



CPNPP

Comanche Peak Nuclear Power Plant

2007 RADIOACTIVE EFFLUENT RELEASE REPORT

January 1, 2007 - December 31, 2007

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ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
CPNPP	Comanche Peak Nuclear Power Plant
ECL	Effluent Concentration Limit
LHMT	Laundry Holdup and Monitor Tanks
LVW	Low Volume Waste
ODCM	Offsite Dose Calculation Manual
PET	Primary Effluent Tanks
REC	Radiological Effluent Control
SORC	Station Operations Review Committee
WMT	Waste Monitor Tanks
WWHT	Waste Water Holdup Tanks

1.0 INTRODUCTION

This Radioactive Effluent Release Report, for Comanche Peak Nuclear Power Plant Unit 1 and Unit 2, is submitted as required by Technical Specification 5.6.3 and Offsite Dose Calculation Manual (ODCM) Administrative Control 6.9.1.4 for the period January 1, 2007, through December 31, 2007.

1.1 Executive Summary

The radioactive effluent monitoring program for the year 2007 was conducted as described in the following report. The results of the monitoring program indicate the continued effort to maintain the release of radioactive effluents to the environment as low as reasonably achievable (ALARA).

A summation of all the radioactive gaseous releases to the environment during 2007 produced the following results:

- The total gaseous tritium activity released from the site for 2007 was 55.9 Curies which is an increase from the 47.4 Curies in 2006. The major contributor to gaseous tritium activity is evaporation from the spent fuel pools. Factors contributing to the tritium activity in the pools is related to the type of fuel used (i.e., 18-month fuel) the core life and power output and number of core cycles.
- The total gaseous fission and activation activity (Noble gas) released from the site in 2007 was 13.9 Curies. This is a decrease from the 148.0 Curies released in 2006. In early 2007 during 1RF12, the PRT gas space was evacuated via an eduction method to the Waste Gas system. In the past, the PRT gas space was "equalized" to the Waste Gas system prior to venting to the Containment Atmosphere. As demonstrated by the 2007 total gaseous fission and activation activity, the PRT eduction method has significantly reduced the amount of radioactive gas released to the environment.
- The total gaseous particulate activity released for 2007 was 1.912E-06 Curies.
- The gross alpha released has continued at 0.00 Curies for 2007 matching the performance of the previous 11 years.
- Iodine was released at a value of 0.0 Curies for 2007.
- The calculated gamma air dose from the site due to noble gases released during 2007 is 1.53E-03 mrad. This is a decrease from 2006 which was 7.21E-03 mrad; the 2007 value represents only 0.008% of the annual limit for each reactor unit. This decrease is a direct result of less total gaseous fission and activation activity released in 2007.

- The calculated beta air dose from the site due to noble gases released during 2007 is 2.068E-03 mrad which is an increase from 2006 which was 1.76E-03 mrad; however, this represents only 0.005% of the annual limit for each unit.
- The total whole body dose from the site due to gaseous radioactivity released based on I-131, I-133, H-3 (tritium), and particulate nuclides for 2007 was 0.0785 mrem. This value is an increase from the 2006 whole body dose of 0.046 mrem.
- Overall the gaseous radioactivity releases from CPNPP are well controlled and maintained ALARA. CPNPP is well below all applicable limits for gaseous releases.
- A summation of all the radioactive liquid releases to the environment during 2007 produced the following results:
 - The total number of Curies of radioactive nuclides released from the site in liquid effluents in 2007 was 532.06 Curies, down from 1520.54 Curies in 2006.
 - Of the total Curies released from the site, tritium accounted for 532.00 Curies while all other nuclides released accounted for only 0.06 Curies. The total curies of tritium released are down from the 2006 total of 1520.0 Curies. This reduction was due mainly to lowered RCS tritium concentrations in both units for much of 2007. RCS tritium concentrations slowly increase to equilibrium during the first half of the fuel cycle. This is followed by a decrease in concentration as RCS dilution overtakes tritium production. Unit 2 refueled late in 2006 and Unit 1 was shutdown for almost 2 months in early 2007 for 1R12 (steam generator replacement). The combination of the timing of these two events resulted in a lower combined 2007 RCS tritium concentration for much of the year. Since most of the liquid effluents were released during the first part of the year, the annual effluent tritium concentration was unusually low.
- The total whole body dose from the site due to liquid effluents was 1.368E-01 mrem, which is only 2.28% of the annual limit for each unit. Tritium accounts for >99% of the calculated total whole body dose.

The CPNPP meteorological system achieved a 98.1% recoverable data rate for the joint frequency parameters required by Regulatory Guide 1.23 for wind speed, wind direction and delta temperature. All other parameters achieved an average of 94.0% recoverable data rate for 2007.

During 2007 there were no Technical Specification/ODCM effluent radiation monitors out of service for >30 days.

There was one revision to the ODCM approved and/or implemented in 2007. Refer to section 6.2 for an explanation of the revision.

For 2007, the total volume of solid radwaste buried increased to 180 cubic meters from 16.9 cubic meters last year and the total radioactivity buried increased to 475 curies from 369 curies in 2006. This increase was due to steam generator replacement during 1R12. The bulk of the buried solid waste volume comes from dry active waste at 177 cubic meters. Also, spent resins and filters were responsible for >99% of the entire total radioactivity buried.

During the spring of 2007, the Chemistry Department acquired responsibility for the Radioactive Effluents Program from the Radiation Protection Department. During this time, the existing radioactive effluents software program (RETDAS) was replaced by the OpenEMS software program.

Overall, the radioactive effluent monitoring program has been conducted in an appropriate manner to ensure the activity released and associated dose to the public has been maintained as low as reasonably achievable (ALARA).

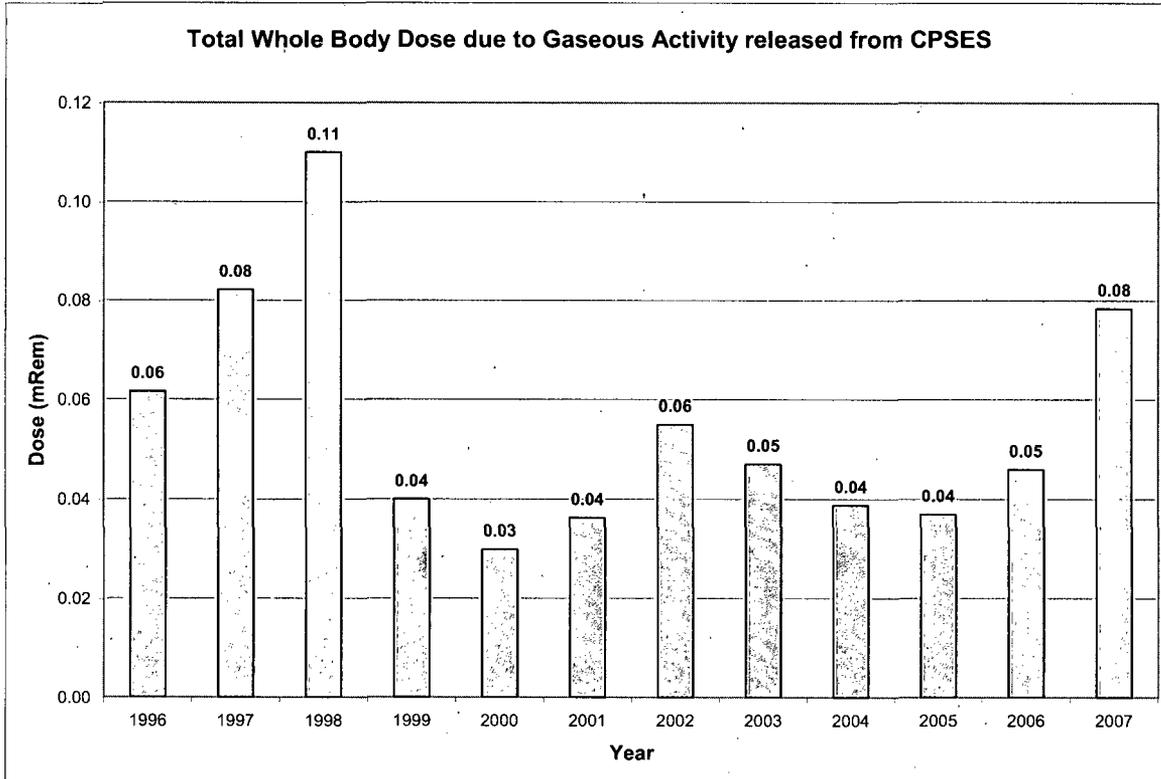
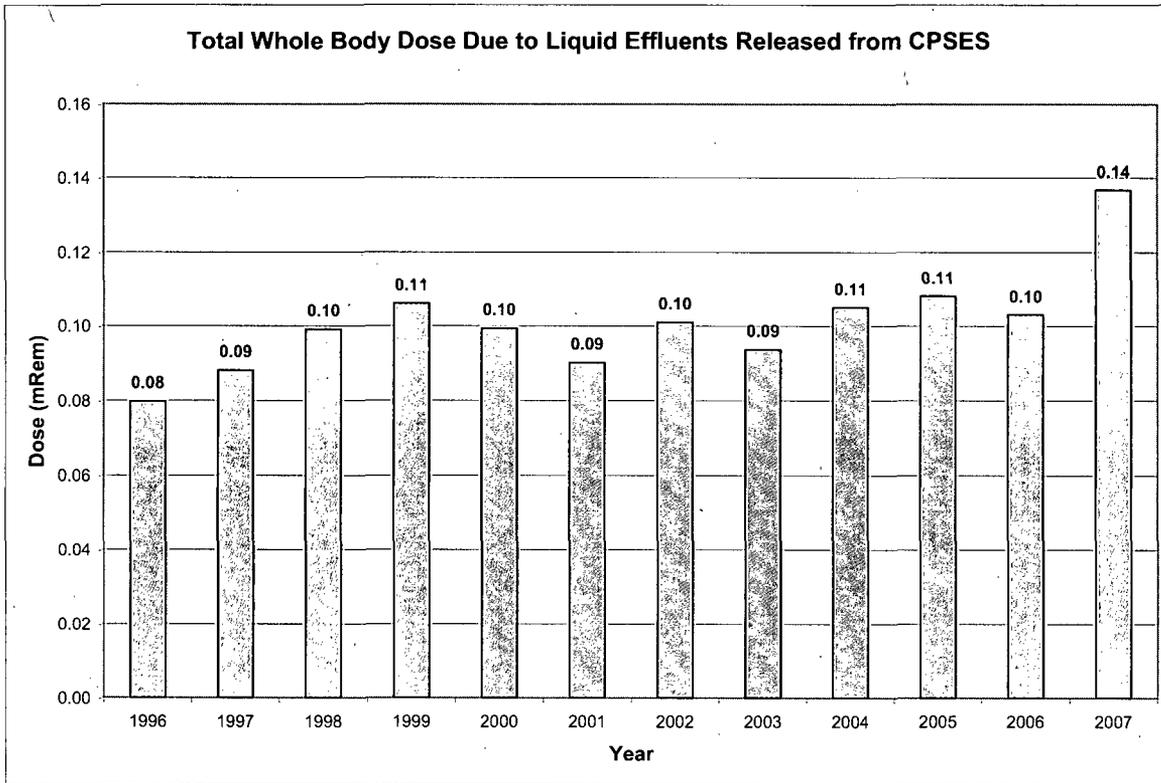
Information pertaining to the following items is included in this report:

- A summary of the quantities of radioactive liquid and gaseous effluents released from CPNPP during the reporting period in the format outlined in Appendix B of Regulatory Guide 1.21, Revision 1, June 1974.
- A summary of solid waste shipped from CPNPP in the format shown in Appendix B of Regulatory Guide 1.21, Revision 1, June 1974, supplemented with three additional categories: class of waste (per 10CFR61), type of container (Strong Tight, HIC) and shipped and buried volumes and curies.
- An explanation of why inoperable liquid or gaseous effluent monitoring instrumentation was not corrected within 30 days.
- ODCM changes during 2007. A copy of the ODCM will be sent along with this report.
- A listing of new locations for dose calculations and/or environmental monitoring identified by the Land Use

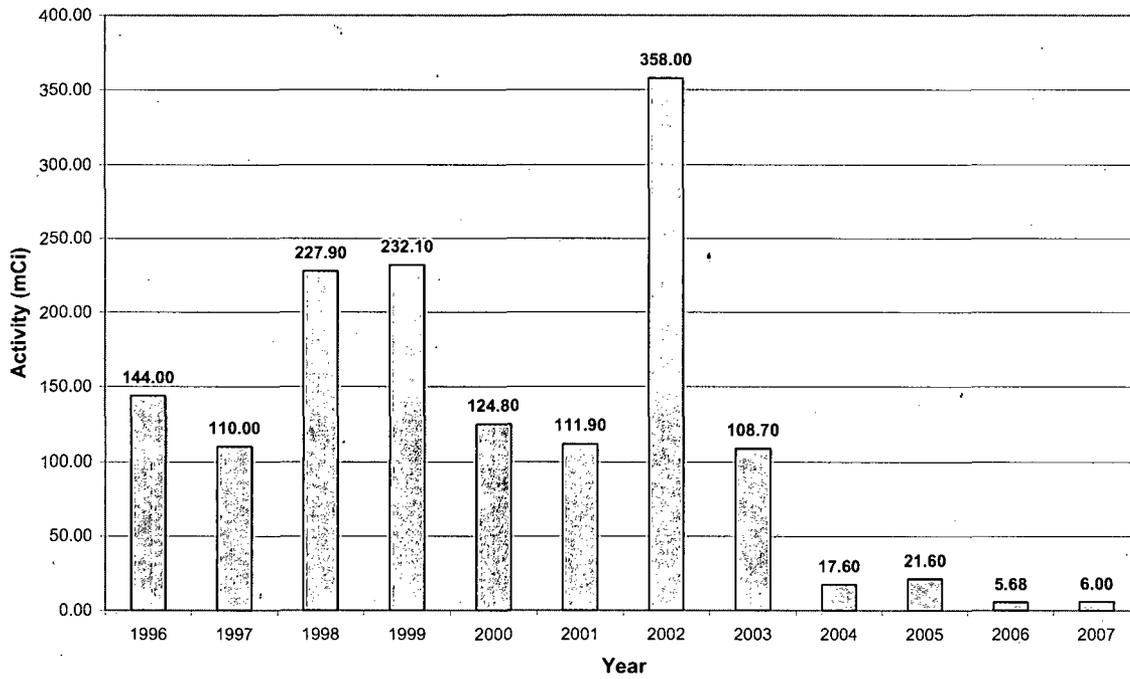
Census.

- A description of the events leading to liquid holdup tanks or gas storage tanks exceeding Technical Specification limits.
- A list and description of abnormal releases of radioactive material from the site to unrestricted areas.
- A description of secondary resin releases to the LVW Pond.
- A description of major changes to radioactive waste treatment systems (liquid, gaseous and solid).
- An assessment of radiation doses due to the radioactive liquid and gaseous effluents released from CPNPP Unit 1 and Unit 2 in 2007.
- An assessment of radiation doses to the likely, most exposed MEMBER OF THE PUBLIC from CPNPP releases and other nearby uranium fuel cycle sources, including doses from primary effluent pathways and direct radiation, for the reporting period, to show conformance with 40 CFR 190, "Environmental Radiation Protection Standards for Nuclear Power Operation."
- An assessment of the radiation doses from radioactive liquid and gaseous effluents to MEMBERS OF THE PUBLIC due to their activities inside the Site Boundary.
- Onsite perched groundwater wells were sampled in accordance with ENV-323, *Tritium Groundwater Monitoring Program*, with no tritium or any other radioactive nuclides detected in 2007.

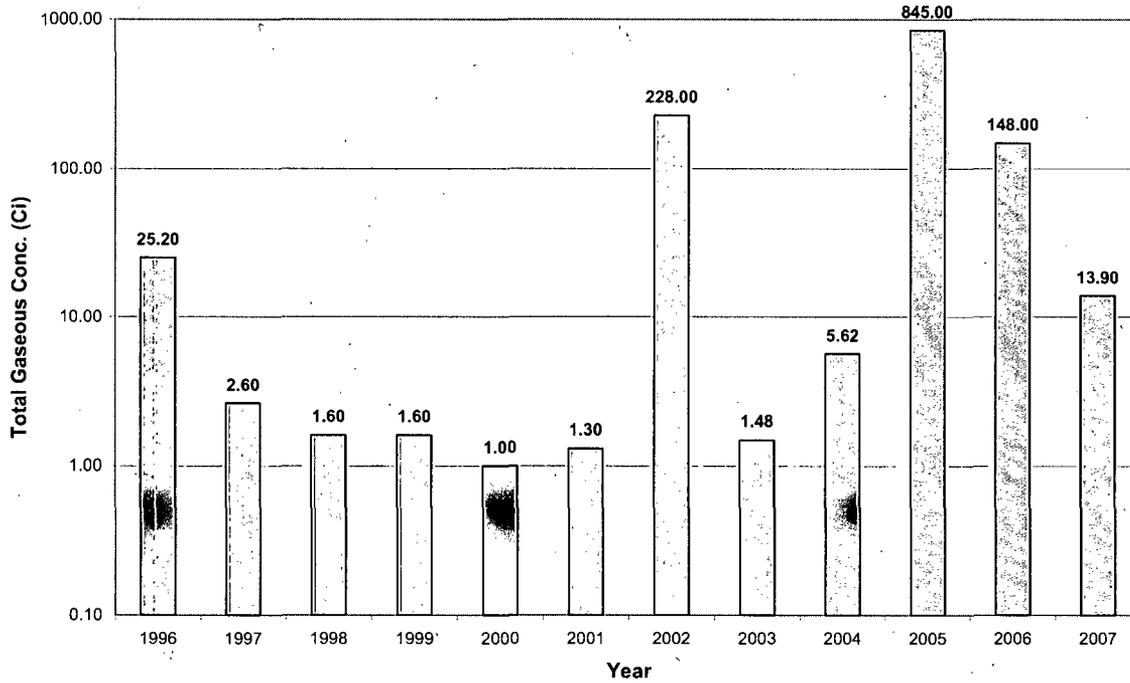
1.2 General Trend Graphs



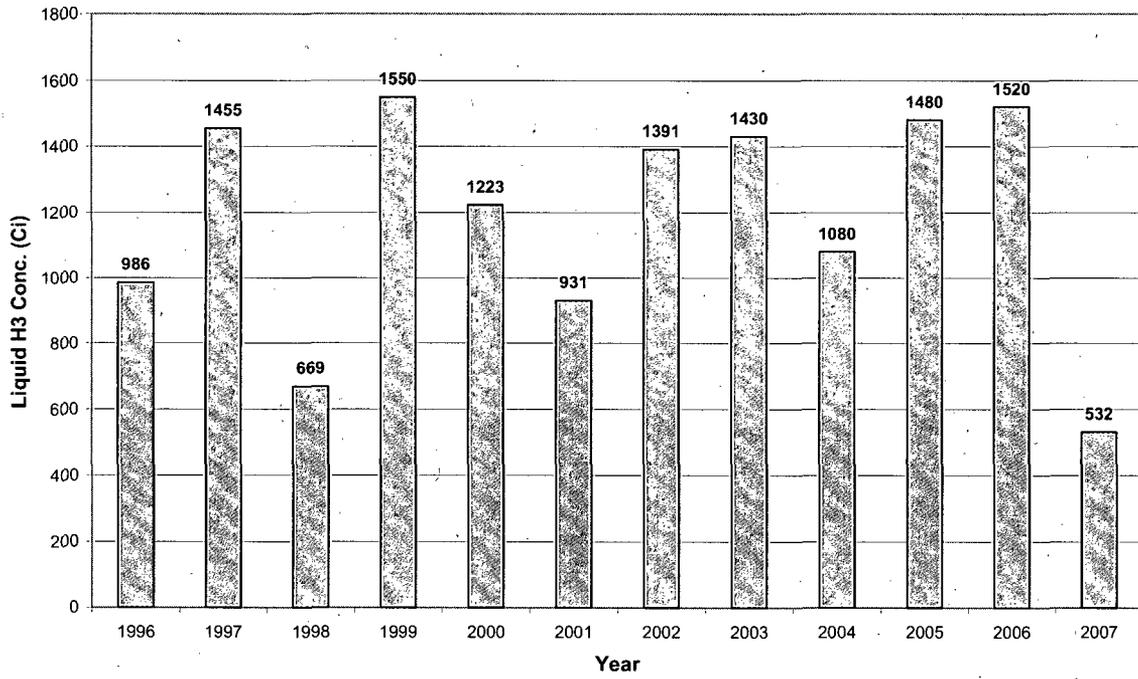
Total Activity (Excluding H3) Released in Liquid Effluents from CPSES



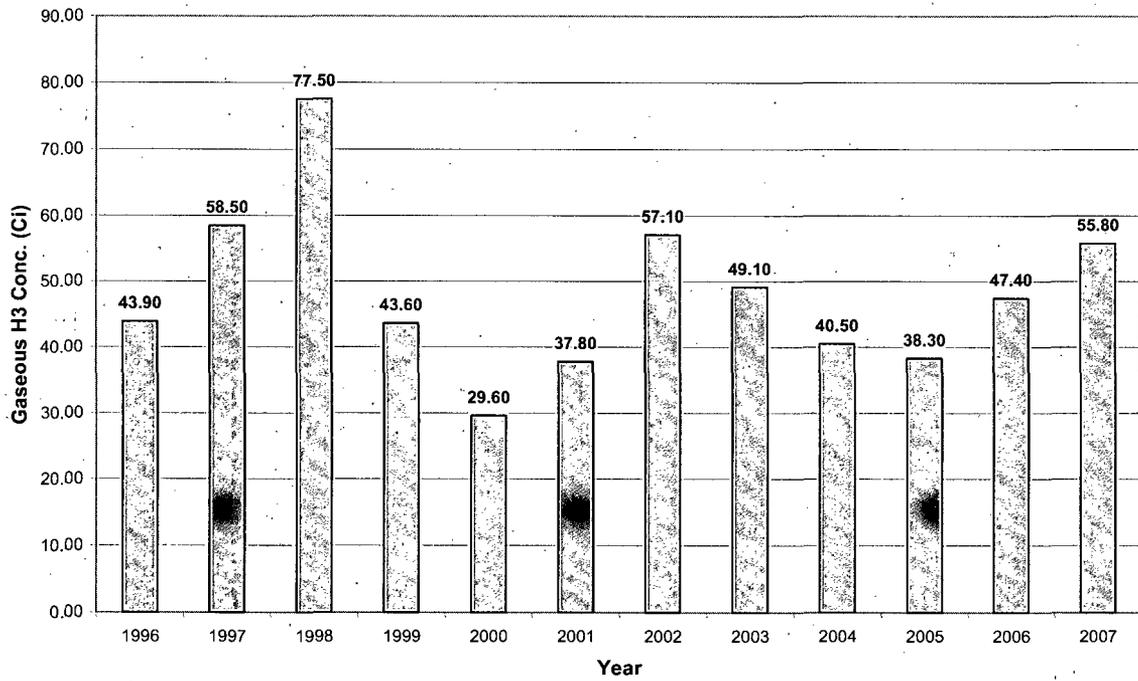
Total Gaseous Fission and Activation Activity Released from CPSES



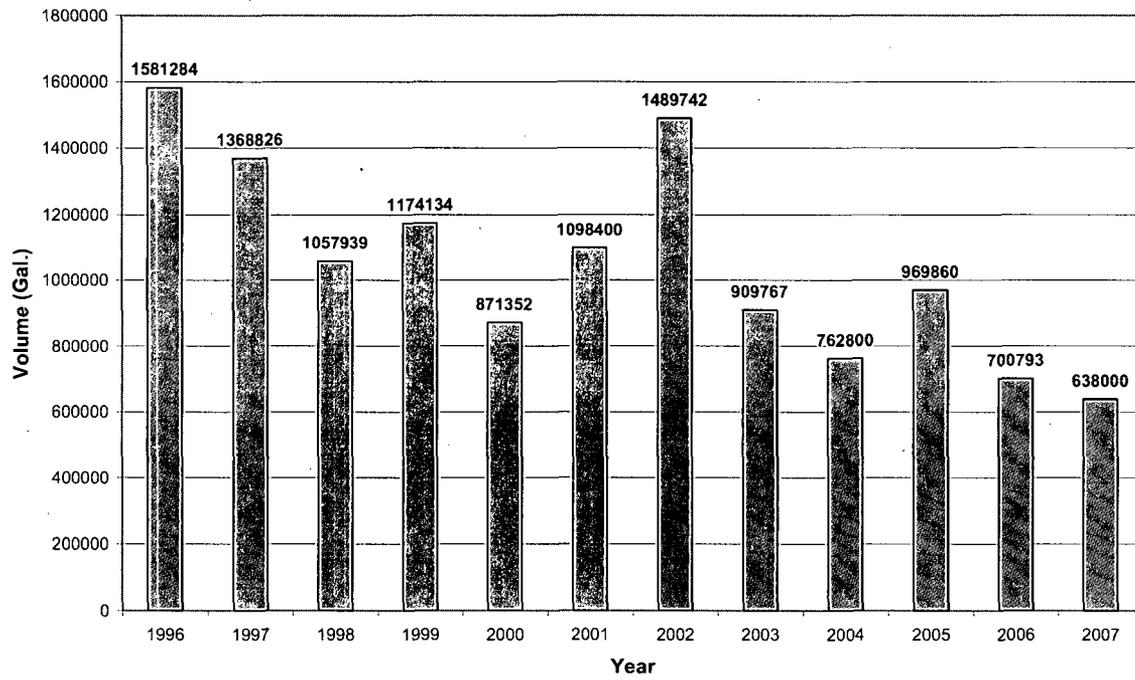
Total Curies of Tritium Released in Liquid Effluents from CPSES



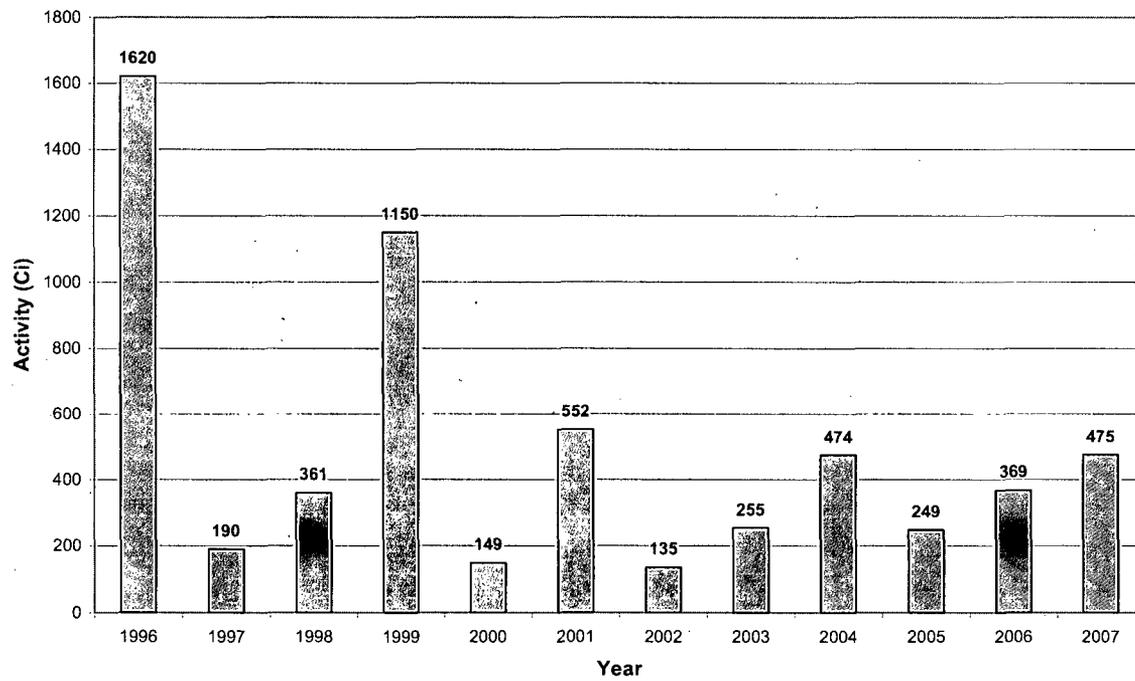
Total Gaseous Tritium Released from CPSES



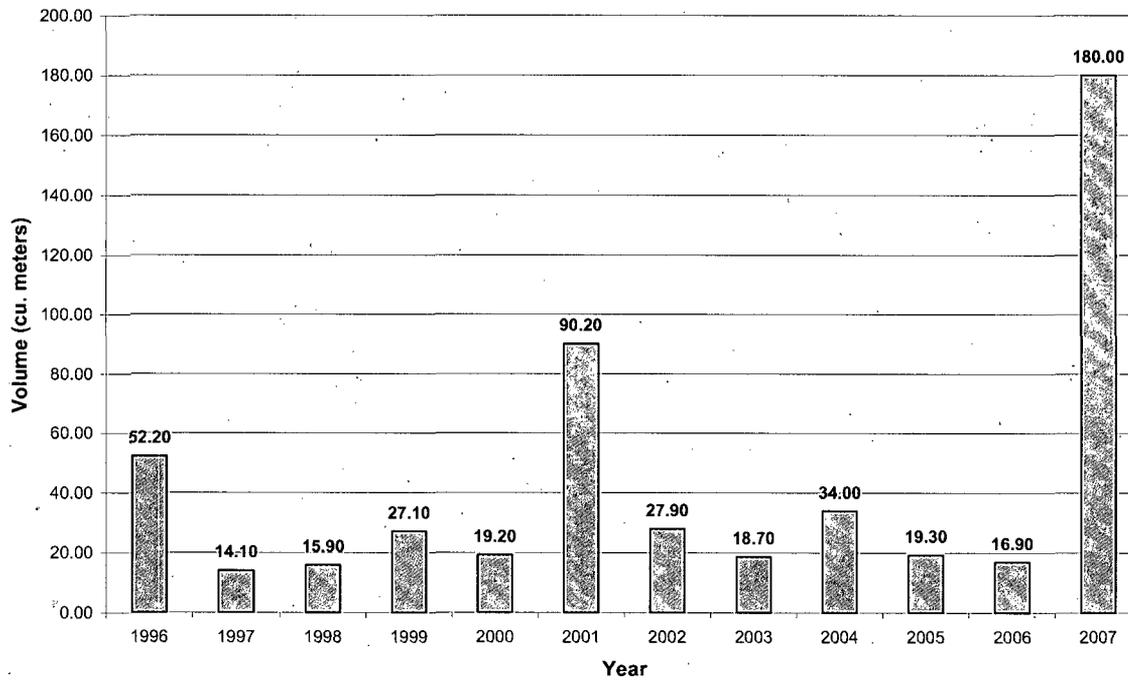
Total Volume Liquid Effluents Released from CPSES



Total Curies of Solid Radwaste Buried from CPSES



Total Volume of Solid Radwaste Buried from CPSES



2.0 SUPPLEMENTAL INFORMATION

2.1 Regulatory Limits

The ODCM Radiological Effluent Control limits applicable to the release of radioactive material in liquid and gaseous effluents are described in the following sections.

2.1.1 Fission and Activation Gases (Noble Gases)

The dose rate due to radioactive materials released in gaseous effluents from the site to areas at and beyond the site boundary shall be limited to less than or equal to 500 mrem/yr to the whole body and less than or equal to 3000 mrem/yr to the skin.

The air dose due to noble gases released in gaseous effluents, from each unit, to areas at and beyond the site boundary shall be limited to the following:

- a. During any calendar quarter: Less than or equal to 5 mrad for gamma radiation and less than or equal to 10 mrad for beta radiation, and
- b. During any calendar year: Less than or equal to 10 mrad for gamma radiation and less than or equal to 20 mrad for beta radiation.

2.1.2 Iodine-131, Iodine-133, Tritium and Radioactive Material in Particulate Form

The dose rate due to iodine-131, iodine-133, tritium and all radionuclides in particulate form with half lives greater than 8 days, released in gaseous effluents from the site to areas at and beyond the site boundary, shall be limited to less than or equal to 1500 mrem/yr to any organ.

The dose to a MEMBER OF THE PUBLIC from iodine-131, iodine-133, tritium and all radionuclides in particulate form with half lives greater than 8 days, in gaseous effluents released, from each unit, to areas at and beyond the site boundary, shall be limited to the following:

- a. During any calendar quarter: Less than or equal to 7.5 mrem to any organ, and
- b. During any calendar year: Less than or equal to 15 mrem to any organ.

2.1.3 Liquid Effluents

The concentration of radioactive material released in liquid effluents to unrestricted areas shall be limited to 10 times the concentrations specified in 10 CFR Part 20, Appendix B, Table 2, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to 2.0E-4 $\mu\text{Ci/ml}$ total activity.

The dose or dose commitment to a MEMBER OF THE PUBLIC from radioactive materials in liquid effluents released, from each unit, to unrestricted areas shall be limited:

- a. During any calendar quarter to less than or equal to 1.5 mrem to the whole body and to less than or equal to 5 mrem to any organ, and
- b. During any calendar year to less than or equal to 3 mrem to the whole body and to less than or equal to 10 mrem to any organ.

2.1.4 LVW Pond Resin Inventory

The quantity of radioactive material contained in resins transferred to the LVW pond shall be limited by the following expression:

$$(264/V) \sum_j A_j/C_j < 1.0$$

excluding tritium, dissolved or entrained noble gases and radionuclides with less than an 8 day half life, where:

A_j = pond inventory limit for a single radionuclide j (Curies),

C_j = 10CFR20, Appendix B, Table 2 Column 2, concentration for a single radionuclide j ($\mu\text{Ci/ml}$),

V = volume of resins in the pond (gallons), and

264 = conversion factor ($\mu\text{Ci/Ci}$ per ml/gal)

2.1.5 Total Dose

The annual (calendar year) dose or dose commitment to any MEMBER OF THE PUBLIC due to releases of radioactivity and to radiation from uranium fuel cycle sources shall be limited to less than or equal to 25 mrems to the whole body or any organ, except the thyroid, which shall be limited to less than or equal to 75 mrems.

2.2 Effluent Concentration Limits

2.2.1 Gaseous Effluents

For gaseous effluents, effluent concentration limits (ECL) values are not directly used in release rate calculations since the applicable limits are expressed in terms of dose rate at the site boundary.

2.2.2 Liquid Effluents

The values specified in 10 CFR Part 20, Appendix B, Table 2, Column 2 are used as the ECL for liquid radioactive effluents released to unrestricted areas. A value of $2.0E-04$ $\mu\text{Ci/ml}$ is used as the ECL for dissolved and entrained noble gases in liquid effluents.

2.3 Measurements and Approximations of Total Radioactivity

Measurements of total radioactivity in liquid and gaseous radioactive effluents were accomplished in accordance with the sampling and analysis requirements of Tables 4.11-1 and 4.11-2, respectively, of the CPNPP ODCM.

2.3.1 Liquid Radioactive Effluents

Each batch release was sampled and analyzed for gamma emitting radionuclides using gamma spectroscopy, prior to release. Composite samples were analyzed monthly and quarterly for the Primary Effluent Tanks (PET), Waste Monitor Tanks (WMT), Laundry Holdup and Monitor Tanks (LHMT) and Waste Water Holdup Tanks (WWHT). Composite samples were analyzed monthly for tritium and gross alpha radioactivity in the onsite laboratory using liquid scintillation and gas flow proportional counting techniques, respectively. Composite samples were analyzed quarterly for Sr-89, Sr-90 and Fe-55 by a contract laboratory. The results of the composite analyses from the previous month or quarter were used to estimate the quantities of these radionuclides in liquid effluents during the current month or quarter. The total radioactivity

in liquid effluent releases was determined from the measured and estimated concentrations of each radionuclide present and the total volume of the effluent released during periods of discharge.

For batch releases of powdex resin to the LVW pond, samples were analyzed for gamma emitting radionuclides, using gamma spectroscopy techniques, prior to release. Composite samples were analyzed quarterly, for Sr-89 and Sr-90, by a contract laboratory.

For continuous releases to the Circulating Water Discharge from the LVW pond, daily grab samples were obtained over the period of pond discharge. These samples were composited and analyzed for gamma emitting radionuclides, using gamma spectroscopy techniques. Composite samples were also analyzed for tritium and gross alpha radioactivity using liquid scintillation and gas flow proportional counting techniques, respectively. Composite samples were analyzed quarterly for Sr-89, Sr-90 and Fe-55 by a contract laboratory.

2.3.2 Gaseous Radioactive Effluents

Each gaseous batch release was sampled and analyzed for radioactivity prior to release. For releases from Waste Gas Decay Tanks, noble gas grab samples were analyzed for gamma emitting radionuclides (using gamma spectroscopy). For releases from the Containment Building, samples were taken using charcoal and particulate filters, in addition to noble gas and tritium grab samples, and analyzed for gamma emitting radionuclides prior to each release with the exception of Containment vents made as a precursor to a Containment purge. In these cases, samples collected and analyzed as a prerequisite to the vent were used to estimate total radioactivity released during the subsequent purge. The results of the analyses and the total volume of effluent released were used to determine the total amount of radioactivity released in the batch mode.

For continuous effluent release pathways, noble gas and tritium grab samples were collected and analyzed weekly for gamma emitting radionuclides by gamma spectroscopy and liquid scintillation counting techniques, respectively. Continuous release pathways were continuously sampled using radioiodine adsorbers and particulate filters. The radioiodine adsorbers and particulate filters were analyzed weekly for I-131 and gamma emitting

radionuclides using gamma spectroscopy. Results of the noble gas and tritium grab samples, radioiodine adsorber and particulate filter analyses from the current week and the average effluent flow rate for the previous week were used to determine the total amount of radioactivity released in the continuous mode. Monthly composites of particulate filters were analyzed for gross alpha activity, in the onsite laboratory using the gas flow proportional counting technique. Quarterly composites of particulate filters were analyzed for Sr-89 and Sr-90 by a contract laboratory.

2.4 Batch Releases

A summary of information for gaseous and liquid batch releases is included in Table 7.1.

2.5 Abnormal or Unplanned Releases

Abnormal releases are defined as the unintended discharge of a volume of liquid or airborne radioactivity to the environment. One normal, unplanned gaseous effluent release and one abnormal, unplanned gaseous effluent release occurred during 2007. Refer to section 6.5.1 and 6.5.2 for a detailed description of these events. No abnormal or unplanned liquid effluent releases occurred during 2007. Table 7.2 summarizes the abnormal and unplanned releases.

3.0 GASEOUS EFFLUENTS

The quantities of radioactive material released in gaseous effluents are summarized in Tables 7.3 and 7.4. All releases of radioactive material in gaseous form are considered to be ground level releases.

4.0 LIQUID EFFLUENTS

The quantities of radioactive material released in liquid effluents are summarized in Tables 7.5 and 7.6.

5.0 SOLID WASTES

The quantities of radioactive material released as solid effluents are summarized in Table 7.10.

6.0 RELATED INFORMATION

6.1 Operability of Liquid and Gaseous Monitoring Instrumentation

ODCM Radiological Effluent Controls 3.3.3.4 and 3.3.3.5 require an explanation of why designated inoperable liquid and gaseous monitoring instrumentation was not restored to operable status within thirty days.

During the period covered by this report, there were no instances where these instruments were inoperable for more than thirty days.

6.2 Changes to the Offsite Dose Calculation Manual

During the period covered by this report, there was one revision to the ODCM approved and/or implemented. The revision number is 27. A complete copy of the ODCM, with change bars, will be provided as a separate Enclosure to the letter transmitting this report.

6.3 New Locations for Dose Calculations or Environmental Monitoring

ODCM Administrative Control 6.9.1.4 requires any new locations for dose calculations and/or environmental monitoring, identified by the Land Use Census, to be included in the Radioactive Effluent Release Report. Based on the 2007 Land Use Census, no new receptor locations were identified which resulted in changes requiring a revision in current environmental sample locations. Values for the current nearest resident, milk animal, garden, X/Q and D/Q values in all sectors surrounding CPNPP were included in the 2007 Land Use Census.

6.4 Liquid Holdup and Gas Storage Tanks

ODCM Administrative Control 6.9.1.4 requires a description of the events leading to liquid holdup or gas storage tanks exceeding the limits required to be established by Technical Specification 5.5.12. Technical Requirements Manual 13.10.33 limits the quantity of radioactive material contained in each unprotected outdoor tank to less than or equal to ten curies, excluding tritium and dissolved or entrained noble gases. Technical Requirements Manual 13.10.32 limits the quantity of radioactive material contained in each gas storage tank to less than or equal to 200,000 curies of noble gases (considered as Xe-133 equivalent). These limits were not exceeded during the period covered by this report.

6.5 Noncompliance with Radiological Effluent Control Requirements

This section provides a listing and description of Abnormal Releases, issues that did not comply with the applicable requirements of the Radiological Effluents Controls given in Part I of the CPNPP ODCM and/or issues that did not comply with associated Administrative Controls and that failed to meet CPNPP expectations regarding Station Radioactive Effluent Controls. Detailed documentation concerning evaluations of these events and corrective actions is maintained onsite.

6.5.1 Normal, Unplanned Gaseous Release

A normal, unplanned gaseous effluent release occurred on 2/12/07 and originated from Waste Gas Decay Tank X-03. While performing normal Waste Gas System operations, 654 ft³ gas volume leaked from GDT 3 via a body to bonnet leak on inlet valve XGH-7820C. Fasteners on this valve were later found to be loose. This normal, unplanned gaseous effluent release was documented in release permit number 2007-027 and Smart Form number 2007-000468.

6.5.2 Abnormal, Unplanned Gaseous Effluent Release

An abnormal, unplanned gaseous effluent release occurred on 4/14/07 during the 1RF12 Containment Integrated Leak Rate Test (ILRT) and originated from the Unit 1 emergency airlock inner door boundary (outer door was open). The leakage was found in room 1-111 by the ILRT team. This room is not ventilated by the primary plant ventilation system and is therefore an unmonitored unplanned release. An analysis was performed that determined the leakage through the emergency airlock inner boundary while at full ILRT test pressure (about 50 psig) was approximately 0.0314 weight %/day which is equivalent to about 78,000 SCCM or 2.75 SCFM. Pressurization for the ILRT started on 4/14/07 at 00:40 hours and the leak was discovered/stopped at 2240 hours the same day. This abnormal, unplanned gaseous effluent release was documented in release permit number 2007-064 and Smart Form number 2007-001327.

6.5.3 Abnormal, Unplanned Liquid Effluent Releases

No abnormal or unplanned liquid effluent releases occurred during 2007.

6.6 Resin Releases to the LVW Pond

A total of 172 ft³ of powdex resin was transferred to the LVW pond during the period covered by this report. The cumulative activity deposited in the LVW pond since operations began through the end of 2007 is 1.18E-03 Curies, consisting of Co-58, Co-60, Cs-134, Cs-137, I-131 and Sb-125.

6.7 Changes to the Liquid, Gaseous, and Solid Waste Treatment Systems

In accordance with the CPNPP Process Control Program, Section 6.2.6.2, changes to the Radwaste Treatment Systems (liquid, gaseous and solid) should be summarized and reported to the Commission in the Radioactive Effluent Release Report if the changes implemented required a 10CFR50.59 safety evaluation.

For the reporting period of this report, no changes to the Radwaste Treatment Systems occurred that meet the reporting criteria of the Process Control Program.

6.8 Meteorological Monitoring Program

In accordance with ODCM Administrative Control 6.9.1.4, a summary of hourly meteorological data, collected during 2007, is retained onsite. This data is available for review by the NRC upon request. Joint Frequency Tables are included in Attachment 8.1. During 2007, the goal of >90% joint data recovery was met.

6.9 Assessment of Doses

6.9.1 Doses Due to Liquid Effluents

The doses to an adult from the fish and cow-meat consumption pathways from Squaw Creek Reservoir were calculated in accordance with the methodology and parameters in the ODCM. The results of the calculations are summarized on a quarterly and annual basis in 7.7.

6.9.2 Doses Due to Gaseous Effluents

The air dose due to gamma emissions and the air dose due to beta emissions were calculated using the highest annual average atmospheric dispersion factor at the Site Boundary location, in accordance with the methodology and parameters in the ODCM. The results of the calculations are summarized on a quarterly and annual basis in Table 7.8.

6.9.3 Dose Due to Radioiodines, Tritium and Particulates

The doses to an adult, teen, child, and infant from radioiodines and particulates, for the pathways listed in Part II, Table 2.4 of the ODCM, were calculated using the highest dispersion and deposition factors, as appropriate, in accordance with the methodology and parameters in the ODCM. The results of the calculations are summarized on a quarterly and annual basis in Table 7.9.

6.9.4 40CFR190 Dose Evaluation

ODCM Radiological Effluent Control 3.11.4 requires dose evaluations to demonstrate compliance with 40 CFR Part 190 only if the calculated quarterly or yearly doses exceed two times the applicable quarterly or annual dose limits. At no time during 2007 were any of these limits exceeded, therefore no evaluations are required.

6.9.5

Doses to a MEMBER OF THE PUBLIC From Activities Inside the Site Boundary

Three activities are considered in this evaluation: fishing on Squaw Creek Reservoir, recreation activities at the CPNPP employee recreational area and site tours through the CPNPP Visitors Center.

The highest dose occurred in the evaluation for fishing, resulting in a dose of $1.27E-4$ mrem/yr. The dose to a MEMBER OF THE PUBLIC (fisherman) on Squaw Creek Reservoir was calculated based on fishing twice a week, five hours each day, six months per year. Pathways included in the calculation were gaseous inhalation and submersion. Liquid pathways are not considered since all doses are calculated at the point of circwater discharge into the lake.

The dose to a MEMBER OF THE PUBLIC engaged in recreational activities at the CPNPP employee recreational park was calculated based on one visit a week, five hours each day, six months per year. Pathways included in the calculation were gaseous inhalation, submersion and ground plane.

The dose to a MEMBER OF THE PUBLIC during site tours through the CPNPP Visitors Center was calculated based on two visits per year, thirty minutes each visit. Pathways included in the calculation were gaseous inhalation and submersion.

Due to increased security, routine fishing on Squaw Creek Reservoir and visitation by the public on-site has been significantly restricted. The calculations are still valid and included in the event security access restrictions are ever returned to previous conditions and controls.

All calculations were performed in accordance with the methodology and parameters in the ODCM.

SECTION 7.0
TABLES

Table 7.1
Site Liquid and Gaseous Batch Release Summary (2007)

	Units	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year Totals
A. Liquid Releases						
Number of batch releases	:	15	10	4	5	34
Total time period for Batch releases	(Minutes):	5.095E+03	3.300E+03	1.270E+03	1.513E+03	1.118E+04
Maximum time period for a batch release	(Minutes):	3.850E+02	4.300E+02	3.300E+02	3.230E+02	4.300E+02
Average time period for a batch release	(Minutes):	3.397E+02	3.300E+02	3.175E+02	3.026E+02	3.288E+02
Minimum time period for a batch release	(Minutes):	3.000E+02	2.450E+02	2.900E+02	2.800E+02	2.450E+02
Average stream flow	(GPM) :	5.537e+04	4.531E+04	1.788E+04	2.021E+04	1.388E+05
B. Gaseous Releases						
Number of batch releases	:	31	34	32	35	132
Total time period for batch releases	(Minutes):	1.113E+04	1.362E+04	1.169E+04	1.234E+04	4.878E+04
Maximum time period for a batch release	(Minutes):	4.540E+02	1.320E+03	3.990E+02	4.110E+02	1.320E+03
Average time period for a batch release	(Minutes):	3.589E+02	4.007E+02	3.653E+02	3.526E+02	3.696E+02
Minimum time period for a batch release	(Minutes):	1.820E+02	2.800E+02	3.260E+02	2.730E+02	1.820E+02

Table 7.2
Site Abnormal Batch Liquid and Gaseous Release Summary (2007)

		1ST	2ND	3RD	4TH	Year
	Units	Quarter	Quarter	Quarter	Quarter	Totals
A. Liquid Releases						
Number of Releases	:	0	0	0	0	
Total Time For All Releases	(Minutes):	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Maximum Time For A Release	(Minutes):	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Average Time For A Release	(Minutes):	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Minimum Time For A Release	(Minutes):	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Total activity for all releases	(Curies) :	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
B. Gaseous Releases						
Number of Releases	:	1	1	0	0	2
Total Time For All Releases	(Minutes):	3.000E+02	1.320E+03	0.000E+00	0.000E+00	1.620E+03
Maximum Time For A Release	(Minutes):	3.000E+02	1.320E+03	0.000E+00	0.000E+00	1.320E+03
Average Time For A Release	(Minutes):	3.000E+02	1.320E+03	0.000E+00	0.000E+00	8.100E+02
Minimum Time For A Release	(Minutes):	3.000E+02	1.320E+03	0.000E+00	0.000E+00	3.000E+02
Total activity for all releases	(Curies) :	3.757E-01	7.843E-07	0.000E+00	0.000E+00	3.757E-01

Table 7.3
Site Gaseous Effluents - Summation Of All Releases (2007)

Type of Effluent	Units	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year Totals
A. Fission and Activation Gases						
Total Release	Curies	4.569E+00	1.096E+00	1.374E+00	6.879E+00	1.392E+01
Average Release rate for period	uCi/sec	5.795E-01	1.390E-01	1.743E-01	8.725E-01	1.765E+00
Percent of Applicable Limit	%	*	*	*	*	
B. Radioiodines						
Total Iodine-131		0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Average Release rate for period		0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Percent of Applicable Limit	%	*	*	*	*	
C. Particulates						
Particulates (Half-Lives > 8 Days)	Curies	0.000E+00	1.912E-06	0.000E+00	0.000E+00	1.912E-06
Average Release rate for period	uCi/sec	0.000E+00	2.425E-07	0.000E+00	0.000E+00	2.425E-07
Percent of Applicable Limit	%	*	*	*	*	
D. Tritium						
Total Release	Curies	1.256E+01	1.279E+01	1.898E+01	1.156E+01	5.588E+01
Average Release rate for period	uCi/sec	1.593E+00	1.622E+00	2.407E+00	1.467E+00	7.088E+00
Percent of Applicable Limit	%	*	*	*	*	
E. Gross Alpha						
Total Release		0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Average Release rate for period		0.000E+00	0.000E+00	0.000E+00	0.000E+00	

* Applicable limits are expressed in terms of dose. Estimated total error for all values is <1.0%

Table 7.4
Site Gaseous Effluents - Ground Level Releases (2007)

Continuous Mode Nuclides Released	Units	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total
Fission Gases						
Ar-41	Curies	0.000E+00	0.000E+00	0.000E+00	4.611E-01	4.611E-01
Xe-133	Curies	2.162E+00	0.000E+00	0.000E+00	2.394E+00	4.556E+00
Total for Period	Curies	2.162E+00	0.000E+00	0.000E+00	2.855E+00	5.017E+00
Iodines						
No Nuclides Found		N/A	N/A	N/A	N/A	
Particulates						
Cs-134	Curies	0.000E+00	1.912E-06	0.000E+00	0.000E+00	1.912E-06
Total for Period	Curies	0.000E+00	1.912E-06	0.000E+00	0.000E+00	1.912E-06
Tritium						
H-3	Curies	1.252E+01	1.277E+01	1.895E+01	1.153E+01	5.578E+01
Gross Alpha						
No Nuclides Found		N/A	N/A	N/A	N/A	

Table 7.4 (cont.)
Site Gaseous Effluents - Ground Level Releases (2007)

Batch Mode Nuclides Released	Units	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total
Fission Gases						
Ar-41	Curies	1.974E-01	1.238E-01	1.322E-01	1.492E-01	6.025E-01
Kr-85m	Curies	2.294E-02	0.000E+00	0.000E+00	5.045E-05	2.299E-02
Kr-85	Curies	3.301E-01	8.272E-01	1.075E-01	1.393E+00	2.658E+00
Kr-87	Curies	9.158E-03	0.000E+00	0.000E+00	0.000E+00	9.158E-03
Kr-88	Curies	3.265E-02	0.000E+00	8.604E-05	0.000E+00	3.274E-02
Xe-131m	Curies	8.184E-03	7.788E-05	1.734E-02	3.833E-02	6.393E-02
Xe-133m	Curies	2.464E-02	0.000E+00	2.845E-03	1.176E-02	3.925E-02
Xe-133	Curies	1.520E+00	1.447E-01	1.114E+00	2.426E+00	5.205E+00
Xe-135m	Curies	1.042E-01	1.463E-04	0.000E+00	0.000E+00	1.044E-01
Xe-135	Curies	1.578E-01	4.764E-05	3.508E-04	4.567E-03	1.628E-01
Xe-138	Curies	0.000E+00	0.000E+00	0.000E+00	4.844E-04	4.844E-04
Total for Period	Curies	2.407E+00	1.096E+00	1.374E+00	4.023E+00	8.901E+00
Iodines						
No Nuclides Found		N/A	N/A	N/A	N/A	
Particulates						
No Nuclides Found		N/A	N/A	N/A	N/A	
Tritium						
H-3	Curies	3.152E-02	2.003E-02	2.581E-02	2.843E-02	5.842E-02
Gross Alpha						
No Nuclides Found		N/A	N/A	N/A	N/A	

Table 7.5
Site Liquid Effluents - Summation of All Releases (2007)

	Units	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year
A. Fission and Activation Products						
Total Release(not including tritium, gases, alpha)	Curies	1.097E-03	3.951E-03	1.174E-03	1.410E-03	7.631E-03
Average diluted concentration during period	uCi/mL	7.495E-11	3.286E-10	2.466E-10	2.618E-10	9.119E-10
Percent of Applicable Limit	%	0.000022	0.000259	0.000022	0.000105	
B. Tritium						
Total Release	Curies	4.068E+02	7.869E+01	2.230E+01	2.417E+01	5.320E+02
Average diluted Concentration during period	uCi/mL	2.780E-05	6.544E-06	4.685E-06	4.488E-06	4.351E-05
Percent of Applicable Limit	%	2.780	0.654	0.469	0.449	
C. Dissolved and Entrained Gases						
Total Release	Curies	3.847E-02	6.914E-03	1.066E-05	3.139E-03	4.853E-02
Average diluted Concentration during period	uCi/mL	2.628E-09	5.749E-10	2.239E-12	5.830E-10	3.788E-09
Percent of Applicable Limit	%	0.001	0.000	0.000	0.000	
D: Gross Alpha Radioactivity						
Total Release		0.000E+00	0.000E+00	0.000E+00	0.000E+00	
E: Waste Vol Release (Pre-Dilution)						
	Liters	1.095E+06	7.083E+05	2.812E+05	3.291E+05	2.414E+06
F. Volume of Dilution Water Used						
	Liters	1.463E+10	1.202E+10	4.759E+09	5.384E+09	3.680E+10

Table 7.6
Site Liquid Effluents (2007)

Continuous Mode						
Nuclides Released	Unit	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year
Fission & Activation Products						
No Nuclides Found		N/A	N/A	N/A	N/A	
Tritium						
H-3	Curies	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Dissolved And Entrained Gases						
No Nuclides Found		N/A	N/A	N/A	N/A	
Gross Alpha						
No Nuclides Found		N/A	N/A	N/A	N/A	
Batch Mode						
Nuclides Released	Unit	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year
Fission & Activation Products						
Cr-51	Curies	0.000E+00	2.166E-05	2.785E-05	0.000E+00	4.950E-05
Mn-54	Curies	0.000E+00	0.000E+00	0.000E+00	4.643E-05	4.643E-05
Fe-55	Curies	4.928E-04	3.433E-05	0.000E+00	0.000E+00	5.272E-04
Co-57	Curies	0.000E+00	0.000E+00	0.000E+00	4.476E-06	4.476E-06
Co-58	Curies	8.451E-05	4.766E-04	1.298E-04	3.565E-04	1.047E-03
Co-60	Curies	5.393E-05	7.382E-05	3.005E-05	4.238E-04	5.816E-04
Zr-95	Curies	0.000E+00	0.000E+00	0.000E+00	1.681E-05	1.681E-05
Nb-95	Curies	0.000E+00	0.000E+00	0.000E+00	2.640E-05	2.640E-05
Ru-103	Curies	0.000E+00	0.000E+00	1.144E-06	0.000E+00	1.144E-06
Sb-125	Curies	4.656E-04	3.334E-03	9.849E-04	5.353E-04	5.320E-03
Ce-144	Curies	0.000E+00	1.085E-05	0.000E+00	0.000E+00	1.085E-05
Total for Period	Curies	1.097E-03	3.951E-03	1.174E-03	1.410E-03	7.631E-03

Table 7.6 (cont.)
Site Liquid Effluents (2007)

Batch Mode Nuclides Released	Unit	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year
Tritium						
H-3	Curies	4.068E+02	7.869E+01	2.230E+01	2.417E+01	5.320E+02
Dissolved And Entrained Gases						
Kr-85	Curies	9.947E-03	6.637E-03	0.000E+00	2.745E-03	1.933E-02
Xe-131m	Curies	1.362E-03	0.000E+00	0.000E+00	0.000E+00	1.362E-03
Xe-133m	Curies	1.889E-05	0.000E+00	0.000E+00	0.000E+00	1.889E-05
Xe-133	Curies	2.714E-02	2.767E-04	1.066E-05	3.939E-04	2.782E-02
Total for Period	Curies	3.847E-02	6.914E-03	1.066E-05	3.139E-03	4.853E-02
Gross Alpha						
No Nuclides Found		N/A	N/A	N/A	N/A	

* Zeroes in this table indicate that no radioactivity was present at detectable levels.

Table 7.7
Doses Due to Liquid Releases - Site (2007)

Cumulative Doses per Quarter

Organ	Tech Spec Limit		1st Quarter	% of Tech Spec Limit	2nd Quarter	% of Tech Spec Limit	3rd Quarter	% of Tech Spec Limit	4th Quarter	% of Tech Spec Limit
Bone	5.000E+00 mRem		1.987E-06	3.974E-05	8.042E-07	1.608E-05	1.870E-07	3.741E-06	1.581E-07	3.161E-06
GI-Lli	5.000E+00 mRem		3.148E-02	6.295E-01	3.746E-02	7.491E-01	3.721E-02	7.441E-01	3.087E-02	6.173E-01
Kidney	5.000E+00 mRem		3.147E-02	6.294E-01	3.744E-02	7.489E-01	3.720E-02	7.441E-01	3.067E-02	6.135E-01
Liver	5.000E+00 mRem		3.147E-02	6.295E-01	3.745E-02	7.489E-01	3.720E-02	7.441E-01	3.068E-02	6.135E-01
Lung	5.000E+00 mRem		3.148E-02	6.297E-01	3.751E-02	7.503E-01	3.722E-02	7.445E-01	3.068E-02	6.137E-01
Thyroid	5.000E+00 mRem		3.147E-02	6.294E-01	3.744E-02	7.489E-01	3.720E-02	7.441E-01	3.067E-02	6.135E-01
Total Body	1.500E+00 mRem		3.147E-02	2.098E+00	3.745E-02	2.496E+00	3.720E-02	2.480E+00	3.068E-02	2.045E+00

**Table 7.7 (cont.)
Doses Due to Liquid Releases - Site (2007)**

Cumulative Doses per Year

Organ	Tech Spec Limit	Year to Ending Date	% of Tech Spec Limit	Receptor	Limit
Bone	1.000E+01 mRem	3.136E-06	3.136E-05	Liquid Receptor - Adult	Liq Annual Organ Dose
Liver	1.000E+01 mRem	1.368E-01	1.368E+00	Liquid Receptor - Adult	Liq Annual Organ Dose
Thyroid	1.000E+01 mRem	1.368E-01	1.368E+00	Liquid Receptor - Adult	Liq Annual Organ Dose
Kidney	1.000E+01 mRem	1.368E-01	1.368E+00	Liquid Receptor - Adult	Liq Annual Organ Dose
Lung	1.000E+01 mRem	1.369E-01	1.369E+00	Liquid Receptor - Adult	Liq Annual Organ Dose
GI-Lli	1.000E+01 mRem	1.370E-01	1.370E+00	Liquid Receptor - Adult	Liq Annual Organ Dose
Total Body	3.000E+00 mRem	1.368E-01	4.560E+00	Liquid Receptor - Adult	Liq Annual TB Dose
Bone	2.500E+01 mRem	3.136E-06	1.254E-05	Liquid Receptor - Adult	40CFR190.10 (a) Organ
Liver	2.500E+01 mRem	1.368E-01	5.472E-01	Liquid Receptor - Adult	40CFR190.10 (a) Organ
Thyroid	7.500E+01 mRem	1.368E-01	1.824E-01	Liquid Receptor - Adult	40CFR190.10 (a) Thyroid
Kidney	2.500E+01 mRem	1.368E-01	5.472E-01	Liquid Receptor - Adult	40CFR190.10 (a) Organ
Lung	2.500E+01 mRem	1.369E-01	5.476E-01	Liquid Receptor - Adult	40CFR190.10 (a) Organ
GI-Lli	2.500E+01 mRem	1.370E-01	5.480E-01	Liquid Receptor - Adult	40CFR190.10 (a) Organ
Total Body	2.500E+01 mRem	1.368E-01	5.472E-01	Liquid Receptor - Adult	40CFR190.10 (a) TB
Total Dilution Volume for 1st Quarter		:	1.463E+10		
Total Dilution Volume for 2nd Quarter		:	1.202E+10		
Total Dilution Volume for 3rd Quarter		:	4.759E+09		
Total Dilution Volume for 4th Quarter		:	5.384E+09		

Table 7.8
Doses Due to Gaseous Releases - Site (2007)

Cumulative Doses Per Quarter

Radiation Type	Tech Spec Limit	1st Quarter	% of Tech Spec Limit	2nd Quarter	% of Tech Spec Limit	3rd Quarter	% of Tech Spec Limit	4th Quarter	% of Tech Spec Limit
Beta	1.000E+01 mRad	6.177E-04	6.177E-03	2.272E-04	2.272E-03	1.923E-04	1.923E-03	1.031E-03	1.031E-02
Gamma	5.000E+00 mRad	4.588E-04	9.176E-03	1.274E-04	2.548E-03	1.705E-04	3.411E-03	7.769E-04	1.554E-02

Cumulative Doses Per Year

Radiation Type	Tech Spec Limit	Year to End Date	% of Tech Spec Limit	Receptor	Limit
Gamma	1.000E+01 mRad	1.534E-03	1.534E-02	Gas Receptor SB - Adult	NG Annual Gamma Air Dose
Gamma	1.000E+01 mRad	1.534E-03	1.534E-02	Gas Receptor SB - Teen	NG Annual Gamma Air Dose
Gamma	1.000E+01 mRad	1.534E-03	1.534E-02	Gas Receptor SB - Child	NG Annual Gamma Air Dose
Gamma	1.000E+01 mRad	1.534E-03	1.534E-02	Gas Receptor SB - Infant	NG Annual Gamma Air Dose
Gamma	1.000E+01 mRad	1.534E-03	1.534E-02	Gas Receptor MI - Adult	NG Annual Gamma Air Dose
Gamma	1.000E+01 mRad	1.534E-03	1.534E-02	Gas Receptor MI - Teen	NG Annual Gamma Air Dose
Gamma	1.000E+01 mRad	1.534E-03	1.534E-02	Gas Receptor MI - Child	NG Annual Gamma Air Dose
Gamma	1.000E+01 mRad	1.534E-03	1.534E-02	Gas Receptor MI - Infant	NG Annual Gamma Air Dose
Beta	2.000E+01 mRad	2.068E-03	1.034E-02	Gas Receptor SB - Adult	NG Annual Beta Air Dose
Beta	2.000E+01 mRad	2.068E-03	1.034E-02	Gas Receptor SB - Teen	NG Annual Beta Air Dose
Beta	2.000E+01 mRad	2.068E-03	1.034E-02	Gas Receptor SB - Child	NG Annual Beta Air Dose
Beta	2.000E+01 mRad	2.068E-03	1.034E-02	Gas Receptor SB - Infant	NG Annual Beta Air Dose
Beta	2.000E+01 mRad	2.068E-03	1.034E-02	Gas Receptor MI - Adult	NG Annual Beta Air Dose
Beta	2.000E+01 mRad	2.068E-03	1.034E-02	Gas Receptor MI - Teen	NG Annual Beta Air Dose
Beta	2.000E+01 mRad	2.068E-03	1.034E-02	Gas Receptor MI - Child	NG Annual Beta Air Dose
Beta	2.000E+01 mRad	2.068E-03	1.034E-02	Gas Receptor MI - Infant	NG Annual Beta Air Dose

Table 7.9
Doses Due to Radioiodines, Tritium, and Particulates in Gaseous Releases - Site (2007)

Cumulative Doses Per Quarter

Organ	Tech Spec Limit	1st Quarter	% of T.S. Limit	2nd Quarter	% of T.S. Limit	3rd Quarter	% of T.S. Limit	4th Quarter	% of T.S. Limit
Bone	7.500E+00 mRem	0.000E+00	0.000E+00	2.947E-04	3.929E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
GI-Lli	7.500E+00 mRem	1.761E-02	2.348E-01	1.793E-02	2.391E-01	2.662E-02	3.549E-01	1.622E-02	2.162E-01
Kidney	7.500E+00 mRem	1.761E-02	2.348E-01	1.804E-02	2.406E-01	2.662E-02	3.549E-01	1.622E-02	2.162E-01
Liver	7.500E+00 mRem	1.761E-02	2.348E-01	1.829E-02	2.439E-01	2.662E-02	3.549E-01	1.622E-02	2.162E-01
Lung	7.500E+00 mRem	1.761E-02	2.348E-01	1.797E-02	2.396E-01	2.662E-02	3.549E-01	1.622E-02	2.162E-01
Skin	7.500E+00 mRem	0.000E+00	0.000E+00	1.620E-05	2.160E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Thyroid	7.500E+00 mRem	1.761E-02	2.348E-01	1.793E-02	2.391E-01	2.662E-02	3.549E-01	1.622E-02	2.162E-01
Total Body	7.500E+00 mRem	1.761E-02	2.348E-01	1.802E-02	2.403E-01	2.662E-02	3.549E-01	1.622E-02	2.162E-01

Cumulative Doses per Year

Organ	Tech Spec Limit	Year to End Date	% of T.S.	Receptor	Limit
Total Body	2.500E+01 mRem	7.846E-02	3.138E-01	Gas Receptor SB - Child	40CFR190.10 (a) TB
Total Body	2.500E+01 mRem	7.846E-02	3.138E-01	Gas Receptor MI - Child	40CFR190.10 (a) TB
Thyroid	7.500E+01 mRem	7.837E-02	1.045E-01	Gas Receptor SB - Child	40CFR190.10 (a) Thyroid
Thyroid	7.500E+01 mRem	7.837E-02	1.045E-01	Gas Receptor MI - Child	40CFR190.10 (a) Thyroid
Skin	2.500E+01 mRem	1.620E-05	6.479E-05	Gas Receptor SB - Adult	40CFR190.10 (a) Organ
Skin	2.500E+01 mRem	1.620E-05	6.479E-05	Gas Receptor SB - Teen	40CFR190.10 (a) Organ
Liver	2.500E+01 mRem	7.873E-02	3.149E-01	Gas Receptor SB - Child	40CFR190.10 (a) Organ
Kidney	2.500E+01 mRem	7.848E-02	3.139E-01	Gas Receptor SB - Child	40CFR190.10 (a) Organ
Lung	2.500E+01 mRem	7.841E-02	3.136E-01	Gas Receptor SB - Child	40CFR190.10 (a) Organ
GI-Lli	2.500E+01 mRem	7.837E-02	3.135E-01	Gas Receptor SB - Child	40CFR190.10 (a) Organ
Skin	2.500E+01 mRem	1.620E-05	6.479E-05	Gas Receptor SB - Child	40CFR190.10 (a) Organ
Bone	2.500E+01 mRem	2.947E-04	1.179E-03	Gas Receptor SB - Infant	40CFR190.10 (a) Organ
Skin	2.500E+01 mRem	1.620E-05	6.479E-05	Gas Receptor SB - Infant	40CFR190.10 (a) Organ
Skin	2.500E+01 mRem	1.620E-05	6.479E-05	Gas Receptor MI - Adult	40CFR190.10 (a) Organ
Skin	2.500E+01 mRem	1.620E-05	6.479E-05	Gas Receptor MI - Teen	40CFR190.10 (a) Organ
Liver	2.500E+01 mRem	7.873E-02	3.149E-01	Gas Receptor MI - Child	40CFR190.10 (a) Organ
Kidney	2.500E+01 mRem	7.848E-02	3.139E-01	Gas Receptor MI - Child	40CFR190.10 (a) Organ
Lung	2.500E+01 mRem	7.841E-02	3.136E-01	Gas Receptor MI - Child	40CFR190.10 (a) Organ
GI-Lli	2.500E+01 mRem	7.837E-02	3.135E-01	Gas Receptor MI - Child	40CFR190.10 (a) Organ
Skin	2.500E+01 mRem	1.620E-05	6.479E-05	Gas Receptor MI - Child	40CFR190.10 (a) Organ
Bone	2.500E+01 mRem	2.947E-04	1.179E-03	Gas Receptor MI - Infant	40CFR190.10 (a) Organ

Table 7.9 (cont.)**Doses Due to Radioiodines, Tritium, and Particulates in Gaseous Releases - Site (2007)****Cumulative Doses per Year (cont.)**

Organ	Tech Spec Limit	Year to End Date	% of T.S.	Receptor	Limit
Skin	2.500E+01 mRem	1.620E-05	6.479E-05	Gas Receptor MI - Infant	40CFR190.10 (a) Organ
Skin	1.500E+01 mRem	1.620E-05	1.080E-04	Gas Receptor SB - Adult	Gas Annual Organ Dose
Skin	1.500E+01 mRem	1.620E-05	1.080E-04	Gas Receptor SB - Teen	Gas Annual Organ Dose
Liver	1.500E+01 mRem	7.873E-02	5.249E-01	Gas Receptor SB - Child	Gas Annual Organ Dose
Total Body	1.500E+01 mRem	7.846E-02	5.231E-01	Gas Receptor SB - Child	Gas Annual Organ Dose
Thyroid	1.500E+01 mRem	7.837E-02	5.225E-01	Gas Receptor SB - Child	Gas Annual Organ Dose
Kidney	1.500E+01 mRem	7.848E-02	5.232E-01	Gas Receptor SB - Child	Gas Annual Organ Dose
Lung	1.500E+01 mRem	7.841E-02	5.227E-01	Gas Receptor SB - Child	Gas Annual Organ Dose
GI-Lli	1.500E+01 mRem	7.837E-02	5.225E-01	Gas Receptor SB - Child	Gas Annual Organ Dose
Skin	1.500E+01 mRem	1.620E-05	1.080E-04	Gas Receptor SB - Child	Gas Annual Organ Dose
Bone	1.500E+01 mRem	2.947E-04	1.965E-03	Gas Receptor SB - Infant	Gas Annual Organ Dose
Skin	1.500E+01 mRem	1.620E-05	1.080E-04	Gas Receptor SB - Infant	Gas Annual Organ Dose
Skin	1.500E+01 mRem	1.620E-05	1.080E-04	Gas Receptor MI - Adult	Gas Annual Organ Dose
Skin	1.500E+01 mRem	1.620E-05	1.080E-04	Gas Receptor MI - Teen	Gas Annual Organ Dose
Liver	1.500E+01 mRem	7.873E-02	5.249E-01	Gas Receptor MI - Child	Gas Annual Organ Dose
Total Body	1.500E+01 mRem	7.846E-02	5.231E-01	Gas Receptor MI - Child	Gas Annual Organ Dose
Thyroid	1.500E+01 mRem	7.837E-02	5.225E-01	Gas Receptor MI - Child	Gas Annual Organ Dose
Kidney	1.500E+01 mRem	7.848E-02	5.232E-01	Gas Receptor MI - Child	Gas Annual Organ Dose
Lung	1.500E+01 mRem	7.841E-02	5.227E-01	Gas Receptor MI - Child	Gas Annual Organ Dose
GI-Lli	1.500E+01 mRem	7.837E-02	5.225E-01	Gas Receptor MI - Child	Gas Annual Organ Dose
Skin	1.500E+01 mRem	1.620E-05	1.080E-04	Gas Receptor MI - Child	Gas Annual Organ Dose
Bone	1.500E+01 mRem	2.947E-04	1.965E-03	Gas Receptor MI - Infant	Gas Annual Organ Dose
Skin	1.500E+01 mRem	1.620E-05	1.080E-04	Gas Receptor MI - Infant	Gas Annual Organ Dose

TABLE 7.10
SOLID RADWASTE AND IRRADIATED FUEL SHIPMENTS -2007

**A. Solid Waste Shipped Offsite for Burial or Disposal
(Not Irradiated Fuel)**

1. Type of Waste	Shipped M ³	Shipped Ci	Buried m ³	Buried Ci	Percent Error
a. Spent resins/filters	1.02E+01	6.36E+02	3.14E+00	4.73E+02	25%
b. Dry active waste	1.40E+03	1.57E+01	1.77E+02	1.42E+00	25%
c. Irradiated components	-0-	-0-	-0-	-0-	N/A
d. Other-oil/miscellaneous liquids sent to processor for volume reduction)	-0-	-0-	-0-	-0-	N/A
TOTAL	1.41E+03	6.52E+02	1.80E+02	4.75E+02	25%

Note: Shipped volumes and curies are not always equal to the buried volumes and curies since some disposal occurs outside the twelve month time period in which shipments occurred.

Dry active waste also includes some low-level radioactive resins tank sediments and filters that are handled and processed in a manner that is consistent with this waste stream.

TABLE 7.10 (Continued)

2. Estimate of Major Nuclide type of waste)	Composition (by	Nuclide	% Abund.	Activity (Ci)
a. Spent resins/filters		Ni-63	47.13	3.00E+02
		Fe-55	18.73	1.19E+02
		Co-60	9.00	5.72E+01
		CS-134	8.79	5.59E+01
		CS-137	8.78	5.58E+01
		Co-58	5.30	3.37E+01
		Mn-54	1.26	8.04E+00
		H-3	0.01	4.54E-02
		C-14	LLD	-0-
		Tc-99	LLD	-0-
		I-129	LLD	-0-
		<u>Other*</u>	<u>1.00</u>	<u>6.29E+00</u>
		Total	100.00	6.36E+02

Nuclides representing <1% of total shipped activity: Co-57, Ni-59, Sr-90, Sb-122, Sb-125, Ce-144, Pu-238, Pu-239/240, Pu-241, Am-241, Cm-242, Cm-243/244.

TABLE 7.10 (Continued)

SOLID RADWASTE AND IRRADIATED FUEL SHIPMENTS -2007

2. Estimate of Major Nuclide Composition (by type of waste)	Nuclide	% Abund.	Activity (Ci)
b. Dry active waste	Fe-55	59.88	9.38E 00
	Ni-63	18.80	2.95E 00
	Co-60	15.58	2.44E 00
	CO-58	3.80	5.96E-01
	Cs-137	0.09	1.44E-02
	H-3	0.05	8.24E-03
	C-14	LLD	-0-
	Tc-99	LLD	-0-
	I-129	LLD	-0-
	<u>Other*</u>	<u>1.80</u>	<u>2.82E-01</u>
	<u>Total</u>	<u>100.00</u>	<u>1.57E+01</u>

Nuclides representing <1% of total shipped activity: Cr-51, Mn-54, Co-57, Ni-59, Sr-90, Nb-95, Zr-95, Sb-125, Cs-134, Ce-144, Pu-238, Pu-239/240, Pu-241, Am-241, Cm-242, Cm-243/244.

2. Estimate of Major Nuclide Composition (by type of waste)	Nuclide	% Abund.	Activity (Ci)
d. Other (oil/miscellaneous liquids sent to processor for volume reduction)			
-0-	-0-	-0-	-0-

TABLE 7.10 (Continued)

SOLID RADWASTE AND IRRADIATED FUEL SHIPMENTS -2007

3. Solid Waste Disposition (Mode of Transportation: Truck)				
Waste Type	Waste Class	Container Type	Number of Shipments	Destination
a. Resin/filters	B	Poly *HIC	1	Studsvik Erwin, TN.
	C	Poly *HIC	2	Studsvik Erwin, TN.
b. Dry active waste	A	General Design	23	Energy Solutions Oak Ridge, TN.
	A/B**	General Design	1	Energy Solutions Oak Ridge, TN.

* High Integrity Container

** One shipment included both Class A and B waste.

B. Irradiated Fuel Shipments (Disposition)

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
0	N/A	N/A

ATTACHMENT 8.1

2007 Joint Frequency Tables

R. G. 1.21 JOINT FREQUENCY TABLE

TXU ELECTRIC COMPANY

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JAN-07 00:00 TO 31-DEC-07 23:59

STABILITY CLASS:A

ELEVATION: 10 m.

Wind Speed (mph) at 10 m. level							
Wind Direction	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	1	5	1	0	0	7
NNE	0	3	7	3	0	0	13
NE	0	3	6	0	0	0	9
ENE	0	3	2	0	0	0	5
E	1	2	3	0	0	0	6
ESE	0	14	16	1	0	0	31
SE	0	16	28	7	0	0	51
SSE	0	6	36	19	1	0	62
S	0	3	26	41	2	1	73
SSW	0	1	23	22	1	0	47
SW	0	7	7	1	0	3	18
WSW	0	2	0	0	0	0	2
W	0	1	0	0	0	0	1
WNW	0	0	0	6	0	0	6
NW	0	0	1	5	1	0	7
NNW	1	0	1	7	11	4	24
VARIABLE	0	0	0	0	0	0	0
TOTAL	2	62	161	113	16	8	362
Periods of calm (hours): 0							
Hours of missing data: 6							

R. G. 1.21 JOINT FREQUENCY TABLE

TXU ELECTRIC COMPANY

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JAN-07 00:00 TO 31-DEC-07 23:59

STABILITY CLASS:B

ELEVATION: 10 m.

Wind Speed (mph) at 10 m. level							
Wind Direction	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	3	9	6	2	0	20
NNE	1	7	5	7	0	0	20
NE	5	10	5	2	0	0	22
ENE	2	9	4	0	0	0	15
E	1	13	1	0	0	0	15
ESE	1	25	5	0	0	0	31
SE	5	14	18	8	0	0	45
SSE	0	20	41	27	2	0	90
S	0	6	35	40	6	0	87
SSW	0	8	17	14	4	0	43
SW	0	14	5	4	0	0	23
WSW	1	3	2	4	0	0	10
W	0	0	1	1	0	0	2
WNW	0	0	2	3	0	0	5
NW	0	4	9	8	4	2	27
NNW	0	7	11	7	14	3	42
VARIABLE	7	1	0	0	0	0	8
TOTAL	23	144	170	131	32	5	505
Periods of calm (hours):	0						
Hours of missing data:	7						

R. G. 1.21 JOINT FREQUENCY TABLE

TXU ELECTRIC COMPANY

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JAN-07 00:00 TO 31-DEC-07 23:59

STABILITY CLASS:C

ELEVATION: 10 m.

Wind Speed (mph) at 10 m. level							
Wind Direction	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	5	18	9	4	1	37
NNE	6	11	5	10	0	0	32
NE	11	10	4	1	0	0	26
ENE	11	17	6	1	0	0	35
E	9	10	2	0	0	0	21
ESE	5	33	7	0	0	0	45
SE	1	16	25	7	0	0	49
SSE	3	29	37	33	3	0	105
S	2	18	59	50	6	0	135
SSW	3	17	28	5	0	0	53
SW	0	14	12	4	0	0	30
WSW	3	13	1	1	0	1	19
W	1	3	1	3	0	0	8
WNW	0	1	9	6	1	0	17
NW	1	7	6	12	5	1	32
NNW	2	7	20	9	16	5	59
VARIABLE	19	0	0	0	0	0	19
TOTAL	77	211	240	151	35	8	722
Periods of calm (hours):	0						
Hours of missing data:	4						

R. G. 1.21 JOINT FREQUENCY TABLE

TXU ELECTRIC COMPANY

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JAN-07 00:00 TO 31-DEC-07 23:59

STABILITY CLASS:D

ELEVATION: 10 m.

Wind Speed (mph) at 10 m. level							
Wind Direction	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	12	74	192	111	23	1	413
NNE	21	69	106	33	7	0	236
NE	19	44	70	9	0	0	142
ENE	25	47	47	3	0	0	122
E	28	99	26	2	0	0	155
ESE	47	156	51	5	0	0	259
SE	21	241	338	69	5	0	674
SSE	16	145	401	209	18	0	789
S	20	100	273	142	14	0	549
SSW	7	71	71	16	1	0	166
SW	19	50	14	10	1	0	94
WSW	15	28	4	4	1	0	52
W	10	29	15	6	2	0	62
WNW	10	19	44	11	7	2	93
NW	9	25	49	45	23	3	154
NNW	13	54	120	119	16	2	324
VARIABLE	88	34	7	1	0	0	130
TOTAL	380	1285	1828	795	118	8	4414
Periods of calm (hours):	1						
Hours of missing data:	13						

R. G. 1.21 JOINT FREQUENCY TABLE

TXU ELECTRIC COMPANY

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JAN-07 00:00 TO 31-DEC-07 23:59

STABILITY CLASS:E

ELEVATION: 10 m.

Wind Speed (mph) at 10 m. level

Wind Direction	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	3	14	10	9	0	0	36
NNE	0	32	17	2	0	0	51
NE	1	6	2	0	0	0	9
ENE	6	11	1	0	0	0	18
E	18	36	1	0	0	0	55
ESE	35	111	10	0	0	0	156
SE	36	294	120	2	0	0	452
SSE	41	226	225	9	0	0	501
S	25	101	94	7	0	0	227
SSW	31	59	37	8	0	0	135
SW	28	24	14	6	0	0	72
WSW	17	21	5	1	0	0	44
W	11	19	9	3	0	0	42
WNW	16	30	21	1	0	0	68
NW	10	37	31	1	0	0	79
NNW	6	14	8	4	0	0	32
VARIABLE	85	15	2	1	0	0	103
TOTAL	369	1050	607	54	0	0	2080
Periods of calm (hours):	2						
Hours of missing data:	14						

R. G. 1.21 JOINT FREQUENCY TABLE

TXU ELECTRIC COMPANY

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JAN-07 00:00 TO 31-DEC-07 23:59

STABILITY CLASS:F

ELEVATION: 10 m.

Wind Speed (mph) at 10 m. level							
Wind Direction	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	2	0	0	0	0	0	2
NNE	0	3	2	0	0	0	5
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	1	0	0	0	0	0	1
ESE	5	1	0	0	0	0	6
SE	7	50	7	0	0	0	64
SSE	16	27	2	0	0	0	45
S	18	25	6	1	0	0	50
SSW	20	18	2	0	0	0	40
SW	12	12	5	2	0	0	31
WSW	16	25	11	1	0	0	53
W	16	6	1	0	0	0	23
WNW	12	13	1	0	0	0	26
NW	21	24	7	0	0	0	52
NNW	4	1	1	0	0	0	6
VARIABLE	19	1	0	0	0	0	20
TOTAL	169	206	45	4	0	0	424
Periods of calm (hours):	1						
Hours of missing data:	3						

R. G. 1.21 JOINT FREQUENCY TABLE

TXU ELECTRIC COMPANY

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JAN-07 00:00 TO 31-DEC-07 23:59

STABILITY CLASS:G

ELEVATION: 10 m.

Wind Speed (mph) at 10 m. level

Wind Direction	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	1	0	0	0	0	0	1
NNE	1	0	0	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	1	0	0	0	0	0	1
ESE	1	0	0	0	0	0	1
SE	3	3	0	0	0	0	6
SSE	7	1	0	1	0	0	9
S	5	5	1	2	0	0	13
SSW	8	11	2	0	0	0	21
SW	15	17	9	0	0	0	41
WSW	8	19	9	0	0	0	36
W	10	4	2	0	0	0	16
WNW	8	8	0	0	0	0	16
NW	7	12	0	0	0	0	19
NNW	0	2	0	0	0	0	2
VARIABLE	2	0	0	0	0	0	2
TOTAL	77	82	23	3	0	0	185
Periods of calm (hours):	2						
Hours of missing data:	6						

R. G. 1.21 JOINT FREQUENCY TABLE

TXU ELECTRIC COMPANY

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JAN-07 00:00 TO 31-DEC-07 23:59

STABILITY CLASS: ALL

ELEVATION: 10 m.

Wind Speed (mph) at 10 m. level

Wind Direction	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	18	97	234	136	29	2	516
NNE	29	125	142	55	7	0	358
NE	36	73	87	12	0	0	208
ENE	44	87	60	4	0	0	195
E	59	160	33	2	0	0	254
ESE	94	340	89	6	0	0	529
SE	73	634	536	93	5	0	1341
SSE	83	454	742	298	24	0	1601
S	70	258	494	283	28	1	1134
SSW	69	185	180	65	6	0	505
SW	74	138	66	27	1	3	309
WSW	60	111	32	11	1	1	216
W	48	62	29	13	2	0	154
WNW	46	71	77	27	8	2	231
NW	48	109	103	71	33	6	370
NNW	26	85	161	146	57	14	489
VARIABLE	220	51	9	2	0	0	282
TOTAL	1097	3040	3074	1251	201	29	8692

Periods of calm (hours): 6

Hours of missing data: 62