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U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

H. B. ROBINSON STEAM ELECTRIC PLANT (HBRSEP), UNIT NO. 2
DOCKET NO. 50-261 / RENEWED LICENSE NO. DPR-23

2014 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

Ladies and Gentlemen:

Attached is the Annual Radioactive Effluent Release Report for H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2 for the period of January 1, 2014 through December 31, 2014. This report is submitted in accordance with 10 CFR 50.4, as required by 10 CFR 50.36a(a)(2) and HBRSEP, Unit No. 2, Technical Specifications (TS) Section 5.6.3.

This document contains no new Regulatory Commitments. If you have any questions on this subject, please contact Richard Hightower, Manager – Nuclear Regulatory Affairs at (843) 857-1329.

Sincerely,

Angela K. Krakow for

Sharon W. Peavyhouse
Director – Nuclear Organization Effectiveness

SWP/mjp

Attachment

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IE48
NRR

DUKE ENERGY

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

RENEWED OPERATING LICENSE NO. DPR-23

DOCKET NO. 50-261

RADIOACTIVE AND EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

January 1, 2014 - December 31, 2014

TABLE OF CONTENTS

Description ..... Page

EXECUTIVE SUMMARY 4

A. Discussion 4
B. Significant Variances 9
C. Regulatory Compliance 9

SUPPLEMENTAL INFORMATION 10

B. Regulatory Limits 10
B. Measurements and Approximations of Total Radioactivity 11
C. Estimated Total Errors 12

GASEOUS EFFLUENTS 13

C. Batch Releases 13
B. Abnormal Releases 13
C. Data Tables 13

LIQUID EFFLUENTS 18

D. Batch Releases 18
B. Abnormal Releases 18
C. Data Tables 18

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS 24

E. Waste Class A 24
B. Waste Class B 27
C. Waste Class C 29

40 CFR 190 DOSE CONFORMANCE 30

METEOROLOGICAL DATA 31

D. Continuous Release Diffusion Analysis 31

ADDENDUMS. 35

LIST OF TABLES

Table	Description	Page
Table I-A	Gaseous Effluents - Summation of All Releases	14
Table I-B	Gaseous Effluents - Ground Level and Mixed Mode Releases	16
Table II-A	Liquid Effluents - Summation of All Releases	19
Table II-B	Liquid Effluents - Continuous Mode and Batch Mode Releases	21
Table III-A	Solid Waste and Irradiated Fuel Shipments – Waste Class A	24
Table III-A	Solid Waste and Irradiated Fuel Shipments – Waste Class B	27
Table III-A	Solid Waste and Irradiated Fuel Shipments – Waste Class C	29
Table V-A	Joint Occurrence Frequencies for LOWNDDEG and LOWNDSPD – Ground Continuous Releases	33

I. EXECUTIVE SUMMARY

A. Discussion

1. Effluent Controls

The H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, Offsite Dose Calculation Manual specifies controls and dose limits pertaining to releases of radioactivity to the environment. None of these controls or dose limits were exceeded during 2014.

2. Protection Standards

The main objective in the control of radiation is to ensure that any exposure is kept not only within regulatory limits, but As Low As Reasonably Achievable (ALARA). The ALARA concept applies to reducing radiation exposure both to workers at HBRSEP, Unit No. 2, and to the general public. Reasonably achievable means that radiation exposure reduction is based on sound environmental practices, economic decisions, and operating practices. By practicing ALARA, HBRSEP minimizes health risk and environmental detriment, and ensures that exposures are maintained well below regulatory limits.

3. Sources of Radioactivity Released

During normal operations of a nuclear power station, most of the fission products are retained within the fuel and fuel cladding. However, small quantities of radioactive fission and activation products are present in the reactor coolant water. The types of radioactive material released are noble gases, iodines and particulates, and tritium.

The noble gas fission products in the reactor coolant water are released as a gas when the coolant is depressurized. These gases are collected by a system designed for collection and storage for radioactive decay prior to release to the environment.

Small releases of radioactivity in liquids may occur from equipment associated with the reactor coolant system. These liquids are collected and processed for radioactivity removal, prior to and during release.

4. Noble Gas

Some of the fission products released in airborne effluents are radioactive isotopes of noble gases, such as argon and xenon. Noble gases are by nature inert and do not concentrate in humans or other organisms. Noble gases contribute to human radiation exposure as external exposure.

5. Iodines and Particulates

The main contribution of radioactive iodine to human exposure is to the thyroid gland, where the body concentrates iodine. The particulates contribute to internal exposure of tissues such as the muscle, liver, and intestines. These particulates can also be a source of exposure if deposited on the ground.

6. Tritium

Tritium, a radioactive isotope of hydrogen, is a predominate radionuclide in liquid and gaseous effluents. Tritium is produced in the reactor via a number of processes. Tritium is a weak beta particle emitter and contributes very little radiation exposure to the human body, and when tritium is inhaled, ingested, or absorbed it is dispersed throughout the body until eliminated.

7. Processing and Monitoring

Effluents are strictly controlled and monitored to ensure that radioactivity released to the environment is minimal and within regulatory limits. Effluent controls include the operation of radiation monitoring systems, in-plant and environmental sampling and analyses, quality assurance programs for both in-plant and environmental sampling and analyses, and procedures that address effluent and environmental monitoring.

The plant radiation monitoring system provides monitors that are designed to ensure that releases are below regulatory limits. Each instrument provides indication of the amount of radioactivity present and is equipped with alarms and indicators in the control room. The alarm setpoints are set below the regulatory limits, i.e., typically at less than 50 percent of the regulatory limit, to ensure that the limits are not exceeded. If a monitor alarms, batch releases to the environment from a tank is automatically suspended. Additionally, releases are sampled and analyzed in the laboratory prior to discharge to the environment. The sampling and analysis done in the laboratory provides a more sensitive and precise method of determining pre-effluent composition than in-plant monitoring instruments.

The plant has a meteorological tower, which is linked to computers that record the meteorological data. This meteorological data and the results of the Land Use Census are used to verify the ground level dispersion factors contained in the ODCM that are used in calculating the dose to the public.

In addition to in-plant equipment, the company maintains a Radiological Environmental Monitoring Program, which consists of devices used to sample the air and water in the environment. The samples collected from the surrounding environment are analyzed to determine the presence of radioactive material in the environment.

8. Exposure Pathways

Radiological exposure pathways are the methods by which people may become exposed to radioactive material. The major pathways of concern are those which could cause the highest calculated radiation dose. The projected pathways are determined from the type and amount of radioactive material that may have been released, the environmental transport mechanism, and the use of the environment.

Environmental transport mechanisms include, but are not limited to, hydrological (i.e., water) and meteorological (i.e., weather) characteristics of the area. Information on water flow, wind speed and direction, dietary intake of residents, recreational use of the area, and location of homes and farms in the area are some of the many factors used to calculate the potential exposure to offsite personnel.

The release of radioactive gaseous effluents includes pathways such as external whole body exposure, deposition on plants and soils, and human inhalation. The release of radioactive material in liquid effluents includes pathways such as fish consumption and direct exposure from the lake at the shoreline.

Even though radionuclides can reach humans by many different pathways, some radionuclides result in more exposure than others. The critical pathway is the one that, for a specific radionuclide, will result in the greatest exposure to a population, or a specific group of the population, called the critical group. The critical group may vary depending on the radionuclides involved, the age and diet of the group, and other cultural factors. The exposure may be received by the whole body or to a specific organ, with the organ receiving the largest fraction of the exposure called the critical organ.

The exposures to the general public in the area surrounding HBRSEP, Unit No. 2, are calculated for gaseous and liquid releases. The exposure due to radioactive material released in gaseous effluents is calculated using factors such as the amount of radioactive material released the concentration beyond the site boundary, locations of exposure pathways, and usage factors. The exposures calculated due to radioactive materials released in liquid effluents are calculated using factors such as the total volume of liquid, the total volume of dilution water, and usage factors.

9. Plant Operation

HBRSEP, Unit No. 2, operated continuously with the exception of two maintenance outages on 1/10/2014 through 1/13/2014 and 3/8/2014 through 4/10/2014.

10. Results

The Radioactive Effluent Release Report is a detailed listing of the radioactivity released from the HBRSEP, Unit No. 2, during the period from January 1, 2014 through December 31, 2014. Some of the gaseous and liquid release parameters for this reporting period are summarized below:

Table 1A: Gaseous Effluents – Summation of All Releases

	Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Fission & Act. Gas	Ci	1.52E-01	2.48E-02	2.26E-02	2.50E-02
I-131	Ci	ND[1]	ND[1]	ND[1]	ND[1]
Part. >8 Day Half-Lives	Ci	6.64E-09	2.37E-07	4.78E-09	5.69E-07
Tritium	Ci	3.89E+00	3.94E+00	4.28E+00	3.26E+00

Appendix I Dose Assessment:

Gaseous Effluents:

- Beta Air Dose 1.37E-03 millirad
- Gamma Air Dose 3.16E-03 millirad
- Critical Organ Dose 5.62E-01 millirem, Bone

Note - Carbon-14 releases resulted in 0.112 mrem to the total body of a child and 0.562 mrem to the bone of a child, which is not included in the above doses. It is estimated that 8.2 curies of Carbon-14 were released during 2014.

Table 2A: Liquid Effluents – Summation of All Releases

	Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Fission & Act. Products	Ci	1.98E-02	6.49E-03	1.92E-03	2.28E-03
Tritium	Ci	1.18E+02	2.74E+01	8.39E+00	2.55E+01
Pri. Waste Volume	Liters	5.17E+05	4.47E+05	1.86E+05	2.61E+05
Dilution Volume	Liters	2.32E+11	2.45E+11	2.54E+11	2.42E+11

During the period of January 1, 2014 through December 31, 2014, the estimated maximum individual offsite dose due to radioactivity released in effluents was:

Appendix I Dose Assessment:

Liquid Effluents:

- Total Body Dose 6.58E-04 millirem
- Critical Organ Dose 6.24E-03 millirem, GI-LLI

Note – an additional 0.194 mrem to a child was estimated based on the evaporation of tritium from Lake Robinson. This is based on Lake Robinson 2014 environmental sample results, 2014 meteorology and represents the dose from the buildup in the lake. This conservatively bounds the dose due to 2014 tritium effluents.

[1] ND, No Detectable Activity

B. Significant Variances

1. No variances in historical data of significance were identified during this period.

C. Regulatory Compliance

1. The 10 CFR 50, Appendix I, doses were calculated using the Canberra Effluent Management System (OPENEMS[1]). The OPENEMS Software provides day-by-day dose estimates that are conservative because all releases are assigned to the limiting receptor, using the continuous ground level dispersion factors calculated from 2005 - 2009 meteorology. Pathways assumed for the limiting receptors are ingestion (vegetation and meat) and inhalation. When projected on a day-by-day basis, utilizing conservative meteorological conditions, the dose commitment from gaseous and liquid effluents is a small fraction of the 10 CFR 50, Appendix I, limits. Compliance with 40 CFR 190 must also be demonstrated by evaluating dose from direct radiation to the maximum exposed individual. The most significant source of direct radiation exposure is the HBRSEP Independent Spent Fuel Storage Installation (ISFSI). Estimated dose to the maximum exposed individual is discussed in the HBRSEP ISFSI Safety Analysis Report. Assessment of the actual dose from direct radiation is performed as part of the HBRSEP Radiological Environmental Monitoring Program (REMP) and reported in the Annual Radiological Environmental Operating Report. During 2014, the assessment of dose from direct radiation, performed as part of the REMP, demonstrated no measurable contribution above background attributable to HBRSEP operations.
2. There were no changes to the waste solidification Process Control Program (PCP) during this reporting period. See page 36
3. There were no changes to the Radioactive Waste Systems (i.e., liquid, gaseous, or solid) during this reporting period. See page 36.
4. There were no reportable instrumentation inoperability (greater than 30 days) event during this reporting period. See page 36.
5. There were no outside liquid holdup tanks that exceeded the 10 curie limit during this reporting period. See page 36.
6. There were no Waste Gas Decay Tanks that exceeded the 1.9E+04 curie limit during this reporting period. See page 36.
7. There were no instances of missed compensatory samples during this reporting period. See page 36.
8. There were no revisions to the ODCM during this reporting period. See page 35.
9. There were no dose calculations performed or special reports made as a result of any spills or leaks during this period. See page 36.
10. There were no events associated with a failure to meet an ODCM specified sampling frequency. See page 37.

[1] OPENEMS, Effluent Management System Software is a product of Canberra Nuclear Industries used for determining dose from radioactive effluent releases.

II. SUPPLEMENTAL INFORMATION

A. Regulatory Limits

1. Fission and Activation Gases:

   10 CFR 20 Limits (Instantaneous Release Rate)
   - Total Body Dose ≤500 mrem/yr
   - Skin Dose ≤3000 mrem/yr

   10 CFR 50, Appendix I
   - For Calendar Quarter
     - Gamma Dose ≤5 mrad
     - Beta Dose ≤10 mrad
   - For Calendar Year
     - Gamma Dose ≤10 mrad
     - Beta Dose ≤20 mrad

2. Iodine-131 and 133, Tritium, and Particulates >8 day half-lives:

   10 CFR 20 Limits (Instantaneous Release Rate)
   - Dose from Inhalation (only) to a child to any organ ≤1500 mrem/yr

   10 CFR 50, Appendix I (Organ Doses)
   - For Calendar Quarter ≤7.5 mrem
   - For Calendar Year ≤15 mrem

3. Liquids:

   Concentrations are specified in 10 CFR 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 2.00E-04 µCi/ml total activity.

   10 CFR 50, Appendix I
   - For Calendar Quarter
     - Total Body Dose ≤1.5 mrem
     - Any Organ Dose ≤5 mrem
   - For Calendar Year
     - Total Body Dose ≤3 mrem
     - Any Organ Dose ≤10 mrem

B. Measurements and Approximations of Total Radioactivity

1. Continuous Gaseous Releases

a) Fission and Activation Gases - The total activity released is determined from the net count rate of the gaseous monitor, its calibration factor, and the total exhaust flow. The activity of radioactive gas is determined by the fraction of that radioactive gas in the isotopic analysis for that period.

b) Iodines - The activity released as Iodine-131, 133, and 135 is based on isotopic analysis of the charcoal cartridge and particulate filter, and the total exhaust flow.

c) Particulates - The activity released via particulates with half-lives greater than eight days is determined by isotopic analysis of particulate filters and the total exhaust flow.

d) Tritium - The activity released as tritium is based on weekly grab sample analysis and total exhaust flow.

e) Carbon 14 – The activity released is determine using NUREG-0017 (GALE Code) Section 2.2.25, as specified in ODCM, Section 3.16 and corrected for Effective Full Power Days (EFPD) for 2014.

2. Batch Gaseous Releases

a) Fission and Activation Gases - The activity released is based on the volume released and the activity of the individual nuclides obtained from an isotopic analysis of the grab sample taken prior to the release.

b) Iodines - The iodines from mixed mode batch releases are included in the iodine determination from the mixed mode continuous Reactor Auxiliary Building release.

c) Particulates - The particulates from mixed mode batch releases are included in the particulate determination from the mixed mode continuous Reactor Auxiliary Building release.

d) Tritium - The activity released as tritium is based on the grab sample analysis of each batch and the batch volume.

e) Carbon 14 – The activity released is determine by using NUREG-0017 (GALE Code) Section 2.2.25, as specified in ODCM, Section 3.16 and corrected for Effective Full Power Days (EFPD) for 2014.

3. Liquid Releases

a) Fission and Activation Products - The total release values (not including tritium, gases, and alpha) are comprised of the sum of the individual radionuclide activities in each release to the discharge canal for the respective quarter. These values represent the activity known to be present in the liquid radwaste effluent.

b) Tritium - The activity released as tritium is based on the grab sample analysis of each batch and the batch volume. For continuous releases, the activity released as tritium is based on analysis of a weekly composite sample. For continuous releases without a composite sampler, the tritium activity is based on analysis of daily grab samples or a composite of grab samples.

c) Alpha - The measured alpha concentration in a monthly composite sample is used to calculate the total release and average diluted concentration during each period.

d) Strontium-89, 90, Nickel-63 and Iron-55 - The total release values are measured quarterly from composite samples.

C. Estimated Total Errors

1. Estimated total errors for gaseous effluents are based on uncertainties in counting equipment calibration, counting statistics, exhaust flow rates, exhaust sample flow rates, non-steady release rates, chemical yield factors, and sample losses for such items as charcoal cartridges.

2. Estimated total errors for liquid effluents are based on uncertainties in counting equipment calibration, counting statistics, non-steady release flow rate, sampling and mixing losses, and volume determinations.

3. Estimated total errors for solid waste are based on uncertainties in equipment calibration, dose rate measurements, geometry, and volume determinations.

III. GASEOUS EFFLUENTS

A. Batch Releases

	Jan - June 2014	July - Dec 2014
Number of batch releases	55	38
Total time period for batch releases	4.15E+04 min	2.35E+04 min
Maximum time period for a batch release	1.73E+04 min	1.04E+04 min
Average time period for a batch release	7.55E+02 min	6.19E+02 min
Minimum time period for a batch release	2.40E+01 min	1.00E+00 min

B. Abnormal Releases

	Jan - June 2014	July – Dec 2014
Number of releases	0	0
Total activity released	0.00E+00 Ci	0.00E+00 Ci

C. Data Tables

The following tables provide the details of gaseous releases:

Table I-A Summation of All Releases
Table I-B Ground Level and Mixed Mode Releases
Table I-C Typical Lower Limits of Detection for Gaseous Effluents

TABLE I-A
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT - 2014
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

	Unit	Quarter 1	Quarter 2	Est. Total Error %
A. Fission and Activation Gases				
1. Total release	Ci	1.52E-01	2.48E-02	3.24E+01
2. Average release rate for period	µCi/sec	1.95E-02	3.15E-03	
B. Iodines				
1. Total Iodine-131	Ci	ND	ND	6.21E+01
2. Average release rate for period	µCi/sec	ND	ND	
C. Particulates				
1. Particulates with half-lives >8 days	Ci	6.64E-09	2.37E-07	5.80E+01
2. Average release rate for period	µCi/sec	8.54E-10	3.01E-08	
3. Gross alpha radioactivity	Ci	ND	ND	
D. Tritium				
1. Total release	Ci	3.89E+00	3.94E+00	5.25E+01
2. Average release rate for period	µCi/sec	5.01E-01	5.01E-01	
E. Carbon-14				
1. Total release[1]	Ci	2.04E+00	2.06E+00	
F. Percent of 10 CFR 50, Appendix I				
1. Quarterly limit				
Gamma air	%	3.04E-02	1.11E-02	
Beta air	%	7.83E-03	2.00E-03	
Organ: Bone[2]	%	2.78E-03	1.33E-03	
2. Cumulative Annual limit*				
Gamma air	%	1.52E-02	2.08E-02	
Beta air	%	3.92E-03	4.92E-03	
Organ: Bone[2]	%	1.39E-03	2.06E-03	

*Cumulative total for the year-to-date using the methodology in the ODCM.
[1]The estimated releases of Carbon-14 are not based on measurements of effluents, but on the methodology of NUGEG-0017 adjusted for EFPD. The calculated annual release is divided among four calendar quarters, and based on the number of days in each quarter.
[2]The maximum organ dose (determined to be the bone from measured effluents) includes Carbon-14 bone dose of 0.141 mrem per quarter. Total Body dose from Carbon-14 releases is 0.028 mrem per quarter.
ND = None Detected

TABLE I-A
(Continued)
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT - 2014
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

	Unit	Quarter 3	Quarter 4	Est. Total Error %
A. Fission and Activation Gases				
1. Total release	Ci	2.26E-02	2.50E-02	3.63E+01
2. Average release rate for period	µCi/sec	2.84E-03	3.15E-03	
B. Iodines				
1. Total Iodine-131	Ci	ND	ND	1.74E+01
2. Average release rate for period	µCi/sec	ND	ND	
C. Particulates				
1. Particulates with half-lives >8 days	Ci	4.78E-09	5.69E-07	1.05E+01
2. Average release rate for period	µCi/sec	6.01E-10	7.16E-08	
3. Gross alpha radioactivity	Ci	ND	ND	
D. Tritium				
1. Total release	Ci	4.28E+00	3.26E+00	2.31E+01
2. Average release rate for period	µCi/sec	5.39E-01	4.10E-01	
E. Carbon-14				
1. Total release[1]	Ci	2.08E+00	2.08E+00	
F. Percent of 10 CFR 50, Appendix I				
1. Quarterly limit				
Gamma air	%	9.74E-03	1.19E-02	
Beta air	%	1.77E-03	2.10E-03	
Organ: Bone[2]	%	7.92E-05	1.92E-04	
2. Cumulative Annual limit*				
Gamma air	%	2.56E-02	3.16E-02	
Beta air	%	5.80E-03	6.85E-03	
Organ: Bone[2]	%	2.10E-03	2.19E-03	

*Cumulative total for the year-to-date using the methodology in the ODCM.
[1]The estimated releases of Carbon-14 are not based on measurements of effluents, but on the methodology of NUREG-0017 adjusted for EFPD. The calculated annual release is divided among four calendar quarters, and based on the number of days in each quarter.
[2]The maximum organ dose (determined to be the bone from measured effluents) includes Carbon-14 bone dose of 0.141 mrem per quarter. Total Body dose from Carbon-14 releases is 0.028 mrem per quarter.

TABLE I-C
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT - 2014
GASEOUS EFFLUENTS - GROUND LEVEL AND MIXED MODE RELEASES

		Continuous Mode		Batch Mode	
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 1	Quarter 2
1. Fission Gases[1]					
Ar-41	Ci	ND	ND	5.84E-02	2.33E-02
Kr-85m	Ci	ND	ND	2.90E-05	ND
Xe-131m	Ci	ND	ND	4.01E-04	ND
Xe-133m	Ci	ND	ND	1.70E-03	ND
Xe-133	Ci	ND	ND	8.09E-02	1.47E-03
Xe-135	Ci	ND	ND	1.06E-02	ND
Total for Period	Ci	ND	ND	1.52E-01	2.48E-02
2. Iodines[1]					
I-131	Ci	ND	ND	ND	ND
Total for Period	Ci	ND	ND	ND	ND
3. Particulates[1]					
Co-58	Ci	ND	5.21E-08	6.64E-09	1.85E-07
Co-60	Ci	ND	ND	ND	ND
Total for Period	Ci	ND	5.21E-08	6.64E-09	1.85E-07

[1]Mixed mode continuous accountability includes mixed mode batch accountability (but excludes tritium).

TABLE I-C
(Continued)
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT - 2014
GASEOUS EFFLUENTS - GROUND LEVEL AND MIXED MODE RELEASES

		Continuous Mode		Batch Mode	
Nuclides Released	Unit	Quarter 3	Quarter 4	Quarter 3	Quarter 4
1. Fission Gases[1]					
Ar-41	Ci	ND	ND	2.04E-02	2.49E-02
Kr-85m	Ci	ND	ND	ND	ND
Xe-131m	Ci	ND	ND	ND	ND
Xe-133m	Ci	ND	ND	ND	ND
Xe-133	Ci	2.17E-03	ND	7.01E-05	1.08E-04
Xe-135	Ci	ND	ND	ND	ND
Total for Period	Ci	2.17E-03	ND	2.04E-02	2.50E-02
2. Iodines[1]					
I-131	Ci	ND	ND	ND	ND
Total for Period	Ci	ND	ND	ND	ND
3. Particulates[1]					
Co-58	Ci	ND	ND	ND	4.70E-07
Co-60	Ci	ND	ND	4.78E-09	9.85E-08
Total for Period	Ci	ND	ND	4.78E-09	5.69E-07

[1]Mixed mode continuous accountability includes mixed mode batch accountability (excludes tritium).

IV. LIQUID EFFLUENTS

A. Batch Releases

	Jan - June 2014	July - Dec 2014
Number of batch releases	45	16
Total time period for batch releases	9.57E+03 min	3.22E+03 min
Maximum time period for a batch release	4.33E+02 min	3.72E+02 min
Average time period for a batch release	2.13E+02 min	2.02E+02 min
Minimum time period for a batch release	8.50E+01 min	1.05E+02 min
Average Stream Flow During Release Periods	3.73E+05 gpm	3.81E+05 gpm

B. Abnormal Releases

	Jan - June 2014	July - Dec 2014
Number of releases	0	0
Total activity released	0.00E+00 Ci	0.00E+00 Ci

C. Data Tables

The following tables provide the details of liquid releases:

Table IV-A Summation of All Releases
Table IV-B Continuous Mode and Batch Mode Releases
Table IV-C Typical Lower Limits of Detection for Liquid Effluents

TABLE II-A
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT - 2014
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

	Unit	Quarter 1	Quarter 2	Est. Total Error %
A. Fission and Activation Products				
1. Total release (not including tritium, gases, alpha)	Ci	1.98E-02	6.49E-03	1.07E+01
2. Average diluted concentration during period	µCi/ml	8.51E-11	2.65E-11	
B. Tritium				
1. Total release	Ci	1.18E+02	2.74E+01	9.20E+00
2. Average diluted concentration during period	µCi/ml	5.08E-07	1.12E-07	
C. Dissolved and entrained gases				
1. Total release	Ci	2.56E-03	8.05E-05	9.60E+00
2. Average diluted concentration during period	µCi/ml	1.10E-11	3.29E-13	
3. Percent of applicable limit	%	5.52E-06	1.65E-07	
D. Gross alpha radioactivity				
1. Total release	Ci	ND	ND	ND
E. Volume of waste released prior to dilution	Liters	5.17E05	4.47E+05	
F. Volume of dilution water used during period	Liters	2.32E+11	2.45E+11	
G. Percent of 10 CFR 50, Appendix I				
1. Quarterly Limit Organ: GI-LLI[1&2], Liver[1] Total body	 % %	 1.15E-02[1] 3.68E-02	 1.13E-01[2] 6.02E-03	
2. Cumulative Annual Limit* Organ: Liver, GI-LLI Total body	 % %	 5.73E-03[1] 1.84E-02	 6.21E-02[2] 2.14E-02	

[1] GI-LLI (gastrointestinal-lower large intestine) & Liver received the highest dose for Quarter 1. GI-LLi & Liver dose contributions were equal for Quarter 1.
[2]GI-LLi received the highest dose for Quarter 2.
*Cumulative total for the year-to-date using the methodology in the ODCM.

TABLE II-A
(Continued)
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT - 2014
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

	Unit	Quarter 3	Quarter 4	Est. Total Error %
A. Fission and Activation Products				
1. Total release (not including tritium, gases, alpha)	Ci	1.92E-03	2.28E-03	1.07E+01
2. Average diluted concentration during period	µCi/ml	7.57E-12	9.44E-12	
B. Tritium				
1. Total release	Ci	8.39E+00	2.55E+01	9.20E+00
2. Average diluted concentration during period	µCi/ml	3.30E-08	1.06E-07	
C. Dissolved and entrained gases				
1. Total release	Ci	ND	2.40E-06	9.60E+00
2. Average diluted concentration during period	µCi/ml	ND	9.93E-15	
3. Percent of applicable limit	%	ND	4.96E-09	
D. Gross alpha radioactivity				
1. Total release	Ci	ND	ND	ND
E. Volume of waste released prior to dilution	Liters	1.86E+05	2.61E+05	
F. Volume of dilution water used during period	Liters	2.54E+11	2.42E+11	
G. Percent of 10 CFR 50, Appendix I				
1. Quarterly Limit Organ: GI-LLI[1] Total body	 % %	 9.52E-05[1] 2.05E-04	 4.54E-04[1] 8.31E-04	
2. Cumulative Annual Limit* Organ: GI-LLI[1] Total body	 % %	 6.22E-02[1] 2.15E-02	 6.24E-02[1] 2.19E-02	

[1] GI-LLI, gastrointestinal-lower large intestine received the highest dose for Quarter 3 and Quarter 4.
*Cumulative total for the year-to-date using the methodology in the ODCM.

TABLE II-B
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT - 2014
LIQUID EFFLUENTS - BATCH MODE RELEASES

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
H-3	Ci	1.17E+02	2.73E+01	8.39E+00	2.55E+01
Gross Alpha	Ci	ND	ND	ND	ND
Cr-51	Ci	ND	1.27E-04	ND	ND
Mn-54	Ci	ND	3.99E-05	ND	5.76E-06
Fe-55	Ci	7.14E-05	8.62E-04	1.22E-03	1.23E-03
Fe-59	Ci	ND	1.94E-05	ND	ND
Co-56	Ci	7.43E-07	ND	ND	ND
Co-57	Ci	ND	4.98E-06	3.08E-06	5.19E-06
Co-58	Ci	6.66E-04	3.31E-03	3.79E-04	2.26E-04
Co-60	Ci	2.64E-04	7.71E-04	1.78E-04	3.50E-04
Ni-63	Ci	1.32E-04	3.41E-04	8.91E-05	2.13E-04
Nb-95	Ci	ND	ND	9.69E-07	2.06E-06
Ag-110m	Ci	ND	2.31E-06	4.70E-06	5.07E-06
Sn-117m	Ci	5.54E-06	1.70E-05	1.02E-06	ND
Sb-122	Ci	3.88E-05	ND	ND	ND
Sb-124	Ci	3.74E-05	2.63E-06	ND	ND
Sb-125	Ci	1.41E-04	1.25E-04	3.99E-05	1.31E-04
Te-123m	Ci	5.69E-06	1.74E-05	1.05E-06	ND
I-134	Ci	ND	ND	ND	6.80E-06
Cs-137	Ci	4.82E-06	1.70E-05	ND	ND
Ba-133	Ci	ND	1.37E-06	ND	2.64E-06
Ba-142	Ci	ND	ND	ND	9.03E-05
Ce-141	Ci	ND	1.32E-06	ND	ND
Eu-152	Ci	ND	1.50E-05	5.88E-06	1.56E-05
Total for Period	Ci	1.37E-03	5.67E-03	1.92E-03	2.28E-03

TABLE II-B
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT - 2014
LIQUID EFFLUENTS - BATCH MODE RELEASES (Continued)

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Xe-133m	Ci	4.11E-06	ND	ND	ND
Xe-133	Ci	2.49E-03	1.28E-05	ND	2.40E-06
Xe-138	Ci	ND	6.77E-05	ND	ND
Total for Period	Ci	2.50E-03	8.05E-05	ND	2.40E-06

TABLE II-B
(Continued)
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT - 2014
LIQUID EFFLUENTS - CONTINUOUS MODE RELEASES

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
H-3	Ci	5.74E-01	9.58E-02	4.22E-04	8.56E-04
Gross Alpha	Ci	ND	ND	ND	ND
F-18	Ci	1.71E-02	ND	ND	ND
Na-24	Ci	9.29E-06	ND	ND	ND
Cr-51	Ci	1.21E-07	ND	ND	ND
Mn54	Ci	1.38E-09	ND	ND	ND
Fe-59	Ci	2.58E-09	ND	ND	ND
Co-56	Ci	4.60E-05	ND	ND	ND
Co-58	Ci	1.04E-05	5.49E-04	ND	ND
Co-50	Ci	2.81E-08	ND	ND	ND
Zr-95	Ci	2.12E-09	ND	ND	ND
Nb-95	Ci	3.92E-09	2.74E-04	ND	ND
I-132	Ci	2.81E-04	ND	ND	ND
I-133	Ci	3.57E-04	ND	ND	ND
I-134	Ci	1.32E-04	ND	ND	ND
I-135	Ci	4.54E-04	ND	ND	ND
Total for Period	Ci	1.84E-02	8.22E-04	ND	ND
Xe-135m	Ci	4.68E-05	ND	ND	ND
Xe-135	Ci	2.10E-05	ND	ND	ND
Total for Period	Ci	6.78E-05	ND	ND	ND

III. SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

Report Time Period: January 1, 2014, through December 31, 2014

SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (not irradiated fuel)

Waste Class A

Type of Waste	Waste Volume M^3	[1] Activity Curies	[2] Est. Total Error %	No. of Shipments
a. Spent resins, filter sludges, etc.	4.51E+00	7.05E-01	±25%	2
b. Dry compressible waste, contaminated equip, etc.	2.37E+02	2.66E-01	±25%	4
c. Irradiated components, control rods, etc.	N/A	N/A	N/A	N/A
d. Other (describe) Oil, Waste Holdup Tank Sludge/Water	N/A	N/A	N/A	N/A

[1]Excludes successful GIC/PCW Waste
[2]Estimated

III. SOLID WASTE AND IRRADIATED FUEL SHIPMENTS (Continued)

Report Time Period: January 1, 2014, through December 31, 2014

SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Continued)
Estimate of major nuclide composition (by type of waste)

Resins		
Radionuclide	%	Ci
N/A	N/A	N/A
Ni-63	5.67E+01	4.00E-01
Co-60	9.75E+00	6.87E-02
Fe-55	1.32E+01	9.32E-02
C-14	2.27E+00	1.60E-02
Sb-125	2.53E+00	1.78E-02
Co-58	9.19E+00	6.48E-02
H-3	1.48E+00	1.04E-02
Cs-137	9.59E-01	6.76E-03
Mn-54	8.44E-01	5.95E-03
Ni-59	6.00E-01	4.23E-03
Co-57	4.35E-01	3.07E-03

* Other nuclides: Tc-99, Cs-134, Sr-90, Ce-144, Te-123m and I-129

Dry Compressible Waste/Contaminated Equipment		
Radionuclide	%	Ci
Co-60	2.41E+01	6.41E-02
Ni-63	4.27E+01	1.14E-01
Fe-55	2.37E+01	6.31E-02
Co-58	2.64E+00	7.03E-03
C-14	4.34E-01	1.16E-03
Cs-137	1.41E+00	3.75E-03
Nb-95	1.65E+00	4.39E-03
Zr-95	9.37E-01	2.50E-03
H-3	3.43E-01	9.13E-02
Mn-54	6.87E-01	1.83E-04
Ag-110m	5.13E-01	1.37E-03
Cr-51	2.89E-01	7.71E-04

* Other nuclides: Sb-125, Ru-106, Sn-113, Fe-59, Tc-99, Te-123m, Co-57, Cm-243 and I-129.

III. SOLID WASTE AND IRRADIATED FUEL SHIPMENTS (Continued)

Report Time Period: January 1, 2014, through December 31, 2014

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Continued)

Irradiated Fuel Shipments

Number of Shipments:	0
Mode of Transportation	N/A
Destination	N/A

Solid Waste

Number of Shipments:	6
Mode of Transportation	Highway - Exclusive Use
Destination	Energy Solutions (Barnwell , SC), Duratek Services, Inc.(Oak Ridge, TN)

III. SOLID WASTE AND IRRADIATED FUEL SHIPMENTS (Continued)

Report Time Period: January 1, 2014, through December 31, 2014

B. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (not irradiated fuel)

Waste Class B

Type of Waste	Waste Volume M^3	[1] Activity Curies	[2] Est. Total Error %	No. of Shipments
a. Spent resins, filter sludges, etc.	N/A	N/A	N/A	N/A
b. Dry compressible waste, contaminated equip, etc.	N/A	N/A	N/A	N/A
c. Irradiated components, control rods, etc.	N/A	N/A	N/A	N/A
d. Other (describe) Oil, Waste Holdup Tank Sludge/Water	N/A	N/A	N/A	N/A

Estimate of major nuclide composition (by type of waste)

Resins		
Radionuclide	%	Ci
Ni-63	ND	ND
Fe-55	ND	ND
Co-60	ND	ND
Co-58	ND	ND
Sb-125	ND	ND
C-14	ND	ND
Mn-54	ND	ND
Cs-137	ND	ND
Cs-134	ND	ND
Co-57	ND	ND
Ni-59	ND	ND
Sr-90	ND	ND

* Other Nuclides: ND

III. SOLID WASTE AND IRRADIATED FUEL SHIPMENTS (Continued)

Report Time Period: January 1, 2014, through December 31, 2014

B. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Continued)

Irradiated fuel shipments

Number of Shipments:	0
Mode of Transportation	N/A
Destination	N/A

Solid Waste

Number of Shipments:	0
Mode of Transportation	N/A
Destination	N/A

III. SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
Report Time Period: January 1, 2014, through December 31, 2014
C. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (not irradiated fuel)

Waste Class C

Type of Waste	Waste Volume M^3	[1] Activity Curies	[2] Est. Total Error %	No. of Shipments
a. Spent resins, filter sludges, etc.	7.25E-01	9.35E+00	±25%	1
b. Dry compressible waste, contaminated equip, etc.	N/A	N/A	N/A	N/A
c. Irradiated components, control rods, etc.	N/A	N/A	N/A	N/A
d. Other (describe) Oil, Waste Holdup Tank Sludge/Water	N/A	N/A	N/A	N/A

[1]Excludes successful GIC/PCW Waste
[2]Estimated

Estimate of major nuclide composition (by type of waste)

Resins		
Radionuclide	%	Ci
Co-60	2.07E+01	1.93E-00
Fe-55	3.67E+01	3.43E-00
Ni-63	1.35E+01	1.27E-00
C-14	1.42E+00	1.33E-01
Co-58	1.76E+01	1.64E-00
Zr-95	3.10E+00	2.90E-01
Mn-54	5.56E-01	5.20E-02
Nb-95	2.15E+00	2.01E-01
Sb-125	1.08E+00	1.01E-01
H-3	1.94E-00	1.81E-01
Cr-51	4.08E-01	3.82E-02
Ce-144	2.06E-01	1.93E-02

* Other Nuclides : Ag-110m, Tc-99, Te-123m, Sr-90, Co-57, Cs-137, Fe-59, Ru-106, I-129, Sb-124, Cs-134, Hf-181, Cm-242, Cm-243

Irradiated Fuel Shipments

Number of Shipments:	0
Mode of Transportation	N/A
Destination	N/A

Solid Waste

Number of Shipments:	1
Mode of Transportation	Highway – Exclusive Use
Destination:	Energy Solutions – Barnwell, SC

IV. 40 CFR 190 DOSE CONFORMANCE

In accordance with the requirements of 40 CFR 190, the annual dose commitment to any member of the general public shall be calculated to assure that doses are limited to 25 millirems to the total body or any organ with the exception of the thyroid, which is limited to 75 millirems. The fuel cycle dose assessment for HBRSEP includes liquid and gaseous effluent dose contributions from HBRSEP, evaporation of tritium in Lake Robinson, and direct and air-scatter dose from the onsite ISFSI. No other uranium fuel cycle facility contributes significantly to the maximum exposed individual. Included in the gaseous effluent dose calculations is an estimate of the dose contributed by Carbon-14. The combined dose to a maximum exposed individual from HBRSEP's effluent releases and direct and air-scatter dose from the ISFSI is below 40 CFR 190 limits as shown by the following summary:

Maximum Total Body Dose: 5.19E-01 mrem

Gaseous:	3.24E-01 mrem
Liquid:	6.58E-04 mrem
Evaporation:	1.94E-01 mrem

Maximum Organ Dose (other than TB): 5.62E-01 mrem

Critical Organ:	Bone
Gaseous:	5.62E-01 mrem
Liquid:	2.19E-04 mrem
Evaporation:	0.00E+00 mrem (tritium does not contribute dose to Bone)

Direct Radiation Dose

Direct and air-scatter radiation dose contributions from the onsite ISFSI at HBRSEP have been calculated and documented in the ISFSI Safety Analysis Report. The dose rate to the maximum exposed individual from the ISFSI is conservatively calculated to be less than 5 mrem/yr.

The below excerpt from the HBRSEP ISFSI Safety Analysis Report is provided to document the conclusion that the HBRSEP ISFSI contributes less than 5 mrem/year to the maximum exposed individual.

> *7.6.2 ANALYSIS OF MULTIPLE CONTRIBUTION*
>
> *The maximally exposed member of the public would receive approximately 1.6 mrem per year from an ISFSI made up of a three-unit HSM (reference Figure 7.6.1). An ISFSI consisting of an eight-unit HSM would contribute approximately 4.3 mrem per year. This is a result of external radiation only; there are no gaseous, particulate, or liquid effluents associated with the normal operation of the ISFSI. It can be concluded that the actual exposure contribution from the ISFSI along with the total of all other uranium fuel cycle activities is within the regulatory limits set forth in 40CFR190.*

Assessment of the actual dose from direct radiation is performed as part of the HBRSEP Radiological Environmental Monitoring Program (REMP) and reported in the Annual Radiological Environmental Operating Report. During 2014, the assessment of dose from direct radiation, performed as part of the REMP, demonstrated no measurable contribution above background attributable to HBRSEP operations.

V. METEOROLOGICAL DATA

A. Continuous Release Diffusion Analysis

Table V-A presents the number and frequency of wind direction occurrences by wind speed class as recorded at the onsite meteorological system during continuous release, for the period January 1, 2014, through December 31, 2014.

The frequencies are presented as a percent of total occurrences for each stability class, as well as a summary for all classes for the lower (10 meter) sensor elevation.

Pertinent information available from the tables are as follows:

1. Stability

Percent occurrence Pasquill Stability categories based on lower level (10 meter) wind distribution:

Stability Classes 2014

STAB	Frequency	Percent
A	540	6.19
B	552	6.33
C	636	7.29
D	3755	43.05
E	1662	19.05
F	772	8.85
G	806	9.24

Note: Stability Class Frequency A = Most Unstable, G = Most Stable

2. Wind Speed and Wind Direction 10 Meter
Meteorological Statistics (hourly data)

Variable	Label	Mean	Median	Max	Min	Data Recovery
Upper Wind Speed	(m/s)	3.778	3.576	12.785	0.045	98.09
Upper Wind Direction	(degs)	167.853	189.7	361	1	99.49
Lower Wind Speed	(m/s)	2.119	1.922	8.494	0	99.26
Lower Wind Direction	(degs)	179.464	189.8	361	1	99.49
Lower Sigma	no units	19.783	17.9	70.8	3.2	99.49
Upper Sigma		11.377	10.1	75	0	99.41
Lower Temperature	degs F	62.123	65	94.9	11	99.49
Delta-Temperature	degs F	0.116	-0.89	18.14	-2.67	99.48
Precipitation	inches	0.004	0	1.34	0	88.74
Dewpoint	degs F	51.562	54.2	75.6	-5.6	94.19
Solar	W/m2	181.658	6.973	1045.95	0	99.49
Pressure	in Hg	29.798	29.79	30.36	29.11	99.49

TABLE V-A JOINT OCCURRENCE FREQUENCIES FOR LOWNDDEG AND LOWNDSPD – GROUND CONTINUOUS RELEASES
1USNRC COMPUTER CODE-XOQDOQ,

XOQDOQ - GROUND LEVEL RELEASE FROM THE LAKE ROBINSON. 2014 METEOROLOGY.

JFD_RNP2014_Ground.pdf

RNP 2014 Lower Level JFD		Hours of Occurrence															
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
Stability	Wind Speed (mph)	0	0	0	1	0	3	1	0	0	0	1	0	0	0	0	0
A	0.75-3.50																
	3.51-7.50	8	10	12	18	20	8	21	18	17	35	51	38	27	6	2	0
	7.51-12.50	5	2	0	0	0	0	2	17	31	50	54	23	12	11	13	3
	12.51-18.50	0	0	0	0	0	0	0	0	4	2	5	2	0	1	4	0
	18.51-25.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
B	0.75-3.50	1	1	2	1	5	9	6	3	2	1	2	2	3	1	0	0
	3.51-7.50	30	25	22	18	22	11	12	14	18	23	55	38	25	15	12	2
	7.51-12.50	13	5	0	0	0	0	1	4	17	20	33	15	7	12	15	11
	12.51-18.50	0	0	0	0	0	0	0	0	5	3	6	1	0	2	1	0
	18.51-25.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	0.75-3.50	3	10	9	21	13	17	18	4	4	2	4	6	5	0	1	5
	3.51-7.50	54	48	27	25	24	6	14	19	15	21	35	22	31	21	5	14
	7.51-12.50	17	16	0	0	0	0	1	5	11	15	22	4	3	7	6	10
	12.51-18.50	0	0	0	0	0	0	0	3	1	2	3	1	0	4	0	1
	18.51-25.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	0.75-3.50	42	99	142	135	92	79	75	63	37	34	42	41	30	29	18	19
	3.51-7.50	293	447	170	114	53	18	38	153	152	137	100	81	47	48	48	95
	7.51-12.50	151	133	4	0	0	0	4	53	58	71	32	30	24	16	20	82
	12.51-18.50	9	9	0	0	0	0	0	2	11	7	6	0	1	10	9	13
	18.51-25.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

E	0.75-3.50	42	33	26	17	9	11	19	72	109	136	105	61	49	45	38	33
	3.51-7.50	53	12	9	9	0	1	1	80	88	97	78	53	38	36	56	128
	7.51-12.50	1	0	0	0	0	0	0	3	14	7	5	3	2	7	8	28
	12.51-18.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	18.51-25.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	0.75-3.50	25	11	6	0	3	6	27	73	71	57	60	41	24	30	55	43
	3.51-7.50	4	0	0	0	0	0	1	7	15	10	21	15	3	9	30	40
	7.51-12.50	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
	12.51-18.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	18.51-25.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G	0.75-3.50	32	15	3	5	0	9	28	53	58	51	29	20	19	27	64	94
	3.51-7.50	8	0	0	0	0	0	0	6	0	0	6	2	1	4	7	16
	7.51-12.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12.51-18.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	18.51-25.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ADDENDUM 1

CHANGES TO ODCM, PCP, AND
RADIOACTIVE WASTE SYSTEMS

TABLE OF CONTENTS

Description ..... Page

I. Changes to the Offsite Dose Calculation Manual (ODCM) 36
II. Changes to the Radioactive Waste Systems 36
III. Changes to the Process Control Program (PCP) 36
IV. Changes to the Land Use Census 36
V. Instrument Inoperability 36
VI. Liquid Holdup Tank Curie Limit 36
VII. Waste Gas Decay Tank Curie Limit 36
VIII. Missed Compensatory Samples 36
IX. Special Ground Water Protection Requirements 37
X. Missed ODCM Samples 37

I. CHANGES TO THE OFFSITE DOSE CALCULATION MANUAL (ODCM)

There were no changes to the ODCM during this reporting period.

II. CHANGES TO THE RADIOACTIVE WASTE SYSTEMS

There were no changes to the Radioactive Waste Systems during this reporting period.

III. CHANGES TO THE PROCESS CONTROL PROGRAM (PCP)

There were no changes to the Process Control Program during this reporting period.

IV. CHANGES TO THE LAND USE CENSUS

The Land Use Census is currently performed every 12 months and was last performed in 2014. The results of the 2014 Land Use Census and the 2014 meteorological data identified no changes that required an ODCM change. The next Land Use Census will be performed in 2015.

V. INSTRUMENT INOPERABILITY

There were no reportable instrumentation inoperability event during this reporting period.

VI. LIQUID HOLDUP TANK CURIE LIMIT

There were no outside liquid holdup tanks that exceeded the ten curie limit during this reporting period.

VII. WASTE GAS DECAY TANK CURIE LIMIT

There were no waste gas decay tanks with a curie content that exceeded the 1.90E+04 curie limit during this reporting period.

VIII. MISSED COMPENSATORY SAMPLES

There were no instances of missed compensatory samples during this reporting period.

IX. SPECIAL GROUND WATER PROTECTION REQUIREMENTS

There were no dose calculations performed or special reports made as a result of any spills or leaks during this period.

The following changes were made to the Groundwater Protection Program.

1. Additional groundwater monitoring wells were sampled and analyzed during 2014 as part of the NEI 07-07 Groundwater Protection Initiative. (See table below for results.)
2. As part of the Ashpond Closure Project, SCDHEC requested installation of 3 additional wells to around the Ashpond. Previously installed NPDES wells MW-1, MW-2, MW-03A and MW-4, were drilled deeper, due to low water level concerns and MW-5, MW-6 and MW-7 were added. The new wells were renamed as follows: MW-1R (NPDES) ASH, MW-2R (NPDES) ASH, MW-3R (NPDES) ASH, MW-4R (NPDES) ASH, MW-5 (NPDES) ASH, MW-6 (NPDES) ASH, and MW-7 (NPDES) ASH.
3. Following installation of the new wells, there are a total of twenty-four wells monitored routinely for radiological contaminants; fifteen of these wells are required by the ODCM. The data from the required wells are reported annually in the Annual Radiological Environmental Operating Report.

The table below, contains sample results from all wells sampled outside of the ODCM requirement. There were no plant related gamma activity detected. Some of the non ODCM wells contained low level tritium, but all the monitoring wells remain under the 20,000 pCi/L EPA drinking water limit.

Groundwater Tritium - 2014
pCi/L

Well ID	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
P-1	1440	4190	2830	1560
P-2	ND	324	430	ND
MW-1R (NPDES) ASH	NS	NS	ND	ND
MW-2R (NPDES) ASH	NS	NS	245	200
MW-3R (NPDES) ASH	NS	NS	1520	1270
MW-4R (NPDES) ASH	NS	NS	653	ND
MW-5 (NPDES) ASH	NS	NS	663	866
MW-6 (NPDES) ASH	NS	NS	1410	1200
MW-7 (NPDES) ASH	NS	NS	1080	627

ND = none detectable; below MDA (MDA = 250 pCi/L)

NS = Not sampled; These wells were added to the program 3rd quarter 2014.

X. MISSED ODCM SAMPLES

There were no failures to meet the ODCM specified sample frequencies or analyses during this reporting period.

ADDENDUM 2

CORRECTIONS TO PREVIOUS REPORTS

TABLE OF CONTENTS

	Description	Page
I.	There were no changes to the previous reports identified	38

TRANSMITTAL FORM

TRANSMITTAL No.: 0001356091 TRANSMITTER: WALTERS, HEIDI
TRANSMITTAL DATE: 04/28/2015

FACILITY: RNP	UNIT:
RECORD NO: 000000005665327	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00675523	
DOC DATE: 04/21/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: EC 94830 50.59 SCREEN	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

FACILITY: RNP	UNIT:
RECORD NO: 000000005669756	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00740340	
DOC DATE: 04/27/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: SP-1532 PRR 713691	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

FACILITY: RNP	UNIT:
RECORD NO: 000000005669754	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00740873	
DOC DATE: 04/27/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: GP-005 REVISION 125	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

Total Number of Records: 25

TRANSMITTAL FORM

Page 2 of 9

TRANSMITTAL No.: 0001356091 TRANSMITTER: WALTERS, HEIDI
TRANSMITTAL DATE: 04/28/2015

FACILITY: RNP	UNIT:
RECORD NO: 000000005667120	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00742374	
DOC DATE: 04/23/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: PLP-007 REV 82 - PRR 711245 (PAR CHANGES)	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

FACILITY: RNP	UNIT:
RECORD NO: 000000005665328	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00742590	
DOC DATE: 04/21/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: SP-1527 PRR 00742576	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

FACILITY: RNP	UNIT:
RECORD NO: 000000005668195	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00743364	
DOC DATE: 04/24/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: 50.59 SCREEN FOR REVISION 20 OF EMP-004	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

TRANSMITTAL FORM

TRANSMITTAL No.: 0001356091 TRANSMITTER: WALTERS, HEIDI

TRANSMITTAL DATE: 04/28/2015

FACILITY: RNP	UNIT:
RECORD NO: 000000005667140	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00743409	
DOC DATE: 04/23/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: OST-611-18, REV 1	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

FACILITY: RNP	UNIT:
RECORD NO: 000000005667137	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00743630	
DOC DATE: 04/23/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: OST-254	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

FACILITY: RNP	UNIT:
RECORD NO: 000000005667139	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00743909	
DOC DATE: 04/23/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: OST-023, MONTHLY SURVEILLANCES, REV. 32	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

TRANSMITTAL FORM

Page 4 of 9

TRANSMITTAL No.: 0001356091 TRANSMITTER: WALTERS, HEIDI
TRANSMITTAL DATE: 04/28/2015

FACILITY: RNP	UNIT:
RECORD NO: 000000005665329	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00743958	
DOC DATE: 04/21/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: OP-501, CONDENSATE SYSTEM, REV. 86	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

FACILITY: RNP	UNIT:
RECORD NO: 000000005667136	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00744523	
DOC DATE: 04/23/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: 50.59 SCREEN FOR CP-100, ENHANCEMENTS	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

FACILITY: RNP	UNIT:
RECORD NO: 000000005665325	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00744526	
DOC DATE: 04/21/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: OP-910	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

TRANSMITTAL FORM

TRANSMITTAL No.: 0001356091 TRANSMITTER: WALTERS, HEIDI
TRANSMITTAL DATE: 04/28/2015

FACILITY: RNP	UNIT:
RECORD NO: 000000005665324	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00744608	
DOC DATE: 04/21/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: OST-410	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

FACILITY: RNP	UNIT:
RECORD NO: 000000005665326	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00744624	
DOC DATE: 04/21/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: OMM-022 (PRR 663835) REG AR	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

FACILITY: RNP	UNIT:
RECORD NO: 000000005668194	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00744834	
DOC DATE: 04/24/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: EC 77392 REV 5	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

TRANSMITTAL FORM

Page 6 of 9

TRANSMITTAL No.: 0001356091 TRANSMITTER: WALTERS, HEIDI
TRANSMITTAL DATE: 04/28/2015

FACILITY: RNP	UNIT:
RECORD NO: 000000005667141	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00744867	
DOC DATE: 04/23/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: SCREEN FOR OST-701-6, REVISION 16	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

FACILITY: RNP	UNIT:
RECORD NO: 000000005667135	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00745020	
DOC DATE: 04/23/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: SCREEN FOR OST-167-3, REVISION 2	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

FACILITY: RNP	UNIT:
RECORD NO: 000000005667138	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00745228	
DOC DATE: 04/23/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: OP-506, TURBINE LUBE OIL, REV. 60	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

TRANSMITTAL FORM

Page 7 of 9

TRANSMITTAL No.: 0001356091 TRANSMITTER: WALTERS, HEIDI
TRANSMITTAL DATE: 04/28/2015

FACILITY: RNP	UNIT:
RECORD NO: 000000005668196	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00745271	
DOC DATE: 04/24/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: MST-050 AND MST-050-1 REPLACING EST-148	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

FACILITY: RNP	UNIT:
RECORD NO: 000000005667121	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00745307	
DOC DATE: 04/23/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: EPCLA-01 PRR 745215	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

FACILITY: RNP	UNIT:
RECORD NO: 000000005668193	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00745329	
DOC DATE: 04/23/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: OST-154, SI SYSTEM HIGH HEAD CHECK VALVE TEST, REV. 52	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

TRANSMITTAL FORM

Page 8 of 9

TRANSMITTAL No.: 0001356091 TRANSMITTER: WALTERS, HEIDI
TRANSMITTAL DATE: 04/28/2015

FACILITY: RNP	UNIT:
RECORD NO: 000000005669753	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00745336	
DOC DATE: 04/27/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: RNP SCREEN FOR AD-SY-ALL-0270 REVISION	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

FACILITY: RNP	UNIT:
RECORD NO: 000000005669755	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00745379	
DOC DATE: 04/27/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: MST-802, REV 16, 50.59 SCREEN	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

FACILITY: RNP	UNIT:
RECORD NO: 000000005669757	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00745443	
DOC DATE: 04/27/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: OP-703, REVISION 36	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	

TRANSMITTAL FORM

TRANSMITTAL No.: 0001356091 TRANSMITTER: WALTERS, HEIDI
TRANSMITTAL DATE: 04/28/2015

FACILITY: RNP	UNIT:
RECORD NO: 000000005669758	DOC TYPE(SUB TYPE): AR (REG)
DOC NBR: 00745832	
DOC DATE: 04/27/2015	REV: 000
RECORD CLASS: QA	Retention: PERM
TITLE: EST-148 BEING SUPERSEDED AND DELETED BY MST-050 AND MST-050	
COLOR: N	SECURITY: N
ADDITIONAL DETAILS:	