Luminant

Rafael Flores
Senior Vice President &
Chief Nuclear Officer
rafael.flores@luminant.com

Luminant Power
P O Box 1002
6322 North FM 56
Glen Rose, TX 76043

T 254.897.5590
F 254.897.6652
C 817.559.0403

CP-201101345
Log # TXNB-11061

Ref. # 10 CFR 52

September 29, 2011

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
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION NO. 5854
(SECTION 11.2)

Dear Sir:

Luminant Generation Company LLC (Luminant) submits herein the response to Request for Additional Information (RAI) No. 5854 (CP RAI #224) for the Combined License Application for Comanche Peak Nuclear Power Plant Units 3 and 4. The RAI addresses the evaporation pond.

Should you have any questions regarding this response, 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 September 29, 2011.

Sincerely,

Luminant Generation Company LLC

RD Bird for

Rafael Flores

Attachment: Response to Request for Additional Information No. 5854 (CP RAI #224)

D090
NRO

Electronic distribution w/attachment:

Rafael.Flores@luminant.com
mlucas3@luminant.com
jeff.simmons@energyfutureholdings.com
Bill.Moore@luminant.com
Brock.Degeyter@energyfutureholdings.com
rbird1@luminant.com
Allan.Koenig@luminant.com
Timothy.Clouser@luminant.com
Ronald.Carver@luminant.com
David.Volkening@luminant.com
Bruce.Turner@luminant.com
Eric.Evans@luminant.com
Robert.Reible@luminant.com
donald.woodlan@luminant.com
John.Conly@luminant.com
JCaldwell@luminant.com
David.Beshear@txu.com
Ashley.Monts@luminant.com
Fred.Madden@luminant.com
Dennis.Buschbaum@luminant.com
Carolyn.Cosentino@luminant.com
NuBuild Licensing files
sfrantz@morganlewis.com
jrund@morganlewis.com
tmatthews@morganlewis.com
regina.borsh@dom.com
diane.aitken@dom.com
askolhek@bechtel.com
yoshinori_fujiwara@mhi.co.jp
kano_saito@mhi.co.jp
shigemitsu_suzuki@mhi.co.jp
Luminant Records Management (.pdf files only)

shinji_kawanago@mnes-us.com
masanori_onozuka@mnes-us.com
ck_paulson@mnes-us.com
joseph_tapia@mnes-us.com
russell_bywater@mnes-us.com
william_mcconaghy@mnes-us.com
mutsumi_ishida@mnes-us.com
yukako_hill@mnes-us.com
nicholas_kellenberger@mnes-us.com
ryan_sprengel@mnes-us.com
al_freitag@mnes-us.com
masaya_hoshi@mnes-us.com
rjb@nei.org
kra@nei.org
michael.takacs@nrc.gov
cp34update@certrec.com
michael.johnson@nrc.gov
David.Matthews@nrc.gov
Balwant.Singal@nrc.gov
Hossein.Hamzehee@nrc.gov
Stephen.Monarque@nrc.gov
jeff.ciocco@nrc.gov
michael.willingham@nrc.gov
john.kramer@nrc.gov
Brian.Tindell@nrc.gov
Alicia.Williamson@nrc.gov
Elmo.Collins@nrc.gov
Loren.Plisco@nrc.com
Susan.Vrahoretis@nrc.gov
Frank.Akstulewicz@nrc.gov
ComanchePeakCOL.Resource@nrc.gov

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Comanche Peak, Units 3 and 4

Luminant Generation Company LLC

Docket Nos. 52-034 and 52-035

RAI NO.: 5854 (CP RAI #224)

SRP SECTION: 11.02 - Liquid Waste Management System

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 8/9/2011

QUESTION NO.: 11.02-18

The staff's review of FSAR Section 11.2 and of the applicant's responses to related RAIs on the evaporation pond found that design information on site-specific sample points and locations was not fully described. These site-specific sample points, that ensure that representative samples of the evaporation pond are taken before its contents are transferred to the SCR via the CPNPP Units 1 and 2 circulating water return line, are planned to be located during the "detailed design." In FSAR Section 11.2, please describe the "detailed design" information on the site-specific sample points and locations; discuss the operational program and applicable procedures and NRC guidance; and identify the sample points and locations on a P&ID of the evaporation pond that will satisfy its stated design objective.

ANSWER:

The evaporation pond is designed to receive and temporarily hold treated liquid effluents when it is determined to be undesirable to increase the tritium concentration in Squaw Creek Reservoir (SCR) by discharging treated effluent from Units 3 and 4. When the Unit 3 and 4 effluents staged in the evaporation pond can be discharged to SCR, the evaporation pond discharge pump and circulation piping are used to circulate and mix the contents of the pond. The evaporation pond may contain a large volume of liquid, so the pump may circulate the pond contents for several days, depending on the volume of liquid staged in the pond at the time. The circulation ensures that the contents are mixed thoroughly to provide a representative sample. A sample point for the evaporation pond is provided at the circulation header of the evaporation pond discharge pump and a sample is taken after a predetermined amount of mixing. After confirmation of the tritium concentration in the pond contents, the pond contents are transferred to the Unit 1 flow receiver and head box, which ultimately discharges to SCR.

The procedures for circulation and sampling will be governed by the Offsite Dose Calculation Manual for the Comanche Peak site, which has an implementation milestone established in FSAR Table 13.4-201.

FSAR Sections 2.4 and 11.2 have been revised as reflected in the attached markups. The changes are mainly editorial for reorganization and clarification. The design and basic operation of the evaporation pond have not been changed. However, the previous FSAR information about multiple effluent samples around the pond perimeter has been replaced with new design information about the circulation of the evaporation pond contents as discussed above.

Impact on R-COLA

See attached marked-up FSAR Revision 2 pages 2.4-93, 11.2-5, 11.2-6, 11.2-7, 11.2-8, 11.2-9, 11.2-10, 11.2-11, 11.2-12, 11.2-13, 11.2-14, 11.2-15, 11.2-16, 11.2-17, and Figure 11.2-201, Sheet 9.

Impact on S-COLA

None; this response is site-specific.

Impact on DCD

None.

Refueling Water Storage Auxiliary Tank - located outside

Chemical Drain Tank - located in the A/B

The Volume Control Tank, the Chemical Drain Tank, and Sump Tanks were eliminated from consideration based on smaller volumes and lower radionuclide contents than the Boric Acid Tank (BAT). The evaporation pond contains treated liquid effluents in trace amounts of radionuclide content that meet discharge requirements specified in 10 CFR 20 Appendix B, Table 2, and has radionuclide contents below that of the boric acid tank contents. Hence, the contamination level due to the failure of the evaporation pond is bounded by the failure of the boric acid tanks. The Primary Makeup Water Tank was eliminated from consideration based upon the fact that the Primary Makeup Water Tank stores demineralized water from the Treatment System. and low level radioactive condensate water from the Boric Acid Evaporator. Condensate water contains low levels of radionuclide concentrations. including tritium. Additionally, the Refueling Water Storage Auxiliary Tank (RWSAT) was eliminated from consideration because it stores refueling water. Prior to refueling, tank water is supplied to the refueling cavity where the reactor coolant radionuclide concentration dilutes with refueling cavity water. Radionuclide concentration of cavity water is reduced by the purification system of the Chemical and Volume Control System (CVCS) and the Spent Fuel Pit Cooling and Purification System (SFPCS) during refueling operations. Upon refueling completion, part of the cavity water is returned to this tank where the radionuclide concentration is low. Accordingly. the impact of RWST or Primary Makeup Water Storage Tank failure is small. RCOL2_11.02-18

After eliminating the tanks described above, the remaining tanks left to consider for the failure analysis are those in the A/B, which is a seismic category II Building. As shown in DCD Figure 1.2-29, these tanks are located on the lowest elevation of the A/B at elevation 793 ft ms. In selecting the appropriate tank for the failure analysis, the guidance in Branch Technical Position (BTP) 11-6 was utilized based upon the concentrations generated from the RATAF Code for Pressurized Water Reactors. The concentration of the radioactive liquid in the tanks, such as the Boric Acid Evaporator, the Holdup Tank, and the BAT, are larger than the Waste Holdup Tank since they receive reactor coolant water extracted from the Reactor Coolant System. Since the enrichment factor of 50 is considered for the liquid phase of the Boric Acid Evaporator. the radioactive concentrations in the liquid phase of the Boric Acid Evaporator, and in the BAT (which receives the enriched liquid from the Boric Acid Evaporator) becomes large when compared to the other tanks. The BAT has been selected since its volume is larger than the liquid phase of the Boric Acid Evaporator. Credit is taken for the removal effect by demineralizers or other treatment equipment for the liquid radioactive waste prior to entering the tank. No chelating agents are used in the plant system design in order to provide chemical control of the reactor-coolant. Only a very small amount of chelating agents is used in the sampling system for analysis. The sampling drain, which contains only a small amount of chelating agents is directly sent to the dedicated chemical drain tank and treated separately. Chemical agents used in laboratory analysis are also sent to the chemical drain tank for treatment.

specifications. Therefore, there is no impact on the annual liquid release and the annual dose to the members of the public if the bypass valve is inadvertently left fully-open.

If the monitor reaches the high setpoint, it sends signals to initiate pump shutdown, valve closure and operator actions.

11.2.3.1 Radioactive Effluent Releases and Dose Calculation in Normal Operation

---

CP COL 11.2(2)
CP COL 11.2(4)

Replace the last six paragraphs in DCD Subsection 11.2.3.1 with the following.

The detailed design information of release point is described in Subsection 11.2.2.

The annual average release of radionuclides is estimated by the PWR-GALE Code (Ref.11.2-13) with the reactor coolant activities ~~that is~~ described in Section 11.1. The version of the code is a proprietary modified version of the NRC PWR-GALE code reflecting the ~~design~~ specifics of the US-APWR design (Ref. 11.2-27). The parameters used by the PWR-GALE Code are provided in DCD Table 11.2-9~~,~~ and the calculated effluents are provided in Table 11.2-10R. The calculated effluents for the maximum releases are provided in Table 11.2-11R. ~~On~~For this site-specific application, handling of contaminated laundry is contracted to off-site services. Therefore, the detergent waste effluent ~~need~~is not ~~be~~ considered. RCOL2_11.02-18 RCOL2_11.02-18 RCOL2_11.02-18

The calculated effluent concentrations using annual release rates are then compared against the concentration limits of 10 CFR 20 Appendix B (see Tables 11.2-12R and 11.2-13R.).

Once it is confirmed that the treated effluent meets discharge requirements, the effluent is released into Squaw Creek Reservoir (SCR) via the CPNPP Units 1 and 2 circulating water return line. The liquid effluent is maintained at ambient temperature, as it is stored inside the ~~a~~Auxiliary ~~b~~Building (A/B) waste monitoring tanks (WMTs). Currently, ~~Squaw Creek Reservoir~~SCR has a tritium ~~concentration limit~~reporting level of 30,000 pCi/L (Reference 11.2-201, ODCM for CPNPP Units 1 and 2). Based on an analysis, the tritium concentration in ~~Squaw Creek Reservoir~~SCR is anticipated to remain within the ~~tritium~~ limit due to ~~the~~ local rainfall, evaporation, and ~~spillover (~~controlled release~~) from Squaw Creek Reservoir~~ to Squaw Creek. RCOL2_11.02-18 RCOL2_11.02-18

However, during the maximum tritium generation condition (i.e., all four units operating at full power), the tritium ~~concentration~~reporting level in SCR could be exceeded. When ~~the tritium concentration in Squaw Creek Reservoir is determined to be close to the offsite dose calculation manual (ODCM) limit~~it is RCOL2_11.02-18 determined to be undesirable to increase the tritium concentration in SCR by discharging treated effluent from Units 3 and 4, ~~as much as~~up to half of the treated liquid effluent from CPNPP Units 3 and 4 can be diverted to the evaporation pond for temporary staging (Subsection 11.2.3.4). RCOL2_11.02-18 RCOL2_11.02-18

~~When the tritium concentration in Squaw Creek Reservoir again decreases below the operating target, the effluent in the pond is sampled and analyzed for suitability to discharge back into Squaw Creek Reservoir. In the event that both CPNPP Units 1 and 2 are temporarily not in operation, or when there is no dilution flow, the CPNPP Units 3 and 4 waste holdup tanks (WHTs) and waste monitor tanks (WMTs) have enough capacity to store more than a month of the daily waste input. The evaporation pond can also receive 100 percent of the CPNPP Units 3 and 4 liquid effluent on a temporary basis. The treated effluent release piping is non-safety and does not have any safety function. In addition, the Unit 1 flow receiver and head box, circulating water system and discharge box are not required to perform any safety function or important to safety functions.~~

~~The evaporation pond is designed to provide sufficient surface area for natural evaporation based on the local area rainfall, evaporation rate, and receiving half of the CPNPP Units 3 and 4 liquid effluent. The evaporation pond is sized to prevent overflow due to local maximum rainfall condition. Rainfall is the primary contributing source for dilution of the pond. The pond design includes a transfer pump and discharge line to keep the pond from overflowing during periods of extreme weather conditions, and to forward the effluent to Squaw Creek Reservoir. The effluent is sampled before discharge and is monitored for radionuclide concentration by a radiation monitor which can turn off the pump, shut off the discharge valve and initiate an alarm signal to the Main Control Room and the Radwaste Control Room for operator actions. Doses from airborne particulates from the evaporation pond are described in Subsection 11.3.3.~~

~~The evaporation pond is designed with two layers of high density polyethylene (HDPE) with smooth surfaces and a drainage net in between for leak detection and collection. The bottom of the pond is sloped towards the leak drainage pit and a separate discharge pump pit. The leak drainage pit is a small pit underneath the two layers of HDPE, and leakage through the HDPE is caught and detected in this pit. The discharge pump pit is designed to faciliate pumping water out of the pond and is equipped with a discharge pump. An operating requirement is established to wash the pond and discharge the wash water to a flow receiver and head box for disposal each time the pond is drained. Based on the design evaluation, the pond does not need to be used continuously, because during normal operating conditions and anticipated operational occurrences, diversion of flow is not required. Diversion is required only when the tritium concentration in the SCR is approaching the set limit due to adverse meteorological conditions (e. g., drought condition leading to minimal spillover). The pond also has a berm to minimize infiltration of storm water. These design features (using HDPE, the leak detection pit, and sloping towards the drainage pit for discharge) and operating procedures (cleaning, diversion only when required) ensure ease of decontamination and~~

~~minimization of cross contamination (leakage to the groundwater), and thus satisfy 10 CFR 20.1406 and RG 4.21.~~ RCOL2_11.02-18

~~The evaporation pond discharge pump and discharge isolation valve are under supervisory control. Prior to discharge, multiple effluent samples around the pond perimeter are required to ensure the pond effluent meets the discharge specifications. The evaporation pond is a relatively small pond. The effluent to the pond has been filtered and ion exchanged and it is expected that effluent concentration in the pond is uniform. Stagnation and stratification of concentrations is not expected. This is confirmed by obtaining representative samples from the pond. The bottom of the pond is designed to be sloped towards the discharge pit to facilitate complete drainage. The pond is washed each time the contents are emptied to significantly reduce the potential for accumulation of residual contamination. Further, a radiation monitor is located close to the pump discharge to monitor the radiation level of the contents. The radiation monitor alarms in the Main Control Room and the Radwaste Operator Control Room and also isolates the pump and its discharge valve in the unlikely event of the content exceeding the setpoint. The radiation monitor setpoint for the evaporation pond discharge is the same as that used at the Waste Monitor Tank discharge.~~

Isotopic concentrations are calculated~~,~~ assuming 247,500 gpm per unit of circulating water from CPNPP Units 1 and 2 (Reference 11.2-201~~, ODCM for CPNPP Units 1 and 2~~). The isotopic ratios between the expected releases and the concentration limits of 10 CFR 20 Appendix B are listed in Tables 11.2-12R. The isotopic ratios between the maximum releases and the concentration limits of 10 CFR 20 Appendix B are listed in Table 11.2-13R. These ratio values are less than the allowable value of 1.0.

The individual doses and population doses are evaluated with the LADTAP II Code (Reference 11.2-14). The site-specific parameters used in the LADTAP II Code are listed in Table 11.2-14R, and the calculated individual doses are listed in Table 11.2-15R. 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. The exposure pathways considered due to the public use of SCR are fishing and shoreline recreation. There are no drinking water pathways or irrigated food pathways associated with SCR. Swimming is not a significant contributor to population dose and the 50-mile population dose due to fish ingestion is unchanged due to the public use of SCR. Therefore, drinking water, irrigated foods, swimming and fish ingestion are not considered for the 50-mile population dose.The calculated population dose from liquid effluents is 2.36 person-rem for whole-body and 2.07 person-rem for thyroid. Based on these parameters, the maximum individual dose to total body is 0.90 mrem/yr (adult) and the maximum individual dose to organ is 1.29 mrem/yr (teenager's liver). These values are less than the 10 CFR 50 Appendix I criteria of 3 mrem/yr and 10 mrem/yr, respectively. Evaluating the dose contribution from the evaporation pond (conservatively assuming 50% evaporation of the diverted flow) amounts to 1.15E-01 mrem/yr (Adult's GI-Tract) described in FSAR Table 11.3-204 and the combined dose from the vent stack gaseous emission and the evaporation pond emission amounts to 2.73E+00 mrem/yr (Adult's GI-Tract) described in FSAR Table 11.3-205, which is well within the 10 CFR Appendix I limit. Based on the above, the evaporation pond meets the acceptance criteria of SRP 11.2. ~~With regards to RG 1.143,~~ RG 1.143 does not provide any guidance on specific design requirements for an evaporation pond. Hence RG 1.143 is not applicable to the ~~desing~~design of the evaporation pond.According to NUREG-0543 (Reference 11.2-202), there is reasonable assurance that sites with up to four operating reactors that have releases within Appendix I design objective values are also in conformance with the EPA Uranium Fuel Cycle Standard, 40 CFR 190. Once the proposed ~~CPNPP~~ Units 3 and 4 are constructed, the Comanche Peak site will consist of four operating reactors. RCOL2_11.02-18 RCOL2_11.02-18 RCOL2_11.02-18

11.2.3.2 Radioactive Effluent Releases Due to Liquid Containing Tank Failures

---

CP COL 11.2(3) Replace the last sentence in the second paragraph in DCD Subsection 11.2.3.2 with the following.

Source term for each tank is provided in the DCD and the assessment of this model using the site-specific parameters to evaluate the conservatism of this analysis is described below.

CP COL 11.2(3) Replace the first two sentences in the last paragraph in DCD Subsection 11.2.3.2 with the following.

The evaluation of potential radioactive effluent releases to surface water or groundwater due to failure of the ~~holdup tank~~boric acid tank is provided in Subection 2.4.13. Releases from this tank result in concentrations at the nearest unrestricted potable water supply that are within the limits of 10 CFR 20, Appendix B (Ref 11.2-8). RCOL2_11.02-18

CP SUP 11.2(1) Add the following Subsection after DCD Subsection 11.2.3.3.

11.2.3.4 Evaporation Pond

The primary purpose of the evaporation pond is to ~~provide a means to~~ receive, store, and process treated radioactive effluent from the ~~CPNPP Units 3 and 4 liquid radioactive waste management systems~~LWMS when ~~the tritium concentration in Squaw Creek Reservoir is approaching the ODCM limit.~~it is RCOL2_11.02-18 undesirable to potentially increase the SCR tritium concentration by discharging Unit 3 and 4 treated effluent into SCR. RCOL2_11.02-18

The open evaporation pond covers approximately 1.5 acres and can hold up to 2.1 million gallons of treated effluent from the LWMS. The pond liquid depth is 4 ft with a 2-ft freeboard provided by a berm designed to prevent surface flooding from entering the pond.

The evaporation pond is designed to provide sufficient surface area for natural evaporation based on the local area rainfall, evaporation rate, and receiving half of the Units 3 and 4 treated liquid effluent. The evaporation pond is sized to prevent overflow due to local maximum rainfall condition. Rainfall is the primary contributing source for dilution of the pond.

The evaporation pond is constructed with two layers of high-density polyethelene (HDPE) material suitable for this service. The HDPE is a minimum of 60 mils thickness. A drainable mesh mat with a minimum thickness of 30 mils is provided in between the two layers of HDPE to allow movement and detection of leakage from the top layer of HDPE. An alarm signal is sent to the MCR and the Radwaste Control Room for operator action if leakage is detected.

The bottom of the evaporation pond is sloped toward the leak detection pit and toward the discharge pump pit. The leak detection pit is a small pit underneath the two layers of HDPE in which leakage through the HDPE is caught and detected. The discharge pump pit is designed to facilitate pumping water out of the pond. The pond does not need to be used continuously because diversion of flow is not required during normal operating conditions and anticipated operational occurrences. The design features (HDPE, leak detection pit, and sloping towards the drainage pit for discharge) and operating procedures (cleaning, diversion only when required) ensure ease of decontamination and minimization of cross contamination (leakage to the groundwater), and thus satisfy 10 CFR 20.1406 and RG 4.21.

The LWMS piping for transporting treated effluent from the discharge valve inside the A/B to the evaporation pond and the piping from the pond to the Unit 1 flow receiver and head box consists of the following piping segments:

1. From the WMT discharge valves, single-walled carbon steel pipe is routed in pipe chases from the A/B, through the Power Source Building (PS/B), up to the Turbine Building (T/B) exit wall penetration.

2. The effluent pipe is then connected to a single-walled carbon steel pipe or double-wall HDPE piping from the T/B wall to the yard near the condensate storage tank. This portion of pipe is run in the condensate transfer piping trench. A transition manhole is constructed near the plant pavement boundary to accommodate splitting the radwaste effluent pipe into two piping segments: the first segment goes to the Unit 1 flow receiver

and headbox, and the second segment goes to the radwaste evaporation pond. RCOL2_11.02-18

3. Buried double-walled HDPE piping from the transition manhole to the Unit 1 flow receiver and head box and to the evaporation pond.

4. Buried double-walled HDPE piping from the radwaste evaporation pond to the Unit 1 flow receiver and head box. This pipe is buried parallel to the effluent pipe from the WMTs and passes through the same manholes for testing and inspection for piping integrity.

Additional manholes are provided for testing and inspection of the buried piping. Each manhole is equipped with drain collection basins and leak detection instruments to send a signal when activated by fluid in the manhole to a receiver in the MCR for operator action. This design approach minimizes leakage and provides accessibility to facilitate periodic testing (hydrostatic or pressure), or visual inspection to maintain pipe integrity and is compliant with RG 4.21. A back flow preventer is provided near the Units 1 and 2 discharge boxes to prevent back flow from the circulating water.

The treated effluent release piping is non-safety and does not have any safety function. In addition, the Unit 1 flow receiver and head box, circulating water system, and discharge box are not required to perform any safety function or important to safety functions.

The evaporation pond is designed and constructed in accordance with the following standards; others may be applicable as the design is finalized:

Texas Administrative Code (TAC), Title 30 on Environmental Quality, Part 1 Texas Commission on Environmental Quality (TCEQ):

TCEQ 321.255, Requirements for Containment of Wastes and Pond(s)

TCEQ 330, Municipal Solid Waste

TCEQ 217.203, Design Criteria for Natural Treatment Facilities

American Society for Testing and Materials (ASTM)

ASTM D3020, Specification for Polyethylene and Ethylene Copolymer Plastic Sheeting for Pond, Canal and Reservoir Lining

ASTM D5514-06, Standard Test Method of Large Scale Hydrostatic Puncture Testing of Geosynthetics

ASTM D7002-03, Standard Practice for Leak Location on Exposed Geomembranes Using the Water Puddle System

Industry standards such as ANSI / HI -2005 "Pump Standards" will be used in designing the pumps DCD_11.02-18

Geosynthetic Research Institute Standard GM13 will be utilized for HDPE

The evaporation pond construction requirements from the TECQ and ASTM codes and standards listed above are specified in a construction specification that includes sloping the pond, liner type, instrument calibration, number of layers, thickness, etc.

The evaporation pond is constructed on top of a layer of clay with permeability less than 1E-7 centimeter per second. The overall construction meets or exceeds the requirements for waste water ponds stipulated by TCEQ. Some TCEQ requirements are as follows:

- In situ clay soils or placed and re-compacted clay soils meeting:
  - more than 30% passing a Number 200 mesh sieve
  - liquid limit greater than 30%
  - plasticity index greater than 15
  - a minimum thickness of two feet
  - permeability equal to or less than $1x10^{-7}$centimeter per second
- Soil compaction will be 95% standard proctor density at optimum moisture content
- The pond is protected from inundation by a ten-year, two-hour rainfall event

The evaporation pond will be initially inspected and tested following construction and prior to the initial release of treated liquid effluents from the LWMS to the pond. Testing and inspection of the evaporation pond will consist of the following:

- Inspection of the liner for integrity, lack of damage, and welt seam construction
- Slope and drainage capability
- Instrumentation calibration
- Leakage detection system

The evaporation pond will be periodically tested and inspected using the acceptance criteria established in the codes and standards listed above. The periodic testing and inspection procedures for the evaporation pond meet the TCEQ permit process and requirements, and include the following: RCOL2_11.02-18

- Water sample and analysis before draining and decontamination to monitor concentration buildup
- Liner and welt seam integrity
- Drainage capability
- Instrument calibration
- Soil and groundwater contamination analysis per NEI 07-07

If testing and/or inspection results require the liner to be repaired, the pond contents are removed, and the pond is rinsed before repair is performed.

~~In order to minimize contamination, the pond is rinsed each time the pond content is emptied. The rinse water is also forwarded to Squaw Creek Reservoir, via the discharge box and blended with the CPNPP Units 1 or 2 circulation water flow.~~

~~The evaporation pond is equipped with a leak detection system. In the event a leak is developed, a signal is sent to the Main Control Room and the Radwaste Control Room for operator actions, which may include removing the contents from the pond to facilitate inspection and repair as required.~~

~~The pond liner is inspected regularly to determine liner integrity with respect to the liners and their seams. In the event of punctures and/or rupture and repair is required, the pond contents are removed, and the pond is rinsed before repair is performed.~~

~~The construction, testing, and inspection requirements for the evaporation pond meet the TCEQ permit process and requirements.~~

~~The evaporation pond is designed and constructed in accordance with the following standards (others may be applicable as the design is finalized):~~

~~Texas Administrative Code (TAC), Title 30 on Environmental Quality, Part 1 Texas Commission on Environmental Quality (TCEQ):~~

~~TCEQ 321.255, Requirements for Containment of Wastes and Pond(s)~~

~~TCEQ 330, Municipal Solid Waste~~

~~TCEQ 217.203, Design Criteria for Natural Treatment Facilities~~

~~American Society for Testing and Materials (ASTM)~~

~~ASTM D3020, Specification for Polyethylene and Ethylene Copolymer Plastic Sheeting for Pond, Canal and Reservoir Lining~~ RCOL2_11.02-18

~~ASTM D5514-06, Standard Test Method of Large Scale Hydrostatic Puncture Testing of Geosynthetics~~

~~ASTM D7002-03, Standard Practice for Leak Location on Exposed Geomembranes Using the Water Puddle System~~

~~Industry standards such as ANSI / HI 2005 "Pump standard" will be used in designing the pumps~~

~~Geosynthetic Research Institute Standard GM13 will be utilized for HDPE~~

~~The evaporation pond will be initially inspected and tested following construction and prior to the initial release of liquid effluents from the liquid waste management system to the pond. The evaporative pond construction requirements from the TECQ and ASTM codes and standards listed above are specified in a construction specification that includes sloping the pond, liner type, instrument calibration, number of layers, thickness, etc. After construction, initial testing and inspection of the evaporation pond will consist of the following:~~

- ~~Inspection of the liner for integrity, lack of damage, and welt seams construction~~
- ~~Slope and drainage capability~~
- ~~Instrumentation calibration~~
- ~~Leakage detection system~~

~~The specific requirements are listed in the following paragraphs.~~

~~The evaporation pond will be periodically tested and inspected. Using the acceptance criteria established in the codes and standards listed above. The periodic testing and inspection procedures for the evaporation pond will include the following:~~

- ~~Water sample and analysis before draining and decontamination to monitor concentration buildup~~
- ~~Liner and welt integrity~~
- ~~Drainage capability~~
- ~~Instrument calibration~~

- ~~Soil and groundwater contamination analysis per NEI 07-07~~ RCOL2_11.02-18

~~The evaporation pond is designed and constructed to contain treated effluent that is contaminated with radioactive nuclides. The pond opens to the environment to allow the tritiated water to naturally evaporate.~~

~~The evaporation pond is constructed with two layers of High Density Polyethylene material suitable for this service. The High Density Polyethylene is a minimum of 60 mils thickness.~~

~~A drainable mesh mat, with a minimum thickness of 30 mils, is provided in between the two layers of High Density Polyethylene to allow movement of the liquid due to leakage of the content from the top layer of High Density Polyethylene.~~

~~The evaporation pond is constructed with a total depth of six feet, with four feet below grade and two feet freeboad. A berm is constructed to prevent surface water from entering the pond during rainy seasons.~~

~~The evaporation pond is constructed with a layer of clay with permeability less than 1E-7 centimeter per second to support the pond. The overall construction meets or exceeds the requirements for waste water pond stipulated by TCEQ. Some TCEQ requirements are as follows:~~

- ~~In situ clay soils or placed and compacted meeting:~~
  - ~~more than 30% passing a Number 200 mesh sieve~~
  - ~~liquid limit greater than 30%~~
  - ~~plasticity index greater than 15~~
  - ~~a minimum thickness of two feet~~
  - ~~Permeability equal to or less than $1x10^{-7}$ centimeter per second~~
- ~~Soil compaction will be 95% standard proctor density at optimum moisture content~~
- ~~The pond is protected from inundation by a ten-year 2 hour rainfall event~~

Evaporation Pond Operation

When it is determined to be undesirable to increase the tritium concentration in SCR by discharging treated effluent from CPNPP Units 3 and 4, the liquid effluent from CPNPP Units 3 and 4 can be diverted to the evaporation pond for temporary staging. When the tritium concentration in SCR decreases to a level that allows discharge to the reservoir, the effluent in the evaporation pond is sampled and analyzed for discharge into SCR. In the event that both CPNPP Units 1 and 2 are temporarily not in operation, or when there is no dilution flow, the CPNPP Units 3 and 4 waste holdup tanks (WHTs) have enough capacity to store more than a month of the daily waste input. The evaporation pond can also receive 100 percent of the CPNPP Units 3 and 4 treated liquid effluent on a temporary basis, up to two years. RCOL2_11.02-18

The evaporation pond is equipped with a centrifugal pump to ~~return~~discharge the contents to ~~the Squaw Creek Reservoir~~SCR ~~as~~when the tritium concentration in ~~Squaw Creek Reservoir~~SCR permits. The ~~return~~discharge piping leaving the evaporation pond ~~is connected to the circulating water return line discharge box upstream of the discharge point~~discharges into the Unit 1 receiver and head box. A radiation monitor ~~is provided~~ close to the evaporation pond discharge pump ~~discharge to monitor radiation level of the content, and~~ provides a signal to automatically turn off the pump, shut ~~off~~ the discharge valve, and ~~initiate a signal to~~ alarm in the ~~Main Control Room~~MCR and the Radwaste Control Room ~~for operator actions~~. The setpoint of the evaporation pond discharge radiation monitor is the same as the setpoint of the WMT discharge radiation monitors that monitor flow going into the evaporation pond.

~~The LWMS effluent release piping for transporting radioactive effluent from the discharge valve inside the Auxiliary Building (A/B) to the pond and the piping from the pond to the Unit 1 flow receiver and head box consists of the following piping segments:~~

1. ~~From the discharge valve, single walled carbon steel pipe is routed in pipe chases from the A/B, through the Power Source Building (PS/B), up to the Turbine Building (T/B) exit wall penetration.~~

2. ~~The effluent pipe is then connected to a single walled carbon steel pipe or double wall High Density Polyethylene (HDPE) piping from the T/B wall to the yard near the CST. This portion of pipe is run via the condensate transfer piping trench. A transition manhole is constructed near the plant pavement boundary to accomodate splitting the radwaste effluent pipe into two piping segments: first segment goes to the Unit 1 flow receiver and headbox, and second effluent pipe to the radwaste evaporation pond.~~

3. ~~Buried double walled HDPE piping from the transition manhole to the Unit 1 flow receiver and head box.~~

4. ~~Buried double walled HDPE piping from the transition manhole to the radwaste evaporation pond. Additional manholes are constructed to monitor leakage along the buried pathway.~~

5. ~~The radwaste evaporation pond return pipe is buried double walled HDPE piping from the pond to the Unit 1 flow receiver and head box. This return pipe is buried parallel to the effluent pipe and passes through the same manholes for testing and inspection for piping integrity.~~

~~Additional manholes are provided for testing and inspection for the buried piping. Each manhole is equipped with drain collection basins and leak detection instruments to send the signal when activated by fluid in the manhole to a receiver in the Main Control Room (MCR) for operator action. This design approach minimizes leakage and provides accessibility to facilitate periodic testing (hydrostatic or pressure), or visual inspection to maintain pipe integrity and is compliant with RG 4.21. A back flow preventer is provided near the CPNPP Units 1 and 2 discharge boxes to prevent back flow from the circulating pipe.~~ RCOL2_11.02-18

The evaporation pond discharge pump also acts as a recirculation pump for the pond. The pond is recirculated sufficiently to obtain a representative sample at the discharge pump before discharging the pond contents to the CPNPP Unit 1 flow receiver and head box.

The evaporation pond discharge pump and discharge isolation valve are under supervisory control.

~~Evaporation Pond Design Summary:~~

~~Volume: 2.1 million gallon net capacity~~

~~Surface area: 1.5 acre~~

~~Depth: Total 6 feet deep (4 feet liquid depth with 2 feet freeboard)~~

~~Type: Open with no cover~~

~~Liner material: High Density Polyethylene, 60 mils, two layers~~

~~Permeability: 1x10^{-7}cm/sec~~

~~The evaporation pond contains treated liquid effluents in trace amounts that meet discharge requirements specified in 10 CFR 20 Appendix B, Table 2, and has radionuclide contents below that of the boric acid tank contents. Hence, the contamination level due to the failure of the evaporation pond is bounded by the failure of the boric acid tanks.~~

~~The evaporation pond is designed to meet and operate in accordance with RG 4.21. Preventive maintenance, monitoring and routine surveillance programs are an important part to minimize the potential for contamination. Leakage detection design, radiation monitors are added for early detection to prevent spread of contamination. The current CPNPP pond management program is expanded to include the above requirements for the evaporation pond and its supporting components including the radiation monitor, pumps and valves.~~

Operating procedures limit the use of the evaporation pond to receive treated effluent on an as-needed basis and the pond will be washed each time it is emptied. Sampling procedures confirm the tritium concentration in ~~the~~ SCR is RCOL2_11.02-18 below the pre-determined setpoint, and that the effluent is acceptable for ~~release~~discharge to SCR. The tritium sampling procedures will be ~~included in~~governed by the site-wide ODCM, which ~~will be part of Radiological Effluent Controls Program. The Radiological Effluent Controls Program already~~ has an implementation milestone established as shown in Table 13.4-201. RCOL2_11.02-18

11.2.4 Testing and Inspection Requirements

CP COL 11.2(7) Add the following sentences to the end of the last paragraph of DCD Subsection 11.2.4.

The licensee has an Epoxy Coatings Program used to facilitate the ALARA objective of promoting decontamination in radiologically controlled areas outside containment. The program controls refurbishment, repair, and replacement of coatings in accordance with the manufacturers' product data sheets and good painting practices. The program will be implemented as described in FSAR Table 13.4-201.

11.2.5 Combined License Information

Replace the content of DCD Subsection 11.2.5 with the following.

STD COL 11.2(1) ***11.2(1)*** *The mobile and temporary liquid radwaste processing equipment*

This combined license (COL) item is addressed in Subsection 11.2.1.6.

CP COL 11.2(2) ***11.2(2)*** *Site-specific information of the LWMS*

This COL item is addressed in Subsections 11.2.2 and 11.2.3.1.

CP COL 11.2(3) ***11.2(3)*** *The liquid containing tank failure*

This COL item is addressed in Subsection 11.2.3.2.

CP COL 11.2(4) ***11.2(4)*** *The site-specific dose calculation*

This COL item is addressed in Subsection 11.2.3.1, Table 11.2-10R, Table 11.2-11R, Table 11.2-12R, Table 11.2-13R, Table 11.2-14R and Table 11.2-15R.

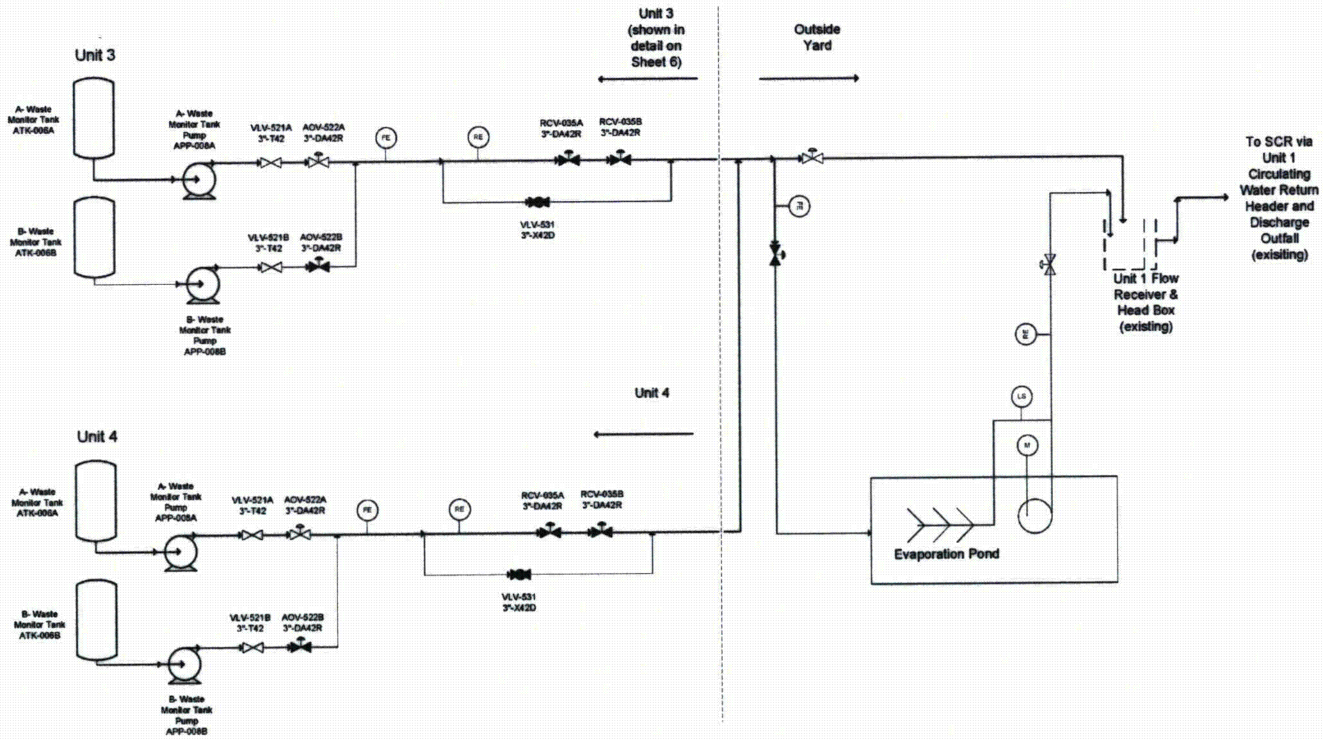
CP COL 11.2(5) ***11.2(5)*** *Site-specific cost benefit analysis*

This COL item is addressed in Subsection 11.2.1.5.

CP COL 11.2(6) ***11.2(6)*** *Piping and instrumentation diagrams*

This COL item is addressed in Subsection 11.2.2 and Figure 11.2-201.

CP COL 11.2(7) ***11.2(7)*** *The implementation milestones for the coatings program used in the LWMS*



RCOL2_11.02-18

CP COL 11.2(6)

Figure 11.2-201 Liquid Waste Management System Piping and Instrumentation Diagram (Sheet 9 of 10)