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 5550
C 817 559 0403
F 254 897 6652

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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT
DOCKET NOS. 50-445 AND 50-446
TRANSMITTAL OF YEAR 2013 RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

Dear Sir or Madam:

Enclosed is the Annual Radiological Environmental Operating Report for the Comanche Peak Radiological Environmental Monitoring Program. This report is submitted pursuant to Section 5.6.2 of the Comanche Peak Units 1 and 2 Technical Specifications (Appendix A to Operating License Nos. NPF-87 and NPF-89). The report covers the period from January 1, 2013 through December 31, 2013 and summarizes the results of measurements and analysis of data obtained from samples collected during this interval.

If there are any questions regarding this report, please contact Steve Dixon at (254) 897-5482 or Scott Bradley at (254) 897-5495.

Sincerely,

Luminant Generation Company LLC

Rafael Flores

By: _____
Fred W. Madden
Director, External Affairs

IE25
NRR

Enclosure - Comanche Peak Annual Radiological Environmental Operating Report For 2013

c - M. L. Dapas, Region IV
K. M. Kennedy, Region IV
L. K. Gibson, NRR
Resident Inspectors, Comanche Peak

Enclosure 1

Comanche Peak Annual Radiological Environmental Operating Report For 2013

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COMANCHE PEAK NUCLEAR POWER PLANT

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT FOR 2013

JANUARY 1, 2013 through DECEMBER 31, 2013

LUMINANT REVIEW and APPROVAL

CREATED BY: _____ 4-6-14
Bonnie Vaughan / John M. Watts — Date
Radiation Protection Technicians

REVIEWED BY: _____ 4.6.14
Mike Macho — Date
Radiation Protection Supervisor

APPROVED BY: _____ 4/9/14
Deborah O'Connor — Date
Health Physics Supervisor

Documented on RPI-710-2

Table of Contents

I. Introduction

Results of the Radiological Environmental Monitoring Program for the Comanche Peak Nuclear Power Plant (CPNPP) for the year 2013 are contained within this report. This report covers the period from January 1, 2013 through December 31, 2013 and summarizes the results of measurements and analysis of data obtained from environmental samples collected during this same timeframe.

A. Site and Station Description

CPNPP consists of two pressurized water reactor units, each designed to operate at a power level of about 1250 megawatts (electrical). The Station is located on Squaw Creek reservoir in Somervell and Hood counties, about forty miles southwest of Fort Worth, Texas. Unit 1 received a low power operating license February 8, 1990 and achieved initial criticality on April 3, 1990. A full power license for Unit 1 was issued on April 17, 1990 and commercial operation was declared on August 13, 1990. Unit 2 achieved initial criticality on March 24, 1993 and synchronized to the electrical grid on April 9, 1993.

B. Objectives and Overviews of the CPNPP Radiological Environmental Monitoring Program

The United States Nuclear Regulatory Commission (USNRC) regulations require that nuclear power plants be designed, constructed, and operated to keep levels of radioactive material in effluents to unrestricted areas as low as reasonably achievable (ALARA). To assure that these criteria are met, each license authorizing reactor operation includes technical specifications governing the release of radioactive effluents.

In-plant monitoring is used to assure that these predetermined release limits are not exceeded. However, as a precaution against unexpected and undefined processes that might allow undue accumulation of radioactivity in any sector of the environment, a program for monitoring the plant environs is also included.

Sampling locations were selected on the basis of local ecology, meteorology, physical characteristics of the region, and demographic and land use features of the site vicinity. The radiological environmental monitoring program was designed on the basis of the USNRC Branch Technical Position "An Acceptable Radiological Environmental Monitoring Program" on radiological environmental monitoring issued by the Radiological Assessment Branch, Revision 1 (November 1979), the CPNPP Technical Specification "Technical Specifications for Comanche Peak Nuclear Power Plant Units 1 and 2" and the "CPSES Offsite Dose Calculation Manual" (ODCM).

In 2013, the Radiological Environmental Monitoring Program included the following:

- The measurement of ambient gamma radiation by Thermal Luminescent dosimetry;
- The determination of airborne gross beta, gamma emitters, and Iodine-131;
- The determination of tritium and gamma emitters in surface water;
- The determination of gross beta, tritium, Iodine-131, and gamma emitters in drinking water;
- The determination of tritium and gamma emitters in ground water;
- The determination of gamma emitters in sediment and fish;
- The determination of gamma emitters in food products and;
- The determination of gamma emitters and Iodine-131 in broadleaf vegetation.

The regulations governing the quantities of radioactivity in reactor effluents allow nuclear power plants to contribute, at most, only a small percentage increase above normal background radioactivity. Background levels at any one location are not constant but vary with time as they are influenced by external events such as cosmic ray bombardment; weapons test fallout, and seasonal variations. These levels also can vary spatially within relatively short distances reflecting variations in geological composition. To differentiate between background radiation levels and increases resulting from operation of CPNPP, the radiological surveys of the plant environs were divided into pre-operational and operational phases.

The pre-operational phase of the program provided a general characterization of the radiation levels and concentrations prevalent in these areas prior to plant operation along with an indication of the degree of natural variation to be expected. The operational phase of the program obtains data which, when considered along with the data obtained in the pre-operational phase, assists in the evaluation of the radiological impact of plant operation.

Pre-operational measurements were conducted at CPNPP from 1981 to 1989. These pre-operational measurements were performed to:

- Evaluate procedures, equipment, and techniques;
- Identify potentially important pathways to be monitored after plant operation;
- Measure background levels and the variations along potentially important pathways;
- Provide baseline data for statistical comparisons with future operational analytical results.

The operational Radiological Environmental Monitoring Program is conducted to:

- Verify that measurable concentrations of radioactive materials and levels of radiation are not higher than expected on the basis of the effluent measurements and modeling of the environmental exposure pathways;
- Verify the effectiveness of in-plant measures used for controlling the release of radioactive materials;
- Identify changes in the areas at and beyond the site boundary that may impact the principal pathways of exposure.

This report documents the twenty-first year of operational measurements and is submitted in accordance with the requirements of the CPSES Offsite Dose Calculation Manual, Part I, Administrative Control 6.9.1.3.

II. Program Descriptions and Results

A. Sample Locations

Within a radius of twenty miles of the CPNPP site there are seventy-two (72) sample locations included in the monitoring program for the year 2013. The number of sample points and the specific locations for the sample points were determined by considering locations where the highest off-site environmental concentrations have been predicted from plant effluent source terms, site hydrology, and site meteorological conditions. Other factors considered were applicable regulations, population distribution, and ease of access to sampling stations, availability of samples at desired locations, security and future program integrity. Additionally an annual land use census is conducted to identify changes in the areas surrounding the plant. If changes are identified that impact the principle pathways of exposure, appropriate changes to the radiological environmental monitoring program are implemented. A copy of the report "Comanche Peak Nuclear Power Plant Land Use Census 2013" is provided in Appendix A to this report.

Table 1 – Comanche Peak Nuclear Power Plant Radiological Environmental Monitoring Program for 2013 contains a brief outline of the current program. This table specifies the sample media type, the number of locations for each media type, the sector and distance identifier for each sample location, the sample frequency, the type of analysis required and the analytical frequency required.

Table 2 – Key to Environmental Sampling Locations provides a reference that links the sampling point designations used in procedures and forms to the appropriate physical sample location (sector and distance) and to the correct sample type. This cross-reference enhances the ability to review data and tie the data to the correct sample points and to ensure all samples are collected and analyzed as specified.

Currently there are no milk sample locations within ten miles of the CPNPP site and there are no milk sample locations within twenty miles that will participate in the environmental program. CPNPP already samples extra broadleaf locations as required due to no milk locations within the ten-mile radius therefore, no changes to the program are necessary. Milk sampling will be resumed if any future annual land use census determines a dairy has been established within the specified area.

Table 1 – Comanche Peak Nuclear Power Plant Radiological Environmental Monitoring Program for 2013

Media	Number of Locations	Identification by Sector and Distance (miles)	Sampling Frequency (a)	Analysis	Analytical Frequency (a)
Gamma Exposure	43	N-1.45; N-4.4; N-6.5; N-9.4; NNE-1.1; NNE-5.65; NE-1.7; NE-4.8; ENE-2.5; ENE-5.0; E-0.5; E-1.9; E-3.5; E-4.2; ESE-1.4; ESE-4.7; SE-1.3; SE-3.85; SE-4.6; SSE-1.3; SSE-4.4; SSE-4.5; S-1.5; S-4.2; SSW-1.1; SSW-4.4; SW-0.9; SW-4.8; SW-12.3; WSW-1.0; WSW-5.35; WSW-7.0; W-1.0; W-2.0; W-5.5; WNW-1.0; WNW-5.0; WNW-6.7; NW-1.0; NW-5.7; NW-9.9; NNW-1.35; NNW-4.6	Q, A	Thermo Luminescent (TLD)Dosimetry	Q, A
Air Particulate Air Iodine	8	N-9.4; E-3.5; SSE-4.5; SW-12.3; NW-1.0; N-1.45; SW/WSW-0.95; S/SSW-1.2	W	Gross Beta Gamma Isotopic Filter Gamma Isotopic Charcoal	W QC W
Surface Water	4	N-19.3; ESE-1.4; N-1.5; NE-7.4	M(b)	Gamma Isotopic Tritium	M QC
Surface Water/Drinking	2	NNW-0.1; N-9.9	M(c)	Gross Beta Gamma Isotopic Iodine-131 Tritium	M M M QC
Ground Water	5	SSE-4.6; W-1.2; WSW-0.1; N-9.8; N-1.45	Q	Gamma Isotopic Tritium	Q Q
Sediment	4	N-9.9; NNE-1.0; NE-7.4; SE-5.3	SA	Gamma Isotopic	SA
Fish	2	NNE-8.0; ENE-2.0	SA	Gamma Isotopic	SA
Food Products	1	ENE-9.0, E-4.2	MH	Gamma Isotopic Iodine-131	MH MH
Broadleaf Vegetation	3	N-1.45; SW-1.0; SW-13.5	M	Gamma Isotopic	M

(a) Frequency codes are: W--Weekly; M-Monthly; Q-Quarterly; QC-Quarterly Composite; MH-Monthly at Harvest; SA-Semiannual; A-Annual

(b) Surface water samples from Squaw Creek are monthly composites of weekly grab samples. Surface water samples from Lake Granbury are monthly grab samples.

(c) Surface water drinking samples are a monthly composite of weekly grab samples.

Table 2
Key to Environmental Sampling Locations

SAMPLING POINT	LOCATION (SECTOR-MILE)	SAMPLE TYPE*	SAMPLING POINT	LOCATION (SECTOR-MILE)	SAMPLE TYPE*
A1	N-1.45	A	R29	SW-12.3	R
A2	N-9.4	A	R30	WSW-1.0	R
A3	E-3.5	A	R31	WSW-5.35	R
A4	SSE-4.5	A	R32	WSW-7.0	R
A5	S/SSW-1.2	A	R33	W-1.0	R
A6	SW-12.3	A	R34	W-2.0	R
A7	SW/WSW-0.95	A	R35	W-5.5	R
A8	NW-1.0	A	R36	WNW-1.0	R
R1	N-1.45	R	R37	WNW-5.0	R
R2	N-4.4	R	R38	WNW-6.7	R
R3	N-6.5	R	R39	NW-1.0	R
R4	N-9.4	R	R40	NW-5.7	R
R5	NNE-1.1	R	R41	NW-9.9	R
R6	NNE-5.65	R	R42	NNW-1.35	R
R7	NE-1.7	R	R43	NNW-4.6	R
R8	NE-4.8	R	SW1	N-1.5	SW
R9	ENE-2.5	R	SW2	N-9.9	SW/DW
R10	ENE-5.0	R	SW3	N-19.9	SW
R11	E-0.5	R	SW4	NE-7.4	SW
R12	E-1.9	R	SW5	ESE-1.4	SW
R13	E-3.5	R	SW6	NNW-0.1	SW/DW
R14	E-4.2	R	GW1	W-1.2	GW/DW
R15	ESE-1.4	R	GW2	WSW-0.1	GW/DW
R16	ESE-4.7	R	GW3	SSE-4.6	GW/DW
R17	SE-1.3	R	GW4	N-9.8	GW/DW
R18	SE-3.85	R	GW5	N-1.45	GW/DW
R19	SE-4.6	R	SS1	NNE-1.0	SS
R20	SSE-1.3	R	SS2	N-9.9	SS
R21	SSE-4.4	R	SS3	NE-7.4	SS
R22	SSE-4.5	R	SS4	SE-5.3	SS
R23	S-1.5	R	F1	ENE-2.0	F
R24	S-4.2	R	F2	NNE-8.0	F
R25	SSW-1.1	R	FP1	ENE-9.0	FP
R26	SSW-4.4	R	FP2	E-4.2	FP
R27	SW-0.9	R	BL1	N-1.45	BL
R28	SW-4.8	R	BL2	SW-1.0	BL
			BL3	SW-13.5	BL

Sample Type*

A – AIR SAMPLE
F – FISH
SS – SHORELINE SEDIMENT
SW – SURFACE WATER
DW – DRINKING WATER
GW – GROUND WATER
R – DIRECT RADIATION
FP – FOOD PRODUCT
BL – BROADLEAF VEGETATION

B. Direct Radiation

Starting in 2013 Thermo Luminescent Dosimeters (TLDs) were used to determine the direct (ambient) radiation levels at the designated monitoring locations. The monitoring locations were chosen according to the criteria given in the USNRC Branch Technical Position on Radiation Monitoring (Revision 1, November 1979). The area around the station was divided into 16 radial sectors of 22-1/2 degrees each, corresponding to the cardinal points of the compass. TLDs were placed in each of these sectors. The TLDs were placed in two rings around the station. An inner ring was located as close as possible to the site boundary and an outer ring was located at a distance of 4 to 6 miles from the station. Eleven additional TLDs were located at points of special interest, including two control locations. For routine direct radiation measurements, two sets of the TLDs were used at each of the 43 monitoring locations. One set of TLDs was exchanged on a quarterly basis and a second set of TLDs was exchanged on a yearly basis. Additional sets of in-transit TLDs were used as control TLDs for the quarterly and annual TLDs.

In 2013 CPNPP contracted the services of Mirion Technologies to provide and process Thermo Luminescent Dosimeters (TLDs.) The TLDs are used to determine the direct (ambient) radiation levels in designated monitoring locations. Mirion Technologies is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP.)

From years 2009-2012 CPNPP contracted the services of Landauer Inc. to provide and process Optically Stimulated Luminescent dosimeters (OSLs) to determine the direct (ambient) radiation levels at the designated monitoring locations. Landauer Inc. is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP.)

From years 2001 to 2008 Thermo Luminescent Dosimeters (TLDs) were processed on-site by CPNPP National Voluntary Laboratory Accreditation Program (NVLAP) certified. Individual dosimeters were calibrated by exposure to an accurately known radiation field from a certified Cs-137 source. The year 2001 was the first year that CPNPP used the Panasonic TLD System to supply all the required direct radiation (ambient) monitoring.

D. C. Oakley's report "National Radiation Exposure in the United States", published in 1972, calculated a background radiation dose rate equivalent of 0.22 mr/day for the area surrounding Fort Worth, Texas. This calculated value varies widely with changes in location but represents an appropriate reference value to compare with actual measured TLD doses.

Using data from the pre-operational program for the two years prior to the startup of Unit 1, the quarterly TLDs averaged a calculated dose rate of 0.14 mr/day while the yearly TLDs averaged a calculated dose rate of 0.16 mr/day. The range of measured values from this same two-year period varied from a minimum of 0.11 mr/day to a maximum of 0.22 mr/day.

Table 3 – 2013 Environmental Direct Radiation Results contains the measured dose (mr) for each quarterly TLD from each of the 43 monitoring locations. The corresponding quarterly calculated dose rate (mr/day) values are listed as well. The statistical average doses (mr) and dose rate (mr/day) values for each set of quarterly TLDs is also displayed. Additionally, the table includes the total dose (mr) of all four quarters for each specific location. The table also includes the measured dose (mr) for each annual TLD from each of the 43 monitoring locations. The corresponding annual calculated dose rate (mr/day) values are listed as well. The statistical annual average dose (mr) for the entire set of annual TLDs is reported along with the average dose rate (mr/day) for the entire set of annual TLDs.

For the year 2013, the measured dose rates of all the quarterly TLDs ranged from a minimum of **0.077 mR/day** to a maximum of **0.168 mr/day** with an average dose rate of **0.127 mR/day**. This resulted in an average quarterly dose of 11 **mR** and a total annual dose of **44.00 mR** for all of the forty three monitoring stations.

The measured dose rates of all the annual TLD's ranged from a minimum of **0.078 mR/day** to a maximum of **0.165 mR/day** with an average dose rate of **0.123 mR/day**. This resulted in an average quarterly dose of **10.8 mR** and a total annual dose of **43.0 mR** for all of the forty three monitoring stations.

Comparing the pre-operational data and operational data collected through the year 2013 did not produce any anomalies. The direct radiation dose data for 2013 was consistent with previous years of data during the pre-operational program. Table 14 – TLD Trend Quarterly Average contains the average quarterly OSL/TLD for the five most current years from each of the 43 monitoring locations. The implementation of the Mirion TLDs and the background subtract method used to report the data from the TLDs accounts for the lower values and account for consistent response from each locations' total quarterly TLDs to the Annual TLDs.
[See CR-2013-004934 for additional clarification on the background subtraction method].

The 2012 CPNPP Annual Direct Radiation results were reported using personnel OSLs packaged as environmental OSL field badges. The difference between the two is the chips under copper filters. The environmental OSLs use the average of two chips and the personnel OSLs use one to calculate the direct radiation results. Condition Report CR-2012-003122 can be referenced.

In 2013 CPNPP performed a Background TLD Study which improved the reporting accuracy Direct Radiation Results. In summary, this study incorporated calculating the daily average in mR/Day of the background TLDs stored in the lead storage container during the monitoring period. Details of this study can be found in Condition Report 2013-0004934.

No abnormal quarterly results were obtained by either CPNPP or by the State of Texas, Bureau of Radiation Control.

During the year 2013, were the no exceptions to the Direct Radiation Program.

Table 3 – 2013 Environmental Direct Radiation Results
(Units of mr dose and mr/day dose rate)

Location		1ST QTR Total	Average mR/Day	2ND QTR Total	Average mR/Day	3RD QTR Total	Average mR/Day	4TH QTR Total	Average mR/Day	AVG QTR TLD Total	Annual TLD Total	Annual Average TLD mR/day
N-1.45	R1	10	0.113	10	0.110	12	0.134	12	0.124	11	46	0.125
N-4.4	R2	11	0.124	13	0.143	13	0.145	14	0.149	13	51	0.138
N-6.5	R3	10	0.113	11	0.121	11	0.123	12	0.128	11	44	0.120
N-9.4	R4	11	0.124	11	0.121	12	0.134	12	0.132	12	47	0.129
NNE-1.1	R5	8	0.092	7	0.077	8	0.090	9	0.091	8	29	0.080
NNE-5.65	R6	10	0.113	12	0.132	12	0.134	13	0.138	12	50	0.137
NE-1.7	R7	7	0.079	7	0.077	7	0.079	8	0.084	7	29	0.078
NE-4.8	R8	12	0.136	13	0.143	12	0.134	13	0.142	13	52	0.141
ENE-2.5	R9	11	0.124	13	0.143	14	0.151	13	0.137	13	55	0.150
ENE-5.0	R10	13	0.147	13	0.143	14	0.155	16	0.168	14	61	0.165
E-0.5	R11	11	0.124	12	0.126	12	0.134	13	0.138	12	50	0.135
E-1.9	R12	9	0.101	9	0.099	9	0.098	10	0.105	9	40	0.108
E-3.5	R13	9	0.101	10	0.110	11	0.123	11	0.121	10	45	0.122
E-4.2	R14	12	0.136	13	0.143	12	0.134	13	0.143	13	51	0.140
ESE-1.4	R15	10	0.113	10	0.110	12	0.129	14	0.146	12	48	0.131
ESE-4.7	R16	11	0.124	11	0.121	12	0.134	14	0.151	12	50	0.137
SE-1.3	R17	11	0.124	11	0.121	11	0.119	13	0.130	12	49	0.134
SE-3.85	R18	10	0.113	10	0.110	11	0.123	11	0.120	11	43	0.118
SE-4.6	R19	10	0.113	10	0.110	11	0.123	11	0.118	11	45	0.123
SSE-1.3	R20	11	0.124	11	0.121	11	0.119	13	0.131	12	46	0.125
SSE-4.4	R21	11	0.124	11	0.121	11	0.123	12	0.133	11	45	0.122
SSE-4.6	R22	11	0.124	10	0.110	11	0.123	12	0.133	11	45	0.122
S-1.5	R23	10	0.113	10	0.110	11	0.119	11	0.115	11	42	0.115
S-4.2	R24	11	0.124	10	0.110	11	0.123	12	0.124	11	47	0.127
SSW-1.1	R25	10	0.113	11	0.121	13	0.140	13	0.133	12	48	0.130
SSW-4.8	R26	11	0.124	11	0.121	11	0.123	13	0.137	12	45	0.123
SW-0.9	R27	10	0.113	10	0.110	11	0.119	12	0.121	11	43	0.117
SW-4.8	R28	10	0.113	10	0.110	11	0.123	12	0.123	11	43	0.116
SW-12.3 (C)	R29	11	0.124	12	0.132	11	0.123	11	0.121	11	48	0.130
WSW-1.0	R30	10	0.113	11	0.121	12	0.129	13	0.132	12	49	0.134
WSW-5.35	R31	10	0.113	9	0.099	10	0.112	11	0.120	10	42	0.113
WSW-7.0 (C)	R32	12	0.136	12	0.132	13	0.145	14	0.149	13	50	0.136
W-1.0	R33	9	0.101	10	0.110	10	0.108	11	0.115	10	37	0.102
W-2.0	R34	9	0.101	8	0.088	10	0.112	10	0.108	9	38	0.102
W-5.5	R35	10	0.113	10	0.110	10	0.112	11	0.118	10	39	0.105
WNW-1.0	R36	12	0.136	12	0.132	13	0.145	13	0.134	13	51	0.138
WNW-5.0	R37	10	0.113	11	0.121	12	0.134	13	0.140	12	45	0.122
WNW-6.7	R38	10	0.113	10	0.110	11	0.123	12	0.128	11	43	0.117
NW-1.0	R39	10	0.113	11	0.121	11	0.123	11	0.119	11	41	0.113
NW-5.7	R40	11	0.124	10	0.110	11	0.123	12	0.124	11	44	0.119
NW-9.9	R41	10	0.113	10	0.110	11	0.123	11	0.121	11	41	0.111
NNW-1.35	R42	7	0.080	7	0.077	7	0.079	8	0.083	7	29	0.079
NNW-4.6	R43	12	0.136	13	0.143	13	0.145	14	0.152	13	52	0.143
AVERAGES		**10**	**0.116**	**10**	**0.116**	**11**	**0.124**	**12**	**0.148**	**11**	**43**	**0.123**

Table 14 – OSL Trend Quarterly Average (Five most current years)

Location	2009	2010	2011	2012	2013	% Diff 2013 to 2012	2009-2013 mR Avg	% Diff 2013 to Average
R1	20	22	23	26	11	-81%	20.40	-60%
R2	34	23	22	26	13	-67%	23.60	-58%
R3	15	22	20	25	11	-78%	18.60	-51%
R4	24	22	22	26	12	-74%	21.20	-55%
R5	10	17	17	20	8	-86%	14.40	-57%
R6	18	23	23	27	12	-77%	20.60	-53%
R7	2	19	17	21	7	-100%	13.20	-61%
R8	23	25	24	25	13	-63%	22.00	-51%
R9	34	24	23	27	13	-70%	24.20	-60%
R10	44	24	26	30	14	-73%	27.60	-65%
R11	28	23	21	25	12	-70%	21.80	-58%
R12	19	20	21	23	9	-88%	18.40	-69%
R13	34	22	21	25	12	-70%	22.80	-62%
R14	32	25	23	27	13	-70%	24.00	-59%
R15	14	22	21	24	11	-74%	18.40	-50%
R16	31	23	23	26	12	-74%	23.00	-63%
R17	26	23	24	26	12	-74%	22.20	-60%
R18	23	21	22	22	11	-67%	19.80	-57%
R19	26	22	21	24	11	-74%	20.80	-62%
R20	23	23	21	24	12	-67%	20.60	-53%
R21	28	23	21	24	11	-74%	21.40	-64%
R22	24	23	21	27	11	-84%	21.20	-63%
R23	23	21	19	21	11	-63%	19.00	-53%
R24	21	20	21	24	11	-74%	19.40	-55%
R25	17	21	22	25	12	-70%	19.40	-47%
R26	27	22	22	26	12	-74%	21.80	-58%
R27	16	20	22	25	11	-78%	18.80	-52%
R28	23	22	21	24	11	-74%	20.20	-59%
R29	16	23	21	25	11	-78%	19.20	-54%
R30	26	22	20	26	12	-74%	21.20	-55%
R31	15	22	22	25	10	-86%	18.80	-61%
R32	23	24	21	26	13	-67%	21.40	-49%
R33	11	20	19	23	10	-79%	16.60	-50%
R34	8	22	18	22	9	-84%	15.80	-55%
R35	18	20	19	23	10	-79%	18.00	-57%
R36	28	23	24	26	13	-67%	22.80	-55%
R37	26	24	23	25	12	-70%	22.00	-59%
R38	21	23	22	25	11	-78%	20.40	-60%
R39	25	23	21	23	11	-71%	20.60	-61%
R40	30	23	22	24	11	-74%	22.00	-67%
R41	11	21	19	23	11	-71%	17.00	-43%
R42	0	18	17	20	7	-96%	12.40	-56%
R43	32	24	21	26	13	-67%	23.20	-56%

Legend:	< 50%
	> 25%

R5, R7, R42 – 2009 OSL readings were lower than subsequent OSL readings . The OSL elements could have been wet since they are located on Squaw Creek Reservoir.

C. Airborne Program

Air particulate and air iodine samples were collected each week from the eight monitoring locations described in Table 1 – Comanche Peak Nuclear Power Plant Radiological Monitoring Program for 2013. Each air particulate sample was collected by drawing air through a 47 millimeter-diameter glass-fiber filter. Air iodine was collected by drawing air through a TEDA impregnated charcoal cartridge which was connected in series behind the air particulate filter. Shipped to an independent laboratory, air particulate filters were analyzed weekly for gross beta activity and were composited quarterly for gamma spectrometry analysis. Charcoal cartridges were analyzed weekly for Iodine-131.

For the year 2013, a total of 423 air particulate filters were collected and analyzed for gross beta activity. The reported gross beta activity ranged from a minimum value of **1.8E-02 pCi/m^3** to a maximum value of **1.79E-01 pCi/m^3**. Table 4 – 2013 Environmental Airborne Particulate Gross Beta Results contains the reported values of all samples. There were no anomalies noted in the data reported for 2013 when compared to pre-operational and previous operational data. Graph 1 – 2013 Environmental Air Sample Gross Beta Results – Maximum and Minimum trends the weekly high and low gross beta values to show the seasonal variation of the results as well as providing indication of consistency between the individual monitoring locations.

A total of 423 charcoal cartridges were analyzed for airborne Iodine-131. Table 5 – 2011 Environmental Air Sample Iodine-131 Results contains the reported values of each Iodine-131 analysis, all of which are less than the required lower limit of detection (LLD).

All air particulate filters were collected and composited quarterly and then analyzed by gamma spectrometry. The gamma isotopic data is presented in Table 6 – 2013 Environmental Air Particulate Composite Gamma Isotopic Results. Typical of pre-operational and previous operational data results, the only radioactive nuclide identified in all the samples was cosmogenic Beryllium-7, a naturally occurring isotope. Several Air Particulate Composite results were positive for Potassium-40. However, results indicate both were below the reporting levels,

A review of all the State of Texas air sample data indicated no anomalies.

During the year 2013, there were two exceptions to the Airborne Program.

On February 7th 2013 CPNPP was notified by GEL Laboratories that Air Sample Location A-1 (Particulate Filter and Charcoal Cartridge) was not received with the Environmental Weekly Shipment. CPNPP performed an investigation and determined that all procedural requirements for shipping Environmental Samples were met. These requirements include the Environmental Technician and Radiation Protection Supervisor performing a required self check and peer check prior to the shipment being sent. Sample could not be located by Gel Laboratories or CPNPP. Details are documented in Condition Report 2013-001311.

Positive Beta Activity above the LLD was detected on Air Samples collected at locations A-3, A-4, A-5, A-6, and A-8 for the monitoring period of December 9th through 16th of 2013 and at location A-3 for the monitoring period of December 23rd through 30th 2013. There is no CPNPP ODCM Air Sample Gross Beta Activity limit, but CPNPP has not had any recent history of more than a couple random samples indicating Gross Beta Activity above the LLD. A Condition Report was generated to dive deeper into the increased number of Gross Beta Activities greater than the LLD. GEL Laboratories was notified by Radiation Protection Supervision pertaining to the positive results and CPNPP requested that the filters to be reanalyzed. The results indicated similar positive Beta activity results. The initial data received by GEL that indicated the positive beta activity results were used in this report. South Texas Project (STP) was contacted and they confirmed that they frequently experience similar high Gross beta Activity above their LLD. This exception was documented in Condition Report 2014-0000703

Table 4 – 2013 Environmental Airborne Particulate Gross Beta Results
(Units of pCi/m3)

	A-8	A-7	A-5	A-6	A-4	A-3	A-1	A-2
	Location							
	NW-1.0	SW/WSW-0.95	S/SSW-1.2	SW-12.3	SSE-4.5	E-3.5	N-1.45	N-9.4
Date				Control				Control
01-02-13	7.37 E-02	1.03E-01	1.07E-01	9.40E-02	9.19E-02	8.96E-02	1.47E-01	1.09E-01
01-08-13	7.75E-02	1.00E-01	1.06E-01	9.70E-02	8.64E-02	8.73E-02	1.41E-01	1.01E-01
01-15-13	3.36E-02	5.79E-02	5.72E-02	4.28E-02	4.62E-02	4.50E-02	4.90E-02	4.57E-02
01-22-13	5.36E-02	7.19E-02	9.06E-02	7.35E-02	7.86E-02	6.82E-02	6.83E-02	8.20E-02
01-29-13	8.11E-02	9.58E-02	9.09E-02	8.47E-02	9.42E-02	9.37E-02	1.13E-01	1.05E-01
02-05-13	4.58E-02	6.05E-02	5.82E-02	5.01E-02	6.07E-02	5.49E-02	CR 1311	6.38E-02
02-12-13	3.88E-02	5.21E-02	5.91E-02	4.72E-02	5.20E-02	4.31E-02	4.90E-02	6.14E-02
02-19-13	3.94E-02	4.67E-02	4.14E-02	4.72E-02	4.11E-02	5.03E-02	5.38E-02	4.30E-02
02-26-13	3.39E-02	4.77E-02	3.59E-02	4.67E-02	4.63E-02	4.11E-02	5.06E-02	5.07E-02
03-05-13	5.27E-02	5.81E-02	6.26E-02	4.82E-02	5.35E-02	6.94E-02	5.79E-02	6.23E-02
03-12-13	3.83E-02	5.08E-02	5.32E-02	4.54E-02	4.76E-02	4.95E-02	5.85E-02	6.79E-02
03-19-13	5.71E-02	7.30E-02	7.94E-02	6.90E-02	6.84E-02	7.90E-02	6.18E-02	7.23E-02
03-26-13	4.00E-02	5.44E-02	7.06E-02	4.61E-02	4.86E-02	4.41E-02	4.44E-02	5.22E-02
04-02-13	5.47E-02	6.17E-02	7.37E-02	5.43E-02	6.37E-02	6.30E-02	5.55E-02	6.91E-02
04-09-13	2.96E-02	3.72E-02	4.26E-02	3.66E-02	4.84E-02	3.72E-02	3.90E-02	4.04E-02
04-16-13	4.22E-02	5.49E-02	6.46E-02	4.37E-02	4.87E-02	5.38E-02	5.40E-02	7.02E-02
04-23-13	3.49E-02	5.40E-02	5.83E-02	4.39E-02	4.89E-02	4.17E-02	4.67E-02	5.21E-02
04-30-13	3.68E-02	5.76E-02	5.60E-02	4.51E-02	5.56E-02	4.46E-02	5.54E-02	5.92E-02
05-07-13	2.68E-02	3.36E-02	3.16E-02	3.22E-02	3.48E-02	3.54E-02	3.79E-02	4.10E-02
05-14-13	5.22E-02	6.22E-02	4.89E-02	5.55E-02	6.06E-02	5.52E-02	5.93E-02	6.51E-02
05-21-13	4.20E-02	5.67E-02	4.38E-02	5.17E-02	5.41E-02	5.63E-02	6.45E-02	5.48E-02
05-28-13	3.48E-02	3.77E-02	3.68E-02	3.74E-02	3.92E-02	3.49E-02	3.99E-02	6.06E-02
06-04-13	2.64E-02	3.25E-02	1.80E-02	2.90E-02	2.68E-02	2.81E-02	3.17E-02	4.14E-02
06-11-13	4.01E-02	3.96E-02	3.43E-02	3.45E-02	4.11E-02	3.20E-02	3.11E-02	5.45E-02
06-18-13	3.42E-02	4.65E-02	4.52E-02	4.07E-02	4.29E-02	3.61E-02	3.74E-02	5.57E-02
06-25-13	5.26E-02	6.25E-02	3.92E-02	4.90E-02	5.44E-02	3.83E-02	5.27E-02	7.75E-02
07-02-13	5.15E-02	7.09E-02	5.57E-02	5.55E-02	3.76E-02	4.98E-02	5.76E-02	7.41E-02
07-09-13	3.95E-02	5.00E-02	4.40E-02	4.00E-02	4.07E-02	4.65E-02	5.49E-02	7.02E-02
07-16-13	3.79E-02	4.38E-02	3.82E-02	4.20E-02	4.17E-02	4.26E-02	4.93E-02	6.89E-02
07-23-13	2.54E-02	2.89E-02	2.27E-02	3.22E-02	2.38E-02	2.42E-02	3.47E-02	3.63E-02
07-30-13	4.37E-02	5.96E-02	4.39E-02	5.20E-02	5.00E-02	4.86E-02	6.17E-02	8.20E-02
08-06-13	4.72E-02	6.18E-02	4.76E-02	4.23E-02	3.93E-02	4.88E-02	6.58E-02	7.75E-02
08-13-13	4.97E-02	5.35E-02	5.31E-02	4.51E-02	5.40E-02	4.73E-02	5.58E-02	7.28E-02
08-20-13	5.89E-02	6.87E-02	6.04E-02	5.00E-02	5.69E-02	5.06E-02	6.31E-02	7.98E-02
08-27-13	4.00E-02	3.21E-02	3.52E-02	3.39E-02	3.64E-02	2.42E-02	4.20E-02	4.81E-02
09-03-13	4.91E-02	6.36E-02	3.89E-02	5.36E-02	5.02E-02	4.17E-02	6.45E-02	7.90E-02
09-10-13	3.91E-02	5.60E-02	4.38E-02	4.59E-02	3.89E-02	3.55E-02	7.15E-02	5.76E-02
09-17-13	7.46E-02	7.41E-02	6.58E-02	6.56E-02	6.04E-02	5.46E-02	8.74E-02	8.37E-02
09-24-13	3.96E-02	4.48E-02	3.69E-02	4.40E-02	3.29E-02	3.05E-02	4.48E-02	4.88E-02
10-01-13	4.32E-02	4.91E-02	5.09E-02	3.89E-02	4.67E-02	4.56E-02	6.19E-02	6.30E-02
10-08-13	3.68E-02	3.92E-02	3.83E-02	3.28E-02	4.15E-02	3.64E-02	4.78E-02	4.69E-02
10-15-13	4.58E-02	5.68E-02	4.85E-02	4.82E-02	4.41E-02	4.26E-02	5.63E-02	5.69E-02
10-22-13	3.22E-02	3.95E-02	3.73E-02	4.27E-02	4.10E-02	3.02E-02	4.72E-02	4.65E-02
10-29-13	3.55E-02	4.96E-02	4.92E-02	4.53E-02	4.69E-02	3.45E-02	5.64E-02	6.45E-02
11-05-13	3.69E-02	2.76E-02	3.94E-02	3.67E-02	3.25E-02	2.78E-02	4.58E-02	4.61E-02
11-12-13	3.59E-02	4.18E-02	4.47E-02	4.28E-02	4.24E-02	4.85E-02	3.35E-02	8.02E-02
11-19-13	3.66E-02	3.87E-02	4.07E-02	4.17E-02	4.35E-02	5.54E-02	3.09E-02	9.33E-02
11-26-13	3.80E-02	4.31E-02	4.72E-02	3.53E-02	4.23E-02	5.29E-02	3.21E-02	8.78E-02
12-03-13	4.36E-02	3.36E-02	4.93E-02	4.67E-02	3.89E-02	6.59E-02	3.47E-02	6.98E-02
12-10-13	6.17E-02	5.39E-02	6.42E-02	6.67E-02	6.99E-02	1.04E-01	5.81E-02	3.40E-02
12-17-13	1.07E-01	9.38E-02	1.43E-01	1.26E-01	1.01E-01	1.79E-01	9.07E-02	6.25E-02
12-23-13	6.06E-02	5.34E-02	6.51E-02	6.62E-02	5.00E-02	9.65E-02	4.11E-02	4.07E-02
12-30-13	6.38E-02	5.44E-02	7.84E-02	6.85E-02	5.38E-02	1.03E-01	4.80E-02	5.39E-02
Required LLD	**1.00E-02**							

Graph 1 -- 2013 Environmental Air Sample Gross Beta Results - Maximum and Minimum

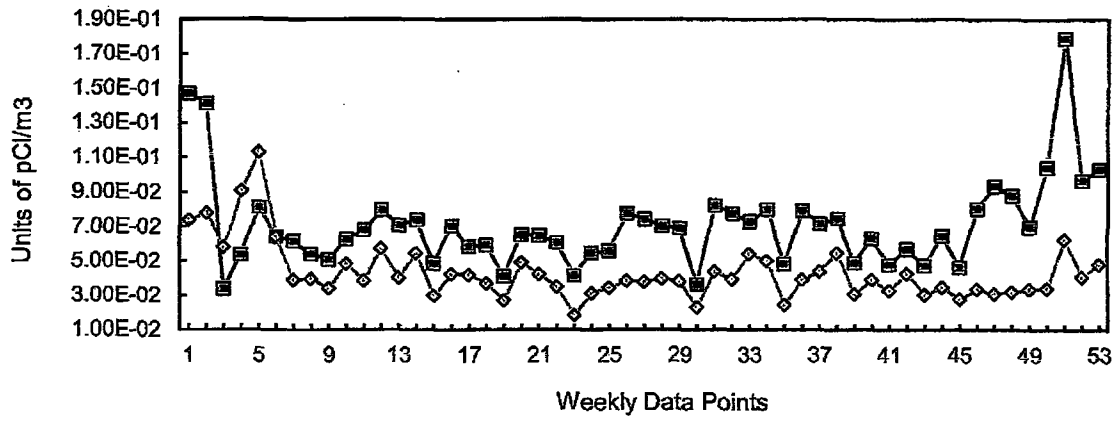


Table 5 -- 2013 Environmental Air Sample Iodine-131 Results
(Units of pCi/m3)

	A-8	A-7	A-5	A-6	A-4	A-3	A-1	A-2
	NW-1.0	SW/WSW-0.95	S/SSW-1.2	SW-12.3	SSE-4.5	E-3.5	N-1.45	N-9.4
Date				Control				Control
01-02-13	<1.33E-02	<2.75E-02	<1.68E-02	<3.98E-02	<2.03E-02	<2.96E-02	<2.11E-02	<2.00E-02
01-08-13	<2.27E-02	<3.83E-02	<2.95E-02	<3.03E-02	<2.09E-02	<2.59E-02	<4.83E-02	<2.75E-02
01-15-13	<1.93E-02	<8.78E-03	<1.67E-02	<9.85E-03	<2.81E-02	<1.51E-02	<9.42E-03	<1.14E-02
01-22-13	<1.80E-02	<2.71E-02	<3.19E-02	<3.03E-02	<3.03E-02	<1.43E-02	<2.11E-02	<2.82E-02
01-29-13	<2.18E-02	<2.16E-02	<1.88E-02	<1.89E-02	<2.05E-02	<1.96E-02	<3.52E-02	<2.42E-02
02-05-13	<2.63E-02	<2.54E-02	<3.31E-02	<2.24E-02	<1.93E-02	<4.27E-02	CR 1311	<2.68E-02
02-12-13	<2.02E-02	<2.72E-02	<2.79E-02	<2.56E-02	<4.35E-02	<2.01E-02	<2.84E-02	<2.52E-02
02-19-13	<3.15E-02	<2.40E-02	<2.07E-02	<1.89E-02	<3.61E-02	<2.69E-02	<3.76E-02	<2.90E-02
02-26-13	<2.46E-02	<3.93E-02	<2.47E-02	<2.48E-02	<1.51E-02	<2.27E-02	<2.16E-02	<2.44E-02
03-05-13	<2.38E-02	<3.30E-02	<1.87E-02	<3.26E-02	<2.14E-02	<2.45E-02	<3.99E-02	<2.83E-02
03-12-13	<2.36E-02	<2.69E-02	<2.08E-02	<2.02E-02	<2.47E-02	<2.80E-02	<2.51E-02	<1.89E-02
03-19-13	<2.63E-02	<1.66E-02	<1.55E-02	<2.61E-02	<2.35E-02	<4.44E-02	<2.87E-02	<2.10E-02
03-26-13	<2.51E-02	<1.88E-02	<2.33E-02	<2.27E-02	<2.75E-02	<2.36E-02	<3.81E-02	<2.29E-02
04-02-13	<2.31E-02	<2.32E-02	<2.93E-02	<1.88E-02	<3.33E-02	<2.49E-02	<1.85E-02	<1.35E-02
04-09-13	<3.29E-02	<4.51E-02	<2.65E-02	<3.82E-02	<4.43E-02	<3.08E-02	<3.05E-02	<3.42E-02
04-16-13	<2.45E-02	<2.88E-02	<2.62E-02	<3.35E-02	<2.47E-02	<5.71E-02	<5.18E-02	<3.61E-02
04-23-13	<1.82E-02	<2.39E-02	<2.31E-02	<1.64E-02	<2.56E-02	<2.48E-02	<2.84E-02	<2.56E-02
04-30-13	<3.22E-02	<1.36E-02	<3.62E-02	<2.60E-02	<3.13E-02	<2.30E-02	<3.65E-02	<2.21E-02
05-07-13	<2.76E-02	<4.08E-02	<2.53E-02	<1.94E-02	<3.72E-02	<2.59E-02	<3.20E-02	<4.46E-02
05-14-13	<2.15E-02	<3.27E-02	<4.01E-02	<5.05E-02	<4.88E-02	<3.28E-02	<3.95E-02	<3.49E-02
05-21-13	<2.11E-02	<2.97E-02	<3.38E-02	<3.68E-02	<4.64E-02	<2.84E-02	<5.64E-02	<4.07E-02
05-28-13	<2.77E-02	<2.29E-02	<2.43E-02	<4.77E-02	<3.08E-02	<2.17E-02	<2.12E-02	<2.89E-02
06-04-13	<2.21E-02	<2.46E-02	<3.02E-02	<3.44E-02	<2.24E-02	<2.67E-02	<4.37E-02	<2.38E-02
06-11-13	<2.26E-02	<2.12E-02	<4.21E-02	<2.59E-02	<1.66E-02	<2.69E-02	<2.95E-02	<1.60E-02
06-18-13	<2.40E-02	<2.73E-02	<2.97E-02	<1.98E-02	<4.31E-02	<3.03E-02	<2.04E-02	<2.71E-02
06-25-13	<2.10E-02	<2.61E-02	<3.53E-02	<2.04E-02	<3.08E-02	<4.93E-02	<2.21E-02	<2.31E-02
07-02-13	<2.54E-02	<1.83E-02	<2.59E-02	<3.21E-02	<3.44E-02	<2.46E-02	<1.87E-02	<3.09E-02
07-09-13	<6.04E-02	<5.78E-02	<4.65E-02	<5.28E-02	<5.26E-02	<6.40E-02	<6.71E-02	<4.59E-02
07-16-13	<3.83E-02	<5.32E-02	<4.89E-02	<6.63E-02	<5.25E-02	<6.60E-02	<3.85E-02	<3.67E-02
07-23-13	<4.35E-02	<2.80E-02	<6.66E-02	<5.00E-02	<3.46E-02	<5.42E-02	<6.35E-02	<4.86E-02
07-30-13	<3.27E-02	<3.75E-02	<5.26E-02	<3.31E-02	<3.34E-02	<2.24E-02	<3.51E-02	<4.29E-02
08-06-13	<2.09E-02	<4.36E-02	<2.85E-02	<2.35E-02	<3.99E-02	<4.00E-02	<2.68E-02	<2.93E-02
08-13-13	<2.61E-02	<2.42E-02	<2.68E-02	<3.15E-02	<2.67E-02	<2.45E-02	<1.85E-02	<2.43E-02
08-20-13	<4.00E-02	<2.47E-02	<3.11E-02	<5.71E-02	<2.97E-02	<5.21E-02	<1.60E-02	<5.61E-02
08-27-13	<2.51E-02	<2.23E-02	<2.23E-02	<2.16E-02	<3.62E-02	<3.97E-02	<2.58E-02	<4.36E-02
09-03-13	<5.27E-02	<4.64E-02	<6.44E-02	<6.52E-02	<3.77E-02	<2.15E-02	<2.79E-02	<5.50E-02
09-10-13	<5.78E-02	<2.00E-02	<3.17E-02	<3.66E-02	<3.17E-02	<3.21E-02	<3.30E-02	<5.05E-02
09-17-13	<3.39E-02	<5.24E-02	<3.71E-02	<6.41E-02	<2.80E-02	<2.62E-02	<3.45E-02	<4.12E-02
09-24-13	<2.27E-02	<1.74E-02	<1.80E-02	<2.18E-02	<1.62E-02	<3.85E-02	<3.79E-02	<2.37E-02
10-01-13	<3.63E-02	<2.54E-02	<4.54E-02	<2.25E-02	<4.26E-02	<3.66E-02	<3.36E-02	<5.12E-02
10-08-13	<2.18E-02	<2.49E-02	<1.87E-02	<2.40E-02	<4.33E-02	<1.73E-02	<2.58E-02	<1.98E-02
10-15-13	<1.84E-02	<5.28E-02	<3.27E-02	<1.50E-02	<2.78E-02	<1.68E-02	<3.89E-02	<2.69E-02
10-22-13	<4.21E-02	<3.99 E-02	<3.89E-02	<2.13E-02	<2.68E-02	<3.05E-02	<4.49E-02	<2.87E-02
10-29-13	<5.08E-02	<3.19E-02	<2.80E-02	<3.11E-02	<1.98E-02	<2.49E-02	<3.63E-02	<3.69E-02
11-05-13	<2.83E-02	<4.18E-02	<3.65E-02	<2.61E-02	<2.60E-02	<2.70E-02	<2.24E-02	<1.87E-02
11-12-13	<2.27E-02	<4.82E-02	<2.45E-02	<2.99E-02	<1.84E-02	<3.22E-02	<2.76E-02	<2.46E-02
11-19-13	<3.79E-02	<2.58E-02	<2.85E-02	<2.40E-02	<2.60E-02	<2.57E-02	<3.30E-02	<2.47E-02
11-26-13	<2.23E-02	<1.63E-02	<2.07E-02	<3.01E-02	<2.21E-02	<1.76E-02	<1.95E-02	<3.08E-02
12-03-13	<3.44E-02	<2.60E-02	<2.50E-02	<3.40E-02	<2.96E-02	<2.46E-02	<2.88E-02	<2.35E-02
12-10-13	<2.20E-02	<3.46E-02	<3.94E-02	<6.32E-02	<1.59E-02	<2.32E-02	<2.66E-02	<2.67E-02
12-17-13	<1.34E-02	<3.83E-02	<4.25E-02	<2.48E-02	<4.28E-02	<2.42E-02	<3.93E-02	<2.68E-02
12-24-13	<2.91E-02	<1.41E-02	<4.10E-02	<3.95E-02	<2.81E-02	<2.58E-02	<3.07E-02	<6.93E-02
12-31-13	<3.06E-02	<3.00E-02	<2.26E-02	<3.65E-02	<2.64E-02	<1.58E-02	<1.95E-02	<1.83E-02
Required LLD 7.00E-02								

Table 6 -- 2013 Environmental Air Particulate Composite Gamma Isotopic Results
(Units of pCi/m3)

		A-8	A-7	A-5	A-6	A-4	A-3	A-1	A-2	
	Location	NW-1.0	SW/WSW-0.95	SSW-1.2	SW-12.3	SSE-4.5	E-3.5	N-1.45	N-9.4	
	Nuclides				Control				Control	
	Ba-140	<2.52E-01	<2.36E-01	<2.83E-01	<4.65E-01	<1.92E-01	<2.09E-01	<2.61E-01	<2.11E-01	
	Be-7	1.36E-01	1.73E-01	1.78E-01	1.88E-01	1.67E-01	1.63E-01	1.99E-01	2.06E-01	
	Co-57	<4.09E-04	<3.01E-04	<3.68E-04	<5.37E-04	<2.99E-04	<3.01E-04	<2.70E-04	<3.68E-04	
	Co-58	<1.24E-03	<1.19E-03	<1.34E-03	<2.26E-03	<9.88E-04	<9.77E-04	<1.07E-03	<1.10E-03	
Composite Dates	Co-60	<5.57E-04	<6.79E-04	<6.45E-04	<1.22E-03	<6.63E-04	<6.38E-04	<8.55E-04	<6.94E-04	
1ST QTR	Cs-134	<6.63E-04	<6.26E-04	<5.67E-04	<1.16E-03	<5.20E-04	<5.61E-04	<6.78E-04	<5.63E-04	Required LLD 5.0E-2
1/2/13 – 3/26/13	Cs-137	<6.31E-04	<5.65E-04	<5.82E-04	<9.98E-04	<5.28E-04	<4.15E-04	<5.54E-04	<5.20E-04	Required LLD 6.0E-2
	Fe-59	<3.76E-03	<4.12E-03	<3.18E-03	<8.16E-03	<4.28E-03	<4.46E-03	<5.70E-03	<3.35E-03	
	K-40	1.07E-02	1.08E-02	<7.69E-03	<9.39E-03	<5.56E-03	<7.25E-03	<1.26E-02	1.02E-02	
	La-140	<7.47E-02	<8.99E-02	<9.65E-02	<1.58E-01	<5.47E-02	<8.98E-02	<1.60E-01	<8.39E-02	
	Mn-54	<6.87E-04	<5.60E-04	<5.75E-04	<1.24E-03	<3.84E-04	<6.56E-04	<6.12E-04	<5.91E-04	
	Nb-95	<1.37E-03	<1.30E-03	<1.35E-03	<2.46E-03	<1.22E-03	<1.35E-03	<1.72E-03	<1.26E-03	
	Zn-65	<1.32E-03	<1.30E-03	<1.34E-03	<2.66E-03	<1.42E-03	<1.64E-03	<2.12E-03	<1.47E-03	
	Zr-95	<2.44E-03	<2.31E-03	<2.22E-03	<5.01E-03	<2.12E-03	<1.50E-03	<2.02E-03	<2.14E-03	
	Ba-140	<1.47E+00	<1.28E+00	<2.69E+00	<1.12E+00	<9.47E-01	<1.59E+00	<1.07E+00	<1.21E+00	
	Be-7	1.61E-01	1.56E-01	1.51E-01	1.57E-01	1.73E-01	1.78E-01	1.88E-01	2.61E-01	
	Co-57	<5.49E-04	<4.94E-04	<7.50E-04	<6.45E-04	<5.13E-04	<6.37E-04	<4.91E-04	<5.47E-04	
	Co-58	<2.18E-03	<2.16E-03	<3.48E-03	<2.83E-03	<1.45E-03	<2.24E-03	<2.10E-03	<1.82E-03	
Composite Dates	Co-60	<1.11E-03	<1.03E-03	<2.03E-03	<1.15E-03	<6.97E-04	<1.15E-03	<9.42E-04	<8.96E-04	
2ND QTR	Cs-134	<6.94E-04	<1.05E-03	<1.83E-03	<1.35E-03	<8.30E-04	<9.70E-04	<8.15E-04	<7.45E-04	Required LLD 5.0E-2
4/2/13 – 6/25/13	Cs-137	<6.84E-04	<7.41E-04	<1.27E-03	<1.06E-03	<5.96E-04	<7.53E-04	<7.43E-04	<7.01E-04	Required LLD 6.0E-2
	Fe-59	<9.22E-03	<1.24E-02	<2.09E-02	<9.91E-03	<1.01E-02	<9.04E-03	<6.75E-03	<6.53E-03	
	K-40	<1.48E-02	<6.30E-03	<2.41E-02	<1.01E-02	<1.81E-02	<8.65E-03	1.72E-02	<7.29E-03	
	La-140	<6.70E-01	<5.10E-01	<1.52E+00	<7.20E-01	<6.01E-01	<5.75E-01	<2.46E-01	<1.06E-01	
	Mn-54	<1.18E-03	<7.82E-04	<1.53E-03	<1.08E-03	<1.00E-03	<7.16E-04	<9.12E-04	<8.51E-04	
	Nb-95	<2.41E-03	<2.58E-03	<6.23E-03	<2.76E-03	<2.17E-03	<2.33E-03	<1.91E-03	<2.49E-03	
	Zn-65	<2.47E-03	<2.37E-03	<4.44E-03	<2.06E-03	<2.41E-03	<2.82E-03	<2.32E-03	<2.37E-03	
	Zr-95	<3.73E-03	<3.53E-03	<1.09E-02	<3.31E-03	<4.50E-03	<3.37E-03	<4.17E-03	<4.95E-03	

Table 6 – 2013 Environmental Air Particulate Composite Gamma Isotopic Results (continued)
(Units of pCi/m3)

		A-8	A-7	A-5	A-6	A-4	A-3	A-1	A-2	
	Location	**NW-1.0**	**SW/WSW-0.95**	**SSW-1.2**	**SW-12.3**	**SSE-4.5**	**E-3.5**	**N-1.45**	**N-9.4**	
	Nuclides				**Control**				**Control**	
	Ba-140	<1.23E-01	<1.10E-01	<2.35E-01	<1.10E-01	<1.42E-01	<1.27E-01	<1.17E-01	<1.43E-01	
	Be-7	1.53E-01	1.85E-01	1.63E-01	1.65E-01	1.64E-01	1.51E-01	2.35E-01	2.36E-01	
	Co-57	<3.21E-04	<3.39E-04	<4.93E-04	<3.31E-04	<3.57E-04	<3.08E-04	<3.58E-04	<3.03E-04	
	Co-58	<1.25E-03	<9.38E-04	<2.21E-03	<9.47E-04	<1.02E-03	<1.10E-03	<1.04E-03	<7.71E-04	
Composite Dates	**Co-60**	<6.39E-04	<4.73E-04	<1.04E-03	<5.47E-04	<6.28E-04	<5.73E-04	<4.97E-04	<5.80E-04	
3RD QTR	**Cs-134**	<6.29E-04	<5.13E-04	<1.17E-03	<5.87E-04	<7.32E-04	<5.87E-04	<5.93E-04	<5.26E-04	**Required LLD 5.0E-2**
7/2/13 – 9/24/13	**Cs-137**	<6.69E-04	<4.38E-04	<9.48E-04	<4.77E-04	<5.09E-04	<4.50E-04	<4.04E-04	<5.14E-04	**Required LLD 6.0E-2**
	Fe-59	<3.46E-03	<2.70E-03	<6.69E-03	<3.03E-03	<3.48E-03	<3.37E-03	<3.39E-03	<2.95E-03	
	K-40	9.85E-03	9.55E-03	<1.83E-02	<5.38E-03	<6.85E-03	<2.33E-03	1.25E-02	1.44E-02	
	La-140	<5.88E-02	<4.39E-02	<1.09E-01	<4.70E-02	<7.20E-02	<6.09E-02	<5.84E-02	<5.29E-02	
	Mn-54	<6.47E-04	<5.36E-04	<1.26E-03	<5.93E-04	<7.00E-04	<4.10E-04	<6.24E-04	<5.94E-04	
	Nb-95	<1.35E-03	<1.06E-03	<1.66E-03	<9.99E-04	<1.48E-03	<1.25E-03	<1.13E-03	<1.42E-03	
	Zn-65	<1.87E-03	<1.37E-03	<2.29E-03	<1.35E-03	<1.52E-03	<1.32E-03	<1.35E-03	<1.31E-03	
	Zr-95	<2.60E-03	<1.88E-03	<3.15E-03	<2.05E-03	<1.97E-03	<1.88E-03	<1.84E-03	<2.24E-03	
	Ba-140	<4.88E-02	<6.65E-02	<1.76E-01	<7.26E-02	<2.03E-02	<4.36E-02	<4.31E-02	<5.31E-02	
	Be-7	1.35E-01	1.27E-01	1.61E-01	1.56E-01	1.45E-01	1.53E-01	1.17E-01	1.67E-01	
	Co-57	<4.36E-04	<5.02E-04	<6.87E-04	<6.20E-03	<5.99E-04	<5.10E-04	<5.23E-04	<4.02E-04	
	Co-58	<1.66E-03	<1.06E-03	<2.49E-03	<1.61E-03	<1.65E-03	<1.57E-03	<1.51E-03	<1.74E-03	
Composite Dates	**Co-60**	<9.38E-04	<9.83E-04	<2.28E-03	<1.20E-03	<8.87E-04	<7.19E-04	<7.48E-04	<4.45E-04	
4TH QTR	**Cs-134**	<9.56E-04	<7.37E-04	<1.80E-03	1.08E-04	<1.22E-03	<8.89E-04	<9.31E-04	<1.04E-03	**Required LLD 5.0E-2**
9/31/13- 12/30/13	**Cs-137**	<6.37E-04	<8.16E-04	<1.26E-03	<7.69E-04	<1.02E-03	<7.34E-04	<8.14E-04	<7.18E-04	**Required LLD 6.0E-2**
	Fe-59	<4.46E-03	<4.27E-03	<4.76E-03	<4.79E-03	<5.87E-03	<5.99E-03	<4.85E-03	<1.61E-03	
	K-40	1.88E-03	<9.75E-03	<2.01E-02	<1.67E-02	6.46E-03	1.66E-02	<1.38E-02	1.49E-02	
	La-140	<4.88E-02	<6.65E-02	<1.76E-01	<7.26E-02	<2.03E-02	<4.36E-02	<4.31E-02	<5.31E-02	
	Mn-54	<7.52E-04	<7.12E-04	<1.34E-03	<1.24E-03	<8.31E-04	<7.68E-04	<6.89E-04	<9.66E-04	
	Nb-95	<2.03E-03	<1.38E-03	<3.97-03	<1.73E-03	<2.15E-03	<1.68E-03	<1.33E-03	<2.07E-03	
	Zn-65	<2.15E-03	<1.94E-03	<2.52E-03	<2.34E-03	<2.07E-03	<2.41E-03	<2.22E-03	<2.06E-03	
	Zr-95	<3.00E-03	<2.33E-03	<6.57E-03	<2.14E-03	<3.19E-03	<3.02E-03	<3.17E-03	<2.89E-03	

D. Surface Water Program

Surface water monitoring stations are found at four locations as detailed in Table 1 – Comanche Peak Nuclear Power Plant Radiological Environmental Monitoring Program. Location N-1.5 provides samples representative of Squaw Creek reservoir surface water at a location beyond significant influence of the plant discharge. Location ESE-1.4 provides samples representative of discharges from Squaw Creek reservoir downstream to Squaw Creek and to Lake Granbury via an installed return line. [*NOTE: The installed return line to Lake Granbury has never been used to send water back to Lake Granbury.*] Location NE-7.4 provides samples of Lake Granbury surface water downstream of the discharge from the return line from Squaw Creek reservoir. A control sample is obtained from the Brazos River, upstream of Lake Granbury at location N-19.3. Surface water samples from Squaw Creek reservoir locations were collected weekly and composited for monthly gamma isotopic analysis. Samples from Lake Granbury locations were collected monthly and analyzed by gamma spectrometry. All surface water samples were also composited quarterly by location for tritium analysis.

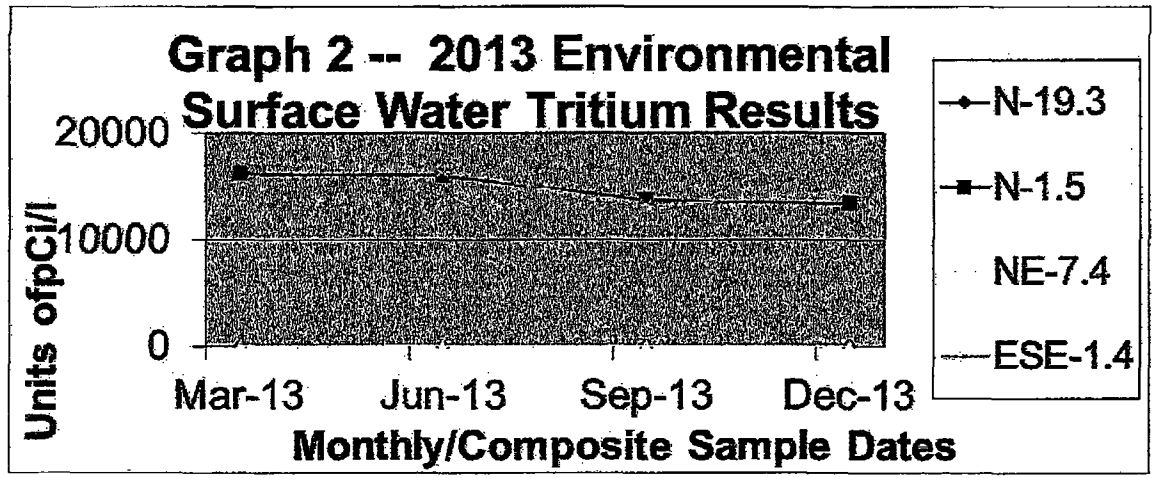
For the year 2013 all surface water samples were collected as required. Table 7 -- 2013 Environmental Surface Water Tritium and Gamma Isotopic Results contains the reported values. Forty-eight samples were analyzed by gamma spectrometry. All results for the required radionuclides were reported as less than the required LLDs. Sixteen quarterly composited samples were analyzed for tritium. The results of the reported tritium values for Squaw Creek reservoir were in line with expected concentrations. The tritium values ranged from a high of **1.75E+04** pCi/l to a low of **1.32E+04** pCi/l. The results from Lake Granbury were all less than the required LLDs as expected. The tritium concentration reported in Squaw Creek is well below the action level of **3.0E+4** pCi/l and is following the expected concentration variations based on fuel cycles, power histories and reservoir makeup due to rain and pump transfers from Lake Granbury. Graph 2 – 2013 Environmental Surface Water Tritium Results indicates the current results and the short-term trend of the tritium concentration in Squaw Creek reservoir. Graph 3 – Squaw Creek Maximum Tritium Values trends the reservoir tritium concentration since it was first detected in 1990 after Unit 1 startup and is located on page 29. This long-term graph also indicates that equilibrium concentrations may have been obtained. **Squaw Creek reservoir tritium is a direct product of the operation of CPNPP and is the only consistent indicator detectable in the environment surrounding Comanche Peak.**

There should not be any significant changes in the tritium concentrations in the near future and no action levels are anticipated. A review of pre-operational and operational data indicated the 2013 results were both expected and consistent with previous data and that no anomalies had occurred.

During the year 2013, there was no exceptions to the Surface Water Program.

Table 7 -- 2013 Environmental Surface Water Tritium and Gamma Isotopic Results
(Units of pCi/l)

	SW-5	H-3	Nuclides													
Date	Location		Ba-140	Be-7	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	K-40	La-140	Mn-54	Nb-95	Zn-65	Zr-95
01-29-13	ESE-1.4		<7.16E+00	<1.79E+01	<2.01E+00	<1.79E+00	<1.98E+00	<1.91E+00	<4.70E+00	<1.11E+01	<1.73E+01	<7.16E+00	<1.77E+00	<2.02E+00	<3.52E+00	<3.68E+00
02-26-13	ESE-1.4		<4.44E+00	<1.29E+01	<1.60E+00	<1.43E+00	<1.52E+00	<1.48E+00	<3.51E+00	<6.49E+00	4.11E+01	<4.44E+00	<1.42E+00	<1.64E+00	<3.00E+00	<2.96E+00
03-26-13	ESE-1.4	1.75E+04	<1.39E+01	<1.96E+01	<2.09E+00	<2.03E+00	<2.20E+00	<1.85E+00	<4.66E+00	<9.01E+00	4.80E+01	<6.01E+00	<1.83E+00	<1.89E+00	<4.14E+00	<4.15E+00
04-30-13	ESE-1.4		<7.27E+00	<2.28E+01	<2.25E+00	<2.19E+00	<2.23E+00	<2.14E+00	<5.36E+00	<1.28E+01	<1.98E+01	<7.27E+00	<2.00E+00	<2.52E+00	<4.40E+00	<4.28E+00
05-28-13	ESE-1.4		<5.93E+00	<1.98E+01	<2.17E+00	<2.23E+00	<2.13E+00	<2.18E+00	<5.05E+00	<9.23E+00	<1.98E+01	<5.93E+00	<2.08E+00	<2.38E+00	<4.74E+00	<3.93E+00
06-25-13	ESE-1.4	1.64E+04	<3.85E+00	<1.44E+01	<1.62E+00	<1.76E+00	<1.66E+00	<1.57E+00	<3.30E+00	<6.07E+00	<1.53E+01	<3.85E+00	<1.54E+00	<1.57E+00	<3.01E+00	<2.97E+00
07-30-13	ESE-1.4		<6.28E+00	<1.72E+01	<1.92E+00	<1.82E+00	<2.03E+00	<1.71E+00	<4.07E+00	<1.08E+01	<1.80E+01	<6.28E+00	<1.61E+00	<1.53E+00	<3.54E+00	<3.29E+00
08-27-13	ESE-1.4		<3.97E+00	<1.38E+01	<1.48E+00	<1.45E+00	<1.42E+00	<1.46E+00	<3.09E+00	<5.67E+00	<1.21E+01	<3.97E+00	<1.30e+00	<1.85E+00	<2.73E+00	<2.65E+00
09-24-13	ESE-1.4	1.32E+04	<5.79E+00	<1.63E+01	<1.74E+00	<1.65E+00	<1.65E+00	<1.59E+00	<3.83E+00	<8.06E+00	<1.70E+01	<5.79E+00	<1.60E+00	<2.08E+00	<3.55E+00	<3.26E+00
10-29-13	ESE-1.4		<5.85E+00	<1.80E+01	<1.96E+00	<2.00E+00	<1.97E+00	<1.68E+00	<4.67E+00	<8.68E+00	2.66E+01	<5.85E+00	<1.87E+00	<1.85E+00	<4.12E+00	<3.49E+00
11-26-13	ESE-1.4		<6.15E+00	<2.08E+01	<2.16E+00	<2.01E+00	<2.35E+00	<2.20E+00	<4.73E+00	<9.89E+00	2.29E+01	<6.15E+00	<1.88E+00	<2.63E+00	<4.29E+00	<3.47E+00
12-30-13	ESE-1.4	1.46E+04	<4.97E+00	<1.40E+01	<1.52E+00	<1.39E+00	<1.57E+00	<1.39E+00	<3.28E+00	<7.98E+00	3.39E+01	<4.97E+00	<1.33E+00	<1.73E+00	<2.89E+00	<2.86E+00
	SW-1															
01-29-13	N-1.5		<5.79E+00	<1.74E+01	<1.79E+00	<1.57E+00	<1.88E+00	<1.80E+00	<4.30E+00	<1.10E+01	<1.59E+01	<5.79E+00	<1.70E+00	<1.96E+00	<3.39E+00	<3.19E+00
02-26-13	N-1.5		<4.00E+00	<1.39E+01	<1.44E+00	<1.42E+00	<1.48E+00	<1.43E+00	<3.25E+00	<6.33E+00	2.45E+01	<4.00E+00	<1.30E+00	<1.43E+00	<2.86E+00	<2.88E+00
03-26-13	N-1.5	1.62E+04	<5.48E+00	<1.70E+01	<1.65E+00	<1.75E+00	<1.62E+00	<1.65E+00	<3.78E+00	<9.46E+00	<1.72E+01	<5.48E+00	<1.57E+00	<1.84E+00	<3.32E+00	<3.11E+00
04-30-13	N-1.5		<6.70E+00	<2.04E+01	<2.10E+00	<2.04E+00	<2.20E+00	<2.07E+00	<4.46E+00	<1.12E+01	<2.87E+01	<6.70E+00	<1.88E+00	<2.32E+00	<3.55E+00	<3.94E+00
05-28-13	N-1.5		<5.55E+00	<1.84E+01	<2.09E+00	<2.16E+00	<1.83E+00	<1.78E+00	<4.30E+00	<8.08E+00	<2.88E+01	<5.55E+00	<1.81E+00	<2.05E+00	<4.36E+00	<3.68E+00
06-25-13	N-1.5	1.60E+04	<3.18E+00	<1.31E+01	<1.37E+00	<1.46E+00	<1.41E+00	<1.51E+00	<2.87E+00	<4.62E+00	<1.32E+01	<3.18E+00	<1.31E+00	<1.45E+00	<2.97E+00	<2.56E+00
07-30-13	N-1.5		<5.84E+00	<1.62E+01	<1.81E+00	<1.64E+00	<1.74E+00	<1.68E+00	<4.42E+00	<1.01E+01	<1.58E+01	<5.84E+00	<1.59E+00	<1.81E+00	<3.65E+00	<3.47E+00
08-27-13	N-1.5		<3.56E+00	<1.38E+01	<1.41E+00	<1.32E+00	<1.47E+00	<1.50E+00	<3.00E+00	<5.24E+00	<1.26E+01	<3.56E+00	<1.28E+00	<1.61E+00	<2.70E+00	<2.55E+00
09-24-13	N-1.5	1.37E+04	<6.71E+00	<1.94E+01	<2.10E+00	<1.82E+00	<1.94E+00	<1.92E+00	<4.59E+00	<1.02E+01	<2.79E+01	<6.71E+00	<1.79E+00	<2.26E+00	<3.48E+00	<3.61E+00
10-29-13	N-1.5		<5.87E+00	<2.06E+01	<2.28E+00	<2.42E+00	<2.16E+00	<2.18E+00	<5.53E+00	<9.87E+00	2.06E+01	<5.87E+00	<1.88E+00	<2.29E+00	<4.70E+00	<3.63E+00
11-26-13	N-1.5		<6.88E+00	<2.11E+01	<2.39E+00	<2.45E+00	<2.35E+00	<2.16E+00	<5.88E+00	<1.02E+01	5.04E+01	<6.88E+00	<2.17E+00	<2.65E+00	<4.57E+00	<4.23E+00
12-30-13	N-1.5	1.34E+04	<6.63E+00	<2.01E+01	<2.06E+00	<1.85E+00	<2.03E+00	<1.84E+00	<4.81E+00	<1.05E+01	4.02E+01	<6.63E+00	<1.84E+00	<2.35E+00	<4.01E+00	<3.66E+00
	SW-4															
01-29-13	NE-7.4		<2.55E+00	<1.32E+01	<1.50E+00	<1.52E+00	<1.65E+00	<2.11E+00	<3.20E+00	<2.33E+00	<2.10E+01	<2.55E+00	<1.54E+00	<1.63E+00	<3.15E+00	<2.56E+00
02-26-13	NE-7.4		<2.44E+00	<1.34E+01	<1.49E+00	<1.64E+00	<1.75E+00	<1.65E+00	<3.10E+00	<2.84E+00	<1.46E+01	<2.44E+00	<1.42E+00	<1.56E+00	<2.86E+00	<2.66E+00
03-26-13	NE-7.4	<5.05E+02	<3.34E+00	<1.64E+01	<2.13E+00	<1.96E+00	<2.07E+00	<2.10E+00	<4.08E+00	<3.68E+00	<2.72E+01	<3.34E+00	<2.24E+00	<1.97E+00	<4.11E+00	<3.69E+00
04-30-13	NE-7.4		<3.03E+00	<1.77E+01	<1.88E+00	<1.98E+00	<2.16E+00	<2.10E+00	<4.40E+00	<3.57E+00	<2.09E+01	<3.03E+00	<1.90E+00	<1.89E+00	<4.32E+00	<3.12E+00
05-28-13	NE-7.4		<3.81E+00	<1.98E+01	<2.08E+00	<2.04E+00	<2.35E+00	<2.18E+00	<3.88E+00	<3.91E+00	<2.08E+01	<3.81E+00	<2.00E+00	<2.08E+00	<3.99E+00	<3.82E+00
06-25-13	NE-7.4	<5.38E+02	<1.94E+00	<1.23E+01	<1.32E+00	<1.47E+00	<1.55E+00	<1.46E+00	<2.66E+00	<1.98E+00	<1.41E+01	<1.94E+00	<1.37E+00	<1.41E+00	<2.87E+00	<2.51E+00
07-30-13	NE-7.4		<5.12E+00	<2.03E+01	<2.51E+00	<2.90E+00	<2.62E+00	<2.29E+00	<5.57E+00	<4.63E+00	<3.23E+01	<5.12E+00	<2.25E+00	<2.31E+00	<4.86E+00	<4.39E+00
08-27-13	NE-7.4		<3.60E+00	<1.85E+01	<2.03E+00	<2.61E+00	<2.70E+00	<2.03E+00	<4.20E+00	<3.44E+00	<2.30E+01	<3.60E+00	<2.14E+00	<2.02E+00	<4.51E+00	<3.79E+00
09-24-13	NE-7.4	<4.05E+02	<3.22E+00	<1.37E+01	<1.64E+00	<1.52E+00	<1.52E+00	<1.68E+00	<3.14E+00	<3.22E+00	<1.42E+01	<3.22E+00	<1.49E+00	<1.66E+00	<3.09E+00	<2.75E+00
10-29-13	NE-7.4		<2.72E+00	<1.51E+01	<1.75E+00	<1.86E+00	<2.08E+00	<2.11E+00	<3.67E+00	<2.40E+00	<2.91E+01	<2.72E+00	<1.77E+00	<1.76E+00	<3.74E+00	<3.10E+00
11-26-13	NE-7.4		<5.00E+00	<2.18E+01	<2.11E+00	<2.69E+00	<2.76E+00	<2.51E+00	<5.25E+00	<4.41E+00	3.00E+01	<5.00E+00	<2.47E+00	<2.49E+00	<4.85E+00	<4.13E+00
12-30-13	NE-7.4	<3.78E+02	<5.14E+00	<3.54E+01	<3.17E+00	<4.42E+00	<5.15E+00	<4.12E+00	<8.04E+00	<8.30E+00	<4.66E+01	<5.14E+00	<2.77E+00	<4.18E+00	<7.52E+00	<5.98E+00
	SW-3															
01-29-13	N-19.3		<2.45E+00	<1.39E+01	<1.54E+00	<1.46E+00	<1.54E+00	<1.61E+00	<3.11E+00	<2.43E+00	<1.61E+01	<2.45E+00	<1.65E+00	<1.57E+00	<3.35E+00	<2.93E+00
02-26-13	N-19.3		<2.15E+00	<1.16E+01	<1.34E+00	<1.79E+00	<1.44E+00	<1.35E+00	<2.78E+00	<2.39E+00	<1.99E+01	<2.15E+00	<1.28E+00	<1.36E+00	<2.62E+00	<2.45E+00
03-26-13	N-19.3	<5.07E+02	<2.92E+00	<1.37E+01	<1.62E+00	<1.81E+00	<1.89E+00	<1.62E+00	<3.45E+00	<3.07E+00	<2.44E+01	<2.92E+00	<1.67E+00	<1.70E+00	<3.51E+00	<2.96E+00
04-30-13	N-19.3		<3.15E+00	<1.56e+01	<1.64E+00	<1.76E+00	<1.94E+00	<2.28E+00	<3.64E+00	<3.26E+00	<2.57E+01	<3.15E+00	<1.72E+00	<1.87E+00	<3.41E+00	<3.16E+00
05-28-13	N-19.3		<2.69E+00	<1.54E+01	<1.69E+00	<1.98E+00	<1.91E+00	<1.98E+00	<3.46E+00	<3.34E+00	<1.80E+01	<2.69E+00	<1.85E+00	<1.90E+00	<3.58E+00	<3.23E+00
06-25-13	N-19.3	<5.49E+02	<1.98E+00	<1.18E+01	<1.25E+00	<1.46E+00	<1.46E+00	<1.45E+00	<2.50E+00	<1.84E+00	<1.51E+01	<1.98E+00	<1.26E+00	<1.52E+00	<2.98E+00	<2.34E+00
07-30-13	N-19.3		<3.84E+00	<1.86E+01	<2.08E+00	<2.35E+00	<2.32E+00	<2.07E+00	<4.47E+00	<4.61E+00	<2.04E+01	<3.84E+00	<1.91E+00	<2.12E+00	<3.96E+00	<3.77E+00
08-27-13	N-19.3		<3.65E+00	<1.91E+01	<1.99E+00	<2.36E+00	<2.22E+00	<2.38E+00	<4.63E+00	<3.36E+00	<2.09E+01	<3.65E+00	<1.91E+00	<2.49E+00	<4.85E+00	<3.73E+00
09-24-13	N-19.3	<3.99E+02	<2.93E+00	<1.41E+01	<1.52E+00	<1.79E+00	<1.69E+00	<2.06E+00	<3.02E+00	<3.60E+00	<1.59E+01	<2.93E+00	<1.56E+00	<1.88E+00	<2.90E+00	<2.81E+00
10-29-13	N-19.3		<2.30E+00	<1.33E+01	<1.60E+00	<1.83E+00	<1.74E+00	<1.80E+00	<3.26E+00	<2.30E+00	<1.63E+01	<2.30E+00	<1.61E+00	<1.71E+00	<3.08E+00	<2.81E+00
11-26-13	N-19.3		<4.01E+00	<1.97E+01	<2.01E+00	<2.55E+00	<2.37E+00	<2.42E+00	<4.63E+00	<4.27E+00	6.73E+01	<4.01E+00	<2.24E+00	<2.27E+00	<4.50E+00	<3.94E+00
12-30-13	N-19.3	<3.85E+02	<7.02E+00	<3.47E+01	<3.49E+00	<4.48E+00	<4.83E+00	<4.86E+00	<9.13E+00	<7.38E+00	<6.81E+01	<7.02E+00	<4.20E+00	<4.02E+00	<9.29E+00	<7.19E+00
Required LLD's		2.00E+03	1.50e+01		1.50e+01	1.50e+01	1.50e+01	1.50e+01	3.00e+01			1.50e+01	1.50e+01	1.50e+01	3.00e+01	1.50e+01
Reportable Level		3.00e+04	2.00e+02		1.00e+03	3.00e+02	3.00e+01	5.00e+01	4.00e+02			2.00e+02	1.00e+03	4.00e+02	3.00e+02	4.00e+02


Graph 2 -- 2013 Environmental Surface Water Tritium Results
20000
10000
0
Units ofpCi/l
Mar-13
Jun-13
Sep-13
Dec-13
Monthly/Composite Sample Dates
N-19.3
N-1.5
NE-7.4
ESE-1.4

E. Surface Drinking Water Program

Surface drinking water was collected at two monitoring locations. Table 1 -- Comanche Peak Nuclear Power Plant Radiological Environmental Monitoring Program for 2013 details the location and types of analysis required. Samples of water from Squaw Creek reservoir were collected at the monitoring location NNW-0.1 and analyzed at detection levels required for drinking water standards even though the water is not allowed to be used as potable water. There is not a surface water drinking source within a mile of CPNPP. Monitoring location N-9.9 was used as a surface drinking water location based on the proximity of the City of Granbury intake to the Granbury potable water system. All surface drinking water samples were collected weekly and then composited for Iodine-131 analysis, gamma isotopic analysis, and gross beta analysis on a monthly basis. Tritium analysis was performed on a quarterly basis.

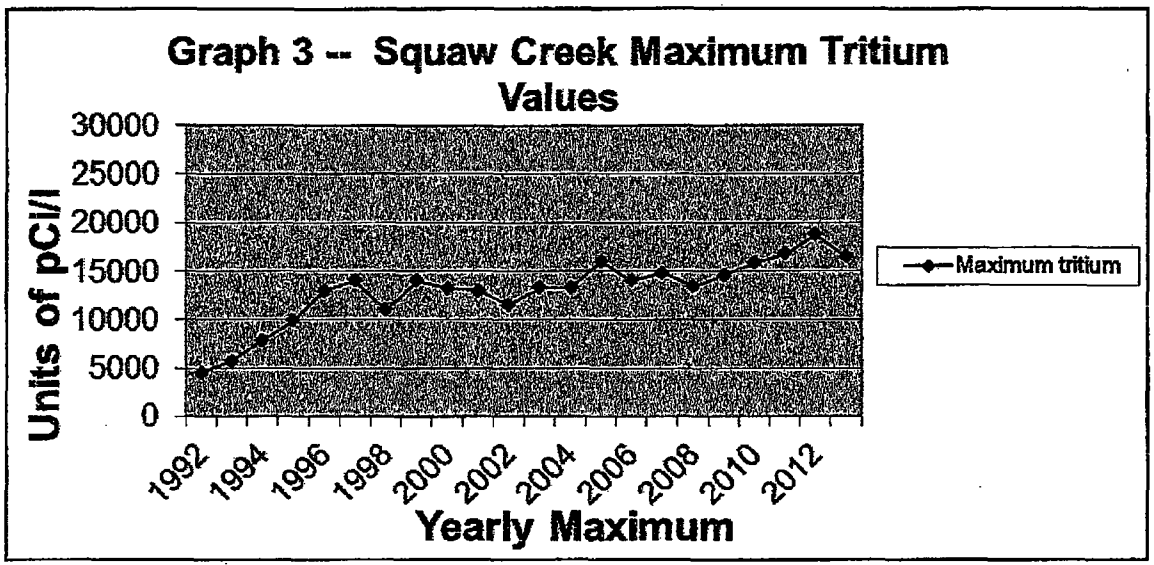
For the year 2013, all samples were analyzed for gamma emitting radionuclides. The results are reported in Table 8 – Environmental Surface Drinking Water Tritium, Gross Beta and Gamma Isotopic Results. There were no gamma emitting radionuclides identified in any of the twenty-four composite samples. Tritium reported in Squaw Creek reservoir ranged from **1.37E+04 pCi/l to 1.64E+04 pCi/l** and **averaged 1.49E+04 pCi/l.** Tritium reported from all Lake Granbury water samples indicated less than the required LLD as expected. Graph 4 – 2013 Environmental Surface Drinking Water Tritium Results trends the results reported for the year 2013. Gross Beta results at the indicator location NNW-0.1 ranged from **<8.33+00 pCi/l to 2.55E+01 pCi/l** with an average of **1.74+01 pCi/l.** Gross Beta results at the control location N-9.9 ranged from **<2.49E+00 pCi/l to 1.31E+01 pCi/l** with an average of **8.63E+00 pCi/l.** Graph 5 – 2011 Environmental Surface Drinking Water Gross Beta Results trends the gross beta results for the two monitor locations and indicates no influence from Comanche Peak in the levels detected in the two different bodies of water. Past gross beta results for Lake Granbury have been as high as **83 pCi/l.** The gross beta results received are within values previously reported and there is no reportable level for gross beta so no action is required at this time.

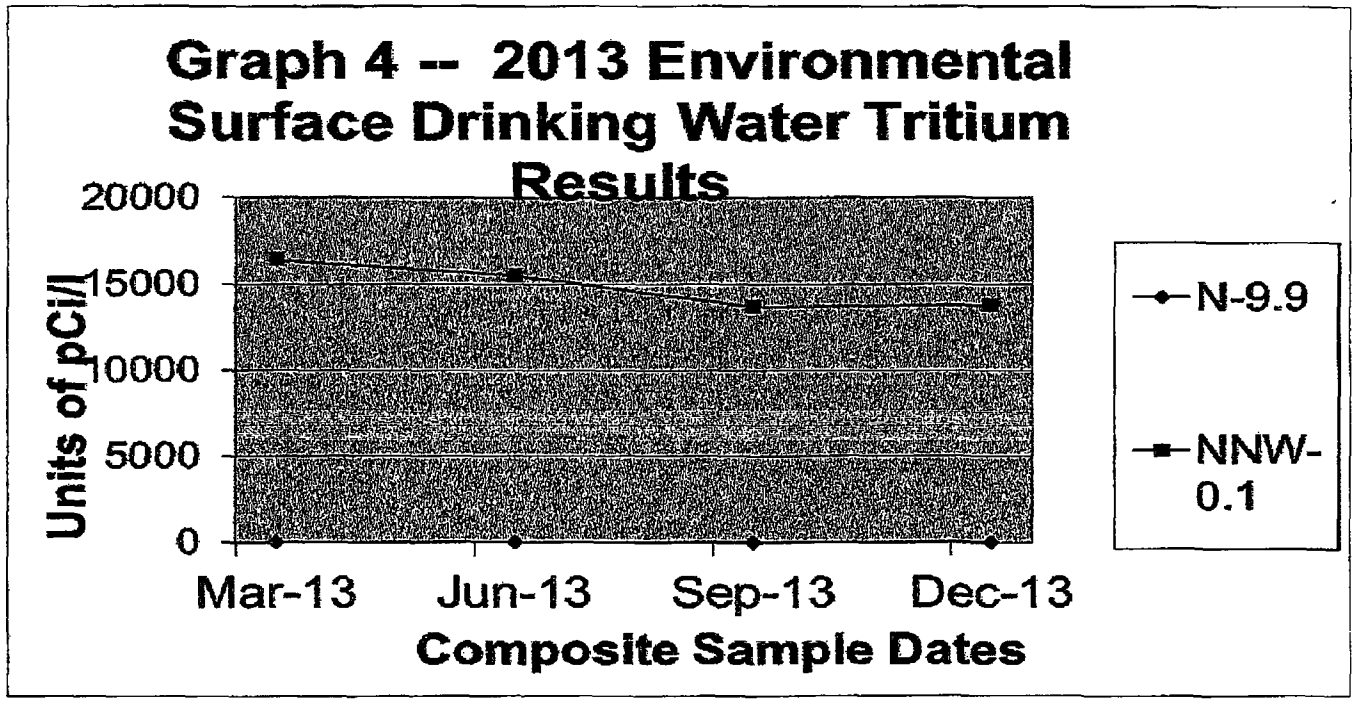
During the year 2013, there was one exception to the Surface Drinking Water Program.

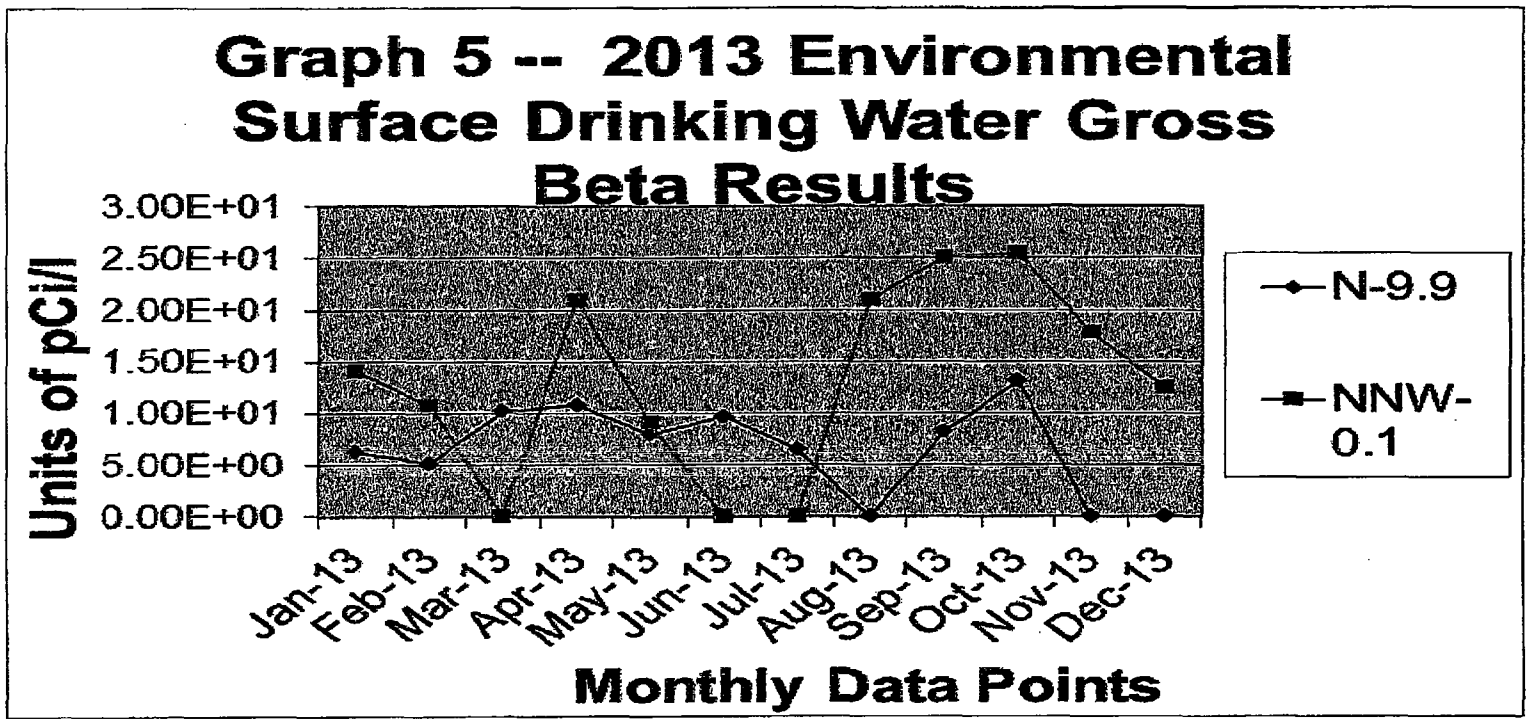
On 1/26/13/, 2/26/13, and 3/26/13 locations SW-2 and SW-6 samples did not meet LLD for Gross BETA. See Condition Report 2013-008260 for details.

Table 8 -- 2013 Environmental Surface Drinking Water Tritium, Gross Beta and Gamma Isotopic Results
(Units of pCi/l)

	SW-6		Gross	Nuclides											
Date	Location	H-3	Beta	I-131	Ba-140	Co-58	Co-60	Cs-134	Cs-137	Fe-59	La-140	Mn-54	Nb-95	Zn-65	Zr-95
01-29-13	NNW-0.1		1.41E+01	<9.94E-01	<6.48E+00	<1.74E+00	<1.68E+00	<1.77E+00	<1.60E+00	<4.27E+00	<6.48E+00	<1.76E+00	<2.18E+00	<3.94E+00	<3.31E+00
02-26-13	NNW-0.1		1.07E+01	<8.46E-01	<4.43E+00	<1.50E+00	<1.45E+00	<1.59E+00	<1.46E+00	<3.56E+00	<4.43E+00	<1.43E+00	<1.65E+00	<3.21E+00	<2.73E+00
03-26-13	NNW-0.1	1.64E+04	<1.79E+01	<9.89E-01	<5.04E+00	<1.76E+00	<1.79E+00	<1.77E+00	<2.11E+00	<3.85E+00	<5.04E+00	<1.56E+00	<1.83E+00	<3.50E+00	<3.27E+00
04-30-13	NNW-0.1		2.10E+01	<9.09E-01	<6.01E+00	<1.82E+00	<1.75E+00	<1.73E+00	<1.72E+00	<4.05E+00	<6.01E+00	<1.64E+00	<2.07E+00	<3.49E+00	<3.25E+00
05-28-13	NNW-0.1		9.07E+00	<8.93E-01	<6.90E+00	<2.05E+00	<1.97E+00	<2.24E+00	<2.03E+00	<4.85E+00	<6.90E+00	<2.09E+00	<2.25E+00	<4.61E+00	<3.88E+00
06-25-13	NNW-0.1	1.55E+04	<8.33E+00	<8.77E-01	<4.16E+00	<1.51E+00	<1.62E+00	<1.63E+00	<1.65E+00	<3.48E+00	<4.16E+00	<1.50E+00	<1.89E+00	<3.23E+00	<3.01E+00
07-30-13	NNW-0.1		<1.12E+01	<5.30E-01	<7.08E+00	<2.12E+00	<1.85E+00	<1.92E+00	<2.04E+00	<4.89E+00	<7.08E+00	<1.91E+00	<2.17E+00	<3.73E+00	<3.71E+00
08-27-13	NNW-0.1		2.10E+01	<9.22E-01	<3.77E+00	<1.56E+00	<1.64E+00	<1.41E+00	<1.52E+00	<3.46E+00	<3.77E+00	<1.42E+00	<1.61E+00	<3.03E+00	<2.94E+00
09-24-13	NNW-0.1	1.37E+04	2.51E+01	<9.53E-01	<4.84E+00	<1.66E+00	<1.65E+00	<1.71E+00	<1.56E+00	<3.29E+00	<4.84E+00	<1.43E+00	<1.80E+00	<3.19E+00	<3.05E+00
10-29-13	NNW-0.1		2.55E+01	<1.10E+00	<4.66E+00	<1.72E+00	<1.76E+00	<1.70E+00	<1.88E+00	<3.69E+00	<4.66E+00	<1.63E+00	<1.71E+00	<3.32E+00	<3.35E+00
11-26-13	NNW-0.1		1.78E+01	<9.12E+00	<6.29E+00	<2.24E+00	<1.97E+00	<2.24E+00	<2.07E+00	<4.87E+00	<6.29E+00	<1.98E+00	<2.19E+00	<4.14E+00	<3.85E+00
12-30-13	NNW-0.1	1.38E+04	1.25E+01	<1.64E+01	<1.21E+01	<3.80E+00	<3.45E+00	<3.51E+00	<3.28E+00	<8.37E+00	<1.21E+01	<3.18E+00	<3.98E+00	<7.31E+00	<6.46E+00
	SW-2														
01-29-13	N-9.9		8.21E+00	<9.15E-01	<9.42E+00	<2.64E+00	<2.66E+00	<2.60E+00	<2.32E+00	<5.82E+00	<9.42E+00	<2.24E+00	<2.60E+00	<5.32E+00	<4.95E+00
02-26-13	N-9.9		5.14E+00	<8.58E-01	<5.00E+00	<1.69E+00	<1.80E+00	<1.76E+00	<1.68E+00	<4.73E+00	<5.00E+00	<1.59E+00	<1.88E+00	<3.36E+00	<3.06E+00
03-26-13	N-9.9	<5.11E+02	1.02E+01	<9.05E-01	<4.65E+00	<1.64E+00	<1.85E+00	<1.69E+00	<1.49E+00	<3.85E+00	<4.65E+00	<1.62E+00	<1.93E+00	<3.28E+00	<3.02E+00
04-30-13	N-9.9		1.08E+01	<8.77E-01	<9.03E+00	<2.73E+00	<2.56E+00	<2.75E+00	<2.44E+00	<6.63E+00	<9.03E+00	<2.13E+00	<2.90E+00	<5.56E+00	<4.93E+00
05-28-13	N-9.9		7.89E+00	<8.11E-01	<6.77E+00	<2.22E+00	<2.23E+00	<2.18E+00	<1.92E+00	<4.16E+00	<6.77E+00	<1.97E+00	<2.01E+00	<3.84E+00	<3.67E+00
06-25-13	N-9.9	<5.35E+01	9.68E+00	<8.25E-01	<4.03E+00	<1.58E+00	<1.64E+00	<1.85E+00	<1.66E+00	<3.61E+00	<4.03E+00	<1.49E+00	<1.72E+00	<3.55E+00	<3.04E+00
07-30-13	N-9.9		6.43E+00	<8.86E-01	<8.06E+00	<2.43E+00	<2.32E+00	<2.07E+00	<2.21E+00	<4.73E+00	<8.06E+00	<2.05E+00	<2.49E+00	<3.99E+00	<4.26E+00
08-27-13	N-9.9		<2.49E+00	<9.16E-01	<3.85E+00	<1.50E+00	<1.45E+00	<1.48E+00	<1.38E+00	<3.23E+00	<3.85E+00	<1.27E+00	<1.65E+00	<2.90E+00	<2.65E+00
09-24-13	N-9.9	<4.05E+02	8.18E+00	<9.53E-01	<4.89E+00	<1.70E+00	<1.71E+00	<1.70E+00	<1.55E+00	<3.68E+00	<4.89E+00	<1.41E+00	<1.76E+00	<3.10E+00	<3.10E+00
10-29-13	N-9.9		1.31E+01	<9.61E-01	<5.18E+00	<1.80E+00	<1.62E+00	<1.92E+00	<1.79E+00	<4.01E+00	<5.18E+00	<1.66E+00	<1.83E+00	<3.50E+00	<3.41E+00
11-26-13	N-9.9		<5.71E+00	<7.03E-00	<4.76E+00	<1.83E+00	<1.74E+00	<1.76E+00	<1.69E+00	<4.18E+00	<4.76E+00	<1.65E+00	<2.02E+00	<3.38E+00	<3.57E+00
12-30-13	N-9.9	<3.77E+02	<3.87E+00	<2.10E+01	<1.01E+01	<4.75E+00	<4.44E+00	<5.03E+00	<3.59E+00	<9.31E+00	<1.01E+01	<3.67E+00	<4.62E+00	<8.78E+00	<8.60E+00
Required LLD's		2.00E+03	4.00E+00	1.00E+00	1.50E+01	1.50E+01	1.50E+01	1.50E+01	1.80E+01	3.00E+01	1.50E+01	1.50E+01	1.50E+01	3.00E+01	1.50E+01
Reportable Level		2.00E+04	None	2.00E+00	2.00E+02	1.00E+03	3.00E+02	3.00E+01	5.00E+01	4.00E+02	2.00E+02	1.00E+03	4.00E+02	3.00E+02	4.00E+02


Graph 3 -- Squaw Creek Maximum Tritium Values
Units of pCi/l
30000
25000
20000
15000
10000
5000
0
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
Yearly Maximum
Maximum tritium


Graph 4 -- 2013 Environmental Surface Drinking Water Tritium Results
20000
15000
10000
5000
0
Units of pCi/l
Mar-13
Jun-13
Sep-13
Dec-13
Composite Sample Dates
N-9.9
NNW-0.1


Graph 5 -- 2013 Environmental Surface Drinking Water Gross Beta Results
Units of pCi/l
3.00E+01
2.50E+01
2.00E+01
1.50E+01
1.00E+01
5.00E+00
0.00E+00
Jan-13
Feb-13
Mar-13
Apr-13
May-13
Jun-13
Jul-13
Aug-13
Sep-13
Oct-13
Nov-13
Dec-13
Monthly Data Points
N-9.9
NNW-0.1

F. Ground Water Program

Table 1 – Comanche Peak Nuclear Power Plant Radiological Environmental Monitoring Program for 2013 specifies the five groundwater monitoring locations. Groundwater supplies in the site area are not affected by plant effluents and are sampled only to provide confirmation that groundwater is not affected by plant discharges. Groundwater samples were collected quarterly and analyzed for gamma isotopes and tritium at each location.

For the year 2013 a total of twenty groundwater samples were collected from the five different monitoring locations. There were no radionuclides identified in any of the samples. All required LLDs were met for each required gamma emitting radionuclide. Tritium analysis was performed on twenty samples, all indicated less than the required LLD. Results for all the groundwater analyses are reported in Table 9 - 2013 Environmental Groundwater Tritium and Gamma Isotopic Results. These results confirm that plant discharges are having no effect on groundwater in the area surrounding Comanche Peak.

For 2013 seventeen (17) sample locations of perched groundwater were taken quarterly in accordance with STA-654, " Groundwater Protection Program". In 2013 tritium was identified during the routine quarterly sample in CP-A which was attributed to Clarifier water. Clarifier water leakage and corrective actions were documented in CR-2013-012215.

During the year 2013, there were no exceptions to the Ground Water Program.

Table 9 – 2013 Environmental Groundwater Tritium and Gamma Isotopic Results
(Units of pCi/l)

		Nuclides												
	Location	H-3	Ba-140	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	La-140	Mn-54	Nb-95	Zn-65	Zr-95
Date	GW-3													
03-26-13	SSE-4.6	<3.93E+02	<2.60E+00	<1.60E+00	<1.71E+00	<1.58E+00	<1.76E+00	<3.47E+00	<2.91E+00	<2.60E+00	<1.52E+00	<1.66E+00	<3.25E+00	<2.96E+00
06-25-13	SSE-4.6	<4.23E+02	<2.68E+00	<1.63E+00	<1.84E+00	<1.96E+00	<1.91E+00	<3.16E+00	<2.57E+00	<2.68E+00	<1.62E+00	<1.78E+00	<3.37E+00	<3.09E+00
09-24-13	SSE-4.6	<3.87E+02	<2.54E+00	<1.49E+00	<1.55E+00	<1.62E+00	<1.55E+00	<3.01E+00	<3.13E+00	<2.54E+00	<1.42E+00	<1.59E+00	<2.96E+00	<2.67E+00
12-30-13	SSE-4.6	<3.73E+02	<9.13E+00	<3.57E+00	<4.93E+00	<3.42E+00	<5.10E+00	<8.96E+00	<8.41E+00	<9.13E+00	<4.77E+00	<4.37E+00	<1.05E+01	<7.21E+00
	GW-5													
03-26-13	N-1.45	<3.83E+02	<3.95E+00	<2.44E+00	<2.51E+00	<2.80E+00	<2.32E+00	<5.54E+00	<3.95E+00	<3.95E+00	<2.31E+00	<2.23E+00	<4.56E+00	<4.56E+00
06-25-13	N-1.45	<4.26E+02	<1.94E+00	<1.37E+00	<1.65E+00	<1.52E+00	<1.49E+00	<2.96E+00	<2.01E+00	<1.94E+00	<1.36E+00	<1.40E+00	<3.00E+00	<2.41E+00
09-24-13	N-1.45	<3.88E+02	<2.88E+00	<1.46E+00	<1.58E+00	<1.58E+00	<2.06E+00	<3.46E+00	<3.39E+00	<2.88E+00	<1.54E+00	<1.67E+00	<2.67E+00	<2.71E+00
12-30-13	N-1.45	<3.84E+02	<4.90E+00	<3.77E+00	<4.24E+00	<3.65E+00	<4.38E+00	<7.46E+00	<7.84E+00	<4.90E+00	<3.29E+00	<3.90E+00	<1.02E+01	<7.39E+00
	GW-4													
03-26-13	N-9.8	<3.87E+02	<4.76E+00	<2.44E+00	<2.49E+00	<2.96E+00	<2.77E+00	<5.09E+00	<4.19E+00	<4.76E+00	<2.30E+00	<2.79E+00	<5.07E+00	<4.27E+00
06-25-13	N-9.8	<4.26E+00	<1.91E+00	<1.32E+00	<1.48E+00	<1.40E+00	<1.42E+00	<2.59E+00	<2.12E+00	<1.91E+00	<1.33E+00	<1.49E+00	<2.66E+00	<2.26E+00
09-24-13	N-9.8	<3.84E+02	<2.65E+00	<1.41E+00	<1.52E+00	<1.60E+00	<1.41E+00	<2.70E+00	<3.39E+00	<2.65E+00	<1.30E+00	<1.64E+00	<3.01E+00	<2.55E+00
12-30-13	N-9.8	<3.76E+02	<6.64E+00	<4.30E+00	<2.70E+00	<3.73E+00	<4.36E+00	<1.02E+01	<6.44E+00	<6.64E+00	<3.11E+00	<5.44E+00	<8.43E+00	<7.43E+00
	GW-1													
03-26-13	W-1.2	<4.00E+02	<3.82E+00	<2.01E+00	<2.02E+00	<2.14E+00	<2.32E+00	<4.20E+00	<3.85E+00	<3.82E+00	<2.10E+00	<2.11E+00	<3.96E+00	<3.73E+00
06-25-13	W-1.2	<4.09E+02	<1.95E+00	<1.43E+00	<1.46E+00	<1.52E+00	<1.52E+00	<2.65E+00	<2.06E+00	<1.95E+00	<1.44E+00	<1.46E+00	<2.56E+00	<2.50E+00
09-24-13	W-1.2	<3.86E+02	<2.54E+00	<1.39E+00	<1.74E+00	<1.72E+00	<1.51E+00	<3.03E+00	<3.14E+00	<2.54E+00	<1.42E+00	<1.56E+00	<2.78E+00	<2.92E+00
	W-1.2	<3.82E+02	<6.91E+00	<3.77E+00	<4.83E+00	<4.81E+00	<3.84E+00	<9.49E+00	<8.00E+00	<6.91E+00	<4.27E+00	<4.51E+00	<9.15E+00	<6.55E+00
	GW-2													
03-26-13	WSW-0.1	<3.89E+02	<2.59E+00	<1.67E+00	<1.70E+00	<1.94E+00	<1.81E+00	<3.45E+00	<3.22E+00	<2.59E+00	<1.65E+00	<1.85E+00	<3.69E+00	<3.23E+00
06-25-13	WSW-0.1	<4.26E+02	<1.92E+00	<1.26E+00	<1.42E+00	<1.48E+00	<1.37E+00	<2.56E+00	<2.01E+00	<1.92E+00	<1.23E+00	<1.42E+00	<3.00E+00	<2.51E+00
09-24-13	WSW-0.1	<3.87E+02	<2.85E+00	<1.46E+00	<1.62E+00	<1.76E+00	<1.60E+00	<3.38E+00	<3.58E+00	<2.85E+00	<1.59E+00	<1.74E+00	<2.90E+00	<2.89E+00
12-30-13	WSW-0.1	<3.92E+02	<6.75E+00	<4.19E+00	<3.98E+00	<3.88E+00	<4.14E+00	<8.62E+00	<7.15E+00	<6.75E+00	<3.76E+00	<3.57E+00	<7.99E+00	<6.34E+00
Required LLD's		3.00E+03	1.50E+01	1.50E+01	1.50E+01	1.50E+01	1.80E+01	3.00E+01	1.50E+01	1.50E+01	1.50E+01	1.50E+01	3.00E+01	1.50E+01
Reportable Levels		2.00E+04	2.00E+02	1.00E+03	3.00E+02	3.00E+01	5.00E+01	4.00E+02	2.00E+01	2.00E+02	1.00E+03	4.00E+02	3.00E+02	4.00E+02

G. Sediment Program

Shoreline sediments were collected at four different monitoring locations. One sample location is along the shore of Squaw Creek Reservoir, one sample location is on Squaw Creek downstream of the dam discharge and two locations are along Lake Granbury's shores. Each sample is collected on a six-month frequency and sent to the contract laboratory for analysis by gamma spectrometry.

The process of shoreline sedimentation is a complex evolution whereby potential radionuclides and stable elements may concentrate in the bottom sediment of particular bodies of water. The concentrations are effected by such things as colloidal particles combining with chelating agents and biological action of bacteria and other benthic organisms. Monitoring of the area shorelines provides one of the first and best indicators of radionuclide deposition.

For the year 2013 results from the gamma isotopic analysis of shoreline sediments is reported in Table 10 – 2013 Environmental Sediment Gamma Isotopic Results. As expected and in agreement with previous results from both the pre-operational and operational programs, naturally occurring Potassium-40 was detected in all eight samples and Beryillum-7 was detected in two samples. All required radionuclide results were reported as less than the required LLDs. During previous years, both pre-operational and operational, positive indications occasionally had been noted for Cesium-137 and during 2013 there were no positive Cesium-137 results reported. As expected, there were no results in any sediment sample that indicated any direct influence from CPNPP discharges to the local environment.

During the year 2013, there were no exceptions to the Sediment Program.

Table 10 -- 2013 Environmental Sediment Gamma Isotopic Results
(Units of pCi/kg)

		Nuclides													
		Ba-140	Be-7	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	K-40	La-140	Mn-54	Nb-95	Zn-65	Zr-95
Date	Location														
01-08-13	SE-5.3	<8.03E+02	<6.43E+02	<7.75E+01	<6.54E+01	<6.91E+01	<6.65E+01	<1.65E+02	<4.85E+02	3.99E+03	<1.87E+02	<6.47E+01	<7.87E+01	<1.34E+02	<1.39E+02
01-08-13	NNE-1.0	<5.94E+02	<5.58E+02	<8.11E+01	<5.30E+01	<6.33E+01	<5.32E+01	<1.40E+02	<4.41E+02	3.43E+03	<2.04E+02	<5.18E+01	<7.27E+01	<1.22E+02	<1.01E+02
01-08-13	NE-7.4	<3.52E+02	<3.13E+02	<3.14E+01	<2.95E+01	<3.58E+01	<3.05E+01	<8.23E+01	<2.12E+02	6.36E+03	<1.45E+02	<2.89E+01	<4.15E+01	<8.47E+01	<8.31E+01
01-08-13	N-9.9	<4.25E+02	3.24E+02	<3.77E+01	<3.62E+01	<3.88E+01	<3.50E+01	<8.05E+01	<2.36E+02	1.88E+03	<1.30E+02	<2.89E+01	<4.01E+01	<8.31E+01	<7.48E+01
07-09-13	SE-5.3	<8.97E+02	1.90E+03	<8.53E+01	<6.87E+01	<7.75E+01	<6.88E+01	<1.83E+02	<6.09E+02	5.59E+03	<2.42E+02	<7.15E+01	<9.92E+01	<1.54E+02	<1.43E+02
07-09-13	NNE-1.0	<8.96E+02	<8.53E+02	<8.34E+01	<5.35E+01	<7.63E+01	<7.46E+01	<1.75E+02	<5.45E+02	2.07E+03	<3.09E+02	<6.30E+01	<9.96E+01	<1.44E+02	<1.44E+02
07-09-13	NE-7.4	<5.01E+02	<4.12E+02	<4.09E+01	<3.29E+01	<3.90E+01	<2.65E+01	<1.08E+02	<3.14E+02	4.78E+03	<1.53E+02	<4.33E+01	<3.83E+01	<7.34E+01	<8.61E+01
07-09-13	N-9.9	<4.80E+02	<3.96E+02	<5.02E+01	<3.98E+01	<4.65E+01	<3.97E+01	<1.30E+02	<2.37E+02	3.93E+03	<1.51E+02	<3.06E+01	<4.65E+01	<9.68E+01	<8.26E+01
Required LLD's						1.50E+02	1.80E+02								
Reportable Levels						None	None								

NOTE: During previous years, both pre-operational and operational, positive indications occasionally had been noted for Cesium-137 and during 2013 there were no positive Cesium-137 results reported.

H. Fish Program

Fish samples were collected at two locations during the year 2013. One monitoring location is an area approximately two miles east-northeast of the site on Squaw Creek Reservoir. The second location is on Lake Granbury approximately eight miles north-northeast of the site. Fish sampling is scheduled for the months of April and October. The collected fish are frozen and shipped to the independent laboratory where the edible portions are analyzed for gamma emitting radio-nuclides.

For the year 2013, the results of the analysis performed on the collected fish samples are reported in Table 11 -- 2013 Environmental Fish Gamma Isotopic Results. Catfish and Bass samples were analyzed as indicated in the table. There were no positive results reported except for the expected Potassium-40, which is naturally occurring in all living organisms. All required radionuclide results were reported as less than the required LLDs. As a result of the fish-sampling program, there were no anomalies noted and no indication of any influence on the surrounding environment from Comanche Peak plant discharges.

No abnormal results were reported by CPNPP or by the State of Texas. As expected, Potassium-40 was the only positive isotope found.

During the year 2013there were no exceptions to the Fish Program.

Table 11 -- 2013 Environmental Fish Gamma Isotopic Results
(Units of pCi/kg wet)

		Nuclides													
		Ba-140	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	K-40	La-140	Mn-54	Nb-95	Zn-65	Zr-95	Fish Type
Date	Location														
04-16-13	Squaw Creek	<1.47E-02	<2.69E-03	<3.00E-03	<2.85E-03	<2.37E-03	<6.70E-03	<5.10E-03	2.84E+00	<3.80E-03	<2.42E-03	<2.71E-03	<6.49E-03	<4.63E-03	*Catfish*
04-16-13	Squaw Creek	<1.80E-02	<3.52E-03	<3.23E-03	<3.45E-03	<3.39E-03	<7.84E-03	<7.18E-03	3.41E+00	<4.79E-03	<3.29E-03	<3.41E-03	<7.55E-03	<5.54E-03	*Bass*
10-01-13	Squaw Creek	<1.52E-02	<2.86E-03	<3.63E-03	<3.35E-03	<3.20E-03	<7.16E-03	<5.35E-03	3.13E+00	<4.93E-03	<3.03E-03	<3.31E-03	<8.60E-03	<5.44E-03	*Catfish*
10-01-13	Squaw Creek	<1.73E-02	<3.33E-03	<3.84E-03	<3.70E-03	<3.55E-03	<8.25E-03	<5.96E-03	3.08E+00	<5.21E-03	<3.15E-03	<3.51E-03	<8.44E-03	<5.78E-03	*Bass*
04-16-13	Lake Granbury	<1.58E-02	<2.85E-03	<3.18E-03	<3.06E-03	<2.78E-03	<7.24E-03	<6.19E-03	2.11E+00	<4.36E-03	<2.75E-03	<3.05E-03	<7.38E-03	<5.04E-03	*Catfish*
05-14-13	Lake Granbury	<6.48E-03	<4.82E-03	<4.48E-03	<5.47E-03	<4.54E-03	<1.03E-02	<8.41E-03	3.18E+00	<6.48E-03	<4.73E-03	<4.49E-03	<1.00E-02	<8.24E-03	*Bass*
11-05-13	Lake Granbury	<7.89E-02	<2.88E-02	<3.79E-02	<3.11E-02	<2.86E-02	<6.90E-02	<3.42E-02	2.82E+00	<5.78E-02	<2.73E-02	<2.64E-02	<6.64E-02	<4.05E-02	*Catfish*
10-01-13	Lake Granbury	<7.15E-02	<1.44E-02	<1.50E-02	<1.73E-02	<1.61E-02	<3.43E-02	<2.53E-02	2.93E+00	<2.20E-02	<1.63E-02	<1.49E-02	<3.45E-02	<2.88E-02	*Bass*
Required LLD's			1.30E+02	1.30E+02	1.30E+02	1.50E+02	2.60E+02				1.30E+02		2.60E+02		
Reportable Levels			3.00E+04	1.00E+04	1.00E+03	2.00E+03	1.00E+04				3.00E+04		2.00E+04		

I. Food Products Program

Food products (pecans) were collected at the time of harvest. The samples are obtained at monitoring location ENE-9.0 at the time of harvest and are shipped to the contract laboratory for gamma isotopic analysis. There were no food products produced that required monitoring for location E-4.2 in 2013.

For the year 2013, results of the gamma isotopic analyses are reported in Table 12 -- 2013 Environmental Food Products Gamma Isotopic Results. Naturally occurring Potassium 40 was detected in the samples as expected.

During the year 2013, there were no exceptions to the Food Products Program.

Table 12 -- 2013 Environmental Food Products Gamma Isotopic Results
(Units of pCi/kg wet)

Food Type – Pecans/Fruit &Vegetables															
		Nuclides													
		Ba-140	Be-7	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	K-40	La-140	Mn-54	Nb-95	Zn-65	Zr-95
Date	Location														
11-19-13	ENE-9.0	<3.52E+01	<7.13E+01	<9.32E+00	<9.08E+00	<9.88E+00	<8.73E+00	<1.77E+01	<1.24E+01	3.49E+03	<1.20E+01	<8.31E+00	<9.14E+00	<1.87E+01	<1.54E+01
	Location														
	E-4.2														
N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Required LLD's						6.00E+01	8.00E+01		6.00E+01						
Reportable Levels						1.00E+03	2.00E+03		1.00E+02						

J. Broadleaf Program

Broadleaf sample collection is conducted in accordance with the requirements of the Radiological Environmental Monitoring Program. The program specifies the sampling based on the absence of milk monitoring locations. One broadleaf control location is located at SW-13.5 in the vicinity of the previous control milk location. The two indicator locations, N-1.45 and SW-1.0, are located near the site boundaries. The broadleaf samples consist of mainly native grasses and cedar leaves and are analyzed for Iodine-131 and gamma emitting isotopes.

For the year 2013, all radionuclide analysis met their required LLDs. The naturally occurring radionuclide of Potassium-40 was found in 36 of 36 samples taken. The radionuclide Beryllium-7 was present in 35 of 36 samples. No positive results for Cesium-137 were present.

No abnormal results were reported by CPNPP or by the State of Texas.

During the year 2013, there were no exceptions to the Broadleaf Program.

Table 13 – 2013 Environmental Broadleaf Iodine-131 and Gamma Isotopic Results
(Units of pCi/kg wet)

		Nuclides													
	BL-1	I-131	Ba-140	Be-7	Co-58	Co-60	Cs-134	Cs-137	Fe-59	K-40	La-140	Mn-54	Nb-95	Zn-65	Zr-95
Date	Location														
01-29-13	N-1.45	<3.04E+01	<9.34E+01	6.84E+03	<2.10E+01	<2.42E+01	<2.44E+01	<2.37E+01	<4.20E+01	1.75E+03	<2.80E+01	<2.10E+01	<2.25E+01	<4.38E+01	<3.62E+01
02-26-13	N-1.45	<3.98E+01	<1.20E+02	1.17E+04	<2.66E+01	<3.01E+01	<3.25E+01	<3.13E+01	<5.60E+01	8.33E+02	<4.39E+01	<2.94E+01	<2.98E+01	<6.64E+01	<4.93E+01
03-26-13	N-1.45	<5.10E+01	<1.53E+02	8.95E+03	<3.41E+01	<3.90E+01	<4.25E+01	<4.18E+01	<7.22E+01	1.94E+03	<5.45E+01	<3.90E+01	<3.83E+01	<7.94E+01	<6.99E+01
04-30-13	N-1.45	<1.66E+01	<5.35E+01	7.75E+02	<1.64E+01	<1.89E+01	<1.54E+01	<1.45E+01	<3.20E+01	5.32E+03	<1.54E+01	<1.49E+01	<1.46E+01	<3.20E+01	<2.43E+01
05-28-13	N-1.45	<3.91E+01	<3.89E+01	2.32E+03	<2.41E+01	<2.87E+01	<2.82E+01	<2.83E+01	<5.31E+01	4.86E+03	<3.89E+01	<2.38E+01	<2.52E+01	<5.75E+01	<4.73E+01
06-25-13	N-1.45	<2.24E+01	<8.32E+01	2.89E+03	<1.62E+01	<1.55E+01	<1.86E+01	<1.67E+01	<2.78E+01	5.90E+03	<1.91E+01	<1.75E+01	<1.64E+01	<3.24E+01	<2.80E+01
07-30-13	N-1.45	<5.59E+01	<1.39E+02	5.76E+03	<2.53E+01	<2.60E+01	<2.77E+01	<2.67E+01	<4.75E+01	2.47E+03	<3.87E+01	<2.43E+01	<2.54E+01	<4.48E+01	<4.57E+01
08-27-13	N-1.45	<3.53E+01	<9.29E+01	1.45E+03	<1.72E+01	<1.62E+01	<1.92E+01	<1.83E+01	<3.66E+01	3.93E+03	<3.45E+01	<1.75E+01	<1.81E+01	<3.54E+01	<3.14E+01
09-24-13	N-1.45	<3.23E+01	<9.64E+01	8.44E+02	<1.82E+01	<2.05E+01	<2.02E+01	<1.87E+01	<3.43E+01	2.74E+03	<3.14E+01	<1.93E+01	<1.89E+01	<4.27E+01	<3.23E+01
10-29-13	N-1.45	<3.51E+01	<1.02E+02	2.54E+03	<2.71E+01	<2.91E+01	<2.60E+01	<2.40E+01	<4.61E+01	2.00E+03	<2.22E+01	<2.57E+01	<2.14E+01	<5.03E+01	<4.01E+01
11-26-13	N-1.45	<3.20E+01	<8.14E+01	2.79E+03	<1.84E+01	<1.86E+01	<2.15E+01	<1.89E+01	<3.88E+01	1.46E+03	<2.44E+01	<1.93E+01	<1.86E+01	<4.18E+01	<3.17E+01
12-30-13	N-1.45	<5.13E+01	<1.73E+02	4.98E+03	<3.08E+01	<4.46E+01	<3.45E+01	<4.02E+01	<7.06E+01	5.33E+03	<5.45E+01	<3.74E+01	<4.40E+01	<8.92E+01	<6.77E+01
	BL-3	I-131	Ba-140	Be-7	Co-58	Co-60	Cs-134	Cs-137	Fe-59	K-40	La-140	Mn-54	Nb-95	Zn-65	Zr-95
	Control														
01-29-13	SW-13.5	<3.17E+01	<9.31E+01	<1.54E+02	<1.90E+01	<2.02E+01	<2.30E+01	<1.87E+01	<4.26E+01	1.25E+04	<3.00E+01	<1.98E+01	<1.94E+01	<5.09E+01	<3.34E+01
02-26-13	SW-13.5	<3.78E+01	<1.07E+02	6.00E+03	<2.97E+01	<2.71E+01	<2.91E+01	<2.83E+01	<3.94E+01	1.26E+03	<3.28E+01	<2.70E+01	<2.78E+01	<5.43E+01	<4.89E+01
03-26-13	SW-13.5	<1.30E+01	<4.08E+01	6.18E+02	<9.78E+00	<1.21E+01	<1.18E+01	<1.05E+01	<2.34E+01	8.13E+03	<1.26E+01	<9.22E+00	<1.01E+01	<2.51E+01	<1.68E+01
04-30-13	SW-13.5	<1.46E+01	<4.60E+01	6.22E+02	<1.28E+01	<1.27E+01	<1.36E+01	<1.23E+01	<2.35E+01	8.03E+03	<1.22E+01	<1.20E+01	<1.20E+01	<2.80E+01	<2.06E+01
05-28-13	SW-13.5	<1.64E+01	<1.40E+01	7.76E+02	<3.44E+00	<9.69E+00	<1.13E+01	<9.86E+00	<2.30E+01	4.61E+03	<1.40E+01	<9.29E+00	<9.76E+00	<2.09E+01	<1.78E+01
06-25-13	SW-13.5	<9.60E+00	<2.98E+01	1.02E+03	<8.02E+00	<8.74E+00	<8.52E+00	<9.29E+00	<1.74E+01	3.89E+03	<1.03E+01	<7.89E+00	<7.57E+00	<1.85E+01	<1.32E+01
07-30-13	SW-13.5	<1.49E+01	<4.00E+01	1.94E+02	<7.37E+00	<8.30E+00	<8.38E+00	<8.04E+00	<1.92E+01	4.96E+03	<1.20E+01	<7.72E+00	<8.18E+00	<1.92E+01	<1.40E+01
08-27-13	SW-13.5	<4.35E+01	<1.13E+02	4.65E+02	<1.88E+01	<2.30E+01	<2.07E+01	<2.14E+01	<4.99E+01	5.00E+03	<3.70E+01	<2.10E+01	<1.97E+01	<4.73E+01	<3.57E+01
09-24-13	SW-13.5	<2.76E+01	<7.82E+01	4.75E+02	<1.45E+01	<1.69E+01	<1.74E+01	<1.66E+01	<3.55E+01	3.51E+03	<2.58E+01	<1.63E+01	<1.81E+01	<3.56E+01	<2.90E+01
10-29-13	SW-13.5	<2.61E+01	<8.17E+01	1.15E+03	<2.33E+01	<2.39E+01	<2.21E+01	<2.10E+01	<4.45E+01	3.62E+03	<2.47E+01	<1.94E+01	<1.67E+01	<5.06E+01	<3.84E+01
11-26-13	SW-13.5	<3.43E+01	<1.00E+02	3.83E+03	<2.14E+01	<2.46E+01	<2.30E+01	<2.10E+01	<3.83E+01	1.05E+03	<4.32E+01	<2.23E+01	<2.12E+01	<4.58E+01	<3.69E+01
12-30-13	SW-13.5	<5.01E+01	<1.60E+02	4.47E+03	<3.56E+01	<4.51E+01	<4.24E+01	<4.52E+01	<6.40E+01	1.75E+03	<5.69E+01	<3.38E+01	<3.49E+01	<8.36E+01	<6.85E+01
	BL-2	I-131	Ba-140	Be-7	Co-58	Co-60	Cs-134	Cs-137	Fe-59	K-40	La-140	Mn-54	Nb-95	Zn-65	Zr-95
01-29-13	SW-1.0	<2.61E+01	<8.15E+01	5.98E+03	<1.65E+01	<2.04E+01	<1.96E+01	<1.82E+01	<3.59E+01	1.73E+03	<2.77E+01	<1.86E+01	<1.86E+01	<3.59E+01	<3.19E+01
02-26-13	SW-1.0	<2.92E+01	<9.84E+01	6.67E+03	<1.90E+01	<2.40E+01	<2.18E+01	<2.45E+01	<4.10E+01	2.12E+03	<2.86E+01	<2.11E+01	<2.18E+01	<4.29E+01	<3.59E+01
03-26-13	SW-1.0	<5.12E+01	<1.80E+02	1.14E+04	<4.70E+01	<4.78E+01	<5.00E+01	<4.99E+01	<8.52E+01	6.66E+02	<6.89E+01	<5.15E+01	<4.84E+01	<9.77E+01	<8.53E+01
04-30-13	SW-1.0	<3.81E+01	<9.81E+01	6.23E+03	<1.73E+01	<1.66E+01	<2.02E+01	<1.86E+01	<3.69E+01	2.00E+03	<3.27E+01	<1.68E+01	<1.75E+01	<3.81E+01	<2.88E+01
05-28-13	SW-1.0	<2.40E+01	<1.97E+01	6.43E+02	<1.29E+01	<1.67E+01	<1.56E+01	<1.67E+01	<3.08E+01	3.89E+03	<1.97E+01	<1.51E+01	<1.27E+01	<3.26E+01	<2.28E+01
06-25-13	SW-1.0	<1.29E+01	<4.34E+01	7.74E+02	<1.08E+01	<1.27E+01	<1.22E+01	<1.30E+01	<2.49E+01	4.41E+03	<1.36E+01	<1.05E+01	<1.17E+01	<2.64E+01	<1.74E+01
07-30-13	SW-1.0	<2.67E+01	<8.94E+01	4.63E+03	<1.28E+01	<1.26E+01	<1.36E+01	<1.34E+01	<2.59E+01	4.03E+03	<2.18E+01	<1.19E+01	<1.41E+01	<2.94E+01	<2.05E+01
08-27-13	SW-1.0	<5.78E+01	<1.61E+02	1.96E+03	<3.11E+01	<3.09E+01	<3.41E+01	<3.08E+01	<6.64E+01	4.91E+03	<4.33E+01	<2.72E+01	<3.05E+01	<6.86E+01	<5.23E+01
09-24-13	SW-1.0	<2.42E+01	<6.26E+01	7.96E+02	<1.35E+01	<1.62E+01	<1.43E+01	<1.82E+01	<2.69E+01	3.01E+03	<2.07E+01	<1.45E+01	<1.44E+01	<3.14E+01	<2.42E+01
10-29-13	SW-1.0	<3.03E+01	<9.47E+01	1.86E+03	<2.23E+01	<2.84E+01	<2.37E+01	<2.53E+01	<4.06E+01	3.88E+03	<3.38E+01	<2.38E+01	<2.29E+01	<5.13E+01	<4.29E+01
11-26-13	SW-1.0	<4.10E+01	<1.08E+02	1.66E+03	<2.29E+01	<2.69E+01	<2.56E+01	<2.55E+01	<4.88E+01	2.88E+03	<3.72E+01	<2.29E+01	<2.42E+01	<4.88E+01	<3.88E+01
12-30-13	SW-1.0	<4.44E+01	<1.40E+02	4.50E+03	<3.18E+01	<4.73E+01	<4.28E+01	<3.56E+01	<6.86E+01	2.36E+03	<5.56E+01	<3.62E+01	<3.81E+01	<9.04E+01	<5.71E+01
Required LLD's		6.00E+01					6.00E+01	8.00E+01							
Reportable Levels		1.00E+02					1.00E+03	2.00E+03							

K. Conclusions

For the year 2013, based on the results presented in this report and from comparisons with the pre-operational and operational program results from previous years, it can be concluded that the impact of Comanche Peak on the environment is very small. **The only indication directly attributable to Comanche Peak is the tritium detected in Squaw Creek reservoir.**

Gross beta trend indications concerning Squaw Creek Reservoir are consistent with previous values and do not indicate any increase due to influence from Comanche Peak. Future data will be evaluated as it is received and changes will be addressed as necessary.

The tritium in Squaw Creek reservoir is reaching equilibrium and is expected to remain well below the reportable level.

There were no values reported during the year 2013 that exceeded any NRC reportable limit.

L. Inter Laboratory Comparison and Cross Check Program

GEL Laboratories LLC

GEL Laboratories LLC is the independent contract laboratory that processes the radiological environmental monitoring samples collected by CPNPP. The contract laboratory is required to participate in an Interlaboratory Comparison Program in accordance with the ODCM Control 3.12.3. GEL participates in multiple programs to ensure all environmental media sent to them are analyzed to the proper standards.

GEL Laboratories, LLC (GEL) is a privately owned environmental laboratory. GEL was established as an analytical testing laboratory in 1981. Now a full service lab, their analytical divisions use state of the art equipment and methods to provide a comprehensive array of organic, inorganic, and radiochemical analyses.

GEL administers the QA program in accordance with the Quality Assurance Plan, GL-QSB-001. Their Quality Systems include all quality assurance (QA) policies and quality control (QC) procedures necessary to plan, implement, and assess the work they perform. GEL's QA Program establishes a quality management system (QMS) that governs all of the activities of their organization.

In 2013 there wasn't a NUPIC Audit on GEL; the next scheduled NUPIC audit is to be performed by Cooper Station in May 2014.

Summary of 2011 Data Results
During 2011, forty-three radioisotopes associated with seven matrix types were analyzed under Ziegler Analytics. Matrix types were representative of client analyses performed during 2011. The list below contains the type of matrix evaluated by GEL.

- Air Filter
- Cartridge
- Water
- Milk
- Soil
- Liquid
- Vegetation

Summary of Participation in the Eckert & Ziegler Analytics Environmental Cross-Check Program
Eckert & Ziegler Analytics provided samples for 89 individual environmental analyses. The accuracy of each result reported to Eckert & Ziegler Analytics, Inc. is measured by the ratio of GEL's result to the known value. Of the 89 analyses, 98% (87 out of 89) of all results fell within GEL's acceptance criteria. Two analytical failures occurred with the analysis of Chromium-51 in water and Strontium-90 in milk.

Corrective Action Request and Report (CARR)
There are two categories of corrective action at GEL. One is corrective action implemented at the analytical and data review level in accordance with the analytical SOP. The other is formal corrective action documented by the Quality Systems Team in accordance with GL-QS-E-002. A formal corrective action is initiated when a nonconformance reoccurs or is so significant that permanent elimination or prevention of the problem is required. GEL includes quality requirements in most analytical standard operating procedures to ensure that data are reported only if the quality control criteria are met or the quality control measures that did not meet the acceptance criteria are documented. A formal corrective action is implemented according to GL-QS-E-002 for Conducting Corrective/Preventive Action and Identifying Opportunities for Improvement. Recording and documentation is performed
following guidelines stated in GL-QS-E-012 for Client NCR Database Operation. Any employee at GEL can identify and report a nonconformance and request that corrective action be taken. Any GEL employee can participate on a corrective action team as requested
by the QS team or Group Leaders. The steps for conducting corrective action are detailed in GL-QS-E-002. In the event that correctness or validity of the

laboratory's test results in doubt, the laboratory will take corrective action. If investigations show that the results have been
impacted, affected clients will be informed of the issue in writing within five (5) calendar days of the discovery.

Quality Assurance Program for Internal and External Audits
During each annual reporting period, at least one internal assessment is conducted in accordance with the pre-established schedule from Standard Operating Procedure for the Conduct of Quality Audits, GL-QS-E001. The annual internal audit plan is reviewed for adequacy and includes the scheduled frequency and scope of quality control actions necessary to GEL's QA program. Internal audits are conducted at least annually in accordance with a schedule approved by the Quality Systems Director. Supplier audits are contingent upon the categorization of the supplier, and may or may not be conducted prior to the use of a supplier
or subcontractor. Type I suppliers and subcontractors, regardless of how they were initially qualified, are re-evaluated at least once every three years. In addition, prospective customers audit GEL during pre-contract audits. GEL hosts several external audits each year for both our clients and other programs. These programs include environmental monitoring, waste characterization, and radiobioassay. The following list of
Programs may audit GEL at least annually or up to every three years depending on the program.

- NELAC, National Environmental Laboratory Accreditation Program
- DOECAP, U.S. Department of Energy Consolidated Audit Program
- DOELAP, U.S. Department of Energy Laboratory Accreditation Program
- DOE QSAS, U.S. Department of Energy, Quality Systems for Analytical Services
- ISO/IEC 17025
- A2LA, American Association for Laboratory Accreditation
- DOD ELAP, US Department of Defense Environmental Accreditation Program
- NUPIC, Nuclear Procurement Issues Committee
- South Carolina Department of Heath and Environmental Control (SC DHEC)

The annual radiochemistry laboratory internal audit (11-RAD-001) was conducted in March 2011. Two (2) findings, three (3) observations, and four (4) recommendations resulted from this assessment. In April 2011, each finding was closed and appropriate laboratory staff addressed each observation and recommendation.

Appendix A

Comanche Peak Nuclear Power Plant
Land Use Census
2013

COPY

The Land Use Census identified receptors within a five (5) mile radius of the plant in each of the sixteen (16) meteorological sectors. The Land Use Census was conducted July 16 -17, 2013 and includes the following items:

1. Evaluation of the 2013 Land Use Census
2. Nearest Resident by Sector, Distance, X/Q and D/Q
3. Nearest Garden by Sector, Distance and D/Q
4. Nearest Milk Animal by Sector, Distance and D/Q
5. Population by Sector and Distance
6. Environmental Sample Locations Table
7. Environmental Monitoring Locations Map – 2 Mile Radius
8. 5 Mile Sector and Road Map with Field Data*
9. Environmental Monitoring Locations Map – all sample locations*

*These maps are vaulted along with this census. Copies of this census will not contain a copy of these maps unless specifically requested.

Evaluation of the 2013 Land Use Census

The results of the 2013 Land Use Census were reviewed for impact on the Radiological Environmental Monitoring Program (REMP). The specific areas reviewed, that could be affected by changes found in the land use census, were the sampling requirements for milk, broadleaf vegetation and food products.

Reviewing the milk sampling requirements from the ODCM Table 3.12-1 requires that samples are to be obtained from milking animals in three locations within a 5 km distance having the highest potential dose. If none are available, samples are acceptable from milking animals in locations 5 to 8 km distance where doses are calculated to be greater than 1 mrem per year. A sample is also required at a control location. There are currently no identified milking animals (cow or goat) within the specified distances therefore, there are no current milk samples during the year 2013. NOTE: A Control milk location was identified at 12.3 Miles SW, Deridder Dairy, but operator did not wish to participate. CR-2011-0013802.

If no milk samples are available, the broadleaf vegetation sampling specified in ODCM Table 3.12-1 will be performed. Broadleaf sample requirements are such that samples of broadleaf vegetation are to be collected from each of two offsite locations of the highest predicted annual average D/Q if milk sampling is not performed at all the required locations. Currently, broadleaf vegetation samples are collected at two indicator locations (N - 1.45 and SW - 1.0) and one control location (SW - 13.5). These indicator locations are near the site boundary in sectors where broadleaf vegetation is available and D/Q is high. Therefore, no change to the broadleaf sampling program is required.

Food product sample requirements of ODCM Table 3.12-1 requires that one sample of each principal class of food product be collected from any area that is irrigated with water in which liquid plant waste has been discharged. Of the gardens identified in the land use census, no gardens are located in any area that irrigates with water in which liquid plant wastes are discharged. Currently, food products are sampled from one indicator location (ENE - 9.0) when in season. The indicator location for ENE-9.0 for pecans at time of harvest will be continued since it is a major source of food products sold to the public.

The 2012 Land Use Census identified one location within 5 miles with a garden of greater than 500 ft^2 producing broadleaf vegetation as outlined in CPNPP procedures and Comanche Peak Steam Electric Station Offsite Dose Calculation Manual. This garden was not in operation for the year 2013.

Calculated values for the associated X/Q and D/Q values for each controlling receptor location and pathway are included along with the receptor distances in the data tables of this land use census. The values used to determine potential dose due to radioactive effluent discharges are the highest calculated values based on annual average values. The annual average X/Q used for dose calculations is 3.30E-6, tritium X/Q is 4.36E-6, and the D/Q value is 3.34 E-8. All these values are conservative based on the 2013 Land Use Census data and therefore no changes are required in the dose calculation parameters as verified by the field data.

The X/Q and D/Q data was reviewed in 2013 with respect to the meteorological data, found to be conservative, and documented in CR-2014-001059.

* X/Q units are Sec/cubic meter * D/Q units are inverse square meters

Nearest Resident by Sector, Distance, X/Q and D/Q

Sector	Distance (Miles)	X/Q	D/Q
N	2.6	2.67E-07	1.10E-09
NNE	2.2	5.58E-07	2.90E-09
NE	2.2	3.92E-07	1.42E-09
ENE	2.6	1.00E-07	1.81E-10
E	2.5	2.70E-07	5.80E-10
ESE	2.2	3.68E-07	1.18E-09
SE	2.0	7.1E-07	2.80E-09
SSE	1.5	1.10E-06	6.60E-09
S	1.5	8.50E-07	5.20E-09
SSW	1.8	5.66 E-7	2.79 E-9
SW	0.8	3.56E-06	1.85E-08
WSW	0.8	3.92E-06	1.32E-08
W	1.6	7.64E-07	2.50E-09
WNW	2.8	4.07E-07	1.18E-09
NW	4.8	2.52E-07	1.30E-10
NNW	2.2	1.02E-06	4.64E-09

Note: The Annual Average X/Q used for dose calculations is 3.30E-06 sec/cubic meter. The Tritium value X/Q used for dose calculations is 4.36E-06 sec/cubic meter. The Annual Average D/Q used for dose calculations is 3.34E-08 inverse square meters.

Nearest Garden by Sector, Distance and D/Q

Sector	Distance (Miles)*	D/Q
N	None	None
NNE	None	None
NE	None	None
ENE	None	None
E	None	None
ESE	None	None
SE	None	None
SSE	None	None
S	None	None
SSW	None	None
SW	None	None
WSW	None	None
W	None	None
WNW	None	None
NW	None	None
NNW	None	None

Nearest Milk Animal by Sector, Distance and D/Q

Sector	Distance (Miles)*	D/Q
N	None	None
NNE	None	None
NE	None	None
ENE	None	None
E	None	None
ESE	None	None
SE	None	None
SSE	None	None
S	None	None
SSW	None	None
SW	None	None
WSW	None	None
W	None	None
WNW	None	None
NW	None	None
NNW	None	None

*No Milk samples are currently being collected.

Population by Sector and Distance

Sector	0-1	1-2	2-3	3-4	4-5	Total
N	-	-	5	57	100	162
NNE	-	-	8	75	31	114
NE	-	-	60	196	239	495
ENE	-	-	90	25	18	133
E	-	-	156	201	22	379
ESE	-	-	66	104	88	258
SE	-	-	178	269	55	502
SSE	-	77	72	85	2480	2714
S	-	17	121	39	181	358
SSW	-	6	3	6	63	78
SW	9	198	9	80	50	346
WSW	11	165	9	8	-	193
W	-	80	6	18	3	107
WNW	-	-	6	31	44	81
NW	-	-	-	-	3	3
NNW	-	-	6	36	39	81
TOTAL	20	543	795	1230	3416	6004

The average number of residents per house was obtained from North Central Texas Council of Governments for Hood and Somervell Counties. The number of residents per house is 2.57 and 2.74, respectively.

Note: 2011 thru 2013 Land Use Census was performed with the use of maps and information provided by Somervell County/Hood County 9-1-1 addressing/ geographic information system. Changes were noted during the 2011 Land Use Census in sector population which attributed to use of 911 (Hood and Somervell counties) dispatchers maps. A 9-1-1 map is vaulted under RPI-714-1.

Environmental Sample Locations Table

Sampling Point	Location	Sample Type*
A1	N-1.45 (Squaw Creek Park)	A
A2	N-9.4 (Granbury)	A
A3	E-3.5 (Children's Home)	A
A4	SSE-4.5 (Glen Rose)	A
A5	S/SSW-1.2	A
A6	SW-12.3 (CONTROL)	A
A7	SW/WSW-0.95	A
A8	NW-1.0	A
R1	N-1.45 (Squaw Creek Park)	R
R2	N-4.4	R
R3	N-6.5	R
R4	N-9.4 (Granbury)	R
R5	NNE-1.1	R
R6	NNE-5.65	R
R7	NE-1.7	R
R8	NE-4.8	R
R9	ENE-2.5	R
R10	ENE-5.0	R
R11	E-0.5	R
R12	E-1.9	R
R13	E-3.5 (Children's Home)	R
R14	E-4.2	R
R15	ESE-1.4	R
R16	ESE-4.7	R
R17	SE-1.3	R
R18	SE-3.85	R

Environmental Sample Locations Table (cont.)

Sampling Point	Location	Sample Type*
R19	SE-4.6	R
R20	SSE-1.3	R
R21	SSE-4.4 (Glen Rose)	R
R22	SSE-4.5 (Glen Rose)	R
R23	S-1.5	R
R24	S-4.2	R
R25	SSW-1.1	R
R26	SSW-4.4 (State Park)	R
R27	SW-0.9	R
R28	SW-4.8 (Girl Scout Camp)	R
R29	SW-12.3 (CONTROL)	R
R30	WSW-1.0	R
R31	WSW-5.35	R
R32	WSW-7.0 (CONTROL)	R
R33	W-1.0	R
R34	W-2.0	R
R35	W-5.5	R
R36	WNW-1.0	R
R37	WNW-5.0	R
R38	WNW-6.7	R
R39	NW-1.0	R
R40	NW-5.7	R
R41	NW-9.9 (Tolar)	R
R42	NNW-1.35	R
R43	NNW-4.6	R

Environmental Sample Locations Table (cont.)

Sampling Point	Location	Sample Type*
SW1	N-1.5 (Squaw Creek Reservoir Marina)	SW
SW2	N-9.9 (Lake Granbury)	SW/DW[1]
SW3	N-19.3 (CONTROL-Brazos River)	SW
SW4	NE-7.4 (Lake Granbury)	SW
SW5	ESE-1.4 (Squaw Creek Reservoir)	SW[2]
SW6	NNW-0.1 (Squaw Creek Reservoir)	SW/DW[2, 3]
GW1	W-1.2 (Security Rifle Range)	GW[7]
GW2	WSW-0.1 (Somerville Water district)	GW[3, 4,6]
GW3	SSE-4.6 (Glen Rose – Somerville Water District)	GW[4]
GW4	N-9.8 (Granbury)	GW[1, 4,6]
GW5	N-1.45 (Squaw Creek Park)	GW[4]
SS1	NNE-1.0 (Squaw Creek Reservoir)	SS
SS2	N-9.9 (Lake Granbury)	SS
SS3	NE-7.4 (Lake Granbury)	SS
SS4	SE-5.3 (Squaw Creek)	SS
F1	ENE-2.0 (Squaw Creek Reservoir)	F
F2	NNE-8.0 (Lake Granbury)	F
FP1	ENE-9.0 (Leonard Bros. Pecan Farm)	FP

Environmental Sample Locations Table (cont.)

Sampling Point	Location	Sample Type*
BL1	N-1.45	BL
BL2	SW-1.0	BL[5]
BL3	SW-13.5 (CONTROL)	BL[5]

*Sample Type: A - Air Sample; R - Direct Radiation; SW - Surface Water; DW - Drinking Water GW - Ground Water; SS - Shoreline Sediments; M - Milk; F - Fish; FP - Food Products; BL - Broadleaf Vegetation

NOTES: 1) The municipal water system for the City of Granbury is supplied by surface water from Lake Granbury (location SW2) and ground water (location GW4). Each of these supplies is sampled. These samples are not required for compliance with Radiological Effluent Control 3/4.12.1, Table 3.12-1, because they are not affected by plant discharges.

2) This sample (location SW6) is representative of discharges from Squaw Creek Reservoir both down Squaw Creek and to Lake Granbury via the return line to Lake Granbury if used.

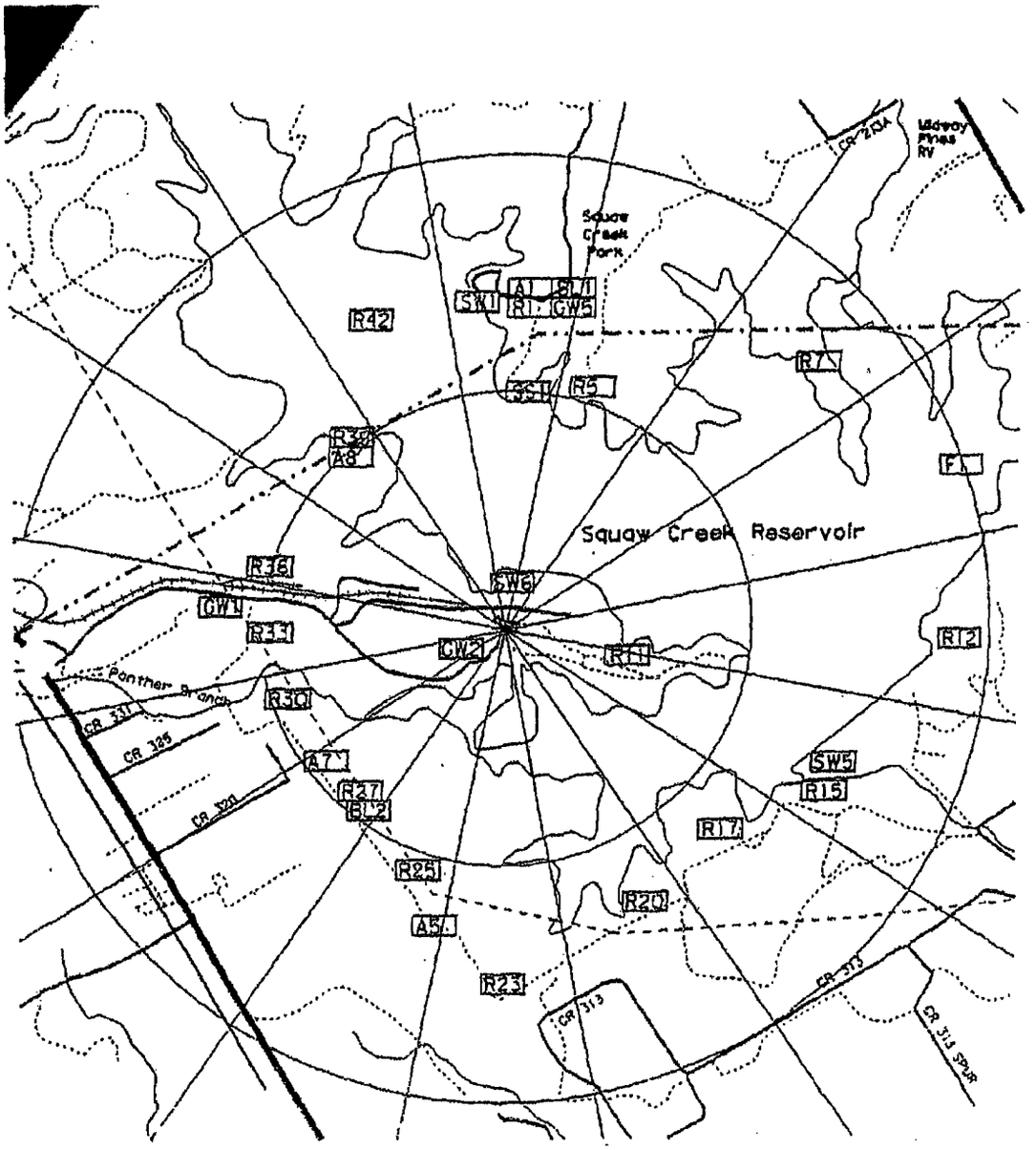
3) Plant potable water could be supplied by surface water from Squaw Creek Reservoir (location SW6) or ground water from onsite wells (location GW2) but is currently supplied by the Somerville County Water District from the Wheeler Branch Reservoir. Each of these possible sources of water are sampled.

4) Ground water supplies in the plant site area are not affected by plant liquid effluents as discussed in CPSES FSAR Section 2.4.13 and are therefore not required to be monitored for radioactivity to meet the requirements of the Radiological Effluent Control 3/4.12.1, Table 3.12-1.

5) Broadleaf sampling will be performed at the specified locations if milk samples are unavailable from any location.

6) Plant Potable Water (GW2) and Glen Rose (GW3) are supplied from surface water by the Somerville Water District from the Wheeler Branch Reservoir.

7) CPNPP Security Rifle Range (GW1) is supplied by a local Well.



Environmental Sample Locations Map - 2 Mile Radius