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CP-201200548
Log # TXNB-12017

Ref. # 10 CFR 52

May 31, 2012

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555
ATTN: David B. Matthews, Director
Division of New Reactor Licensing

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT, UNITS 3 AND 4
DOCKET NUMBERS 52-034 AND 52-035
ENVIRONMENTAL REPORT UPDATE TRACKING REPORT REVISION 0
(CHAPTERS 2, 3, 5, AND 6)

Dear Sir:

Luminant Generation Company LLC (Luminant) submits herein Update Tracking Report (UTR) Revision 0 for the Environmental Report, which is Part 3 of the Combined License Application (COLA) for Comanche Peak Nuclear Power Plant Units 3 and 4, Revision 2. The UTR reflects changes to maintain consistency with US-APWR Design Control Document (DCD) Revision 3, subsequent DCD Tracking Reports through Revision 2, and the Final Safety Analysis Report. The changes do not impact the conclusions provided in the Environmental Report. The tracking report revision list provides a summary of and a reason for each change, and addresses any differences in page numbers between COLA Revision 2 and the UTR.

Should you have any questions regarding the UTR, please contact Don Woodlan (254-897-6887, Donald.Woodlan@luminant.com) or me.

There are no commitments in this letter.

I state under penalty of perjury that the foregoing is true and correct.

Executed on May 31, 2012.

Sincerely,

Luminant Generation Company LLC

Rafael Flores for

Attachment: COL Application Part 3 Environmental Report Revision 2, Update Tracking Report Revision 0

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NRO

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May 31, 2012

Comanche Peak Nuclear Power Plant, Units 3 & 4
COL Application

Part 3

Environmental Report Revision 2

Update Tracking Report

Revision 0

Revision History

Revision	Date	Update Description
-	6/28/2011	COLA Revision 2 Transmittal See Luminant Letter no. TXNB-11044 Date 6/28/2011
0	5/31/2012	Updated Chapters: Ch. 2, 3, 5, 6

Chapter 1

Chapter 1 Tracking Report Revision List

Change ID No.	Section	ER Rev. 2 Page*	Reason for change	Change Summary	Rev. of ER T/R

*Page numbers for the attached marked-up pages may differ from the revision 1 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

Chapter 2

Chapter 2 Tracking Report Revision List

Change ID No.	Section	ER Rev. 2 Page*	Reason for change	Change Summary	Rev. of ER T/R
CTS-01422	2.7.1.2.8	2.7-18	Consistency with DCD	Changed quote to be verbatim (previously this was not word-for-word) to what is stated in the DCD: "seismic category I structures have sloped roofs designed to preclude roof ponding. This design channels rainfall expeditiously off the roof"	0

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- Ice Load = 5.06 in * 5.20 $lb/ft^2/in$ = 26.1 lb/ft^2

From Hydrometeorological Report No. 53, NUREG/CD-1486 the 24-hr probable maximum winter precipitation (PMWP) for a 10 sq-mi area is estimated to be 43 in. The 72-hr PMWP for a 10 sq-mi area is estimated to be 53 in. Assuming a linear relationship between these values gives a 48-hr PMWP of 48 in. Because of the southern location of the site, almost all of this PMWP occurs as liquid. As stated in the US-APWR Design Control Document (DCD) Section 3.4.1.2, "If PMP were to occur, US-APWR safety-related SSCs would not be jeopardized." US-APWR "seismic category I building roofs are designed as a drainage system capable of handling the PMP." The US-APWR DCD also states that "~~seismic category I structures have sloped roofs designed to preclude roof ponding. This is accomplished by channeling rainfall expeditiously off the roof~~seismic category I structures have sloped roofs designed to preclude roof ponding. This design channels rainfall expeditiously off the roof." CTS-01422

2.7.1.2.9 Dust Storms

Blowing dust or sand may occur occasionally in West Texas where strong winds are more frequent and vegetation is sparse. While blowing dust or sand may reduce visibility to less than 5 mi over an area of thousands of square miles, dust storms that reduce visibility to 1 mi or less are quite localized and depend on soil type, soil condition, and vegetation in the immediate area. The NCDC Storm Event database did not report any dust storms in Somervell County between January 1, 1950 and August 31, 2007.

2.7.1.2.10 Extreme Winds

Estimated extreme winds (fastest mile) for the general area based on the Frechet distribution are:

Return Period (Year)	Wind Speed (mph)
2	51
10	61
50	71
100	76

Fastest mile winds are sustained winds, normalized to 30 ft msl and include all meteorological phenomena except tornadoes (CPSES 2007).

Chapter 3

Chapter 3 Tracking Report Revision List

Change ID No.	Section	ER Rev. 2 Page*	Reason for change	Change Summary	Rev. of ER T/R
DCD_09.02.01-52	3.4.1.1	3.4-3	Consistent with FSAR Ch9 and Reflect Response to DCD RAI No.585	Deleted "one 100 percent strainer upstream of the CCWS heat exchange" as a result of design change. CCWS heat exchanger inlet strainer was removed and replaced with automatic self-cleaning ESWP discharge strainers.	0
CTS-01489	3.5.1.1.1.4	3.5-5	Erratum	Corrected sentence to reference a P&ID DCD Figure (not PDF).	0
CTS-01419	3.5.1.1.1.4	3.5-5	Erratum	Changed section referenced to FSAR Section 10.4.	0
CTS-01420	3.5.1.5	3.5-8	Erratum	Changed section referenced to FSAR Section 11.2.1.5 which discusses cost benefit analysis.	0
CTS-01467	3.5.2.1	3.5-9	Correction	Changed P&ID to PFD since DCD figure provides a process flow diagram	0
CTS-01467	3.5.4	3.5-21	Correction	Removed "and the P&IDs" since the DCD Figure only provide a PFD.	0
CTS-01470	3.5.4	3.5-24	Correction	Revised section to state the discharge point is the same height as the top of the containment and specify the elevation of release point.	0
CTS-01421	3.5.4	3.5-24	Erratum	Deleted referenced FSAR Figure 11.3.1.	0
CTS-01468	3.5.4	3.5-25	Clarification	Added 'Sheet 2 of 2' after DCD Figure 9.4.6-1	0
CTS-01469	3.5.4	3.5-26	Correction	Changed DCD Figure 9.4.6-1 to DCD Figure 9.4.5-1	0

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Essential Service Water System

The ESWS provides cooling water to remove the heat from the component cooling water system (CCWS) heat exchangers and the essential chiller units. The ESWS transfers the heat from these components to the ultimate heat sink (UHS).

The ESWS consists of four 50 percent capacity pumps. The ESWS is arranged into four independent trains (A, B, C, and D). Each train consists of one ESWS pump, two 100 percent strainers in the pump discharge line, ~~one 100 percent strainer upstream of the CCWS heat exchanger,~~ one CCWS heat exchanger, one essential chiller unit, associated piping, valves, instrumentation, and controls. Heat is dissipated via the UHS, which consists of four 50 percent wet mechanical draft cooling towers. The ESWS pumps are vertical, wet-pit, centrifugal, constant speed, electric motor driven, and are located at the essential service water intake basin. Essential service water is pumped through the strainers to the CCWS heat exchangers for heat removal. The temperature rise across the heat exchangers varies with each mode of operation. For Trains A and B during normal operation with a maximum heat load, the temperature rise is approximately 11.6°F – 31.6°F during cool down, 11.0°F during refueling, 8.0°F during plant startup, and 31.6°F during safe shutdown. For Trains C and D during normal operation with a maximum heat load, the temperature rise is approximately 5.6°F – 31.6°F during cool down, 6.7°F during refueling, 6.9°F during plant startup, and 31.6°F during safe shutdown. The heated essential service water returns to the UHS where the heat is then rejected to the atmosphere. DCD_09.02.01-52

The essential service water blowdown is diverted to Lake Granbury via the CWS blowdown pipe. This blowdown is used to control levels of solids concentration in the ESWS.

The MWS supplies water to the ESWS cooling tower to make up for water consumed as the result of evaporation, drift, and blowdown. The chemical concentration factor for the ESWS cooling tower is 2.4 cycles of concentration.

Makeup Water System

The MWS supplies makeup water from Lake Granbury to the CWS and ESWS and consists of five 50 percent capacity pumps, two for each unit and one spare pump in standby, common for both units. The intake structure is described in Subsection 3.4.2.1.

3.4.1.2 Operational Modes

Circulating Water System

The CWS provides cooling during the power operation mode. The power operation mode rejects the most heat as the CWS removes heat rejected from the turbine by way of the condenser. The CPNPP Units 3 and 4 are in power operation mode for an estimated 97 percent of the operating cycle. During startup and hot standby, a smaller amount of heat is rejected by way of the condenser. The CPNPP Units 3 and 4 are estimated to be in the startup mode for less than 1 percent of the operating cycle, in refueling for 2 percent of the operating cycle, in the hot standby mode for less than 1 percent of the operating cycle, and in the safe shutdown mode for less than 1 percent of the operating cycle. These estimates do not include forced outages as they cannot be predicted. The power operating mode is paramount, operating for over 23 months out

contaminants. This stream is filtered and released through the discharge header to the monitor tank.

After processing, the waste is held in the monitor tank where a sample is taken, and if discharge standards are met, the waste is discharged to the Squaw Creek Reservoir (SCR). Any waste not meeting discharge requirements is transferred to the WHT for further processing.

3.5.1.1.1.3 Chemical Drain Subsystem Processing

The chemical drain subsystem consists of a chemical drain tank with pH adjustment, waste analysis features, and a chemical drain tank pump. A PFD for this subsystem is presented in DCD Figure 11.2-1, Sheet 2. A P&ID is presented in FSAR Section 11.2. This system is located in the A/B.

The chemical drain subsystem collects laboratory wastes and some of the decontamination solutions. To the greatest extent practicable, all decontamination solutions and process liquids are inherently free of hazardous materials and toxic substances. Use of these decontamination solutions and process liquids must not generate mixed waste. Additionally, laboratory wastes are collected for treatment and disposed in appropriate portable containers. Only small amounts of laboratory wastes, basically those associated with the cleaning of glassware and similar activities, are expected to be in the chemical drain subsystem. Any such wastes that do not contain significant quantities of chemical constituents may be transferred to the floor drain processing subsystem.

Dilute acids and bases, along with heavy metals, are captured by the chemical drain subsystem. When the tank is full, the contents are neutralized, sampled, and characterized. This content is then transferred to disposal containers (drums) for transfer to approved off-site processing facilities. Alternatively, absorbing agents are added to stabilize the waste for disposal.

3.5.1.1.1.4 Steam Generator Blowdown

The SGBD monitor measures the radiation level in the SGBD water after it is treated and before it is returned to the condenser. A sample from the SGBD mixed bed demineralizers is monitored for radiation. Normally, the treated SGBD water is not radioactive. In the event of significant primary-to-secondary system leakage due to a steam generator tube leak, the SGBD liquid may be contaminated with radioactive material. Detection of radiation above a predetermined setpoint automatically initiates an alarm in the main control room for operator actions, and automatically turns off the valve through which treated liquid is sent to the condenser. Plant personnel are required to manually sample the SGBD water for analysis. When it is confirmed that the liquid is contaminated, the liquid is routed to the LWMS for processing. A ~~PFD~~P&ID is presented in DCD CTS-01489
Figure 10.4.8-1 (Sheets 1 and 2)~~, Sheets 1~~ and~~ 2. A P&ID is presented~~ in FSAR
Section ~~10.2~~10.4. CTS-01419

3.5.1.1.2 Reactor Coolant Drain System

The RCDS consists of a containment vessel reactor coolant drain tank (CVDT) and two pumps. The RCDS is inside the containment vessel (C/V). A PFD for this subsystem is presented in DCD Figure 11.2-1, Sheet 3. A P&ID is presented in FSAR Section 11.2.

3.5.1.4 Maximum Individual and Population Doses

The calculated maximum individual and population doses for normal plant operation are addressed in Section 5.4.

3.5.1.5 Components and Parameters Considered in the Benefit-Cost Balance

The LWMS is designed for use at any site. The design is flexible so that site-specific requirements such as preference of technologies, degree of automated operation, and radioactive liquid waste storage can be incorporated with minor modifications to the design.

RG 1.110 outlines compliance with 10 CFR 50, Appendix I numerical guidelines for off-site radiation doses as a result of radioactive liquid effluents during normal operations, including AOOs. The cost-benefit numerical analysis as required by 10 CFR 50, Appendix I, Section II, Paragraph D demonstrates that the addition of items of reasonably demonstrated technology does not provide a more favorable cost benefit. The LWMS provided in this design is considered to meet the numerical guides for dose design objectives. The site-specific cost-benefit analysis regarding population doses due to liquid effluents during normal plant operation is addressed in FSAR Section ~~11.2.3~~11.2.1.5. CTS-01420

3.5.2 GASEOUS RADIOACTIVE WASTE MANAGEMENT AND EFFLUENT CONTROL SYSTEMS

The GWMS is designed to monitor, control, collect, process, handle, store, and dispose of gaseous radioactive waste generated as the result of normal operation, including AOOs, using the guidance of NUREG-0017 and RG 1.143 as it applies to the GWMS.

The GWMS is designed to process radioactive materials in the gaseous waste for release to the environment. The GWMS manages radioactive gases collected from the off-gas system, including charcoal delay beds, HTs and gas surge tanks (GSTs), and other tank vents containing radioactive materials. The gaseous wastes from the above sources are processed to reduce the quantity of radioactive material prior to release to the environment.

During normal operation, radioactive isotopes including xenon, krypton, and iodine are generated as fission products. A portion of these nuclides are present in the primary coolant due to fuel cladding defects. These nuclides are stripped out of the coolant in the volume control tank (VCT) and the HTs into the cover gas and form the input to the GWMS. Charcoal bed adsorbers are used to control and minimize the release of radioactive nuclides into the environment by delaying the release of the radioactive noble gases. The charcoal bed adsorbers contain activated charcoal that has been used extensively to remove radioactive iodine.

Subsystems and components of the GWMS are not shared between units. The GWMS is designed for individual unit operation, where CPNPP Unit 3 is separate from CPNPP Unit 4. The information provided below pertains to the GWMS for each unit.

3.5.2.1 System Description and Operation of the GWMS

The GWMS consists of two gas compressors, a gas dryer skid, four charcoal delay beds, four GSTs, two hydrogen analyzer units each with one hydrogen and one oxygen analyzer, and an oxygen analyzer unit containing dual oxygen analyzers.

1. One of the two gas compressors operates continuously to draw gaseous waste from the CVCS HT and the CVDT, and directs the gaseous waste into the GST.

2. Upon completion of decay, or at operator discretion, the gaseous waste is processed through the dryer, the charcoal bed adsorbers, and sent to the plant stack for release.

3. When the gas pressure in the VCT reaches the predetermined setpoint, the pressure control valve opens and the gas is released into gas dryer and charcoal bed adsorbers for process, sampling, and release.

4. A recycle line to the suction side of the gas compressors is provided to direct the gaseous waste from the VCT to go to the GSTs.

A list containing the design information for the major equipment in the GWMS is provided in DCD Table 11.3-2. A ~~P&ID~~PFD is presented in DCD Figure 11.3-1, Sheets 1 through 3. CTS-01467

The charcoal bed adsorbers are used to control and minimize the release of radionuclides into the environment by delaying the release of the radioactive noble gases, including krypton and xenon. The charcoal bed adsorbers contain activated charcoal that has been used extensively to remove radioactive iodine and other noble gases before the gaseous waste is routed to the discharge structure. The charcoal bed adsorbers provide up to 45 days of delay time for these gases at the design flow conditions.

Any liquid generated from the operation of the GWMS is collected and routed to the LWMS for processing. The equipment drains from GWMS are routed to the WHTs in LWMS for further processing.

Some hydrogen and oxygen are generated from the hydrolysis and radiolysis of the coolant water. At sufficiently high concentrations, these gases can form flammable and explosive mixtures. Streams in the GWMS are monitored for both hydrogen and oxygen contents so that a flammable limit will not be reached. The GWMS provides sufficient dilution of nitrogen gas to maintain a hydrogen concentration below 4 percent by volume and oxygen concentration below 4 percent by volume before the gaseous waste is sent to the plant stack. This gas is further diluted with the A/B ventilation flow in the plant vent stack before it is discharged to the atmosphere.

Initially, the waste gas from the HTs and the CVDT is compressed, cooled, moisture separated, and then routed to be released to the atmosphere via the plant vent stack. Component cooling water (CCW) is supplied to the gas cooler located downstream from the compressors, and is designed to cool the gaseous waste stream to separate the moisture from the gas stream in the moisture separator. The moisture separator has level control and automatically activates the valve to drain the moisture into the LWMS WHTs. The gaseous waste stream is then routed to

A PFD of the system indicating the capacities (cu ft), number, and design and operating storage pressures of the storage tanks is shown in DCD Table 11.3-2.

3. A description of the normal operation of the system is provided in ER Subsection 3.5.2.1 and DCD Subsection 11.3.2.

   The minimum holdup time used in the evaluation and the basis for this value is 45 days.

4. There are no HEPA filters used in this system.

5. A description of the charcoal delay system is provided in ER Subsection 3.5.2.1 and DCD Subsection 11.3.2.

   The minimum holdup time for each radionuclide considered in the evaluation is 45 days for xenon.

   A list of all parameters, including mass of charcoal (lb), flow rate (cu ft/min), operating and dew point temperatures, and dynamic adsorption coefficients for xenon and krypton used in calculating the holdup times is shown in DCD Tables 11.2-9 and 11.3-1 and DCD Figure 11.3-1.

6. The PFDs ~~and the P&IDs~~ for the gaseous radioactive waste systems and other systems influencing the source term calculations are shown in DCD Figure 11.3-1, Sheets 1, 2, and 3. CTS-01467

   DCD Section 11.3 contains additional system information.

f. Ventilation and Exhaust Systems

The information provided below describes the information pertaining to radioactive releases, release rates, DFs, and description of the release points for the SGBD system vent exhaust, the plant vent, and the main condenser air removal system. Also, information is provided below for the containment building pertaining to the building free volume, a description of the internal recirculation system, purge and venting frequencies, and purge rates.

1. SGBD System Vent Exhaust

   The SGBD water from the steam generators exits containment and is directed to the SGBD flash tank located in the turbine building at 25-ft elevation above plant grade. The vent on the blowdown flash tank vents to the condenser. On a high radiation signal, the SGBD lines are isolated. After recovery from this failure, SGBD water is initially directed to the condenser, and after the blowdown water quality becomes stable, SG blowdown demineralizers start purifying the blowdown water.

The provisions incorporated to reduce radioactive releases through this exhaust system include the use of charcoal bed and gas storage tanks to delay and decay the gas before discharge. MCES uses dilution techniques by the plant stack flow to further dilute the gas. Full details are presented in DCD Section 11.3.

4. Plant Stack

The description of this release point is located in DCD Section 11.3.2. The plant stack is located along side of the C/V. ~~The discharge point is above the top of the C/V.~~ The discharge point is the same height of the top of the containment. Radiation monitors are provided before the discharge valve so that release limits are not exceeded. CTS-01470

The following information is provided in FSAR Chapter 11:

- The height above grade for this release point.
- ~~The location relative to adjacent structures for this vent is above containment (FSAR Figure 11.3-1).~~ The release point of the vent stack is at an elevation of 1051' 5" CTS-01421 CTS-01470
- The expected average temperature difference between this effluent and the ambient air.
- The flow rate through this vent is 1.2 standard cubic feet per minute (scfm).
- The exit velocity at this vent.
- The shape of the flow orifice for this vent.

5. Containment

The containment building free volume is 2.74 E6 cu ft.

The containment ventilation and cooling systems are provided to control and maintain the environment, temperature, and radioactivity concentration within the containment at a level suitable for the plant equipment operation and to allow the safe access to the containment for the operating personnel during inspection and maintenance periods.

Internal to containment is a containment fan cooler system, a reactor cavity and reactor support cooling system, an airborne radioactivity removal system (ARRS), and a control rod drive mechanism cooling system (CRDM). Also serving containment is the annulus emergency exhaust air filtration system and the containment vent and purge system.

The containment fan cooler system consists of four fan coolers, each sized for 33 percent of the total containment heat load. Three units are required to operate while the other unit remains on standby. Each fan cooler consists of cooling coils and an isolation damper. Containment air is drawn over the chilled water cooling coils of the operating containment fan coolers where the heat dissipated in the containment is transferred from the containment air to the chilled water system. This system operates continuously. There are no charcoal or HEPA filters. The containment fan cooler system air flow diagram is shown in DCD Figure 9.4.6-1. Design data for the principal components of the system are presented in DCD Table 9.4.6-1.

The reactor cavity and reactor support cooling system consists of two exhaust air fans, each sized for 100 percent of the required air flow rate; one fan is required for operation, while the other fan is placed in standby. The system air flow diagram is shown in DCD Figure 9.4.6-1. The design data for the principal components are presented in DCD Table 9.4.6-1.

The ARRS consists of two airborne radioactivity removal air-cleaning units, each sized for 100 percent capacity, and a medium-efficiency filter, HEPA filter, charcoal adsorber, and centrifugal fan. Airborne radioactivity removal units are manually started from the control room. The operator is expected to operate the units individually or in combination on a regular schedule to limit buildup of the airborne radioactivity in the containment atmosphere.

The frequency of operation depends on the concentration of particulate activities present in the containment, as measured by the radiation monitors. Air flow of each unit is automatically modulated by respective variable inlet vane dampers at a constant rate to assure a fairly constant residence time of 0.50 seconds, irrespective of the fluctuation of the system resistance through the filter banks. The ARRS air flow diagram is shown in DCD Figure 9.4.6-1 (Sheet 2 of 2). The design data for the principal components of the system are presented in DCD Table 9.4.6-1. CTS-01468

The CRDM cooling system is sized to remove the heat generated and dissipated by the CRDMs and transfer the heat borne by the exhausted air to the chilled water system without imposing additional thermal load on the containment fan cooler system. The system consists of chilled water cooling coils, two motorized dampers, and two centrifugal fans, each driven by an independent motor. Each fan is sized for 100 percent capacity of the required air flow; one fan is required for operation, while the other is placed in standby. Containment air, during normal operation, is drawn through the CRDM shroud, over the CRDM mechanisms through air leak-tight ductwork through the cooling coil then discharged by the fan to the containment atmosphere. The CRDM cooler is supplied with chilled water from the nonessential chilled water system. The CRDM cooler is manually started from the control room with fan intake dampers electrically interlocked with their respective fan motor starters to open when the fans are energized. The CRDM cooling system air flow diagram is shown in DCD Figure 9.4.6-1. The design data for the principal components are presented in DCD Table 9.4.6-1.

The annulus emergency exhaust air filtration system consists of two units of a fan and a filtration unit containing a HEPA and charcoal adsorber filters. Each unit provides 12,000 cfm and discharges to the plant vent. The annulus emergency exhaust air filtration system is shown in DCD Figure ~~9.4.6-1~~9.4.5-1. The design data for the principal components are presented in DCD Table 9.4.5-1. CTS-01469

The containment vent system consists of one makeup air unit consisting of filter banks, electric heating coil, chilled water cooling coil, and supply air centrifugal fan; the unit is sized for 100 percent capacity. The makeup air unit draws outdoors filtered and treated air and discharges it into containment. The containment vent exhaust air is drawn through a containment penetration isolation valves assembly to an air-cleaning exhaust unit. The vent exhaust air flow passes through HEPA filter banks and charcoal adsorber prior to discharge to the atmosphere through the plant vent stack. The exhausted air from the turbine vacuum pump is routed to the containment vent exhaust air filtration unit for filtration prior to release to the atmosphere through the plant vent stack. The capacity of the containment vent system is sized to maintain, in conjunction with the operation of the ARRS, an acceptable limit of radioactivity, including noble gases, during normal operation of the plant.

The containment purge system consists of a containment purge makeup air unit consisting of filter banks, electric heating coil, chilled water cooling coil, and supply air centrifugal fan; the unit is sized for 100 percent capacity. An atmospheric air-cleaning unit is provided to exhaust the purged air through HEPA filter banks and charcoal adsorber prior to discharge to the plant vent stack.

During containment purge operation, outside air is drawn by a makeup air unit, where the air is filtered, cooled, or heated as required and discharged into the containment through the supply ductwork and the containment penetration protected by three containment isolation valves. Supply air temperature from the makeup unit is tempered or cooled by the unit's electric heating coil or chilled water cooling coil to attain an acceptable supply air temperature between 55°F and 65°F.

The containment purge exhaust air is drawn through the containment penetration protected by three containment isolation valves and exhaust ductwork, leading to the air-cleaning unit where the exhaust air is filtered and discharged to the atmosphere through the plant vent stack. The initiation of the purge operation and the starting of the makeup air unit and air-cleaning unit are manually initiated from the control room.

The containment vent and purge system is shown in DCD Figure 9.4.6-1. The design data for the principal components are presented in DCD Table 9.4.6-1.

Chapter 4

Chapter 4 Tracking Report Revision List

Change ID No.	Section	ER Rev. 2 Page*	Reason for change	Change Summary	Rev. of ER T/R

*Page numbers for the attached marked-up pages may differ from the revision 1 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

Chapter 5

Chapter 5 Tracking Report Revision List

Change ID No.	Section	ER Rev. 2 Page*	Reason for change	Change Summary	Rev. of ER T/R
CTS-01481	Table 5.4-1 (sheet 2 of 2)	5.4-15	Clarification	Changed total leafy vegetable and total all other vegetables units from lb (kgm) to lb/yr (kg/yr) to properly represent that these are annual values.	0
CTS-01482	Table 5.4-3 (Sheet 1 of 2)	5.4-17	Clarification	Changed vegetable production unit from kgm to kg/yr to properly present that it is an annual value (comma removed as well).	0
CTS-01483	Table 5.4-6	5.4-26	Correction	Corrected Y-93 value from 2.90 E-04 to 3.10E-04.	0
CTS-01484	Table 5.4-12 (Sheet 2 of 6)	5.4-34	Correction	Corrected lung dose for a child from 9.79E-02 to 9.67E-03.	0
CTS-01400	Table 5.4-13	5.4-39	Errata	Corrected dose value to 6.50E-01 mrad (from 6.05E-01 mrad). Sequence of '0' and '5' were incorrect.	0

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TABLE 5.4-1 (Sheet 2 of 2)
LIQUID EFFLUENT PATHWAY PARAMETERS

Description	Parameter
Dilution factor for drinking water, multiplied by a factor of two for dilution in Whitney Reservoir (Case 2)	54.4 (27.2*2)
Projected population of Cleburne	53,440
Projected population of Whitney	3,722
Distance to assumed location of fish harvest (above Whitney Reservoir, City of Cleburne diversion)	given above
Total annual fish harvest, Whitney Reservoir and the Brazos River	715,125 lb/yr (324,375 kg/yr)
Transit time for aquatic food	66 hrs
Dilution factor for aquatic foods (Case 1 / Case 2)	822.7 / 27.2
Downstream distance of shoreline, boating and swimming use (midpoint of Whitney Reservoir)	9.6 mi (50,654 ft) downstream of Cleburne
Shore-width factor for shoreline use (Whitney Reservoir)	0.3
Transit time for recreational usage	77 hr
Dilution factor for recreational usage (Case 1 / Case 2)	1645.4 / 54.2
Shoreline, boating and swimming usage based on RG 1.109 exposure times and age group fractions and 50 percent of the 50 mile population (population dose due to public use of SCR is estimated to be 250 times the maximum SCR individual dose based on an estimated maximum usage of 250 people)	22,358,746 person-hr/yr (each activity)
Location of assumed irrigation diversion (City of Cleburne)	given above
Transit time for irrigation usage	66 hr
Dilution factor (Case 1 / Case 2)	822.7 / 27.2
Irrigation rate	74.6 L/m^2/mo
Total Meat Production along the Brazos River	281,000 (kg/yr)
Total Milk Production along the Brazos River	943,000 (l/yr)
Irrigated Agricultural Products along the Brazos River	
Total Leafy Vegetables	54,038 lb/yr (25,000 kg~~m~~/yr)
Total All Other Vegetables	11,619,279 lb/yr (5,270,000 kg~~m~~/yr)

CTS-01481

a) Based on USGS minimum pool elevation of 772.98 ft

Note: Default values from RG 1.109 used for all input values not listed above.

TABLE 5.4-3 (Sheet 1 of 2)
GASEOUS EFFLUENT PATHWAY PARAMETERS

Description	Value
Population Data	Table 5.4-5
Milk Production	908,000,000 l/yr
Vegetable Production	481,000,000~~,~~ kg~~m~~/yr CTS-01482
Meat Production	42,500,000 kg/yr
Source Term	Table 5.4-7
Nearest Residence (for plant vent release)	0.79 mi SSW
Point of Maximum Concentration at the EAB (for plant vent release)	0.37 mi NNW
Nearest Residence (for evaporation pond release)	0.31 mi SSW
Midpoint of plant life	30 yrs
Nearest Residence χ/Q and D/Q values for plant vent release	
No decay, undepleted	4.4×10^{-7} s/m^3
2.26 day decay, undepleted	4.4×10^{-7} s/m^3
8 day decay, depleted	3.9×10^{-7} m^{-2}
D/Q for maximum individual dose calculation	4.5×10^{-9} m^{-2}
EAB χ/Q and D/Q values for plant vent release	
No decay, undepleted	5.5×10^{-6} s/m^3
2.26 day decay, undepleted	5.5×10^{-6} s/m^3
8 day decay, depleted	5.1×10^{-6} s/m^3
D/Q for maximum individual dose calculation	5.5×10^{-8} m^{-2}
Nearest Residence χ/Q and D/Q values for evaporation pond release	
No decay, undepleted	3.10×10^{-6} s/m^3
2.26 day decay, undepleted	3.10×10^{-6} s/m^3
8 day decay, depleted	2.90×10^{-6} s/m^3
D/Q for maximum individual dose calculation	2.10×10^{-8} m^{-2}
Annual Average χ/Q (worst location)	4.4×10^{-7} s/m^3
Annual Average D/Q (worst location)	4.5×10^{-9} m^{-2}
Annual Average Decayed χ/Q (worst location)	3.9×10^{-7} s/m^3 for 8.00 day decay (depleted)

TABLE 5.4-6
ESTIMATED LIQUID RADIONUCLIDE RELEASES

Released Activity
(one unit, Ci/yr)

Na-24	4.70E-03	Ru-106	3.81E-02
P-32	0.00E+00	Ag-110m	6.00E-04
Cr-51	1.30E-03	Sb-124	0.00E+00
Mn-54	7.00E-04	Te-129m	7.80E-05
Fe-55	5.00E-04	Te-129	3.10E-04
Fe-59	1.00E-04	Te-131m	2.50E-04
Co-58	1.90E-03	Te-131	7.60E-05
Co-60	0.00E+00	I-131	4.00E-04
Ni-63	0.00E+00	Te-132	4.70E-04
Zn-65	2.20E-04	I-132	3.10E-04
W-187	3.50E-04	I-133	8.10E-04
Np-239	5.30E-04	I-134	8.90E-05
Rb-88	2.80E-02	Cs-134	1.00E-03
Sr-89	6.00E-05	I-135	7.80E-04
Sr-90	8.00E-06	Cs-136	2.16E-02
Sr-91	6.80E-05	Cs-137	2.00E-03
Y-91m	4.40E-05	Ba-140	4.89E-03
Y-91	1.00E-05	La-140	8.00E-03
Y-93	~~2.90~~3.10E-04	Ce-141	6.00E-05 CTS-01483
Zr-95	2.00E-04	Ce-143	5.00E-04
Nb-95	1.00E-04	Pr-143	7.90E-05
Mo-99	1.64E-03	Ce-144	1.70E-03
Tc-99m	1.70E-03	Pr-144	1.70E-03
Ru-103	3.11E-03	Total (except H-3)	1.29E-01
		H-3	1.60E+03

Notes:

1. CPNPP Units 3 and 4 will not have an on-site laundry therefore detergent wastes listed in the DCD source term are not included in the above listing.

2. LADTAP II calculations can only be performed for radionuclides that are included in the LADTAP dose conversion factor library. As a result, releases of Rh-103m, Rh-106, AG-110, and Ba-137m are not used in this analysis. Given the relatively short half-lives of these radionuclides, 56.12 minutes, 29.92 seconds, 24.57 seconds and 2.55 minutes, respectively, the effect of this omission is considered negligible.

TABLE 5.4-12 (Sheet 2 of 6)
GASEOUS PATHWAYS - MAXIMUM EXPOSED INDIVIDUAL DOSE SUMMARY

PLANT VENT

Pathway/Age Group	Total Body	GI-Tract	Bone (max organ)	Liver	Kidney	Thyroid	Lung	Skin
Goat Milk								
Adult	2.72E-02	1.09E-02	6.92E-02	3.33E-02	1.78E-02	6.42E-02	1.23E-02	9.72E-03
Teen	3.37E-02	1.83E-02	1.21E-01	5.78E-02	3.07E-02	1.03E-01	2.19E-02	1.67E-02
Child	5.20E-02	3.97E-02	2.86E-01	1.07E-01	6.13E-02	2.13E-01	4.63E-02	3.85E-02
Infant	9.08E-02	7.90E-02	4.95E-01	2.09E-01	1.14E-01	5.03E-01	9.18E-02	7.78E-02
Inhalation								
Adult	5.75E-03	5.89E-03	1.53E-03	5.79E-03	5.70E-03	1.33E-02	9.33E-03	5.56E-03
Teen	5.77E-03	5.93E-03	1.81E-03	5.90E-03	5.81E-03	1.59E-02	1.13E-02	5.61E-03
Child	5.07E-03	5.09E-03	2.15E-03	5.25E-03	5.13E-03	1.79E-02	~~9.79E-02~~ 9.67E-03	4.96E-03
Infant	2.92E-03	2.90E-03	9.47E-04	3.07E-03	2.96E-03	1.48E-02	6.13E-03	2.85E-03

CTS-01484

a) The nearest milking cow for human consumption is located beyond 5 mi.

TABLE 5.4-13
GASEOUS PATHWAYS - COMPARISON OF MAXIMUM INDIVIDUAL DOSE COMPARED TO 10 CFR 50, APPENDIX I CRITERIA (PER UNIT)

Type of Dose	10 CFR 50 Design Objective	Calculated Dose
Gaseous Effluents (Noble Gases)		
Gamma Air Dose	10 mrad	8.42E-02 mrad
Beta Air Dose	20 mrad	~~6.05~~6.50E-01 mrad
Total Body Dose	5 mrem	5.38E-02 mrem
Skin Dose	15 mrem	5.03E-01 mrem
Radioiodines and Particulates		
Maximum to any organ	15 mrem	2.55 mrem

CTS-01400

Notes:

Doses were calculated at the locations resulting in the highest pathway doses to the public.

mrad = millirad

Chapter 6

Chapter 6 Tracking Report Revision List

Change ID No.	Section	ER Rev. 2 Page*	Reason for change	Change Summary	Rev. of ER T/R
CTS-01423	6.6.1.2	6.6-4	Erratum	Changed figure referenced to Figure 2.4.12-208.	0

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sampling program supports the environmental descriptions for hydrology, water use, water quality, aquatic ecology, and water supply discussed in Chapters 2 and 3.

6.6.1.2 Preapplication Groundwater Monitoring

In January 2007, a groundwater sampling program was initiated as part of a subsurface study to evaluate current geologic and hydrogeologic conditions at the CPNPP site. Twenty groundwater monitoring well clusters (47 wells total), one aquifer test recovery well, and three aquifer test observation wells were installed from October 2006 to February 2007. The groundwater monitoring wells were developed, and water levels were measured monthly from December 2006 through December 2007. A list of the monitoring wells and relevant installation data are presented in Subsection 2.3.1.5.5 (Table 2.3-29) and FSAR Subsection 2.4.12 (FSAR Table 2.4.12-201). The locations of the groundwater monitoring wells are presented in Figure 2.3-26 and FSAR Figure ~~2.4.12-201~~2.4.12-208. In addition to the water level measurements, quarterly groundwater samples were taken from 10 of the wells and analyzed for a variety of constituents, and the results of the groundwater sampling are presented in Subsection 2.3.1.5.5 (Table 2.3-50). The groundwater samples were obtained following generally accepted field sampling procedures, including the use of clean sampling devices, and clean and prepared sample containers supplied by the laboratory that performs the analysis. The samples were taken on approximately 90-day intervals. Sample preservation and analysis followed the procedures for groundwater sampling and analysis. Groundwater samples were submitted in accordance with chain-of-custody protocol to independent third-party commercial laboratories. CTS-01423

6.6.2 CONSTRUCTION MONITORING

A construction monitoring program may be required by TCEQ to provide data necessary to assess surfacewater quality changes resulting from construction of CPNPP Units 3 and 4, especially in relation to construction-area stormwater runoff. The land area disturbed by construction of CPNPP Units 3 and 4 is expected to be 675 ac, which exceeds the one-ac limit, requiring a stormwater construction permit in accordance with 40 CFR 122.26 (Subsection 4.2.1.10).

If construction monitoring is required by TCEQ, the results can be compared with the preapplication quarterly surfacewater and groundwater sampling program discussed in Subsections 6.6.1.1 and 6.6.1.2 and used to detect any deviations from the baseline water quality.

6.6.2.1 Construction Surfacewater Monitoring

Construction activities for CPNPP Units 3 and 4 require a TPDES stormwater construction permit in accordance with 40 CFR 122.26 and the Texas Water Code (TCEQ 2007). The CPNPP site preparation and construction activities are expected to be performed under a TPDES permit, with all requirements implemented in the monitoring program, as required.

6.6.2.2 Construction Groundwater Monitoring

Construction is expected to have no effect on groundwater; consequently, no construction groundwater monitoring program is anticipated. As described in Subsection 6.3.2.2, as

Chapter 7

Chapter 7 Tracking Report Revision List

Change ID No.	Section	ER Rev. 2 Page*	Reason for change	Change Summary	Rev. of ER T/R

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Chapter 8

Chapter 8 Tracking Report Revision List

Change ID No.	Section	ER Rev. 2 Page*	Reason for change	Change Summary	Rev. of ER T/R

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Chapter 9

Chapter 9 Tracking Report Revision List

Change ID No.	Section	ER Rev. 2 Page*	Reason for change	Change Summary	Rev. of ER T/R

*Page numbers for the attached marked-up pages may differ from the revision 1 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

Chapter 10

Chapter 10 Tracking Report Revision List

Change ID No.	Section	ER Rev. 2 Page*	Reason for change	Change Summary	Rev. of ER T/R

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