanche Peak Nuclear Power Plant,
10 Units 3 and 4 Combined License Application (Accession No.
11 ML083460577).

12 December 23, 2008 Letter from William Burton, NRC, to Chairman Billy Horse, Kiowa Tribe of
13 Oklahoma, transmitting Notification and Request for Consultation and
14 Participation in the Scoping Process for the Environmental Review of the
15 Comanche Peak Nuclear Power Plant, Units 3 and 4 Combined License
16 Application (Accession No. ML083460598).

17 December 23, 2008 Letter from William Burton, NRC, to President Carleton Naiche-Palmer,
18 Mescalero Apache Tribe, transmitting Notification and Request for
19 Consultation and Participation in the Scoping Process for the
20 Environmental Review of the Comanche Peak Nuclear Power Plant,
21 Units 3 and 4 Combined License Application (Accession No.
22 ML083460623).

23 December 23, 2008 Letter from William Burton, NRC, to President Leslie Standing, Wichita
24 and Affiliated Tribes, transmitting Notification and Request for
25 Consultation and Participation in the Scoping Process for the
26 Environmental Review of the Comanche Peak Nuclear Power Plant,
27 Units 3 and 4 Combined License Application (Accession No.
28 ML083470301).

29 December 23, 2008 Letter from William Burton, NRC, to Principal Chief Jim Roan Grey,
30 Osage Nation, transmitting Notification and Request for Consultation and
31 Participation in the Scoping Process for the Environmental Review of the
32 Comanche Peak Nuclear Power Plant, Units 3 and 4 Combined License
33 Application (Accession No. ML083470322).

34 January 5, 2009 Letter from Mr. Donald L. Patterson, Tonkawa Tribe of Oklahoma, to the
35 NRC transmitting reply to Environmental Review of the Comanche Peak
36 Nuclear Power Plant, Units 3 and 4 Combined License Application
37 (Accession No. ML090500590).

38 January 8, 2009 Letter from Mr. David Bernhart, National Marine Fisheries Service, to
39 William Burton, NRC, transmitting response to the Nuclear Regulatory
40 Commission (NRC) letter dated December 23, 2008 regarding the

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1 Comanche Peak Nuclear Power Plant near Glen Rose, Texas (Accession
2 No. ML090230148).

3 January 30, 2009 Federal Register Notice - Comanche Peak Nuclear Power Plant, Units 3
4 and 4, Opportunity to Petition for Leave to Intervene and Order Imposing
5 Procedures for Access to Sensitive Unclassified Non-Safeguards (74 FR
6 6177) (Accession No. ML090140359).

7 January 30, 2009 Letter from Stephen Raul Monarque, NRC, to Mr. Mitch Lucas, Luminant,
8 transmitting Comanche Peak Nuclear Power Plant, Units 3 and 4,
9 Opportunity to Petition for Leave to Intervene and Order Imposing
10 Procedures for Access to Sensitive Unclassified Non-Safeguards
11 Information and Safeguards Information for Contention Preparation
12 (Accession No. ML083440401).

13 February 2, 2009 Memorandum from Michael Willingham, NRC, to William Burton, NRC,
14 transmitting Summary of Public Scoping Meetings Related to the
15 Combined License Application Review of the Comanche Peak Nuclear
16 Power Plant, Units 3 and 4 (Accession No. ML090300226).

17 February 5, 2009 Press Release No. 09-023: NRC Announces Opportunity to Participate In
18 Hearing On New Reactor Application For Comanche Peak Site In Texas
19 (Accession No. ML090360555).

20 February 5, 2009 Letter from Mr. Mitch Lucas, Luminant, to David Matthews, NRC,
21 transmitting Comanche Peak, Units 3 and 4, Joint Venture
22 Announcement and Name Change of Nuclear Project Company LLC
23 (Accession No. ML090540056).

24 February 13, 2009 Letter from Mr. Mitch Lucas, Luminant, to David Matthews, NRC,
25 transmitting Comanche Peak Nuclear Power Plant, Units 3 and 4,
26 Submittal of Golden-Cheeked Warbler Report (Accession No.
27 ML090490382).

28 February 13, 2009 Letter from Mr. Mitch Lucas, Luminant, to David Matthews, NRC,
29 transmitting Comanche Peak, Units 3 and 4, Update Regarding
30 Proprietary Information and Submittal of Nuclear Power Plant Siting
31 Report (Accession No. ML090490419).

32 February 13, 2009 Letter from Ms. Cathy Gilmore, Environmental Protection Agency, to
33 Michael Lesar, NRC, transmitting Early Coordination Comanche Peak
34 Nuclear Power Plant (Accession No. ML090680037).

35 February 16, 2009 Letter from Mr. Carter Smith, Texas Parks and Wildlife Department, to
36 Michael Lesar, NRC, transmitting Comanche Peak, Units 3 and 4
37 Combined License Application Environmental Impact Statement
38 (Accession No. ML090680387).

1 February 17, 2009 Letter from Ms. Charlene Dwin Vaughn, Advisory Council on Historic
2 Preservation, to William Burton, NRC, transmitting reply to notification
3 and request for consultation and participation in the scoping process for
4 Units 3 and 4 Combined License Application Review for the Comanche
5 Peak Nuclear Power Plant near Glen Rose, Texas (Accession No.
6 ML090500077).

7 February 19, 2009 E-mail from Sean Patrick Edwards, U.S. Fish and Wildlife Service, to
8 Michael Willingham, NRC, comments in regard to Units 3 and 4
9 Combined License Application Review for the Comanche Peak Nuclear
10 Power Plant near Glen Rose, Texas (Accession No. ML092430749).

11 February 23, 2009 Letter from James Biggins, NRC, to Representative Lon Burnam, State of
12 Texas, transmitting Response to Request for Access to Sensitive
13 Unclassified Non-Safeguards Information Luminant Generation Company,
14 LLC, Comanche Peak Nuclear Power Plant, Units 3 and 4 (Accession No.
15 ML090550065).

16 February 23, 2009 Letter from James Biggins, NRC, to Mr. Robert Eye, Kaufman Eye,
17 transmitting Response to Request for Access to Sensitive Unclassified
18 Non-Safeguards Information Luminant Generation Company, LLC,
19 Comanche Peak Nuclear Power Plant, Unit 3 and 4 (Accession No.
20 ML090550232).

21 February 23, 2009 Letter from James Biggins, NRC, to Mr. Tom "Smitty" Smith and
22 Mr. Matthew Johnson, Public Citizen, Texas Office, transmitting
23 Response to Request for Access to Sensitive Unclassified Non-
24 Safeguards Information Luminant Generation Company, LLC, Comanche
25 Peak Nuclear Power Plant, Units 3 and 4 (Accession No. ML090550368).

26 March 10, 2009 Letter from Gregory P. Hatchett, NRC, to Mr. Stephen Brooks, U.S. Army
27 Corps of Engineers (USACE), transmitting CPNPP Units 3 and 4,
28 Invitation Ltr. to Participate as a Cooperating Agency in the NRC Staff's
29 Preparation of an Environmental Impact Statement (Accession No.
30 ML090140149).

31 March 31, 2009 Letter from Mr. Rafael Flores, Luminant, to David Matthews, NRC,
32 transmitting Comanche Peak, Units 3 and 4, Submittal of Documents to
33 Facilitate Environmental Review (Accession No. ML091120524).

34 April 2, 2009 Letter from Mr. Rafael Flores, Luminant, to David Matthews, NRC,
35 transmitting Comanche Peak, Units 3 and 4, Submittal of Combined
36 License Application Update Tracking Report, Revision 0 (Accession No.
37 ML091120280).

38 April 15, 2009 Letter from Gregory P. Hatchett, NRC, to Mr. Don Woodlan, Luminant,
39 transmitting Comanche Peak Nuclear Power Plant, Units 3 and 4, COL

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1 License Application Online Reference Portal (TAC RF2695) (Accession
2 No. ML090890219).

3 April 15, 2009 Letter from Mr. Rafael Flores, Luminant, to David Matthews, NRC,
4 transmitting Comanche Peak, Units 3 and 4, Submittal of Documents to
5 Facilitate the Environmental Review (Accession No. ML091120279).

6 April 16, 2009 Letter from Mr. Rafael Flores, Luminant, to David Matthews, NRC,
7 transmitting Comanche Peak, Units 3 and 4, Transmittal of Combined
8 License Application Update Tracking Report, Rev. 1 (Accession No.
9 ML091130575).

10 April 21, 2009 Letter from Mr. Rafael Flores, Luminant, to David Matthews, NRC,
11 transmitting Comanche Peak, Units 3 and 4, Response to Conditions for
12 Using an Online Reference Portal During the Review of Combined
13 License Application (Accession No. ML091120717).

14 April 24, 2009 Letter from Ms. Karen Hardin, Texas Parks and Wildlife Department, to
15 Michael Lesar, NRC, transmitting Comanche Peak, Units 3 and 4
16 Combined License Application on Specific Yucca Species During Site
17 Audit & Refined Data Regarding Known Occurrences of Rare Resources
18 in Vicinity of Specific (Accession No. ML091310617).

19 April 27, 2009 Letter from Mr. Rafael Flores, Luminant, to David Matthews, NRC,
20 transmitting Comanche Peak Nuclear Power Plant, Units 3 and 4,
21 Submittal of Documents to Facilitate Environmental Review (Accession
22 No. ML093290427).

23 April 28, 2009 Letter from Mr. Rafael Flores, Luminant, to David Matthews, NRC,
24 transmitting Comanche Peak, Units 3 and 4 Combined License
25 Application, Update Tracking Report (Accession No. ML091260719).

26 May 8, 2009 Letter from Mr. Rafael Flores, Luminant, to David Matthews, NRC,
27 transmitting Comanche Peak, Units 3 and 4, Submittal of Document to
28 Facilitate Environmental Review (Accession No. ML091320330).

29 May 14, 2009 Letter from Mr. Rafael Flores, Luminant, to David Matthews, NRC,
30 transmitting Comanche Peak, Units 3 and 4 Combined License
31 Application, Submittal of Update Tracking Report (Accession No.
32 ML091400217).

33 May 27, 2009 Letter from Mr. Rafael Flores, Luminant, to David Matthews, NRC,
34 transmitting Comanche Peak, Units 3 and 4, Submittal of Documents to
35 Facilitate Environmental Review (Accession No. ML091490263).

36 June 26, 2009 Letter from Michael Willingham, NRC, to Mr. Don Woodlan, Luminant,
37 transmitting Request for Additional Information (RAI) Regarding the
38 Environmental Review of the Combined License Application for

1 Comanche Peak Nuclear Power Plant, Units 3 and 4 (Accession No.
2 ML091460707).

3 July 1, 2009 Memorandum from Michael Willingham, NRC, to Gregory P. Hatchett,
4 NRC, transmitting Scoping Summary Report Related to the
5 Environmental Scoping Process for the CPNPP, Units 3 and 4, COL
6 Application (Accession No. ML091390873).

7 July 20, 2009 Letter from Mr. Rafael Flores, Luminant, to David Matthews, NRC,
8 transmitting Comanche Peak, Units 3 and 4, First Partial Response to
9 Request for Additional Information re the Environmental Review of the
10 Combined License Application (Accession No. ML092090653).

11 July 24, 2009 Letter from Mr. Rafael Flores, Luminant, to David Matthews, NRC,
12 transmitting Comanche Peak, Units 3 and 4 Combined License
13 Application Update Tracking Report (Accession No. ML092090582).

14 July 27, 2009 Letter from Mr. Rafael Flores, Luminant, to David Matthews, NRC,
15 transmitting Comanche Peak, Units 3 and 4, Second Partial Response to
16 Request for Additional Information Regarding the Environmental Review
17 of the Combined License Application (Accession No. ML092180066).

18 August 3, 2009 Letter from John Fringer, NRC, to Mr. Don Woodlan, Luminant,
19 transmitting RAI - Regarding the Environmental Review of the COL
20 Application for Comanche Peak Nuclear Power Plant, Units 3 and 4
21 (Accession No. ML091970377).

22 August 10, 2009 Letter from Mr. Rafael Flores, Luminant, to David Matthews, NRC,
23 transmitting Comanche Peak Nuclear Power Plant, Units 3 and 4, Final
24 Partial Response to Request for Additional Information Regarding the
25 Environmental Review of the Combined License Application (Accession
26 No. ML092360142).

27 August 12, 2009 Letter from Mr. Rafael Flores, Luminant, to David Matthews, NRC,
28 transmitting Comanche Peak Nuclear Power Plant, Units 3 and 4,
29 Supplement to Final Partial Response to Request for Additional
30 Information Regarding the Environmental Review of the Combined
31 License Application of Comanche Peak Units 3 and 4 (Accession No.
32 ML092290396).

33 August 28, 2009 Letter from Mr. Rafael Flores, Luminant, to David Matthews, NRC,
34 transmitting Comanche Peak, Units 3 and 4, Supplemental Information for
35 the Environmental Review RAI Questions SOC-09 through SOC-14
36 (Accession No. ML092440358).

37 September 1, 2009 Memorandum from John Fringer, NRC, to Gregory P. Hatchett, NRC,
38 transmitting 08/12/2009 Summary of Teleconference Held with Luminant

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- 1 Generation Company LLC Regarding Requests for Additional Information
2 (Accession No. ML092290018).
- 3 September 9, 2009 Letter from Mr. Rafael Flores, Luminant, to David Matthews, NRC,
4 transmitting Comanche Peak Nuclear Power Plant, Units 3 and 4,
5 Supplemental Information for Environmental Review RAI Responses
6 (Accession No. ML093080095).
- 7 September 14, 2009 Memorandum from Michael Willingham, NRC, to Gregory P. Hatchett,
8 NRC, transmitting Trip Report - Ecology Site Audit and Alternative Sites
9 Visit related to the Review of Luminant's Combined License Application
10 for Comanche Peak Nuclear Power Plant, Units 3 and 4 (Accession No.
11 ML091410721).
- 12 September 16, 2009 Letter from Mr. Rafael Flores, Luminant, to David Matthews, NRC,
13 transmitting Comanche Peak, Units 3 and 4, Supplemental Information for
14 the Environmental Review RAI, Questions GEN-03, HYD-16, SOC-23,
15 SOC-27, TE-04, TE-11, TE-15, TE-18, and TE-19 (Accession No.
16 ML092640643).
- 17 October 9, 2009 Memorandum from John Fringer, NRC, to Gregory P. Hatchett, NRC,
18 transmitting Summary of Teleconference Held with Luminant Generation
19 Company LLC Regarding Requests for Additional Information (Accession
20 No. ML092590369).
- 21 October 21, 2009 Letter from Mr. Rafael Flores, Luminant, to David Matthews, NRC,
22 transmitting Comanche Peak, Units 3 and 4 Combined License
23 Application Update Tracking Report (FSAR #7, ER #5) (Accession No.
24 ML093020156).
- 25 December 4, 2009 Memorandum from Michael Willingham, NRC, to Gregory P. Hatchett,
26 NRC, transmitting Summary of the Environmental Site Audit Related to
27 the Review of the Luminant's Combined License Application for
28 Comanche Peak Nuclear Power Plant, Units 3 and 4 (Accession No.
29 ML092510499).
- 30 December 7, 2009 Memorandum from John Fringer, NRC, to Gregory P. Hatchett, NRC,
31 transmitting Summary of August 20, 2009, Teleconferences held with
32 Luminant Generation Company LLC regarding Requests for Additional
33 Information (Accession No. ML092880235).
- 34 December 8, 2009 Letter from Rafael Flores, Luminant, to Dave Matthews, NRC, transmitting
35 Comanche Peak Nuclear Power Plant, Units 3 and 4 Combined License
36 Application Part 3, Environmental Report, Revision 1, Update Tracking
37 Report Revision 0 (Accession No. ML093440179).
- 38 December 18, 2009 Letter from Rafael Flores, Luminant, to Dave Matthews, NRC, transmitting
39 Comanche Peak Nuclear Power Plant, Units 3 and 4, Supplemental

1 Information in Response to the Request for Additional Information
2 Regarding the Environmental Review (Accession No. ML093620032).

3 January 15, 2010 Letter from Michael Willingham, NRC, to Mr. Don Woodlan, Luminant,
4 transmitting Request for Additional Information Regarding the
5 Environmental Review of the COL Application for CPNPP, Units 3 and 4
6 (Accession No. ML093280707).

7 January 15, 2010 Letter from Rafael Flores, Luminant, to Dave Matthews, NRC, transmitting
8 Comanche Peak Nuclear Power Plant, Units 3 and 4, COL Application
9 Part 3, Environmental Report, Update Tracking Report (Accession No.
10 ML100191529).

11 January 19, 2010 Letter from Rafael Flores, Luminant, to Dave Matthews, NRC, transmitting
12 Comanche Peak Nuclear Power Plant, Units 3 and 4, Corrections for COL
13 Application Part 3, Environmental Report, Update Tracking Report
14 (Accession No. ML100210301).

15 January 19, 2010 Letter from Dave Matthews, NRC, to Rafael Flores, Luminant, transmitting
16 Combined License Application Environmental Review Schedule for
17 Comanche Peak Nuclear Power Plant, Units 3 and 4 (Accession No.
18 ML100260655).

19 February 24, 2010 Letter from Rafael Flores, Luminant, to Dave Matthews, NRC, transmitting
20 Comanche Peak Nuclear Power Plant, Units 3 and 4, Response to
21 Request for Additional Information Regarding the Environmental Review
22 and Supplemental Information for Previous Environmental Questions
23 (Accession No. ML100630660).

24 March 3, 2010 Letter from Gregory P. Hatchett, NRC, to Donald Woodlan, Luminant,
25 transmitting NRC Staff Clarification for the Environmental Impact of the
26 Blow-down Treatment Facility Proposed in the Comanche Peak Nuclear
27 Power Plant, Units 3 and 4 Combined License Application (Accession No.
28 ML100500642).

29 March 3, 2010 Letter from Rafael Flores, Luminant, to Dave Matthews, NRC, transmitting
30 Comanche Peak Nuclear Power Plant, Units 3 and 4, COL Application
31 Part 3, Environmental Report, Update Tracking Report Revision 3
32 (Accession No. ML100640170).

33 March 5, 2010 Letter from Rafael Flores, Luminant, to Dave Matthews, NRC, transmitting
34 Comanche Peak Nuclear Power Plant, Units 3 and 4, Response to
35 Environmental Review Questions ALT-03 and SOC-33, and Supplemental
36 Information for Question TE-04 (Accession No. ML100710613).

Appendix C

1 March 9, 2010 Letter from Rafael Flores, Luminant, to Dave Matthews, NRC, transmitting
2 Comanche Peak Nuclear Power Plant, Units 3 and 4, Supplemental
3 Information for Environmental Review Requests for Additional Information
4 HYD-11, HYD-18, and HYD-19 (Accession No. ML100710027).

5 March 19, 2010 Letter from Rafael Flores, Luminant, to Dave Matthews, NRC, transmitting
6 Comanche Peak Nuclear Power Plant, Units 3 and 4, Supplemental
7 Information for Responses to Environmental Review Request for
8 Additional Information GEN-03 and GEN-07 (Accession No.
9 ML100820402).

10 April 12, 2010 Letter from Rafael Flores, Luminant, to Dave Matthews, NRC, transmitting
11 Comanche Peak Nuclear Power Plant, Units 3 and 4, Unclassified
12 Change to Physical Security Plan Due to Squaw Creek Reservoir
13 Opening (Accession No. ML101040261).

Appendix D

Scoping Comments and Responses

Appendix D

Scoping Comments and Responses

1 On December 12, 2008, the U.S. Nuclear Regulatory Commission (NRC) published a Notice of
2 Intent to Prepare an Environmental Impact Statement and Conduct Scoping Process in the
3 *Federal Register* (73 FR 77076-8). The Notice of Intent notified the public of the staff's intent to
4 prepare an environmental impact statement (EIS) and conduct scoping for the combined license
5 (COL) application received from Luminant Generation Company LLC (Luminant), acting for itself
6 and as agent for Nuclear Project Company LLC, for 2 units, identified as Comanche Peak
7 Nuclear Power Plant (CPNPP) Units 3 and 4, to be located adjacent to the existing CPNPP
8 Units 1 and 2, located approximately 40 mi southwest of Fort Worth, Texas. This EIS has been
9 prepared in accordance with provisions of the National Environmental Policy Act of 1969
10 (NEPA), Council on Environmental Quality guidelines, and Title 10 of the Code of Federal
11 Regulations (CFR) Parts 51 and 52. As outlined by NEPA, the NRC initiated the scoping
12 process with the issuance of the *Federal Register* Notice. The NRC invited the applicant;
13 Federal, Tribal, State, and local government agencies; local organizations; and individuals to
14 participate in the scoping process by providing oral comments at the scheduled public meeting
15 and/or submitting written suggestions and comments no later than February 17, 2009.

16 **D.1 Overview of the Scoping Process**

17 The scoping process provides an opportunity for public participation to identify issues to be
18 addressed in the EIS and to highlight public concerns and issues. The notice of intent identified
19 the following objectives of the scoping process:

- 20 • Define the proposed action that is to be the subject of the EIS.
- 21 • Determine the scope of the EIS and identify significant issues to be analyzed in depth.
- 22 • Identify and eliminate from detailed study those issues that are peripheral or that are not
23 significant.
- 24 • Identify any environmental assessments and other EISs that are being prepared or will be
25 prepared that are related to, but not part of, the scope of the EIS being considered.
- 26 • Identify other environmental review and consultation requirements related to the proposed
27 action.
- 28 • Identify parties consulting with the NRC under the National Historic Preservation Act
29 (NHPA), as set forth in 36 CFR 800.8(c)(1)(i).
- 30 • Indicate the relationship between the timing of the preparation of the environmental
31 analyses and the NRC's tentative planning and decision-making schedule.
- 32 • Identify any cooperating agencies and, as appropriate, allocate assignments for preparation
33 and schedules for completing the EIS to the NRC and any cooperating agencies. By letter
34 dated April 21, 2009, the U.S. Army Corps of Engineers (USACE) accepted the NRC's
35 invitation to participate as a cooperating agency on the CPNPP Units 3 and 4 COL
36 application environmental review.
- 37 • Describe how the EIS will be prepared, and identify any contractor assistance to be used.

38 Two public scoping meetings were held at the Glen Rose Expo Center, in Glen Rose, Texas, on
39 January 6, 2009. The NRC announced the meetings in local and regional newspapers (*Glen
40 Rose Newspaper, Hood County News, and Fort Worth Star-Telegram*) and issued press

1 releases locally. Approximately 110 people attended the afternoon scoping meeting and
2 approximately 50 attended the evening session. The scoping meetings began with NRC staff
3 members providing a brief overview of NRC's review process for COL applications and the
4 NEPA process. After the NRC's prepared statements, the meetings were opened for public
5 comments.

6 Twenty-five (25) afternoon scoping meeting attendees and 26 evening scoping meeting
7 attendees provided oral comments that were recorded and transcribed by a certified court
8 reporter. Twelve (12) written statements were received during the meeting. In addition to the
9 oral and written statements provided at the public scoping meeting, 2 letters and 30 e-mail
10 messages were received during the scoping period.

11 Transcripts for both afternoon and evening scoping meetings can be found in ADAMS under
12 accession numbers ML090290409 and ML090291005, respectively. A scoping meeting
13 summary memorandum (ML090300226) was issued February 2, 2009.

14 At the conclusion of the scoping period, the NRC staff reviewed the scoping meeting transcripts
15 and all written material received during the comment period and identified individual comments.
16 These comments were organized according to topic within the proposed EIS or according to the
17 general topic, if outside the scope of the EIS. Once comments were grouped according to
18 subject area, the staff determined the appropriate response for the comment. The staff made a
19 determination on each comment that it was one of the following:

- 20 • A comment that was actually a question and introduced no new information.
- 21 • A comment that was either related to support or opposition of combined licensing in general
22 (or specifically the Comanche Peak Unit 3 and 4 COL) or that made a general statement
23 about the COL process. In addition, it provided no new information and did not pertain to
24 10 CFR Part 52.
- 25 • A comment about an environmental issue that
 - 26 – provided new information that would require evaluation during the review
 - 27 – provided no new information.
- 28 • A comment that was outside the scope of the COL, which included, but was not limited to
29 – a comment on the safety of the existing units.

30 Preparation of the EIS has taken into account the relevant issues raised during the scoping
31 process. The comments received on the draft EIS will be considered in the preparation of the
32 final EIS. The final EIS, along with the staff's Safety Evaluation Report (SER), will provide much
33 of the basis for the NRC's decision on whether to grant the Comanche Peak Unit 3 and 4 COL.

34 The comments related to this environmental review are included in this appendix. They were
35 extracted from the *Specific Plant Combined License Scoping Summary Report (ML091390849)*,
36 and are provided for convenience of those interested specifically in the scoping comments
37 applicable to this environmental review. The comments that are outside the scope of the
38 environmental review for the proposed Comanche Peak Units 3 and 4 are not included in this
39 Appendix. These include comments related to:

- 40 • Safety
- 41 • Emergency Preparedness
- 42 • NRC Oversight for operating plants
- 43 • Security and Terrorism

- 1 • Support or Opposition to the licensing action, licensing process, nuclear power, hearing
2 process or the existing plant

3 More detail regarding the disposition of general or out of scope comments can be found in the
4 Scoping Summary Report (ML091390849). To maintain consistency with the Scoping Summary
5 Report, the comment source ID and comment number along with the name of the commenter
6 used in that report is retained in this appendix.

7 Table D-1 identifies in alphabetical order the individuals providing comments during the scoping
8 period, their affiliation, if given, and the ADAMS accession number that can be used to locate
9 the correspondence. Although all commenters are listed, the comments presented in this
10 appendix are limited to those within the scope of the environmental review. Table D-2 lists the
11 comment categories in alphabetical order and commenter names and comment numbers for
12 each category. The balance of this appendix presents the comments themselves with NRC
13 staff responses organized by topic category.

Table D-1. Individuals Providing Comments During the Comment Period

Commenter	Affiliation (if stated)	Comment Source and ADAMS Accession #	Correspondence ID Number
Atkinson, Bill	Glen Rose Chamber of Commerce	Meeting Transcript (ML090290409)	0016
Bahlburg, Kelly	Self	Email (ML090230174)	0013
Bernhart, David	NOAA, National Marine Fisheries Service	Email (ML090230148)	0003
Bernier, Jim	Self	Email (ML090300670)	0020
Berry, Steve	Hood County	Meeting Transcript (ML090290409)	0016
Bisbee, Kay	Self	Meeting Transcript (ML090291005)	0017
Boydston, Kathy	Texas Parks and Wildlife Department	Email (ML090490221)	0029
Burnam, Lon	Texas Legislature	Meeting Transcript (ML090290409)	0016
Burnam, Lon	Texas Legislature	Meeting Transcript (ML090291005)	0017
Cathey, Jack	Self	Meeting Transcript (ML090260390)	0018
Cathey, Jack	Self	Meeting Transcript (ML090290409)	0016
Chorost, Amy	Self	Email (ML090230169)	0012
Cohn, Ann	Self	Meeting Transcript (ML090291005)	0017
Downing, Kevin	Self	Meeting Transcript (ML090291005)	0017
Drechel, Gary	Self	Email (ML090230155)	0007
Duck, Kathy	Self	Email (ML090230157)	0009
Duncan, Jim	North Texas Renewable Energy	Meeting Transcript (ML090291005)	0017
Duvall-Gabriel, Najah	Advisory Council on Historic Preservation	Email (ML090500077)	0036
Edwards, Chet	U.S. House of Representatives	Meeting Transcript (ML090260371)	0019
English, Maurice	Self	Meeting Transcript (ML090290409)	0016
Gentling, Suzanne	Self	Email (ML090490226)	0031

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Table D-1. (contd)

Commenter	Affiliation (if stated)	Comment Source and ADAMS Accession #	Correspondence ID Number
Hadden, Karen	Sustainable Energy & Economic Development (SEED) Coalition	Email (ML090230176)	0014
Hadden, Karen	Sustainable Energy & Economic Development (SEED) Coalition	Email (ML09049231)	0033
Hadden, Karen	Sustainable Energy & Economic Development (SEED) Coalition	Email (ML090480025)	0022
Hadden, Karen	Sustainable Energy & Economic Development (SEED) Coalition	Email (ML090490224)	0030
Hadden, Karen	Sustainable Energy & Economic Development (SEED) Coalition	Meeting Transcript (ML090260371)	0019
Hadden, Karen	Sustainable Energy & Economic Development (SEED) Coalition	Meeting Transcript (ML090290409)	0016
Hadden, Karen	Sustainable Energy & Economic Development (SEED) Coalition	Meeting Transcript (ML090291005)	0017
Hale, Rod	Self	Meeting Transcript (ML090290409)	0016
Harper, Debbie	Self	Meeting Transcript (ML090291005)	0017
Harper, Paul	Glen Rose Network Corp.	Meeting Transcript (ML090291005)	0017
Hind, Rebecca	Nuclear Energy for Texans (NET)	Meeting Transcript (ML090260390)	0018
Illegible, Illegible	Tokawa Tribe of Oklahoma	Letter (ML090500590)	0037
Independent School District, Glen Rose	Self	Meeting Transcript (ML090260371)	0019
Inge, Charles and Dominique	Self	Email (ML090490218)	0028
Johnson, Lisa	City of Granbury	Meeting Transcript (ML090290409)	0016
Kinzie, W.T.	Self	Meeting Transcript (ML090290409)	0016
Leising, Joe	Self	Meeting Transcript (ML090291005)	0017
Lowe, Ed	Friends of the Brazos River	Email (ML090480028)	0025
Luton, John Henry	First National Bank of Granbury	Email (ML090230149)	0004
Marks, Gary	Glen Rose Medical Center	Meeting Transcript (ML090290409)	0016
Maynard, Walter	Somervell County Commissioners Court	Meeting Transcript (ML090290409)	0016

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Table D-1. (contd)

Commenter	Affiliation (if stated)	Comment Source and ADAMS Accession #	Correspondence ID Number
Maynard, Walter	Somervell County Commissioners Court	Meeting Transcript (ML090291005)	0017
Mayo, Ann B.	Self	Email (ML090480029)	0026
Meyers, Kevin	Self	Meeting Transcript (ML090290409)	0016
Miller, Pam	Glen Rose	Meeting Transcript (ML090291005)	0017
Miller, Russ	Chalk Mountain Wildlife Management Association; Light Pollution Committee	Email (ML090480030)	0024
Norton, Barbara & Tom	Self	Letter (ML090500381)	0038
Orcutt, David	Lake Granbury Medical Center	Meeting Transcript (ML090260390)	0018
Orcutt, David	Lake Granbury Medical Center	Meeting Transcript (ML090290409)	0016
Oswski Morgan, Sharon L.	U.S. Environmental Protection Agency	Email (ML090480031)	0027
Otte, Melinda	Comanche Peak WIN chapter	Email (ML090230168)	0011
Overstreet, Lee	Granbury Rotary Club	Meeting Transcript (ML090290409)	0016
Phillips, Marilyn	Somervell School District	Meeting Transcript (ML090290409)	0016
Phillips, Marilyn	Somervell School District	Meeting Transcript (ML090291005)	0017
Ramsey, Terry	Self	Email (ML090230152)	0006
Rash, Andy	Hood County Commissioners Court	Meeting Transcript (ML090290409)	0016
Rash, Andy	Hood County Commissioners Court	Meeting Transcript (ML090291005)	0017
Reed, Cyrus	Lone Star Chapter of the Sierra Club	Email (ML09040228)	0032
Reed, Cyrus	Lone Star Chapter of the Sierra Club	Email (ML090490228)	0035
Reed, Cyrus	Lone Star Chapter of the Sierra Club	Meeting Transcript (ML090290409)	0016
Richardson, Karen	Self	Email (ML090430065)	0021
Rittenhouse, Ryan	Public Citizen	Meeting Transcript (ML090291005)	0017

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Table D-1. (contd)

Commenter	Affiliation (if stated)	Comment Source and ADAMS Accession #	Correspondence ID Number
Roan, Richard	Self	Meeting Transcript (ML090260390)	0018
Roan, Richard	Self	Meeting Transcript (ML090290409)	0016
Rooke, Molly	Self	Meeting Transcript (ML090291005)	0017
Rosenfeld, Joshua	Brazos River Conservation Commission	Meeting Transcript (ML090290409)	0016
Sanders, Jan	Self	Meeting Transcript (ML090291005)	0017
Scott, Mike	Granbury Chamber of Commerce	Meeting Transcript (ML090260371)	0019
Scott, Mike	Granbury Chamber of Commerce	Meeting Transcript (ML090290409)	0016
Shaar, Julie	Self	Meeting Transcript (ML090290409)	0016
Sheaks, Jerry	Self	Meeting Transcript (ML090291005)	0017
Shroyer, Danielle	Self	Email (ML090230167)	0010
Smith, Hugh	Self	Meeting Transcript (ML090290409)	0016
Smith, Tom	Texas Office of Public Citizen	Email (ML090210450)	0002
Spears, Linda	Self	Email (ML090230177)	0015
Stamler, Richard	Self	Email (ML090230156)	0008
Stuard, Gary	Interfaith Environmental Alliance	Meeting Transcript (ML090291005)	0017
Sumners, Allen	Self	Meeting Transcript (ML090291005)	0017
Sykes, Victoria	Congressman Chet Edward's Office	Meeting Transcript (ML090290409)	0016
Taylor, Kevin	Somervell County Water District	Meeting Transcript (ML090290409)	0016
Ubico, Jean	Self	Email (ML090480027)	0023
Ward, Mary	Granbury-Hood County Economic Development Corporation	Meeting Transcript (ML090290409)	0016

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Table D-1. (contd)

Commenter	Affiliation (if stated)	Comment Source and ADAMS Accession #	Correspondence ID Number
Wildwood, Kathleen	Self	Meeting Transcript (ML090290409)	0016
Wohler, Will	Self	Meeting Transcript (ML090260390)	0018
Wohler, Will	Self	Meeting Transcript (ML090291005)	0017
Wolz, Conrad	Trophy Club Texas	Email (ML090230150)	0005
Wyatt, Dr. Bill	Self	Meeting Transcript (ML090291005)	0017

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Table D-2. Comment Categories with Associated Commenters and Comment IDs

Comment Category	Commenter (Comment ID)
Accidents-Design Basis	<ul style="list-style-type: none"> • Gentling, Suzanne (0031-6) • Hadden, Karen (0017-26) (0022-47) (0022-54) • Osowski Morgan, Sharon L. (0027-4) • Reed, Cyrus (0032-10)
Accidents-Severe	<ul style="list-style-type: none"> • Burnam, Lon (0016-41) • Hadden, Karen (0019-11) (0022-28) (0022-45) • Harper, Debbie (0017-51) • Reed, Cyrus (0032-11)
Alternatives-Energy	<ul style="list-style-type: none"> • Bisbee, Kay (0017-47) • Burnam, Lon (0017-16) • Cohn, Ann (0017-34) (0017-37) • Duncan, Jim (0017-53) • Hadden, Karen (0016-12) (0016-14) (0016-15) (0016-17) (0016-19) (0016-20) (0019-7) (0022-5) (0022-48) (0022-49) (0022-50) (0022-51) (0030-2) (0030-7) • Osowski Morgan, Sharon L. (0027-3) • Reed, Cyrus (0016-51) (0032-14) (0032-15) (0032-17) • Rittenhouse, Ryan (0017-61) • Sanders, Jan (0017-73) • Shaar, Julie (0016-76) • Shroyer, Danielle (0010-2) • Stuard, Gary (0017-79) • Wildwood, Kathleen (0016-61) • Wohler, Will (0017-59) (0018-3)
Alternatives-No-Action	<ul style="list-style-type: none"> • Wohler, Will (0017-58)
Alternatives-System Design	<ul style="list-style-type: none"> • Hadden, Karen (0022-19) (0022-41) • Lowe, Ed (0025-2) • Miller, Russ (0024-1) • Osowski Morgan, Sharon L. (0027-6) (0027-8) (0027-11) • Reed, Cyrus (0032-12)

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Table D-2. (contd)

Comment Category	Commenter (Comment ID)
Benefit-Cost Balance	<ul style="list-style-type: none"> • Gentling, Suzanne (0031-8) • Hadden, Karen (0019-8) (0030-1) • Harper, Debbie (0017-50) • Osowski Morgan, Sharon L. (0027-24) (0027-26) • Richardson, Karen (0021-3) • Sanders, Jan (0017-81) • Stuard, Gary (0017-77) • Ubico, Jean (0023-7)
2 Cumulative Impacts	<ul style="list-style-type: none"> • Burnam, Lon (0016-37) • Cathey, Jack (0016-65) • Hadden, Karen (0022-24) (0022-27) • Osowski Morgan, Sharon L. (0027-25) • Reed, Cyrus (0032-9) • Rittenhouse, Ryan (0017-64) (0017-65) • Stuard, Gary (0017-78)
Decommissioning	<ul style="list-style-type: none"> • Burnam, Lon (0016-38) • Hadden, Karen (0022-16) (0022-17) (0022-39) • Inge, Charles and Dominique (0028-3) • Reed, Cyrus (0032-18)
Ecology-Aquatic	<ul style="list-style-type: none"> • Bernier, Jim (0020-2) • Boydston, Kathy (0029-1) (0029-3) (0029-5) (0029-16) (0029-17) (0029-18) (0029-19) • Burnam, Lon (0016-43) (0017-18) • Cathey, Jack (0016-64) (0018-5) (0018-7) • Gentling, Suzanne (0031-3) • Hadden, Karen (0019-12) (0022-8) (0022-11) (0022-13) (0022-18) (0022-21) • Kinzie, W.T. (0016-69) • Lowe, Ed (0025-1) • Osowski Morgan, Sharon L. (0027-10) (0027-21) • Reed, Cyrus (0032-7)

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Table D-2. (contd)

Comment Category	Commenter (Comment ID)
2 Ecology-Terrestrial	<ul style="list-style-type: none"> • Boydston, Kathy (0029-2) (0029-6) (0029-7) (0029-8) (0029-9) (0029-10) (0029-11) (0029-12) (0029-13) (0029-14) (0029-15) (0029-21) (0029-22) (0029-23) (0029-24) (0029-25) • Hadden, Karen (0022-14) • Miller, Russ (0024-2) • Osowski Morgan, Sharon L. (0027-7) (0027-22) (0027-23)
Environmental Justice	<ul style="list-style-type: none"> • Hadden, Karen (0019-25) • Osowski Morgan, Sharon L. (0027-20)
Geology	<ul style="list-style-type: none"> • Hadden, Karen (0019-22) (0022-9)
Health-Radiological	<ul style="list-style-type: none"> • Burnam, Lon (0016-39) (0017-10) (0017-14) (0017-17) • Gentling, Suzanne (0031-4) • Hadden, Karen (0016-21) (0016-22) (0016-25) (0019-9) (0019-10) (0019-15) (0019-27) (0022-7) (0022-12) (0022-15) (0022-26) (0022-29) (0022-30) (0022-35) (0022-36) (0022-37) (0022-38) (0022-40) • Osowski Morgan, Sharon L. (0027-5) • Reed, Cyrus (0016-53) (0016-54) (0032-8) • Rittenhouse, Ryan (0017-62) • Rooke, Molly (0017-38) (0017-39) • Sanders, Jan (0017-69) (0017-71)
Historic and Cultural Resources	<ul style="list-style-type: none"> • Duvall-Gabriel, Najah (0036-1) • Illegible, Illegible (0037-1) • Osowski Morgan, Sharon L. (0027-19)
Hydrology-Groundwater	<ul style="list-style-type: none"> • Cohn, Ann (0017-35) • Hadden, Karen (0019-13) (0019-14) (0019-28) • Kinzie, W.T. (0016-66) • Osowski Morgan, Sharon L. (0027-15) (0027-16) • Richardson, Karen (0021-2) • Rooke, Molly (0017-40) (0017-43)

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Table D-2. (contd)

Comment Category	Commenter (Comment ID)
2 Hydrology-Surface Water	<ul style="list-style-type: none"> • Bernier, Jim (0020-1) • Berry, Steve (0016-28) • Burnam, Lon (0016-42) • Cathey, Jack (0016-63) (0018-4) (0018-6) • Gentling, Suzanne (0031-2) • Hadden, Karen (0016-23) (0019-16) (0019-17) (0019-31) (0019-32) (0022-6) (0022-10) (0022-20) (0022-22) (0022-55) (0030-5) • Inge, Charles and Dominique (0028-1) (0028-2) • Kinzie, W.T. (0016-62) (0016-68) • Osowski Morgan, Sharon L. (0027-9) (0027-12) (0027-13) (0027-14) • Reed, Cyrus (0016-52) (0032-5) (0032-6) • Richardson, Karen (0021-1) • Rooke, Molly (0017-41) (0017-42) • Rosenfeld, Joshua (0016-79) • Sanders, Jan (0017-66) (0017-72) • Stamler, Richard (0008-1) • Stuard, Gary (0017-76)
Land Use-Site and Vicinity	<ul style="list-style-type: none"> • Luton, John Henry (0004-3)
Land Use-Transmission Lines	<ul style="list-style-type: none"> • Hadden, Karen (0019-24)
Meteorology and Air Quality	<ul style="list-style-type: none"> • Osowski Morgan, Sharon L. (0027-18)

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
Need for Power	<ul style="list-style-type: none"> • Burnam, Lon (0017-11) (0017-15) • Hadden, Karen (0016-13) (0019-21) (0030-8) • Reed, Cyrus (0016-50) (0032-16) • Bisbee, Kay (0017-46) • Cohn, Ann (0017-33) • Gentling, Suzanne (0031-1) • Harper, Debbie (0017-52) • Mayo, Ann B. (0026-3) • Stuard, Gary (0017-74) • Burnam, Lon (0016-45) • Hadden, Karen (0016-10) (0017-19) (0017-20) (0017-21) (0017-22) (0017-23) (0017-24) (0017-25) (0019-29) (0022-1) (0022-2) • Harper, Debbie (0017-49) • Mayo, Ann B. (0026-2) • Reed, Cyrus (0016-48) (0016-56) (0032-1) (0032-2) • Duncan, Jim (0017-54) • Hadden, Karen (0016-11) (0019-6) • Mayo, Ann B. (0026-1) • Reed, Cyrus (0016-49) • Rittenhouse, Ryan (0017-60) • Shroyer, Danielle (0010-1) • Wolz, Conrad (0005-1) • Berry, Steve (0016-27) • Burnam, Lon (0017-13) • Downing, Kevin (0017-31) • Hadden, Karen (0019-18) (0019-19) (0019-20) (0022-46) • Inge, Charles and Dominique (0028-4) • Maynard, Walter (0017-6) • Norton, Barbara & Tom (0038-2) • Hadden, Karen (0022-52) • Inge, Charles and Dominique (0028-5) • Smith, Tom (0002-1) • Hadden, Karen (0017-27) (0022-42) • Shroyer, Danielle (0010-4) • Hadden, Karen (0030-3) • Burnam, Lon (0016-36) • Hadden, Karen (0017-28) (0019-33) (0022-33) (0022-53) (0030-4) • Inge, Charles and Dominique (0028-6) • Kinzie, W.T. (0016-67) • Reed, Cyrus (0032-13) • Shroyer, Danielle (0010-3)

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
1 Process-NEPA	<ul style="list-style-type: none">• Chorost, Amy (0012-1)• Downing, Kevin (0017-30)• Osowski Morgan, Sharon L. (0027-1) (0027-2) (0027-27)
Site Layout and Design	<ul style="list-style-type: none">• Boydston, Kathy (0029-4)• Osowski Morgan, Sharon L. (0027-17)• Rooke, Molly (0017-44)• Ubico, Jean (0023-2) (0023-3) (0023-4) (0023-5) (0023-6)

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Table D-2. (contd)

Comment Category	Commenter (Comment ID)
Socioeconomics	<ul style="list-style-type: none"> • Boydston, Kathy (0029-20) • Burnam, Lon (0017-12) • Drechel, Gary (0007-1) • Hadden, Karen (0019-23) (0022-23) • Johnson, Lisa (0016-3) • Kinzie, W.T. (0016-70) • Luton, John Henry (0004-4) • Miller, Pam (0017-1) • Miller, Russ (0024-3) • Rosenfeld, Joshua (0016-78) • Sheaks, Jerry (0017-56) • Ubico, Jean (0023-1) • Ward, Mary (0016-32) • Atkinson, Bill (0016-47) • Bahlburg, Kelly (0013-1) • Berry, Steve (0016-26) (0016-29) • Downing, Kevin (0017-32) • Duck, Kathy (0009-1) • English, Maurice (0016-74) • Hind, Rebecca (0018-8) • Independent School District, Glen Rose (0019-2) • Johnson, Lisa (0016-2) • Leising, Joe (0017-55) • Luton, John Henry (0004-2) • Marks, Gary (0016-59) • Maynard, Walter (0016-5) (0017-5) • Meyers, Kevin (0016-46) • Miller, Pam (0017-2) • Norton, Barbara & Tom (0038-1) • Orcutt, David (0016-72) (0018-2) • Overstreet, Lee (0016-62) • Phillips, Marilyn (0016-31) (0017-9) • Ramsey, Terry (0006-1) • Rash, Andy (0016-7) (0016-9) (0017-7) • Roan, Richard (0016-6) (0018-1) • Scott, Mike (0016-34) (0019-3) • Sheaks, Jerry (0017-57) • Smith, Hugh (0016-77) • Sumners, Allen (0017-80) • Sykes, Victoria (0016-57) • Taylor, Kevin (0016-35)

2

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
	<ul style="list-style-type: none"> • Ward, Mary (0016-33) • Wyatt, Dr. Bill (0017-29) • Edwards, Chet (0019-1) • Spears, Linda (0015-1) • English, Maurice (0016-73) • Hale, Rod (0016-71) • Johnson, Lisa (0016-1) • Luton, John Henry (0004-1) • Marks, Gary (0016-58) • Maynard, Walter (0016-4) (0017-4) • Miller, Pam (0017-3) • Phillips, Marilyn (0016-30) (0017-8) • Rash, Andy (0016-8)
Transportation	<ul style="list-style-type: none"> • Gentling, Suzanne (0031-7)
Uranium Fuel Cycle	<ul style="list-style-type: none"> • Burnam, Lon (0016-40) (0016-44) • Cohn, Ann (0017-36) • Gentling, Suzanne (0031-5) • Hadden, Karen (0016-16) (0016-18) (0016-24) (0019-26) (0019-30) (0022-3) (0022-4) (0022-25) (0022-31) (0022-32) (0022-34) (0022-43) (0022-44) (0030-6) • Harper, Paul (0017-48) • Reed, Cyrus (0016-55) (0032-3) (0032-4) • Rittenhouse, Ryan (0017-63) • Rooke, Molly (0017-45) • Sanders, Jan (0017-67) (0017-68) (0017-70) • Shaar, Julie (0016-75) • Stuard, Gary (0017-75) • Wildwood, Kathleen (0016-60)

2 D.2 In-Scope Comments and Responses

3 The in-scope comment categories are listed alphabetically in Table D-3 in the order that they
4 are presented in this EIS. In-scope comments and responses are included below the table.
5 Parenthetical numbers shown after each comment refer to the Comment Identification (ID)
6 number (document number-comment number) and the commenter name.

1

Table D-3. Comment Categories in Order as Presented in This Report

D.2.2 Comments Concerning Process - NEPA
D.2.3 Comments Concerning Site Layout and Design
D.2.4 Comments Concerning Land Use - Site and Vicinity
D.2.5 Comments Concerning Land Use - Transmission Lines
D.2.6 Comments Concerning Meteorology and Air Quality
D.2.7 Comments Concerning Geology
D.2.8 Comments Concerning Hydrology - Surface Water
D.2.9 Comments Concerning Hydrology - Groundwater
D.2.10 Comments Concerning Ecology - Terrestrial
D.2.11 Comments Concerning Ecology - Aquatic
D.2.12 Comments Concerning Socioeconomics
D.2.13 Comments Concerning Historic and Cultural Resources
D.2.14 Comments Concerning Environmental Justice
D.2.16 Comments Concerning Health - Radiological
D.2.17 Comments Concerning Accidents - Design Basis
D.2.18 Comments Concerning Accidents - Severe
D.2.19 Comments Concerning the Uranium Fuel Cycle
D.2.20 Comments Concerning Transportation
D.2.21 Comments Concerning Decommissioning
D.2.23 Comments Concerning Cumulative Impacts
D.2.25 Comments Concerning the Need for Power
D.2.26 Comments Concerning Alternatives - No-Action
D.2.27 Comments Concerning Alternatives - Energy
D.2.28 Comments Concerning Alternatives - System Design
D.2.30 Comments Concerning Benefit - Cost Balance

2

1 **D.2.2 Comments Concerning Process - NEPA**

2 **Comment:** Please seriously consider environmental impact when deciding on the two new
3 reactors proposed for the Comanche Peak site. (0012-1 [Chorost, Amy])

4 **Response:** *The NRC Staff is considering the potential environmental impacts of the proposed*
5 *licensing action. An explanation of the NRC's approach to evaluating and documenting*
6 *environmental impacts is available in Title 10 of the Code of Federal Regulations, Part 51.*

7 **Comment:** I think that with the due diligence that is represented by the people in this room, by
8 the due diligence of the people that I know at the plant.

9 You have heard of Bruce Turner's name tonight several times. I have a lot of faith and
10 confidence in that gentleman, and in other people like him that work for Luminant.
11 Environmental impact studies need to happen. (0017-30 [Downing, Kevin])

12 **Response:** *This comment provides no information related to the scope of this EIS and will*
13 *therefore not be considered further in the staff's environmental review.*

14 **Comment:** The need for the project should be clearly stated, as well as potential benefits and
15 adverse effects of the proposed project. Project impacts and impact mitigation are evaluated in
16 the context of project need. (0027-1 [Osowski Morgan, Sharon L.])

17 **Response:** *The purpose and need for the proposed power plant will be explained in Section*
18 *1.3 of the EIS. The impacts and alternatives will be evaluated in the context for the project*
19 *need.*

20 **Comment:** The analysis of alternatives is the core of the NEPA process. The forthcoming
21 Environmental Impact Statement (EIS) should include a minimum of two feasible action
22 alternatives to be fully considered, as well as the No-Action Alternative.

23 A rationale for rejecting certain alternatives from further consideration should be provided. The
24 rationale should include environmental reasons, along with other considerations. The selected
25 alternative should avoid/minimize adverse impacts, so that the need for mitigation of impacts will
26 be lessened or eliminated. A critical factor of the alternatives analysis is the
27 avoidance/minimization of adverse impacts. (0027-2 [Osowski Morgan, Sharon L.])

28 **Response:** *Analysis of alternatives is at the heart of the NEPA process. Chapter 9 of the EIS*
29 *will evaluate appropriate alternatives to the proposed action and explain why other alternatives*
30 *were not examined in detail. Mitigation measures will be examined and addressed as*
31 *appropriate in Chapters 4 and 5 of the EIS.*

32 **Comment:** There is no mention of CPNPP participation in EPA's Performance Track Program
33 or whether CPNPP has an Environmental Management System (EMS) in place. The Council on
34 Environmental Quality (CEQ) published Aligning NEPA processes with Environmental
35 management Systems-A Guide for NEPA and EMS Practitioners to improve NEPA
36 implementation and environmental sustainability goals in NEPA and Executive Order 13423.
37 The NEPA document should discuss EMS as appropriate. (0027-27 [Osowski Morgan,
38 Sharon L.])

39 **Response:** *Although the NRC does not require nuclear power plants to employ an*
40 *environmental management system (EMS), the NRC will evaluate whether or not Luminant has*
41 *developed an EMS and its use in the development of the environmental report in Section 3.3 of*
42 *the EIS.*

1 **D.2.3 Comments Concerning Site Layout and Design**

2 **Comment:** do you know what would happen when the ambient temperature becomes too high,
3 and the water temperature becomes too high for the plant to operate safely? And when that
4 happens, do you have plans in place? Do you know what would happen at that point?

5 (0017-44 [Rooke, Molly])

6 **Response:** *Section 3.3.2.2 of the EIS will explain what changes to plant operations would be*
7 *initiated in response to unusually high ambient temperatures. At minimum, plant power would*
8 *be reduced to ensure continued safe plant operation within the constraint of the available*
9 *cooling capacity. Analyses for the EIS and/or environmental regulator requirements may also*
10 *lead to additional constraints on plant power to protect environmental resources.*

11 **Comment:** How long are spent rods from nuclear waste stored in temporary pools from the
12 existing Comanche Peak reactor? (0023-2 [Ubico, Jean])

13 **Comment:** How many pounds of nuclear waste presently exist in the temporary storage bins at
14 Comanche Peak? (0023-3 [Ubico, Jean])

15 **Comment:** How much additional nuclear waste will be generated as the nuclear reactor ages?
16 (0023-5 [Ubico, Jean])

17 **Comment:** What is the long-term plan for disposal of nuclear waste at Comanche Peak?
18 (0023-6 [Ubico, Jean])

19 **Response:** *Section 3.3.3 of the EIS will describe radioactive waste management activities*
20 *associated with operation of the proposed units. The environmental impacts of waste*
21 *management activities will be discussed in Chapter 6 of the EIS.*

22 **Comment:** How much additional waste will be generated per day by the proposed construction
23 of the two additional reactors? (0023-4 [Ubico, Jean])

24 **Comment:** Chapter 3 -Plant Description

25 The ER does not provide details of the site plan for the blowdown treatment facility (BDTF) other
26 than large blocks showing the proposed location. The February 2, 2009 site visit indicated that
27 several ponds of unknown size, shape or location would be constructed within this area. Power
28 transmission lines were observed in the area.

29 **Comment:** The size, shape, and location of the BDTF ponds relative to the transmission lines
30 need to be revealed in a site plan drawing. (0029-4 [Boydston, Kathy])

31 **Response:** *Plant construction will be described in Section 3.3 of the EIS. The plant description*
32 *will include details requested in the comments.*

33 **Comment:** The ER does not provide much information on meeting the requirements of the
34 Resource Conservation and Recovery Act (RCRA). Clarification on RCRA permitting of Units 3
35 and 4, hazardous waste satellite accumulation areas, and storage times (i.e., greater than
36 90 days) is requested.

37 The contaminant monitoring list seems too narrow. We recommend reviewing site operations,
38 wastes, chemical storage and use, etc. to determine appropriateness of including other
39 contaminants on list. The constituents of concern (COC's) should reflect the actual constituents
40 and their daughter or degradation products that are being utilized by CPNPP.

1 The information on solid waste management should be expanded. Discussion should include
2 summary of how groundwater monitoring will include all RCRA wastes and any potential solid
3 waste management units. (0027-17 [Osowski Morgan, Sharon L.]

4 **Response:** *Section 3.3.4 of the EIS will describe nonradioactive waste management systems,*
5 *including systems for management of hazardous materials.*

6 **D.2.4 Comments Concerning Land Use - Site and Vicinity**

7 **Comment:** The expansion of the current plant allows the wise use of the existing infrastructure
8 ??? cooling lake, transmission lines, and the like with little or no impact on surrounding
9 landowners or the environment. (0004-3 [Luton, John Henry])

10 **Response:** *The impacts on land use resulting from construction and operation of the proposed*
11 *facility will be discussed in Chapters 4 and 5 of the EIS.*

12 **D.2.5 Comments Concerning Land Use - Transmission Lines**

13 **Comment:**

14 What land will need to be condemned or purchased in order to build or upgrade new
15 transmission lines?

16 What environmental and economic impacts will result from new transmission lines, including the
17 345 kV line planned to go between the plant site and the Whitney Switch, going through much of
18 Somervell and Bosque Counties? (0019-24 [Hadden, Karen])

19 **Response:** *Environmental impacts associated with any planned new transmission rights-of-*
20 *way will be addressed in Chapters 4 and 5 of the EIS, as will potential impacts associated with*
21 *any upgrades to existing lines or corridors. The applicant is required to follow all Federal, State,*
22 *and local guidelines concerning siting, construction, and maintenance of proposed transmission*
23 *corridors and lines, although the NRC does not have regulatory authority over these activities.*

24 **D.2.6 Comments Concerning Meteorology and Air Quality**

25 **Comment:** All emissions resulting from the project must be in compliance with all applicable air
26 quality regulations, particularly relative to the National Ambient Air Quality Standards (NAAQS)
27 for criteria air pollutants (e.g., ozone, carbon monoxide, nitrogen oxides, sulfur dioxide, lead and
28 particulates). All construction equipment should be tuned to manufacturer's specifications to
29 reduce air emissions. We recommend water for fugitive dust control during construction, instead
30 of oils and other chemicals. (0027-18 [Osowski Morgan, Sharon L.]

31 **Response:** *The NRC staff will evaluate air quality impacts from construction and operation of*
32 *the station in Chapters 4 and 5, respectively, of the EIS. This evaluation will include*
33 *assessment of potential equipment operation and dust control measures that may be used to*
34 *reduce emissions.*

35 **D.2.7 Comments Concerning Geology**

36 **Comment:** Subsidence is a shifting downward of the earth's surface. Causes of subsidence
37 include depleted groundwater, mining, natural gas and oil extraction. What impacts are there
38 from existing industries that put the area at risk? What landfills are still in existence that could
39 contaminate cooling water? Will local oil and gas operations impact the plant site or vice versa?
40 (0019-22 [Hadden, Karen])

1 **Response:** *Geologic impacts on the proposed facility from off-site actions are within the scope*
 2 *of the safety analysis and will be addressed in the (final safety analysis report) (FSAR) issued*
 3 *and maintained by the applicant and in the SER issued by the NRC. The topic of subsidence*
 4 *and the potential impact on the proposed facility will be addressed in Section 2.5 of the*
 5 *FSAR. This portion of the comment is out of scope with regard to the EIS. The impacts of non-*
 6 *plant discharges to water bodies used for Unit 3 and 4 makeup water will be addressed in the*
 7 *EIS, as will cumulative impacts of Unit 3 and 4 water use and discharges on local and regional*
 8 *water resources.*

9 **Comment:** Additional analysis should be undertaken to determine the long-term viability of the
 10 Squaw Creek Reservoir retention structure under various scenarios including seismic events,
 11 protracted drought and abandonment by the licensee. (0022-9 [Hadden, Karen])

12 **Response:** *The availability of water for Unit 3 and 4 operations and its potential impact on*
 13 *water availability for Unit 1 and 2 operations will be addressed in the EIS. Seismic hazards are*
 14 *outside of the scope of the environmental review. As part of the NRC's site safety review, the*
 15 *staff considers whether, taking into consideration the site criteria in 10 CFR Part 100 and*
 16 *information provided by the applicant, a proposed reactor or reactors can be constructed and*
 17 *operated without undue risk to the health and safety of the public. Abandonment of Squaw*
 18 *Creek Dam by the licensee is outside the scope of the EIS, but would be regulated by the Texas*
 19 *Commission on Environmental Quality (TCEQ) under Title 30 of the Texas Administrative Code,*
 20 *Chapter 299, and would be addressed by State and Federal regulations governing*
 21 *decommissioning and operating license termination for the nuclear plant.*

22 **D.2.8 Comments Concerning Hydrology - Surface Water**

23 **Comment:** my question relates to the water requirement. I know from experience that when the
 24 Comanche peak reservoir gets low, they drain Lake Granbury to make up the difference. I've
 25 seen our lake drop over a foot and a half in less than a week during severe drought conditions.
 26 This combined with Brazos River Authorities recent decision to sell millions of gallons of water
 27 to the natural gas industry looks like it can form a perfect storm to drain our lake during these
 28 times of drought. (0008-1 [Stamler, Richard])

29 **Comment:** We need to look closely at water that would be used. I've looked into the license
 30 application and found that each reactor, and there's two, would use over 30,000 gallons of water
 31 every single minute. And that's huge. And the acre-feet per year are also extensive. There are
 32 some diagrams and some facts and figures that we'll be glad to get to you. (0016-23 [Hadden,
 33 Karen])

34 **Comment:** And, you know, even our lake—we'll talk about our lake. Granbury is built on a lake
 35 community. The whole community, we're lucky, because our water is used to cool those
 36 reactors. Because of that, we're not a constant-level lake with BRA, but because of that reason,
 37 our lake always will have access to water. (0016-28 [Berry, Steve])

38 **Comment:** I think we've barely begun to look at the water quantity and quality issues here, but
 39 I do find it interesting the reminder that the lake is a guaranteed constant-level lake. Well, what
 40 do you think that does to everybody else down river? (0016-42 [Burnam, Lon])

41 **Comment:** It's been mentioned about the water flow down the Brazos River. In the—every
 42 Thursday in the Fort Worth paper, it tells how much low the lakes are and the water flow. The
 43 last—on the first of this year, the PK, where this water comes from and where it would have to
 44 be released from if it came here, was 2-1/2 foot low, and the floatation was below minimum. So

1 if this—if y'all's lake here and your river needs more water, you're going to have to find
2 someplace else to get it.

3 Granbury was also 2-1/4 foot low.. It was below minimum floatation, and the water flow was 30
4 cubic feet per second. And Whitney is 20 [cubic] feet per second. Sounds like the river is drying
5 up. Their floatation is also below minimum. Whitney was 9-3/4 foot low.

6 (0016-62 [Kinzie, W.T.])

7 **Comment:** The water is the biggest issue of all, I would think, because there's so much a
8 demand for it. And if this plant takes more water than it's already taking, then, of course, they
9 have to release more water from the Brazos River Authority. However, when they release this
10 water, the plant takes the water, and that leaves nothing coming down the river, the Brazos
11 River. (0016-63 [Cathey, Jack])

12 **Comment:** So the people here may have to make a choice between, what it said in the paper,
13 \$22 billion in the economic impact and how good that's going to do you when you have no
14 drinking water. And that problem is hitting the Dallas-Fort Worth area also.

15 Lon, you probably know the more specifics on the Dallas-Fort Worth area trying to have another
16 lake or two built, reservoirs for drinking water? And the people in the local areas didn't want their
17 land flooded to make a lake, so it's not going to happen. So Fort Worth and Dallas are trying to
18 get other places for their drinking water. And it's getting to them to where they're not so much
19 worried about their electricity and where it comes from, nuclear power or gas. They're worried
20 about water. (0016-68 [Kinzie, W.T.])

21 **Comment:** our water which we use for drinking water and for recreation, will also be under
22 pressure. So, we have to be very careful, as many have already stated, about the water. (0016-
23 79 [Rosenfeld, Joshua])

24 **Comment:** how will the use of the water affect the run of the river water needed for
25 environmental flows? (0017-41 [Rooke, Molly])

26 **Comment:** if global warming, climate change is occurring, and as severe as we anticipate, will
27 there be enough water for cooling decline, with a 35 percent decrease, when it occurs, in river
28 flows? (0017-42 [Rooke, Molly])

29 **Comment:** Waste of water. (0017-66 [Sanders, Jan])

30 **Comment:** Water; we need to be conserving water. Not developing an energy form that is
31 going to soak it up. We need it for our plants, for our agriculture. We need it to keep on cooling
32 the two reactors that we already have, not building two more. (0017-72 [Sanders, Jan])

33 **Comment:** it is now being predicted that the Southwestern part of the United States will be
34 suffering from a permanent drought for many years. We already see that water is a shortage of
35 water is a critical issue in this state, and will continue to be. (0017-76 [Stuard, Gary])

36 **Comment:** Water flow from Granbury Lake needs to be looked at. (0018-4 [Cathey, Jack])

37 **Comment:** If global warming is occurring and as severe as scientists predict will there be
38 enough cool water to operate the reactors safely? The EIS needs to include analysis based on
39 input from global warming scientists. (0019-16 [Hadden, Karen])

40 **Comment:** In drought conditions, will there be enough water for cities, businesses, farms and
41 ranches if two nuclear reactors are built? (0019-17 [Hadden, Karen])

1 **Comment:** Every minute 31,341 gallons of makeup water from Lake Granbury would be
2 needed for each reactor. (from Environmental report 3.3-5) "Makeup water" replaces the water
3 lost to evaporation and the water called "blowdown" would be returned to Lake Granbury.
4 **(0019-31 [Hadden, Karen])**

5 **Comment:** This year was one of the worst for water availability that I have seen in the past 31
6 years. The lake has been sustained at 2.5 feet down from normal levels for most of 2008 and
7 now going into 2009. My family hasn't been able to use the lake for skiing for most of this time.
8 Not being able to use the lake as intended is probably due to a general lack of rain. The
9 increase in water consumption from the lake, authorized by the BRA, hasn't helped the
10 situation. We may be looking at decreased lake levels for years to come due to global warming.

11 There was an article in the Hood County News that was entitled "NUCLEAR: Lake Granbury
12 water will cool the units". This is in reference to our water being taken to cool two new reactors.
13 There are two points where questions should be asked. Since the conservation pool level is at
14 693 ft. above mean sea level and the minimum operating elevation is at 675 ft., (a difference of
15 18 ft.) and Luminant is still in negotiation with the BRA on releasing 75,000 acre feet of water
16 that will help keep Granbury at a usable level and construction is proposed to start late in 2009,
17 then where is the assurance to the people of Granbury that our lake will be usable in the future.
18 Negotiations are not complete, and prevailing rain is not looking good. Is the BRA going to
19 cripple Possum Kingdom Lake to save Lake Granbury? **(0020-1 [Bernier, Jim])**

20 **Comment:** Global warming and its impacts on rainfall are better understood now and must be
21 considered in the context of determining whether adequate water resources will be available for
22 nuclear plant operations. It is clear that nuclear plants require enormous amounts of water for
23 operations. In fact, the environmental report states that 30,000 gallons of water are needed for
24 each reactor every minute, and shows in Figure 2.3-30 that approximately two-thirds of this
25 water would evaporate. It is also clear, based on the Comanche Peak environmental report, that
26 the proponents of the plant assume that there will be adequate water resources for purposes of
27 plant operations associated with Comanche Peak Units 3 and 4. However, impacts from global
28 warming will include protracted drought that may seriously compromise water resources
29 required for plant operations. **(0022-55 [Hadden, Karen])**

30 **Comment:** Expanded use of nuclear power in North Texas assumes that there will be an
31 adequate supply of fresh water for purposes of plant operations. This assumption is faulty
32 because of the failure of the Comanche Peak environmental report to analyze impacts of global
33 warming on rainfall and the hydrological cycle. **(0022-6 [Hadden, Karen])**

34 **Comment:** Future demands on water use should be evaluated. How will CPNPP interact with
35 the surrounding area? For example, investigate interactions with activities related to the Barnett
36 Shale as well as municipal and agricultural water use. A citation from the Texas Water
37 Development Board (TWDB) indicates uncertainty as to whether all supplies indicated in the ER
38 can be obtained. **(0027-12 [Osowski Morgan, Sharon L.]**

39 **Comment:** The Environmental Report is confusing regarding water uses from sources other
40 than the SCR. For example, p. 2.4-21 indicates that CPNPP is authorized to use 48,300 acre-
41 feet from Lake Granbury each year, but 45,826 was transported in 2006. This seems to indicate
42 that CPNPP exceeded their authorized use. Also, it is not clear why Lake Granbury is used
43 instead of SCR. Please clarify the water uses; perhaps a matrix indicating water intake and
44 discharge, with amounts, etc. would be helpful. **(0027-13 [Osowski Morgan, Sharon L.]**

45 **Comment:** According to the ER, the estimated water withdrawal for the operation of CPNPP
46 Units 3 and 4 from Lake Granbury is 63,550 gpm (91,512,000 gpd) during maximum operations.

1 The water discharge rate to Lake Granbury during maximum operations, including loss
 2 estimates is estimated at 24,876 gpm (35,821,440 gpd). Consumptive water use for Units 3 and
 3 4 is estimated at 55,690,560 gallons per day. Where are the 55 million gallons of water going
 4 each day? (0027-14 [Osowski Morgan, Sharon L.]

5 **Comment:** 100,000 acre feet per year gross water allocation for two new reactors is excessive
 6 considering Lake Granbury's 130,000 gross acre foot pool, and the current (and increasing)
 7 contractual obligations for water usage relative to this pool. (0028-1 [Inge, Charles and
 8 Dominique])

9 **Comment:** Vast quantities of increasingly precious water would be consumed (0030-5
 10 [Hadden, Karen])

11 **Comment:** The projected amount of water required for the cooling system is unacceptable and
 12 risky, to say the least. We are currently facing a water crisis not only in this area but all of
 13 Texas. Long range projections indicate a likely increase in drought conditions due to climate
 14 change. The continuing, rampant development of this area, along with the Barnett Shale
 15 industry, has already pushed the use of our existing water resources to dangerous limits.
 16 (0031-2 [Gentling, Suzanne])

17 **Comment:** The application assumes that plenty of water will be available at Squaw Reservoir
 18 utilizing a complex pipeline scheme. The EIS must address short and long-term climate change
 19 and the resulting hydrological balance. Significant scholarly work now concludes that central
 20 north Texas will likely be drier, with less rainfall, putting the plant's expected water use in
 21 jeopardy. (0032-5 [Reed, Cyrus])

22 **Comment:** The EIS should also analyze the loss of water to the Brazos River System ???
 23 including the Paluxy River, Whitney Lake, Lake Granbury and Possum Kingdom, as well as the
 24 bays downstream, and their likely hydrological and ecological impacts. (0032-6 [Reed, Cyrus])

25 **Response:** *The construction and operation of a nuclear plant involves the consumption of*
 26 *water. The staff will independently assess the impact of these consumptive water losses on the*
 27 *sustainability of both the local and regional water resources. This assessment will consider both*
 28 *current and future conditions, including changes in water demands to serve the needs of the*
 29 *future population and changes in water supply resulting from climate variability and climate*
 30 *change. While NRC does not regulate or manage water resources, it does have the*
 31 *responsibility under NEPA to assess and disclose the impacts of the proposed action on water*
 32 *resources. The staff's assessment of the impacts on the sustainability of water resources will*
 33 *be presented in Chapters 4 and 5 of the EIS for construction and operation, respectively.*

34 **Comment:** Need study of impact "down" river. (0018-6 [Cathey, Jack])

35 **Comment:** Biocide, algacide, pH adjuster, corrosion inhibitor and silt dispersant would be
 36 injected into water drawn from Lake Granbury, and only a fraction of the "blowdown" water
 37 would be treated before being returned to the lake or sent to an evaporation pond. Why wouldn't
 38 all of the water be treated before being returned to the lake? (0019-32 [Hadden, Karen])

39 **Comment:** My primary environmental impact concerns deal with water. Specifically:

- 40 • The amount of surface water required for cooling. (33 billion gallon/year)
- 41 • The amount of evaporation rate, taking 18 billions gallons per year out of the current fresh
- 42 water system
- 43 • The impact on the immediate environment having 18 billion gallons of water vapor released
- 44 yearly

- 1 • The impact on the water flow in the Brazos River downstream of Lake Granbury
- 2 • The quality of the water in Lake Granbury

3 (0021-1 [Richardson, Karen])

4 **Comment:** Global warming and its impacts on rainfall are better understood now and must be
 5 considered in the context of determining whether adequate water resources will be available for
 6 nuclear plant operations. It is clear that nuclear plants require enormous amounts of water for
 7 operations. In fact, the environmental report states that 30,000 gallons of water are needed for
 8 each reactor every minute, and shows in Figure 2.3-30 that approximately two-thirds of this
 9 water would evaporate. It is also clear, based on the Comanche Peak environmental report, that
 10 the proponents of the plant assume that there will be adequate water resources for purposes of
 11 plant operations associated with Comanche Peak Units 3 and 4. However, impacts from global
 12 warming will include protracted drought that may seriously compromise water resources
 13 required for plant operations.

14 The compromised water resources should be considered both from a quantitative perspective
 15 and a temperature sensitive analysis since plant operations are dependent on a narrow band of
 16 water temperatures. (0022-10 [Hadden, Karen])

17 **Comment:** The study should also include an analysis of pollution impacts downstream from
 18 water contaminated by chemical treatment such as biocides, algaecides, pH adjustors,
 19 corrosion inhibitor and silt dispersant chemicals injected at the reactor site as well as chlorine,
 20 salts and non-radioactive effluent. The differential impact of treatment of 100 percent of the
 21 water versus the lesser amount of treatment proposed by the applicant should be considered.
 22 (0022-20 [Hadden, Karen])

23 **Comment:** The EIS should also consider whether regional waterways will be impacted in terms
 24 of water quantity and quality by the use of vast quantities of water for Units 3 and 4, including
 25 Lake Granbury, the Brazos River, the Paluxy River, Whitney Lake, a popular fishing lake, and
 26 popular recreational areas such as Possum Kingdom. According to the Texas Parks and Wildlife
 27 Department web site, the drinking water at Possum Kingdom State Park is currently non-potable
 28 due to a high salt content, and visitors must bring their own water for consumption. The potential
 29 to increase salt content of waterways in the region by further drawdown of water levels,
 30 including impacts to the local aquifer and drinking wells should be examined thoroughly in the
 31 EIS. (0022-22 [Hadden, Karen])

32 **Comment:** Questions of the water quality and quantity of “blowdown” water returned to the lake
 33 need more thorough evaluation (volume; flow; temperature; salinity; pollutants). (0028-2 [Inge,
 34 Charles and Dominique])

35 **Response:** *The construction and operation of a nuclear plant involves the consumption of*
 36 *water and some discharges to nearby water bodies. The Clean Water Act designated the EPA*
 37 *as the Federal agency with responsibility for effluent discharges to the nation’s waters. While*
 38 *the NRC does not regulate effluents other than radiological effluents, it does have the*
 39 *responsibility under NEPA to assess and disclose the expected impacts of the proposed action*
 40 *on water quality throughout the plant’s life. That assessment will include consideration of salts*
 41 *concentrated in the blowdown system and chemicals injected into raw water systems. Neither*
 42 *does NRC regulate or manage water resources, but it does have the responsibility under NEPA*
 43 *to assess and disclose the impacts of the proposed action on water resources. The staff’s*
 44 *assessment will independently determine if the designated uses of the local and regional water*
 45 *supplies are jeopardized by the construction or operation of a nuclear plant at the proposed site,*
 46 *and will independently assess the impact of any consumptive water losses on the sustainability*

1 *of both the local and regional water resources. This assessment will consider both current and*
 2 *future conditions, including changes in water demands to serve the needs of the future*
 3 *population and changes in water supply resulting from climate variability and climate*
 4 *change. The staff's assessments of the nonradiological impacts to water quality and impacts to*
 5 *water supply sustainability will be presented in Chapters 4 and 5 of the EIS for construction and*
 6 *operation, respectively.*

7 **Comment:** I do have significant questions about water quantity and 'water quality and the
 8 impacts of taking that much water from Lake Granbury downstream. And I would urge you, as
 9 part of your assessment, to also look at climate models and weather, given what we think we
 10 know about climate change, how that will change the water balances in Lake Granbury.
 11 **(0016-52 [Reed, Cyrus])**

12 **Response:** *The construction and operation of a nuclear plant involves the consumption of*
 13 *water and some discharges to nearby water bodies. The Clean Water Act designated the EPA*
 14 *as the Federal agency with responsibility for effluent discharges to the nation's waters. While*
 15 *the NRC does not regulate effluents other than radiological effluents, it does have the*
 16 *responsibility under NEPA to assess and disclose the expected impacts of the proposed action*
 17 *on water quality throughout the plant's life. Neither does NRC regulate or manage water*
 18 *resources, but it does have the responsibility under NEPA to assess and disclose the impacts of*
 19 *the proposed action on water resources. The staff's assessment will independently determine if*
 20 *the designated uses of the local and regional water supplies are jeopardized by the construction*
 21 *or operation of a nuclear plant at the proposed site, and will independently assess the impact of*
 22 *any consumptive water losses on the sustainability of both the local and regional water*
 23 *resources. This assessment will consider both current and future conditions, including changes*
 24 *in water demands to serve the needs of the future population and changes in water supply*
 25 *resulting from climate variability and climate change. The staff's assessments of the*
 26 *nonradiological impacts to water quality and impacts to water supply sustainability will be*
 27 *presented in Sections 4 and 5 of the EIS for construction and operation, respectively.*

28 **Comment:** Section 6.2.5: This section indicates that within the CPNPP environs, there have
 29 been detections of tritium above lower limits of detection in Squaw Creek Reservoir (SCR), and
 30 those detections have been well below the reporting limit (30,000 pCi/l). Please clarify whether
 31 this means that there have been no detections of tritium in water in Squaw Creek below the
 32 dam. Figure 6.2-1 indicates the presence of a surface water collection site on Squaw Creek,
 33 although Table 6.2-3 does not list it. It is important to characterize tritium levels in downstream
 34 waters as well as the SCR. It would be helpful if the EIS clarified what radiologicals are being
 35 collected in Squaw Creek below the dam and provide any data available. **(0027-9 [Osowski**
 36 **Morgan, Sharon L.]**)

37 **Response:** *Staff will clarify the availability of tritium monitoring in and downstream of SCR and*
 38 *will include an assessment of available information in the EIS.*

39 **D.2.9 Comments Concerning Hydrology - Groundwater**

40 **Comment:** [if global warming, climate change is occurring, and as severe as we anticipate] and
 41 so then, will the ground water decline? **(0017-43 [Rooke, Molly])**

42 **Response:** *The construction and operation of a nuclear plant involves the consumption of*
 43 *water. The staff will independently assess the impact of these consumptive water losses on the*
 44 *sustainability of both the local and regional water resources. This assessment will consider both*
 45 *current and future conditions, including changes in water demands to serve the needs of the*
 46 *future population and changes in water supply resulting from climate variability and climate*

1 *change. While NRC does not regulate or manage water resources, it does have the*
 2 *responsibility under NEPA to assess and disclose the impacts of the proposed action on water*
 3 *resources. The staff's assessment of the impacts on the sustainability of water resources will*
 4 *be presented in Chapters 4 and 5 of the EIS for construction and operation, respectively.*

5 **Comment:** will it need any groundwater for make up water. (0017-40 [Rooke, Molly])

6 **Response:** *The design of Units 3 and 4 as presented in the license application does not*
 7 *require the use of groundwater for operation.*

8 **Comment:** The aquifer below Karnes County has been contaminated by uranium mill tailings.
 9 The Department of Energy estimates clean up will cost \$348 million but, according to a Texas
 10 Department of Agriculture report, will not implement the clean up plan. (0019-28 [Hadden,
 11 Karen])

12 **Response:** *The issue raised in the comment is outside the scope of the environmental*
 13 *review. There is no evidence of hydrologic connection between Comanche Peak Nuclear Plant*
 14 *surface or subsurface hydrology and that of the aquifer below Karnes County, TX.*

15 **Comment:** So, you know, and then recently most of y'all have heard about the Barnett shale in
 16 the Tarrant County and Dallas County area, and y'all may have some of it here too. One of the
 17 things they do is drill wells, water wells, to get their water from to drill the gas wells, In Parker
 18 County, the local farmers, their water wells are drying up. (0016-66 [Kinzie, W.T.])

19 **Response:** *Local and regional uses of groundwater will be considered in Section 2.3.2 of the*
 20 *EIS.*

21 **Comment:** The EIS should examine the impacts of vast water consumption on the aquifer and
 22 the water table levels. Will wells be sucked dry? (0019-13 [Hadden, Karen])

23 **Comment:** [What are] The indirect impacts on the major aquifers in the region [? Specifically,
 24 the]---Paluxy and Trinity. (0021-2 [Richardson, Karen])

25 **Response:** *The applicant is proposing to use less groundwater in the future than what is*
 26 *currently used. The impacts of the proposed groundwater use will be addressed in the*
 27 *Section 5.2 of the EIS.*

28 **Comment:** you have mentioned ground water (0017-35 [Cohn, Ann])

29 **Comment:** How high is the risk of contamination of the aquifer and other waterways through
 30 radioactive leaks? Could the problem ever be remediated if radioactive or chemical leaks
 31 occurred? (0019-14 [Hadden, Karen])

32 **Comment:** The hydrogeological characterization appears adequate for a fundamental
 33 understanding of the site (future reactors 3 and 4). Information contained in the ER includes
 34 subsurface geology, groundwater occurrence, water levels, flow direction and velocity, and
 35 other related information. However, the characterization may not be adequate for detailed
 36 analysis of complex groundwater flow conditions and mechanisms including complex fracture
 37 flow, groundwater flow along bedding planes, preferential pathways, and other flow
 38 complications. (0027-15 [Osowski Morgan, Sharon L.])

39 **Comment:** The ER discusses packer tests and concludes the Glen Rose Formation and
 40 sections of the Twin Mountain Formation are impermeable. The Twin Mountain Formation is a
 41 highly productive aquifer around the site including numerous public supply wells. It is
 42 recommended that additional information be provided to substantiate the claim that these are
 43 indeed impermeable.

1 The ER does not include an individual section indicating the risk of groundwater contamination
 2 nor was a methodology for evaluating groundwater risk identified. This information should be
 3 part of the conceptual site model. To evaluate site impacts from future groundwater production,
 4 it will be necessary to develop a sub-regional scale groundwater model to predict how
 5 increased/decreased uses could affect units 3 and 4.

6 Groundwater flow velocity has been estimated using input from site-specific hydrologic test
 7 results. However, if groundwater flow directions or gradients are found to be different than
 8 reported, or change over time, the effectiveness of the well network will need to be reevaluated.
 9 It is reasonable to expect that additional wells will need to be installed as more water level data
 10 become available and flow directions are refined over time.

11 Groundwater monitoring should include monitoring for contaminants and mixed waste from
 12 these sources: non-radioactive solid, liquid, and gaseous waste streams associated with the
 13 construction and operation of CPNPP Units 3 and 4, chlorinated fluorocarbons (CFCs),
 14 solvents, and used oil. Other sources may include liquid scintillation fluids, other types of
 15 organic materials, and metals such as lead and chromium, and aqueous corrosives. **(0027-16**
 16 [Oowski Morgan, Sharon L.]

17 **Response:** *The risk of contamination of aquifers and other waterways will be addressed in the*
 18 *EIS. Although NRC regulations require licensees to make surveys, as necessary, to evaluate*
 19 *the potential hazard of radioactive material released in order to assess doses to members of the*
 20 *public and workers, recent discoveries of releases at other plants indicate that undetected*
 21 *leakage to groundwater from facility structures, systems, or components can occur, resulting in*
 22 *unmonitored and unassessed exposure pathways to members of the public. The NRC has*
 23 *identified several instances of unintended tritium releases, and all available information shows*
 24 *no threat to the public. Nonetheless, the NRC is inspecting each of these events to identify the*
 25 *cause, verify the impact on public health and safety, and review licensee plans to remediate the*
 26 *event. The NRC also established a lessons learned task force to address inadvertent,*
 27 *unmonitored liquid radioactive releases from U.S. commercial nuclear power plants. This task*
 28 *force reviewed previous incidents to identify lessons learned from these events and to*
 29 *determine what, if any, changes are needed to the regulatory program. Detailed information*
 30 *and updates on these liquid releases can be found on the NRC public website at*
 31 *<http://www.nrc.gov/reactors/operating/ops-experience/grndwtr-contam-tritium.htm>.*

32 **D.2.10 Comments Concerning Ecology — Terrestrial**

33 **Comment:** When the first two reactors were built the sky glow light pollution went from zero to
 34 off the scale in the direction of the reactors. The latest round of fixture modernization reduced
 35 the sky glow by about 40 percent. Our Concern is the two new units will increase the sky glow
 36 beyond what it was after initial construction. We would like to see a comprehensive relighting
 37 program for all four reactors, using the latest technology zero cut-off fixtures, such as those
 38 approved by the International Dark-sky Association in order to achieve an overall reduced light
 39 pollution impact than what now exists. www.darksky.org **(0024-2** [Miller, Russ])

40 **Response:** *Potential impacts on wildlife of light pollution from operation of the proposed two*
 41 *new nuclear reactor units will be addressed in Chapter 5 of the EIS.*

42 **Comment:** The environmental report indicates that Squaw Creek Reservoir will continue to be
 43 the receiving body of water for various discharges from Comanche Peak Units 3 and 4. The
 44 Environmental Report concedes that radioactive particulate matter released to Squaw Creek
 45 Reservoir in liquid effluents will be deposited into the sediment layer of the reservoir bottom and
 46 remain there indefinitely. Comanche Peak NPP Environmental Report, p.5.11-3. In the event of

1 a protracted drought, and inadequate flow into Squaw Creek Reservoir. The sediment layer
2 could become exposed and, if adequately deliquified, would become dust and subject to
3 transport by wind with clear public health and environmental consequences.

4 Therefore, it is crucial that the EIS include a complete radiological profile of the existing
5 sediment in Squaw Creek Reservoir and an analysis of the cumulative radiological impacts
6 expected from operations on it from Units 3 and 4. This analysis is required in order to fully
7 gauge the environmental and public health impacts from the use of the earthen Squaw Creek
8 Reservoir as a discharge point for radioactive effluent from Comanche Peak Units 3 and 4. Part
9 of this analysis should be an assumption that the Squaw Creek Reservoir dam will at some
10 point fail and release the sediment that is burdened by radioactive particulates. Downstream
11 impacts on water quality, use, and impacts on mortality and morbidity must be a part of a proper
12 EIS. The Squaw Creek Reservoir dam should also be analyzed for structural integrity.
13 Protracted drought, seismic activity, or other natural events have the potential to weaken the
14 dam and if a failure of the structure occurs radioactive sediment could be carried downstream
15 with significant potential for environmental and public health impacts. **(0022-14** [Hadden,
16 Karen])

17 **Response:** *The staff will evaluate the radiological impacts of normal operation of the proposed*
18 *new reactor units in Chapter 5 and the cumulative impacts of the new units in conjunction with*
19 *existing Units 1 and 2 in Chapter 7 of the EIS. Potential effects on both human health and*
20 *ecological receptors will be assessed based on appropriate exposure scenarios.*

21 **Comment:** The EIS should discuss the location, amount, type, and quality of wetland acreage
22 in the study area, and how wetlands were delineated (i.e., COE, contractor, lead agency, etc.).
23 A draft mitigation plan to compensate for predicted wetland losses should be developed during
24 the NEPA process. Feasible alternatives that avoid wetland impacts should be consistent with
25 the 404(b)(1) guidelines of the Clean Water Act. **(0027-7** [Osowski Morgan, Sharon L.]

26 **Response:** *The NRC staff will describe wetlands potentially impacted by the project in Section*
27 *2.3.4 of the EIS. The potential impacts to these wetlands will be evaluated in Sections 4.3 and*
28 *5.3 of the EIS. Mitigation will be considered in Sections 4.3.3.5 and 5.3.3.5.*

29 **Comment:** Biodiversity is defined as the variety of plants and animals (biota) of a site or region,
30 and is typically measured by the number of different species and number of individuals per
31 species. In general, the more diverse an area is (number of habitat types and animal
32 inhabitants) and the better represented these components are (population counts), the more
33 rigorous (resistant, undisturbed, natural, healthy) the area is considered. Specifically,
34 sustainable (or self managed) native biodiversity is preferred compared to an increase in the
35 number of invasive, edge, or opportunistic species. Invasive, edge, or opportunistic species may
36 compete with native species and have the potential to dramatically change local ecosystems so
37 that they are not sustainable. Implementing BMPs or other measures to reduce invasive species
38 establishment should be discussed (Executive Order 13112).

39 The NEPA document should discuss native biodiversity aspects of the proposal as appropriate.
40 For example, will the project increase, restore, or decrease native biodiversity of the area or
41 region? Coordination with the U.S. Fish and Wildlife Service (FWS), and Texas Parks and
42 Wildlife Department is recommended regarding the design of any project mitigation areas to
43 enhance or restore biodiversity. **(0027-22** [Osowski Morgan, Sharon L.]

44 **Response:** *The NRC staff will consider and describe biodiversity in the project area in Section*
45 *2.4 of the EIS. Impacts to biodiversity, and mitigation measures as appropriate, will be*
46 *discussed in Sections 4.3 and 5.3.*

1 **Comment:** The FWS is the responsible agency for endangered species compliance, so EPA
2 defers to FWS regarding assessments of Federally-protected endangered species. However,
3 the NEPA document should discuss survey results and adjust the proposed alignment as
4 appropriate. Early coordination with FWS is recommended. (0027-23 [Oowski Morgan,
5 Sharon L.]

6 **Response:** *The NRC staff has begun early consultation with the U.S. Fish and Wildlife Service*
7 *(FWS) concerning potential project impacts on federally protected threatened and endangered*
8 *species. NRC's consultations with FWS regarding threatened and endangered species will be*
9 *discussed in Chapter 4 of the EIS.*

10 **Comment:** Chapter 2 -Existing Environment

11 Section 2.4 of the ER references a List of Somervell County Threatened and Endangered
12 Species to address state-listed threatened or endangered species that may occur at the
13 proposed CPNPP site. The ER failed to include the TPWD Annotated List of Rare Species for
14 Hood County, though it appears that components of the project would occur within Hood
15 County. Additionally, the ER only addressed state-listed threatened or endangered species, but
16 did not address all species included on the Annotated County List of Rare Species. Those
17 species on the list with a blank under federal or state status are tracked by TPWD and
18 considered rare. Rare species are of conservation concern by TPWD within Texas, and efforts
19 to minimize impact to such species are encouraged to help prevent future listing of the species.

20 The most up-to-date TPWD Annotated County Lists of Rare Species are available at
21 <http://gis.tpwd.state.tx.us/TpwEndangeredSpecies/DesktopDefault.aspx>. The lists provide
22 information regarding rare species that have potential to occur within each county. Rare species
23 could potentially be impacted if suitable habitat is present at or near the project site. (0029-
24 2[Boydston, Kathy])

25 **Comment:** The EIS should address all species on the Hood and Somervell County Lists
26 including rare, threatened, and endangered species. The project site should be assessed to
27 determine if suitable habitat for any of these species occurs within or near the proposed area
28 and to determine if construction and operation of the project would impact the species or
29 habitats. (0029-2 [Boydston, Kathy])

30 **Response:** *The NRC staff will address potential impacts to terrestrial and aquatic biota,*
31 *including State-listed threatened and endangered species, and suitable habitat potentially on*
32 *the project site, in Sections 4.3 and 5.3 of the EIS.*

33 **Comment:** Wooded riparian corridors along streams generally provide nesting habitat for birds,
34 soil stabilization for enhanced water quality, and food, cover, and travel corridors for wildlife.
35 Riparian habitat is a high priority habitat type for conservation by TPWD across the state.
36 **Comment:** The project should be designed and constructed to avoid disturbance to stream and
37 riparian areas. (0029-6 [Boydston, Kathy])

38 **Response:** *The NRC staff will address potential impacts to stream and riparian areas, and*
39 *mitigation measures as appropriate, in Sections 4.3 and 5.3 of the EIS.*

40 **Comment:** The proposed project is situated in the Cross Timbers and Prairies Ecoregion of
41 Texas which has generally supported native grassland valley communities with higher wooded
42 divides. Native grassland communities have become increasingly rare in Texas due to historical
43 conversion to row crop agriculture, overgrazing, invasion by woody species from a lack of fire on
44 the landscape, conversion to non-native pastures and hayland, and other development
45 associated with humans. Native grasslands are an important resource for wildlife adapted to

1 grassland environments. Population declines of many grassland birds are attributed to this loss
2 of habitat. (0029-7 [Boydston, Kathy])

3 **Comment:** The location of facilities should be sited to avoid native grassland communities and
4 placed in areas of previous disturbance or in areas previously converted to non-native pasture.
5 (0029-7 [Boydston, Kathy])

6 **Response:** *The NRC staff will address potential impacts to native grassland communities, and
7 mitigation measures as appropriate, in Sections 4.3 and 5.3 of the EIS.*

8 **Comment:** Because native vegetation is adapted to the soil and climate of the area, it usually
9 requires less maintenance and watering than introduced species. Water conservation is
10 warranted for the relatively dry climate of the project area. The disease tolerance of native
11 vegetation provides longevity to the landscape without high cost. Mature trees and shrubs
12 provide nesting, loafing, and forage habitat for birds and other wildlife. (0029-8 [Boydston,
13 Kathy])

14 **Comment:** The project site should be carefully planned and constructed to avoid and preserve
15 existing native vegetation. To eliminate or reduce the need for permanent irrigation, native trees,
16 shrubs, grasses, and forbs should be incorporated into the landscape plan. The following
17 websites describe appropriate native vegetation for the project area,
18 <http://www.tpwd.state.tx.us/huntwild/wild/wildscapes/> and <http://tpid.tpwd.state.tx.us/>. (0029-8
19 [Boydston, Kathy])

20 **Response:** *The NRC staff will discuss preservation of native vegetation and use of native
21 species for revegetation in Sections 4.3 and 5.3 of the EIS.*

22 **Comment:** The revegetation and maintenance plan for temporary disturbed areas should focus
23 on re-establishing native cover through natural regeneration and/or planting and should be
24 developed in coordination with TPWD. Plans for natural regeneration and/or revegetation of
25 disturbed areas should include measures to treat and control undesirable and/or invasive
26 species and should include management practices to benefit wildlife. (0029-9 [Boydston, Kathy])

27 **Response:** *The NRC staff will discuss preservation of native vegetation, use of native species
28 for revegetation, and consideration of control of invasive species in Sections 4.3 and 5.3 of the
29 EIS.*

30 **Comment:** The ER did not address the potential for the project site to contain rare plant
31 species or sensitive plant communities that are tracked by TPWD and/or included on our
32 annotated county lists of rare species; therefore impacts to those species or communities were
33 not addressed. (0029-10 [Boydston, Kathy])

34 **Comment:** Sites should be surveyed to identify potential impacts to rare plant species and
35 natural communities identified by TPWD. (0029-10 [Boydston, Kathy])

36 **Response:** *The NRC staff will describe rare and sensitive plant species that potentially occur
37 on the project site in Section 2.4. The potential impacts to these species, based on the
38 likelihood of such species to be present, and potential mitigation measures, will be evaluated in
39 Sections 4.3 and 5.3 of the EIS.*

40 **Comment:** Protecting vegetated buffers is discussed in Section 4.3.1.1, though no vegetated
41 buffer areas are specifically identified in the ER. (0029-11 [Boydston, Kathy])

42 **Comment:** The vegetated buffer areas that would receive protection need to be identified and
43 mapped. (0029-11 [Boydston, Kathy])

1 **Response:** *The NRC staff will discuss locations and preservation of vegetative buffer areas in*
2 *Sections 4.3 and 5.3 of the EIS.*

3 **Comment:** Figure 4.2-1 indicates that the area immediately adjacent to the wetland identified
4 along SCR on the cooling tower peninsula is slated as a construction area. During the February
5 2,2009 site visit, Luminant noted that a buffer area would be placed around the wetland. It is
6 unclear the amount of wooded area on the slopes of the draw that would be excluded from
7 construction activities to serve as the buffer area to the wetland. (0029-12 [Boydston, Kathy])

8 **Comment:** A buffer area developed in coordination with TPWD should be established along the
9 slopes to protect water quality, provide wildlife habitat, and shelter the wetland located down
10 slope at this location. (0029-12 [Boydston, Kathy])

11 **Response:** *The NRC staff will address wetland mitigation, including provision of buffer areas,*
12 *in Chapters 4 and 5 of the EIS.*

13 **Comment:** Section 4.3.1 of the ER indicates that the disturbed area is equivalent to 275 acres
14 and 384 acres, for the CPNPP and the BDTF, respectively. The ER does not distinguish
15 between permanent and temporary disturbance areas per the CPNPP site and the BDTF. The
16 275-acre CPNPP site is the only area showing impacts by cover type, but the amount of each
17 cover type lost to permanent construction is not provided. No impact assessment per cover type
18 is provided for the 384-acre BDTF, the pipelines, the power transmission lines, or the intake and
19 return structure areas. (0029-13 [Boydston, Kathy])

20 **Comment:** The permanent and temporary disturbances should be revealed per cover type
21 (grassland, scrub brush, disturbed, juniper woodland, wetland, hardwood forest, etc.) per facility
22 (CPNPP, BDTF, power transmission lines, pipelines, and intake and return structure areas).
23 Total temporary and permanent impacts per cover type should be provided for the proposed
24 project, inclusive of the CPNPP, the BDTF, the pipelines, the transmission lines, and the intake
25 and discharge structure areas. This type data can easily be presented in table form. (0029-13
26 [Boydston, Kathy])

27 **Response:** *The NRC staff will distinguish between permanent and temporary disturbance*
28 *areas on the project site, including the area of the proposed Blowdown Treatment Facility, as*
29 *well as assessing habitat cover types in the entire project area. Ecological impacts within the*
30 *entire project area will be evaluated in Sections 4.3 and 5.3.*

31 **Comment:** Construction crews should be informed of the rare species in the project counties
32 and should avoid disturbance to sensitive species if encountered during construction. Only
33 personnel with a TPWD scientific collection permit are allowed to handle and move state listed
34 species. For further information on the required permit please contact Chris Maldonado at (512)
35 389-4647. (0029-14 [Boydston, Kathy])

36 **Response:** *The NRC staff will describe mitigation measures for rare species in Sections 4.3*
37 *and 5.3. Should mitigation include handling and movement of State-listed species, all legal and*
38 *regulatory requirements would be met.*

39 **Comment:** The ER did not address the potential for the project site to contain rare species that
40 are tracked by TPWD and included on our annotated county lists of rare species; therefore
41 impacts to those species were not addressed. The ER does not include a detailed evaluation of
42 impacts associated with the BDTF construction. (0029-15 [Boydston, Kathy])

1 **Comment:** Site surveys of the CPNPP and BDTF sites for rare species with potential to occur
 2 within the area should be conducted prior to construction. Occurrences should be avoided or a
 3 mitigation plan developed in coordination with TPWD. (0029-15 [Boydston, Kathy])

4 **Response:** *The NRC staff will describe rare and sensitive plant species that potentially occur*
 5 *on the project site, including the Blowdown Treatment Facility, in Section 2.4. The potential*
 6 *impacts to these species, based on the likelihood for such species to be present, and potential*
 7 *mitigation measures, will be evaluated in Sections 4.3 and 5.3 of the EIS.*

8 **Comment:** It is not apparent that Chapter 5 of the ER addresses impacts to wildlife associated
 9 with operation of the BDTF. The proposed site for the BDTF would include a large area of ponds
 10 that may be placed near and/or under existing power transmission lines. The BDTF area is also
 11 in close proximity to a large reservoir. Therefore, there is increased potential for use of the area
 12 near the transmission lines by migratory and resident waterfowl and shorebirds once the BDTF
 13 ponds are installed. The attractiveness of the BDTF ponds to birds would increase the potential
 14 for bird collision with the transmission lines. (0029-21 [Boydston, Kathy])

15 **Comment:** Potential collision impacts to migratory and resident birds as a result of constructing
 16 large ponds near and/or under transmission lines should be addressed. Measures to avoid or
 17 mitigate potential impacts should be developed in coordination with TPWD, such as
 18 transmission line marking, relocation of the proposed BDTF ponds, and pre-and post-
 19 construction monitoring. (0029-21 [Boydston, Kathy])

20 **Response:** *The NRC staff will describe potential impacts to wildlife from operation of the*
 21 *proposed Blowdown Treatment Facility, and potential mitigation measures, in Sections 4.3 and*
 22 *5.3 of the EIS.*

23 **Comment:** Any potential dangers to wildlife as a result of exposure to the BDTF ponds should
 24 also be made apparent. Significant impacts should be mitigated. (0029-22 [Boydston, Kathy])

25 **Response:** *The NRC staff will describe potential impacts to wildlife from operation of the*
 26 *proposed Blowdown Treatment Facility, including associated ponds, and potential mitigation*
 27 *measures, in Sections 4.3 and 5.3 of the EIS.*

28 **Comment:** Comment: TPWD is concerned that high salinity reject water (brine) from any
 29 desalination process be disposed of in a manner that does not impact fish and wildlife
 30 resources. TPWD may offer additional comment when Luminant provides greater detail of
 31 proposed operations of the BDTF. (0029-23 [Boydston, Kathy])

32 **Response:** *The NRC staff notes the comment.*

33 **Comment:** Because the CPNPP boundary encompasses approximately 7,950 acres inclusive
 34 of Squaw Creek Reservoir and large areas of undeveloped property, there is opportunity for
 35 Luminant to develop a working plan for conservation, protection, and management of fish and
 36 wildlife resources within the CPNPP boundary. An adaptive wildlife management plan should
 37 be developed in coordination with TPWD. Suggestions for activities to address in the
 38 management plan include, but are not limited to:

- 39 – Opening Squaw Creek Reservoir or portions of the reservoir for public fishing
- 40 – Creating and maintaining native grassland communities within transmission line ROWs and
- 41 areas of non-native grasslands
- 42 – Creating and protecting riparian corridor habitat
- 43 – Developing a grazing management plan for areas leased to livestock

- 1 - Developing livestock exclusion areas or rotation plans near ponds to help improve water
2 quality and increase wildlife diversity
- 3 - Conducting deer management in areas that are overpopulated
- 4 - Monitoring and treatment of invasive or undesirable species (**0029-24** [Boydston, Kathy])

5 **Response:** *Creation of an adaptive wildlife plan is outside the scope of this review.*

6 **Comment:** Rare Resource Occurrences

7 To support preparation of the EIS, the NRC has requested information regarding state-listed,
8 proposed, and candidate species and protected habitat that may be in the vicinity of the
9 proposed site, the alternative sites, and the transmission line ROWs.

10 The ER indicates that three alternative sites and a preferred site were considered for the
11 proposed nuclear power plants. The applicant has not revealed the alternative site locations
12 because they hold the locations as proprietary information. The three alternative sites have
13 been described as occurring A) near the border of Victoria and Calhoun counties, B) near the
14 border of San Augustine and Sabine counties, and C) near the border of McLennan and
15 Limestone counties. Therefore, TPWD must present the data regarding known occurrences of
16 rare resources based on countywide sets of data for two counties per site. TPWD has included
17 a 1-mile radius buffer beyond the two counties because including a buffer to a project site is
18 typical practice for Texas Natural Diversity Database (TXNDD) searches. This buffer also
19 encompasses area that may be in a different county, but still within 10 miles of the border of the
20 two given counties. To eliminate bias in the evaluation of site alternatives by the NRC, TPWD is
21 submitting data for the proposed site in the same manner encompassing Hood and Somervell
22 counties and a 1a-mile radius buffer area.

23 If the actual locations of the alternative sites are provided to TPWD, then we will provide a less
24 intensive list of TXNDD occurrences to the NRC by site location rather than countywide.

25 TPWD is also submitting a set of data specific to the proposed site location including
26 occurrences within a 1-mile buffer area. This data should be considered when assessing the
27 potential impacts to rare resources if the alternatives analysis of the EIS indicates that the
28 proposed site is adequate as the preferred site. Thus, an appropriate evaluation of impacts to
29 rare resources specific to the preferred site can be conducted.

30 The ER identifies two new proposed 345-kV transmission line routes requiring new ROW, one
31 extending 45 miles to a substation near Lake Whitney in Bosque County and one extending 17
32 miles to a switching station near Lake Granbury. There are also two new proposed circuits that
33 will be added to vacant positions on two separate existing 345-kV double lattice steel tower
34 structures, one extending 44.8 miles to a switching station in Tarrant County and one extending
35 41.6 miles to a switching station in Parker County. TPWD understands that the proposed
36 transmission line ROW routes are preliminary and not final. Therefore, the information provided
37 regarding resources within the vicinity of the two new proposed 345-kV transmission line ROWs
38 will need to be updated and an assessment of potential impacts to rare resources will need to
39 be reevaluated once specific routes are identified.

40 Determining the actual presence of a species in a given area depends on many variables
41 including daily and seasonal activity cycles, environmental activity cues, preferred habitat,
42 transiency and population density (both wildlife and human). The absence of a species can be
43 demonstrated only with great difficulty and then only with repeated negative observations, taking
44 into account all the variable factors contributing to the lack of detectable presence.

1 The TXNDD is intended to assist users in avoiding harm to rare species or significant ecological
 2 features. Given the small proportion of public versus private land in Texas, the TXNDD does not
 3 include a representative inventory of rare resources in the state. Absence of information in the
 4 database does not imply that a species is absent from that area. Although it is based on the
 5 best data available to TPWD regarding rare species, the data from the TXNDD do not provide a
 6 definitive statement as to the presences, absence or condition of special s (0029-25 [Boydston,
 7 Kathy])

8 **Response:** *The NRC staff notes the comment. Since actual locations of the alternative sites*
 9 *have been provided to Texas Parks and Wildlife Department by NRC, staff notes that scope of*
 10 *the occurrence list will be reduced.*

11 **D.2.11 Comments Concerning Ecology - Aquatic**

12 **Comment:** I want an honest environmental impact statement on protein sources at the estuary
 13 of the Brazos River. We keep, over and over again, putting negative impacts on our ability to
 14 produce protein from our coastline. And this is just one more example of that. If the NRC does
 15 not do an honest assessment of that, it is not a legitimate planning process. I'd like to see that
 16 addressed. (0016-43 [Burnam, Lon])

17 **Comment:** It is about the production of protein at the end of this river stream. We are facing a
 18 probably extended drought, and you have got the protection here, because your lake is a
 19 guaranteed level. But I want to ask you about Possum Kingdom, which is low already. I want to
 20 ask you about maintaining the estuary and the protein production at the end of this assembly
 21 line, as it were. (0017-18 [Burnam, Lon])

22 **Response:** *The impact of water withdrawals from and discharges to the Brazos River for*
 23 *operation of the proposed new nuclear units will be evaluated and presented in Chapter 5 of the*
 24 *EIS.*

25 **Comment:** I used to go fishing in Squaw Creek. In the local paper, like I said, it always gives
 26 the lake levels and the temperature of the waters. Squaw Creek would go -the highest I ever
 27 saw it was 104 degrees. And, yes, there would be fish dead. Matter of fact, no matter where I
 28 was in the lake, I could always see at least one dead fish, unless I was on the—close to the
 29 bank. Then there was a lot of dead fish and a lot of buzzards.

30 And that may sound kind of funny, but the ones that the dead fish and the maggots and that sort
 31 of stuff that the buzzards eat, it kind of went over the spillway. And that might be why these
 32 problems with Squaw Creek downstream. And also, when you came over the hill to go down to
 33 the boat ramp area, you could smell dead fish.

34 And it's not as if I was going to eat something I caught out of that lake at that time, but I just
 35 went out there to kind of see what kind of deal this is. And I wish I had taken a movie or
 36 something to show you, because it would make an effect on your—just the way you think.
 37 (0016-69 [Kinzie, W.T.]

38 **Comment:** Discharging "hot" water from Squaw Creek needs to be studied. Loss of fish,
 39 turtles, frogs. (0018-5 [Cathey, Jack])

40 **Response:** *The NRC staff will assess potential impacts to aquatic life in Lake Granbury, the*
 41 *Brazos River, and Squaw Creek due to thermal discharge from the proposed new reactor units*
 42 *in Section 5 of the EIS.*

1 **Comment:** Need study of impact "down" river. (0018-7 [Cathey, Jack])

2 **Response:** *The NRC staff will assess potential ecological and hydrological impacts in Lake*
3 *Granbury, the Brazos River, and Squaw Creek Reservoir due to operation of the intake and*
4 *discharge from the proposed new reactor units in Chapter 5 of the EIS.*

5 **Comment:** The adverse effects of elevating water temperatures in our rivers is sacrificing the
6 integrity of these precious ecosystems and harming biological development and survival. This is
7 unacceptable and irresponsible. (0031-3 [Gentling, Suzanne])

8 **Response:** *The NRC staff will assess potential impacts to aquatic life in the Brazos River from*
9 *thermal discharge of the proposed new reactor units in Chapter 5 of the EIS.*

10 **Comment:** The EIS must do a full analysis of how much of each of these contaminants [i.e.,
11 biocide, algacide, pH adjuster, corrosion inhibitor and silt dispersant] would end up in Lake
12 Granbury, how much would migrate into the Brazos River and how much would escape through
13 evaporation. The exact chemical names must be included, not just generic terms such as
14 "biocide." The impacts of exposure of humans, animals and wildlife to these toxic compounds
15 should be analyzed. (0019-12 [Hadden, Karen])

16 **Comment:** The study should also include an analysis of pollution impacts downstream from
17 water contaminated by chemical treatment such as biocides, algacides, pH adjustors,
18 corrosion inhibitor and silt dispersant chemicals injected at the reactor site as well as chlorine,
19 salts and non-radioactive effluent. The differential impact of treatment of 100 percent of the
20 water versus the lesser amount of treatment proposed by the applicant should be considered.
21 (0022-18 [Hadden, Karen])

22 **Response:** *The staff's assessment of the nonradiological impacts to water quality will be*
23 *presented in Chapter 5 of the EIS.*

24 **Comment:** Global warming and its impacts on rainfall are better understood now and must be
25 considered in the context of determining whether adequate water resources will be available for
26 nuclear plant operations. It is clear that nuclear plants require enormous amounts of water for
27 operations. In fact, the environmental report states that 30,000 gallons of water are needed for
28 each reactor every minute, and shows in Figure 2.3-30 that approximately two-thirds of this
29 water would evaporate. It is also clear, based on the Comanche Peak environmental report, that
30 the proponents of the plant assume that there will be adequate water resources for purposes of
31 plant operations associated with Comanche Peak Units 3 and 4. However, impacts from global
32 warming will include protracted drought that may seriously compromise water resources
33 required for plant operations. The compromised water resources should be considered both
34 from a quantitative perspective and a temperature sensitive analysis since plant operations are
35 dependent on a narrow band of water temperatures. (0022-11 [Hadden, Karen])

36 **Comment:** The EIS should also consider whether regional waterways will be impacted in terms
37 of water quantity and quality by the use of vast quantities of water for Units 3 and 4, including
38 Lake Granbury, the Brazos River, the Paluxy River, Whitney Lake, a popular fishing lake, and
39 popular recreational areas such as Possum Kingdom. According to the Texas Parks and Wildlife
40 Department web site, the drinking water at Possum Kingdom State Park is currently non-potable
41 due to a high salt content, and visitors must bring their own water for consumption. The potential
42 to increase salt content of waterways in the region by further drawdown of water levels,
43 including impacts to the local aquifer and drinking wells should be examined thoroughly in the
44 EIS. Coastal environmental impacts are known to result from alterations of freshwater flow into
45 the Gulf of Mexico, affecting lagoons, estuaries and wetlands, altering salinity patterns,
46 nutrients, dissolved oxygen levels and therefore impacting productivity of coastal plant and

1 animal populations. The biological impacts must be considered in the EIS including the
2 possibility of eutrophication, productivity and sediment impacts, and potential contamination.
3 **(0022-21 [Hadden, Karen])**

4 **Comment:** Friends of the Brazos River (FBR) is a non-profit organization with 450 members in
5 the Glen Rose, Granbury, Dallas and Ft. Worth area whose main concern is the ecological
6 integrity of the Brazos between Lakes Granbury and Whitney. In our opinion, the Brazos is an
7 imperiled ecosystem, largely due to the over-allocation of Brazos water by the Brazos River
8 Authority. We are currently working cooperatively with BRA, TCEQ and other state agencies to
9 insure that BRA's current water right application allows for adequate in stream flows.
10 It is our understanding that the cooling systems for the additional reactors at Comanche Peak
11 will lose approximately 55,000 acre ft. of Brazos water annually to evaporation. Whereas, we do
12 not oppose the additional reactors. We do oppose the loss of so much Brazos water. **(0025-1**
13 **[Lowe, Ed])**

14 **Response:** *The staff will assess the impact of consumptive water losses related to the*
15 *proposed action on the sustainability of both local and regional water resources. This*
16 *assessment will consider both current and future conditions, including changes in water*
17 *demands to serve the needs of future populations, and changes in water supply resulting from*
18 *climate variability and climate change. The staff's assessment of impacts on water resources*
19 *and related ecological impacts will be presented for construction and operation in Chapters 4*
20 *and 5 of the EIS, respectively.*

21 **Comment:** The environmental report indicates that Squaw Creek Reservoir will continue to be
22 the receiving body of water for various discharges from Comanche Peak Units 3 and 4. The
23 Environmental Report concedes that radioactive particulate matter released to Squaw Creek
24 Reservoir in liquid effluents will be deposited into the sediment layer of the reservoir bottom and
25 remain there indefinitely. Comanche Peak NPP Environmental Report, p.5.11-3. In the event of
26 a protracted drought, and inadequate flow into Squaw Creek Reservoir. The sediment layer
27 could become exposed and, if adequately deliquified, would become dust and subject to
28 transport by wind with clear public health and environmental consequences.

29 Therefore, it is crucial that the EIS include a complete radiological profile of the existing
30 sediment in Squaw Creek Reservoir and an analysis of the cumulative radiological impacts
31 expected from operations on it from Units 3 and 4. This analysis is required in order to fully
32 gauge the environmental and public health impacts from the use of the earthen Squaw Creek
33 Reservoir as a discharge point for radioactive effluent from Comanche Peak Units 3 and 4. Part
34 of this analysis should be an assumption that the Squaw Creek Reservoir dam will at some
35 point fail and release the sediment that is burdened by radioactive particulates. Downstream
36 impacts on water quality, use, and impacts on mortality and morbidity must be a part of a proper
37 EIS. The Squaw Creek Reservoir dam should also be analyzed for structural integrity.
38 Protracted drought, seismic activity, or other natural events have the potential to weaken the
39 dam and if a failure of the structure occurs radioactive sediment could be carried downstream
40 with significant potential for environmental and public health impacts. **(0022-13 [Hadden,**
41 **Karen])**

42 **Comment:** Squaw Creek Reservoir should be analyzed for radiological hazards because of
43 radioactive particulates currently discharged from Comanche Peak Units 1 and 2 that are
44 accumulating in sediment and additional radionuclide loading if Units 3 and 4 are operational.
45 **(0022-8 [Hadden, Karen])**

46 **Response:** *The staff will evaluate the radiological impacts of normal operation of the proposed*
47 *new reactor units in Chapter 5, and the cumulative impacts of the new units in conjunction with*

1 *existing Units 1 and 2 in Chapter 7 of the EIS. Potential effects on both human health and*
2 *ecological receptors will be assessed based on appropriate exposure scenarios.*

3 **Comment:** Tritium and other radioactive particulates as well as water temperatures are major
4 concerns for the receiving waters. These must be adequately addressed in light of the additional
5 water discharges from Units 3 and 4 both in the receiving waters, but also downstream. (0032-7
6 [Reed, Cyrus])

7 **Response:** *The staff will evaluate the radiological impacts of normal operation of the proposed*
8 *new reactor units in Chapter 5, and the cumulative impacts of the new units in conjunction with*
9 *existing Units 1 and 2 in Chapter 7 of the EIS. Potential effects on both human health and*
10 *ecological receptors will be assessed based on appropriate exposure scenarios. Potential*
11 *impacts to aquatic life from the thermal discharge of the proposed new units also will be*
12 *assessed for Lake Granbury and the Brazos River downstream in Section 5 of the EIS.*

13 **Comment:** The other thing I'd like to address is the biggest thing that we missed of all, is on the
14 environmental studies, is what happens after they cool the plant. They release the water down
15 Squaw Creek, which is just about a mile behind you. And that water is extremely hot. It's not
16 warm water; it's hot water.

17 Now then, in the past ten to 12 years—and I'm just talking about Squaw Creek, which is not a
18 very big area—there were many, many frogs and soft-shelled turtles, many of them, and nobody
19 in this room has been on that river more than I have. There's no soft-shelled turtles down there.
20 The frogs are gone. And I've always been informed in environmental, frogs are the first thing
21 that tell you there's something wrong. And there's something wrong with the release of that
22 water.

23 The water is too hot. It has bothered the spawning of the fish. When I say there's no—I don't
24 mean there's not any. mean, they're disappearing. The fish, they're still there, but they're
25 disappearing. There's something wrong that needs to be looked into in your study very, very
26 serious. Something that's not happening, not something that you need to do later on; it's
27 something that needs to be done right now. It's happening as we're sitting here.
28 And it's something on all these studies—and I notice on that chart up there, it said aquatic
29 studies. I've never seen one. I've never seen one of what happens after the fact. Studies are
30 done about the fish in the lake, but nothing is happen—and it's just growing right down the river.
31 The—it's not the only problem, The problem is with low water, if you add hot water, you get hot
32 water down the river in the summertime. And if you—all you have to do is go stick your hand in
33 it. And it's hot. And it's something that I'd like for you to address, and really it's never been even
34 looked at. And why we let it get by, I don't know, but I never thought about it until after the fact.
35 And the only way that I really know about this is firsthand information, because I'm on that river
36 every single day. (0016-64 [Cathey, Jack])

37 **Response:** *The NRC staff will assess potential impacts to aquatic life in Lake Granbury, the*
38 *Brazos River, and Squaw Creek due to thermal discharge from the proposed new reactor units*
39 *in Chapter 5 of the EIS.*

40 **Comment:** The above article said that water will be returned at 91 to 93 degrees. If we have
41 limited rain and the BRA chooses to decrease the flow from PK then what will happen to the
42 water temperature of the water at the dam site? This is the only deep water area of the lake.
43 What becomes of our game fish?
44 (0020-2 [Bernier, Jim])

1 **Response:** *The NRC staff will assess potential ecological and hydrological impacts in Lake*
 2 *Granbury, the Brazos River, and Squaw Creek Reservoir due to operation of the intake and*
 3 *discharge from the proposed new reactor units in Chapter 5 of the EIS.*

4 **Comment:** A Total Dissolved Solids (TDS) concentration of 1680 mg/l is on the borderline for
 5 lethal toxicity, and a TDS concentration of 2500 mg/l is above. Given that there will also be
 6 biocide usage in the cooling towers, whole effluent toxicity (WET) testing will be required, and
 7 there is reason to expect lethal and sublethal effects in WET testing. CPNPP should sample the
 8 water from Lake Granbury and perform 7-day chronic toxicity tests. CPNPP should also
 9 evaporate a portion of the sample to approximately 2500 mg/l and perform the same test. This
 10 would be predictive of the final effluent and would provide a sound basis for decision-making.
 11 **(0027-10 [Osowski Morgan, Sharon L.]**

12 **Response:** *Impacts on aquatic biota and habitat due to liquid chemical effluents resulting from*
 13 *facility operation will be discussed in Section 5.3.2.*

14 **Comment:** Biodiversity is defined as the variety of plants and animals (biota) of a site or region,
 15 and is typically measured by the number of different species and number of individuals per
 16 species. In general, the more diverse an area is (number of habitat types and animal
 17 inhabitants) and the better represented these components are (population counts), the more
 18 rigorous (resistant, undisturbed, natural, healthy) the area is considered. Specifically,
 19 sustainable (or self managed) native biodiversity is preferred compared to an increase in the
 20 number of invasive, edge, or opportunistic species. Invasive, edge, or opportunistic species may
 21 compete with native species and have the potential to dramatically change local ecosystems so
 22 that they are not sustainable. Implementing BMPs or other measures to reduce invasive species
 23 establishment should be discussed (Executive Order 13112).

24 The NEPA document should discuss native biodiversity aspects of the proposal as appropriate.
 25 For example, will the project increase, restore, or decrease native biodiversity of the area or
 26 region? Coordination with the U.S. Fish and Wildlife Service (FWS), and Texas Parks and
 27 Wildlife Department is recommended regarding the design of any project mitigation areas to
 28 enhance or restore biodiversity.

29 Studies as similar as possible to those performed prior to Units 1 and 2 becoming operational
 30 (1981) should be conducted for comparison purposes and to ascertain losses in species
 31 abundance and richness over time. For example, 26 species of fish were caught in 1987, but
 32 only 10 in 2007 (Table 2.4-13). Tables 2.4-3, 2.4-4, 2.4-7, 2.4-13, and 2.4-14 all show declines
 33 in species richness over time. If the method used led to misleading sample, then new sampling
 34 schemes should be developed or methods used in 1987 should be used (p. 2.4-24). Table 2.4-4
 35 has observed and expected data; therefore, simple statistics (like Chi squared, etc) could be
 36 performed to provide confidence bounds on the data and to determine whether the observations
 37 show a true pattern or are random statistical events.

38 The ER indicated that CPNPP would draw water for cooling from Lake Granbury. Additional
 39 studies of the impacts to aquatic ecology should be performed. Even though aquatic organisms
 40 may retreat to other areas in SCR or Lake Granbury, there are limits to what the organisms can
 41 tolerate, both in pollutant load, sediment load, high water temperature, and the amount of time
 42 they are exposed to such conditions (p. 4.3-10). **(0027-21 [Osowski Morgan, Sharon L.]**

43 **Response:** *Impacts on aquatic ecology from cooling water withdrawals and discharges,*
 44 *including the potential for impacts on the biodiversity of aquatic communities, will be analyzed*
 45 *based on available data for Lake Granbury, the Brazos River, and Squaw Creek Reservoir in*
 46 *Chapters 4 and 5 of the EIS.*

1 **Comment:** Chapter 2 -Existing Environment: Section 2.4 of the ER references a List of
2 Somervell County Threatened and Endangered Species to address state-listed threatened or
3 endangered species that may occur at the proposed CPNPP site. The ER failed to include the
4 TPWD Annotated List of Rare Species for Hood County, though it appears that components of
5 the project would occur within Hood County. Additionally, the ER only addressed state-listed
6 threatened or endangered species, but did not address all species included on the Annotated
7 County List of Rare Species. Those species on the list with a blank under federal or state status
8 are tracked by TPWD and considered rare. Rare species are of conservation concern by TPWD
9 within Texas, and efforts to minimize impact to such species are encouraged to help prevent
10 future listing of the species.

11 The most up-to-date TPWD Annotated County Lists of Rare Species are available at
12 <http://gis.tpwd.state.tx.us/TpwEndangeredSpecies/DesktopDefault.aspx>. The lists provide
13 information regarding rare species that have potential to occur within each county. Rare species
14 could potentially be impacted if suitable habitat is present at or near the project site. **(0029-1**
15 **[Boydston, Kathy]**)

16 **Comment:** The EIS should address all species on the Hood and Somervell County Lists
17 including rare, threatened, and endangered species. The project site should be assessed to
18 determine if suitable habitat for any of these species occurs within or near the proposed area
19 and to determine if construction and operation of the project would impact the species or
20 habitats. **(0029-1 [Boydston, Kathy])**

21 **Response:** *For both Somervell and Hood Counties, species with a Federal or State listing*
22 *status of endangered or threatened and species considered by the State as rare will be*
23 *identified in Chapters 2 of the EIS, and potential impacts to these species from construction and*
24 *operation of the proposed new reactor units will be evaluated in Chapters 4 and 5, respectively.*

25 **Comment:** Section 2.4.2.2 of the ER provides basic details about the fish studies conducted for
26 Squaw Creek Reservoir and Lake Granbury. Fish avoidance of gill nets is a known problem in
27 reservoirs with high water clarity, such as Squaw Creek Reservoir and near the dam on Lake
28 Granbury. **(0029-3 [Boydston, Kathy])**

29 **Comment:** Further information is needed about the monofilament nets used to sample the fish
30 population, the depth at which gill nets were placed, and the gill net mesh size used. Mesh sizes
31 too large to capture smaller fish would produce inaccurate results. Electrofishing, even with high
32 total dissolved solids, would likely provide important additional information on fish populations in
33 both reservoirs. Seining in littoral areas could provide information about smaller species that are
34 unlikely to be captured by gill nets. **(0029-3 [Boydston, Kathy])**

35 **Response:** *Additional information about fish sampling methods and apparatus will be provided*
36 *in Section 2.4.2 of the EIS.*

37 **Comment:** During the February 2, 2009 site visit, and in Section 4.3.2.4 of the ER, it was
38 mentioned that fish populations are struggling in Lake Granbury. The consultant's sampling at
39 four sites near the dam claims to support this opinion. The TPWD Inland Fisheries staff
40 conducts full fishery studies on the lake every four years as well as ongoing fish sampling.
41 These studies show that only a few fish species have declined post-golden algae kills, many
42 have remained at the same population levels, and some have increased in numbers (Baird and
43 Tibbs 2006). The opinion that the fishery is dead by the dam due to golden algae is not
44 supported by the information provided. Request: TPWD requests a copy of the fish studies
45 conducted by Luminant's consultant, specifically the studies referenced in Chapter 2.4 of the

1 ER, Bio-West 2008a and 2008b. TPWD staff may have additional comments following review of
2 the consultant's report. (0029-5 [Boydston, Kathy])

3 **Response:** *The information provided by the TPWD fisheries study in Lake Granbury will be*
4 *considered in conjunction with the studies cited in the applicant's ER when the NRC staff*
5 *assesses in the EIS the current condition of fish populations in the lake and potential future*
6 *impacts.*

7 **Comment:** Section 5.2 discusses water-related impacts associated with water withdrawal from
8 Lake Granbury, water loss, and return discharge to Lake Granbury. The ER claims that there is
9 currently minimal use of water in the Brazos River from Possum Kingdom Lake to Lake
10 Whitney; and due to the minimal water use and other users returning water to the Brazos River
11 Basin, the project impacts are not expected to affect the available water for other water users
12 nor for the aquatic ecological communities of the Brazos River. The ER considers the impacts
13 from the CPNPP water withdrawal and discharge rates as small. The ER presents the reported
14 mean monthly discharges at DeCordova Bend Dam at 1,031 cubic feet per second (cfs) and
15 indicates that anticipated normal discharge would be 55.43 cfs during operation of CPNPP
16 Units 3 and 4.

17 The operational impacts associated with water use do not specifically address potential impacts
18 to aquatic resources such as potential impacts to the state threatened Brazos Water Snake
19 (*Nerodia harteri*), various rare species of mollusks listed on the county lists, and other aquatic
20 resources occurring or potentially occurring downstream of Lake Granbury. Potential impacts
21 associated with CPNPP water losses need to be specifically addressed for aquatic resources
22 within the Brazos River Basin. (0029-16 [Boydston, Kathy])

23 **Response:** *The NRC staff will assess potential impacts on aquatic life in the Brazos River*
24 *basin due to hydrological effects from operation of the proposed new reactor units in Chapter 5*
25 *of the EIS.*

26 **Comment:** Chapter 2 Section -2.3.3.1.9 and Chapter 5 Sections -5.2.1. 7 and 5.2.3.4, Golden
27 algae, specifically *Prymnesium parvum*, are microscopic plants present in Possum Kingdom
28 Reservoir, Lake Granbury, and Lake Whitney, as well as other areas in the state. The alga
29 prefers saltier water for growth as it is a marine species. Lower water levels in Possum Kingdom
30 Reservoir would likely make the lake more susceptible to golden alga. Like most other
31 reservoirs, when the water level in Possum Kingdom Reservoir is low, conditions become more
32 saline and nutrients become more concentrated. Historically, both conditions have been
33 associated with increased occurrence and severity of golden algal blooms in Possum Kingdom
34 Reservoir and other Texas reservoirs. An increase in salinity (conductivity) within Lake
35 Granbury would likely also cause enhanced golden algal blooms. With the return water entering
36 by the dam, the potential for increased conductivity by the dam and immediately downstream is
37 a concern as well. (0029-17 [Boydston, Kathy])

38 **Comment:** If golden alga occurrences increase in severity after periods of water loss, then
39 Luminant may be required through TPWD's civil restitution process to mitigate for fish mortalities
40 from these golden alga kills and may be asked to contribute to annual restocking efforts or
41 golden alga treatment and research. (0029-17 [Boydston, Kathy])

42 **Response:** *Water quality impacts from operation of the proposed new reactor units and their*
43 *potential effects on aquatic life will be assessed in Chapter 5 of the EIS.*

44 **Comment:** TPWD has concerns about increased selenium levels in Lake Granbury and
45 downstream portions of the Brazos River resulting from the discharge. As stated in
46 Section 5.2.3.4, When half the detection limit was used to estimate concentrations that would

1 result from CPNPP Units 3 and 4 2.4-cycle cooling tower operation, selenium was estimated to
 2 exceed the Texas Commission on Environmental Quality (TCEQ) Criteria for Specific Metals in
 3 Water for Protection of Aquatic Life and also for both the mean and maximum concentrations
 4 when mixed with Lake Granbury at low flow. However, selenium is expected to be reduced to
 5 concentrations less than the TCEQ standards for Specific Metals in Water for Protection of
 6 Aquatic Life at the edge of the mixing zone in Lake Granbury during the annual mean flow for
 7 both mean and maximum concentrations. The acute freshwater criteria for selenium is 0.020
 8 mg/L and freshwater chronic criteria is 0.005 mg/L (TCEQ 2008). Exceeding the set criteria can
 9 be harmful to aquatic life within and downstream of the reservoir. (0029-18 [Boydston, Kathy])

10 **Comment:** Section 5.2.2.3.1: The consumptive demands from the project are a concern for the
 11 Brazos River Basin. Chapter 3 Section 4 indicates that Luminant will use up to 103,000 acre-
 12 feet per year (ac-ft/yr) of water from Lake Granbury for the cooling process with an estimated
 13 evaporative loss of 61,000 ac-ft/yr. The loss of 61,000 ac-ft/yr from Possum Kingdom Reservoir,
 14 Lake Granbury and the Brazos River will lead to declines in lake levels, a reduction of
 15 streamflow downstream of Lake Granbury, and a resultant wide range of impacts on fish and
 16 wildlife resources and recreation.

17 Fisheries may be impacted; reduced flows in the Brazos River below Waco may impact several
 18 imperiled fish species, as well as a vulnerable alligator gar fishery. Water levels are also
 19 anticipated to drop in Possum Kingdom Reservoir since the water for Units 3 and 4 will be taken
 20 from Lake Granbury but supplied by releases from Possum Kingdom Reservoir. Currently,
 21 Possum Kingdom Reservoir struggles with having enough water to inundate littoral vegetation
 22 during spawning times for a variety of sport fish. The proposed water loss would exacerbate an
 23 already less than desirable condition. In addition, lowering the water level in Possum Kingdom
 24 Reservoir will expose fish habitat used for sheltering and feeding, as well as for breeding. This
 25 loss of habitat, especially during spawning season, is likely to impact fish populations. (0029-19
 26 [Boydston, Kathy])

27 **Response:** *The NRC staff will assess potential hydrological, water quality, and resulting*
 28 *ecological impacts in the Brazos River basin associated with the intake and discharge from*
 29 *operation of the proposed new reactor units in Chapter 5 of the EIS.*

30 D.2.12 Comments Concerning Socioeconomics

31 **Comment:** And as far as y'all wanting to bring in extra jobs and more people, you would think it
 32 would be a joke about Weatherford having traffic problems. But try to be on Main Street or
 33 Santa Fe some day between four and five o'clock. Weatherford has traffic jams, and it's crazy,
 34 but at least they've got those big trucks and all the equipment that are related to the Barnett
 35 shale drilling. And the trucks are tearing up our roads. (0016-70 [Kinzie, W.T.])

36 **Response:** *Potential effects on local roads and traffic conditions will be addressed in Section 4*
 37 *of the EIS for the construction period and in Chapter 5 of the EIS for the operations period.*

38 **Comment:** The City knows that this could have some burdens on the City, because we don't
 39 get any tax dollars for it, and we know that it could prevent a lot of people from moving into the
 40 city. It might have an effect on the water and the sewer and the roads. (0017-1 [Miller, Pam])

41 **Response:** *Potential effects on local roads and traffic conditions, public services, and tax*
 42 *revenues will be addressed in Chapter 4 of the EIS for the construction period and in Chapter 5*
 43 *of the EIS for the operations period.*

44 **Comment:** The EIS should also consider whether regional waterways will be impacted in terms
 45 of water quantity and quality by the use of vast quantities of water for Units 3 and 4, including

1 Lake Granbury, the Brazos River, the Paluxy River, Whitney Lake, a popular fishing lake, and
 2 popular recreational areas such as Possum Kingdom. According to the Texas Parks and Wildlife
 3 Department web site, the drinking water at Possum Kingdom State Park is currently non-potable
 4 due to a high salt content, and visitors must bring their own water for consumption. The potential
 5 to increase salt content of waterways in the region by further drawdown of water levels,
 6 including impacts to the local aquifer and drinking wells should be examined thoroughly in the
 7 EIS. (0022-23 [Hadden, Karen])

8 **Response:** *Potential impacts of plant operations on water quantity and quality in regional*
 9 *waterways will be addressed in Chapter 5 of the EIS.*

10 **Comment:** Since the specialized job skills required to manufacture nuclear reactors are
 11 virtually non-existent in the US, what is the plan to create jobs for Americans if the Comanche
 12 Peak project is approved? (0023-1 [Ubico, Jean])

13 **Response:** *Potential effects on employment will be addressed in Chapter 4 of the EIS for the*
 14 *construction period and in Chapter 5 of the EIS for the operations period.*

15 **Comment:** When the first two reactors were built the sky glow light pollution went from zero to
 16 off the scale in the direction of the reactors. The latest round of fixture modernization reduced
 17 the sky glow by about 40 percent. Our Concern is the two new units will increase the sky glow
 18 beyond what it was after initial construction. We would like to see a comprehensive relighting
 19 program for all four reactors, using the latest technology zero cut-off fixtures, such as those
 20 approved by the International Dark-sky Association in order to achieve an overall reduced light
 21 pollution impact than what now exists.

22 www.darksky.org (0024-3 [Miller, Russ])

23 **Response:** *The effects of light pollution from the proposed new reactors will be addressed in*
 24 *Chapter 5 of the EIS.*

25 **Comment:** I would like to see the lake at the Comanche Peak Nuclear Power Plant reopened
 26 for fishing. The possibility of a special license seems like a logical way to go to me. Restricted to
 27 Texas residences with concealed handgun licenses may be an option, since they have already
 28 passed a background check. Also, advance reservations, limited number of boats on the lake at
 29 a time, no more than 3 people per boat, etc. Fingerprints, photo on file, etc. Fishing only. No
 30 skiing or jet skis. Daylight hours only. I would like to allow tube floats and oar propelled
 31 watercraft. You could even set it up with a limited season only open during certain months. It
 32 just seems a shame to me that this lake is closed to the taxpayers of Texas and the honest law
 33 abiding fishermen (and women). (0007-1 [Drechel, Gary])

34 **Response:** *The potential effects of plant construction and operations on recreation will be*
 35 *addressed in Chapters 4 and 5 of the EIS.*

36 **Comment:** The new plant will need to use existing roads and to build new ones. Lots of cars,
 37 trucks, and machinery will pass over them.

- 38 • How will Luminant ensure that roads are not congested? How will Luminant transport
- 39 uranium and on which highways? Which communities will it pass through, and will their
- 40 police and firefighting forces be trained to deal with a radioactive accident?
- 41 • How would Luminant transport low-level and high-level radioactive waste if offsite storage
- 42 ever gets approved?

43 (0019-23 [Hadden, Karen])

1 **Response:** Existing local road and traffic conditions will be described in Chapter 2 of the
2 EIS. The effects of plant construction and operations on local roads and traffic will be addressed
3 under Socioeconomics in Chapters 4 and 5. In addition, the impacts of transporting unirradiated
4 and spent fuel will be addressed directly in Chapter 6 of the EIS.

5 **Comment:** Comanche Peak is very vital to the local economy (0004-4 [Luton, John Henry])

6 **Response:** The potential effects of plant construction and operations on local employment,
7 expenditures, and tax revenues will be addressed in Chapters 4 and 5 of the EIS.

8 **Comment:** The City of Granbury has joined Hood County in soliciting funds, or looking for
9 funds, to build the new access route to come near the Comanche Peak location, to provide
10 better access to and from the location. We do hope you all will endorse that project as well.
11 (0016-3 [Johnson, Lisa])

12 **Response:** A description of local roads and traffic conditions in the vicinity of the site will be
13 provided in Chapter 2 of the EIS. The effects on local roads and traffic conditions during the
14 construction and operation periods will be addressed in Chapters 4 and 5 of the
15 EIS. Endorsement of mitigation activities are outside the scope of the NRC's authority and will
16 not be addressed further.

17 **Comment:** And as an economic development, I know that the NRC is not in economic
18 development, but it's very nice for our community to have the jobs that come along with
19 expansion, the jobs and the need for new housing, the need for restaurants and services in our
20 community, which currently is vastly needed. (0016-32 [Ward, Mary])

21 **Response:** The effects of plant construction and operations on local employment,
22 expenditures, and housing will be addressed in Chapters 4 and 5 of the EIS.

23 **Comment:** I'm also the incoming president of the Brazos River Conservation Coalition. ...

24 We're an organization of about 700 members from Parker, Palo Pinto, and Hood and Somervell
25 County. Right now we have an initiative to declare the—and it's in the legislature, or it's going in
26 this session—the Brazos River and Lake Granbury—Brazos River in Hood and Somervell
27 County as part of the John Graves Scenic Riverway. I don't know how many people from
28 outside the area know just what a beautiful resource it is. We heard some of the people talking
29 about it. It's a resource that's under a lot of pressure. (0016-78 [Rosenfeld, Joshua])

30 **Response:** A description of local aesthetic and recreational resources in the vicinity of the site
31 will be provided in Chapter 2 of the EIS. Effects on local aesthetic and recreational resources
32 during the construction and operation periods will be addressed in Chapters 4 and 5 of the EIS.

33 **Comment:** We don't need to contribute to the economy of Somervell County and Hood County
34 for the benefit of their gaining on a rate. (0017-12 [Burnam, Lon])

35 **Response:** The impacts of plant construction and operations on local employment,
36 expenditures, and tax revenues will be addressed in Chapters 4 and 5 of the EIS.

37 **Comment:** I am a business owner here in Glen Rose. I have been, and I have had land here
38 for over ten years. And one of the things that attracted me to this area was the fact that there
39 was a nuclear power plant here. Recently, I just invested over \$6 million in this community in a
40 hotel. Based on the future growth that these kind of communities bring. (0017-56 [Sheaks,
41 Jerry])

42 **Response:** The effects of plant construction and operations on the local economy and the
43 demand for housing will be addressed in Chapters 4 and 5 of the EIS.

1 **Comment:** Section 5.2.2.3.1: The consumptive demands from the project are a concern for the
 2 Brazos River Basin. Chapter 3 Section 4 indicates that Luminant will use up to 103,000 acre
 3 feet per year (ac-ft/yr) of water from Lake Granbury for the cooling process with an estimated
 4 evaporative loss of 61,000 ac-ft/yr. The loss of 61,000 ac-ft/yr from Possum Kingdom Reservoir,
 5 Lake Granbury and the Brazos River will lead to declines in lake levels, a reduction of
 6 streamflow downstream of Lake Granbury, and a resultant wide range of impacts on fish and
 7 wildlife resources and recreation. ... Potential recreational effects span from Possum Kingdom
 8 Reservoir, to below the Lake Granbury dam, to the Brazos River below the city of Waco.
 9 Possum Kingdom Reservoir receives heavy recreational use, Lake Granbury supports
 10 recreational use, water skiers frequently use the Brazos River between Lake Granbury and
 11 Lake Whitney, and Lake Whitney has been rated the top destination by the citizens in the
 12 Dallas/Fort Worth area. Downstream of Lake Whitney, the Brazos River has been recognized as
 13 a canoeing and kayaking destination and Lake Brazos within the city of Waco is currently being
 14 developed into a major greenbelt. (0029-20 [Boydston, Kathy])

15 **Response:** *Potential impacts of plant operation on water-based recreation in the region will be*
 16 *addressed in Chapter 5 of the EIS.*

17 **D.2.13 Comments Concerning Historic and Cultural Resources**

18 **Comment:** On December 30, 2008, the Advisory Council on Historic Preservation (ACHP)
 19 received from the Nuclear Regulatory Commission (NRC) a notification pursuant to Section
 20 800.8(c) of the ACHP's regulations, Protection of Historic Properties (36 CFR 800), regarding
 21 the referenced project. We appreciate receiving your notification, which establishes that NRC
 22 will use the process and documentation required for the preparation of an EA/FONSI or an
 23 EIS/ROD to comply with Section 106 of the National Historic Preservation Act in lieu of the
 24 procedures set forth in 36 CFR 800.3 through 800.6.

25 In addition to notification to the ACHP, NRC must also notify the Texas State Historic
 26 Preservation Officer and meet the standards in Section 800.8(c)(1)(i) through (v) for the
 27 following:

- 28 • identifying consulting parties;
- 29 • involving the public;
- 30 • identifying historic properties and assessing the undertaking's effects on historic properties;
 31 and
- 32 • consulting regarding the effects of the undertaking on historic properties with the
 33 SHPO/THPO, Indian tribes and Native Hawaiian organizations that might attach religious
 34 and cultural significance to affected historic properties, other consulting parties, and the
 35 ACHP, where appropriate, during NEPA scoping, environmental analysis, and the
 36 preparation of NEPA documents.

37 To meet the requirement to consult with the ACHP as appropriate, the NRC should notify the
 38 ACHP in the event NRC determines, in consultation with the SHPO/THPO and other consulting
 39 parties, that the proposed undertaking(s) may adversely affect properties listed, or eligible for
 40 listing, on the National Register of Historic Places (historic properties). In addition, Section
 41 800.8(c)(2)(i) requires that you submit to the ACHP any DEIS or EIS you prepare. Inclusion of
 42 your adverse effect determination in both the DEIS/EIS and in your cover letter transmitting the
 43 DEIS/EIS to the ACHP will help ensure a timely response from the ACHP regarding its decision
 44 to participate in consultation. Please indicate in your cover letter the schedule for Section 106
 45 consultation and a date by which you require a response by the ACHP.

1 The regulations do not specifically require that an agency submit an EA to the ACHP. However,
2 keep in mind that, in the case of an objection from the ACHP or another consulting party,
3 Sections 800.8(c)(2)(ii) and (c)(3) provide for ACHP review of an EA (in addition to a DEIS or
4 EIS) to determine whether preparation of the EA, DEIS or EIS has met the standards set forth in
5 Section 800.8(c)(1) and/or to evaluate whether the substantive resolution of the effects on
6 historic properties proposed in an EA, DEIS or EIS is adequate.

7 If NRC's determination of adverse effect will be documented in an EA, we request that you
8 notify us of the adverse effect and provide adequate documentation for its review. The ACHP's
9 decision to review an EA, DEIS or EIS will be based on the applicability of the criteria in
10 Appendix A of the ACHP's regulations. (0036-1 [Duvall-Gabriel, Najah])

11 **Response:** *If the staff determines that the proposed undertaking will adversely affect properties*
12 *listed, or eligible for listing, on the National Register of Historic Places (historic properties), the*
13 *NRC will notify the ACHP in accordance with the consulting requirements. Additionally, in*
14 *accordance with Section 800.8(c)(2)(i) of 36 CFR Chapter 800, the NRC staff will submit copies*
15 *of the DEIS and EIS to the ACHP upon completion of the documents. As part of its*
16 *environmental review of historic and cultural resources, the NRC staff consulted with the Texas*
17 *Historical Commission (THC) and other appropriate information sources. The results of the*
18 *analysis will be presented in Chapter 4 of the EIS, and the staff will take any appropriate action*
19 *called for as a result of this review.*

20 **Comment:** The Tonkawa Tribe has no specifically designated historical or cultural sites
21 identified in any of the above listed project areas. However if any human remains, funerary
22 objects, or other evidence of historical or cultural significance is inadvertently discovered then
23 the Tonkawa Tribe would certainly be interested in proper disposition thereof.

24 We appreciate notification by your office of the many projects on-going, and as always the
25 Tonkawa Tribe is willing to work with your representatives in any manner to uphold the
26 provisions of NAGPRA to the extent of our capability. (0037-1 [Illegible, Illegible])

27 **Response:** *As part of its environmental review of historic and cultural resources, the staff met*
28 *with the Texas Historical Commission (THC) and other appropriate information sources. The*
29 *results of the analysis will be presented in Chapter 4 of the EIS, and the staff will take any*
30 *appropriate action called for as a result of this review.*

31 **Comment:** A cultural resource survey should be coordinated with the State Historic
32 Preservation Officer (SHPO). Besides the consideration of listed historical sites, the NEPA
33 document should discuss procedures for events such as unearthing archaeological sites during
34 prospective construction. Such procedures should include work cessation in the area until
35 SHPO approval of continued construction. (0027-19 [Osowski Morgan, Sharon L.])

36 **Response:** *A previously conducted cultural resource survey provided coverage of the area that*
37 *might be impacted by the proposed project. On February 21, 2007, the Texas State Historic*
38 *Preservation Officer (SHPO) sent a concurrence letter to the applicant noting that no historic*
39 *properties would be affected by the proposed action. This letter was referenced in the*
40 *applicant's Environmental Report and will be included in an appendix of the EIS. Additionally,*
41 *the NRC staff will discuss the applicant's procedures for dealing with unanticipated*
42 *archaeological finds in Chapter 4 of the EIS.*

1 **D.2.14 Comments Concerning Environmental Justice**

2 **Comment:** The proposed new plants would affect low income and minority residents.

- 3 • How much will rent go up when the influx of construction workers and their families come to
- 4 Somervell County?
- 5 • Will pollution from construction and operation reach low-income housing areas?
- 6 **(0019-25 [Hadden, Karen])**

7 **Response:** *Effects on housing availability will be addressed in Chapter 4 of the EIS for the*
 8 *construction period and in Section 5 of the EIS for the operations period. Effects on minority*
 9 *and low-income populations specifically will also be addressed in Chapters 4 and 5 of the EIS.*

10 **Comment:** Consistent with Executive Order 12898, potential EJ [environmental justice] impacts
 11 should be considered in the NEPA document. An EJ survey is to ensure equitable
 12 environmental protection regardless of race, ethnicity, economic status or community, so that no
 13 segment of the population bears a disproportionate share of the consequences of environmental
 14 pollution attributable to a proposed project.

15 Since uranium mining that occurs in the US may impact tribal lands or environmental justice
 16 areas in the western states primarily (including portions of New Mexico and Texas), the potential
 17 impacts of increased uranium mining (e.g., in situ leach) and increased exposure of residents
 18 should be evaluated. Links between the proposed project and NUREG-1910 should be included
 19 in the NEPA document.

20 Secondary impacts to low income, minority, and tribal communities concerning the use of the
 21 Yucca Mountain repository and transportation routes from the uranium processing facility should
 22 also be incorporated.

23 EPA recommends that the EIS provide clarification regarding resource dependencies or
 24 practices, such as subsistence agriculture, hunting, or fishing, through which certain populations
 25 could be disproportionately affected. Low-income populations are likely to conduct such
 26 subsistence practices. EPA recommends the EIS include a more comprehensive discussion of
 27 potential benefits and impacts associated with the project, as it relates to minority and low-
 28 income populations and the population at large. **(0027-20 [Osowski Morgan, Sharon L.]**

29 **Response:** *Impacts on low-income and minority populations residing in the impact region,*
 30 *including impacts associated with subsistence activities in the vicinity of the plant, will be*
 31 *addressed in Chapters 4 and 5 of the EIS. Possible impacts occurring outside the impact region*
 32 *(such as those associated with mining and spent fuel storage) are beyond the scope of this*
 33 *environmental review and will not be addressed in the EIS. Mining, milling, and waste storage*
 34 *operations are all subject to separate regulatory processes.*

35 **D.2.16 Comments Concerning Health - Radiological**

36 **Comment:** There are routine releases from nuclear plants. Most people don't know this. This is
 37 not being adequate addressed, and needs to be, through the environmental impact statement
 38 and other avenues. There is no federal standard called a MACT, maximum achievable control
 39 technology standard, for radionuclides. That has been done for other industries, for example, for
 40 their mercury in the coal plants. That needs to happen. **(0016-21 [Hadden, Karen])**

41 **Comment:** Right now there are high levels of tritium from this plant, and this needs to be
 42 looked into in the environmental impact statement. And they are high compared to other nuclear
 43 reactors in the country. **(0016-25 [Hadden, Karen])**

1 **Comment:** But let's talk about the cancer and the background rate.

2 It is a simple fact of life that there is background radiation. And then there is also a simple fact of
3 life, since the first above-ground explosions of nuclear weapons, we've increased that
4 background radiation. There's also a simple fact of life that background radiation is higher at
5 every nuclear power facility in the country. And if you double that, it's a simple fact of life that
6 you're going to double background radiation in this community.

7 I want the environmental impact statement to do an honest analysis and assessment of what
8 that means to the cancer rate in this region. I represent 150,000 people within 50 miles of this
9 facility, and I think it's reasonable to expect that that kind of analysis is done. **(0016-39** [Burnam,
10 Lon])

11 **Comment:** I also hope that you'll be looking at issues like release of tritium to the water, the
12 potential—I'm not—I don't know that much about this particular process, because frankly the
13 design hasn't been certified yet, but in terms of—there have been problems in the past with
14 releases of tritium into water at nuclear plants. I don't know if that would be the case in this
15 particular plant. So I would urge you to look at that.

16 **(0016-53** [Reed, Cyrus])

17 **Comment:** I would urge you to look at, you know, there's not a lot of scientific study on what
18 are the impacts of noble gases, which are often released at nuclear plants. But I hope that will
19 be part of your review as well. **(0016-54** [Reed, Cyrus])

20 **Comment:** But the problem is, that not only do we have a massive increase of cancer, because
21 of the entire fuel line from the uranium mining, to the fact that we haven't been able to resolve
22 the deposition of the polluted radiation, we have got a gene pool issue. **(0017-10** [Burnam, Lon])

23 **Comment:** Why is the tritium level higher here? You have got the problem now with the two
24 facilities. Will two additional facilities make that tritium level even that much higher? **(0017-14**
25 [Burnam, Lon])

26 **Comment:** One of my biggest concerns is the risk from the radiation. And the fact that the
27 more radiation that there is, that the greater risk will be to the community. And the
28 Environmental Impact Statement should thoroughly examination all of the radiation health risks.

29 And no national standard has been set for the radio nucleate emissions, despite the fact that
30 nuclear reactors routinely emit cancer causing radioactivity. And really, no new reactors should
31 be licensed until this standard has been set.

32 Research has shown an increase in cancer rates around nuclear plants. And Dr. Joseph
33 Mangano of the Radiation and Public Health Project studied the cancer death rate in the three
34 counties closest to the South Texas Nuclear Project. An area that originally had a cancer rate
35 below the statewide rate, in 16 years after the reactors began running, the cancer death rate in
36 the area had risen over 16 percent. **(0017-38** [Rooke, Molly])

37 **Comment:** the EIS should research the extent to which the new reactors would add to the
38 cancer risks.

39 And four reactors at one site would produce significantly more radioactive risks than the two
40 existing reactors.

41 And what would be the total amount of low level radiation emitted? And how much would
42 surrounding populations be exposed to this? And how much radioactivity would be emitted, just
43 in the routine operations.

1 And so the EIS should use background radiation levels in their studies and to compare them to
2 construction of the two existing nuclear reactors. And I am concerned about what would happen
3 with the radioactive gasses that would be vented. And not just during the normal operations, but
4 during purges. And I am also concerned about what tritium would be released into the water at
5 the new proposed plant. (0017-39 [Rooke, Molly])

6 **Comment:** Because as you have heard other people say, radiation affects you on a genetic
7 level. It affects your DNA. So what damages your DNA will remain in all of the generations of
8 your family to come. (0017-62 [Rittenhouse, Ryan])

9 **Comment:** from the very beginning to the very end, there is risk of radioactive release.
10 (0017-69 [Sanders, Jan])

11 **Comment:** It hits the genetic mechanism of the human body and messes it up. And it is a slow
12 deformity. But it has been tested out. It has been proven. And so why take the risk?
13 (0017-71 [Sanders, Jan])

14 **Comment:**
15 The EIS should research the extent to which new reactors would add to cancer risks. Four
16 reactors at one site would produce significantly more radioactive risk than the two existing
17 reactors. What would be the total amount of low-level radiation emitted? How much would
18 surrounding populations be exposed? How much radioactivity would be in routine operations?

19 The EIS should use background radiation levels not only from before the construction of the two
20 existing nuclear reactors also from before the testing of nuclear weapons in the United States,
21 which resulted in radioactive fallout. (0019-10 [Hadden, Karen])

22 **Comment:** Radioactive tritium can leak from nuclear reactors and increase cancer risks.
23 According to NRC reports tritium levels are already high at the Comanche Peak site compared
24 to other reactor sites. What would adding more reactors do to the already high levels of
25 contamination? (0019-15 [Hadden, Karen])

26 **Comment:** The Environmental Impact Statement (EIS) should thoroughly examine radiation
27 health risks. (0019-9 [Hadden, Karen])

28 **Comment:** Comanche Peak Units 1 and 2 already utilize Squaw Creek Reservoir as a
29 discharge water body that receives radionuclides including tritium and radioactive particulates.
30 Dr. Arjun Makhijani, president of the Institute for Energy and Environmental Research has noted
31 the relatively high levels of tritium at this site compared to other nuclear reactors, which should
32 be examined and compared to other sites in the EIS, and additional cumulative impacts should
33 be analyzed. (0022-12 [Hadden, Karen])

34 **Comment:** The cumulative impacts on the food chain from the bioaccumulation and
35 bioconcentration of radionuclides discharged from Units 3 and 4 should be considered in terms
36 of the public health implications and the mortality and morbidity calculations related thereto
37 should be a part of the EIS. (0022-29 [Hadden, Karen])

38 **Comment:** The EIS for the proposed expansion of Comanche Peak should quantify and
39 speciate the various radionuclides emitted and quantify the total air emissions anticipated as a
40 result of operation of Units 3 and 4 and determine mortality and morbidity consequences
41 thereof. Additionally, because radionuclides are considered a hazardous air pollutant the EIS
42 should analyze radioactive air emissions on a comparative basis with the emissions permitted

1 under the more relaxed standards applied to Units 1 and 2 and air emissions from Units 3 and 4
2 under a MACT standard. (0022-38 [Hadden, Karen])

3 **Comment:** Squaw Creek Reservoir should be analyzed for radiological hazards because of
4 radioactive particulates currently discharged from Comanche Peak Units 1 and 2 that are
5 accumulating in sediment and additional radionuclide loading if Units 3 and 4 are operational.
6 (0022-7 [Hadden, Karen])

7 **Comment:** The inevitable increase in radioactive emissions into the environment will not be
8 beneficial. (0031-4 [Gentling, Suzanne])

9 **Comment:** Tritium and other radioactive particulates ... are major concerns for the receiving
10 waters. These must be adequately addressed in light of the additional water discharges from
11 Units 3 and 4 both in the receiving waters, but also downstream. (0032-8 [Reed, Cyrus])

12 **Response:** *The EIS will address the human health impacts of exposure to radiological effluents*
13 *from the existing and proposed Comanche Peak units in Section 5.9 of the EIS.*

14 **Comment:** We need to look closely at worker exposure. (0016-22 [Hadden, Karen])

15 **Comment:** Risks to employees and area residents should be addressed.

16 Statements about high doses and low doses of radiation, their potential health effects, and
17 established risk or exposure standards should be included in the NEPA document. (0027-5
18 [Osowski Morgan, Sharon L.]

19 **Response:** *Occupational radiation exposure will be discussed in Chapter 5 of the*
20 *EIS. Radiation exposure to construction workers will be addressed in Chapter 4 of the EIS.*

21 **Comment:** According to the Nuclear Information and Resource Service, the "Use of MOX fuel
22 attacks commercial nuclear reactors where they are the weakest ... Because of its high neutron
23 flux levels, the reactor pressure vessel can become embrittled and fail during accident
24 conditions. A nuclear accident involving MOX fuel could cause a meltdown more serious than
25 Three Mile Island or Chernobyl, because the levels of radiation inside a reactor using MOX are
26 even higher than in a normal atomic reactor." These increased risks and the related increased
27 worker and terrorism risks and potential resulting economic impacts from utilization of MOX fuel
28 should be included in the EIS. (0022-26 [Hadden, Karen])

29 **Response:** *Luminant has stated that it does not plan to use mixed-oxide fuel. If at some future*
30 *date, Luminant should decide to use mixed oxide fuel at the Comanche Peak plant, the NRC*
31 *staff would conduct a safety and environmental review of the proposal.*

32 **Comment:** The Comanche Peak environmental report at p. 5.7-3 concedes the fact that there
33 is presently no means by which to dispose of high-level waste. Management of high-level waste
34 on-site is limited to spent fuel pools or dry cask storage units. Alternatively, the environmental
35 report suggests that for plants with inadequate wet or dry on-site storage capacity, spent fuel
36 could be transferred off-site to another plant that has adequate storage capacity available. The
37 EIS therefore, must consider the long-term environmental and public health consequences of
38 spent fuel remaining on site at Comanche Peak indefinitely. A federal repository for spent fuel
39 has not been approved and the prospects for such are, at best, problematic. Long-term spent
40 fuel management on-site represents risks that are not fully assessed in the environmental
41 report. ... Even if the dry cask storage units are not breached they still represent significant long-
42 term sources of radiation. These radiation measurements should be calculated and added to the
43 current projections for exposures to the extent that the environmental report understates such
44 based on the assumption that spent fuel will eventually be moved off-site. The EIS should

1 assume that the dry cask storage units will remain on Comanche Peak's site indefinitely and
2 make radiation exposure projections accordingly. (0022-40 [Hadden, Karen])

3 **Response:** *Discussions of the estimated dose to construction workers and the public, including*
4 *doses from dry cask storage, will be found in Chapters 4 and 5 of the EIS.*

5 **Comment:** I would love to see the issue addressed about Kleberg County, where the ground
6 water currently contains unsafe levels of uranium and the EPA strongly advises against
7 drinking it.

8 It is not just about your counties. It is about Kleberg County. (0017-17 [Burnam, Lon])

9 **Comment:** The Environmental Protection Agency has warned residents of Kleberg County that
10 their groundwater currently contains unsafe levels of uranium, and strongly advises against
11 drinking it. (0019-27 [Hadden, Karen])

12 **Response:** *The NRC will consider this information as part of the evaluation of cumulative*
13 *impacts of the existing and proposed Comanche Peak units in Chapter 7 of the EIS.*

14 **Comment:**

15 In 1980 the NRC conducted a study of what would happen under a worst-case scenario
16 accident at each nuclear plant site. The Comanche Peak estimates were

- 17 • 1210 early deaths (25 mile radius around plant)
- 18 • 13,800 early injuries (35 mile radius)
- 19 • \$117 billion (1980 dollars) in financial consequences

20 The EIS should update these risk figures and include the analysis in the report, taking into
21 account the current population since the area has grown significantly since 1980 and since
22 there would be two additional reactors at the site.

23 The National Academy of Sciences has concluded that radiation is dangerous even at low levels
24 (BEIR VII study). While low-level radiation exposure is not as damaging as high-level radiation
25 on a short-term basis, prolonged exposure to low-level radioactivity can be just as damaging to
26 humans. The EIS should research the extent to which new reactors would add to cancer risks,
27 birth defects and genetic impacts.

28 The EIS should include analysis of how much radioactivity would be released in routine
29 operations and the frequency of releases that would occur.

30 Original background radiation levels should be included in the report. Data or radiation
31 estimates from before the two existing nuclear reactors were constructed should be included, as
32 well as calculations of the true original background level that was present before the testing of
33 nuclear weapons in the United States, and the radioactive fallout that resulted. (0022-30
34 [Hadden, Karen])

35 **Response:** *The NRC will evaluate the human health impacts of exposure to radiological*
36 *effluents from the existing and proposed Comanche Peak units in Section 5.9 of the EIS. The*
37 *NRC will evaluate the human health risks of severe accidents in Section 5.10 of the EIS.*

38 **Comment:** The Comanche Peak environmental report relies on data from Table S-3. P. 5.7-17.
39 However, Table S-3, fails to consider health effects from radioactive effluents and further does
40 not estimate releases of either Radon-222 or Technetium-99. The Comanche Peak
41 environmental report does discuss the dose commitment estimates of both RN-222 and TC-99.

1 However, there is no analysis of mortality or morbidity consequences related to conditions of
2 either radionuclide. The EIS should consider the mortality and morbidity consequences related
3 to the emissions of all the radionuclides anticipated from the routine operations of Comanche
4 Peak Units 3 and 4. Mortality and morbidity analyses should also occur for accident scenarios
5 involving releases of radionuclides from Comanche Peak Units 3 and 4. (0022-36 [Hadden,
6 Karen])

7 **Comment:** The EIS for the proposed expansion of Comanche Peak must account for
8 increased quantities of radiological waste streams and the environmental impacts and public
9 health consequences thereof. The environmental report fails to fully quantify the environmental
10 impacts and public health consequences and omits altogether mortality and morbidity analyses
11 associated therewith. A proper EIS must account for environmental and public health
12 consequences associated with increased quantities of radioactive waste originating at Units 3
13 and 4. This analysis should include disposition of large plant components such as steam
14 generators that may require replacement before expiration of the reactors' useful lives.
15 Replacement and disposition of steam generators is not a far-fetched or speculative possibility.
16 The Trojan nuclear plant in Oregon replaced its steam generators. Trojan's original steam
17 generators were shipped on the Columbia River by barge to a disposition site in Washington
18 state. The EIS related to Comanche Peak should include an analysis of the environmental
19 impacts and public health consequences of replacing steam generators at Comanche Peak
20 Units 3 and 4 including radiological impacts both on-site and off-site. (0022-37 [Hadden, Karen])

21 **Response:** *The impacts of the uranium fuel cycle, including disposal of low-level radioactive*
22 *waste and spent fuel, will be addressed in Chapter 6 of the EIS.*

23 **Comment:** The environmental report indicates that Squaw Creek Reservoir will continue to be
24 the receiving body of water for various discharges from Comanche Peak Units 3 and 4. The
25 Environmental Report concedes that radioactive particulate matter released to Squaw Creek
26 Reservoir in liquid effluents will be deposited into the sediment layer of the reservoir bottom and
27 remain there indefinitely. Comanche Peak NPP Environmental Report, p.5.11-3. In the event of
28 a protracted drought, and inadequate flow into Squaw Creek Reservoir, the sediment layer
29 could become exposed and, if adequately deliquified, would become dust and subject to
30 transport by wind with clear public health and environmental consequences.

31 Therefore, it is crucial that the EIS include a complete radiological profile of the existing
32 sediment in Squaw Creek Reservoir and an analysis of the cumulative radiological impacts
33 expected from operations on it from Units 3 and 4. This analysis is required in order to fully
34 gauge the environmental and public health impacts from the use of the earthen Squaw Creek
35 Reservoir as a discharge point for radioactive effluent from Comanche Peak Units 3 and 4. Part
36 of this analysis should be an assumption that the Squaw Creek Reservoir dam will at some
37 point fail and release the sediment that is burdened by radioactive particulates. Downstream
38 impacts on water quality, use, and impacts on mortality and morbidity must be a part of a proper
39 EIS. The Squaw Creek Reservoir dam should also be analyzed for structural integrity.
40 Protracted drought, seismic activity, or other natural events have the potential to weaken the
41 dam and if a failure of the structure occurs radioactive sediment could be carried downstream
42 with significant potential for environmental and public health impacts. (0022-15 [Hadden,
43 Karen])

44 **Comment:** Because the Comanche Peak nuclear plants discharge radioactive effluent into the
45 Squaw Creek Reservoir that drains into the Brazos River and Paluxy River, the EIS should
46 quantify the mortality and morbidity impacts, potential cancer and birth defect increases and
47 genetic damage from exposure to radioactive water by municipal and other users. This analysis
48 should include consideration of the public health and environmental consequences of a failure

1 of the Squaw Creek dam and the transport downstream of radioactive particulates in the
2 reservoir's sediment. (0022-35 [Hadden, Karen])

3 **Response:** *The NRC will evaluate the human health impacts of exposure to radiological*
4 *effluents from the existing and proposed Comanche Peak units in Section 5.9 of the EIS. This*
5 *evaluation will include exposure to radionuclides expected to be deposited in the sediments of*
6 *Squaw Creek Reservoir during routine operation. The other dose pathway scenarios postulated*
7 *by the commenters are very unlikely and will not be addressed in the EIS.*

8 **D.2.17 Comments Concerning Accidents - Design Basis**

9 **Comment:** I would like to request an explanation of how it is safe to build and operate new
10 nuclear reactors prior to the implementation of the same post 9-11 security hardening
11 requirements that existing nuclear reactors have that has not been done. Without this in place,
12 there are risks to the environment that are increased. This should be analyzed in the
13 Environmental Impact Statement. If they can do this at existing reactors, why not new ones?
14 (0017-26 [Hadden, Karen])

15 **Response:** *Comments related to security and terrorism are safety issues that are not within the*
16 *scope of the staff's environmental review. The NRC is devoting substantial time and attention to*
17 *terrorism-related matters, including coordination with the Department of Homeland Security. As*
18 *part of its mission to protect public health and safety and the common defense and security*
19 *pursuant to the Atomic Energy Act, the NRC staff is conducting vulnerability assessments for*
20 *the domestic utilization of radioactive material. Since the events of September 2001, the NRC*
21 *has identified the need for license holders to implement compensatory measures and has*
22 *issued several orders to license holders imposing enhanced security requirements. Finally, the*
23 *NRC has taken actions to ensure that applicants and license holders maintain vigilance and a*
24 *high degree of security awareness. Consequently, the NRC will continue to consider measures*
25 *to prevent and mitigate the consequences of acts of terrorism in fulfilling its safety*
26 *mission. Additional information about the NRC staff's actions regarding physical security since*
27 *September 11, 2001, can be found on the NRC's public web site <http://www.nrc.gov>.*

28 **Comment:** Luminant is adding two reactors on top of two existing reactors and the cumulative
29 impacts of all four units must be addressed In addition, the impacts of any minor or major
30 accident at one unit on other units must be addressed. (0032-10 [Reed, Cyrus])

31 **Response:** *The frequency and consequences of accident scenarios that lead to radiological*
32 *consequences are determined through the use of probabilistic risk assessment techniques. In*
33 *accordance with MHI, LTD., "U.S-APWR Probabilistic Risk Assessment (Level 3)," MUAP-8004-*
34 *P (R1), the estimated CDF for Comanche Peak 3 and 4 is 1.2E-06 per year per unit and the*
35 *sum of all containment release frequencies is 1E-07 per year per unit. Therefore, the frequency*
36 *where a severe accident could potentially impact the operating units is approximately 2E-07 per*
37 *year. Because this frequency is below the screening criteria (1E-06 per year) for initiating*
38 *events contained in ASME/ANS RA-S-2008, "Standard for Level 1/Large Early Release*
39 *Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications," Supporting*
40 *Requirement IE-C4, its impact on the operating units would not be considered to be*
41 *material. The impact of accident scenarios associated with the current units, Comanche Peak 1*
42 *and 2, on the proposed units, Comanche Peak 3 and 4, is not considered to be in-scope of the*
43 *current EIS. Cumulative impacts will be addressed in Chapter 7 of the EIS.*

44 **Comment:** The evaluation methodology utilized in the Comanche Peak environmental report
45 for design basis accidents is flawed. P. 7.1-1. The postulated loss of cooling accident assumes
46 that there will be a lower magnitude of radioactivity releases than a worst-case scenario

1 assumes. The EIS should approach a loss of cooling accident from the perspective that a
2 complete loss of radioactive inventory will occur. A complete loss of radioactive inventory should
3 be the base assumption for determining anticipated doses that may be received by the public.
4 Accordingly, the EIS should not adopt the Comanche Peak environmental report evaluation
5 methodology for design basis accidents and should assume a worst-case scenario that includes
6 a complete release of all radiation from both Units 3 and 4. (0022-47 [Hadden, Karen])

7 **Response:** *The staff's position is that the assessment of design basis accidents is based on*
8 *conservative assumptions and calculations used in NRC safety evaluations as stated in Section*
9 *15 of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for*
10 *Nuclear Power Plants." This conservative assessment is used to establish performance*
11 *requirements of the plant's engineered safety features. Among the conservative assumptions*
12 *used pursuant to the Section 15 analysis is the use of adverse meteorological dispersion*
13 *conditions (i.e., 95th percentile X/Q). As actual consequences will likely be far less severe than*
14 *those given for the same events, design basis accidents are evaluated using more realistic*
15 *meteorological conditions (50th percentile site-specific X/Q values). The evaluation*
16 *methodology used in the Comanche Peak environmental report is consistent with this*
17 *approach. In addition, existing requirements provide assurance that the probability of*
18 *simultaneous accidents at multiple units would be substantially less (e.g., over an order of*
19 *magnitude) than the probability of accidents involving a single unit. For example, 10 CFR Part*
20 *50, General Design Criterion 5, "Sharing of structures, systems, and components," requires that*
21 *structures, systems, and components important to safety not be shared unless it can be shown*
22 *that such sharing will not significantly impair their ability to perform their safety functions,*
23 *including, in the event of an accident in one unit, an orderly shutdown and cool down of the*
24 *remaining units. Also, a plant- and site-specific probabilistic risk assessment (PRA) will be*
25 *required prior to operation of any future plant pursuant to 10 CFR 50.34(f)(1)(i). This PRA will*
26 *determine whether the risk from the as-built units will be low and will account for any inter-unit*
27 *dependencies. In contrast, the consequences associated with an accident involving multiple*
28 *units (e.g., a multi-unit core-melt accident) could reasonably be expected to be only marginally*
29 *greater than for a single unit event. For example, given the same accident release*
30 *characteristics for both units, the total releases from two reactor cores (and the associated*
31 *accident consequences) would, as a first-order-of-magnitude approximation, be about twice that*
32 *for a single unit. The substantially lower frequency of a multiple unit accident would more than*
33 *offset the potentially greater consequences of the multiple unit accident. Thus, the risk*
34 *associated with multiple, simultaneous accidents would be a negligible contributor to the overall*
35 *risk from all units on the site. Accordingly, the staff does not plan to address multi-unit*
36 *accidents as part of the EIS review.*

37 **Comment:** Each nuclear reactor design has unique flaws and weaknesses, and experience
38 shows equipment and design failures, as well as areas and situations where human error is
39 likely. The history of similar Pressurized Reactor Water (PWR) reactors in Japan should be
40 considered in the EIS analysis, not just the Design Control Document.

41 The proposed USAPWR reactor design has never been approved and the design has never
42 been built anywhere in the world, but has been developed from the design used in existing PWR
43 reactors in Japan. Problems with existing PWR reactors there could provide clues to potential
44 problems with Comanche Peak Units 3 and 4, allowing estimation of the likelihood that they
45 could result in any number of environmental and health impacts. Design history should be
46 considered in the EIS. (0022-54 [Hadden, Karen])

47 **Comment:** The proposed Mitsubishi reactors are of a design as yet untested in the field. This is
48 not reassuring. (0031-6 [Gentling, Suzanne])

1 **Response:** *The EIS will address the potential environmental impacts of postulated design-*
 2 *basis and severe accidents associated with the US-APWR design (the designation used for the*
 3 *design of the proposed Mitsubishi reactors). In a separate action, the staff is evaluating the*
 4 *potential consequences of design-basis accidents and the probability and consequences of*
 5 *severe accidents for the US-APWR as part of its review of the application for certification of the*
 6 *reactor design. A detailed description of the design certification review is beyond the scope of*
 7 *the EIS. However, the staff uses well-established methods to analyze a new design to*
 8 *determine the potential consequences of accidents. The results of the certification review*
 9 *process will be compared to the results of the evaluation of the environmental impacts of*
 10 *potential radiological releases to ensure consistency.*

11 **Comment:** The EIS should discuss monitoring of radiation, prevention of releases, and
 12 emergency planning procedures in case of an unintended release. (0027-4 [Osowski Morgan,
 13 Sharon L.]

14 **Response:** *Radiation monitoring for the existing and proposed Comanche Peak units will be*
 15 *addressed in Section 5.9 of the EIS. Those radiation releases associated with normal operation*
 16 *will be addressed in Section 5.9, and those releases associated with postulated accidents will*
 17 *be addressed in Section 5.10. Section 5.10 also addresses the identification and evaluation of*
 18 *severe accident design and procedural or training mitigation alternatives that can be justified to*
 19 *further reduce the likelihood or consequences of severe accidents. However, emergency*
 20 *planning is outside the scope of the EIS and will not be considered further in the staff's*
 21 *environmental review. An evaluation of emergency planning issues will be part of the safety*
 22 *evaluation report (see 10 CFR 52.18).*

23 **D.2.18 Comments Concerning Accidents - Severe**

24 **Comment:** There is a whole issue of accident and security. Back in 1980, the NRC conducted
 25 a study, and they concluded at that time that early deaths—and that's a nice catchword for
 26 people that die immediately as opposed to long-term, protracted, strung-out deaths— they
 27 estimated early deaths of 1,210 within the first 25-mile radius. They estimated early injuries
 28 within a 35-mile radius of 13,800.

29 They estimated financial consequences—you know, we always talk in the legislative process
 30 about the unplanned consequences or the unintended consequences—well, the financial
 31 consequences could be in excess of \$117 billion.

32 Well, you know, it doesn't take a brilliant person to figure out that almost 30 years later—it'll be
 33 35 or 40 years later—once this thing, if it's built, is operational, that those early deaths will be far
 34 more than that. In part because of the rapid population growth in Hood and Somervell Counties,
 35 those early injuries will be far more than that. And those financial consequences to the entire
 36 North Texas region will be far more than what you projected back in 1980. So I look for and
 37 anticipate an honest and accurate analysis of those problems.

38 (0016-41 [Burnam, Lon])

39 **Response:** *The EIS will include an evaluation of the risks associated with potential severe*
 40 *accidents, including accidents that involve reactor core melts. The EIS will address the potential*
 41 *consequences of postulated design-basis and severe accidents and will take into account the*
 42 *current and anticipated population growth of the surrounding counties during the projected*
 43 *operational period of these plants. However, comments related to security and terrorism are*
 44 *safety issues that are not within the scope of the NRC staff's environmental review and are*
 45 *regulated by 10 CFR Part 73, "Physical Protection of Nuclear Power and Materials."*

1 **Comment:** The risk of a nuclear accident and the magnitude of devastation would increase
2 with more reactors on the site.

3 ... In 1980 the NRC conducted a study of what would happen under a worst-case scenario
4 accident at each nuclear plant site. The Comanche Peak estimates were:

- 5 • 1210 early deaths (25 mile radius around plant)
- 6 • 13,800 early injuries (35 mile radius)
- 7 • \$117 billion (1980 dollars) in financial consequences

8 The Environmental Impact Statement should include a similar study to update these risk figures,
9 since the population of the region has grown and since there would be more reactors. **(0019-11**
10 **[Hadden, Karen])**

11 **Response:** *The EIS will include an evaluation of the risks associated with potential severe*
12 *accidents, including accidents that involve reactor core melts. The EIS will address the potential*
13 *consequences of postulated design-basis and severe accidents, and will take into account the*
14 *current and anticipated population growth of the surrounding counties during the projected*
15 *operational period of these plants.*

16 **Comment:** Additionally, cumulative impacts from accident scenarios should also be
17 considered. For example, the EIS should consider whether a radiological accident, at one plant
18 could interfere/interrupt operations at the remaining plants at the Comanche Peak site. Further,
19 there should be a careful consideration of whether an accident or event at one plant could
20 actually preclude operations at the remaining plants. This is relevant because of the close
21 proximity of the planned Units 3 and 4 to the existing Units 1 and 2. **(0022-28 [Hadden, Karen])**

22 **Comment:** Luminant is adding two reactors on top of two existing reactors and the cumulative
23 impacts of all four units must be addressed In addition, the impacts of any minor or major
24 accident at one unit on other units must be addressed. **(0032-11 [Reed, Cyrus])**

25 **Response:** *The frequency and consequences of accident scenarios that lead to radiological*
26 *consequences are determined through the use of probabilistic risk assessment techniques. In*
27 *accordance with MHI, LTD., "U.S-APWR Probabilistic Risk Assessment (Level 3)," MUAP-8004-*
28 *P (R1), the estimated CDF for Comanche Peak 3 and 4 is 1.2E-06 per year per unit and the*
29 *sum of all containment release frequencies is 1E-07 per year per unit. Therefore, the frequency*
30 *where a severe accident could potentially impact the operating units is approximately 2E-07 per*
31 *year. Because this frequency is below the screening criteria (1E-06 per year) for initiating*
32 *events contained in ASME/ANS RA-S-2008, "Standard for Level 1/Large Early Release*
33 *Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications," Supporting*
34 *Requirement IE-C4, its impact on the operating units would not be considered to be*
35 *material. The impact of accident scenarios associated with the current units, Comanche Peak 1*
36 *and 2, on the proposed units, Comanche Peak 3 and 4, is not considered to be in-scope of the*
37 *current EIS. Cumulative impacts will be addressed in Chapter 7 of the EIS.*

38 **Comment:** The Comanche Peak emergency evacuation plan assumes that 100% of the
39 affected population from a radiological emergency would be evacuated. p. 7.2-3. The model is
40 further compromised because it does not adequately account for evacuees that are transported
41 25 miles from the Comanche Peak site as they "disappear" from the emergency evacuation
42 analysis. Id. Accordingly, the results of the dose and dollar risk assessments for severe accident
43 analysis are understated in the Comanche Peak environmental report Table 7.2-5. The EIS
44 should not assume that 100% of the affected population will be evacuated. Rejecting this
45 assumption requires that the data in Table 7.2-5 be adjusted to account for increased dose risk,

1 dollar risk, early fatalities, latent fatalities, and water ingestion dose risk. Moreover, there should
 2 be an accounting for evacuees and the doses to which they have been exposed even if those
 3 evacuees are moved 25 miles beyond the Comanche Peak site. (0022-45 [Hadden, Karen])

4 **Response:** *This comment addresses two evacuation model issues that appear to be within the*
 5 *scope of the environmental review: (1) the percentage of population assumed to be evacuated*
 6 *and (2) the treatment of the evacuated population once they are transported over 25 miles. The*
 7 *removal of the evacuated population once they exceed a fixed distance is a standard analysis*
 8 *approach. The distance that is selected (i.e., 25 miles) is a user input. Shorter distances have*
 9 *been used in other analyses. Although a sensitivity analysis has not been performed, it is*
 10 *believed that the any additional dose that would be received by this evacuated population would*
 11 *not be material.*

12 **Comment:** And that, because of this, the other factor is that part of that energy bill said that if
 13 there is some kind of a dangerous, let's say, explosion or something happens that ruins the area
 14 around here, who is going to pay for it? We are. Because they put some things into the energy
 15 bill that does not require the company to be 100 percent responsible for the cleanup for it. It will
 16 be the taxpayers. And the people in Congress have been lowering the standards for that. So it
 17 all falls back on us. (0017-51 [Harper, Debbie])

18 **Response:** *The NRC is not involved in establishing energy policy; rather, it regulates nuclear*
 19 *energy to protect public health and safety within existing policy. These comments provide no*
 20 *new information and were not considered further. This comment provides no information*
 21 *related to the scope of this EIS and will therefore not be considered further in the staff's*
 22 *environmental review.*

23 **D.2.19 Comments Concerning the Uranium Fuel Cycle**

24 **Comment:** There are so many ways to build the local economy more effectively and not put
 25 anyone at risk from radioactive fuel, from handling it, from trying to store it. Right now it's being
 26 stored on site, and it appears that that would be the continuing manner in which the radioactive
 27 waste is handled, because we don't have a national repository. That's of huge concern.
 28 (0016-16 [Hadden, Karen])

29 **Comment:** I want this assessment to include an evaluation of what we do with the radioactive
 30 waste. It's still on site. You all know when this facility started operating in the early '90s, it's still
 31 on site. It doesn't seem like we're any closer than we were in that time frame to get a permanent
 32 waste repository. What are we going to do with this radioactive waste and material? (0016-40
 33 [Burnam, Lon])

34 **Comment:** I'd also like to make it clear that while people in Somervell and Granbury may feel
 35 like it's been relatively clean and unarmful to them, they don't live where the uranium is mined.
 36 And I guarantee you, if you talk to the tribal leaders in New Mexico, you'll find out that it is not a
 37 clean process. And the cancer rates on the tribal lands where this uranium is taken from have
 38 gone up exponentially as a result of the mining. So from the beginning of the process to the end
 39 of the process, we've yet to have an honest analysis of the environmental impact on health and
 40 safety. (0016-44 [Burnam, Lon])

41 **Comment:** And finally, I hope you're going to look at the whole cycle. While we're talking about
 42 a license for a particular plant to basically boil water, it involves a whole cycle of uranium. And 'I
 43 would hope that your assessment will look at that whole cycle, where the uranium will come
 44 from and where the results of using the uranium will go, as part of your assessment. And so I
 45 would urge you to do that. (0016-55 [Reed, Cyrus])

1 **Comment:** For many years I've been concerned about nuclear power and the problem that we
2 seem to ignore, what to do with the waste. I think we really need to look at that very, very
3 carefully. (0016-60 [Wildwood, Kathleen])

4 **Comment:** But there is no mention of the waste, the radioactive waste, which is a problem. I
5 don't think anyone can deny that. (0017-36 [Cohn, Ann])

6 **Comment:** So radioactive low level and high level waste is spewed out as it is being mined. It
7 is at risk when it is being transported, if there is a wreck. There is risk in the actual production of
8 the energy. And then there is a risk as it is put into the waste areas. The full chain is risky.
9 (0017-70 [Sanders, Jan])

10 **Comment:** One is the waste. We know the fact that we are drowning worldwide under nuclear
11 waste. We do not have a safe means of having them stored. Of course, everyone will mention
12 Yucca Mountain. Yucca Mountain is still a no-go. There have been reports of more
13 problems with Yucca Mountain of leakage. It is not a safe place. We don't have something else
14 to take its place. And this stuff is toxic for thousands of years. (0017-75 [Stuard, Gary])

15 **Comment:** In the last ten years, the Texas Department of Health Services has cited several
16 instances of radioactive waste spills by uranium mining companies, including Cogema Inc.'s
17 1998 spill of over 20,000 gallons of radioactive solution in Bruni, Texas. (0019-26 [Hadden,
18 Karen])

19 **Comment:** The uranium fuel cycle has substantial greenhouse gas impacts that should be
20 considered at each phase of the fuel cycle.

21 The uranium fuel cycle is a contributor to greenhouse gases. The EIS should carefully consider
22 and include in its analysis the greenhouse gas impacts that are unavoidable as a result of
23 mining, processing, fabrication, transportation fuel burn up, waste streams management,
24 decommissioning and long-term site maintenance that are an integral part of the uranium fuel
25 cycle. While the proponents of an expanded Comanche Peak nuclear plant posit that there will
26 be fewer greenhouse gases produced as a result of the operations of Comanche Peak Units 3
27 and 4 compared to fossil fueled plants, there are inevitable greenhouse gas emissions
28 associated with each phase of the fuel cycle. These conditions need to be carefully considered
29 to determine the full impact of an expanded Comanche Peak nuclear plant.
30 The decision in Massachusetts V. EPA, 549 U.S.497 (2007) requires that carbon dioxide be
31 considered a pollutant. Carbon dioxide emissions are inevitable in the production of fuel for
32 nuclear plants. Likewise, carbon dioxide emissions can be anticipated during routine operations
33 of a nuclear plant and are foreseeable as a plant is decommissioned. Any benefits derived by
34 operation of a nuclear plant in terms of avoidance of greenhouse gases needs to be considered
35 in light of greenhouse gas production as it occurs in various stages in the fuel cycle. An
36 adequate EIS should require such an analysis. (0022-3 [Hadden, Karen])

37 **Comment:** Each part of the uranium fuel cycle has substantial radiological, environmental and
38 public health impacts that are cumulative in nature and should be considered in the context of
39 an EIS.

40 Each phase of the uranium fuel cycle has radiological, environmental and public health impacts
41 that must be analyzed and quantified in the context of an EIS. For example, mining uranium is
42 known to cause an increase in radiation related illnesses among miners. Mortality and morbidity
43 analyses should be done for uranium mining and associated activities related to supplying fuel
44 to Comanche Peak Units 3 and 4. (0022-4 [Hadden, Karen])

1 **Comment:** radioactive waste would be stored onsite since there is still no national nuclear
2 waste repository. (0030-6 [Hadden, Karen])

3 **Response:** *Impacts related to the uranium fuel cycle and its transportation steps, including*
4 *disposal of low-level radioactive waste and spent fuel, will be addressed in Chapter 6 of the*
5 *EIS. The generic impacts of the fuel cycle are codified in 10 CFR 51.51(b), Table S-3, "Table of*
6 *Uranium Fuel Cycle Environmental Data." Per the guidance in 10 CFR 51.51 and Section 5.7 of*
7 *NUREG-1555, the staff will rely on Table S-3 as a basis for uranium fuel cycle impacts. The*
8 *safety and environmental effects of long-term storage of spent fuel on site have been evaluated*
9 *by the NRC and set forth in the Waste Confidence Rule at 10 CFR 51.23*
10 *(<http://www.nrc.gov/reading-rm/doc-collections/cfr/part051/part051-0023.html>).*

11 **Comment:** Based on the assumption that Comanche Peak Units 3 and 4 will utilize MOX fuel,
12 careful analyses of the radiological and public health impacts associated with MOX fuel
13 fabrication should be a part of the EIS.

14 MOX fuel fabrication has remote handling requirements not associated with uranium fabrication
15 facilities. MOX fuel includes plutonium, a strong alpha emitter, that has a higher specific
16 radioactivity than uranium. The plutonium, if inhaled, presents a well-recognized health hazard.
17 A MOX fuel fabrication facility, while subject to more stringent requirements than a uranium fuel
18 fabrication facility, still involves handling increased amounts of plutonium. The environmental
19 and public health impacts associated with increased use and handling of plutonium should be a
20 part of a proper EIS. CP Environmental Report, page 5.7-4. The EIS should include
21 environmental impacts associated with routine operations of a MOX fuel fabrication facility as
22 well as accident scenarios that could involve such a facility. (0022-25 [Hadden, Karen])

23 **Comment:** Our understanding is that in addition to uranium, the Comanche Peak facility will
24 utilize MOX fuel fabrication, which in itself will lead to other environmental and public health
25 challenges which must be addressed by an EIS. (0032-4 [Reed, Cyrus])

26 **Response:** *The COL submitted by Luminant for CPNP Units 3 & 4 is for reactors fueled with*
27 *uranium oxide only. Any future use of MOX fuel would be covered in separate license*
28 *amendment process. For this reason the environmental effects of MOX fuel will not be covered*
29 *in the EIS.*

30 **Comment:** The Comanche Peak environmental report recognizes that there has been an
31 overall reduction of the demand for uranium fuel and the elimination of legal restrictions on
32 importation of foreign uranium which has caused the closing and decommissioning of most
33 domestic uranium mines and mills. The economic conditions pertaining to the uranium market
34 favor utilization of foreign uranium rather than uranium mined in the United States. The
35 Comanche Peak environmental report suggests that these changes have made uranium mining
36 and milling and enrichment more "environmentally friendly". p. 5.7-4. However, there is no
37 analysis in the environmental report of environmental or public health impacts of mining and
38 milling uranium in foreign countries. The EIS should include a full analysis of the impacts of
39 mining and milling uranium in foreign countries.
40 (0022-31 [Hadden, Karen])

41 **Response:** *The NRC environmental review process only covers environmental effects in the*
42 *United States. The comment above requests the review of mining operations outside the*
43 *US. Since such review is outside the legal scope of this NRC licensing process, such effects*
44 *will not be covered in the EIS.*

45 **Comment:** Nuclear waste is not our solution to energy independence. It has health impacts.
46 (0016-24 [Hadden, Karen])

1 **Comment:** One other concern I will just touch on is, that the contamination from the uranium,
2 what would happen in building more nuclear reactors, is there would have to be more uranium
3 brought in, of course. And it might be something that the local community isn't thinking as much
4 about. But there are other local communities even in Texas that are very concerned about that.
5 **(0017-45 [Rooke, Molly])**

6 **Comment:** And that is the radioactive waste that is stored here in Somervell County. We take
7 our garbage to the local dump. Or if you live in the city, you have it picked up, because the city
8 provides that service. And then it is transported off to somewhere else. Yet we keep our
9 radioactive waste here.

10 Yucca Mountain is not open. And we want to expand the amount of radioactive waste we are
11 actually going to store here in this county, by opening these new plants. I don't think it is such a
12 wise move to keep increasing the size of the radioactive waste, without figuring out what to do
13 with it first. **(0017-48 [Harper, Paul])**

14 **Comment:** No high or low-level waste sites are available.

- 15 • Nuclear reactors produce tons of high and low-level radioactive waste that remains
16 dangerous to living beings for tens of thousands of years. Radioactive and toxic waste is
17 produced at every stage of the fuel cycle, including routine plant operations.
- 18 • Federal law prohibits the licensing of any new nuclear plant until there is an adequate waste
19 disposal plan. Nuclear plants have been operating for 50 years, but the waste disposal
20 problem has not been solved. Radioactive waste remains stored onsite at reactors across
21 the county.
- 22 • There is no national storage facility for high-level radioactive waste and the Yucca Mountain
23 repository is unlikely to open in the near future. The Associated Press wrote: "The Energy
24 Department is cutting operations and the chief contractor is laying off its staff at the desert
25 site where the government plans to build a national nuclear waste repository..." Jan 8, 2008.
- 26 • The Andrews County low-level waste dump application has been deemed incomplete by the
27 Texas Commission on Environmental Quality.
- 28 • The impacts and risks of storing additional high -level radioactive waste on site needs to be
29 studied thoroughly in the EIS. The long-term cumulative health impacts of additional low-
30 level radiation need to be studied thoroughly and included in the environmental impact study
31 as well. Impacts on humans, wildlife and plant life need to be considered, with special
32 attention given to threatened and endangered species.
- 33 • The EIS should study the additional safety and security risks of more radioactive waste.
- 34 • The license for two new reactors at Comanche Peak, or any other reactor, should not be
35 issued since there is no effective resolution of the storage issue.

36 **(0019-30 [Hadden, Karen])**

37 **Comment:** There is a resurgence of uranium mining in South Texas at this time, with nineteen
38 exploration permits being pursued. Impacts on communities in Texas including drinking water
39 contamination which should be researched and examined thoroughly in the EIS. New mining
40 operations are being pursued even though aquifers contaminated by earlier mining operations
41 have not been restored and some residents in Texas still cannot drink their water due to
42 contamination. Adding two more reactors at Comanche Peak would likely impact the amount of
43 mining in South Texas and environmental and health impacts in those communities should be
44 analyzed and considered thoroughly in the EIS. **(0022-34 [Hadden, Karen])**

1 **Comment:** The Comanche Peak environmental report assumes that so-called low-level
2 radioactive waste will be disposed of at land burial facilities. Based on this assumption, the
3 environmental report assumes that there will be no significant radioactive releases to the
4 environment. p. 5.7-8. This assumption is dubious at best considering that low-level radioactive
5 waste streams contain very long-lived radionuclides that would not be adequately sequestered
6 in land burial facilities for the duration of their hazardous lives.

7 Moreover, the availability of land burial sites is problematic. Attempts to establish new land
8 burial sites for the so-called low-level radioactive waste stream have largely been unsuccessful.
9 The sites that were planned for Nebraska, California and Texas have been rejected in the past
10 and the TCEQ decision to issue a state permit for a site in West Texas is likely to be appealed,
11 so it should be assumed in the EIS that there will be no off-site capacity to dispose of the so-
12 called low-level radioactive waste stream. The EIS should consider the long-term environmental
13 and public health consequences of managing the so-called low-level radioactive waste stream
14 on the Comanche Peak site. The analysis of this issue should include an analysis of radiation
15 exposures to employees and the public based on the assumption that the low-level radioactive
16 waste stream will not be disposed of off-site. (0022-43 [Hadden, Karen])

17 **Comment:** The Comanche Peak environmental report assumes that there will be no significant
18 radioactive releases to the environment related to off-site disposal of the radioactive waste
19 streams that originate at Units 3 and 4. p. 5.7-8. The EIS should not adopt this assumption. The
20 EIS should fully consider the public health and environment consequences of major releases to
21 the environment of radioactive materials as a result of off-site disposal activities. The off-site
22 releases could originate from on-site processing, transportation accidents, off-site processing,
23 and long-term releases from the disposal site because of either improper or inadequate waste
24 site characterization, natural events such as earthquakes, and intentional or unintentional
25 releases. Irrespective of the cause of the releases such should be considered for the impacts to
26 the environment and public health consequences. (0022-44 [Hadden, Karen])

27 **Comment:** The only existing solution to the toxic waste issue is to bury it somewhere. I've read
28 that West Texas is currently being identified as a depository. Storage and transportation of
29 these wastes is simply a disaster waiting to happen and is an irresponsible choice for our
30 environment and for future generations. (0031-5 [Gentling, Suzanne])

31 **Comment:** The EIS must address the complete uranium cycle from cradle to grave and the
32 impacts of that cycle. Where will the plant obtain its raw uranium for the life of the plant? Where
33 will it be processed? Enriched? Deconverted? What are the impacts of the mining, processing
34 and enrichment processes in their place of origin?

35 What happens to the waste streams along the way during that process, including at the end of
36 the uranium cycle. Each part of the uranium fuel cycle has environmental, radiological and
37 public health impacts that must be addressed. (0032-3 [Reed, Cyrus])

38 **Response:** *The impact of the uranium fuel cycle and its transportation steps, including disposal*
39 *of low-level radioactive waste and spent fuel, will be addressed in Chapter 6 of the EIS. The*
40 *generic impacts of the fuel cycle are codified in 10 CFR 51.51(b), Table S-3, "Table of Uranium*
41 *Fuel Cycle Environmental Data." Per the regulation in 10 CFR 51.51 and guidance in Section*
42 *5.7 of NUREG-1555, the staff will rely on Table S-3 as a basis for uranium fuel cycle*
43 *impacts. The safety and environmental effects of long-term storage of spent fuel on site has*
44 *been evaluated by the NRC and, as set forth in the Waste Confidence Rule at 10 CFR 51.23*
45 *(available at <http://www.nrc.gov/reading-rm/doc-collections/cfr/part051/part051-0023.html>), the*
46 *NRC generically determined that "if necessary, spent fuel generated in any reactor can be*
47 *stored safely and without significant environmental impacts for at least 30 years beyond the*

1 *licensed life for operation (which may include the term of a revised or renewed license) of that*
2 *reactor at its spent fuel storage basin or at either onsite or offsite independent spent fuel*
3 *installations. Note that the waste confidence decision is being updated through rulemaking and*
4 *references to the timing of repository availability is being omitted in the updated version. It is*
5 *outside the scope of this EIS to address specific low-level waste burial locations, existing or*
6 *proposed. Site specific data for these locations is developed as part of the NRC licensing*
7 *process under 10 CFR 61.*

8 **Comment:** Are we willing to bank on the fact that governments will still be in place thousands
9 of years from now? How many have lasted thousands of years? Are we willing to put our
10 children's children's children at risk because we couldn't figure out a smarter way to use our
11 energy and to generate it? And those smarter ways exist right now, and they create jobs, and
12 they're better for our economy. (0016-18 [Hadden, Karen])

13 **Response:** *Chapter 6 of the EIS will address the impacts of the fuel cycle, including radioactive*
14 *wastes.*

15 **Comment:** I'm also interested in sustainability, and uranium is not a sustainable product.
16 (0016-75 [Shaar, Julie])

17 **Comment:** Dependence on foreign sources for uranium should also be considered in the EIS
18 as a potentially harmful environmental and public health consequence. Recent experience with
19 dependence on foreign sources for oil has heightened awareness that supplies may be
20 interrupted or artificially inflated in costs. The economic impacts from such dependence can be
21 far ranging and adverse. Accordingly, such impacts should be considered in a proper EIS.
22 (0022-32 [Hadden, Karen])

23 **Response:** *The sufficiency of the supply of uranium for nuclear power plant fuel will be*
24 *addressed in Chapter 6 of the EIS.*

25 **Comment:** Nuclear, the mining associated with nuclear power, the uranium mining is incredibly
26 destructive. And it is killing people, literally killing people. (0017-63 [Rittenhouse, Ryan])

27 **Comment:** And waste [of] waste. (0017-67 [Sanders, Jan])

28 **Comment:** It was pointed out that in Texas, we are kind of in the zero target in relation to
29 nuclear, because there are a lot of uranium deposits in Texas. (0017-68 [Sanders, Jan])

30 **Response:** *The impacts related to the uranium fuel cycle will be addressed in Chapter 6 of the*
31 *EIS. The generic impacts of the fuel cycle are codified in 10 CFR 51.51(b), Table S-3, "Table of*
32 *Uranium Fuel Cycle Environmental Data." Per the guidance in 10 CFR 51.51 and Section 5.7 of*
33 *NUREG-1555, the staff will rely on Table S-3 as a basis for uranium fuel-cycle impacts.*

34 **D.2.20 Comments Concerning Transportation**

35 **Comment:** The effect of the increased truck traffic, noise and pollution levels from a
36 construction project of this size on an infrastructure that is already pushed to the limit would not
37 be desirable to humans or wildlife. (0031-7 [Gentling, Suzanne])

38 **Response:** *Impacts of plant construction and operation on the use of existing local*
39 *infrastructure including transportation networks, noise and pollution levels, and other community*
40 *services or the need for such new infrastructure will be addressed in Chapters 4 and 5 of the*
41 *EIS.*

1 D.2.21 Comments Concerning Decommissioning

2 **Comment:** The reality is the two now are halfway through their life cycle. They'll be closed
3 down. They'll be moth-balled. And in the 50 years of the operation of nuclear power plants, we
4 still have not resolved that issue. So any real, accurate environmental impact statement will
5 have a very careful analysis of the implication of storing this material on site forever. (0016-38
6 [Burnam, Lon])

7 **Comment:** Additionally, given the very long-term nature of the radiological hazard represented
8 by the accumulation of radioactive particulates discharged during plant operations, it should be
9 assumed that the reservoir will require, at the minimum, management and perimeter security for
10 a time that extends far beyond the term of operation license. Questions surrounding post-
11 license ownership of and responsibility for Squaw Creek Reservoir should be addressed and
12 resolved in the EIS. Accordingly, the EIS should fully consider the structural reliability of the
13 Squaw Creek Reservoir dam and analyze adverse environmental and public health
14 consequences that could occur as a result of its failure. (0022-16 [Hadden, Karen])

15 **Comment:** The Comanche Peak environmental report acknowledges that it does not provide
16 anything more than an initial projection of expected future environmental impacts related to
17 decommissioning. The details related to environmental impacts expected from decommissioning
18 are put off to a future unspecified date. The Comanche Peak environmental report assumes
19 impacts related to decommissioning are either negligible or require, at most, a site-specific
20 assessment. However, the environmental report assumes that site-specific and off-site land use
21 activities and aquatic ecology activities beyond the operational area, terrestrial ecology activities
22 beyond the operational area, threatened and endangered species, environmental justice, and
23 cultural historic resource impacts beyond the operational area are expected to be negligible.
24 However, there is no analysis in the environmental report whatsoever of any of these impacts
25 either from a public health or environmental consequence standpoint. p. 5.9-1. Accordingly, a
26 proper EIS should carefully consider decommissioning impacts including the likelihood that a
27 decommissioned plant will be disassembled and transported to a site that will be the recipient of
28 highly irradiated materials. Additionally, the EIS should consider contingent possibilities that off-
29 site removal of a decommissioned nuclear plant will not be a practicable alternative. In that
30 scenario, the environmental consequences and public health impacts of the in situ, long-term
31 radioactive decay of Comanche Peak Units 3 and 4 should be considered in the EIS.

32 Decommissioning has its own waste stream issues, as well. The EIS should consider the
33 radiological and public health impacts from the various decommissioning waste streams and
34 environmental justice and other implications of disposition of highly irradiated materials off-site.
35 Additionally, the EIS should consider whether off-site disposition of decommissioning materials
36 is even feasible. The decommissioning of nuclear plants is an evolving technology, and the land
37 use, environmental and public health implications of decommissioning activities are not well
38 understood. The EIS should fully analyze the probability that there will be significant resistance
39 to transportation and disposition of highly irradiated decommissioned plant materials to a remote
40 site.

41 Moreover, in promotional materials published by the reactor manufacturer Mitsubishi, it is
42 acknowledged that technology for decommissioning is still in the process of being developed.
43 Mitsubishi Nuclear Plants, p. 27. Hence, there is currently inadequate technology to carry out
44 decommissioning. The assumption appears to be that adequate technologies will be developed
45 in the future. However, a proper EIS should consider the scenario that adequate technologies
46 for decommissioning are not developed in the future or proved to be inadequate for the task.
47 The EIS should take into account contingencies that would require long-term secure storage of

1 Comanche Peak Units 3 and 4 because either decommissioning technology is inadequate [or]
 2 where there is no remote site available for the disposition of wastes from decommissioning
 3 activities. This analysis would require a consideration of radiological impacts related to the long-
 4 term delay in decommissioning, as well as public health and environmental consequences
 5 related thereto. (0022-39 [Hadden, Karen])

6 **Comment:** These enormous, single-purpose facilities have a limited life and store on site their
 7 partially-spent fuel. What provisions will be made for de-commissioning, with removal of all
 8 structures and hazardous materials, together with restoration of the site? (0028-3 [Inge, Charles
 9 and Dominique])

10 **Comment:** The EIS should examine both the Texas and federal decommissioning procedures,
 11 as well as the funds set up to pay for decommissioning to assure that adequate monies exist to
 12 pay for any clean up and decommissioning and the public is not, as it has on multiple occasions,
 13 held responsible for these costs. How a merchant plant selling power on the wholesale market
 14 will be paid for is of serious concern. (0032-18 [Reed, Cyrus])

15 **Response:** *NRC regulations establish a framework to ensure that decommissioning of all*
 16 *nuclear reactor facilities will be accomplished in a safe and timely manner and that funding will*
 17 *be available for this purpose. Federal regulations (10 CFR 50.33(k) and 10 CFR 50.75(b))*
 18 *require an applicant for a COL license to certify that sufficient funds will be available to ensure*
 19 *radiological decommissioning at the end of power operations. The financial decommissioning*
 20 *funding assurance mechanism analysis will be in the SER not the EIS. The environmental*
 21 *impact from decommissioning a permanently shutdown commercial nuclear power reactor is*
 22 *discussed in Supplement 1 to NUREG-0586, Generic Environmental Impact Statement on*
 23 *Decommissioning of Nuclear Facilities, which was published in 2002. If fuel is maintained*
 24 *onsite in an Independent Spent Fuel Storage Installation (ISFSI), a license for the ISFSI will be*
 25 *maintained and any required security and monitoring would be provided by the ISFSI*
 26 *licensee. Evaluation of such a facility is not within the scope of this EIS. The Squaw Creek*
 27 *Reservoir is an existing site feature constructed for Comanche Peak 1 and 2. The evaluation of*
 28 *the impacts and maintenance of the Squaw Creek Reservoir dam is not within the scope of this*
 29 *EIS.*

30 **Comment:** Additionally, given the very long-term nature of the radiological hazard represented
 31 by the accumulation of radioactive particulates discharged during plant operations, it should be
 32 assumed that the reservoir will require, at the minimum, management and perimeter security for
 33 a time that extends far beyond the term of operation license. Questions surrounding post-
 34 license ownership of and responsibility for Squaw Creek Reservoir should be addressed and
 35 resolved in the EIS. (0022-17 [Hadden, Karen])

36 **Response:** *The NRC regulations require the decommissioning of all nuclear power*
 37 *facilities. The licensee remains responsible for the site until the entire site is surveyed and*
 38 *released for unrestricted use.*

39 **D.2.23 Comments Concerning Cumulative Impacts**

40 **Comment:** The simple fact that you'll have twice as many reactors, the large visible target of
 41 the cooling towers, twice as much transportation issues, both for bringing the radioactive
 42 material in and dealing with it, if you ever choose to deal with it, off site, taking it off site. All of
 43 those are kind of geometrically increased problems over the two. (0016-37 [Burnam, Lon])

1 **Comment:** But this is one thing that needs to be looked into. There's just something wrong.
2 And if you add another power plant or two, to me, that would increase the flow of the—it would
3 also increase the temperature of the water.

4 The water, I understand, it has—can't reach a certain temperature. But when they release that
5 water, it's too hot. You need to release the water some way where it's not as hot, or find some
6 cooling system after you release that water. I think it would help the situation. **(0016-65** [Cathey,
7 Jack])

8 **Comment:** Adding two 1600 MW reactors to a site that has already been impacted by
9 continued operation of Comanche Peak Units 1 and 2 will result in unprecedented
10 concentrations of reactor operations. The cumulative impacts of operational releases of
11 radiation from four operating reactors should be a part of a proper EIS. **(0022-27** [Hadden,
12 Karen])

13 **Comment:** The NEPA document should estimate cumulative impacts of resources of concern
14 associated with the proposed project. Cumulative impacts include the additive effects of a given
15 parameter for all contributing projects in the study area and watershed. The document should
16 define what cumulative impacts would result from implementation of the proposed project.
17 Existing or future projects (Federal and non-Federal projects) with attendant pollutants should
18 also be considered. **(0027-25** [Osowski Morgan, Sharon L.]

19 **Comment:** Luminant is adding two reactors on top of two existing reactors and the cumulative
20 impacts of all four units must be addressed in terms of water discharges, air borne radioactivity,
21 and radioactive waste. **(0032-9** [Reed, Cyrus])

22 **Response:** *Cumulative impacts are the impacts that result from the combination of the*
23 *proposed action and past, present and reasonably foreseeable actions, regardless who takes*
24 *the actions. The cumulative impacts associated with the construction and operation of the*
25 *proposed Units 3 and 4 will be evaluated for each affected resource. The results of cumulative*
26 *impact analyses will be presented in the Chapter 7 of the EIS.*

27 **Comment:** One last thing that I will mention in relationship to this global warming stuff, is there
28 is also global warming on the thermal level. You know, it is not just how much CO₂ we are
29 putting out into the atmosphere. It is actually the active heating of our planet by burning stuff.
30 And that is something that isn't talked about very much. But that is what is referred to as the
31 thermal load of the facility. And a nuclear plant has about three times the thermal load of a coal
32 plant. The heat it emits and the water that it heats up is three times the amount of the average
33 coal plant. So that is also something to consider.

34 **(0017-65** [Rittenhouse, Ryan])

35 **Response:** *Contributions of both direct heat emissions and greenhouse gases to cumulative*
36 *effects on global climate change will be addressed in Section 7.11 of the EIS.*

37 **Comment:** There is a carbon footprint of nuclear plants. Approximately, it is estimated that
38 about a million tons of CO₂ every year is attributed to one nuclear plant. And that is because of
39 the mining process and everything else.

40 Yes, there is no CO₂ coming -out of the water coolant towers or anything like that, but there is
41 fossil fuel burning that goes on in relationship to nuclear power generation. And it does have a
42 carbon footprint.

43 Also, you are probably well aware that nuclear plants take a lot of concrete to build. And it is
44 estimated that in every ton of concrete, there is about a ton of CO₂ that is released in

1 manufacturing that concrete. So this all adds up. And it estimated that it accounts, the amount of
2 CO₂ is about the same as about a fifth to a third of a gas plant. So yes, it is less. But there are
3 other forms—there isn't none. (0017-64 [Rittenhouse, Ryan])

4 **Comment:** nuclear energy is not carbon free. From the cycle, the whole nuclear cycle from
5 uranium mining, ... But the whole process from mining and milling and enrichment, fuel
6 fabrication, and disposal of radioactive waste do add significant greenhouse gas emissions to
7 this planet. (0017-78 [Stuard, Gary])

8 **Comment:** The most prevalent global warming impacts come from increased heat and
9 humidity in the atmosphere. At a nuclear power plant two-thirds of the heat energy gets emitted
10 into the air and heated water vapor is released into the air. Thus nuclear reactors themselves
11 are global warming agents in terms of heat, including water vapor from steam and heat radiating
12 from cooling towers and ponds. The EIS should contain an analysis of the production of heat
13 energy emitted into the atmosphere and water by Comanche Peak Units 3 and 4 in terms of
14 contributions to global warming. (0022-24 [Hadden, Karen])

15 **Response:** *The cumulative effects of heat, water vapor, and greenhouse gas emissions by*
16 *construction and operation (including the fuel cycle) of the proposed units on global warming will*
17 *be addressed in Section 7.11 of the EIS.*

18 **D.2.25 Comments Concerning the Need for Power**

19 **Comment:** The right way to meet our energy needs right now is through energy efficiency, first
20 and foremost, through better building codes. And that's starting to happen throughout the state.
21 Many cities are passing building codes. If we just get smarter about our energy use, we won't
22 need so much. I maintain that these reactors are not necessary. (0016-13 [Hadden, Karen])

23 **Comment:** one thing that I hope you'll do in your assessment of their assessment is to look
24 carefully at their section dealing with the need for energy and the need for this type of power.

25 One thing I would say is, because of when their assessment was written, it was based upon
26 numbers which we already think aren't legitimate. Those numbers are based on ERCOT
27 projections of 2007. Already the ERCOT projections about power needs in Texas of May of
28 2008 have a much different view on the need for additional power in the coming years. And
29 that's simply in part because of changes in the growth of our economy, but also in part because
30 Texas has fairly aggressively begun to implement energy-efficiency programs.

31 And so our—we don't believe this plant is needed to meet our energy needs, and we think there
32 are documents out there that would support that view, including ERCOT's own projections.

33 And I would also point out that we have a new Speaker of the House, someone who is very
34 much in favor of energy efficiency. He passed legislation last session. Part of that legislation
35 was to commission a report to look at the potential for greater gains in energy efficiency so we
36 can meet more of our needs through energy-efficiency programs. So I would urge you to both
37 look at the Itron report—and I can—in my written comments, I can get you a reference to that,
38 but also—I don't know what your time line is, but also look at the actions during this legislative
39 session. We expect, with the new Speaker of the House and with substantial interest in both the
40 House and the Senate on both energy efficiency and promoting other sources of energy, like
41 solar, geothermal, biomass, there will be significant legislative action that will add to our power
42 mix in Texas, not in terms of nuclear, but in terms of both energy efficiency and other
43 renewables.

1 So I want you to look at that projection, look at some of the studies that have been done by
 2 Itron, by ACEEE and others for Texas, to see if their assessment is realistic in terms of what's
 3 needed in Texas and whether we can't meet this demand through other means, including
 4 means that, frankly, Luminant is looking at, like wind, and I know they're looking at the potential
 5 for utility-scale solar. So I'd urge you to look at that. (0016-50 [Reed, Cyrus])

6 **Comment:** Luminant has not proven there is a need for this new energy.

- 7 • The application ignores the effect energy efficiency and renewable energy will have in the
 8 future. Are recent state-mandated energy efficiency and renewable energy goals be factored
 9 into the energy needs assessment?
- 10 • Studies have shown that Dallas/Ft. Worth could meet 101% of projected growth in demand
 11 using efficiency and renewable energy.
- 12 • State energy use projections should be revisited in light of the economic downturn.

13 (0019-21 [Hadden, Karen])

14 **Response:** *The EIS Chapter 8 analysis of need for power will reflect ongoing efforts to promote*
 15 *energy efficiency, conservation mandates, and updated demand forecasts by ERCOT.*

16 **Comment:** Moreover, the report [ER] largely discounts the role energy efficiency can play.
 17 Nonetheless, Luminant will be operating and selling power within ERCOT, where considerable
 18 advances in energy efficiency programs have resulted. First, the Texas Legislature through
 19 SB 7 in 1999 required the large transmission companies to meet 10 percent of their growth in
 20 demand through energy efficiency programs, a requirement that was doubled in 2007 with the
 21 passage of HB 3693. The program at the nine investor-owned utilities has been successful. Full
 22 reports of the program are available at

23 <http://www.texasefficiency.com/report.html>

24 The following table is from the 2007 report from Fronteir Associates and demonstrates the
 25 success of the program in reducing peak demand and saving energy for a fraction of the cost of
 26 the nuclear plant.

27 HB 3693 also required the Public Utility Commission to look at the potential for utilities meeting
 28 50 percent of the growth in demand through energy efficiency programs, and the resulting study
 29 concluded that Texas statewide could reduce its peak energy demand by 23 percent by 2018,
 30 and that the 50 percent goal by 2015 was economically and technically achievable. The full
 31 report - by ITRON - is available through the Public Utility Commission website.

32 <http://www.puc.state.tx.us/rules/rulemake/33487/33487.cfm>. This legislative session, bills have
 33 already been introduced that would accomplish that or similar goals (HB 280, SB 601). (0032-16
 34 [Reed, Cyrus])

35 **Response:** *Chapter 8 of the EIS will reflect legislative mandates for energy conservation that*
 36 *apply to regulated portions of the electric power delivery system in Texas and updates to*
 37 *ERCOT forecasts that reflect the initial impacts of these mandates.*

38 **Comment:** We don't need the energy. (0017-11 [Burnam, Lon])

39 **Comment:** We all know that we need to produce more energy. (0017-15 [Burnam, Lon])

40 **Comment:** Energy efficiency can reduce electric demand, and help address global warming
 41 today, while building the local economy. (0030-8 [Hadden, Karen])

Table 3. Utility Funds Expended with Associated Demand and Energy Savings 2007* (From the Annual Energy Efficiency Reports, including SB7 and non-SB7 programs.)

Utility	Funds Expended (\$)	Demand Savings (MW)	Energy Savings (MWh)
AEP-SWEPCO	1,234,200	1.61	5,496
AEP-TCC	5,203,100	9.50	25,491
AEP-TNC	993,800	1.37	4,894
CNP	19,563,098	52.28	135,364
EGSI	2,968,000	5.34	15,034
EPE	1,115,000	1.21	5,000
TNMP	819,757	2.30	3,394
Oncor	46,384,709	89.23	216,371
Xcel	2,008,000	4.14	16,818
TOTAL	80,289,664	166.98	427,862

* All energy savings are calculated at meter.

1 **Response:** Chapter 8 of the EIS will describe the results of the NRC staff independent review
2 the need for power and will present an analysis of economic conditions and other factors that
3 influence the need for power.

4 **Comment:** Based on the assumption that a federal repository will not be available for spent
5 fuel management, the EIS should consider the environmental and public health consequences
6 of either the State of Texas or the United States government becoming the de facto custodians
7 of spent fuel at the Comanche Peak site after the operating license has lapsed and post-closure
8 activities of the licensee have been completed. If, at the end of the post-closure responsibilities
9 of the licensee, spent fuel remains on-site it will have to be managed and secured for the
10 indefinite future. The only institutional capacity for long-term spent fuel management is a unit or
11 units of government. To the extent that units of government are responsible for managing on-
12 site spent fuel, calculations for employee exposures and public exposures should be included in
13 the EIS. Additionally, other public health environmental consequences reasonably associated
14 with indefinite governmental management of spent fuel on site should also be considered in the
15 EIS.

16 The EIS should also consider specifically what entity would actually have legal ownership of the
17 spent fuel after the operating license has lapsed and post-closure activities have ceased. Will
18 the ownership of the spent fuel default to some unit of government? If so, what costs can be
19 reasonably anticipated by the de facto custodian/owner of spent fuel? Do the anticipated costs

1 have environmental and public health consequences? The EIS should resolve these questions.
2 (0022-42 [Hadden, Karen])

3 **Response:** *Impacts related to the uranium fuel cycle and its transportation steps, including*
4 *disposal of low-level radioactive waste and spent fuel, will be addressed in Chapter 6 of the*
5 *EIS. The generic impacts of the fuel cycle are codified in 10 CFR 51.51(b), Table S-3, "Table of*
6 *Uranium Fuel Cycle Environmental Data." Per the guidance in 10 CFR 51.51 and Section 5.7 of*
7 *NUREG-1555, the staff will rely on Table S-3 as a basis for uranium fuel cycle impacts. The*
8 *safety and environmental effects of long-term storage of spent fuel on site have been evaluated*
9 *by the NRC and set forth in the Waste Confidence Rule at 10 CFR 51.23*
10 *(<http://www.nrc.gov/reading-rm/doc-collections/cfr/part051/part051-0023.html>).*

11 **D.2.26 Comments Concerning Alternatives - No-Action**

12 **Comment:** There are lots of impacts, environmental and otherwise of all alternatives, too,
13 including the oft-overlooked alternative of doing little or nothing about the situation which the
14 project is being considered. (0017-58 [Wohler, Will])

15 **Response:** *The no-action alternative will be evaluated and addressed in Chapter 9 of the EIS*
16 *in comparison with the proposed action.*

17 **D.2.27 Comments Concerning Alternatives - Energy**

18 **Comment:** I would suggest that we very seriously consider geothermal energy. (0016-61
19 [Wildwood, Kathleen])

20 **Comment:** There are so many sustainable products that need to be looked into, such as was
21 mentioned, geothermal, solar, wind, even gas. But that has disadvantages too, but I would like
22 to ask that you look at those questions. (0016-76 [Shaar, Julie])

23 **Comment:** I think there are cleaner, safer and more economical ways to generate electricity,
24 which is what everybody wants. (0017-34 [Cohn, Ann])

25 **Comment:** TXU could produce electricity safer, cleaner, and cheaper, it is my opinion, if they
26 went solar or wind. (0017-37 [Cohn, Ann])

27 **Comment:** There are alternatives; wind, solar. We can do better. Why can't we be visionary
28 about energy? (0017-47 [Bisbee, Kay])

29 **Comment:** They surely knew, saw the handwriting on the wall for the future, existing and future
30 potential for renewable energy. Yet they went ahead and bought at least Luminant, knowing that
31 they had designs to build these new nuclear power plants. All these facts were available. (0017-
32 53 [Duncan, Jim])

33 **Comment:** Alternative renewable energy sources have their own serious environmental
34 impacts. (0017-59 [Wohler, Will])

35 **Comment:** The energy of the future lies in wind and solar, energy efficiency and other forms of
36 renewable power. (0017-61 [Rittenhouse, Ryan])

37 **Comment:** Additionally, processing uranium into fuel requires substantial amounts of electrical
38 energy and water. The impacts from the use of the substantial amounts of energy and water
39 must be part of a proper EIS. Without this analysis of the use of energy and water in the
40 production of uranium fuel there cannot be a meaningful comparison with practicable

1 alternatives that do not utilize large amounts of water and electricity for fuel production.
2 (0022-5 [Hadden, Karen])

3 **Comment:** The Comanche Peak environmental report also fails to carefully compare the
4 greenhouse gas effects expected from each of the alternative technologies. This analysis is
5 crucial because of the relationship between greenhouse gases and global warming and
6 because it is expected that the use of fossil fuels to support the uranium fuel cycle will become
7 more expensive over time. This circumstance will be aggravated by the anticipated use of
8 foreign produced uranium that will have a greater greenhouse gas impact because of, among
9 other reasons, a longer supply line. In contrast, renewable fuel technologies are expanding
10 manufacturing capacities domestically. Hence, the EIS should project anticipated greenhouse
11 gas emissions related to the competing technologies. (0022-51 [Hadden, Karen])

12 **Comment:** Alternatives that assess local power generation should be evaluated. For example,
13 several small, local power plants may equal the amount of electricity generated by the proposed
14 Comanche Peak Nuclear Power Plant (CPNPP) project. Local power generation, in contrast to
15 large regional power generation, may have benefits that have not been explored (e.g., local
16 transmission and use of power instead of long distance transmission, ability to deliver electricity
17 in the event of a catastrophic event, smaller potential impacts to water use, waste generation,
18 etc.) (0027-3 [Osowski Morgan, Sharon L.]

19 **Comment:** Safer, cleaner, more affordable ways are now available to generate electricity,
20 including wind, solar and geothermal energy. (0030-7 [Hadden, Karen])

21 **Response:** *Alternative energy sources, including fossil fuels and renewable energy sources*
22 *such as wind, solar, and geothermal, will be evaluated and addressed in Chapter 9 of the EIS in*
23 *comparison with the proposed action.*

24 **Comment:** If we get energy storage to combine the wind and the solar power, we can have a
25 good base load impact. Our real needs are for peak energy to begin with, and we get that with
26 West Texas Wind. (0016-15 [Hadden, Karen])

27 **Comment:** The Comanche Peak environmental report generally understates the efficacy of
28 alternative sources of electric power generation. p. 9.2-1, et seq. The EIS should evaluate
29 alternative sources of generating capacity based on the current data available regarding
30 capacity factors, technological advances that overcome intermittency challenges regarding wind
31 and solar power, and historical operational experience. It should be noted that Texas leads the
32 nation in wind generation. In 2005, Texas set a goal of 5880 MW of wind by 2015, but the state
33 has already exceeded this amount, and nearly \$5 billion additional transmission lines have
34 already been approved. The costs of various forms of energy generation should be considered
35 as well, especially considering that the Federal Energy Regulatory Commission (FERC)
36 published the following data in 2008, showing nuclear power to be the most expensive way to
37 generate electricity.

38 The Comanche Peak environmental report assumes that renewable fuels such as wind and
39 solar cannot provide adequate baseload generating capacity. However, recent advances in
40 technology such as compressed air energy storage and improved battery storage capacity call
41 into question some of the environmental report's assumptions concerning problems with
42 intermittency. Additionally, current technology advances are proving the assumptions about
43 renewable fuels made in the environmental report to be outdated and inaccurate. Expansions of
44 renewable energy capacity are occurring daily. In contrast, nuclear capacity, as a percentage of
45 total generating capacity, is shrinking. The EIS should evaluate the competing technologies in

1 light of current energy policy which places a greater emphasis on renewable fuels than did
2 previous energy policy that favored nuclear power and fossil fuels. (0022-48 [Hadden, Karen])

3 **Comment:** The Comanche Peak environmental report understates the ability of Texas to meet
4 its energy demands through energy efficiency and renewable energy. While acknowledging that
5 these technologies will play an increasing role, the report submitted by Luminant assumes that
6 Texas needs large base-load plants to meet future energy demand and that solar, wind, and
7 geothermal technologies are incapable of meeting these needs. Nevertheless, recent reports
8 and advances in technology show that Texas can meet its energy demand through a
9 combination of these technologies. (0032-14 [Reed, Cyrus])

10 **Comment:** First of all, the Texas legislature only recently, in 1999, adopted a Renewable
11 Portfolio Standard, requiring certain utilities to obtain part of their energy mix with renewable
12 power. By 2005, the Legislature chose to raise the requirements to 5,880 MWs by 2015 and a
13 target of 10,000 MWs by 2025. However, Texas has already surpassed the 2105 target and
14 recently approved a \$5 billion transmission plan, awarded to some 10 companies, that will lead
15 to approximately 18,000 MWs of largely wind development between existing and planned
16 development. This should occur before 2015. (0032-15 [Reed, Cyrus])

17 **Comment:** Furthermore, recent developments prove that costs for solar power, energy storage
18 and geothermal energy have declined and will continue to decline in the future, especially given
19 federal action to stimulate these new sources of energy. Luminant itself is engaged in a joint
20 investment with Shell to developed air compressed storage from a wind farm in West Texas that
21 could lead to 1,000 MWs of stored energy, in addition to the wind power itself.

22 The recent Federal Stimulus package as well as action by the Texas legislature could make
23 these energy sources even more attractive, and the planned expansion of the nuclear plant
24 should be judged against these energy sources. We would suggest that the EIS incorporate any
25 recent changes in state and federal law which would make the development of these
26 alternatives more likely. We would suggest that the life-cycle costs, environmental and public
27 health impacts of nuclear be compared to solar, wind, geothermal, coal, natural gas, and energy
28 efficiency and conservation as part of the EIS. (0032-17 [Reed, Cyrus])

29 **Response:** *Alternative energy sources, including combinations of sources such as fossil fuels
30 and renewable energy sources, will be evaluated and addressed in Chapter 9 of the EIS in
31 comparison with the proposed action. Due to the extensive wind resources in the ERCOT
32 service area and the actions already taken or planned to expand wind energy, Chapter 9 of the
33 EIS will provide a detailed analysis of environmental impacts of wind energy as alternative to the
34 proposed action.*

35 **Comment:** An expanding number of studies show that nuclear energy is neither clean nor cost-
36 effective in relation to other energy alternatives such as wind and solar energy. The cost of the
37 possible new reactor- up to \$22 billion- could retrofit over 7 million Texas homes to make them
38 more energy efficient. (0010-2 [Shroyer, Danielle])

39 **Comment:** There are cleaner ways that make a stronger local economy. The PUC, the Public
40 Utility Commission of Texas, Commissioner Barry Smitherman, recently testified that for every
41 dollar put into energy efficiency, we get two dollars' worth of savings back. (0016-20 [Hadden,
42 Karen])

43 **Comment:** The technique of analysis used in the Comanche Peak environmental report to
44 determine the relative advantages of renewable fuels compared to nuclear power is inherently
45 flawed. For example, the environmental report essentially eliminates conservation/energy
46 efficiency as an alternative that should be considered. p. 9.2-3. The environmental report

1 excuses the consideration of conservation/energy efficiency, because Comanche Peak Units 3
2 and 4 will be merchant power plants. And as such, conservation and demand side management
3 programs to encourage consumers to modify levels of electricity usage "are not within the
4 capability or responsibility of the wholesale baseload merchant generator." *Id.* However, the
5 Comanche Peak reactors would operate within the ERCOT system in Texas, so the market is
6 not unlimited. They are bound to buy or sell electricity to within ERCOT, which is wholly within
7 the state. The environmental report attempts to rationalize omission of conservation/energy
8 efficiency measures by citing to NRC policy that has determined that conservation measures
9 are not reasonable alternatives to merchant power plants that sell wholesale power. *Id.*
10 However, the EIS should not be controlled by the same artificial constraint. The Comanche
11 Peak nuclear power plant expansion proposal should be viewed in the larger context of other
12 means by which to influence electricity usage. Adopting the environmental report's conclusions
13 essentially allows merchant power plants to ignore the proven effectiveness of conservation and
14 energy efficiency programs that have been tested numerous time by various utilities as a means
15 to curtail demand.

16 Texas is in the process of taking further steps to pursue energy efficiency. A new report
17 commissioned by the Texas Public Utilities Commission shows that the state could reduce
18 electric usage by 23% if utilities invest more in efficiency measures, saving Texans as much
19 \$11.9 billion on their electric bills. The findings bolster the call by a coalition of local elected
20 officials, business leaders, community groups and faith leaders for the Legislature to increase
21 the mandate on utilities for energy efficiency investments. The Texas legislature passed an
22 energy efficiency bill last session (2007) and is expected to strengthen energy efficiency
23 commitments in 2009, as well as enacting improved buildings codes which will significantly
24 reduce energy demand. The federal stimulus bill includes initiatives and incentives which will
25 further these efficiency efforts and reduce the growth in demand for electricity. **(0022-49**
26 [Hadden, Karen])

27 **Comment:** Two additional nuclear reactors are currently proposed by Luminant for the
28 Comanche Peak site southwest of Dallas/Fort Worth near Glen Rose, Texas, where two
29 reactors exist now. The proposed reactors could cost up to \$22 billion. This sum used differently
30 could instead retrofit over seven million homes to make them more energy efficient, saving
31 money for consumers, creating local jobs, reducing pollution and addressing global warming
32 directly right now. **(0030-2** [Hadden, Karen])

33 **Response:** *The NRC is not involved in establishing energy policy; rather, it regulates nuclear*
34 *energy to protect public health and safety within existing policy. While energy efficiency*
35 *measures could reduce energy demands in the Comanche Peak service area, in accordance*
36 *with NUREG-1555, a merchant power plant is not required to perform a demand side*
37 *management analysis or consider measure to increase energy efficiency as an alternative to the*
38 *proposed action.*

39 **Comment:** Be sure to keep the broad picture in view...

40 Why would we consider the environmental impact of any proposed project separately from
41 considering the impacts of whatever the alternative(s) to that project are?? For that matter, how
42 could we consider only the environmental impacts of the project?? There are lots of impacts,
43 environmental and otherwise, of all the alternatives, too -including the oft-ignored alternative of
44 doing little or nothing about the situation for which the project is being considered!!

45 Surely, if we don't take a broad view of the situation, we run the risk of skewed policy decisions,
46 no? (& the narrower our focus, the greater the skewing risk!)

1 Alternative / Renewable energy sources have their own serious environmental Impacts! (not to
 2 mention their much lower energy 'density' & continuity of availability). For example, the
 3 infrastructure needed to harness these other power sources consumes tremendous resources
 4 (in materials, land & monetarily). And unless a great deal more resources are used for the
 5 capacity storage that all these sporadically-available power sources require, we'll still have to
 6 use conventional, always-available power sources to 'fill in' for when the Alternative /
 7 Renewable sources aren't available. (Wind & Solar are highly variable in availability!)

8 Excessive Conservation also has adverse environmental impacts -from the more impoverished
 9 conditions resulting from too much reliance on Conservation. A more prosperous society is
 10 more able to afford the costs of higher levels of environmental preservation!

11 Just as "No one is an Island" (unto themselves), we dare not consider, in isolation, the impacts
 12 of just one (kind of) proposal.

13 Something else to keep in mind as deliberation proceeds on these proposed new nuclear power
 14 generating facilities:

15 The validity of scientific (and other) theories & findings, is not in any way dependent on how
 16 many -or few -people express those theories & findings. Likewise, the wisdom of any particular
 17 public policy(ies) also has no necessary relationship to the number of people supporting them.
 18 None of those things bears any necessary relationship to majority (or minority) views. (0018-3
 19 [Wohler, Will])

20 **Comment:** The right way to meet our energy needs right now is through energy efficiency, first
 21 and foremost, through better building codes. And that's starting to happen throughout the state.
 22 Many cities are passing building codes. If we just get smarter about our energy use, we won't
 23 need so much. I maintain that these reactors are not necessary. (0016-13 [Hadden, Karen])

24 **Comment:** Wind and solar energy are well developed now and more affordable than nuclear
 25 power. Energy efficiency helps curb demand. We do not need nuclear power or the risks that it
 26 entails. (0019-7 [Hadden, Karen])

27 **Response:** *The NRC is not involved in establishing energy policy; rather, it regulates nuclear*
 28 *energy to protect public health and safety within existing policy. While energy efficiency*
 29 *measures could reduce energy demands in the Comanche Peak service area, in accordance*
 30 *with NUREG-1555, a merchant power plant is not required to perform a demand side*
 31 *management analysis or to consider measures to increase energy efficiency as an alternative to*
 32 *the proposed action. Chapter 9 of the EIS will describe potential impacts from alternative*
 33 *energy sources. Due to the extensive wind resources in the ERCOT service area and the*
 34 *actions already taken or planned to expand wind energy, Chapter 9 of the EIS will provide a*
 35 *detailed analysis of environmental impacts of wind energy as alternative to the proposed action.*

36 **Comment:** With the wind turbine, there may be an accident now and then, but you don't have
 37 thousands of people at risk from a radioactive waste release with a wind turbine. (0016-19
 38 [Hadden, Karen])

39 **Comment:** The Comanche Peak environmental report is also flawed to the extent that it fails to
 40 make a realistic comparison between the environmental impacts and public health
 41 consequences of nuclear power compared to energy efficiency and renewable fuels. For
 42 example, there should be a side-by-side comparison of mortality and morbidity consequences of
 43 nuclear power compared to energy efficiency and renewable fuels in order to accurately
 44 determine the consequences of each. Of course, the comparisons would indicate that energy
 45 efficiency and renewable fuels do not cause increased mortality and morbidity while nuclear fuel

1 does. Moreover, there should be a side-by-side comparison of nuclear fuels and energy
2 efficiency and renewable fuels, related to the effects of catastrophic accidents. Such a side-by-
3 side comparison would indicate that a catastrophic loss of, for example, a wind generating
4 accident or capacity loss would be negligible compared to a major loss of cooling accident at
5 Comanche Peak Units 3 and 4. The EIS should engage such a comparative analysis in order to
6 fairly determine the environmental consequences and public health impacts of each. (0022-50
7 [Hadden, Karen])

8 **Response:** *The NRC is not involved in establishing energy policy; rather, it regulates nuclear*
9 *energy to protect public health and safety within existing policy. The EIS will evaluate the risk*
10 *and consequences of design basis and severe accidents in Chapter 5. The discussion of*
11 *alternative energy sources, including wind and solar, will be addressed in Chapter 9 of the EIS,*
12 *which will compare and describe potential environmental impacts from alternative energy*
13 *sources. Alternative energy sources will be evaluated first to determine if the energy source can*
14 *meet the purpose and need of the project. If they cannot meet the purpose and need then they*
15 *are not evaluated further. As part of the COL process and in conjunction with the EIS, the NRC*
16 *staff will conduct a safety review detailing site-specific safety analysis and design specific*
17 *analysis, including NRC acceptance.*

18 **Comment:** It's [nuclear power is] not a useful solution to climate change. You can't build
19 reactors fast enough to meet any significant portion of the energy needs to be produced. (0016-
20 12 [Hadden, Karen])

21 **Response:** *The NRC is not involved in establishing energy policy; rather, it regulates nuclear*
22 *energy to protect public health and safety within existing policy. Alternative energy sources,*
23 *including fossil and renewable energy sources such as wind, solar, and geothermal, will be*
24 *evaluated and addressed in Chapter 9 of the EIS in comparison with the proposed action.*

25 **Comment:** Do I have to waste the energy I'm wasting today? In the little things that we do,
26 inefficient lighting, the extras that we do through every day, the things that we leave on that we
27 could turn off, do we have to do that so badly that we're willing to leave a legacy of radioactive
28 waste that literally will last millions of years, that someone someday is going to have to
29 repackage and make sure it's contained safely so it doesn't escape into the environment.
30 (0016-17 [Hadden, Karen])

31 **Response:** *The NRC is not involved in establishing energy policy; rather, it regulates nuclear*
32 *energy to protect public health and safety within existing policy. While energy efficiency*
33 *measures could reduce energy demands in the Comanche Peak service area, in accordance*
34 *with NUREG-1555, a merchant power plant is not required to perform a demand side*
35 *management analysis or consider measure to increase energy efficiency as an alternative to the*
36 *proposed action. Section 9 of the EIS will describe potential impacts from alternative energy*
37 *sources. The impact of the uranium fuel cycle, including disposal of low-level radioactive waste*
38 *and spent fuel, will be addressed in Chapter 6 of the EIS.*

39 **Comment:** there will be significant legislative action that will add to our power mix in Texas, not
40 in terms of nuclear, but in terms of both energy efficiency and other renewables.

41 And I left in the back sort of some of the legislative goals that Lone Star Chapter of the Sierra
42 Club has, many of—all of which, frankly, are also for economic benefit. It's about promoting
43 other kinds of energy use and energy efficiency that are also good for the economy. And our
44 view is that if you look at all the different energy sources, nuclear really should be the last option
45 we look at.

1 So I want you to look at that projection, look at some of the studies that have been done by
 2 Itron, by ACEEE and others for Texas, to see if their assessment is realistic in terms of what's
 3 needed in Texas and whether we can't meet this demand through other means, including
 4 means that, frankly, Luminant is looking at, like wind, and I know they're looking at the potential
 5 for utility-scale solar. So I'd urge you to look at that. (0016-51 [Reed, Cyrus])

6 **Response:** *The NRC is not involved in establishing energy policy; rather, it regulates nuclear
 7 energy to protect public health and safety within existing policy. The discussion of alternative
 8 energy sources, including wind and solar, will be addressed in Chapter 9 of the EIS, which will
 9 compare and describe potential environmental impacts from alternative energy sources. Due to
 10 the extensive wind resources in the ERCOT service area and the actions already taken or
 11 planned to expand wind energy, Chapter 9 of the EIS will provide a detailed analysis of
 12 environmental impacts of wind energy as alternative to the proposed action.*

13 **Comment:** The right way to meet our energy needs right now is through energy efficiency, first
 14 and foremost, through better building codes. And that's starting to happen throughout the state.
 15 Many cities are passing building codes. If we just get smarter about our energy use, we won't
 16 need so much. I maintain that these reactors are not necessary. (0016-14 [Hadden, Karen])

17 **Comment:** And we all know that we need to do conservation. (0017-16 [Burnam, Lon])

18 **Comment:** An easier way to increase, or to use energy more efficiently is a better way of
 19 conserving energy, and Texas leads in being energy wasteful. Energy conservation and energy
 20 efficiency are easy ways to go. (0017-79 [Stuard, Gary])

21 **Response:** *The NRC is not involved in establishing energy policy; rather, it regulates nuclear
 22 energy to protect public health and safety within existing policy. While energy efficiency
 23 measures could reduce energy demands in the Comanche Peak service area, in accordance
 24 with NUREG-1555, a merchant power plant is not required to perform a demand side
 25 management analysis or consider measure to increase energy efficiency as an alternative to the
 26 proposed action.*

27 **Comment:** say, cut this off right now, and go for alternative sources of energy, truly green jobs.
 28 If you want a jobs program, get one that is not going to hurt the next generation. (0017-73
 29 [Sanders, Jan])

30 **Response:** *The NRC is not involved in establishing energy policy; rather, it regulates nuclear
 31 energy to protect public health and safety within existing policy. Chapter 9 of the EIS will
 32 describe potential impacts from alternative energy sources.*

33 **D.2.28 Comments Concerning Alternatives - System Design**

34 **Comment:** The study should also include an analysis of pollution impacts downstream from
 35 water contaminated by chemical treatment such as biocides, algaecides, pH adjustors,
 36 corrosion inhibitor and silt dispersant chemicals injected at the reactor site as well as chlorine,
 37 salts and non-radioactive effluent. The differential impact of treatment of 100 percent of the
 38 water versus the lesser amount of treatment proposed by the applicant should be considered.
 39 (0022-19 [Hadden, Karen])

40 **Comment:** The proposed project will withdraw water for cooling tower makeup from Lake
 41 Granbury and return the cooling tower blowdown back to Lake Granbury. Currently, Lake
 42 Granbury is listed as being impaired for chlorides. CPNPP should know that a total maximum
 43 daily load (TMDL) will be prepared for Lake Granbury to address the chloride impairment. The
 44 TMDL will give a wasteload allocation for chlorides to CPNPP for its cooling tower blowdown

1 discharge. CPNPP should be aware that it may be required to meet the water quality standard
2 for chlorides or significantly reduce the level of chloride in its discharge. Texas Commission on
3 Environmental Quality (TCEQ) is responsible for developing TMDLs and TMDL Implementation
4 plans. EPA reviews and approves TMDLs developed by TCEQ. (0027-11 [Osowski Morgan,
5 Sharon L.]

6 **Comment:** Best Management Practices (BMPs) should be used to reduce erosion during
7 construction. Typical BMPs include the use of staked hay bales, silt fences, mulching and
8 reseeding, and appropriate buffer zones along water bodies. The document should include an
9 erosion control plan or reference the State erosion control regulations and a commitment to
10 compliance. Compliance should include both BMP application and maintenance. (0027-8
11 [Osowski Morgan, Sharon L.]

12 **Response:** *The construction and operation of a nuclear plant involves some discharges to*
13 *nearby water bodies. The Clean Water Act designated the U.S. Environmental Protection*
14 *Agency as the Federal agency with responsibility over effluent discharges to the nation's*
15 *waters. While it only regulates radiological effluents, the NRC does have the responsibility*
16 *under NEPA to assess and disclose the expected impacts of the proposed action on water*
17 *quality throughout the plant's life. The staff's assessment of the nonradiological impacts to*
18 *water quality will be presented in Chapter 5 of the EIS. Luminant's proposed blowdown waste*
19 *water treatment would return water to Lake Granbury in compliance with all regulatory water*
20 *quality requirements. Consequently, additional levels of water treatment would not be*
21 *necessary. Alternatives for additional water treatment, including those suggested in the*
22 *comment, will not be addressed in the EIS.*

23 **Comment:** The Energy Policy Act of 2005 directed the United States Department of Energy to
24 research and develop proliferation resistant fuel recycling and transmutation technologies that
25 are intended to minimize damage to the environment and public health and to enhance safety of
26 spent fuel management. The EIS should consider this alternative and determine whether it is
27 technologically feasible and prudent to pursue. The reason for this alternative to be considered
28 as a spent fuel management technique is because it assumes that a federal repository for spent
29 fuel will not be available. Proliferation resistant fuel recycling and transmutation technologies
30 may have the effect of managing spent fuel in a way that minimizes adverse impacts to the
31 public's health and the environment. Therefore, the EIS should fully develop the state of these
32 technologies and determine whether such would be available for purposes of managing spent
33 fuel at Comanche Peak. (0022-41 [Hadden, Karen])

34 **Response:** *Chapter 6 of the EIS evaluates the fuel cycle impacts including both a no-recycle*
35 *process and a recycle process. The safety and environmental effects of spent fuel storage*
36 *onsite have been evaluated by the NRC and, as set forth in the Waste Confidence Rule (10 CF*
37 *51.23), the NRC generically determined that such storage could be accomplished without*
38 *significant environmental impacts. In the Waste Confidence Rule, the Commission determined*
39 *that spent fuel can be safely stored onsite for at least 30 years beyond the plant's life.*

40 **Comment:** When the first two reactors were built the sky glow light pollution went from zero to
41 off the scale in the direction of the reactors. The latest round of fixture modernization reduced
42 the sky glow by about 40 percent. Our Concern is the two new units will increase the sky glow
43 beyond what it was after initial construction. We would like to see a comprehensive relighting
44 program for all four reactors, using the latest technology zero cut-off fixtures, such as those
45 approved by the International Dark-sky Association in order to achieve an overall reduced light
46 pollution impact than what now exists. www.darksky.org (0024-1 [Miller, Russ])

1 **Response:** *The physical impacts of the facility operation at the proposed site, including the*
 2 *impacts of the proposed plant lighting, will be evaluated in Chapter 5 of the EIS.*

3 **Comment:** In my conversations with engineers, it is commonly believed that a better
 4 engineered cooling system could easily reduce or eliminate this water loss. [Loss of 55,000 acre
 5 feet per year to evaporative cooling.] FBR [Friends of the Brazos River] respectfully asks that
 6 you delay this permit until a less wasteful cooling system can be designed. (0025-2 [Lowe, Ed])

7 **Response:** *The construction and operation of a nuclear plant involves the consumption of*
 8 *water. The staff will independently assess the impact of these consumptive water losses on the*
 9 *sustainability of both the local and regional water resources. This assessment will consider both*
 10 *current and future conditions, including changes in water demands to serve the needs of the*
 11 *future population, and changes in water supply resulting from climate variability and climate*
 12 *change. While the NRC does not regulate or manage water resources, it does have the*
 13 *responsibility under NEPA to assess and disclose the impacts of the proposed action on water*
 14 *resources. The staff's assessment of the impacts on water resources from the plant's proposed*
 15 *cooling system will be presented in Chapters 4 and 5 of the EIS for construction and operation,*
 16 *respectively. The impacts of alternatives to the proposed cooling system will be evaluated in*
 17 *Chapter 9 of the EIS.*

18 **Comment:** The Comanche Peak report admits that there is no federal site for disposition of
 19 high-level nuclear waste and that present options for disposal of low-level radioactive waste are
 20 limited. Given the difficulty in siting both low-level and high-level radioactive waste, an EIS
 21 should consider all of the waste disposal options, including long-term storage at the site itself.
 22 (0032-12 [Reed, Cyrus])

23 **Response:** *The impact of the uranium fuel cycle, including disposal of low-level radioactive*
 24 *waste and spent fuel, will be addressed in Section 6 of the EIS. The generic impacts of the fuel*
 25 *cycle are codified in 10 CFR 51.51(b), Table S-3, "Table of Uranium Fuel Cycle Environmental*
 26 *Data." Per the guidance in 10 CFR 51.51 and Section 5.7 of NUREG-1555, the staff will rely on*
 27 *Table S-3 as a basis for uranium fuel-cycle impacts. The Waste Confidence Rule (10 CFR*
 28 *51.23) has determined that spent fuel can be safely stored on site for at least 30 years beyond*
 29 *the life of the plant.*

30 **Comment:** Given the uncertainty involved with licensing the Yucca Mountain Nevada facility for
 31 the disposal of spent nuclear fuel, all utilities planning on constructing additional nuclear units on
 32 current sites should consider contingencies for long-term storage of waste on-site. (0027-6
 33 [Osowski Morgan, Sharon L.]

34 **Response:** *The safety and environmental effects of spent fuel storage onsite have been*
 35 *evaluated by the NRC and, as set forth in the Waste Confidence Rule (10 CF 51.23), the NRC*
 36 *generically determined that such storage could be accomplished without significant*
 37 *environmental impacts. In the Waste Confidence Rule, the Commission determined that spent*
 38 *fuel can be safely stored onsite for at least 30 years beyond the plant's life.*

39 **D.2.30 Comments Concerning Benefit - Cost Balance**

40 **Comment:** The two proposed Comanche Peak reactors could cost up to \$22 billion according
 41 to Luminant's own documents. This is before cost overruns. This amount could make 7.3 million
 42 homes more energy efficient. Pursuing efficiency lowers bills, reduces electricity consumed, and
 43 creates local jobs. The existing Comanche Peak reactors ran ten times over budget and were
 44 years late coming online. What if this happened again? (0019-8 [Hadden, Karen])

1 **Response:** *These points will be noted and discussed in the EIS. NUREG-1555 call for the*
2 *Benefit-Cost analysis to include consideration of internal and external costs. The scope of the*
3 *analysis for internal costs are those costs for the design proposed by the applicant (NUREG-*
4 *1555). Scenario analysis of vast departures from these costs is therefore outside the scope of*
5 *this analysis.*

6 **Comment:** Further, I request to see an analysis of water use per kilowatt hour produced for the
7 proposed new plant reactors and the cost of this power if Luminiant had to pay current
8 wholesale water rates. (0021-3 [Richardson, Karen])

9 **Response:** *The EIS will reflect the cost of cooling systems in its analysis and the water*
10 *quantities lost through evaporation and other losses in Chapter 10 of the EIS.*

11 **Comment:** 3. Reactor Lifespan - (a) What is the average effective life span of a nuclear
12 reactor?

13 (b) How much additional funding will be required to maintain an aging reactor?
14 (0023-7 [Ubico, Jean])

15 **Response:** *The assumptions of reactor life span and costs used in this analysis will be*
16 *provided in Section 10 of the EIS. Costs for all phases of reactor construction and maintenance*
17 *will be discussed, but data are specific to the proposed plants and the alternatives chosen and*
18 *cannot be applied to a "representative" reactor. The license period for a combined license is 40*
19 *years. A licensee can request renewal for an additional 20 years. The cost benefit analysis is*
20 *done for the license period of 40 years. It would not be appropriate to assume additional cost or*
21 *benefit for an additional 20 years of license renewal when that action has not been requested or*
22 *approved.*

23 **Comment:** The second piece entitled 'Troubled History of Comanche Peak' is intended to
24 bolster the case for including consideration of existing reactors' history in the EIS. The past is
25 prelude to the future. The EIS must address the possibility that difficulties similar to those which
26 occurred in the past might occur again. The problems that arose in the past were frequently
27 related to using new technologies. As the USAPWR design proposed for Comanche Peak Units
28 3 and 4 has never been built anywhere in the world, the likelihood of problems and resulting
29 health and environmental impacts is likely to increase. A full analysis of the difficulties of
30 building the reactors successfully including an examination of the history of existing reactors
31 should be undertaken in the EIS. (0030-1 [Hadden, Karen])

32 **Response:** *The EIS will contain a detailed analysis of the proposed reactors and comparisons*
33 *of alternatives to the proposed reactors. A detailed analysis of the history of the nuclear power*
34 *industry that goes beyond the proposed reactors and the alternatives is beyond the scope of*
35 *this EIS.*

36 **Comment:** Nuclear technology is not cost effective, requiring massive subsidies from
37 taxpayers. (0031-8 [Gentling, Suzanne])

38 **Response:** *The NRC is not involved in establishing energy policy; rather, it regulates nuclear*
39 *energy to protect public health and safety within existing policy. An analysis of the proposed*
40 *facilities and alternatives will be presented in Chapter 9 of the EIS.*

41 **Comment:** I have read, from a financial standpoint, how much taxpayers are paying for this
42 nuclear power plant. I have read the bills that have to do with the energy bills for 2005 and so
43 on, that show all the subsidies that are going into the nuclear power plants. So we are paying for
44 it. (0017-50 [Harper, Debbie])

1 **Response:** Chapters 9 and 10 of the EIS will review the costs of constructing the plant and
 2 compare the proposed site with alternatives. Non-monetary costs, such as environmental
 3 impacts and other costs, will also be analyzed and summarized in a benefit cost section. The
 4 NRC staff is aware that nuclear energy receives some subsidies and that all other energy forms
 5 are also subsidized in different ways. A complete analysis that compares all of these subsidies
 6 on a common basis is beyond the scope of the EIS.

7 **Comment:** [The proposed Comanche Peak units 3 and 4 are a] Waste of money. (0017-81
 8 [Sanders, Jan])

9 **Response:** Chapter 10 of the EIS will contain an analysis of the need for the power for the
 10 proposed facility, the alternatives to the proposed facility, and a summary of benefits and
 11 costs. Ultimately, the plant will be evaluated relative to other ways to meet the forecasted
 12 demands for power.

13 **Comment:** Ecosystem services are the benefits humans derive from nature. The concept of
 14 ecosystem services encompasses natural renewable resources and processes that are
 15 essential to human well being like clean water, clean air, and a host of other services that have
 16 not been traditionally incorporated into cost-benefit analyses, but can be considered. The
 17 concepts of ecosystem services and sustainability are interconnected. If use of ecosystem
 18 services exceeds the environment's capacity to perform those services, then the activity is not
 19 sustainable over time. The NEPA document should discuss aspects of ecosystem services and
 20 sustainability as appropriate. (0027-24 [Osowski Morgan, Sharon L.]

21 **Response:** The comment correctly notes that the environment and other natural systems
 22 provide services that contribute to societal well-being, but that these services are not marketed
 23 and are difficult to measure. For this reason, the EIS process has traditionally sought to add the
 24 costs of mitigating external impacts to the costs summarized in Chapter 10 of the EIS. Where
 25 possible a quantitative value for mitigated costs will be used and where this is not possible a
 26 qualitative analysis will be used. Unmitigated costs are termed unavoidable and are valued and
 27 included in the analysis in the same way. The scope of this analysis is described in NUREG-
 28 1555 p. 2.4.2 and will be followed in Chapter 10 of the EIS.

29 **Comment:** The cost to the taxpayers. I think all of us should feel quite sore already from the
 30 fact that we have been stuck with high bills, given corporate malfeasance and corruption, and
 31 that we have been left with paying the bill. The only reason why nuclear power could be on the
 32 plate or the playing field is the fact that it is going to be heavily subsidized, i.e.; you and I will
 33 pay for it. I don't know about you, but that doesn't leave a good taste in my mouth.
 34 Also a recent study that has just recently come out, called Business Risks and Costs of New
 35 Nuclear Power has put the generation cost of power or power from nuclear power plants at from
 36 25 to 30 cents per kilowatt hour. That is triple the current U.S. electricity rate. (0017-77 [Stuard,
 37 Gary])

38 **Response:** The EIS will review the environmental costs of constructing the plant and compare
 39 the proposed site with alternatives. Non-monetary costs, such as environmental impacts and
 40 other costs, will also be analyzed and summarized in a benefit cost section. The NRC staff is
 41 aware that nuclear energy receives some subsidies and that all other energy forms are also
 42 subsidized in different ways. A complete analysis that compares all of these subsidies on a
 43 common basis is beyond the scope of the EIS. However, it is noteworthy that following the
 44 restructuring of the ERCOT electric power system, wholesale power producers must compete
 45 with other power suppliers and that their investors have their capital at risk if the facilities cannot
 46 successfully compete in the marketplace. Under this system, power generators are not subject
 47 to rate of return regulation and have no guaranteed profits.

1 **Comment:** The indirect or secondary impacts should be assessed. In particular, the potential
2 impacts associated with water use from sources other than SCR. The secondary impacts from
3 fuel mining and processing should also be investigated. Currently, there does not seem to be
4 enough information in Section 10.2.1.6 section to evaluate. The ER states impacts from mining
5 on geological resources are expected to be small. This statement is not consistent with the large
6 scale and wide-ranging impacts mining may potentially have on the environment. Additional
7 information should be provided. (0027-26 [Osowski Morgan, Sharon L.]

8 **Response:** *Chapters 4 and 5 of the EIS will review secondary impacts from constructing and*
9 *operating the plant including impacts from water usage and from the nuclear fuel cycle,*
10 *including mining, processing, and fuel fabrication. Where staff finds the applicant's analysis*
11 *unpersuasive or inadequate, staff will request additional information from the applicant. If*
12 *necessary staff will carry out additional independent analyses. The public will have an*
13 *opportunity to review the draft EIS and to comment on it.*

Appendix E

Draft Environmental Impact Statement Comments and Responses (Reserved)

Appendix E

Draft Environmental Impact Statement Comments and Responses (Reserved)

Appendix F

Key Consultation Correspondence Regarding the Comanche Peak Nuclear Power Plant, Units 3 and 4, Combined Licenses Application

Appendix F

Key Consultation Correspondence Regarding the Comanche Peak Nuclear Power Plant, Units 3 and 4, Combined Licenses Application

1 Correspondence sent and received during the evaluation process for the combined license
2 application for the siting of two new nuclear units, Units 3 and 4, at the Comanche Peak Nuclear
3 Power Plant site in Somervell and Hood Counties, Texas is identified in Table 1. In addition, a
4 full copy of the Biological Assessment is included in this appendix.

5 **Table 1.** Key Consultation Correspondence

Source	Recipient	Date of Correspondence
U.S. Nuclear Regulatory Commission (William Burton)	Texas State Historic Preservation Officer (Lawrence Oaks)	December 23, 2008 ML083400507
U.S. Nuclear Regulatory Commission (William Burton)	Texas Parks and Wildlife Department (Kathy Boydston)	December 23, 2008 ML083400514
U.S. Nuclear Regulatory Commission (William Burton)	U.S. Advisory Council on Historic Preservation (Don Klima)	December 23, 2008 ML083410002
U.S. Nuclear Regulatory Commission (William Burton)	U.S. Fish and Wildlife Service (Tom Cloud)	December 23, 2008 ML083450242
U.S. Nuclear Regulatory Commission (William Burton)	National Marine Fisheries Service (David Bernhart)	December 23, 2008 ML083450284
U.S. Nuclear Regulatory Commission (William Burton)	Absentee-Shawnee Tribe of Oklahoma (Scott Miller)	December 23, 2008 ML083460276
U.S. Nuclear Regulatory Commission (William Burton)	White Mountain Apache Tribe (Ronnie Lupe)	December 23, 2008 ML083460284

6

Table 1. (contd)

Source	Recipient	Date of Correspondence
U.S. Nuclear Regulatory Commission (William Burton)	Alabama-Coushatta Tribe of Texas (Bryant Celestine)	December 23, 2008 ML083460323
U.S. Nuclear Regulatory Commission (William Burton)	Apache Tribe of Oklahoma (Alonzo Chalepah)	December 23, 2008 ML083460347
U.S. Nuclear Regulatory Commission (William Burton)	Caddo Nation of Oklahoma (LaRue Parker)	December 23, 2008 ML083460378
U.S. Nuclear Regulatory Commission (William Burton)	Cheyenne Arapaho tribes of Oklahoma (Darrell Flyingman)	December 23, 2008 ML083460400
U.S. Nuclear Regulatory Commission (William Burton)	Comanche Nation (Wallace Coffey)	December 23, 2008 ML083460416
U.S. Nuclear Regulatory Commission (William Burton)	The Delaware nation, Delaware Tribe of Western Oklahoma (Kerry Holton)	December 23, 2008 ML083460442
U.S. Nuclear Regulatory Commission (William Burton)	Delaware Tribe of Western Oklahoma (Jerry Douglas)	December 23, 2008 ML083460483
U.S. Nuclear Regulatory Commission (William Burton)	Ft. Sill Apache Tribe of Oklahoma (Jeff Houser)	December 23, 2008 ML083460509
U.S. Nuclear Regulatory Commission (William Burton)	Jicarilla Apache Nation (Lorene Willis)	December 23, 2008 ML083460546
U.S. Nuclear Regulatory Commission (William Burton)	Kickapoo Traditional Tribe of Texas (Juan Garza)	December 23, 2008 ML083460577
U.S. Nuclear Regulatory Commission (William Burton)	Kiowa Tribe of Oklahoma (Billy Horse)	December 23, 2008 ML083460598

1

Table 1. (contd)

Source	Recipient	Date of Correspondence
U.S. Nuclear Regulatory Commission (William Burton)	Mescalero Apache Tribe (Carleton Naiche-Palmer)	December 23, 2008 ML083460623
U.S. Nuclear Regulatory Commission (William Burton)	Wichita and Affiliated Tribes (Leslie Standing)	December 23, 2008 ML083470301
U.S. Nuclear Regulatory Commission (William Burton)	Osage Nation (Jim Roan Gray)	December 23, 2008 ML083470322
U.S. Nuclear Regulatory Commission (William Burton)	Tonkawa Tribe of Oklahoma (Anthony Street)	December 23, 2008 ML083470373
Tonkawa Tribe of Oklahoma (Donald L. Patterson)	U.S. Nuclear Regulatory Commission (William Burton)	January 5, 2009 ML090500590
National Marine Fisheries Service (David M. Bernhart)	U.S. Nuclear Regulatory Commission (William Burton)	January 8, 2009 ML090230148
U.S. Environmental Protection Agency, Region 6 (Cathy Gilmore)	U.S. Nuclear Regulatory Commission (Michael Lesar)	February 13, 2009 ML090680037
Texas Parks and Wildlife Department (Carter Smith)	U.S. Nuclear Regulatory Commission (Michael Lesar)	February 16, 2009 ML090680387
Advisory Council on Historic Preservation (Charlene Dwin Vaughn)	U.S. Nuclear Regulatory Commission (William Burton)	February 17, 2009 ML090500077
U.S. Fish and Wildlife Services (Sean Patrick Edwards)	U.S. Nuclear Regulatory Commission (Michael Willingham)	February 19, 2009 ML092430749
Texas Parks and Wildlife Department (Karen Hardin)	U.S. Nuclear Regulatory Commission (Michael Lesar)	April 24, 2009 ML091310617

2

1

Table 1. (contd)

Source	Recipient	Date of Correspondence
Texas Historical Commission (Mark Wolfe)	Enercon Services Inc. (Stacy Burgess)	June 10, 2009 ML092090669

2

Biological Assessment

U.S. Fish and Wildlife Service

**Comanche Peak Nuclear Power Plant
Units 3 and 4**

**U.S. Nuclear Regulatory Commission Combined License Application
Docket Nos. 52-034 and 52-035**

U.S. Army Corps of Engineers Permit Application

August 2010

U.S. Nuclear Regulatory Commission
Rockville, Maryland

U.S. Army Corps of Engineers
Fort Worth District

1.0 Introduction

1 The U.S. Nuclear Regulatory Commission (NRC) is reviewing an application from Luminant
2 Generation Company LLC (Luminant) for two combined licenses (COLs) for construction and
3 operation of two new nuclear power plants at its Comanche Peak Nuclear Power Plant
4 (CPNPP) site. The CPNPP site lies approximately 5 mi north of Glen Rose, Texas, and
5 approximately 9 mi south of Granbury, Texas, outside the limits of either city (see Figure 1).
6 The COL application was submitted by Luminant to the NRC on September 19, 2008.
7 Concurrent with the NRC's review, the U.S. Army Corps of Engineers (USACE) is reviewing
8 Luminant's COL application for a Department of the Army (DA) Permit to build the reactors and
9 support structures in waters of the United States on the CPNPP site. The NRC and the USACE
10 are cooperating agencies with the NRC being the lead agency, and this biological assessment
11 (BA) supports a joint consultation with the U.S. Fish and Wildlife Service (USFWS) under
12 Section 7 of the Endangered Species Act (ESA) of 1973. The USACE is cooperating with the
13 NRC to ensure the information presented in the EIS is adequate to fulfill the requirements of
14 Corps regulations; the Clean Water Act Section 404(b)(1) Guidelines, which contain the
15 substantive environmental criteria used by the USACE in evaluating discharges of dredged or fill
16 material into waters of the United States; and the USACE public interest review process.
17 Currently there are two operating nuclear reactors on the CPNPP site, Units 1 and 2.

18 The proposed new reactors, Units 3 and 4, would be located adjacent to the existing units in
19 areas that had experienced previous temporary disturbance during development of Units 1 and
20 2, along with some adjoining areas of previously undisturbed areas of land. The proposed
21 support structures would also occupy previously developed land as well as grasslands, Ashe
22 juniper (*Juniperus ashei*) woodland - savanna, and mixed hardwood communities. Luminant
23 has identified the need for new and expanded transmission line and pipeline corridors as part of
24 the project (see Figure 2). The routes for a proposed 17-mi transmission line (referred to as the
25 DeCordova line) and a proposed 17-mi cooling water pipeline to Lake Granbury would go
26 through Somervell and Hood Counties, Texas. A proposed 45-mi transmission line (referred to
27 as the Whitney line) would go through Somervell and Bosque Counties. Although approximate
28 corridors for the new lines have been identified, exact rights-of-way for the new lines are yet-to-
29 be determined. For three other transmission line rights-of-way with lengths of 41.6, 22.4, and
30 22.4 mi, Luminant has stated that no land-use impacts are anticipated, since the new
31 conductors would be added to vacant circuit positions on existing steel towers on rights-of-way
32 where vegetative maintenance is already being performed on those rights-of-way (Luminant
33 2009a).

34 The NRC is required to prepare an environmental impact statement (EIS) as part of the
35 agency's review of the COL and DA permit applications. As required by Title 10 of the Code of
36 Federal Regulations(CFR) Part 51.26, the NRC has published in the *Federal Register* a Notice
37 of Intent (73 FR 77076) to prepare an EIS and to conduct scoping. The final EIS would be
38 issued after considering public comments on the draft EIS. The impact analysis in the EIS
39 includes an assessment of the potential environmental impacts of the construction and
40 operation of the two new nuclear power units at the CPNPP site and along the associated
41 transmission and pipeline corridors, including potential impacts to threatened and endangered
42 species. If approved, the COL and DA permit would authorize Luminant to construct and
43 operate the new units.

44 This BA examines the potential impacts on federally listed threatened or endangered terrestrial
45 species of construction and operation of the proposed Units 3 and 4 at the CPNPP site and
46 along the proposed new transmission and pipeline rights-of-way, pursuant to Section 7(c) of the
47 Endangered Species Act (ESA) of 1973, as amended.

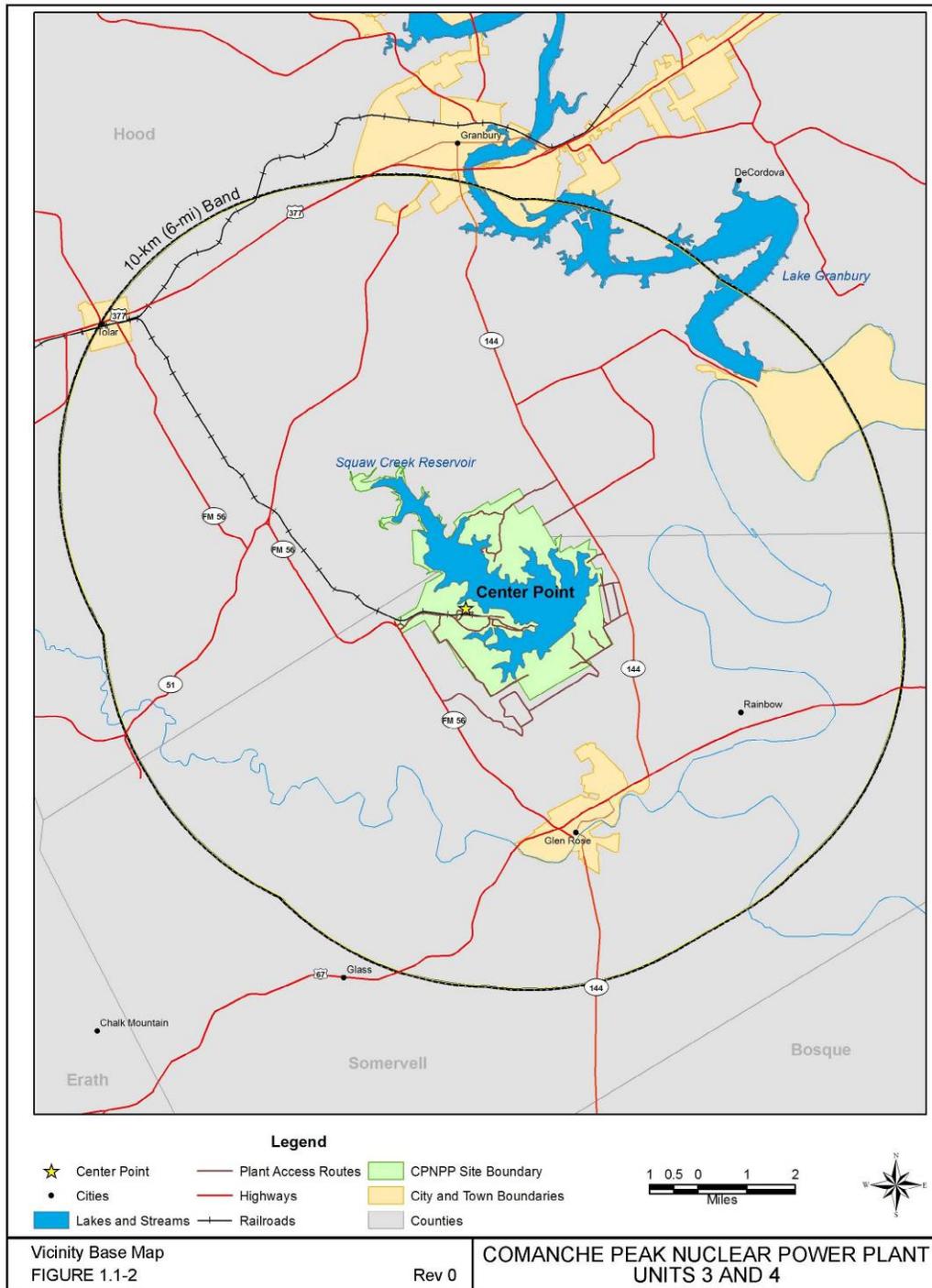


Figure 1. Location of the CPNPP site within Hood and Somervell Counties, Texas (Luminant 2009a).

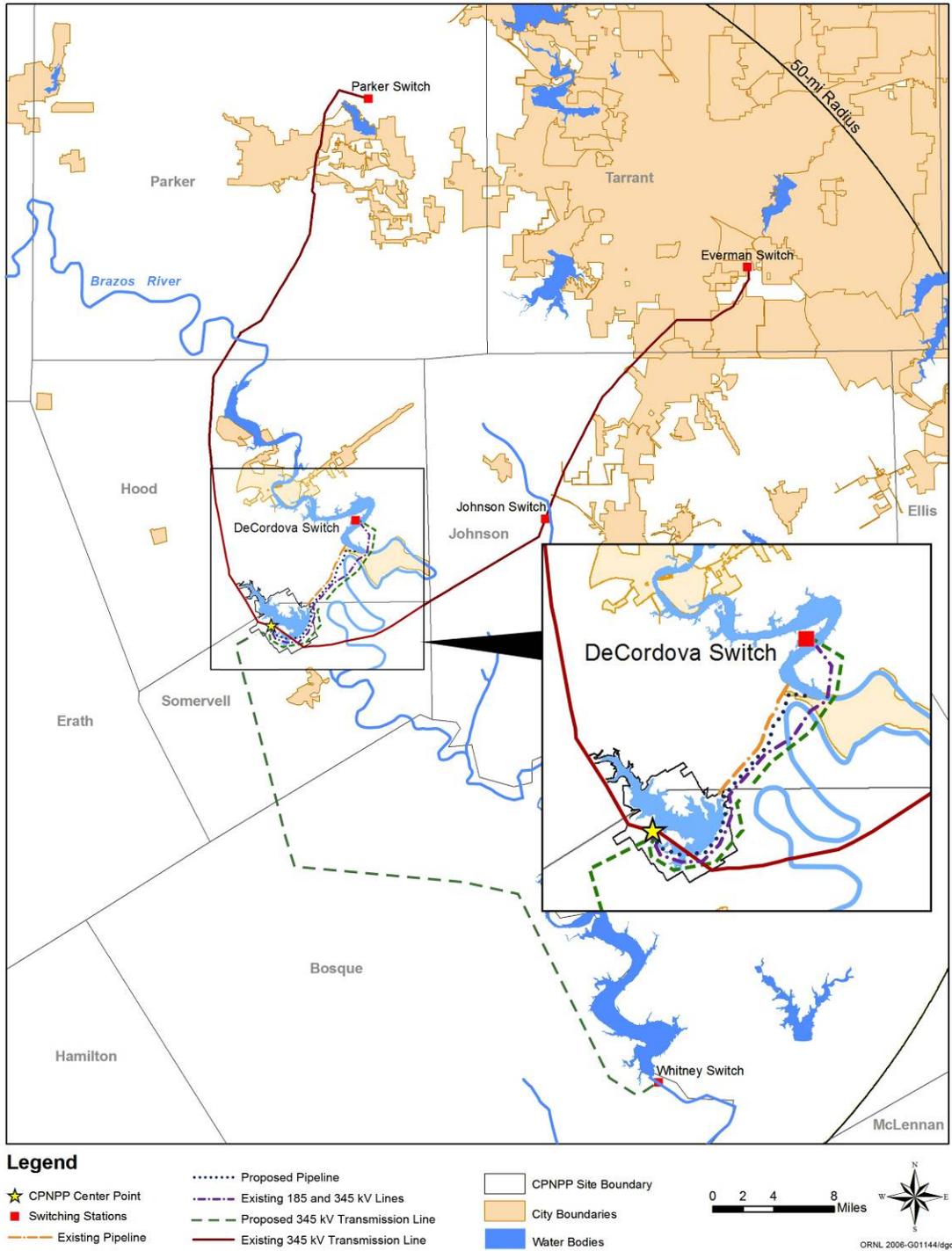


Figure 2. Existing and proposed transmission line rights-of-way and pipeline routes. Note: All routes are approximate, and the exact alignments of the routes have yet to be determined. The existing 345-kV transmission line rights-of-way can support a second circuit on the existing support towers. The existing 185 and 345-kV transmission lines will not be modified (adapted from Luminant 2009a).

2.0 CPNPP Project Site Description

The CPNPP site lies within the Western Cross Timbers subdivision of the Grand Prairie physiographic province (Wermund 1996). The province is transitional between the vast prairies to the west and the forested hills or low mountains to the east. Ecologically, the site lies within the Western Cross Timbers subdivision of the Grand Prairie ecoregion, which is characterized by a mosaic of forest, woodland, savanna, and prairie with dominant vegetation that includes little bluestem (*Schizachyrium scoparium*) with scattered stands of blackjack oak (*Quercus marilandica*) and post oak (*Q. stellata*) (Griffith et al. 2004). Historical records indicate that much of the region existed as a grassland or open live oak savanna that supported herds of bison and other herbivores dependent on the tall grasses that dominated the region (TPWD 2007). The introduction of domestic livestock, farming operations, and wildfire control changed the landscape of much of the region. These practices created a landscape that experienced invasion and localized domination in some areas by problematic scrub species such as mesquite (*Prosopis* spp.), Ashe juniper, and other native woody species. Overgrazing by livestock and elimination of naturally occurring fire also reduced native grass cover and allowed the invasion of other, less desirable annual grasses and forbs.

Luminant prepared an ecological vegetation cover type map of the CPNPP site based on interpretation of aerial photographs showing the current spatial distribution of vegetation types and aquatic habitats present (Figure 3). The two general regional vegetation cover types (oak-mesquite-juniper savanna and woodlands, and silver bluestem [*Bothriochloa saccharoides*]-Texas wintergrass [*Nassella* (= *Stipa*) *leucotricha*]) were further classified into more site-specific descriptions using 1999 infrared aerial photography and ground-truthing in 2006 and 2007 (Luminant 2009a). Figure 3 shows that terrestrial cover of the site is predominantly Ashe juniper woodland – savanna and grasslands. A description of each cover type follows:

Ashe Juniper Woodland - Savanna. Strands of Ashe juniper woodland – savanna are evergreen, dominated by mature Ashe juniper trees or a combination of mature and immature Ashe juniper trees and saplings. Mature Ashe juniper trees are over 15 ft high with 5 in or more in diameter at breast height (DBH), approximately 4.5 ft above the ground. Hardwood species occupy 10 percent or less of the canopy. This cover type is the most common terrestrial habitat type at CPNPP and occupies a total of about 3071 ac or approximately 39 percent of the site. Ashe juniper woodland - savanna covers about 60 percent of the peninsula where new cooling towers for Units 3 and 4 would be located. This peninsula is located just to the northwest of, and adjacent to, the peninsula on which existing Units 1 and 2 are located (Figure 4). Substantial land clearing would be needed on the peninsula to accommodate the cooling towers. Similarly, the proposed blowdown treatment facility (BDTF), which is located to the southeast (see Figure 5), would be developed in what is now predominantly Ashe juniper habitat. This facility is only in design concept phase, but the roughly 400-ac location it would occupy, including its associated evaporation ponds, is depicted in Figure 5.

Mixed Hardwood Forest. Mixed hardwood forests are dominated by a combination of hardwood tree species including live oak (*Quercus virginiana*), cedar elms (*Ulmus crassifolia*), mesquite, hackberry (*Celtis* spp.), Texas ash (*Fraxinus texensis*), chittamwood (*Sideroxylon lanuginosa*), and occasional persimmon (*Diospyros texana*) trees. Ashe junipers comprise 30 percent or less of the tree canopy in mixed hardwood stands. The shrub layer includes buckbrush (*Ceanothus cuneatus*), agarito (*Berberis trifoliata*), lemon sumac (*Rhus aromatica*), and Mexican buckeye (*Ungnadia speciosa*). This cover type occupies a total of about 528 ac at CPNPP or approximately 7 percent of the site. Transect data, collected by Luminant in 2007 (Luminant 2009a) on the peninsula where new cooling towers would be located, show that mixed hardwood forest covers approximately 16 percent of the transect lines surveyed.

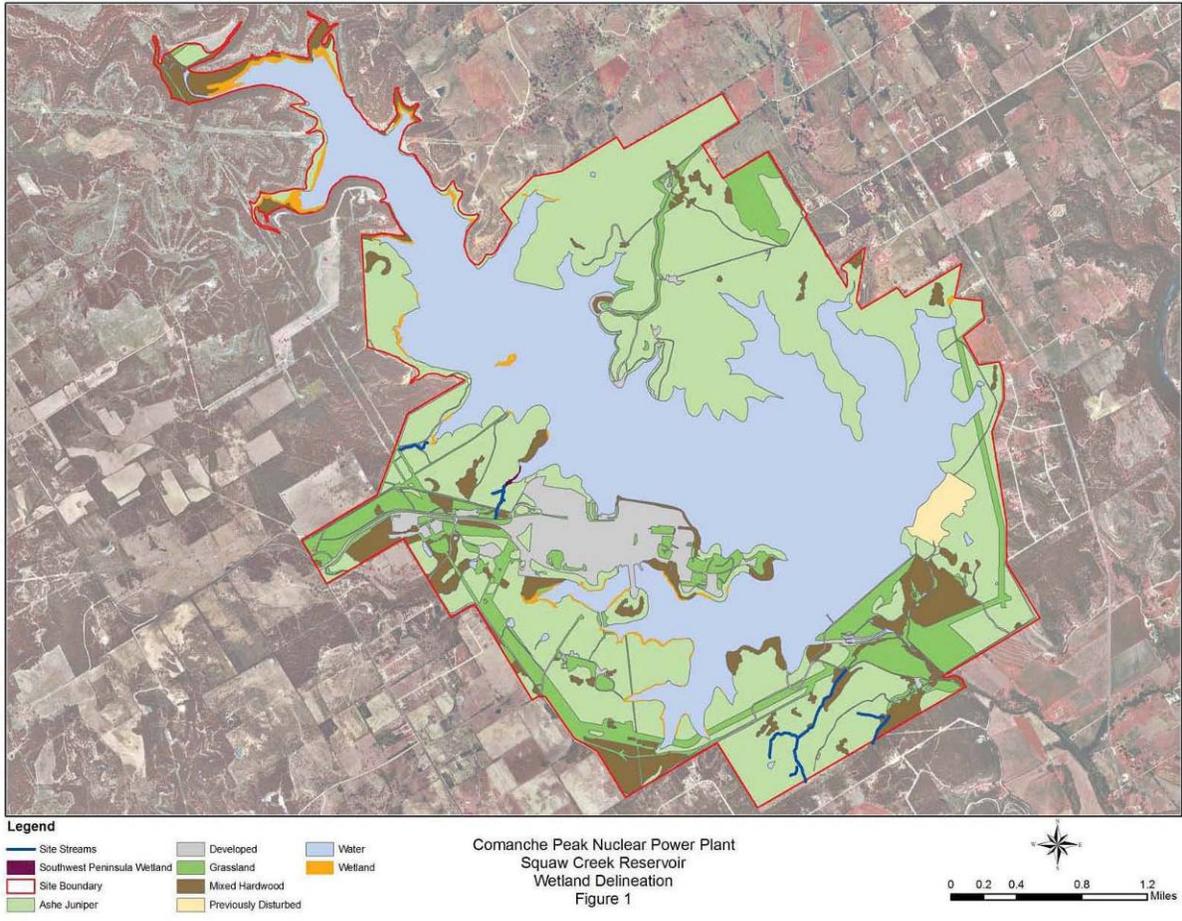


Figure 3. Ecological Vegetation Cover Type Map of the CPNPP Site (Luminant 2009a; Enercon 2009).

1 **Grassland.** Grasslands within the site are dominated by either a variety of native grasses, such
 2 as big (*Andropogon gerardii*), little, and silver bluestem; gramas (*Bouteloua* spp.); Texas
 3 wintergrass; and some forbs, or by monocultures of turf grass such as Bermuda grass
 4 (*Cynodon dactylon*) or fescues (*Festuca* spp.). Bermuda grass lawns are common at the site
 5 near the facility entrance and around buildings. Fescue is a genus of more than 300 species of
 6 tufted grasses commonly planted to supplement native grass in pastures. This cover type
 7 occupies a total of about 698 ac at CPNPP or approximately 9 percent of the site. Transect
 8 data collected by Luminant in 2007 (Luminant 2009a) on the peninsula where new cooling
 9 towers would be located show that grassy openings cover about 24 percent of the transect lines
 10 surveyed.

11 **Previously Disturbed.** These are areas within the site that are either mechanically or naturally
 12 disturbed and consist either of bare ground or weedy plant species that are indicators of
 13 disturbance. This cover type occupies a total of about 60 ac at CPNPP or less than 1 percent of
 14 the site.

15 **Developed Areas.** Developed areas within the site consist of office buildings, reactors and
 16 related facilities, switchyards, and storage facilities as well as pavement or gravel for parking
 17 lots and roads. Also included within this cover type are the dam, spillway, structures related to

- 1 the dam, and the Safe Shutdown Impoundment and its equalization channel. This cover type
 2 occupies a total of about 439 ac at CPNPP or approximately 6 percent of the site.



Figure 4. Peninsula where new cooling towers for Units 3 and 4 would be located (Enercon 2009).

- 3 **Open Water.** The open water type at CPNPP consists primarily of Squaw Creek Reservoir
 4 (SCR), the Safe Shutdown Impoundment, evaporation ponds for nonradioactive waste water,
 5 and an emergency spillway. Because of SCR, open water is the most extensive cover type on
 6 the site and occupies a total of about 3125 ac or approximately 39 percent.
- 7 **Wetlands.** Wetlands are areas transitional between land and open water. At CPNPP small
 8 areas of wetland occur primarily in and along the shoreline of coves on SCR. Wetlands occupy
 9 a total of about 53 ac at CPNPP or less than 1 percent of the site.
- 10 The electric transmission lines and pipelines originating from CPNPP cross forested and range
 11 habitats typical of north-central Texas, predominantly grassland with patches of deciduous and
 12 evergreen forest. Acreages of vegetation types likely to be crossed by new transmission and
 13 pipeline rights-of-way are shown in Table 2. Acreages of vegetation types to be crossed cannot
 14 be determined precisely until the exact right-of-way boundaries are determined.
- 15 Below is a brief description of the construction, operation, and related activities that could
 16 potentially affect federally listed threatened or endangered terrestrial species, should any be
 17 present. The determination of potential effects was based on habitat affinities and life history
 18 considerations, as well as the nature and spatial and temporal considerations of the activities.

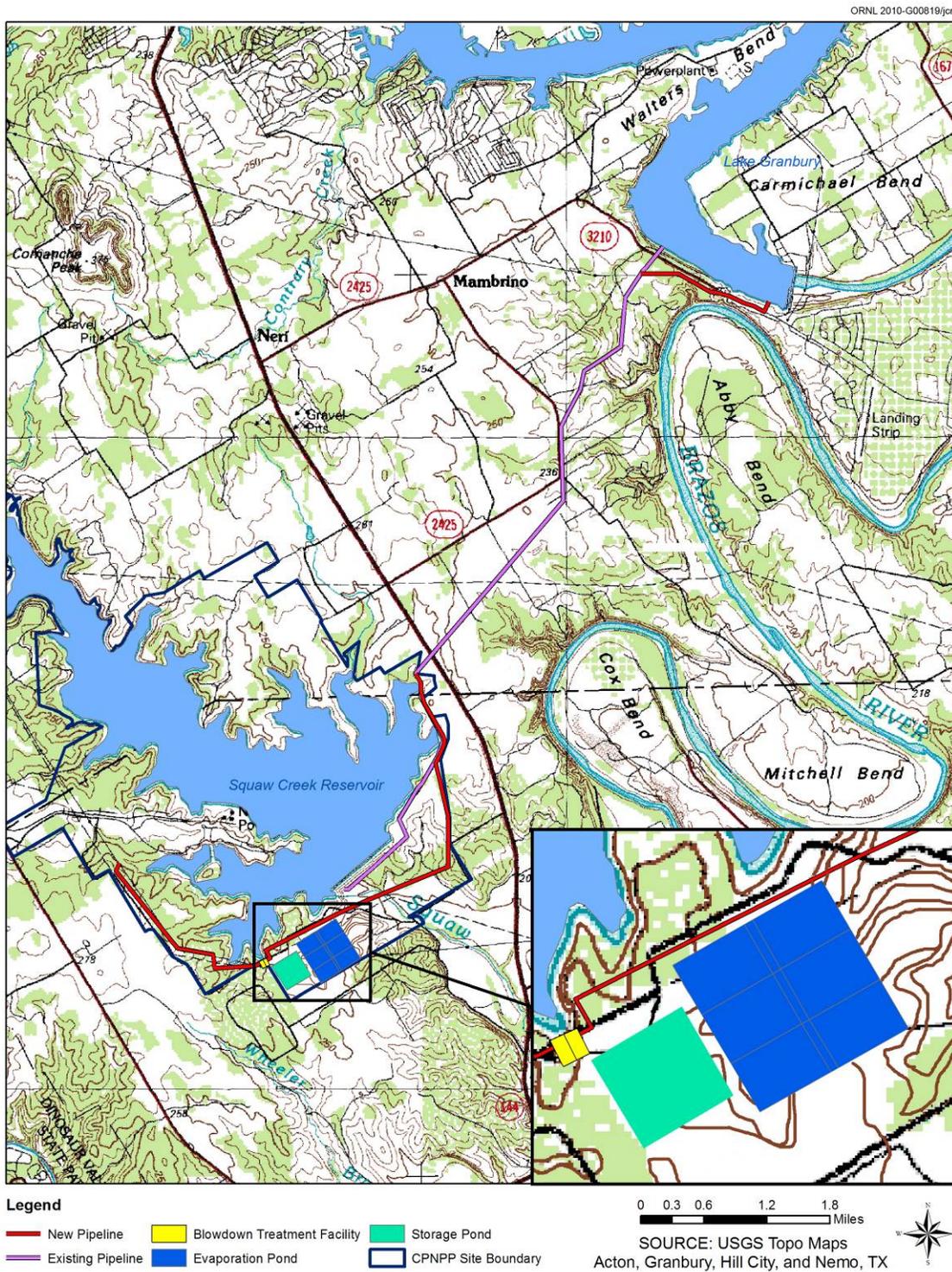


Figure 5. Approximate location of 400 ac BDTF and associated evaporation and storage ponds (adapted from Luminant 2009a).

Table 2. Acreages of vegetation types likely to be crossed by new transmission and pipeline right-of-way.

Cover Type	Whitney	DeCordova	Cooling Water Pipeline
Water	3.1	11.0	0.2
Developed	20.7	12.9	7.7
Barren Land	0.4	0.9	0.2
Deciduous Forest	176.1	10.1	6.3
Evergreen Forest	137.0	3.1	3.7
Mixed Forest	0.0	0.0	0.0
Scrub/Shrub	0.0	0.0	0.0
Grassland	550.0	107.5	31.4
Pasture	35.8	1.3	0.0
Cropland	7.6	0.0	0.4
Woody Wetlands	22.9	1.6	0.1
Total	953.6	148.4	50.0

Source: Luminant 2009a.

3.0 Proposed Federal Actions

1

2 The proposed federal actions are (1) NRC's issuance of two COLs for the construction and
3 operation of two new nuclear reactors at the proposed CPNPP site pursuant to Title 10 of the
4 Code of Federal Regulations (CFR), Section 52.97 (10 CFR 52.97),, and (2) the USACE's
5 issuance of a DA permit pursuant to Section 404 of the Clean Water Act, and Section 10 of the
6 Rivers and Harbors Act of 1899.

7 The NRC, in a final rule dated October 9, 2007 (72 FR 57416), limited the definition of
8 "construction" in 10 CFR 50.10 and to those activities that fall within its regulatory authority in 10
9 CFR 51.4. Many of the activities required to build a nuclear power plant are not part of the NRC
10 action to license the plant. Activities associated with building the plant that are not within the
11 purview of the NRC action are grouped under the term "preconstruction." Examples of
12 preconstruction activities include the clearing and grading, building support buildings, and
13 building transmission lines. Preconstruction activities may take place before the application for
14 a COL is submitted, during the staff's review of a COL application, or after a COL is granted.
15 Although preconstruction activities are outside the NRC's regulatory authority, many of them are
16 within the regulatory authority of local, State, or other Federal agencies. The distinction
17 between construction and preconstruction is not carried forward in this BA, and both are
18 discussed jointly as construction for the purposes of this BA prepared jointly by NRC and
19 USACE.

20 The 7950-ac CPNPP site lies around SCR (Figure 6). Units 3 and 4 would be placed on the
21 peninsula where Units 1 and 2 are located in areas of previously disturbed habitat and some
22 adjoining undeveloped land. Cooling towers would be built on undisturbed land on a peninsula
23 adjacent to and west of the new units, and the BDTF would be located in largely undisturbed
24 habitat

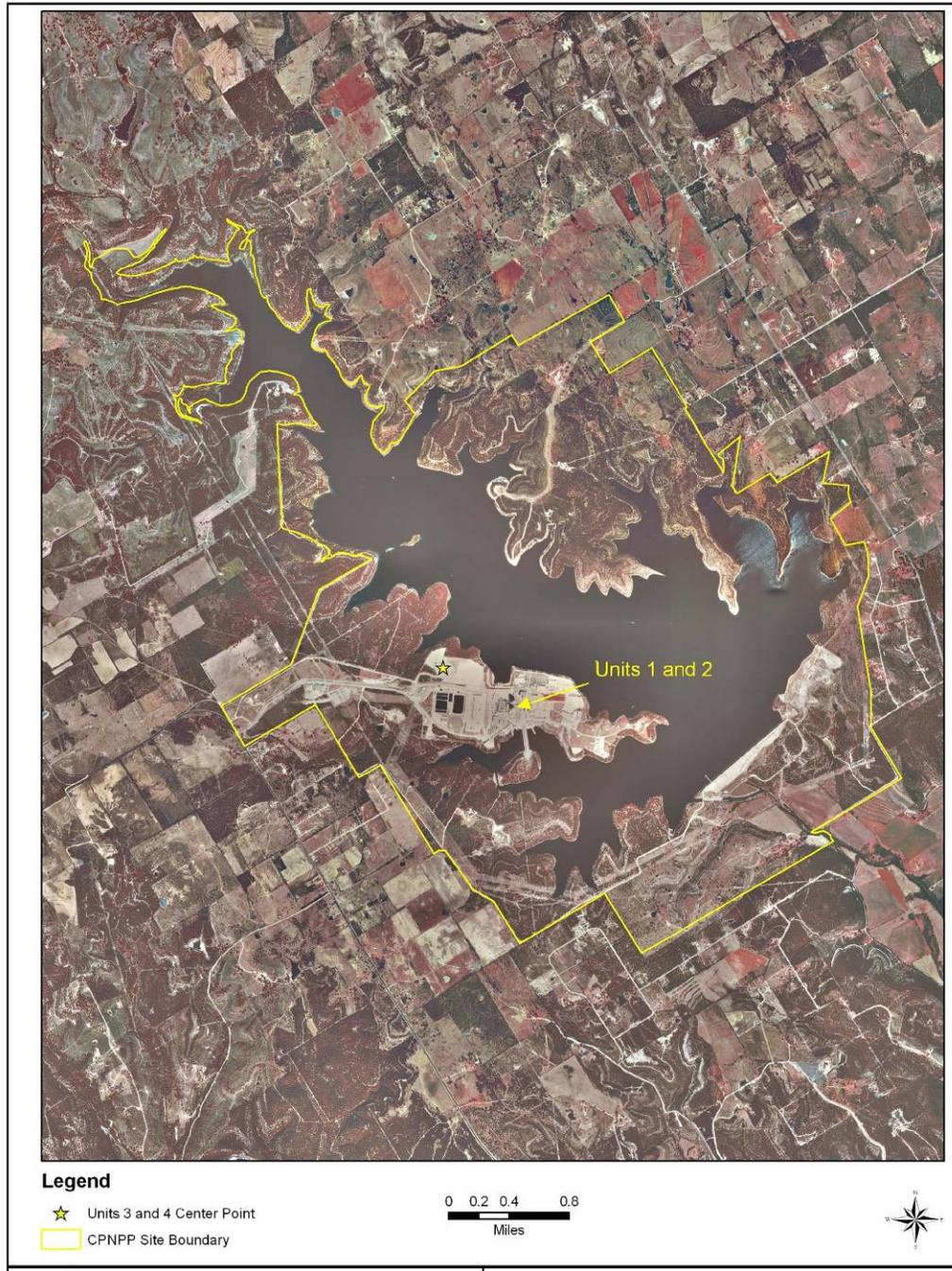


Figure 6. Location of proposed CPNPP Units 3 and 4 in relation to existing Units 1 and 2 (Luminant 2009a).

- 1 southeast of Units 1 and 2 below the SCR dam. The BDTF would remove salt via evaporation
- 2 and reverse osmosis from used cooling water before returning it to its source, Lake Granbury.
- 3 The DeCordova transmission line would leave the site and extend northeast to DeCordova. The
- 4 Whitney transmission line would leave the site along a route to the south to Whitney (Figure 2).
- 5 The cooling water pipeline would leave the site and extend northeast to Lake Granbury. Exact
- 6 routes for these proposed new lines have not yet been determined. Specific locations would be

1 determined through a Routing Study Process considering environmental impacts, conducted
2 under review of the Public Utility Commission of Texas (Luminant 2009a).

3 The development (construction and preconstruction) and operation activities that could affect
4 federally listed species include the following:

5 ***Development (Construction and Preconstruction)***

- 6 • Removal (clearing) of habitat used by federally threatened or endangered terrestrial species
7 for development of reactors and support structures.
- 8 • Removal (clearing) of habitat used by federally threatened or endangered terrestrial species
9 for development of new transmission and pipeline rights-of-way.
- 10 • Fragmentation of habitat and interference with movement of wildlife.
- 11 • Generation of sediment and fugitive dust.
- 12 • Generation of noise by construction equipment and personnel.
- 13 • Possible avian collisions with tall equipment or structures such as construction cranes or
14 transmission towers.

15 ***Operation***

16

- 17 • Potential impacts of noise, salt drift, fogging, and icing from operation of reactor cooling
18 systems, should suitable habitat be present.
- 19 • Potential impacts of required periodic vegetation maintenance on reactor grounds and
20 transmission line and pipeline rights-of-way.

21 **Construction and Preconstruction:** A total of 675 ac at the CPNPP site would be affected by
22 construction and preconstruction activities for Units 3 and 4 and support structures, including
23 the cooling towers and BDTF and associated evaporation ponds (Luminant 2009a). Of this area
24 125 ac would be revegetated, and 550 ac would be occupied by various structures. The habitat
25 that would be affected consists of 413 ac of Ashe juniper, 63 ac of mixed hardwood, 94 ac of
26 grassland, and 105 ac that has already been developed (Luminant 2009a). These activities
27 would result in loss of habitat in the areas developed as structures, and alteration of the
28 remaining affected areas which would be revegetated. During clearing activities, as well as
29 throughout preconstruction and construction work, nearby wildlife could be temporarily
30 displaced and disturbed by noise.

31 Building power lines and pipelines on new rights-of-way would result in a relatively small amount
32 of permanent habitat loss for towers, access roads, and other structures. Most of the land
33 crossed would not be occupied by permanent structures. Tower locations could be adjusted in
34 the field to avoid particularly ecologically sensitive areas. Forested areas would be initially
35 cleared, resulting in loss of forest habitat and fragmentation of remaining forest areas.
36 Grassland areas would not be permanently altered, but all new right-of-way would require
37 vegetation management to keep woody species from becoming established and interfering with
38 operations. As shown in Table 2, forested area to be crossed and managed would be
39 approximately 313 ac for the Whitney transmission line, 13 ac for the DeCordova transmission
40 line, and 10 ac for the cooling water pipeline. Actual acreages cannot be determined until exact
41 routes for these lines have been selected.

42 **Operation:** Wildlife present in locales adjacent to areas cleared by project activities could be
43 affected by operation of the new structures associated with Units 3 and 4. Potential impacts
44 from operation of cooling towers and the BDTF include increased fogging, icing, and salt drift

1 from evaporated water. Wildlife present along new transmission line and pipeline rights-of-way
2 would be affected by periodic vegetation management of these areas.

3 The transmission lines to be constructed are 385-kV (Luminant 2009a). This voltage is
4 relatively small for major transmission lines; no electromagnetic effects to nearby flora and
5 fauna would be expected (NRC 1996).

6 **4.0 Species Descriptions**

7 Federally threatened or endangered species listed by USFWS as occurring in Hood, Somervell,
8 or Bosque counties are all birds: black-capped vireo (*Vireo atricapillus*), golden-cheeked
9 warbler (*Dendroica chrysoparia*), and whooping crane (*Grus americana*) (USFWS 2010). There
10 are two additional species (both fish) potentially occurring in Hood and Somervell Counties that
11 are designated by USFWS as Federal candidates for listing: the sharpnose shiner
12 (*Notropis oxyrhynchus*) and the smalleye shiner (*Notropis buccula*). Candidate species are
13 under consideration for listing but are not currently protected under the ESA: therefore they are
14 not addressed further in this BA. No critical habitat for these species has been designated
15 within these counties (50 CFR Part 17.11).

16 There are no known Federally listed aquatic species recorded as occurring in the three counties
17 in which CPNPP Units 3 and 4 (Hood and Somervell Counties) and the proposed new
18 transmission line ROWs (Somervell and Bosque Counties) would be located.

19 **4.1 Whooping crane**

20 The whooping crane is listed as occurring in Hood, Somervell, and Bosque Counties
21 (USFWS 2010). Critical wintering habitat for the whooping crane lies approximately 525 mi
22 southwest of the site at the Aransas National Wildlife Refuge. This species has not been
23 observed on the CPNPP site (Luminant 2009a). No known occurrences of whooping cranes
24 have been reported within a 10-mi radius of the CPNPP site, or the proposed powerline and
25 pipeline corridors (TPWD 2009), and they are not likely to use the inland habitats found on the
26 CPNPP site for foraging, roosting, or nesting. Therefore they are not considered further in this
27 BA.

28 **4.2 Black-capped vireo**

29 Black-capped vireos are small, about 4.5 inches size, insectivorous, migratory songbirds found
30 only in Oklahoma and Texas. Black-capped vireos prefer patchy woodlands or shrublands.
31 Males are characterized by olive-green backs, white stomachs, and black caps with a white
32 patch around a reddish eye. Females are more cryptic in color than males with dark coloration
33 along their backs (Campbell 2003, Grzybowski 1995, USFWS 1991).

34 The black-capped vireo was Federally listed as endangered in 1987 due to threats from brown-
35 headed cowbird (*Molothrus ater*) nest parasitism and loss of habitat due to such factors as
36 urbanization, grazing, range improvement, and succession (52 FR 37420). A more recent
37 status review of this species recommended the black-capped vireo be downlisted to Federally
38 threatened due to finding that the known population is much larger than at the time of listing,
39 and that while original threats to the species still exist, their magnitude has decreased
40 (USFWS 2007).

41 Black-capped vireos arrive in Texas from mid-March to mid-April. Breeding habitat is quite
42 variable across its range, but generally consists of shrublands with a distinctive patchy structure
43 (USFWS 2007). They nest in areas with 30–60 percent cover of deciduous trees. Their

1 preferred habitat contains woody plants in excess of 6 ft high with cover extending to the
 2 ground. Open grasslands play an important role in habitat, providing foraging areas for the
 3 vireos (Campbell 2003, Graber 1961). Home ranges vary from 3–10 ac (Campbell 2003,
 4 Graber 1961). Males and females both contribute to nest site selection and building, often in a
 5 fork of a deciduous tree branch (Grzybowski 1995). Black-capped vireos may live for more than
 6 five years, and usually return year after year to the same territory. They begin to migrate to the
 7 wintering grounds on Mexico's western coast in July and are usually gone from Texas by mid-
 8 September (USFWS 2007).

9 Habitat losses have occurred through development, overbrowsing, and suppression and
 10 alteration of natural disturbance regimes. Cowbird nest parasitism has reduced vireo
 11 reproduction in many areas (USFWS 1991). Much of the current threat can largely be attributed
 12 to the invasion and growth of juniper species, especially Ashe juniper (USFWS 2007). Juniper
 13 invasion has contributed to an overall afforestation of rangeland habitats throughout much of the
 14 species' breeding range (USFWS 2007). Suppression of fire has favored the spread of junipers
 15 over fire-adapted *Quercus* and *Rhus* species, resulting in loss of black-capped vireo habitat
 16 (USFWS 1991).

17 **4.3 Golden-cheeked warbler**

18 Golden-cheeked warblers are small migratory insectivorous songbirds, about 5 in long, which
 19 are characterized by yellow cheeks bisected by a black streak extending across the eye. Males
 20 and females are similar in appearance, although females are drabber in color (Campbell 2003,
 21 Ladd and Gass 1999). They are endemic to Texas during the breeding season, and certain
 22 upland sites within mature Ashe juniper forest at CPNPP may provide appropriate habitat
 23 (Luminant 2009a). During non-breeding season the range includes portions of Mexico,
 24 Guatemala, Honduras, and Nicaragua (USFWS 1992).

25 The golden-cheeked warbler was Federally listed as endangered in 1990 (55 FR 53153) due to
 26 habitat loss and fragmentation resulting from urban encroachment into its range and widespread
 27 clearing of juniper as a range management practice. Brown-headed cowbird parasitism has
 28 increased in magnitude as habitat becomes more fragmented. A 5-year review to ensure that
 29 the classification of this species is still accurate was announced on April 21, 2006
 30 (71 FR 20714); to date its listing status has not changed (USFWS 2010).

31 Golden-cheeked warblers are dependent on Ashe juniper, but also require stands mixed with
 32 oaks, elms, and other hardwoods in relatively moist areas, such as steep canyons and slopes,
 33 and adjacent uplands (USFWS 1992). Kroll (1980) reported that occupied golden-cheeked
 34 warbler habitats had lower juniper-oak ratio (1.35:1), contained junipers over 40 years old, and
 35 had lower understory diversity than unoccupied areas. Older Ashe junipers have peeling bark
 36 that is an essential component of golden-cheeked warbler nest construction. Older Ashe
 37 junipers are utilized as calling sites during mating.

38 Breeding territory size estimates range from about 3.2 ac (Pulich 1976) to about 19.8 ac
 39 (Kroll 1980) per pair. Wahl et al (1990) reported the median density for all study sites with
 40 golden-cheeked warblers to be 16.5 ac per pair.

41 After females arrive in March, mating begins and extends until April or May. Decline of golden-
 42 cheeked warblers is attributed to habitat loss and fragmentation due to range improvement
 43 practices, rapid urban development, flood control, and construction of impoundments (Ladd and
 44 Gass 1999). Nest parasitism by the brown-headed cowbird, and competition with blue jays
 45 (*Cyanocitta cristata*) have also contributed to population declines (Campbell 2003, Engels and
 46 Sexton 1994). The USFWS along with TPWD have implemented land-owner management

1 plans and Safe Harbor Agreements to protect and enhance existing and potential golden-
2 cheeked warbler habitat (Campbell 2003, Ladd and Gass 1999, USFWS 1992).

3 **5.0 Potential Environmental Effects** 4 **of the Proposed Actions**

5 This section describes potential impacts to black-capped vireo and golden-cheeked warbler
6 from development and operation of the proposed Units 3 and 4 at the CPNPP site.

7 **5.1 Black-capped vireo**

8 **CPNPP site:** Ten occurrences of black-capped vireo have been reported in the Texas Natural
9 Diversity Database (TXNDD) for the area within 10 mi of the CPNPP site and new transmission
10 and pipelines (TPWD 2009). None of the reported occurrences, however, is closer than about
11 2.5 mi to the CPNPP site.

12 Nevertheless, to determine whether black-capped vireos might use habitats at the site,
13 Luminant conducted informal surveys during April 2007 at various times of the day over the
14 course of three days at CPNPP concentrating on the peninsula area proposed for construction
15 of the new cooling towers (Figure 4) (Luminant 2009a). Survey methods consisted of walking
16 transects on east/west axes spaced approximately 100 m (328ft) apart. Black-capped vireos
17 were not audibly or visually identified, and no suitable breeding habitat was noted (Luminant
18 2009a). During an early May visit in 2007, a woven, pendulous nest was noted in a low tree
19 branch. This nest may have been constructed by an unidentified vireo species, or possibly by a
20 golden-cheeked warbler (Luminant 2009a). In April and May of 2008 the same area was
21 surveyed again, but this time looking specifically for golden-cheeked warblers; presence of other
22 bird species was noted and black-capped vireos was not reported (PBS&J 2008).

23 **DeCordova power transmission line, and cooling water pipeline:** Neither the DeCordova
24 transmission line right-of-way, nor the cooling water pipeline right-of-way, lie closer than about
25 2.5 mi to any TXNDD reported occurrence of black-capped vireo (TPWD 2009).

26 **Whitney power transmission line:** Recorded occurrences of black-capped vireo have been
27 documented about 2.5 mi southwest of the CPNPP site in Dinosaur Valley State Park where
28 breeding populations of both species occur (TPWD 2009). The Whitney transmission line right-
29 of-way might pass very close to, or possibly through, a small portion of the northwest corner of
30 the park. Depending on the exact right-of-way that Oncor ultimately chooses, black-capped
31 vireo habitat in Dinosaur Valley State Park, and possibly at other locations along the Whitney
32 right-of-way, could be noticeably affected. Suitable breeding habitat could be lost, and nest
33 parasitism by brown-headed cowbird could be increased due to additional forest fragmentation.

34 **Regulatory Coordination:** Oncor would coordinate with TPWD and USFWS to determine
35 the potential for impacts to black-capped vireo would be undertaken as part of the
36 environmental review process of the Electric Reliability Council of Texas (ERCOT) and the
37 Public Utility Commission of Texas (PUCT) once it selects the exact right-of-way (Luminant
38 2009a). It is likely that with possible rerouting of the right-of-way, adjustment of tower
39 placement, and timing of site preparation activities to avoid the breeding season, impacts to
40 black-capped vireo could be minimized or avoided. The review team expects that Oncor could
41 adjust the exact ROW location and tower placement, as well as time project activities to avoid
42 the breeding season, in a way that avoids or minimizes impacts to black-capped vireo.

1 5.2 Golden-cheeked warbler

2 This section describes potential impacts to golden-cheeked warbler from development and
3 operation of the proposed Units 3 and 4 at the CPNPP site.

4 **CPNPP site:** Thirteen occurrences of golden-cheeked warbler have been reported in the Texas
5 Natural Diversity Database (TXNDD) for the area within 10 mi of the CPNPP site and new
6 transmission and pipelines (TPWD 2009). None of these, however, is closer than about 2.5 mi
7 to the CPNPP site.

8 Nevertheless, to determine whether golden-cheeked warblers might use habitats at the site, an
9 informal survey for them was conducted during April 2007 at various times of the day over the
10 course of three days at CPNPP concentrating on the peninsula area proposed for construction
11 of the new cooling towers (Figure 7). Survey methods consisted of walking transects on
12 east/west axes spaced approximately 100 m (328 ft) apart. Golden-cheeked warblers were not
13 audibly or visually identified (Luminant 2009a). During a separate visit in early May in 2007, a
14 woven, pendulous nest was noted in a low tree branch. This nest may have been constructed
15 by an unidentified vireo species, or possibly by a golden-cheeked warbler (Luminant 2009a). In
16 2007 on the last day of the breeding season, May 15th, a targeted presence/absence survey for
17 golden-cheeked warblers on the peninsula area was conducted, and again no visual or audio
18 confirmation of golden-cheeked warbler presence was noted (PBS&J 2007). The biologist
19 conducting the 2007 survey noted that most of the area of the peninsula would not be
20 considered golden-cheeked warbler habitat due to the lack of a 20-percent mixture of
21 hardwoods (PBS&J 2007). However, at a stream confluence at the southern base of the
22 peninsula contained a slight mixture of hardwoods along the stream channels that would be
23 considered as having very minimal characteristics associated with golden-cheeked warbler
24 habitat (PBS&J 2007).

25 In April and May of 2008, during the breeding season for golden-cheeked warbler, a second
26 targeted presence/absence survey was conducted to USFWS protocol on the peninsula area
27 (Figure 7) (PBS&J 2008). No golden-cheeked warblers were observed within the project survey
28 area (PBS&J 2008). As in the 2007 survey, most of the peninsula area was judged not to meet
29 golden-cheeked warbler habitat requirements, but one 3.7 ac area of a mixture of Ashe juniper
30 and hardwoods at the confluence of three streams (outlined in red on Figure 7) was considered
31 to exhibit marginal golden-cheeked warbler nesting habitat characteristics (PBS&J 2008). The
32 investigators did not consider this area to be favorable for use as breeding/nesting habitat,
33 however, because:

34 These areas are lacking in extended habitat characteristics (canopy cover, hardwood
35 diversity, and structural characteristics) beyond the vegetation surrounding the stream
36 channel perimeter, and are therefore isolated from any nearby populations. The sum of
37 the primary survey area (i.e., the potential golden-cheeked warbler habitat) is 3.7 acres,
38 and is spread out across three thin corridors; this area is considered to be highly
39 fragmented and too small in size to support favorable nesting conditions (PBS&J 2008).

40 The 3.7 ac area was discussed at a scoping meeting with USFWS and TPWD held at CPNPP
41 on February 2, 2009. It was noted that this area is surrounded by a small wetland, and USFWS
42 recommended avoiding the wetland by an additional 100 ft buffer to provide a wildlife corridor in
43 addition to a vegetative run-off “filter” to protect water quality (Edwards 2009). Current project
44 plans, however, show that much of this area would be lost to project development (Enercon
45 2009).

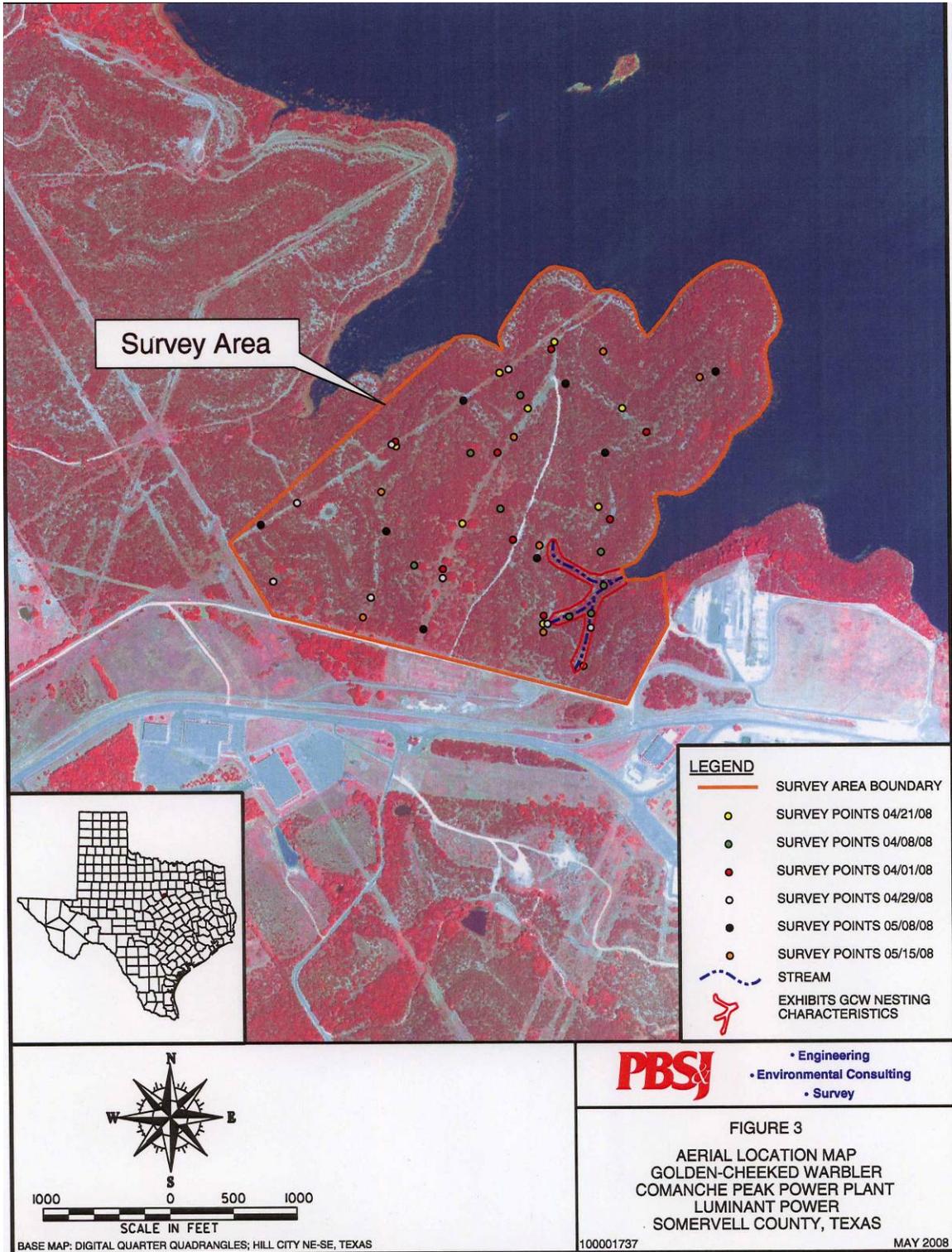


Figure 7. Area surveyed in targeted golden-cheeked warbler survey conducted to USFWS protocol in 2008 (PBS&J 2008).

1 An additional portion of the CPNPP site to be directly affected by development that could
2 possibly contain suitable habitat for the golden-cheeked warbler is the 400-ac area that would
3 be occupied by the BDTF and associated evaporation ponds (Figure 6). This area contains
4 Ashe juniper habitat and smaller areas of mixed hardwood (Figure 4). To learn of habitat
5 suitability, infrared aerial photographs of the area were examined to determine which areas
6 would provide potential nesting habitat for the golden-cheeked warbler based on habitat
7 descriptions provided by the USFWS (Luminant 2009a). Photographic signatures of tree
8 species were used to identify areas that might require focused surveys. Areas were identified
9 that had a mixture of Ashe juniper and deciduous hardwoods. These areas were ground-
10 truthed by a visual qualitative analysis of density, canopy cover, and tree age on November 14,
11 2007 to determine if habitat was present that would be suitable for golden-cheeked warblers
12 (Luminant 2009a). The comparison was based on percent cover of hardwood and evergreen
13 canopy from point-transect data taken within a known golden-cheeked warbler site in Dinosaur
14 Valley State Park. It was determined that the BDTF area did not contain the density and
15 maturity of Ashe junipers necessary to qualify as suitable for golden-cheeked warblers
16 (Luminant 2009a). Canopy cover in and adjacent to the BDTF was found to be only about
17 20 percent, which is less than the 35 percent minimum thought to be required (Luminant
18 2010a). Additional site reconnaissance performed on February 4, 2009 reconfirmed absence of
19 suitable golden-cheeked warbler habitat in the area of the BDTF (Luminant 2009a).

20 It is unknown whether the additional Ashe juniper and hardwood cover type areas in the vicinity
21 of the proposed BDTF, especially the isolated peninsula to the north (see Figure 4), could be
22 suitable golden-cheeked warbler habitat. No golden-cheeked warbler surveys are known to
23 have been performed in these areas. Depending on the location and design chosen for the
24 BDTF, areas outside of the 400 ac could be affected by salt drift. Although salt drift from the
25 misting system proposed to evaporate water at the BDTF has not been modeled in detail, salt
26 concentrations leaving the misters would be approximately 576 kg/min (Luminant 2009a).

27 Luminant estimates that salt drift from the misting units could be deposited up to 1300 ft from
28 the source with a wind speed of 10 mph (Luminant 2009b). The tentative location of the
29 evaporation pond is close to the CPNPP site boundary (Figure 5) and vegetation in the vicinity
30 is primarily Ashe juniper woodland - savanna (Fig 3). Although the exact location of the BDTF
31 has not yet been determined, Luminant provided a conceptual sketch of the location of the
32 ponds within the 400 ac to be occupied by the BDTF (Figure 8) (Luminant 2010b).

33 Luminant's response states that a salt fence would surround the evaporation ponds, and a 500
34 ft wide buffer would be provided between the first bank of misters and the outside edge of the
35 evaporation ponds to provide sufficient distance between the mister nozzles and the salt fence
36 barrier to ensure proper functioning of the salt fence to prevent drift (Luminant 2010b). The salt
37 fence referred to by Luminant (Luminant 2010c) would be a 5 m (16 ft) high agricultural shade
38 cloth netting which would be attached to a framework at the top, but loose at the bottom so it
39 could blow in the wind to cause the fabric to shed accumulated salt. The manufacturer of the
40 netting claims that salt passing through the netting falls out within one meter (3 ft) (Turbomist
41 2010). Further, Luminant states that precautions will be taken to contain the salt within the
42 BDTF by using directional spray misting units in addition to the salt fences (Luminant 2010a).
43 With these measures in place, Luminant estimates that salt deposition is anticipated to be less
44 than 1 kg/ha/yr beyond the 400 ac of the BDTF (Luminant 2010c), which is less than what the
45 NRC recognized as capable of injuring vegetation (NRC 2000).

46 The information provided by Luminant (Turbomist 2010) is not extensive enough to completely
47 eliminate uncertainty regarding the potential for salt to be deposited beyond one meter from the
48 salt fence. Luminant states that without the salt fence salt could drift 1300 ft from the misters
49 (Luminant 2010b). If salt drifts to that distance then the review team estimates that deposition

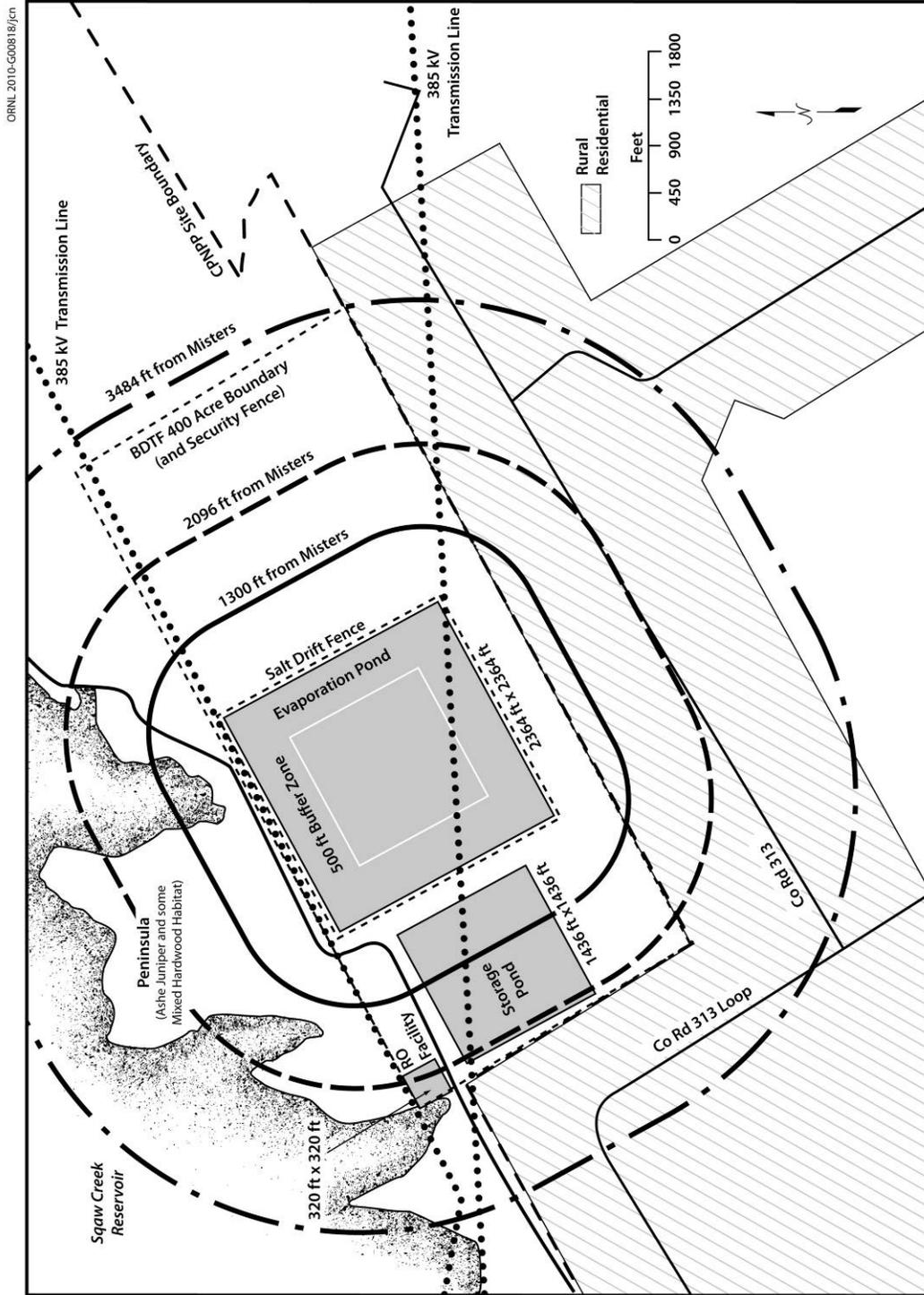


Figure 8. Schematic Layout of the Proposed Blowdown Treatment Facility Showing Distances from the Misters to Nearby Locations (adapted from Luminant 2010d).

1 could spread over an area of about 199 ac beyond the evaporation pond (Quarles 2010). Much
 2 of this areal extent would be within the 400-ac area to be cleared for building the BDTF where
 3 the native vegetation would have been removed.

4 Potential for salt drift may be greater than 1,300 ft, however. A study of salt deposition from an
 5 evaporative spray system using the same general type of mister proposed by Luminant found
 6 that deposition rates of salt were substantially increased at a distance of 2,096 to 3,484 ft
 7 surrounding the misters (Alonso et al. 2005). Based on Luminant's sketch of mister locations
 8 (Luminant 2010b) the review team estimates that this could result in drift over a total area
 9 beyond the evaporation pond of about 494 to 1226 ac. The area of increased salt deposition,
 10 assuming drift over the range of 1,300 to 3,484 ft, would extend over some or all of a peninsula
 11 to the north of the proposed BDTF location and covered by Ashe juniper woodland – savanna
 12 and mixed hardwood forest (Figure 3).

13 Considering the limited case history data available to the review team regarding the misters and
 14 the salt fence, it is uncertain if the measures (including but not limited to salt fence, and
 15 unidirectional operation of the misters) proposed by Luminant could completely prevent salt drift
 16 from the BDTF from affecting nearby natural vegetation. Salt deposition potential from the
 17 BDTF has not been quantified further because the facility is only in conceptual design phase.
 18 Due to the high volumes of salt that would be processed by the facility, even a small percentage
 19 loss of salt to the surrounding environment could have the potential to damage vegetation.

20 Depending on the exact extent of drift that results from operation of the BDTF, some of the Ashe
 21 juniper woodland - savanna and mixed hardwood forest habitat on the isolated peninsula to the
 22 north of the BDTF could be susceptible to salt drift injury. If this area contains suitable habitat
 23 for golden-cheeked warbler, then salt drift could affect this habitat and thereby affect golden-
 24 cheeked warbler. Otherwise, impacts to golden-cheeked warbler would be minimal.

25 **DeCordova power transmission line, and cooling water pipeline:** Neither the DeCordova
 26 transmission line right-of-way, nor the cooling water pipeline right-of-way, lies closer than about
 27 2.5 mi to any TXNDD reported occurrence of golden-cheeked warbler (TPWD 2009). Recorded
 28 occurrences of golden-cheeked warbler, however, as well as black-capped vireo, have been
 29 documented about 2.5 mi southwest of the CPNPP site in Dinosaur Valley State Park where
 30 breeding populations of both species exist (TPWD 2009). The Whitney transmission line right-
 31 of-way might pass very close to, or possibly through, a small portion of the northwest corner of
 32 the park. Depending on the exact right-of-way that Oncor ultimately chooses, golden-cheeked
 33 warbler in Dinosaur Valley State Park, and possibly at other locations along the Whitney right-of-
 34 way, could be affected. Suitable breeding habitat could be lost, and predation by brown-headed
 35 cowbird could be increased due to additional forest fragmentation.

36 **Regulatory Coordination:** Oncor would coordinate with TPWD and USFWS to determine the
 37 potential for impacts to golden-cheeked warbler as part of the environmental review process of
 38 ERCOT and PUCT once it selects the exact location of the new right-of-way (Luminant 2009a).
 39 The review team expects that Oncor could adjust the exact ROW location and tower placement,
 40 as well as time project activities to avoid the breeding season, in a way that avoids or minimizes
 41 impacts to golden-cheeked warbler.

42 **6.0 Cumulative Impacts to Federal Protected Species**

43 In addition to impacts from construction, preconstruction, and operation, the following
 44 cumulative analysis also considers other past, present, and reasonably foreseeable projects
 45 that could affect the black-capped vireo and golden-cheeked warbler. For purposes of this
 46 cumulative analysis, a geographic area of interest is defined as Somervell, Hood, and Bosque

1 Counties. These counties encompass the CPNPP site, anticipated transmission line and
2 pipeline rights-of-way, and adjoining areas. They lie almost completely in the Limestone Cut
3 Plain of the Western Cross Timbers ecoregion (Griffith et al. 2004). They are expected to
4 encompass those other projects capable of interacting with the CPNPP Units 3 and 4 project to
5 affect the the black-capped vireo and golden-cheeked warbler.

6 Prior to settlement, the landscape in the three counties existed as grassland or open live oak
7 savanna that supported herds of bison and other herbivores. Introduction of domestic livestock,
8 farming, and wildfire control substantially altered the landscape. Today the landscape consists
9 of a mosaic of forest, woodland, savanna, and prairie. The grassland with scattered blackjack
10 oak and post oak trees is used mostly for rangeland and pastureland, with some areas of woody
11 plant invasion and closed forest. Habitats favored by the black-capped vireo and golden-
12 cheeked warbler remain in only scattered locations.

13 Since establishment of CPNPP Units 1 and 2, development in the three counties has continued
14 and additional habitat for the black-capped vireo and golden-cheeked warbler has been lost or
15 modified by farming, ranching, residential development, river and watershed projects, and
16 transportation projects. Oil production has been a major activity in the area for over 80 years
17 (Griffith et al. 2004), and oil and natural gas exploration and production continue. These trends
18 are expected to continue over the projected operating life of proposed Units 3 and 4.

19 Current and reasonably foreseeable actions within the three counties that could adversely affect
20 the black-capped vireo and golden-cheeked warbler in a similar way to the CPNPP Units 3 and
21 4 project include multiple proposed transportation projects, future urbanization, and continued
22 oil and gas exploration and development. Other future actions that would contribute to
23 cumulative effects include building and upgrading utility lines, including but not limited to those
24 for Units 3 and 4; new road development and expansion; continued industrial and urban
25 development; increased outdoor recreation; and nonpoint source runoff from agriculture,
26 ranching, and development.

27 Continued urbanization is a contributing factor to the losses of habitat for the black-capped vireo
28 and golden-cheeked warbler. The Texas State Data Center (TSDC) projects that the population
29 in a six-county area surrounding the CPNPP site (including Bosque, Erath, Hood, Johnson,
30 Somervell, and Tarrant Counties) will increase by 41.5 percent by the year 2040 (TSDC 2009).
31 The highest growth in the six-county area is projected to occur in areas close to Fort Worth;
32 however, the more outlying counties are still expected to experience substantial growth. Even
33 with the anticipated growth, the area around the CPNPP site is likely to continue to be
34 predominantly rural in character, with some areas still providing habitat for black-capped vireo
35 and golden-cheeked warbler. Recent urbanization in this area has occurred primarily in and
36 around the cities of Granbury and Glen Rose. This trend is likely to continue, with most of the
37 growth occurring in Hood County around and northeast of Lake Granbury, due primarily to
38 recreation home development and commuting patterns associated with Fort Worth. The
39 preconstruction, construction, and operations workforce for CPNPP Units 3 and 4 would make
40 only a minor contribution to this increase in the urban growth of the region. The cumulative
41 urbanization in the geographic area of interest could reduce habitat available for black-capped
42 vireo and golden-cheeked warbler.

43 Global climate change is another factor contributing to the loss or degradation of habitat for the
44 black-capped vireo and golden-cheeked warbler. The report on Global Climate Change Impacts
45 in the United States, provided by the U.S. Global Change Research Program, summarizes the
46 projected impacts of future climate changes in the U.S. (Karl et al. 2009). The report divides the
47 U.S. into nine regions. The CPNPP site is located in the Great Plains region. The GCRP
48 climate models for this region project continued warming in all seasons and an increase of as

1 much as 12°F from 2000 to 2090. Additionally, climate models project that there will tend to be
 2 less rainfall in this area. The GCRP states that the precipitation could possibly alter the
 3 character of terrestrial habitats in the area, including habitats used by the black-capped vireo
 4 and golden-cheeked warbler.

5 The actions noted above may potentially affect black-capped vireo and golden-cheeked warbler
 6 by decreasing or degrading available habitat. As noted in Chapter 4 of this BA, the major
 7 threats to both species are habitat modification, habitat loss, and habitat fragmentation due to
 8 range management practices and continued development. As noted in Chapter 5 of this BA,
 9 one of the expanded transmission line rights-of-way required for CPNPP Units 3 and 4 (the
 10 Whitney right-of-way) might pass through habitat occupied by both species. In addition, habitat
 11 potentially suitable for the golden-cheeked warbler could be altered by salt drift from the BDTF.
 12 Habitat loss and alteration due to the CPNPP project activities noted above, combined with
 13 effects from other projects, including non-Federal projects, in the area of geographical interest
 14 could be sufficient to noticeably alter populations of both species.

15 Because suitable black-capped vireo habitat is not available on or close to the CPNPP site,
 16 DeCordova transmission line right-of-way, or cooling water pipeline right-of-way, activities
 17 proposed for those locations would not contribute to the cumulative effects on black-capped
 18 vireo. Activities on the Whitney transmission line right-of-way could however contribute
 19 substantially to cumulative effects on the black-capped vireo. Activities on both the site and
 20 transmission line rights-of-way could substantially contribute to cumulative effects on the
 21 golden-cheeked warbler.

22 **7.0 Conclusions**

23 The following section presents the conclusions of this BA.

24 **7.1 CPNPP site, DeCordova power transmission line and** 25 **cooling water pipeline**

26 ***Black-capped vireo***

27 No habitat was seen in these areas; therefore, development and operation of project facilities in
 28 these locations is not likely to adversely affect black-capped vireos. Therefore, the review team
 29 concludes that these project elements would have no effect on the black-capped vireo.

30 ***Golden-cheeked warbler***

31 On-site surveys did not indicate that golden-cheeked warblers are present in the areas
 32 surveyed; only marginal habitat was observed. However, possible golden-cheeked warbler
 33 habitat may exist in areas subject to possible salt drift from the BDTF. Should any of these
 34 areas be suitable for golden-cheeked warbler habitat, then operation at the CPNPP site may
 35 affect golden-cheeked warblers. The potential for significant adverse effects is not
 36 discountable. Therefore, the review team concludes that development and operation of project
 37 facilities may affect, and is likely to adversely affect the golden-cheeked warblers.

1 **7.2 Whitney power transmission line**

2 ***Black-capped vireo and Golden-cheeked warblers***

3 If known locations of black capped vireo and golden-cheeked warblers, including Dinosaur
 4 Valley State Park, are avoided with sufficient buffer, then development and operation of the
 5 transmission line would not affect these species. If known breeding habitat cannot be avoided,
 6 then these species may be adversely affected. Because the potential for significant adverse
 7 effects is not discountable based on information available to the review team, the review team
 8 concludes that the project may affect, and is likely to adversely affect, the black-capped vireo
 9 and the golden-cheeked warbler.

10 **7.3 Summary**

11 Table 3 summarizes the review team's conclusions.

12 **Table 3.** Summary and Conclusions

	Black-capped vireo	Golden-cheeked warbler
CPNPP Site	No effect	May affect, is likely adversely affect
DeCordova line and pipeline	No effect	No effect
Whitney line	May affect, is likely to adversely affect	May affect, is likely to adversely affect

13

8.0 References

- 10 CFR Part 50. Code of Federal Regulations, Title 10, *Energy*, Part 50, “Domestic Licensing of Production and Utilization Facilities.”
- 10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy*, Part 51, “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions.”
- 10 CFR Part 52. Code of Federal Regulations, Title 10, *Energy*, Part 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”
- 50 CFR Part 17. Code of Federal Regulations, Title 50, *Wildlife and Fisheries*, Part 17, “Endangered and Threatened Wildlife and Plants.”
- 52 FR 37420. October 6, 1987. Endangered and Threatened Wildlife and Plants; Determination of the Black-capped Vireo TO BE an Endangered Species.” *Federal Register*.
- 55 FR 53153. December 27, 1990. “Endangered and Threatened Wildlife and Plants; Final Rule to List the Golden-cheeked Warbler as Endangered.” *Federal Register*.
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Appendix G

Supporting Information and Data: Population Projections and Health Physics

Appendix G

Supporting Information and Data: Population Projections and Health Physics

1 **G.1 Population Projections**

2 Tables G-1 and G-2 provide population projections for 2007 followed by 10-year increments to
3 40 years beyond the estimated Comanche Peak Nuclear Power Plant (CPNPP) start-up date in
4 2016 (Luminant 2009a). Projections were derived from county estimates that were based on the
5 cohort-component method (TSDC 2009). Population projections for the years 2007, 2016, 2026,
6 2036, 2046, and 2056 were estimated for each sector using the following methodology:

- 7 1. Using linear and polynomial regression, an equation was derived for each county.
8 This equation was then used in conjunction with the 2000 county level census data
9 to produce a county growth ratio set for each projected year.
- 10 2. Each set was then weighted by area into sectors and summed.
- 11 3. The 2000 Census block level data were then sorted into the radial grid, weighted by
12 area, and summed.
- 13 4. The block level values for each sector were multiplied by their projection ratio,
14 described in Step 1, to produce the final population sector tables (Tables G-1 and
15 G-2) (Luminant 2009a, TSCD 2009).

16 Tables G-3 and G-4 provide transient population data that correspond by sector.

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Table G-1. The projected permanent population for each sector 0–16 km (10 mi) for years 2007, 2016, 2026, 2036, 2046, and 2056

Direction / Year	Sector						
	0-2 (km)	2-4 (km)	4-6 (km)	6-8 (km)	8-10 (km)	10-16 (km)	0-16 (km)
NORTH							
2007	0	16	51	154	337	9395	9953
2016	0	18	59	179	390	10,884	11,530
2026	0	21	67	206	450	12,540	13,284
2036	0	24	76	233	509	14,195	15,037
2046	0	27	85	260	568	15,850	16,790
2056	0	29	94	287	628	17,506	18,544
NNE							
2007	1	18	39	113	220	6379	6770
2016	1	21	45	131	255	7391	7844
2026	1	24	52	151	293	8515	9036
2036	1	26	59	171	332	9639	10,228
2046	1	29	66	191	371	10,763	11,421
2056	1	32	73	210	409	11,887	12,612
NE							
2007	0	15	112	161	359	2296	2943
2016	0	17	130	186	416	2660	3409
2026	0	19	150	214	479	3065	3927
2036	0	21	170	243	542	3469	4445
2046	0	23	190	271	605	3874	4963
2056	0	25	209	299	668	4279	5480
ENE							
2007	0	2	36	84	271	2566	2959
2016	0	2	40	95	311	2970	3418
2026	0	3	45	108	355	3867	3929
2036	0	3	49	121	399	4315	4439
2046	0	3	54	133	443	4315	4948
2056	0	3	58	146	488	4763	5458
EAST							
2007	0	5	131	29	54	161	380
2016	0	6	145	32	60	177	420
2026	0	6	159	35	66	195	461
2036	0	7	174	39	72	213	505
2046	0	8	188	42	78	232	548
2056	0	8	203	45	84	250	590

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Table G-1. (contd)

Direction / Year		Sector							
		0-2 (km)	2-4 (km)	4-6 (km)	6-8 (km)	8-10 (km)	10-16 (km)	0-16 (km)	
ESE		2007	0	23	57	111	247	495	933
		2016	0	25	62	123	272	544	1026
		2026	0	27	69	135	299	600	1131
		2036	0	30	75	147	327	655	1234
		2046	0	33	81	160	355	710	1339
		2056	0	35	87	172	382	765	1442
SE		2007	0	71	89	135	316	304	915
		2016	0	79	98	148	348	335	1008
		2026	0	87	108	163	383	369	1110
		2036	0	95	117	178	419	403	1212
		2046	0	102	127	193	454	437	1313
		2056	0	110	137	208	489	471	1415
SSE		2007	0	140	109	799	1516	598	3162
		2016	0	154	120	879	1668	658	3479
		2026	0	169	132	968	1837	725	3831
		2036	0	185	144	1057	2006	791	4183
		2046	0	200	156	1146	2175	858	4535
		2056	0	216	168	1235	2344	925	4888
SSW		2007	29	67	20	25	40	193	374
		2016	32	74	22	27	44	213	412
		2026	35	81	25	30	48	234	453
		2036	38	89	27	33	52	256	495
		2046	41	96	29	36	57	277	536
		2056	44	104	32	38	61	299	578
SW		2007	28	51	31	44	42	92	288
		2016	31	56	35	48	46	101	317
		2026	34	62	38	53	51	112	350
		2036	37	68	42	58	55	122	382
		2046	40	73	45	63	60	132	413
		2056	43	79	49	67	65	143	446

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Table G-1. (contd)

Direction / Year	Sector						
	0-2 (km)	2-4 (km)	4-6 (km)	6-8 (km)	8-10 (km)	10-16 (km)	0-16 (km)
WSW							
2007	39	31	40	23	44	73	250
2016	43	34	45	26	50	83	281
2026	47	37	50	29	56	94	313
2036	52	41	54	32	62	105	346
2046	56	44	59	36	69	115	379
2056	61	48	64	39	75	126	413
WEST							
2007	12	12	49	101	45	119	338
2016	14	14	57	117	52	138	392
2026	15	16	65	135	60	159	450
2036	16	17	74	153	68	180	508
2046	18	19	83	170	76	201	567
2056	19	21	91	188	83	222	624
WNW							
2007	1	5	22	68	77	216	389
2016	1	6	26	79	89	250	451
2026	1	7	29	91	102	288	518
2036	1	8	33	103	116	326	587
2046	1	9	37	115	130	364	656
2056	1	10	41	127	143	402	724
NW							
2007	1	2	6	4	27	985	1025
2016	1	3	7	4	32	1141	1188
2026	1	3	8	5	37	1315	1369
2036	1	4	9	5	41	1488	1548
2046	1	4	10	6	46	1662	1729
2056	1	4	11	7	51	1835	1909
NNW							
2007	1	4	16	63	169	851	1103
2016	1	4	18	73	196	986	1277
2026	1	5	21	85	226	1136	1473
2036	1	6	24	96	256	1286	1668
2046	1	6	26	107	285	1436	1860
2056	1	7	29	118	315	1585	2054

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Table G-1. (contd)

Direction / Year	Sector						
	0-2 (km)	2-4 (km)	4-6 (km)	6-8 (km)	8-10 (km)	10-16 (km)	0-16 (km)
Totals							
2007	119	542	832	2038	3832	25,088	32,451
2016	131	601	935	2283	4304	28,932	37,186
2026	143	665	1047	2558	4825	33,207	42,445
2036	156	730	1159	2832	5347	37,478	47,702
2046	169	791	1271	3106	5870	41,749	52,956
2056	182	855	1384	3377	6391	46,022	58,211
Cumulative Totals							
	0-2 (km)	0-4 (km)	0-6 (km)	0-8 (km)	0-10 (km)	0-16 (km)	
2007	119	661	1493	3531	7363	32,451	
2016	131	732	1667	3950	8254	37,186	
2026	143	808	1855	4413	9238	42,445	
2036	156	886	2045	4877	10,224	47,702	
2046	169	960	2231	5337	11,207	52,956	
2056	182	1037	2421	5798	12,189	58,211	

Source: Luminant 2009a, TSCD 2009

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Table G-2. The projected permanent population for each sector 16 km (10 mi)–80 km (50 mi) for years 2007, 2016, 2026, 2036, 2046, and 2056

Direction / Year	Sector			
	16-40 (km)	40-60 (km)	60-80 (km)	16-80 (km)
NORTH				
2007	11,320	37,256	17,904	66,480
2016	13,082	42,981	20,702	76,765
2026	15,040	49,342	23,811	88,193
2036	16,997	55,702	26,920	99,619
2046	18,955	62,063	30,028	111,046
2056	20,913	68,424	33,137	122,474
NNE				
2007	7586	61,636	91,401	160,623
2016	8777	70,856	104,610	184,243
2026	10,099	81,100	119,287	210,486
2036	11,422	91,345	133,964	236,731
2046	12,745	101,589	148,641	262,975
2056	14,067	111,834	163,318	289,219

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Table G-2. (contd)

Direction / Year		Sector			
		16-40 (km)	40-60 (km)	60-80 (km)	16-80 (km)
NE					
	2007	5896	207,161	646,328	859,385
	2016	6963	237,503	736,399	980,865
	2026	8149	271,217	836,478	1,115,844
	2036	9335	304,930	936,557	1,250,822
	2046	10,521	338,644	1,036,636	1,385,801
	2056	11,707	372,358	1,136,715	1,520,780
ENE					
	2007	11,865	69,338	142,365	223,568
	2016	14,123	82,491	167,494	264,108
	2026	16,632	97,106	195,416	309,154
	2036	19,141	111,721	223,337	354,199
	2046	21,650	126,336	251,259	399,245
	2056	24,160	140,950	279,180	444,290
EAST					
	2007	27,428	15,290	9326	52,044
	2016	32,648	18,041	11,060	61,749
	2026	38,447	21,097	12,987	72,531
	2036	44,246	24,154	14,914	83,314
	2046	50,045	27,211	16,840	94,096
	2056	55,845	30,267	18,767	104,879
ESE					
	2007	975	3951	13,732	18,658
	2016	1129	4398	15,293	20,820
	2026	1301	4894	17,026	23,221
	2036	1472	5391	18,760	25,623
	2046	1644	5888	20,493	28,025
	2056	1815	6384	22,227	30,426
SE					
	2007	1154	8043	6691	15,788
	2016	1249	8816	7258	17,323
	2026	1355	9676	7999	19,030
	2036	1461	10,535	8740	20,736
	2046	1566	11,394	9481	22,441
	2056	1672	12,254	10,222	24,148

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Table G-2. (contd)

Direction / Year		Sector			
		16-40 (km)	40-60 (km)	60-80 (km)	16-80 (km)
SSE					
	2007	1061	2866	7218	11,145
	2016	1145	3092	7792	12,029
	2026	1238	3342	8430	13,010
	2036	1331	3593	9069	13,993
	2046	1424	3844	9707	14,975
	2056	1517	4094	10,345	15,956
SOUTH					
	2007	1673	933	2547	5153
	2016	1808	1000	2776	5584
	2026	1958	1074	3022	6054
	2036	2108	1147	3262	6517
	2046	2258	1220	3493	6971
	2056	2408	1291	3718	7417
SSW					
	2007	688	2050	4478	7216
	2016	748	2132	4639	7519
	2026	814	2211	4788	7813
	2036	880	2276	4906	8062
	2046	946	2329	4991	8266
	2056	1012	2368	5045	8425
SW					
	2007	1172	1360	1492	4024
	2016	1291	1471	1541	4303
	2026	1424	1590	1580	4594
	2036	1557	1706	1601	4864
	2046	1689	1819	1605	5113
	2056	1822	1927	1592	5341
WSW					
	2007	5206	21,732	5543	32,481
	2016	5738	23,951	5796	35,485
	2026	6329	26,417	6024	38,770
	2036	6919	28,883	6196	41,998
	2046	7510	31,348	6313	45,171
	2056	8101	33,814	6374	48,289

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Table G-2. (contd)

Direction / Year		Sector			
		16-40 (km)	40-60 (km)	60-80 (km)	16-80 (km)
WEST					
	2007	1566	3388	996	5950
	2016	1728	3734	1035	6497
	2026	1908	4118	1068	7094
	2036	2087	4503	1090	7680
	2046	2267	4887	1100	8245
	2056	2447	5271	1100	8818
WNW					
	2007	1236	853	1777	3866
	2016	1374	936	1890	4200
	2026	1527	1027	2009	4563
	2036	1680	1118	2120	4918
	2046	1833	1210	2224	5267
	2056	1986	1301	2320	5607
NW					
	2007	1805	1949	1703	5457
	2016	2061	2104	1834	5999
	2026	2345	2277	1980	6602
	2036	2629	2449	2126	7204
	2046	2914	2622	2272	7808
	2056	3198	2794	2418	8410
NNW					
	2007	4307	7022	23,143	34,472
	2016	4979	8013	25,718	38,710
	2026	5726	9115	28,580	43,421
	2036	6474	10,216	31,441	48,131
	2046	7221	11,317	34,303	52,841
	2056	7969	12,419	37,165	57,553

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Table G-2. (contd)

Direction / Year		Sector 16-40 (km)	40-60 (km)	60-80 (km)	16-80 (km)
Totals					
	2007	84,938	444,828	976,544	1,506,310
	2016	98,843	511,519	1,115,837	1,726,199
	2026	111,292	585,603	1,270,485	1,970,380
	2036	129,739	659,669	1,425,003	2,214,411
	2046	145,188	733,721	1,579,386	2,458,295
	2056	160,639	807,750	1,733,643	2,702,032
Cumulative Totals					
		16-40 (km)	16-60 (km)	16-80 (km)	
	2007	84,938	529,766	1,506,310	
	2016	98,843	610,362	1,726,199	
	2026	114,292	699,895	1,970,380	
	2036	129,739	789,408	2,214,411	
	2046	145,188	878,909	2,458,295	
	2056	160,639	968,389	2,702,032	

Source: Luminant 2009a, TSCD 2009

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Table G-3. The current residential and transient population for each sector 0–16 km (10 mi)

Direction (2007)	Sector						
	0-2 (km)	2-4 (km)	4-6 (km)	6-8 (km)	8-10 (km)	10-16 (km)	0-16 (km)
NORTH	0	16	51	154	337	39,034	39,592
NNE	1	18	39	113	220	6439	6830
NE	0	15	112	161	359	2504	3151
ENE	0	2	36	84	271	2566	2959
EAST	0	5	131	29	54	161	380
ESE	0	23	57	111	247	495	933
SE	0	71	2989	2326	879	373	6638
SSE	0	140	109	799	3238	598	4884
SOUTH	8	80	24	377	68	665	1222
SSW	29	67	726	25	40	193	1080
SW	28	51	31	44	42	92	288
WSW	69	31	40	23	44	73	280
WEST	12	12	49	101	45	119	338
WNW	1	5	22	68	77	216	389
NW	1	2	6	4	27	1154	1194
NNW	0	4	16	63	169	851	1103
Totals	149	542	4438	4482	6117	55,533	71,261
Cumulative Totals	0-2 (km)	0-4 (km)	0-6 (km)	0-8 (km)	0-10 (km)	0-16 (km)	
2007	149	691	5129	9611	15,728	71,261	

Source: Luminant 2009a

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Table G-4. The projected transient population for each sector 0–80 km (50 mi) for years 2007, 2016, 2026, 2036, 2046, and 2056

Distance (km)	Direction	2007	2016	2026	2036	2046	2056
2	WSW	30	33	36	39	42	46
6	SE	2900	3191	2514	3837	4160	4483
6	SSW	706	776	855	934	1012	1091
8	SE	2191	2411	2655	2899	3143	3387
8	S	253	278	307	335	363	391
10	SE	563	620	682	745	808	871
10	SSE	1722	1895	2087	2279	2471	2663
16	N	29,639	34,339	39,561	44,784	50,006	55,228
16	NNE	60	69	80	90	101	111
16	NE	208	242	278	315	352	388
16	SE	69	76	84	91	99	107
16	S	300	330	364	397	431	464
16	NW	169	196	226	255	285	315
40	N	136	157	180	204	227	251
40	NNE	107	124	143	162	181	199
40	NE	80	95	111	127	144	160
40	E	11,634	13,848	16,308	18,768	21,228	23,687
40	SSW	270	294	320	346	372	398
40	SW	1	1	1	1	2	2
40	WSW	5580	6150	6783	7416	8050	8683
40	NW	22	26	29	33	36	40
40	NNW	6	7	8	9	9	10
60	N	45,423	52,403	60,158	67,913	75,668	83,423
60	NNE	92	106	122	137	152	168
60	NE	2215	2539	2899	3260	3620	3981
60	ENE	5680	6757	7955	9152	10349	11,546
60	SE	11,135	12,205	13,395	14,585	15,775	16,964
60	SSE	715	771	834	896	959	1022
80	N	114	131	151	171	191	210
80	NNE	898	1028	1172	1316	1460	1604
80	NE	210,974	240,374	273,042	305,710	338,377	371,045
80	SSE	5321	5744	6215	6685	7155	7626
80	SSW	1750	1813	1871	1917	1950	1971
80	NNW	11,256	12,508	13,900	15,292	16,684	18,075

Source: Luminant 2009a, TSCD 2009

G.2 Supporting Documentation on Radiological Dose Assessment

The U.S. Nuclear Regulatory Commission (NRC) staff reviewed and performed an independent dose assessment of the radiological impacts from normal operation of the new and existing nuclear units at the Comanche Peak Nuclear Power Plant site. The results of the assessment are presented in this appendix and are compared with the results from Luminant's assessment found in the Environmental Report (ER), Section 4.5, Radiation Exposure to Construction workers, and 5.4, Radiological Impacts of Normal Operation (Luminant 2009a, 2010). The appendix is divided into four sections: (1) dose estimates to the public from liquid effluents; (2) dose estimates to the public from gaseous effluents; (3) cumulative dose estimates; and (4) dose estimates to the biota from gaseous and liquid effluents.

G.2.1 Dose Estimates to the Public from Liquid Effluents

The NRC staff used the dose assessment approach specified in Regulatory Guide 1.109 (NRC 1977) and the LADTAP II computer code (Streng et al. 1986) to estimate doses to the maximally exposed individual (MEI) and population within 50 mi from the liquid effluent pathway of the proposed Units 3 and 4. The NRC staff used the projected radioactive effluents release values from the Final Safety Analysis Report (Luminant 2009b). The GASPARD II computer code (Streng et al. 1987) was used to estimate doses to the MEI and population from liquid effluent diverted to an evaporation pond during the course of operations of the proposed Units 3 and 4.

G.2.1.1 Scope

The NRC Staff and Luminant calculated the dose to the MEI assuming recreational use of Squaw Creek Reservoir (SCR). Pathways included were the ingestion of fish caught in SCR and external exposure to contaminated sediments deposited along the shoreline and to waterborne radionuclides while boating on SCR. Water downstream of SCR is not used as either drinking water or for irrigation. Access to SCR for recreational activity (boating, fishing and shoreline activity) is controlled by Luminant. Population doses were calculated for the same pathways as were used for the MEI dose evaluation.

The NRC staff reviewed the assumed exposure pathways and the input parameters and values used by Luminant for appropriateness. Default values from Regulatory Guide 1.109 (NRC 1977) were used when site-specific input parameters were not available. The NRC staff concluded that the assumed exposure pathways were appropriate – ingestion of fish and external exposure associated with recreational activities on SCR. The NRC staff also concluded that the input parameters and values used by Luminant were appropriate.

G.2.1.2 Resources Used

To calculate doses to the public from liquid effluents, the NRC staff used a personal computer version of the LADTAP II code and GASPARD II code entitled, NRCDOSE Version 2.3.15, (Chesapeake Nuclear Services, Inc. 2007) obtained through the Oak Ridge Radiation Safety Information Computational Center (RSICC).

G.2.1.3 Input Parameters

Tables G-5 lists the major parameters used in calculating dose to the public from liquid effluent releases during normal operation. Luminant (2009a) projected the 50 mi population to the year 2058. Section 5.4-1 of the Environmental Standard Review Plan (ESRP) (NRC 2000) suggests that the population be projected only five years out from the date of licensing action under

1 consideration. However, the projected population for 2058 is larger than the projected
2 population for the time suggested by the ESRP; therefore, use of the 2058 population provides
3 a bounding dose estimate.

4 **G.2.1.4 Comparison of Results**

5 NRC staff's dose calculations confirmed the doses estimated by Luminant.

6 **G.2.2 Dose Estimates to the Public from Gaseous Effluents**

7 The NRC staff used the dose assessment approach specified in Regulatory Guide 1.109 (NRC
8 1977) and the GASPAR II computer code (Streng et al. 1987) to estimate doses to the MEI
9 and to the population within 50 mi of the Comanche Peak site from the gaseous effluent
10 pathway for both the proposed units. The NRC staff used the projected radioactive gaseous
11 effluents release values from the Final Safety Analysis Report (Luminant 2009a).

12 **G.2.2.1 Scope**

13 The NRC staff and Luminant calculated the MEI dose at 0.79 mi south-southwest (SSW) of the
14 new units. Pathways included were plume, ground, inhalation, and ingestion of locally grown
15 meat and vegetables. Although no milk animals were reported within 5 mi of the site, ingestion
16 of milk from a cow was also considered at this location (0.79 mi SSW) for completeness; milk
17 animals could be introduced to the 5-mi area around the site in the future.

18 The NRC staff reviewed the parameters and values used by Luminant (2009a) for
19 appropriateness. Default values from Regulatory Guide 1.109 (NRC 1977) were used when
20 site-specific input parameters were not available. The NRC staff concluded that the assumed
21 exposure pathways and input parameters were appropriate. These pathways and parameters
22 were used by the NRC staff in its independent calculations using GASPAR II.

23 Joint frequency distribution data of wind speed and wind direction by atmospheric stability class
24 for the Comanche Peak site provided in ER Table 2.7-105 (Luminant 2009a) were used as input
25 to the XOQDOQ code (Sagendorf et al. 1982) to calculate average χ/Q and D/Q values for
26 routine releases. The NRC staff reviewed the XOQDOQ output files provided by Luminant and
27 concluded they are appropriate for use in dose calculations for the gaseous effluents.

28 Population doses were calculated for all types of releases (i.e., noble gases, particulates,
29 iodines, H-3 and C-14) using the GASPAR II code for the following: plume immersion; direct
30 radiation from radionuclides deposited on the ground, inhalation; and ingestion of vegetables,
31 milk, and meat. As noted in Section 5.9.2.2, milk consumption was included based on an earlier
32 land-use census.

33 **G.2.2.2 Resources Used**

34 To calculate doses to the public from gaseous effluents, the NRC staff used a personal
35 computer version of the XOQDOQ and GASPAR II codes entitled, NRCDOSE Version 2.3.15,
36 (Chesapeake Nuclear Services, Inc. 2007) obtained through the Oak Ridge RSICC.

37 **G.2.2.3 Input Parameters**

38 Tables G-6 provides a listing of the major parameters used in calculating dose to the public from
39 gaseous effluent releases during normal operation.

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Table G-5. Parameters Used in Calculating Dose to the Public from Liquid Effluent Releases

Nuclide ^(a)	Annual Release (Ci)		Nuclide ^(a)	Annual Release (Ci)	
	Liquid	Evaporation Pond		Liquid	Evaporation Pond
H-3	1.60E+03	8.0E+02	Na-24	4.70E-03	2.35E-03
Cr-51	1.30E-03	6.50E-04	Mn-54	7.00E-03	3.50E-04
Fe-55	5.00E-04	2.50E-04	Fe-59	1.00E-04	5.00E-05
Co-58	1.90E-03	9.50E-04	Zn-65	2.20E-04	1.10E-04
Rb-88	2.80E-02	1.40E-02	Sr-89	6.00E-05	3.00E-05
Sr-90	8.00E-06	4.00E-06	Sr-91	6.80E-05	3.40E-05
Y-91m	4.40E-05	2.20E-05	Y-91	1.00E-05	5.00E-06
Y-93	2.90E-04	1.45E-04	Zr-95	2.00E-04	1.00E-04
Nb-95	1.00E-04	5.00E-05	Mo-99	1.64E-03	8.20E-04
Tc-99m	1.70E-03	8.50E-04	Ru-103	3.11E-03	1.56E-03
Ru-106	3.81E-02	1.91E-02	Ag-110m	6.00E-04	3.00E-04
Te-129m	7.80E-05	3.90E-05	Te-129	3.10E-04	1.55E-04
Te-131m	2.50E-04	1.25E-04	Te-131	7.60E-05	3.80E-05
Te-132	4.70E-04	2.35E-04	I-131	4.00E-04	2.00E-04
I-132	3.10E-04	1.55E-04	I-133	8.10E-04	4.05E-04
I-134	8.90E-05	4.45E-05	I-135	7.80E-04	3.90E-04
Cs-134	1.00E-03	5.00E-04	Cs-136	2.16E-02	1.08E-02
Cs-137	2.00E-03	1.00E-03	Ba-140	4.89E-03	2.45E-03
La-140	8.00E-03	4.00E-03	Ce-141	6.00E-05	3.00E-05
Ce-143	5.00E-04	2.50E-04	Ce-144	1.70E-03	8.50E-04
Pr-143	7.90E-05	3.95E-05	Pr-144	1.70E-03	8.50E-04
W-187	3.50E-04	1.25E-04	Np-239	5.30E-04	2.65E-04

(a) Only radionuclides included in Regulatory Guide 1.109 (NRC 1977) are considered.

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Table G-5. (contd)

Parameter	Staff Value	Comments
Discharge flow rate	248500 gal/min 553.7 ft ³ /s	Value from ER Table 5.4-1 (Luminant 2009a).
Source term multiplier	1	To convert single-unit source term to two units.
Site type	Fresh water	Discharge to freshwater SCR
Re-concentration model	Completely mixed impoundment model	Value from ER Table 5.4-1 (Luminant 2009a).
Average effluent discharge rate from SCR	45.4 ft ³ /sec	Value from ER Table 5.4-1 (Luminant 2009a).
Volume of SCR	6.3 x 10 ⁹ ft ³	Value from ER Table 5.4-1 (Luminant 2009a)
Shore width factor (Squaw Creel)	0.2	ER Table 5.4.-1 as suggested for river shoreline (NRC 1977)
Dilution factors for aquatic food and boating, shoreline and swimming, and drinking water (Squaw Creek)	1	ER Table 5.4-1; value of 1 indicates no dilution.
Transit time to location of maximum individual dose (hr)	7.3 hr	ER Table 5.4-1.
Consumption and usage factors for adults, teens, children, and infants	Shoreline usage (hr/yr)	ER Table 5.4-2; values from Reg. Guide 1.1.09, Table E-5.
	12 (adult)	Swimming exposure assumed to be the same as shoreline usage.
	67 (teen)	
	14 (child)	
	NA (infant)	
	Boating exposure (hr/yr)	
	12 (adult)	
	67 (teen)	
	14 (child)	
	NA (infant)	
	Fish consumption (kg/yr)	
	21 (adult)	
	16 (teen)	
6.9 (child)		
NA (infant)		
50-mile population	3,493,553	ER Table 5/4-1 (Luminant 2009a)
Annual fish harvest, Whitney Reservoir and Brazos River (kg/yr)	324,375 kg/yr	ER Table 5.4-1 (Luminant 2009a)

Table G-5. (contd)

Parameter	Staff Value	Comments
50-mi population usage of shoreline)	22,358,746 person-hr/yr	ER Table 5.4.1; based on Reg. Guide 1.109 exposure times, age group fractions and 50% of 50-mi population.
50-mi population swimming usage	22,358,746 person-hr/yr	ER Table 5.4.1; based on Reg. Guide 1.109 exposure times, age group fractions and 50% of 50-mi population.
50-mi population boating usage	22,358,746 person-hr/yr	ER Table 5.4.1; based on Reg. Guide 1.109 exposure times, age group fractions and 50% of 50-mi population.

Table G-6. Parameters Used in Calculating Dose to the Public from Gaseous Effluent Releases.

Nuclide	Annual Release (Ci)	Nuclide	Annual Release (Ci)
H-3	1.80E+02	C-14	7.30E+00
Ar-41	3.40E+01	Cr-51	6.10E-04
Mn-54	4.30E-04	Co-57	8.20E-06
Co-58	2.30E-02	Co-60	8.80E-03
Fe-59	7.90E-05	Kr-85	1.40E+03
Sr-89	3.00E-03	Sr-90	1.20E-03
Zr-95	1.00E-03	Nb-95	2.50E-03
Ru-103	8.00E-05	Ru-106	7.80E-05
Sb-125	6.10E-05	I-131	4.20E-03
I-133	6.40E-02	Xe-131m	2.60E+02
Xe-133m	2.00E+00	Xe-135m	4.00E+00
Xe-135	2.00E+00	Xe-137	4.00E+00
Xe-138	1.00E+00	Cs-134	2.30E-03
Cs-136	8.50E-05	Cs-137	3.60E-03
Ba-140	4.20E-04	Ce-141	4.20E-05

Source: ER Table 5.4-7 (Luminant 2009a).

Table G-6. (contd)

Parameter	Staff Value	Comments		
Wind speed and direction	ER Tables 2.7-58 and 2.7-71 (Luminant 2009a)	Site-specific data for 5-yr period 2001-2006		
Atmospheric dispersion coefficients	ER Tables 2.7-122 to 2.7-126 (Luminant 2009a)	Site-specific data		
Ground deposition coefficient	ER Table 2.7-127 (Luminant 2009a)	Site-specific data		
Annual milk production within 50-mi radius of site	9.08×10^8 L/yr	Site-specific data from ER Table 5.4-3 (Luminant 2009a)		
Annual vegetable production within 50-mi radius of site	4.81×10^8 kg/yr	Site-specific data from ER Table 5.4-3 (Luminant 2009)		
Annual meat production within 50-mi radius of site	4.26×10^7 kg/yr	Site-specific data from ER Table 5.4-3 (Luminant 2009a)		
Receptor locations and Dispersion coefficients		Site specific values ER Table 5.55 (Luminant 2009a)		
	Atmospheric Dispersion Coefficient χ/Q ($s\ m^{-3}$)			
Receptor	Plain	Decayed	Decayed & depleted	D/Q (m^{-2})
EAB 0.37 mi NNW	5.5×10^{-6}	5.5×10^{-6}	5.1×10^{-6}	5.5×10^{-8}
Nearest residence 0.79 mi SSW	4.4×10^{-7}	4.4×10^{-7}	3.9×10^{-7}	4.5×10^{-6}
Plant vents				
Nearest residence 0.79 mi SSW	3.1×10^{-6}	3.1×10^{-6}	2.9×10^{-6}	2.1×10^{-8}
Evaporation Pond				
Swim Beach 0.79 mi SSW	8.3×10^{-7}	8.2×10^{-7}	7.3×10^{-7}	4.5×10^{-7}
Consumption factors:				
	Consumption factors; ER Table 5.4-3 (Luminant 2009a)			
	Adult	Teen	Child	Infant
Milk (L/yr)	310	400	330	330
Meat (kg/yr)	110	65	41	-
Vegetables(kg/yr)				
Leafy	64	42	26	-
Other	520	639	520	-
Fraction of year leafy vegetables are grown	1.0			
				Site-specific value ER Table 5.403 (Luminant 2009a)
Fraction of year milk cows are on pasture	1.0			
				Site-specific value ER Table 5.403 (Luminant 2009a)
Fraction of MEI's vegetable intake from own garden	0.76			
				Site-specific value ER Table 5.403 (Luminant 2009a)

Table G-6. (contd)

Parameter	Staff Value	Comments
Fraction of year beef cattle on pasture	1.0	Site-specific value ER Table 5.403 (Luminant 2009a)
Values from ER Table 5.4-7 (Luminant 2009a)		

1 **G.2.2.4 Comparison of Doses to the MEI from Gaseous Effluent Releases**

2 NRC staff's dose calculations confirmed the doses estimated by Luminant (2009a, 2010). In a
 3 revision of the ER, Luminant indicated that recreational activities will be allowed on SCR under
 4 its control. The NRC staff evaluated the dose to individuals using the "swim beach" location for
 5 such activities. The resulting doses are shown in Table G-7 and were found to be smaller than
 6 the MEI for gaseous effluent releases.

7 Table G-8, developed by NRC staff compares the combined dose estimates from direct
 8 radiation and gaseous and liquid effluents from existing Units 1 and 2 and the proposed Units 3
 9 and 4 against the 40 CFR Part 190 standards. The NRC staff used the reported MEI dose
 10 values for the year 2008 operation of Units 1 and 2 (Luminant 2009b) in Table G-8 .

Table G-7. Annual Dose (mrem/yr) at Swim Beach^(a) Due to Gaseous Effluent Releases

Receptor	Total Body	Thyroid	Skin
Adult	0.000014	0.000020	0.000014
Teen	0.000078	0.00012	0.000077
Child	0.000016	0.000028	0.000016
Infant ^(b)	0.000010	0.000020	0.000010

(a) Recreational activities involve exposure pathways of inhalation and external exposure to plume and ground.

(b) Infant's external exposure during recreational activities based on mother's exposure time.

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Table G-8. Comparison of MEI Annual Doses (mrem/yr) with 40 CFR Part 190 Standards

	CPNPP Units 1 and 2 ^(a)				CPNPP Units 3 and 4 ^(b)			Site Total	Regulatory Standard
	Liquid	Gaseous	Direct ^(c)	Total	Liquid	Gaseous	Total		
Total Body	0.087	0.088	8.8	9.0	1.8	1.7	3.5	12	25
Thyroid	0.13	0.41	8.8	9.3	0.3	3.1	1.8	11	75
Other	<0.001	0.0028	8.8	8.8	2.6	5.1	7.7	17	25

(a) Liquid and gaseous dose values for Unit 1 and 2 operation in 2009 (Luminant 2009b).

(b) Derived from ER Table 5.4-12 (Luminant 2009a).

(c) Direct radiation values from ER Section 5.4.1.3 (Luminant 2009a).

2 **G.2.3 Cumulative and Population Dose Estimates**

3 Based on parameters shown for the liquid and gaseous pathways, Table G-5 and Table G-6,
4 respectively, doses from the two proposed units were calculated for the MEI using LADTAP II
5 and GASPAR II. The NRC staff's assessment of the MEI dose for Units 1 AND 2 is based on
6 the doses reported for the MEI due to operations of Units 1 and 2 in 2008 (Luminant 2009b).
7 The effluent releases during 2008 exceeded those in the preceding five years.

8 Based on parameters shown for the liquid and gaseous pathways, Table G-5 and Table G-6,
9 respectively, doses were calculated using LADTAP II and GASPAR II to the population within 50
10 mi of the CPNPP site (as discussed in Section G.2.1.3 and G.2.2.3). Doses due to milk
11 ingestion were determined based on the 2002 agricultural census except in counties where that
12 census indicated no milk animals (cows or goats) were present; in these cases, data from the
13 1997 census were substituted. The dose estimated to the population within 50 mi of the CPNPP
14 site from operations of proposed Units 3 and 4 is 8.0 person rem. It is noted that the 50-mi
15 population was assumed to be for the year 2058; as discussed in Section G.2.1.3, this results in
16 a bounding calculation of the dose compared to the ESRP methodology. For comparison, the
17 annual background dose to the population within 50 mi from background radiation was
18 estimated to be approximately 985,000 person-rem. This estimate is the product of the annual
19 average dose to individuals from natural sources of 311 mrem, as stated in NCRP Report 160
20 (NCRP 2009), and the 2058 population of 3,490,000 persons.

21 **G.2.4 Dose Estimates to the Biota from Liquid and Gaseous Effluents**

22 The NRC staff performed confirmatory calculations of the doses to biota from liquid and
23 gaseous effluents using the LADTAP II and GASPAR II. The NRC staff used a personal
24 computer version of the LADTAP II code and GASPAR II code entitled, NRCDOSE
25 Version 2.3.15, (Chesapeake Nuclear Services, Inc. 2007) obtained through the Oak Ridge
26 Radiation Safety Information Computational Center (RSICC).

27 **G.2.4.1 Liquid Effluent Pathways**

28 The NRC estimated doses to biota from liquid effluents using fish, invertebrates, and algae as
29 surrogate aquatic biota species. Muskrats, raccoons, herons, and ducks are used as surrogate
30 terrestrial biota species. The NRC staff recognizes the LADTAP II computer program as an
31 appropriate method for calculating dose to the aquatic biota and for calculating the liquid

1 pathway contribution to terrestrial biota. Most of the LADTAP II input parameters are specified
 2 in Section G.2.1.3; including the source term, the discharge flow rate to the receiving fresh
 3 water system, and the shore width factor. The NRC staff concluded these parameters were
 4 appropriate to use in calculating biota dose in the SCR. The NRC staff's dose analysis
 5 confirmed the liquid pathway doses to biota estimated by Luminant as shown in Table 5-13.

6 **G.2.4.2 Gaseous Effluent Pathways**

7 NRC staff assessed doses to terrestrial biota from the gaseous effluent pathway based on the
 8 results of the GASPAP II calculations for human doses discussed in Section G.2.2. Again,
 9 muskrats, raccoons, herons, and ducks are used as surrogate terrestrial biota species. The
 10 NRC staff assessed the doses at the exclusion area boundary (0.37 mi NNW) to achieve a
 11 reasonable estimate of the doses to terrestrial biota that might live on the CPNPP site. It was
 12 assumed that doses for raccoons and ducks were equivalent to adult human doses for
 13 inhalation, vegetation ingestion, and the plume. The dose from ground exposure was doubled.
 14 The doubling of doses from ground deposition reflects the closer proximity of these organisms
 15 to the ground. Muskrats and herons do not consume terrestrial vegetation, so that pathway was
 16 not included for these organisms. The NRC staff's dose assessment confirmed the gaseous
 17 pathway doses to biota estimated by Luminant as shown in Table 5-13.

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Appendix H

List of Authorizations, Permits, and Certifications

Appendix H

List of Authorizations, Permits, and Certifications

1 This appendix contains a list of the environmental-related authorizations, permits, and
2 certifications potentially required by Federal, State, regional, local, and affected Native
3 American tribal agencies related to the combined license for the Comanche Peak Nuclear
4 Power Plant, Units 3 and 4. The table is has been modified from Table 1.2-1 of the
5 Environmental Report submitted to the U.S. Nuclear Regulatory Commission by the applicant,
6 Luminant Generation Company LLC (Luminant 2009a).

7 Reference

8 Luminant Generation Company LLC (Luminant). 2009a. *Comanche Peak Nuclear Power Plant*
9 *Units 3 and 4, COL Application; Part 3, Environmental Report* (Rev. 1). Luminant Generation
10 Company LLC, Glen Rose, Texas, November 20. Accession No. ML100081557.

Table H-1. Authorizations, Permits, and Certifications Required for Combined Licenses

Agency	Authority	Requirements	Activity Covered/Comments
U.S. Nuclear Regulatory Commission (NRC)	10 Code of Federal Regulations (10 CFR) Part 52	Applicant submits Construction and Operating License Application (COLA) to NRC	Applicant is required to submit an application to the NRC for a combined construction and operating license (COL).
NRC	10 CFR 52.79	Applicant submits an Environmental Report (ER)	Applicant is required to submit a complete ER, 10 CFR 52.80 (b), 72 FR 57447, Oct 9, 2007, 10 CFR 52.79, 10 CFR 51.45, 10 CFR 51.50.
U.S. Department of Energy (DOE)	Nuclear Waste Policy Act of 1982; Section 302(b)(B)	Applicant must have an agreement with the Department of Energy for the disposal of high-level waste and spent nuclear fuel	Contracts with DOE exist for disposal of spent nuclear fuel and/or high-level radioactive waste. (Contract No. DE-CR01-09RW09022 for CPNPP Unit 1; Contract No. DE-CR01-09RW09023 for CPNPP Unit 2)
U.S. Fish and Wildlife Service (USFWS) & Texas Parks and Wildlife Department (TPWD)		Consultation with Fish and Wildlife, Federal and State (FWS 2006)	Consultation concerning potential impacts to federally threatened and endangered species must be obtained and interference with any listed species must be resolved prior to disturbance.
Federal Aviation Administration (FAA) & Texas Department of Transportation (TDOT)	14 CFR 77.13	Notice of construction for permanent structures	Permit for structures over 200 ft in height (containment buildings, permanent facilities, cooling towers, etc.). Thirty days prior to construction of the obstruction.
FAA & TDOT	14 CFR 77.13	Notice of construction for temporary structures	Permit for structures over 200 ft in height (construction cranes, towers, etc.). Thirty days prior to construction of the obstruction.

Table H-1. (contd)

Agency	Authority	Requirements	Activity Covered/Comments
Texas Commission on Environmental Quality (TCEQ) & U.S. Environmental Protection Agency (EPA)	30 Texas Annotated Code (TAC) 335; EPA applies only to Units 1 and 2	Notice of Registration for solid waste management	Transport, treatment, storage, and disposal of solid waste. Notice requires modification 3 months prior to any new solid waste not previously described. (Solid Waste Reg. # 33306; EPA ID # TXD02332078)
U.S. Army Corps of Engineers (USACE) & TCEQ	Clean Water Act 404 Permit	Construction in a wetland or shoreline	Submit 24 months prior to dredging/filling activities in wetland if required. Depends on the 401 permit process.
EPA & TCEQ	Clean Water Act Section 401	Construction in a wetland or shoreline	Submit 24 months prior to dredging/filling activities in wetland if required.
TCEQ	Storm Water Pollution Prevention Plan (SWPPP); Texas Water Code Chapter 26	SWPPP for construction activities	Stormwater to surface water discharge associated with land disturbance and industrial activity during construction activities. Submit plan modification with Notice of Intent for a disturbance of 5 acres or more. (General Permit No. TXR 150000)
TCEQ	Notice of Intent (NOI); Texas Water Code Chapter 26 (SWPPP)	Pertains to General Permit relating to stormwater discharges from construction activities	Submit NOI 3 months prior to disturbance of land. (General Permit No. TXR 150000)
TCEQ	SWPPP; Texas Water Code Chapter 26	SWPPP for operations of facility	Submit plan modification concurrent with submittal of Stormwater Operations NOI. (Part III of General Permit No. TXR 050000)

Table H-1. (contd)

Agency	Authority	Requirements	Activity Covered/Comments
TCEQ	NOI; Texas Water Code Chapter 26	Pertains to General Permit relating to stormwater discharges from operation activities	Submit NOI 3 months prior to operations. (General Permit No. TXR 050000)
TCEQ	Texas Water Code Chapter 5 and 26 TPDES Industrial Wastewater Permit (Major Source Modification); Clean Water Act Section 402	Modification or additions to wastewater facilities	Certification and licensing of municipal and domestic wastewater facilities. Submit 18 months prior to new construction or modification. (TPDES # WQ0001854000; Must be renewed, but may require modification)
TCEQ	30 TAC 285	Submit on-site sewage treatment and design permit	Six months prior to construction.
Public Utilities Commission (PUC) of Texas		Certificate of Convenience and Need Application	Certification that present and future public convenience and necessity require or will require the operation of such equipment or facility and that it will be constructed and operated in compatibility with the environment.
State Historic Preservation Officer (SHPO); Native American Tribes	13 TAC 26; Archeological sites	Permission required prior to clearing of any lands	Identification and evaluation of historic properties and any cultural sites of significance to Native American tribes (site, transmission corridors, pipeline corridors).

Table H-1. (contd)

Agency	Authority	Requirements	Activity Covered/Comments
SHPO	Section 106 National Historic Preservation Act (NHPA); 36 CFR 800	Permission required prior to clearing of any lands	Review and analysis of cultural and historical resources, including completion of NHPA Section 106 consultation. SHPO concurrence supports no new study needed at CPNPP site.
Brazos River Authority (BRA)		Use of surface water approved by local water authority	New surface water rights secured from Lake Granbury for transfer to CPNPP site and return to Lake Granbury.
TPWD	31 TAC 69	Scientific Collection Permit	Sampling contractors need to have permit in hand for species collection. (Each Vendor maintains a permit for collection)
TCEQ	30 TAC 335	Landfill #6 Closure Plan	Plan to close landfill is needed 3 months prior to its being disturbed.
TCEQ	30 TAC 335	Landfill #6 Closure Certification Report	Report upon completion of excavation as to the results versus the plan.
TCEQ	30 TAC 116	Concrete batch plant air permit	Concrete batch plant air permit required 6 months prior to construction for operation of an on-site concrete plant.
TCEQ	30 TAC 122	Title V Operating Permit for diesel units	Diesel engines air permit for discharge to environment. Emergency diesels, fire pump diesels, auxiliary boilers, gas turbines, etc. Twelve months prior to initial firing of diesels. [TCEQ Air Permit No. 19225 (not Title V permit); Requires modification]
TCEQ	7 TAC 111	Air permit for burning debris in pit	After burn pit is constructed, the permit is required 3 months prior to any burn activities.

Table H-1. (contd)

Agency	Authority	Requirements	Activity Covered/Comments
EPA	40 CFR 110/112	Spill Prevention Control and Countermeasures Plan (SPCCP)	Revise existing plan 6 months prior to construction if changes are indicated.
EPA	40 CFR 110/112	SPCCP – Revision	A revision to the plan may be required if contractors store more than 1320 gallons of petroleum products.
TDOT; Hood and Somervell County agencies		Road construction, road crossings, interruption of traffic flow	Affected areas involving old or new roads – changes or interruption of traffic.
TCEQ	30 TAC 106	Rock crusher operations	For rock debris going to be crushed, obtain a permit 6 months prior to operation.
NRC		Appendix B - Facilities Operating License Environmental Protection Plan, non-radiological	Changes required in the Environmental Protection Plan, non-radiological, to be modified pending final design reviews, approvals, and prior to operation of the facility.
TCEQ	30 TAC 321.255; 30 TAC 210.23; 30 TAC 309	Evaporation pond liner and size requirements	Certify evaporation pond meets requirements prior to use.
TCEQ		Hazardous materials storage (SARA Title III)	
TCEQ		Toxic chemical release inventory reporting form	
TCEQ	Disposal Facility	Radiological waste disposal registration	

Table H-1. (contd)

Agency	Authority	Requirements	Activity Covered/Comments
PUC of Texas		PUC approval of decommissioning plan	
TCEQ	30 TAC 116	State construction air permit	

Appendix I

Severe Accident Mitigation Alternatives

Appendix I

Severe Accident Mitigation Alternatives

I.1 Introduction

Luminant has submitted an application to construct two U.S. Advanced Pressurized Water Reactors (US-APWR) at the Comanche Peak Nuclear Power Plant (CPNPP) site. Current policy developed after the Limerick decision (Limerick 1989) requires that the U.S. Nuclear Regulatory Commission (NRC) staff consider alternatives to mitigate the consequences of severe accidents in a site-specific environmental impact statement (EIS). The severe accident mitigation alternative (SAMA) review presented here considers both severe accident mitigation design alternatives (SAMDA) and procedural alternatives.

In Title 10 of the Code of Federal Regulations (CFR), 10 CFR 52.79(a)(38), the NRC requires that applicants for combined licenses (COLs) include "... a description and analysis of design features for the prevention and mitigation of severe accidents..." The Final Safety Analysis Report (FSAR) (Luminant 2009b) and the Environmental Report (ER) (Luminant 2009a) in the Luminant COL application address these requirements.

In 10 CFR 52.47(a)(23), the NRC requires that applicants for design certification include "... a description and analysis of design features for the prevention and mitigation of severe accidents..." in the application for design certification. In 10 CFR 52.47(a)(27) the NRC requires a description of a "...plant-specific probabilistic risk assessment (PRA) and its results," and in 10 CFR 52.47(b)(2) the NRC requires an ER that contains the information required by 10 CFR 51.55. Mitsubishi Heavy Industries, Ltd. (MHI) has submitted all of this information in documents that are part of the application for certification of the US-APWR design.

While the NRC staff has not completed its generic SAMDA review of the US-APWR for design certification, the staff has conducted a review of the Luminant SAMDA analysis specific to operation of two US-APWRs at the CPNPP site (Luminant 2009a). The analysis is based on:

1. the PRA included as Section 19.1 of the Comanche Peak FSAR (Luminant 2009b) and the SAMDA analysis in the US-APWR ER (Luminant 2009a), and
2. results of the analysis of probability-weighted risks of US-APWR design at the CPNPP site described in Section 5.11.2 of this EIS.

An analysis for a US-APWR at a generic site is presented first; then the analysis is extended to include consideration of CPNPP site-specific information. The SAMDA analysis for the proposed US-APWR design certification will be finally resolved through the design certification rulemaking process.

I.2 US-APWR SAMDA Review – Generic Site

This section addresses the generic analysis of SAMDAs conducted by MHI, the applicant for certification of the US-APWR design. The SAMA review in Section I.3 extends the generic SAMDA analysis to include CPNPP site-specific factors including meteorology, population, and land use. Section I.3 also addresses SAMAs that were not included in the generic analysis because they do not involve reactor system design.

1 I.2.1 US-APWR PRA Results

2 MHI, the applicant for certification of the US-APWR design conducted Level 1 and Level 2 PRAs
 3 to estimate the core damage frequencies (CDFs) that might result from a large number of
 4 initiating events and accident sequences. Table I-1 lists these CDF estimates and estimates of
 5 the large release frequencies (LRFs) of iodine, cesium, or tellurium. Releases associated with
 6 containment bypass, containment isolation failure, or containment failure at or before reactor
 7 vessel failure are considered to be large. Table I-1 also lists NRC staff goals related to CDFs
 8 and LRFs.

9 **Table I-1.** Comparison of US-APWR PRA Results with the Design Goals

	NRC Design Goal ^(a)		US-APWR PRA Results ^(b)	
	Core Damage Frequency (yr ⁻¹)	Large Release Frequency (yr ⁻¹)	Core Damage Frequency (yr ⁻¹)	Large Release Frequency (yr ⁻¹)
Internal At Power Events	1.0 × 10 ⁻⁴	1.0 × 10 ⁻⁶	1.2 × 10 ⁻⁶	1.0 × 10 ⁻⁷
Internal Flooding Events	1.0 × 10 ⁻⁴	1.0 × 10 ⁻⁶	1.5 × 10 ⁻⁶	4.0 × 10 ⁻⁷
Internal Fire Events	1.0 × 10 ⁻⁴	1.0 × 10 ⁻⁶	1.7 × 10 ⁻⁶	1.2 × 10 ⁻⁷
Low Power and Shutdown Events	1.0 × 10 ⁻⁴	1.0 × 10 ⁻⁶	2.5 × 10 ⁻⁷	2.5 × 10 ⁻⁷

(a) SECY-90-016 (NRC 1990a) and associated SRM (NRC 1990b)
 (b) From Chapter 19 of the US-APWR (MHI 2009c)

10 Although the US-APWR PRAs did not provide quantitative estimates of CDFs and LRFs for
 11 seismic and other external initiating events such as hurricanes and tornadoes, they are
 12 discussed in the FSAR. The Section 19.1.5.1 of the FSAR (MHI 2009a) presents the results of
 13 a seismic margins analysis in which PRA methods are used to identify potential vulnerabilities in
 14 the design and so corrective measures can be taken to reduce risk. Similarly, FSAR Section
 15 19.1.5 addresses risks associated with high winds and tornadoes, external flooding,
 16 transportation and nearby facility accidents and aircraft crash. Risks associated with these
 17 events are considered to be insignificant by MHI.

18 I.2.2 Potential Design Improvements

19 In the ER submitted as part of the design certification application (MHI 2009a), MHI identified
 20 156 candidate alternatives based on a review of industry documents, including previous SAMDA
 21 reviews and NRC evaluations of those reviews, and consideration of plant-specific
 22 enhancements. The candidate alternatives were then screened to identify candidates for
 23 detailed evaluation. The categories use in screening were

- 24 • not applicable
- 25 • already implemented
- 26 • combined

1 • excessive implementation cost

2 • very low benefit

3 The development of the US-APWR design has benefitted from insights gained in numerous
4 PRAs. The low CDFs and LRFs in Table I-1 are attributable to the implementation of design
5 improvements already incorporated into the US-APWR design. The following are examples of
6 the 22 candidate alternatives included in the design:

7 • install a gas turbine generator

8 • improve emergency core cooling system suction strainers

9 • provide an in-containment reactor water storage tank

10 • provide capability to remote, manual operation of secondary side pilot-operated relief valves
11 in a station blackout

12 • provide a reactor coolant depressurization system

13 • provide hardware connections to allow another essential raw cooling water system to cool
14 charging pump seals

15 • provide ability for emergency connection of existing or new water sources to feedwater and
16 condensate systems

17 • provide a reactor cavity flooding system

18 The screening process eliminated 20 candidate alternatives as being inapplicable for the US-
19 APWR design; 3 candidate alternatives were combined with similar alternatives; and 29
20 candidate alternatives were procedural or administrative rather than design alternatives. Of the
21 remaining 82 candidate alternatives, 69 were categorized as very low benefit because it would
22 not significantly reduce risk, and 3 were categorized as having excessive implementation costs.
23 10 candidate alternatives were identified for further evaluation. The 10 candidate SAMDAs are:

24 1. Provide additional direct current (dc) battery capacity (At least one train emergency dc
25 power can be supplied more than 24 hours.)

26 2. Provide an additional diesel generator (At least one train emergency alternating current (ac)
27 power can be supplied more than 24 hours.)

28 3. Install an additional, buried off-site power source

29 4. Provide an additional high pressure injection pump with independent diesel (With dedicated
30 pump cooling)

31 5. Add a service water pump (Add independent train)

32 6. Install an independent reactor coolant pump seal injection system, with dedicated diesel
33 (With dedicated pump cooling)

34 7. Install an additional component cooling water pump (Add independent train)

35 8. Add a motor-driven feedwater pump (With independent room cooling)

36 9. Install a filtered containment vent to remove decay heat

37 10. Install a redundant containment spray system (Add independent train)

38 **I.2.3 Cost-Benefit Comparison**

39 MHI used the cost-benefit methodology found in NUREG/BR-0184, *Regulatory Analysis*
40 *Technical Evaluation Handbook* (NRC 1997), to calculate the maximum attainable benefit
41 associated with completely eliminating all risk for the US-APWR.

Appendix I

1 This methodology involves determining the net value for a SAMDA according to the following
2 formula:

3
$$\text{Net Value} = (\text{APE} + \text{AOC} + \text{AOE} + \text{AOSC}) - \text{COE}$$

4 Where

5 APE = present value of averted public exposure (\$)

6 AOC = present value of averted offsite property damage costs (\$)

7 AOE = present value of averted occupational exposure costs (\$)

8 AOSC = present value of averted onsite costs (\$); this includes cleanup, decontamination,
9 and long-term replacement power costs

10 COE = cost of enhancement (\$)

11 If the net value of a SAMDA is negative, the cost of implementing the SAMDA is larger than the
12 benefit associated with the SAMDA and it is not considered to be cost beneficial.

13 To assess the risk reduction potential for SAMDAs, MHI (MHI 2009b) assumed that each design
14 alternative would completely eliminate all severe accident risk. This assumption is conservative
15 as it maximizes the benefit of each design alternative. The applicant estimated the public
16 exposure benefits for the design alternative on the basis of the reduction of risk expressed in
17 terms of whole body person-rem per year received by the total population within a 50-mi radius
18 of the generic site hosting a US-APWR.

1 Table I-2 summarizes MHI's estimates of each of the associated cost elements. The provided
2 results are based on the approach, parameters, and data listed in NUREG/BR-0184. Baseline
3 risks used in the analysis were 3.0×10^{-1} person-rem Ryr⁻¹ for population dose risk and
4 \$706 Ryr⁻¹ for cost risk for internal events during full-power operation (Luminant 2009a).

5 The monetary present value estimate for each risk attribute does not represent the expected
6 reduction in risk resulting from a single accident; rather, it is the present value of a stream of
7 potential losses extending over the projected lifetime of the facility (in this case projected to be
8 60 years). Therefore, the averted cost estimates reflect the expected annual loss resulting from
9 a single accident, the possibility that such an accident could occur at any time over the licensed
10 life, and the effect of discounting these potential future losses to present value.

1 Table I-2. **Summary of Estimated Maximum Averted Costs for a Generic Site**

Quantitative Attributes		Averted Cost Estimate (\$ x 1000 ^(a))	
		7% discount	3% discount
Health	Public (APE)	29.1	75.1
	Occupational (AOE)	2.3	5.9
Property	Offsite ^(b) (AOC)	0.5	1.3
	Onsite	NA ^(c)	NA ^(c)
Cleanup and Decontamination	Onsite (AOSC) ^(d)	69.8	180.2
Replacement Power	(AOSC) ^(d)	187.6	484.4k
Total		289.3	747.1

(a) From the design certification ER (MHI 2008).

(b) Includes offsite cleanup and decontamination costs.

(c) Not Analyzed.

(d) AOSC includes onsite cleanup and decontamination costs and the cost of replacement power.

(e) Based on internal event, internal flooding, and internal fire risks.

2 As indicated above, MHI estimated the total present dollar value equivalent associated with
3 complete elimination of severe accidents at a single US-APWR unit site to range between about
4 \$289k and about \$747k. The estimated cost of replacement power has the largest effect on the
5 averted cost. For any SAMDA to be cost beneficial, the enhancement cost must be less than
6 \$747k. Based on a cost estimate of \$289k, MHI concluded that none of the SAMDA candidates
7 are cost beneficial. MHI states that older studies were used for cost examples of SAMDA
8 candidates without attempting to adjust to present-day dollars with the exception of cost
9 associated with procurement and installation, and where applicable, long-term maintenance,
10 surveillance, calibration and training. In one case (Containment Spray System, SAMDA 10), the
11 cost was scaled from a lower-power unit to the larger power (1610 Mwe) appropriate for the US-
12 APWR. The cost of other SAMDA candidates was determined without power scaling
13 (MHI 2008).

14 **I.2.4 Staff Evaluation**

15 In 10 CFR 52.47(a)(27), the NRC requires that an applicant for design certification perform a
16 plant- or site-specific PRA. The aim of this PRA is to seek improvements in the reliability of core
17 and containment heat removal systems that are significant and practical. The set of potential
18 design improvements considered for the US-APWR include those from industry guidance,
19 previous SAMDA review, and review of the US-APWR design. The US-APWR design already
20 incorporates many design enhancements related to severe accident mitigation. Such design
21 improvements have resulted in a CDF that is a factor of 3 of magnitude lower than the CDFs for
22 the existing CPNPP Units 1 and 2.

23 MHI's averted cost estimates are based on point-estimate values, without consideration of
24 uncertainties in CDF or offsite consequences. Even though this approach is consistent with that

1 used in previous design alternative evaluations, further consideration of these factors could lead
2 to significantly higher risk reduction values, given the extremely small CDF and risk estimates in
3 the baseline PRA. Uncertainties either in CDF or in offsite radiation exposures resulting from a
4 core damage event are fairly large because key safety features of the US-APWR design are
5 unique, and their reliability has been evaluated through analysis and testing programs rather
6 than through operating experience.

7 Further, in evaluating the costs of SAMDA candidates, MHI did not explicitly assess the capital
8 costs associated with the various alternatives. Instead, MHI used estimated costs of back fitting
9 of similar SAMDAs provided by industry in license renewal applications. This approach has the
10 potential to overestimate the actual costs of SAMDAs because the cost of implementing a
11 modification to a reactor that has been built is always greater than implementing the
12 modification in a design that is still evolving.

13 **I.3 Comanche Peak Site-Specific SAMA Review**

14 The discussion above evaluates SAMDAs for the US-APWR at a generic site. The discussion
15 that follows updates that evaluation to include consideration of CPNPP site-specific factors
16 including meteorological conditions, population distribution, and land use. It is based on the
17 Luminant SAMDA analysis presented in the ER (Luminant 2009a). The last part of this
18 discussion deals with procedural and training SAMAs.

19 **I.3.1 Risk Estimates**

20 Luminant estimated severe accident risks for a US-APWR at the CPNPP site in Section 7.2 of
21 its ER (Luminant 2009a). The NRC staff evaluated the information for the US-APWR design
22 supplied by MHI and Luminant (MHI 2009b; Luminant 2009) and CPNPP site-specific data
23 (meteorology, demographics, and land use) provided by Luminant. The results of these
24 analyses are found in Table 5-22, "Environmental Risks from a US APWR Severe Accident at
25 the Comanche Peak Site," in Chapter 5 of this EIS.

26 Table 5-22, gives a CDF of 1.2×10^{-6} Ryr⁻¹, and population dose and cost risks of 0.3 person-rem
27 Ryr⁻¹ and \$714 Ryr⁻¹, respectively. These risks are based on internally initiated events. Table
28 5-23 [(Total Severe Accident Health Effects (based on 2006 Meteorological Data)] gives a CDF
29 of 4.6×10^{-6} Ryr⁻¹ when internal flooding events, internal fire events that occur while the reactor is
30 at power, and low power and shutdown events are considered.

31 **I.3.2 Cost-Benefit Comparison**

32 In Section 7.3.2 of the ER (Luminant 2009a), Luminant estimates the averted costs associated
33 with eliminating all severe accident risks associated for a US-APWR at the CPNPP site. The
34 Luminant analysis is an update the MHI SAMDA analysis (MHI 2009b) to include site specific
35 information. Luminant substituted population dose and offsite cost risks based on 2056
36 population projections for the CPNPP site for the population dose and offsite property costs in
37 the MHI analysis. Table I-3 shows both the MHI generic averted cost estimates and the
38 Luminant estimates.

1

Table I-3. Summary of Estimated Averted Costs for the Comanche Peak Site

Quantitative Attributes		Averted Cost Value Estimate (\$) x 1000			
		MHI Generic ^(a)		Comanche PeakSite ^(b)	
		7% discount	3% discount	7% discount	3% discount
Health	Public (APE)	29.1	75.1	16.5	42.7
	Occupational (AOE)	2.3	5.9	2.3	6.0
Property	Offsite ^(c) (AOC)	0.5	1.3	28.0	72.4
	Onsite	NA ^(d)	NA ^(d)	NA ^(d)	NA ^(d)
Cleanup and Decontamination	Onsite (AOSC) ^(e)	69.8	180.2	70.5	182.0
Replacement Power	(AOSC) ^(e)	187.6	484.4	187	483.7
Total		289.3	\$747.1	304.6	786.7

(a) From design certification ER (MHI 2009b)

(b) Luminant estimates (Luminant 2009a)

(c) Includes cleanup and decontamination costs

(d) Not analyzed

(e) AOSC includes onsite cleanup and decontamination cost and the cost of replacement power

2 In assessing the risk reduction potential of design improvements for the US-APWR, the NRC
3 staff evaluated the MHI risk reduction estimates for the various design alternatives and
4 assessed the potential impact of uncertainties on the results. The analyses in Table I-2 and
5 Table I-3 present the value of reducing the severe accident risk to zero. These values are used
6 in screening potential SAMDAs. Using the results in Table I-2, MHI concluded that no candidate
7 alternative from an initial list of 156 alternatives would be cost beneficial. The CPNPP site-
8 specific values, although higher than those estimated for a generic site, are below the minimum
9 estimated cost for a design change. Moreover, no SAMDA can reduce the risk to zero.
10 Therefore, the staff concludes that it is highly unlikely that any SAMDA would be cost beneficial
11 at the CPNPP site.

12 I.3.3 Procedural and Training SAMAs

13 The original list of 156 US-APWR SAMDAs included 29 candidate alternatives that were
14 procedural or training in nature. These items were eliminated from consideration because they
15 did not involve design changes. Examples of items screened out for this reason include

- 16 • revise procedure to allow bypass of diesel generator trips
- 17 • develop procedures for replenishing diesel fuel oil
- 18 • emphasize steps in recovery of offsite power after a station blackout in training
- 19 • provide additional training on loss of component cooling water

- 1 • implement procedures to stagger high pressure safety injection pump use after a loss of
2 service water
- 3 • proceduralize local manual operation of auxiliary feedwater system when control power is
4 lost.

5 These candidate alternatives fall within the scope of the SAMA review that the NRC staff
6 conducts as part of its environmental review of applications. However, such SAMAs generally
7 involve procedures that have not been developed for a reactor that has not been built and that
8 are typically not developed until construction has been completed and the plant is approaching
9 operation.

10 The staff reviewed the candidate alternatives that were previously screened out because they
11 did not involve design changes. Because the maximum attainable benefit is low, an SAMA
12 based on procedures or training for a US-APWR at the CPNPP site would have to reduce the
13 CDF or risk by approximately 20 percent to become cost beneficial. Based on the its
14 evaluation, the staff concludes that none of these SAMAs would reduce the CDF or risk by 20
15 percent for a US-APWR at CPNPP. Therefore, they would not be likely to be cost effective if
16 the procedures that are referenced actually existed.

17 Luminant has stated that evaluation of administrative SAMAs would not be appropriate until the
18 plant design is complete and that the appropriate administrative controls on plant operations
19 would be incorporated into the plant's managements systems as part of its baseline
20 configuration (Luminant 2009b, Chapter 19). Based on this statement, the staff expects that
21 Luminant will consider risk insights and mitigation measures in the development of procedures
22 and training; however, this expectation is not crucial to the staff's conclusions because the staff
23 already concluded procedural and training SAMAs would be unlikely to be cost effective.

24 **I.4 Conclusions**

25 Based on its evaluation of the US-APWR PRA (MHI 2009a) and SAMDA analysis (MHI 2009b),
26 the CPNPP site-specific severe accident and SAMDA analyses (Luminant 2009a and Luminant
27 2009b) and its own independent review, the staff concludes that that there are no US-APWR
28 SAMDAs that would be cost beneficial at the CPNPP site. The staff expects that Luminant will
29 consider risk insights and mitigation measures in the development of procedures and training;
30 however, this expectation is not crucial to the staff's conclusions because the staff concludes
31 procedural and training SAMAs would be unlikely to be cost effective.

32 **I.5 References**

33 10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy*, Part 51, "Environmental
34 Protection Regulations for Domestic Licensing and Related Regulatory Functions."

35 10 CFR Part 52. Code of Federal Regulations, Title 10, *Energy*, Part 52, "Early Site Permits;
36 Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

37 *Limerick Ecology Action v. NRC (Limerick)*. 1989. "Federal Reporter, Second Series, Vol 869, P
38 719 [3rd Circuit]."

39 Luminant Generation Company (Luminant). 2009a. *Comanche Peak Nuclear Power Plant*
40 *Units 3 and 4, COL Application; Part 3, Environmental Report* (Rev. 1). Luminant Power
41 Generation Company LLC, Glen Rose, Texas, November 20. Accession No. ML100081557.

- 1 Luminant Generation Company (Luminant). 2009b. *Comanche Peak Nuclear Power Plant,*
2 *Units 3 and 4, COL Application; Part 2, Final Safety Analysis Report* (Rev. 1). Luminant Power
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Appendix J

Carbon Dioxide Footprint Estimates for a 1000 MW(e) Light Water Reactor (LWR)

Appendix J

Carbon Dioxide Footprint Estimates for a 1000 MW(e) Light Water Reactor (LWR)

1 The review team has estimated the carbon dioxide (CO₂) footprint of various activities
2 associated with nuclear power plants. These activities include building, operating, and
3 decommissioning the plant. The estimates include direct emissions from the nuclear facility and
4 indirect emissions from workforce transportation and the uranium fuel cycle.

5 Construction equipment estimates listed in Table J-1 are based on hours of equipment use
6 estimated for a single nuclear power plant at a site requiring a moderate amount of terrain
7 modification. Equipment usage for a multiple unit facility would be larger, but it is likely that it
8 would not be a factor of 2 larger. A reasonable set of emissions factors used to convert the
9 hours of equipment use to CO₂ emissions are based on carbon monoxide emissions (UniStar
10 2007) scaled to CO₂ using a scaling factor of 165 tons of CO₂ per ton of CO. This scaling factor
11 is based on emissions factors in Table 3.3-1 of AP-42 (EPA 1995). Equipment emissions
12 estimated for decommissioning are one half of those for construction.

13 **Table J-1.** Construction Equipment CO₂ Emissions (metric tons equivalent)

Equipment	Construction Total ^(a)	Decommissioning Total ^(b)
Earthwork and Dewatering	1.1×10^4	5.4×10^3
Batch Plant Operations	3.3×10^3	1.6×10^3
Concrete	4.0×10^3	2.0×10^3
Lifting and Rigging	5.4×10^3	2.7×10^3
Shop Fabrication	9.2×10^2	4.6×10^2
Warehouse Operations	1.4×10^3	6.8×10^2
Equipment Maintenance	9.6×10^3	4.8×10^3
TOTAL ^(c)	3.5×10^4	1.8×10^4

(a) Based on hours of equipment usage over 7-yr period.

(b) Based on equipment usage over 10-yr period.

(c) Total not equal to the sum due to rounding.

14 Workforce estimates are typical workforce numbers for new plant construction and operation
15 based on estimates in various COL applications, and decommissioning workforce emissions
16 estimates are based on decommissioning workforce estimates in NUREG-0586 S1, *Generic
17 Environmental Impact Statement on Decommissioning of Nuclear Facilities, Supplement 1
18 Regarding the Decommissioning of Nuclear Power Reactors* (NRC 2002). A typical
19 construction workforce averages about 2500 for a 7-year period with a peak work force of about
20 4000. A typical operations workforce for the 40-year life of the plant is assumed to be about
21 400, and the decommissioning workforce during a decontamination and dismantling period of 10

1 years is assumed to be 200 to 400. In all cases, the daily commute is assumed to involve a
 2 100-mi roundtrip with 2 individuals per vehicle. Considering shifts, holidays, and vacations, 1250
 3 roundtrips per day are assumed each day of the year during construction; 200 roundtrips per
 4 day are assumed each day during operations; and 150 roundtrips per day are assumed 250
 5 days per year for the decontamination and dismantling portion of decommissioning. If the
 6 SAFSTOR decommissioning option is included in decommissioning, 20 roundtrips each day of
 7 the year are assumed for the caretaker workforce.

8 Table J-2 lists the review team's estimates of the carbon dioxide equivalent emissions
 9 associated with workforce transport. The table lists the assumptions used to estimate total miles
 10 traveled by each workforce and the factors used to convert total miles to metric tons CO₂
 11 equivalent. CO₂ equivalent accounts for other greenhouse gases, such as methane and nitrous
 12 oxide, that are emitted by internal combustion engines. The workers are assumed to travel in
 13 gasoline powered passenger vehicles (cars, trucks, vans, and SUVs) that get an average of 19.7
 14 mi per gallon of gas (FHWA 2006). Conversion from gallons of gasoline burned to CO₂
 15 equivalent is based on Environmental Protection Agency emissions factors (EPA 2007a; 2007b).

16 **Table J-2.** Workforce CO₂ Footprint Estimates

	Construction Workforce	Operational Workforce	Decommissioning Workforce	SAFSTOR Workforce
Roundtrips per day	1250	200	150	20
Miles per roundtrip	100	100	100	100
Days per year	365	365	250	365
Years	7	40	10	40
Miles traveled	3.2×10^8	2.9×10^8	3.8×10^7	2.92×10^7
Miles per gallon ^(a)	19.7	19.7	19.7	19.7
Gallons fuel burned	1.6×10^7	1.5×10^7	1.9×10^6	1.58×10^6
Metric tons CO ₂ per gallon ^(b)	8.81×10^{-3}	8.81×10^{-3}	8.81×10^{-3}	8.81×10^{-3}
Metric tons CO ₂	1.4×10^5	1.3×10^5	1.7×10^4	1.3×10^4
CO ₂ equivalent factor ^(c)	0.971	0.971	0.971	0.971
Metric tons CO ₂ equivalent	1.5×10^5	1.3×10^5	1.7×10^4	1.3×10^4

(a) FHWA 2006

(b) EPA 2007b

(c) EPA 2007a

1 Published estimates of uranium fuel cycle CO₂ emissions required to support a nuclear power
 2 plant range from about 1 percent to about 5 percent of the CO₂ emissions from a comparably
 3 sized coal-fired plant (Sovacool 2008). A coal-fired power plant emits about 1 metric ton of CO₂
 4 for each megawatt hour generated (Miller and Van Atten 2004). Therefore, for consistency with
 5 Table S-3 of 10 CFR 51.51, the NRC staff estimated the uranium fuel cycle CO₂ emissions as
 6 0.05 metric tons of CO₂ per MWh generated and assumed an 80 percent capacity factor.
 7 Finally, the review team estimated the CO₂ emissions directly related to plant operations from
 8 the typical usage of various diesel generators onsite using EPA emissions factors (EPA 1995).
 9 The review team assumed an average of 600 hrs of emergency diesel generator operation per
 10 year (total for 4 generators) and 200 hrs of station blackout diesel generator operation per year
 11 (total for 2 generators).

12 Given the various sources of CO₂ emissions discussed above, the review team estimates the
 13 total life CO₂ footprint for a reference 1000 MW(e) nuclear power plant to be about 18 million
 14 metric tons. The components of the footprint are summarized in Table J-3. The uranium fuel
 15 cycle component of the footprint dominates all other components. It is directly related to power
 16 generated. As a result, it is reasonable to use reactor power to scale the footprint to larger
 17 reactors.

18 In closing, the review team considers the footprint estimated in Table J-3 to be appropriately
 19 conservative. The CO₂ emissions estimates for the dominant component (uranium fuel cycle)
 20 are based on 30 year old enrichment technology assuming that the energy required for
 21 enrichment is provided by coal-fired generation. Different assumptions related to the source of
 22 energy used for enrichment or the enrichment technology that would be just as reasonable
 23 could lead to a significantly reduced footprint.

24 **Table J-3. 1000 MW(e) LWR Lifetime Carbon Dioxide Footprint**

Source	Activity Duration (yr)	Total Emissions (metric tons)
Construction Equipment	7	3.5×10^4
Construction Workforce	7	1.5×10^5
Plant Operations	40	1.9×10^5
Operations Workforce	40	1.3×10^5
Uranium Fuel Cycle	40	1.4×10^7
Decommissioning Equipment	10	1.8×10^4
Decommissioning Workforce	10	1.7×10^4
SAFSTOR Workforce	40	1.3×10^4
TOTAL		1.5×10^7

25

1 Emissions estimates presented in the body of this EIS have been scaled to values that are
2 appropriate for the proposed project. The uranium fuel cycle emissions have been scaled by
3 reactor power using the scaling factor determined in Chapter 6 and by the number of reactors to
4 be built. Plant operations emissions have been adjusted to represent the number of large CO₂
5 emissions sources (diesel generators, boilers, etc.) associated with the project. The workforce
6 emissions estimates have been scaled to account for differences in workforce numbers and
7 commuting distance. Finally, equipment emissions estimates have been scaled by estimated
8 equipment usage. As can be seen in Table J-3, only the scaling of the uranium fuel cycle
9 emissions estimates makes a significant difference in the total carbon footprint of the project.

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10. SUPPLEMENTARY NOTES

Docket Nos. 52-034 and 52-035

11. ABSTRACT (200 words or less)

This Environmental Impact Statement (EIS) has been prepared in response to an application submitted to the U.S. Nuclear Regulatory Commission (NRC) by Luminant Generation Company LLC (Luminant), acting for itself and as agent for Nuclear Project Company LLC (subsequently renamed Comanche Peak Nuclear Power Company LLC), for combined licenses (COLs). The U.S. Army Corps of Engineers (Corps) is a cooperating agency on this EIS. This EIS includes the analysis by the NRC and Corps staff that considers and weighs the environmental impacts of constructing and operating two new nuclear units at the Comanche Peak Nuclear Power Plant site and at alternatives sites and mitigation measures available for reducing or avoiding adverse impacts.

After considering the environmental aspects of the proposed NRC action, the NRC staff's preliminary recommendation to the Commission is that the COL be issued as requested. This recommendation is based on (1) the application, including the Environmental Report (ER), submitted by Luminant, and responses to request for additional information; (2) consultation with Federal, State, Tribal and local agencies; (3) the staff's independent review; (4) the staff's consideration of comments related to the environmental review that were received during the public scoping process; and (5) the assessments summarized in the EIS, including the potential mitigation measures identified in the ER and this EIS.

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