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Clinton Power Station
Facility Operating License No. NPF-62
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Subject: Clinton Power Station
Annual Radioactive Effluent Release Report

Attached is the Annual Radioactive Effluent Release Report for Clinton Power Station (CPS) for the period of January 1, 2002, through December 31, 2002. This submittal is provided in accordance with the requirements of section 5.6.3 of the CPS Technical Specifications.

Respectfully,

Keith J. Polson
Plant Manager
Clinton Power Station

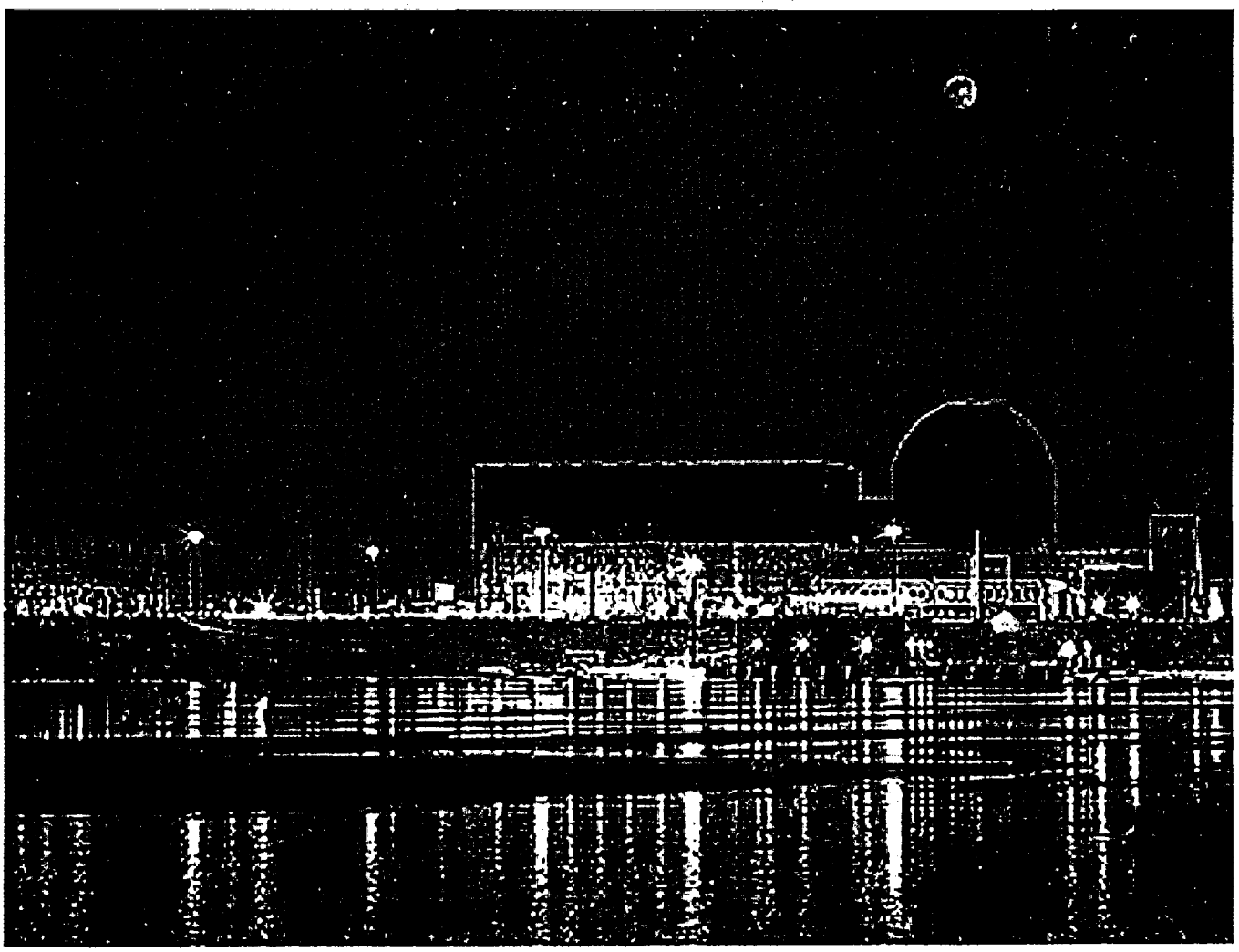
EET/blf

Attachment

cc: Regional Administrator, Region III
NRC Senior Resident Inspector- Clinton Power Station
Office of Nuclear Facility Safety- Illinois Department of Nuclear Safety

IE48

Clinton Power Station 2002 Annual Radioactive Effluent Release Report



Exelon
Nuclear

01 January 2002 – 31 December 2002

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

CLINTON POWER STATION – DOCKET NUMBER 50-461

Prepared by:
Clinton Power Station

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

SECTION 1

EXECUTIVE SUMMARY

The Annual Radioactive Effluent Release Report is a detailed description of gaseous and liquid radioactive effluents released from the Clinton Power Station [CPS] and the resulting radiation doses for the period of 01 January 2002 through 31 December 2002. This report also includes a detailed meteorological section providing weather history of the surrounding area during this period. This information is used to calculate the dose to the public.

The report also includes a summary of the amounts of radioactive material contained in solid waste that is packaged and shipped to a federally approved disposal / burial facility offsite. Additionally, this report notifies the U.S. Nuclear Regulatory Commission [NRC] staff of changes to CPS's Offsite Dose Calculation Manual [ODCM] and exceptions to the CPS effluent monitoring program that must be reported in accordance with ODCM Remedial Requirements 2.7.1.b and 3.9.2.b.

The NRC requires that nuclear power facilities be designed, constructed, and operated in such a manner as to maintain the amount of radioactive material in effluent releases to unrestricted areas As Low As Reasonably Achievable [ALARA]. To ensure compliance with this criterion, the NRC has established limitations governing the release of radioactivity in effluents.

During 2002, CPS operations were well within these federally required limits. The maximum radiation dose delivered to the inhabitants of the area surrounding CPS - due to radioactivity released from the station - was 0.0021 mR [Milli-Roentgen]. The radiation dose to the public in the vicinity of CPS was calculated by using the concentration of radioactive nuclides in each gaseous effluent release coupled with historical weather conditions. The dose from CPS gaseous effluents was only a small fraction of the limit for the maximum exposed member of the public. There were no liquid effluent releases in 2002. As such, there was no dose to the public from the liquid effluent pathway.

INTRODUCTION

SECTION 2

INTRODUCTION

CPS is located in Harp Township, DeWitt County approximately six (6) miles east of the city of Clinton in east-central Illinois. CPS is a ~1,138.5 megawatt gross electrical power output boiling water reactor. General Electric supplied the generating unit with Sargent and Lundy Engineers serving as architect-engineer and Baldwin Associates as the constructor. Construction of CPS began in the mid 1970's. Initial fuel load commenced in September of 1986 with initial criticality of the reactor occurring on 27 February 1987. Commercial operation commenced in April 1987 and the reactor reached 100% power for the first time on 15 September 1987.

CPS releases airborne effluents via two (2) gaseous effluent release points to the environment. They are the Common Station Heating, Ventilating, and Air Conditioning [HVAC] Stack and the Standby Gas Treatment System [SGTS] Vent [see Figure 1]. Each gaseous effluent release point is continuously monitored consisting of a surveillance program of periodic sampling and analysis as specified in the ODCM.

Although CPS has the ability to release liquid effluents in a batch mode, there were no liquid releases in 2002 at CPS. Each release would have been sampled and analyzed prior to release. Depending upon the amount of activity in a release, liquid effluents would vary from 10 to 300 gallons per minute [GPM]. This volume is then further combined with both Plant Service Water flow [a minimum of approximately 5,000 GPM] along with Plant Circulating Water flow [0 to 567,000 GPM] in the seal well, just prior to entering the 3.4 mile discharge flume into Lake Clinton [see Figure 2].

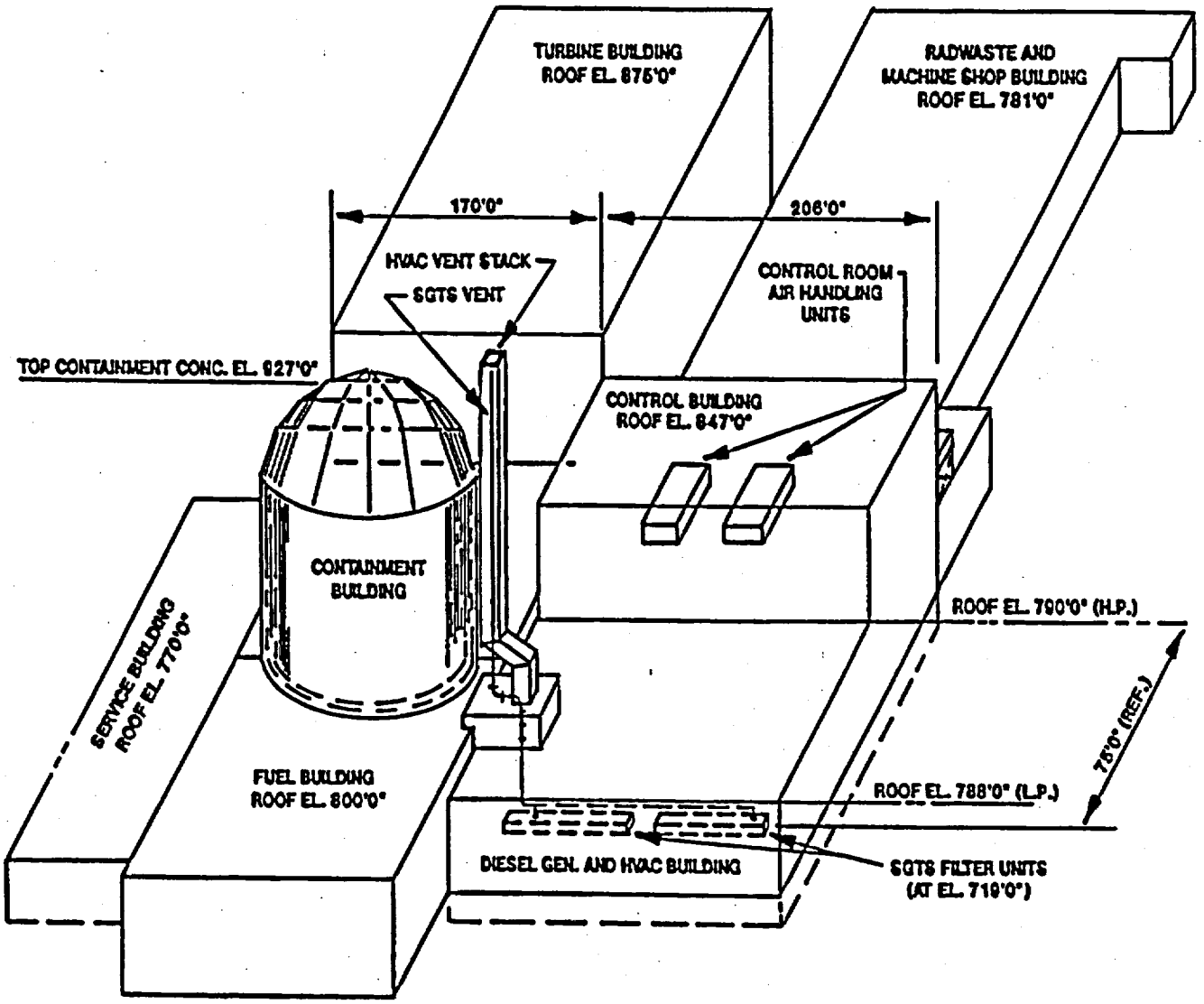
Processing and Monitoring

CPS strictly controls effluents to ensure radioactivity released to the environment is maintained ALARA and does not exceed federal release limit criteria. Effluent controls include the operation of radiation monitoring systems within the plant as well as an offsite environmental analysis programs. In-plant radiation monitoring systems are used to provide a continuous indication of radioactivity in effluent streams. Some are also used to collect particulate and radioiodine samples. Radioactive effluent related samples are analyzed in a controlled laboratory environment to identify the specific concentration of those radionuclides being released. Sampling and analyses provides for a more sensitive and precise method of determining effluent composition to complement the information provided by real-time radiation monitoring instruments.

Beyond the plant itself, a Radiological Environmental Monitoring Program [REMP] is maintained in accordance with Federal Regulations. The basic purpose of the REMP program is to assess the radiological impact on the environment due to the operation of CPS. Implicit in this charter is the federal regulatory requirement to trend and assess radiation exposure rates and radioactivity concentrations that may contribute to dose to the public. The program consists of two phases; pre-operational and operational. During the pre-operational phase of the program, the baseline for the local radiation environment was established. The operational phase of the program includes the objective of making confirmatory measurements to verify that the in-plant controls for the release of radioactive material are functioning as designed. Assessment of the operational impact of CPS on the environment is based on data collected since initial criticality of the reactor.

Figure 1

CPS AIRBORNE EFFLUENT RELEASE POINTS

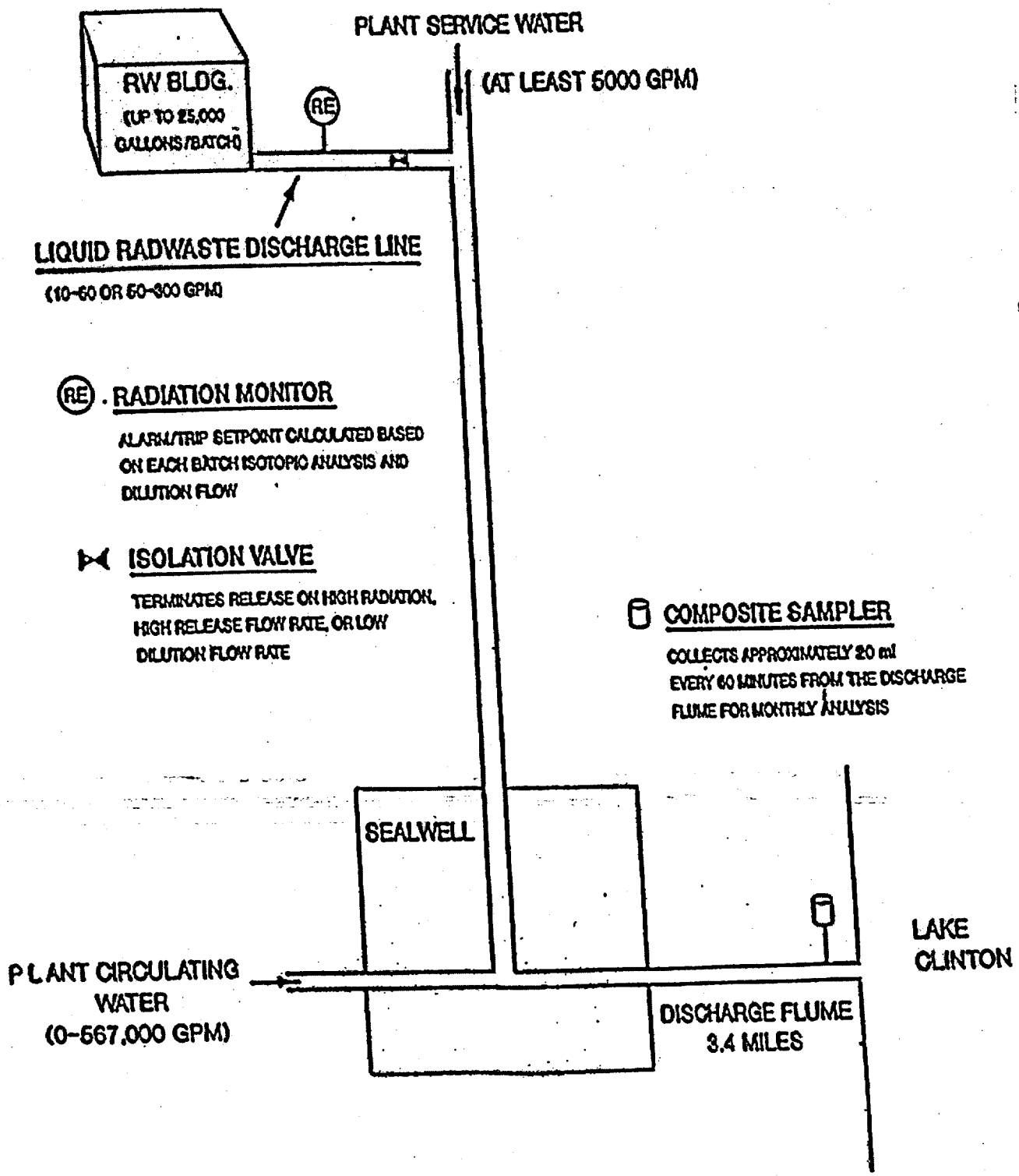


	HVAC Exhaust Vent	SGTS Exhaust Vent
Release Point Height (feet)	200	200
Building Height (feet)	190	190
Release Point Geometry	Duct	Pipe
Release Point Area (ft^2)	120	2
Release Point Diameter (feet)	12*	1
Annual Average Flow Rate (ft^3/sec)	2,738	73
Vertical Exit Velocity (feet/sec)	33	41

* Effective $2(A/\pi)^2$ diameter

Figure 2

CPS WATERBORNE EFFLUENTS RELEASE PATHWAY



Exposure Pathways

A radiological exposure pathway is the vehicle by which people may become exposed to radioactivity released from nuclear facilities. The major pathways of concern are those that could cause the highest calculated radiation dose. These pathways are determined from the type and amount of radioactivity released, the environmental transport mechanism, and how the plant environs are used (i.e., residence, gardens, etc.). The environmental transport mechanism includes the historical meteorological characteristics of the area that are defined by wind speed and wind direction. This information is used to evaluate how the radionuclides will be distributed within the surrounding area. The most important factor in evaluating the exposure pathway is the use of the environment by the public living around CPS. Factors such as location of homes in the area, use of cattle for milk, and the growing of gardens for vegetable consumption are very important considerations when evaluating exposure pathways. Figure 3 illustrates the various effluent exposure pathways that were considered.

The radioactive gaseous effluent exposure pathways include direct radiation, deposition on plants and soil, and inhalation by animals and humans. The radioactive liquid effluent exposure pathways include fish consumption and direct exposure from Lake Clinton.

Dose Assessment

Whole body radiation involves the exposure of all organs in the human body to ionizing radiation. Most naturally occurring background radiation exposures consist of whole body exposure although specific organs can receive radiation exposure from distinct radionuclides. These radionuclides enter the body through inhalation and ingestion and seek different organs depending on the nuclide. For example, radioactive iodine selectively concentrates in the thyroid, radioactive cesium collects in muscle and liver tissue, and radioactive strontium in mineralized bone.

The total dose to organs from a given radionuclide also depends on the amount of activity in the organ and the amount of time that the radionuclide remains in the body. Some radionuclides remain for very short periods of time due to their rapid radioactive decay and / or elimination rate from the body, while others may remain longer.

The radiation dose to the public in the area surrounding CPS is calculated for each release using historical weather conditions coupled with the concentrations of radioactive material present. The dose is calculated for all sixteen geographical sectors surrounding CPS and takes into consideration the location of the nearest residents, vegetable gardens producing broad leaf vegetables and dairy animals in all sectors. The calculated dose also uses the concept of a "maximum exposed individual" and "standard man", and the maximum use factors for the environment, such as how much milk an average person would drink and how much air that person breathes throughout the course of a year.

Section 6 contains more detailed information on dose to the public.

Gaseous Effluents

Gaseous effluent radioactivity released from CPS is classified into two (2) categories. The first category is noble gases. The second category consists of I^{131}, I^{133}, H^3, and all radionuclides in particulate form with radioactive half-lives greater than eight (8) days. Noble

gases - such as xenon and krypton - are biologically and chemically non-reactive. As such, these radionuclides cause external radiation exposure whereas I^{131}, I^{133}, H^3, and radionuclides in particulate form with radioactive half-lives greater than eight (8) days are the major contributors to internal radiation exposure.

Liquid Effluents

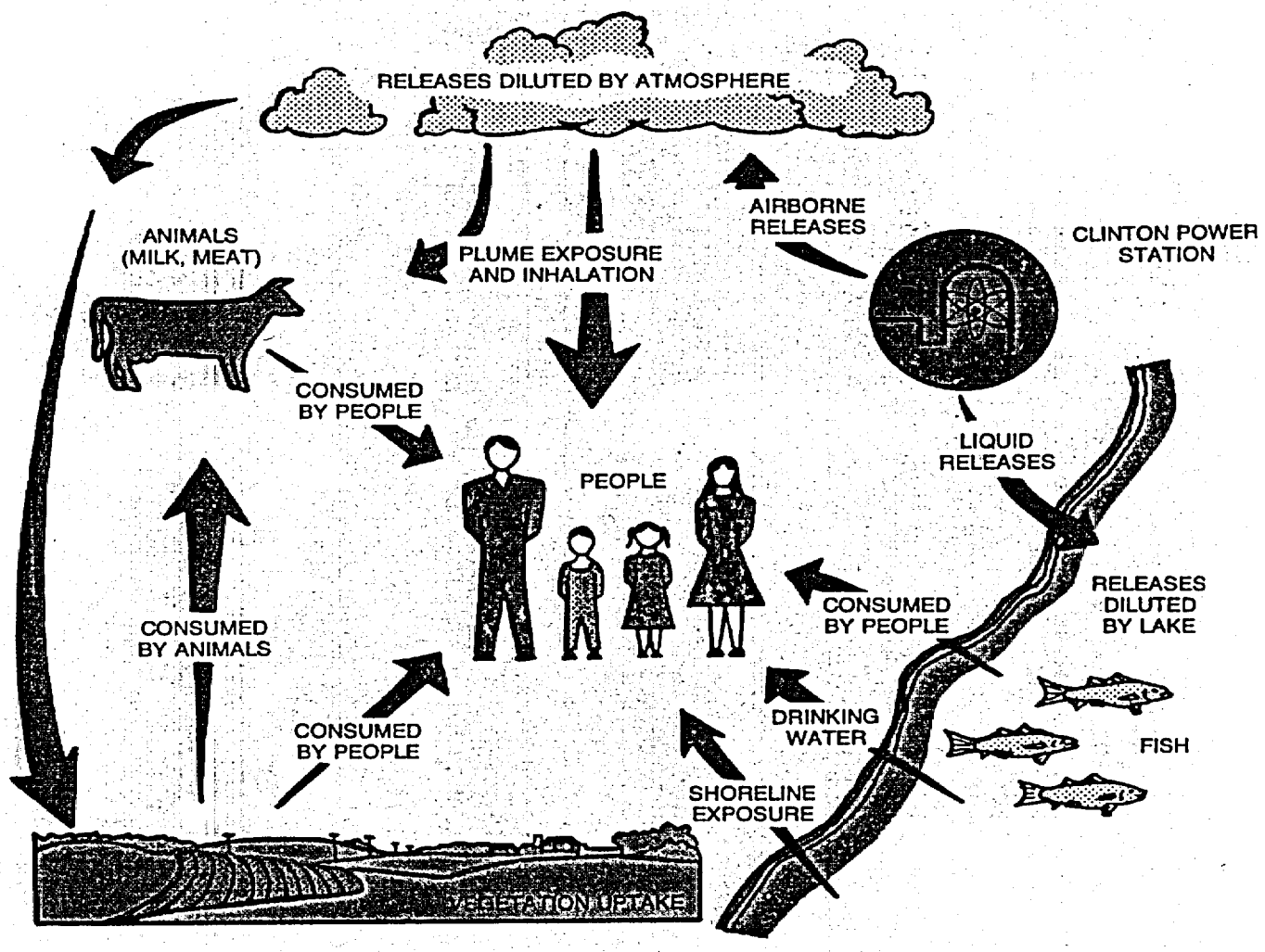
Liquid effluents may originate from two (2) systems at CPS. The first is effluent from the Radioactive Waste Treatment System. This water is demineralized prior to release. Samples are taken after the tank has been allowed to adequately recirculate. The second is from heat exchanger leaks found in closed cooling water systems that service radioactively contaminated systems. This would be considered an abnormal release. As a matter of station management commitment, CPS strives to be a zero (Ø) liquid release plant with the last liquid release occurring in September of 1992 - over ten (10) years ago.

Solid Waste Shipments

In order to reduce the radiation exposure to personnel and maintain the federally required ALARA concept, the NRC and the Department of Transportation [DOT] have established limits on the types of radioactive waste and the amount of radioactivity that may be packaged and shipped offsite for burial or disposal. To ensure that CPS is complying with these regulations, the types of waste and the radioactivity present are reported to the NRC.

FIGURE 3

EFFLUENT EXPOSURE PATHWAYS



SUPPLEMENTAL INFORMATION

SECTION 3

SUPPLEMENTAL INFORMATION

I. REGULATORY LIMITS

The NRC requires nuclear power facilities to be designed, constructed and operated in such a way that the radioactivity in effluent releases to unrestricted areas are kept ALARA. To assure these criteria are met, each license authorizing nuclear reactor operation includes the Offsite Dose Calculation Manual [ODCM] governing the release of radioactive effluents. The ODCM designates the limits for release of effluents, as well as the limits for doses to the general public from the release of radioactive liquids and gases. These limits are taken from Title 10 of the Code of Federal Regulations, Part 50, Appendix I (10CFR50 Appendix I), Title 10 of the Code of Federal Regulations, Part 20.1301 (10CFR20.1301) and Section 5.5.1 of our Station's Technical Specifications. Maintaining effluent releases within these operating limitations demonstrates compliance with ALARA principles. These ALARA limits are just a fraction of the dose limits established by the Environmental Protection Agency [EPA] found within Environmental Dose Standard Title 40, Code of Federal Regulations, Part 190 [40CFR190]. The EPA has established dose limits for members of the public in the vicinity of a nuclear power plant. These dose limits are:

- Less than or equal to 25 mRem per year to the total body.
- Less than or equal to 75 mRem per year to the thyroid.
- Less than or equal to 25 mRem per year to any other organ.

Specific limit information is given below.

A. Gaseous Effluents

1. The maximum permissible concentrations for gaseous effluents shall not exceed the values provided within Section 5.5.4.g of Station Technical Specifications. To ensure these concentrations are not exceeded, dose rates due to radioactive materials released in gaseous effluents from the site to areas at and beyond the site area boundary shall be limited to the following:

   a. Noble gases

      - Less than or equal to 500 mRem/year to the total body.
      - Less than or equal to 3,000 mRem/year to the skin.

   b. I^{131}, I^{133}, H^3, and all radionuclides in particulate form with radioactive half-lives greater than eight (8) days:

      - Less than or equal to 1,500 mRem/year to any organ.

2. In accordance with Title 10 of the Code of Federal Regulations, Part 50, Appendix I, (10CFR50 Appendix I) air dose due to noble gases released in gaseous effluents to areas at and beyond the site boundary shall be limited to the following:

   a. Less than or equal to 5 mRad for gamma radiation and less than or equal to 10 mRad for beta radiation during any calendar quarter.

   b. Less than or equal to 10 mRad for gamma radiation and less than or equal to 20 mRad for beta radiation during any calendar year.

3. In accordance with Title 10 of the Code of Federal Regulations, Part 50, Appendix I, (10CFR50 Appendix I), dose to a member of the public (from I^{131}, I^{133}, H^3, and all radionuclides in particulate form with radioactive half-lives greater than eight (8) days) in gaseous effluents released to areas at and beyond the site boundary shall be limited to the following values:

   a. Less than or equal to 7.5 mRem to any organ, during any calendar quarter.

   b. Less than or equal to 15 mRem to any organ, during any calendar year.

B. Liquid Effluents

1. The concentration of radioactive material released in liquid effluents to unrestricted areas shall be limited to the values provided within Section 5.5.4.b of Station Technical Specifications for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to 2.0E-04 µCi/ml total activity.

2. The dose or dose commitment to a member of the public from radioactive materials in liquid effluents released to unrestricted areas shall be limited to:

   a. Less than or equal to 1.5 mRem to the total body and less than or equal to 5 mRem to any organ during any calendar quarter.

   b. Less than or equal to 3 mRem to the total body and less than or equal to 10 mRem to any organ during any calendar year.

II. AVERAGE ENERGY

The CPS ODCM limits the dose equivalent rates due to the release of fission and activation gases to less than or equal to 500 mRem per year to the total body and less than or equal to 3,000 mRem per year to the skin. These limits are based on dose calculations using actual isotopic concentrations from our effluent release streams and not based upon the gross count rate from our monitoring systems. Therefore, the average beta and gamma energies [E] for gaseous effluents as described in Regulatory Guide 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants", are not applicable.

III. MEASUREMENT AND APPROXIMATIONS OF TOTAL RADIOACTIVITY

A. Fission and Activation Gases

1. Gas samples are collected weekly and are counted on a high purity germanium detector (HPGe) for principal gamma emitters. The HVAC and SGTS release points are continuously monitored and the average release flow rates for each release point are used to calculate the total activity released during a given time period.

2. Tritium is also collected by passing a known volume of the sample stream through a gas washer containing a known quantity of demineralized water. The collected samples are distilled and analyzed by liquid scintillation. The tritium released was calculated for each release point from the measured tritium concentration, the volume of the sample, the tritium collection efficiency, and the respective stack exhaust flow rates.

B. Iodines

Iodine is continuously collected on a charcoal cartridge filter via an isokinetic sampling assembly from each release point. Filters are normally exchanged once per week and then analyzed on an HPGe system. The average flow rates for each release point are averaged over the duration of the sampling period and these results - along with specific isotopic concentrations - are then used to determine the total activity released during the time period in question.

C. Particulates

Particulates are continuously collected on a filter paper via an isokinetic sampling assembly on each release point. Filters are normally exchanged once per week and then analyzed on an HPGe system. The average flow rates for each release point are averaged over the duration of the sampling period and these results - along with specific isotopic concentrations - are then used to determine the total activity released during the time period in question.

D. Liquid Effluents

Each tank of liquid radwaste is recirculated for at least two (2) tank volumes, sampled, and analyzed for principal gamma emitters prior to release. Each sample tank is recirculated for a sufficient amount of time prior to sampling ensuring that a representative sample is obtained. Samples are then analyzed on an HPGe system and liquid release permits are generated based upon the values obtained from the isotopic analysis and the most recent values for H^3, gross alpha, Fe^{55}, Sr^{89} and Sr^{90}. An aliquot based on release volume is saved and added to composite containers. The concentrations of composited isotopes and the volumes of the releases associated with these composites establish the proportional relationships that are then utilized for calculating the total activity released for these isotopes.

IV. DESCRIPTION OF ERROR ESTIMATES

Estimates of measurement and analytical error for gaseous and liquid effluents are calculated as follows:

$$E_T = \sqrt{[(E_1)^2 + (E_2)^2 + ...(E_n)^2]}$$

where: E_T = total percent error, and
$E_1 ... E_N$ = percent error due to calibration standards, laboratory analysis, instruments, sample flow, etc.

RADIOACTIVE EFFLUENT DATA

SECTION 4

RADIOACTIVE EFFLUENT DATA

TABLE 1
GASEOUS EFFLUENTS - Summation Of All Releases
Data Period: 01 January 2002 – 31 December 2002
Continuous Mixed Mode

	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Est. Total Error, %
A. Fission & Activation Gases						
1. Total Release	Ci	**0.00E+00**	**1.31E+00**	**0.00E+00**	**0.00E+00**	30
2. Average release rate for period	µCi/sec	0.00E+00	1.67E-01	0.00E+00	0.00E+00	
3. Percent of ODCM Limit	%	*	*	*	*	
B. Iodines						
1. Total Iodine-131	Ci	**5.32E-05**	**3.87E-05**	**4.90E-05**	**3.78E-05**	31
2. Average release rate for period	µCi/sec	6.85E-06	4.92E-06	6.16E-06	4.76E-06	
3. Percent of ODCM Limit	%	*	*	*	*	
C. Particulates						
1. Particulates with half-lives >8 days	Ci	**2.29E-05**	**9.95E-05**	**5.84E-05**	**1.50E-04**	24
2. Average release rate for period	µCi/sec	2.95E-06	1.27E-05	7.35E-06	1.67E-05	
3. Percent of ODCM Limit	%	*	*	*	*	
4. Gross alpha radioactivity	Ci	5.71E-07	5.64E-07	7.23E-07	7.93E-07	
D. Tritium						
1. Total Release	Ci	**1.14E+01**	**8.63E+00**	**1.15E+01**	**1.46E+01**	21
2. Average release rate for period	µCi/sec	1.46E+00	1.10E+00	1.45E+00	1.83E+00	
3. Percent of ODCM Limit	%	*	*	*	*	

* Applicable limits are expressed in terms of dose. See Tables 1A and 1B of this report.

TABLE 1A

Air Doses Due to Gaseous Releases

Doses per Quarter

Type of Radiation	ODCM Limit	1st Quarter	% of Limit	2nd Quarter	% of Limit	3rd Quarter	% of Limit	4th Quarter	% of Limit
Gamma	5 mRad	0.00E+00	0.00E+00	2.95E-05	5.90E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beta	10 mRad	0.00E+00	0.00E+00	3.78E-05	3.78E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Doses per Year

Type of Radiation	ODCM Limit	Year	% of Limit
Gamma	10 mRad	2.95E-05	2.95E-04
Beta	20 mRad	3.78E-05	1.89E-04

TABLE 1B

Doses to a Member of the Public Due to Radioiodines, Tritium, and Particulates in Gaseous Releases

Doses per Quarter

Type of Radiation	ODCM Limit	Quarter 1	% of Limit	Quarter 2	% of Limit	Quarter 3	% of Limit	Quarter 4	% of Limit
Bone	7.5	7.70E-07	1.03E-05	1.35E-05	1.80E-04	5.45E-07	7.27E-06	8.49E-06	1.13E-04
Liver	7.5	3.50E-04	4.67E-03	2.72E-04	3.62E-03	3.63E-04	4.84E-03	4.35E-04	5.80E-03
TBody	7.5	3.49E-04	4.66E-03	3.06E-04	4.07E-03	3.61E-04	4.81E-03	5.28E-04	7.04E-03
Thyroid	7.5	5.57E-04	7.43E-03	4.14E-04	5.52E-03	5.48E-04	7.31E-03	5.79E-04	7.72E-03
Kidney	7.5	3.50E-04	4.67E-03	2.68E-04	3.58E-03	3.61E-04	4.81E-03	4.35E-04	5.80E-03
Lung	7.5	3.48E-04	4.65E-03	2.66E-04	3.55E-03	3.61E-04	4.81E-03	4.36E-04	5.81E-03
GI LLI	7.5	3.49E-04	4.66E-03	2.75E-04	3.67E-03	3.69E-04	4.92E-03	4.38E-04	5.84E-03

Doses per Year

Type of Radiation	ODCM Limit	Year	% of Limit
Bone	15	2.33E-05	1.55E-04
Liver	15	1.42E-03	9.46E-03
TBody	15	1.54E-03	1.03E-02
Thyroid	15	2.10E-03	1.40E-02
Kidney	15	1.41E-03	9.43E-03
Lung	15	1.41E-03	9.41E-03
GI LLI	15	1.43E-03	9.54E-03

TABLE 2

CLINTON POWER STATION
GASEOUS EFFLUENTS - Nuclides Released

YEAR: 2002

Mixed Mode Release	X
Elevated Release	
Ground-Level Release	

Continuous Mode	X
Batch Mode	

	Units	Quarter 1[2]	Quarter 2[2]	Quarter 3[2]	Quarter 4[2]
A. Fission Gases [1]					
Xe^{135}	Ci	0.00E+00	1.31E+00	0.00E+00	0.00E+00
Total for Period	Ci	**0.00E+00**	**1.31E+00**	**0.00E+00**	**0.00E+00**
B. Iodines [1]					
I^{131}	Ci	5.32E-05	3.87E-05	4.90E-05	3.78E-05
I^{133}	Ci	1.57E-04	7.85E-05	8.59E-05	5.44E-05
Total for Period	Ci	**2.10E-04**	**1.17E-04**	**1.35E-04**	**9.22E-05**
C. Particulates [1]					
Co^{58}	Ci	0.00E+00	1.55E-06	0.00E+00	8.03E-06
Fe^{59}	Ci	0.00E+00	3.40E-06	0.00E+00	8.61E-06
Co^{60}	Ci	8.98E-07	2.29E-05	1.20E-05	3.73E-05
Cr^{51}	Ci	1.85E-05	0.00E+00	0.00E+00	3.57E-05
Mn^{54}	Ci	0.00E+00	4.14E-05	4.54E-05	2.24E-05
Sr^{90}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr^{89}	Ci	0.00E+00	7.12E-06	0.00E+00	5.02E-06
Gross Alpha	Ci	5.71E-07	5.64E-07	7.23E-07	7.93E-07
Mo^{99}	Ci	4.03E-05	4.78E-06	1.12E-05	6.48E-06
Na^{24}	Ci	4.69E-04	3.33E-05	1.09E-04	8.05E-05
Zn^{65}	Ci	3.57E-06	2.31E-05	1.03E-06	1.59E-05
Tc^{99m}	Ci	3.72E-04	4.75E-05	1.01E-04	6.37E-05
Total for Period	Ci	**9.04E-04**	**1.85E-04**	**2.80E-04**	**2.84E-04**
D. Tritium [1]					
Total for Period	Ci	**1.14E+01**	**8.63E+00**	**1.15E+01**	**1.46E+01**

[1] Ten (10) times the values found in 10CFR20 Appendix B, Table 2, Column 1 are used for all Effluent Concentration Limit [ECL] calculations. For dissolved and entrained noble gases, the concentration is limited to 2.00E-04 µCi/cc total activity.

[2] The lower the value of the actual sample activity - with respect to background activity – the greater the counting error. Proportionally, large errors are reported for the various components of CPS gaseous effluents because of their consistent low sample activity.

An entry of 0.00E+00 does not represent the absence of a radionuclide but rather indicates that the Minimum Detectable Activity (MDA) concentration of the nuclide was below the LLD value listed in Table 6.

TABLE 3

RADIOACTIVE GASEOUS WASTE LLD VALUES

TYPE OF ACTIVITY ANALYSIS	Lower Limit of Detection (LLD) [a] (μCi/cc)
Principal Gamma Emitters, [Noble Gases] [b,c]	≤1.00E-04
H^{3} [c]	≤1.00E-06
I^{131} [d]	≤1.00E-12
I^{133} [d]	≤1.00E-10
Principal Gamma Emitters, [Particulates] [b,e]	≤1.00E-11
Sr^{89}, Sr^{90} [g]	≤1.00E-11
Gross Alpha [g]	≤1.00E-11

Table 3 Notations

[a] The Lower Limit of Detection (LLD) as defined for purposes of these specifications, as an "a priori" determination of the smallest concentration of radioactive material in a sample that will yield a net count - above system background - that will be detected with a 95% probability and with only a 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system, which may include radiochemical separation:

$$LLD = \frac{4.66 \cdot s_b}{E \cdot V \cdot 2.22 \times 10^6 \cdot Y \cdot e^{-\lambda \Delta t}}$$

Where:

LLD is the "a priori" lower limit of detection as defined above, as µCi per unit mass or volume,

s_b is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate, in counts per minute (cpm),

E is the counting efficiency, in counts per disintegration,

V is the sample size in units of mass or volume,

2.22E+06 is the number of disintegrations per minute (dpm) per microcurie,

Y is the fractional radiochemical yield, when applicable,

λ is the radioactive decay constant for the particular radionuclide (sec^{-1}) and

Δt for plant effluents is the elapsed time between the midpoint of sample collection and the time of counting (sec).

Typical values of E, V, Y, and Δt should be used in the calculation.

It should be recognized that the LLD is defined as an ***a priori*** (before the fact) limit representing the capability of a measurement system and not as an ***a posteriori*** (after the fact) limit for a particular measurement.

[b]The principal gamma emitters for which the LLD specification applies include the following radionuclides: Kr^{87}, Kr^{88}, Xe^{133}, Xe^{133m}, Xe^{135}, and Xe^{138} in noble gas releases and Mn^{54}, Fe^{59}, Co^{58}, Co^{60}, Zn^{65}, Mo^{99}, I^{131}, Cs^{134}, Cs^{137}, Ce^{141}, and Ce^{144} in iodine and particulate releases. This list does not mean that only these nuclides are to be considered. Other gamma peaks that are identifiable - together with those of the above nuclides - shall also be analyzed and reported in the Radioactive Effluent Release Report.

[c]Weekly grab sample and analysis

[d]Continuous charcoal sample analyzed weekly

[e]Continuous particulate sample analyzed weekly

[f]Composite particulate sample analyzed monthly

[g]Composite particulate sample analyzed quarterly

TABLE 4

WATERBORNE EFFLUENTS - Summation Of All Releases
Data Period: 01 January 2002 through 31 December 2002

There were zero (Ø) liquid radwaste releases from CPS in 2002.

	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Est. Total Error, %
A. Fission & Activation Products						
1. Total Release	Ci	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	N/A
2. Average diluted concentration during period	µCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
3. Percent of ODCM Limit	%	N/A	N/A	N/A	N/A	
B. Tritium						
1. Total Release	Ci	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	N/A
2. Average diluted concentration during period	µCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
3. Percent of ODCM Limit	%	N/A	N/A	N/A	N/A	
C. Dissolved and Entrained Gases						
1. Total Release	Ci	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	N/A
2. Average diluted concentration during period	µCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
3. Percent of ODCM Limit	%	N/A	N/A	N/A	N/A	
D. Gross Alpha Radioactivity						
Gross alpha radioactivity	Ci	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	N/A
E. Volume of Waste Released (prior to Dilution)	Liters	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
F. Volume of dilution water used during period	Liters	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A

TABLE 5

WATERBORNE EFFLUENTS - Nuclides Released [1]
Data Period: 01 January 2002 – 31 December 2002
All Modes

There were zero (Ø) liquid radwaste releases from CPS in 2002.

Continuous Mode		Batch Mode	X

Nuclide	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
A. Tritium					
H^{3}	Ci	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
B. Fission and Activation Products					
Sr^{89}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr^{90}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs^{134}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs^{137}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I^{131}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co^{58}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co^{60}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe^{59}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn^{65}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn^{54}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cr^{51}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr/Ni^{95}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mo^{99}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tc-99m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba/La^{140}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce^{141}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce^{144}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
C. Dissolved and Entrained Noble Gases					
Xe^{133}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe^{135}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**

[1] A value corresponding to ten times the values found in 10CFR20 Appendix B, Table 2, Column 2 are used for all Effluent Concentration Limit (ECL) calculations. For dissolved and entrained noble gases, the concentration is limited to 2.00E-04 µCi/ml total activity.

TABLE 6

RADIOACTIVE LIQUID WASTE LLD VALUES

TYPE OF ACTIVITY ANALYSIS	Lower Limit of Detection (LLD) [a] (μCi/ml)
Principal Gamma Emitters [b]	≤5.00E-07
I^{131}	≤1.00E-06
Dissolved and Entrained Gases (Gamma Emitters) [c]	≤1.00E-05
H^{3}	≤1.00E-05
Gross Alpha	≤1.00E-07
Sr^{89}, Sr^{90}	≤5.00E-08
Fe^{55}	≤1.00E-06

Table 6 Notations

[a] The Lower Limit of Detection (LLD) as defined for purposes of these specifications, as an "a priori" determination of the smallest concentration of radioactive material in a sample that will yield a net count - above system background - that will be detected with a 95% probability and with only a 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system, which may include radiochemical separation:

$$LLD = \frac{4.66 \cdot s_b}{E \cdot V \cdot 2.22 \times 10^6 \cdot Y \cdot e^{-\lambda \Delta t}}$$

Where:

LLD is the "a priori" lower limit of detection as defined above, as μCi per unit mass or volume,

s_b is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate, in counts per minute (cpm),

Table 6 Notations (continued)

E is the counting efficiency, as counts per disintegration,

V is the sample size in units of mass or volume,

2.22E+06 is the number of disintegrations per minute (dpm) per microcurie,

Y is the fractional radiochemical yield, when applicable,

λ is the radioactive decay constant for the particular radionuclide (sec^{-1}) and

Δ_t for plant effluents is the elapsed time between the midpoint of sample collection and the time of counting (sec).

Typical values of E, V, Y, and λt should be used in the calculation.

It should be recognized that the LLD is defined as an ***a priori*** (before the fact) limit representing the capability of a measurement system and not as an ***a posteriori*** (after the fact, MDA) limit for a particular measurement.

[b]The principal gamma emitters for which the LLD requirement applies include the following radionuclides: Mn^{54}, Fe^{59}, Co^{58}, Co^{60}, Zn^{65}, Mo^{99}, Cs^{134}, Cs^{137}, Ce^{141}, and Ce^{144} shall also be measured, but with an LLD of 5.0E-06. This list does not mean that only these nuclides are detected and reported. Other gamma peaks that are measurable - together with those of the above nuclides - shall also be analyzed and reported in the Radioactive Effluent Release Report.

[c]Dissolved and entrained gases are: Xe^{133}, Xe^{135}, Xe^{138}, Kr^{85m}, Kr^{87} and Kr^{88}.

BATCH RELEASES

There were zero (Ø) liquid radwaste releases from CPS in 2002.

A. Batch Liquid Releases: 2002

1.	Number of batch releases:	Ø
2.	Total time period for batch releases:	N/A
3.	Maximum time period for batch release:	N/A
4.	Average time period for batch release	N/A
5.	Minimum time period for batch release:	N/A
6.	Average stream flow during periods of release:	N/A
7.	Total waste volume:	N/A
8.	Total dilution volume:	N/A

B. Batch Gaseous Releases: 2002

1.	Number of batch releases:	Ø
2.	Total time period for batch releases:	N/A
3.	Maximum time period for batch release:	N/A
4.	Average time period for batch release	N/A
5.	Minimum time period for batch release:	N/A

ABNORMAL RELEASES

Information concerning abnormal radioactive liquid and gaseous releases is presented below for the year 2002. There were no abnormal or unplanned liquid or gaseous releases from CPS in 2002.

Liquid Releases:

Number of Abnormal Liquid Releases: Ø

Activity Released [Ci]

Nuclides	Activity [Ci]
N/A	Ø
N/A	Ø
N/A	Ø
N/A	Ø
N/A	Ø
N/A	Ø
Total	Ø

Gaseous Releases:

Number of Abnormal Gaseous Releases: Ø

Activity Released [Ci]

Nuclides	Activity [Ci]
N/A	Ø
N/A	Ø
N/A	Ø
N/A	Ø
N/A	Ø
N/A	Ø
Total	Ø

SOLID WASTE DISPOSAL INFORMATION

SECTION 5

SOLID WASTE DISPOSAL INFORMATION

During this reporting period – 01 January 2002 through 31 December 2002 - there were twenty-four (24) radioactive waste shipments and zero (Ø) irradiated fuel shipments from CPS. In addition, the CPS ODCM requires reporting of the following information for solid waste shipped offsite during the above reporting period:

1. Container volume: Class A Waste: **32,073** ft^3 Class B Waste: **Ø** ft^3

2. Total curie quantity: Class A Waste was 222.58 curies and Class B Waste was Ø curies (determined by dose-to-curie and sample concentration methodology estimates). There were no Class B Waste shipments in 2002.

3. Principal radionuclides: See A.2 for listing of measured radionuclides.

4. Source of waste and processing employed: Resins, filter sludges and evaporator bottoms dewatered or solidified in cement and non-compacted dry active waste. Also, one (1) shipment of mixed waste consisted of mercury waste, roto-brite waste and a turco decon solution).

5. Type of container: Type A and Strong Tight Container.

6. Solidification agent or absorbent: None.

Table 7

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. Solid Waste Shipped Offsite for Burial or Disposal: [***NOT*** irradiated fuel]

A.1. Type of Waste		Units	January – June 2002	July – December 2002	Est. Total Error, %
a.	Spent resins, filter sludges, evaporator bottoms, etc.	ft^3	1,060	1,250	25
		Ci	9.04	212	
b.	Dry compactable Waste, contaminated Equipment, etc.	ft^3	24,500	5,180	25
		Ci	1.37	0.22	
c.	Irradiated components, control rods, etc.	ft^3	(Ø)	(Ø)	0
		Ci	(Ø)	(Ø)	
d.	Other Wastes	ft^3	(Ø)	73.1	25
		Ci	(Ø)	8.35E-07	

A.2. Estimate of major nuclide composition (by type of waste)

1. Spent resins, filters, evaporator bottoms, etc.

Waste Class	Nuclide Name	% Percent Abundance	Curies
A	Mn^{54}	10.901	24.1
	Fe^{55}	71.476	158
	Co^{60}	11.62	25.7
	Ni^{63}	0.358	0.791
	Other	5.645	12.487

Waste Class	Nuclide Name	% Percent Abundance	Curies
B	Mn^{54}	0	0
	Fe^{55}	0	0
	Co^{60}	0	0
	Other	0	0

2. Dry compactable waste, contaminated equipment, etc.

Waste Class	Nuclide Name	% Percent Abundance	Curies
A	Mn^{54}	6.201	0.0981
	Fe^{55}	82.768	1.31
	Co^{60}	10.627	0.168
	Other	0.048	7.42E-04

Table 7

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS [continued]

3. Other Wastes

Waste Class	Nuclide Name	% Percent Abundance	Curies
A	Ni^{63}	3.530	2.95E-08
	Fe^{55}	32.67	2.73E-07
	Co^{60}	62.642	5.23E-07
	Other	1.157	9.66E-09

A.3. Solid Waste Disposition

January - June 2002

Number of Shipments	Mode of Transportation	Destination
9	Hittman Transport	Duratek Oak Ridge, Tennessee
3	Hittman Transport	Envirocare of Utah, Inc.
3	Hittman Transport	Barnwell Waste Management Facility
1	Hittman Transport	Duratek Kingston, Tennessee

July - December 2002

Number of Shipments	Mode of Transportation	Destination
2	Hittman Transport	Envirocare of Utah, Inc.
2	Hittman Transport	Duratek Kingston, Tennessee
2	Hittman Transport	Duratek Oak Ridge, Tennessee
1	Hittman Transport	Barnwell Waste Management Facility
1	Hittman Transport	Perma-Fix of Florida, Inc.

B. Irradiated Fuel Shipments (Disposition)

Number of Shipments	Mode of Transportation	Destination
Zero (Ø)	N/A	N/A

DOSE MEASUREMENTS AND ASSESSMENTS

SECTION 6

DOSE MEASUREMENTS AND ASSESSMENTS

This section of the Annual Effluent Release Report provides the dose received by receptors around CPS from gaseous and liquid effluents. The dose to the receptor that would have received the highest dose in each sector (defined as the Critical Receptor for that sector) is listed within this report. This section also provides the dose to individuals who were inside the Site Boundary. This section also summarizes CPS's compliance with the requirements found within 49CFR190.

The assumptions used in determining dose values are as follows:

- All receptors within a five (5) mile radius are included in the Annual Land Use Census. This Annual Census determines what dose pathways are present as well as the distance of each receptor from the site.

- The annual average meteorological data for 2001 was used in conjunction with the Annual Land Use Census to determine the dose to each receptor within five (5) miles.

- The doses for each receptor from each sector were determined using methodologies given in the ODCM.

- The activity used in these assessments is the total activity released by CPS for the year 2002 including radionuclides with half-lives less than eight (8) days and when dose pathway factors were available.

- The occupancy factor was taken into consideration by calculating the dose to individuals using areas inside the Site Boundary in non-residential areas. The occupancy factor is determined by dividing the number of hour[s] of occupancy per year (taken from the ODCM) and dividing that value by the total number of hour[s] per year.

- Dose to individuals using areas inside the Site Boundary (that are not residences) was calculated using the Ground Plane and Inhalation pathways.

TABLE 8

MAXIMUM OFFSITE DOSES AND DOSE COMMITMENTS TO MEMBERS OF THE PUBLIC IN EACH SECTOR
Data Period: 01 January 2002 – 31 December 2002

This table illustrates the dose that a member from the public would most likely be exposed to from radioactive effluents in each sector from CPS. These values represent the maximum dose likely to expose a member of the public in each sector.

RECEPTOR INFORMATION					AIRBORNE EFFLUENT DOSE				WATERBORNE EFFLUENT DOSE (mRem) [1]	
					Iodine and Particulates (mRem)		Noble Gases (mRad)			
Sector	Distance (miles)	Pathways	Organ	Age	Organ	Total Body	Gamma	Beta	Organ	Total Body
N	0.9	GP, I, M, V	Th	T	2.32E-03	1.98E-03	1.92E-05	2.46E-05	0.00E+00	0.00E+00
NNE	1.0	GP, I	Th	A	7.36E-04	7.12E-04	2.10E-05	2.69E-05		
NE	2.1	GP, I, V	Th	T	6.97E-04	6.17E-04	6.56E-06	8.40E-06		
ENE	1.8	GP, I, V	Th	A	6.65E-04	4.58E-04	6.21E-06	7.96E-06		
E	1.0	GP, I, M, V	Th	A	1.42E-03	8.88E-04	1.06E-05	1.36E-05		
ESE	3.3	GP, I, V	Th	T	2.37E-04	2.08E-04	2.14E-06	2.74E-06		
SE	4.4	GP, I, M, V	Th	C	2.10E-04	1.84E-04	1.42E-06	1.83E-06		
SSE	2.7	GP, I, V	Th	A	2.52E-04	1.71E-04	2.31E-06	2.96E-06		
S	4.1	GP, I, V	Th	A	1.44E-04	1.03E-04	1.43E-06	1.83E-06		
SSW	3.4	GP, I, M	Th	A	1.00E-04	9.10E-05	2.58E-06	3.31E-06		
SW	0.7	GP, I	Th	A	8.76E-04	8.45E-04	2.79E-05	3.57E-05		
WSW	2.3	GP, I, V	Th	C	6.14E-04	5.59E-04	4.72E-06	6.05E-06		
W	2.0	GP, I, V	Th	T	3.49E-04	3.14E-04	3.56E-06	4.56E-06		
WNW	1.6	GP, I, V	Th	A	3.18E-04	2.39E-04	3.37E-06	4.32E-06		
NW	3.7	GP, I, V	Th	A	1.52E-04	1.23E-04	1.78E-06	2.28E-06		
NNW	1.3	GP, I, M,V	Th	T	1.06E-03	9.25E-04	9.52E-06	1.22E-05		

Key for Table 8

GP = Ground Plane	V = Vegetables	A = Adult
I = Inhalation	Th = Thyroid	T = Teen
M = Cows Meat	GI = Gastrointestinal Tract & Lower Large Intestine	C = Child

All doses were within all regulatory limits, including limits from 40CFR190.

[1] There were zero (Ø) liquid radwaste releases from CPS in 2002.

COMPLIANCE WITH 40CFR190 REQUIREMENTS

Thermoluminescent dosimeters [TLD] are stationed around CPS to measure the ambient gamma radiation field. Monitoring stations are placed near the site boundary and approximately five (5) miles from the reactor, in locations representing the sixteen (16) compass sectors. Other locations are chosen to measure the radiation field at places of special interest such as nearby residences, meeting places and population centers. Control sites are located further than ten (10) miles from the site, in areas that should not be affected by plant operations. The results from the TLDs are reported in the Annual Radiological Environmental Monitoring Report [REMP]. The results from this effort indicated no excess dose to offsite areas.

Additionally, NUREG-0543, METHODS FOR DEMONSTRATING LWR COMPLIANCE WITH THE EPA URANIUM FUEL CYCLE STANDARD (40 CFR PART 190) states in section IV, "As long as a nuclear plant site operates at a level below the Appendix I reporting requirements, no extra analysis is required to demonstrate compliance with 40 CFR Part 190." The organ and whole body doses reported in Table 8 are determined using 10 CFR 50 Appendix I methodology. The doses reported are well below the limits of Appendix I.

DOSE TO MEMBERS OF THE PUBLIC WITHIN THE SITE BOUNDARY

CPS Offsite Dose Calculation Manual section 7.2 requires that the Radioactive Effluent Release Report include an assessment of the radiation doses from radioactive liquids and gaseous effluents to MEMBERS OF THE PUBLIC due to their activities inside the SITE BOUNDARY. Within the CPS site boundary there are seven areas that are open to members of the public as identified by CPS ODCM Table 3.4-4 (see Figure 4):

- The Department of Natural Resources Recreation Area at 1.287 kilometers (0.8 miles) in the ESE sector
- A road at 0.495 kilometers (0.3 miles) in the SE sector
- A residence at 2.900 kilometers (1.8 miles) in the SSE sector
- A residence at 1.170 kilometers (0.7 miles) in the SW sector
- Agricultural acreage at 1.372 kilometers (0.9 miles) in the SSW sector
- A residence at 2.520 kilometers (1.6 miles) in the WSW sector
- A portion of Clinton Lake at 0.335 kilometers (0.2 miles) in the NW sector

At all of the above locations, the plume, inhalation and ground-plane exposure pathways are used for dose calculations. The 2002 Annual Land Use Census identified no other exposure pathways. All dose calculations were performed using the methodology contained in the CPS ODCM.

FIGURE 4

AREAS WITHIN THE CPS SITE BOUNDARY OPEN TO MEMBERS OF THE PUBLIC

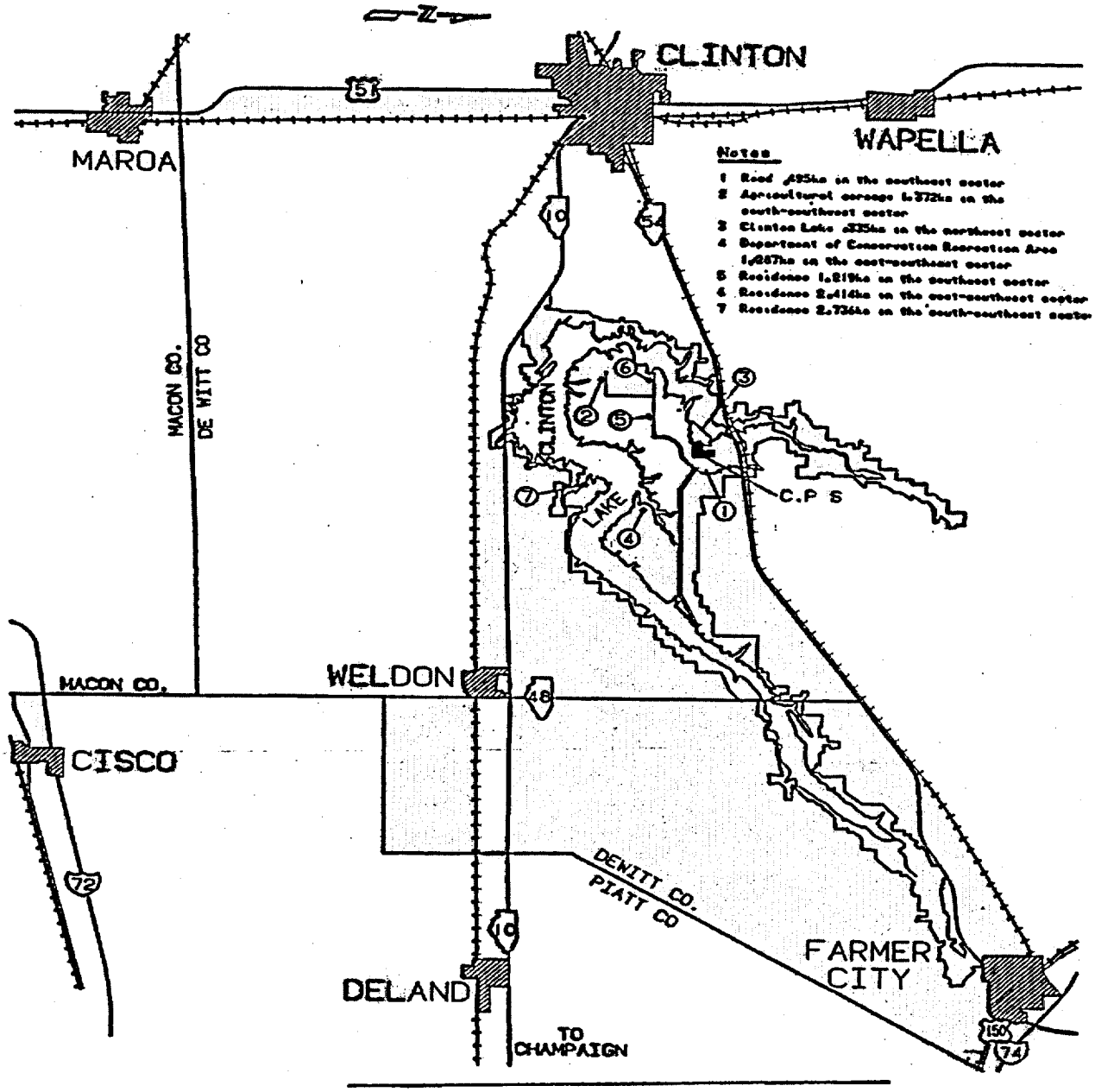


TABLE 9

CALCULATED DOSES TO MEMBERS OF THE PUBLIC DURING USE OF THE DEPARTMENT OF NATURAL RESOURCES RECREATION AREA IN THE EAST-SOUTHEAST SECTOR WITHIN THE CPS SITE BOUNDARY
Data Period: 01 January 2002 – 31 December 2002

DESCRIPTION	DOSE	UNITS
Total Body Dose Rate (Noble Gases)	5.05E-05	mRem/year
Skin Dose Rate (Noble Gases)	1.11E-04	mRem/year
Gamma Air Dose	1.21E-05	mRad
Beta Air Dose	1.55E-05	mRad
Total Body Dose (Particulates)	4.73E-04	mRem
Skin Dose (Particulates) [1]	2.23E-04	mRem

[1] DOSE includes the dose values resulting from the release of iodines, particulates (with half lives >8 days) and tritium in gaseous effluents.

Highest Organ Dose by Age Group:

Teen Thyroid	4.90E-04	mRem
Adult Thyroid	4.84E-04	mRem
Child Thyroid	4.61E-04	mRem
Infant Thyroid	3.53E-04	mRem

TABLE 10

CALCULATED DOSES TO MEMBERS OF THE PUBLIC DURING USE OF THE ROAD IN THE SOUTHEAST SECTOR WITHIN THE CPS SITE BOUNDARY
Data Period: 01 January 2002 – 31 December 2002

DESCRIPTION	DOSE	UNITS
Total Body Dose Rate (Noble Gases)	1.68E-04	mRem/year
Skin Dose Rate (Noble Gases)	3.69E-04	mRem/year
Gamma Air Dose	4.19E-05	mRad
Beta Air Dose	5.36E-05	mRad
Total Body Dose (Particulates)	1.53E-03	mRem
Skin Dose (Particulates) [1]	6.49E-04	mRem

[1] DOSE includes the dose values resulting from the release of iodines, particulates (with half lives >8 days) and tritium in gaseous effluents.

Highest Organ Dose by Age Group:

Teen Thyroid	1.59E-03	mRem
Adult Thyroid	1.57E-03	mRem
Child Thyroid	1.49E-03	mRem
Infant Thyroid	1.11E-03	mRem

TABLE 11

CALCULATED DOSES FOR THE RESIDENTS IN THE SOUTH-SOUTHEAST SECTOR WITHIN THE CPS SITE BOUNDARY
Data Period: 01 January 2002 – 31 December 2002

DESCRIPTION	DOSE	UNITS
Total Body Dose Rate (Noble Gases)	1.63E-05	mRem/year
Skin Dose Rate (Noble Gases)	3.57E-05	mRem/year
Gamma Air Dose	3.85E-06	mRad
Beta Air Dose	4.94E-06	mRad
Total Body Dose (Particulates)	1.32E-04	mRem
Skin Dose (Particulates) [1]	5.05E-05	mRem

[1] DOSE includes the dose values resulting from the release of iodines, particulates (with half lives >8 days) and tritium in gaseous effluents.

Highest Organ Dose by Age Group:

Adult Thyroid	1.37E-04	mRem
Teen Thyroid	N/A [2]	mRem
Child Thyroid	N/A [2]	mRem
Infant Thyroid	N/A [2]	mRem

[2] No receptors of this age at this location

TABLE 12

CALCULATED DOSES FOR THE RESIDENTS IN THE SOUTHWEST SECTOR WITHIN THE CPS SITE BOUNDARY
Data Period: 01 January 2002 – 31 December 2002

DESCRIPTION	DOSE	UNITS
Total Body Dose Rate (Noble Gases)	1.10E-04	mRem/year
Skin Dose Rate (Noble Gases)	2.41E-04	mRem/year
Gamma Air Dose	2.61E-05	mRad
Beta Air Dose	3.35E-05	mRad
Total Body Dose (Particulates)	7.94E-04	mRem
Skin Dose (Particulates) [1]	2.21E-04	mRem

[1] DOSE includes the dose values resulting from the release of iodines, particulates (with half lives >8 days) and tritium in gaseous effluents.

Highest Organ Dose by Age Group:

Adult Thyroid	8.23E-04	mRem
Teen Thyroid	N/A [2]	mRem
Child Thyroid	N/A [2]	mRem
Infant Thyroid	N/A [2]	mRem

[2] No receptors of this age at this location

TABLE 13

CALCULATED DOSES TO MEMBERS OF THE PUBLIC DURING USE OF THE AGRICULTURAL ACREAGE IN THE SOUTH-SOUTHWEST SECTOR WITHIN THE CPS SITE BOUNDARY

Data Period: 01 January 2002 – 31 December 2002

DESCRIPTION	DOSE	UNITS
Total Body Dose Rate (Noble Gases)	5.99E-05	mRem/year
Skin Dose Rate (Noble Gases)	1.32E-04	mRem/year
Gamma Air Dose	1.43E-05	mRad
Beta Air Dose	1.83E-05	mRad
Total Body Dose (Particulates)	4.53E-04	mRem
Skin Dose (Particulates) [1]	1.41E-04	mRem

[1] DOSE includes the dose values resulting from the release of iodines, particulates (with half lives >8 days) and tritium in gaseous effluents.

Highest Organ Dose by Age Group:

Adult Thyroid	4.66E-04	mRem
Teen Thyroid	4.73E-04	mRem
Child Thyroid	N/A [2]	mRem
Infant Thyroid	N/A [2]	mRem

[2] Dose calculated only for the age groups likely to be in the field

TABLE 14

CALCULATED DOSES FOR THE RESIDENTS IN THE WEST-SOUTHWEST SECTOR WITHIN THE CPS SITE BOUNDARY
Data Period: 01 January 2002 – 31 December 2002

DESCRIPTION	DOSE	UNITS
Total Body Dose Rate (Noble Gases)	3.47E-05	mRem/year
Skin Dose Rate (Noble Gases)	7.61E-05	mRem/year
Gamma Air Dose	8.01E-06	mRad
Beta Air Dose	1.03E-05	mRad
Total Body Dose (Particulates)	2.40E-04	mRem
Skin Dose (Particulates) [1]	6.42E-05	mRem

[1] DOSE includes the dose values resulting from the release of iodines, particulates (with half lives >8 days) and tritium in gaseous effluents.

Highest Organ Dose by Age Group:

Adult Thyroid	2.49E-04	mRem
Teen Thyroid	N/A [2]	mRem
Child Thyroid	N/A [2]	mRem
Infant Thyroid	N/A [2]	mRem

[2] No receptors of this age at this location

TABLE 15

CALCULATED DOSES TO MEMBERS OF THE PUBLIC DURING USE OF CLINTON LAKE IN THE NORTHWEST SECTOR WITHIN THE CPS SITE BOUNDARY
Data Period: 01 January 2002 – 31 December 2002

DESCRIPTION	DOSE	UNITS
Total Body Dose Rate (Noble Gases)	3.25E-04	mRem/year
Skin Dose Rate (Noble Gases)	7.13E-04	mRem/year
Gamma Air Dose	8.24E-05	mRad
Beta Air Dose	1.06E-04	mRad
Total Body Dose (Particulates)	2.31E-03	mRem
Skin Dose (Particulates) [1]	4.55E-04	mRem

[1] DOSE includes the dose values resulting from the release of iodines, particulates (with half lives >8 days) and tritium in gaseous effluents.

Highest Organ Dose by Age Group:

Teen Thyroid	2.43E-03	mRem
Adult Thyroid	2.39E-03	mRem
Child Thyroid	2.23E-03	mRem
Infant Thyroid	1.50E-03	mRem

METEROLOGICAL DATA AND DISPERSION ESTIMATES

SECTION 7

METEOROLOGICAL DATA AND DISPERSION ESTIMATES

On 13 April 1972, the meteorological monitoring program commenced at the Clinton Power Station site. The meteorological system consists of a tower 199 feet high with two (2) levels of instrumentation at the 10-meter and 60-meter elevations. A combined cup and vane sensor measures wind direction and wind speed[s] at the 10-meter and 60-meter levels. An aspirated dual temperature sensor senses the temperatures at these levels. One-half of the dual sensors at each elevation are used for ambient temperature while the other half is used to provide a differential temperature between the 10-meter and 60-meter levels. Dew point is measured at the 10-meter level with an aspirated dew-point sensor.

Meteorological monitoring instruments have been placed on the Clinton Power Station microwave tower at the 10-meter level to serve as a redundant backup to the existing [primary] meteorological tower.

Clinton Power Station meteorological data is transmitted to the Main Control Room [MCR] via a dedicated telephone line. Once the signals are received at the MCR, they are then converted to a 4 to 20 milliamp signal and fed individually to a microprocessor and chart recorders. The microprocessor is part of the Clinton Power Station Radiation Monitoring System [RMS]. Meteorological data is available via the microprocessors in the Main Control Room and the Technical Support Center [TSC].

Dispersion modeling for effluents for normal operation of Clinton Power Station is a straight-line, sector-averaged Gaussian plume model designed to estimate average relative concentration at various receptor points. The model was developed in accordance with routine release analysis procedures specified in Regulatory Guide 1.111. For joint frequency input data, periods of calm are distributed in accordance with a directional distribution. For hourly input data, periods of calm are the previous hour's wind direction. Periods of calm are assigned a wind speed value of half the specified instrument threshold value. Reference Table 18 for more detailed information on meteorology and dispersion data.

TABLE 16

METEOROLOGICAL DATA AVAILABILITY

Data Period: 01 January 2002 – 31 December 2002

PARAMETER	PERCENT OF VALID PARAMETER HOURS			
	Quarter 1	Quarter 2	Quarter 3	Quarter 4
1. Wind Speed				
a. 10-Meter sensor	98.5%	88.8%	99.0%	90.8%
b. 60 Meter sensor	98.5%	88.9%	92.2%	90.8%
2. Wind Direction				
a. 10-Meter sensor	96.5%	89.4%	99.0%	90.8%
b. 60 Meter sensor	98.5%	89.4%	99.0%	90.8%
3. Temperature				
a. 10-Meter sensor	98.5%	89.1%	99.0%	90.7%
b. 60 Meter sensor	98.5%	89.2%	99.0%	90.7%
c. Temperature Difference (10m-60m)	98.5%	89.9%	99.0%	90.7%
4. Percent of hours for which valid 10-meter Wind Speed, Wind Direction, and Delta Temperature were available	97%	89%	99%	91%
5. Percent of hours for which valid 60-meter Wind Speed, Wind Direction, and Delta Temperature were available	99%	89%	92%	91%

Clinton Power Station was able to achieve 94% Meteorological Recoverable Data during 2002 exceeding the minimum criteria of 90% as delineated within Regulatory Guide 1.23.

TABLE 17

CLASSIFICATION OF ATMOSPHERIC STABILITY

Stability Classification	Pasquill Category	Defining Conditions
Extremely unstable	A	------ $<\Delta T \leq -1.042$
Moderately unstable	B	$-1.042 < \Delta T \leq -0.933$
Slightly unstable	C	$-0.933 < \Delta T \leq -0.823$
Neutral	D	$-0.823 < \Delta T \leq -0.274$
Slightly stable	E	$-0.274 < \Delta T \leq 0.823$
Moderately stable	F	$0.823 < \Delta T \leq 2.195$
Extremely stable	G	$2.195 < \Delta T \leq$ ------

ΔT = temperature difference in degrees Fahrenheit per 100 feet

TABLE 18

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Reporting Period: 01 January 2002 through 31 December 2002

The following table contains the joint wind frequency tables for CPS. The tables are segregated by sensor elevation and calendar quarter. All tabled values are in hours.

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: A **10 Meter Height** **Quarter: 1**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	1	2	4	0	0	7
NNE	0	0	1	2	0	0	3
NE	0	1	2	6	1	0	10
ENE	0	2	3	0	0	0	5
E	0	0	2	0	0	0	2
ESE	0	1	0	0	0	0	1
SE	0	6	3	2	1	0	12
SSE	1	8	2	9	2	0	22
S	1	3	9	18	0	0	31
SSW	0	1	10	25	0	0	36
SW	0	1	7	13	0	0	21
WSW	1	2	1	4	1	0	9
W	0	0	7	20	9	2	38
WNW	0	3	6	14	7	0	30
NW	0	1	6	2	5	0	14
NNW	0	1	6	5	5	0	17
TOTAL	3	31	67	124	31	2	258

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 77
VARIABLE DIRECTION : 0

Stability Class: A **10 Meter Height** **Quarter: 2**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	0	5	0	0	0	5
NNE	0	0	1	4	0	0	5
NE	0	6	6	0	0	0	12
ENE	2	4	1	0	0	0	7
E	0	6	2	0	0	0	8
ESE	1	7	8	0	0	0	16
SE	2	21	11	3	0	0	37
SSE	1	7	8	9	0	0	25
S	1	16	9	16	5	0	47
SSW	0	5	12	9	1	0	27
SW	0	7	17	9	0	0	33
WSW	0	0	6	3	0	0	9
W	0	1	2	6	5	0	14
WNW	0	2	11	8	2	0	23
NW	0	1	12	11	0	0	24
NNW	0	3	15	0	0	0	18
TOTAL	7	86	126	78	13	0	310

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 246
VARIABLE DIRECTION : 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: A **10 Meter Height** **Quarter: 3**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	3	8	0	0	0	11
NNE	1	5	18	1	0	0	25
NE	1	16	39	0	0	0	56
ENE	3	16	4	0	0	0	23
E	3	20	1	0	0	0	24
ESE	8	15	0	0	0	0	23
SE	10	16	0	0	0	0	26
SSE	8	20	1	0	0	0	29
S	2	19	13	3	0	0	37
SSW	1	24	18	6	0	0	49
SW	0	24	18	2	0	0	44
WSW	0	12	17	0	0	0	29
W	0	9	13	0	0	0	22
WNW	1	8	2	1	0	0	12
NW	0	4	3	0	0	0	7
NNW	0	3	1	0	0	0	4
TOTAL	38	214	156	13	0	0	421

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 23
VARIABLE DIRECTION : 0

Stability Class: A **10 Meter Height** **Quarter: 4**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	1	1	2	2	0	0	6
NNE	0	0	5	0	0	0	5
NE	0	2	3	1	0	0	6
ENE	0	3	7	2	0	0	12
E	0	8	4	0	0	0	12
ESE	1	0	0	0	0	0	1
SE	0	2	5	0	0	0	7
SSE	0	6	0	0	0	0	6
S	0	3	5	0	0	0	8
SSW	0	2	2	2	3	0	9
SW	0	4	9	6	0	0	19
WSW	1	1	5	3	1	0	11
W	0	4	1	6	0	0	11
WNW	0	4	3	5	0	0	12
NW	0	1	6	0	1	0	8
NNW	0	6	8	3	0	0	17
TOTAL	3	47	65	30	5	0	150

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 206
VARIABLE DIRECTION : 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: B **10 Meter Height** **Quarter: 1**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	1	2	3	0	0	6
NNE	0	2	1	0	1	0	4
NE	1	7	2	3	0	0	13
ENE	0	3	2	0	0	0	5
E	0	0	2	0	0	0	2
ESE	0	0	0	0	0	0	0
SE	0	2	1	2	0	0	5
SSE	0	0	1	7	1	0	9
S	0	1	6	7	1	0	15
SSW	0	0	1	10	0	0	11
SW	0	0	9	3	0	0	12
WSW	1	2	5	3	0	0	11
W	0	2	6	7	3	4	22
WNW	0	4	7	6	3	0	20
NW	0	0	3	1	0	0	4
NNW	0	0	4	1	1	0	6
TOTAL	2	24	52	53	10	4	145

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 77
VARIABLE DIRECTION : 0

Stability Class: B **10 Meter Height** **Quarter: 2**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	4	4	0	0	0	8
NNE	0	3	1	0	0	0	4
NE	0	0	2	5	0	0	7
ENE	0	0	0	0	0	0	0
E	2	0	2	1	0	0	5
ESE	1	0	0	1	0	0	2
SE	0	2	2	0	0	0	4
SSE	0	10	4	2	0	0	16
S	2	13	6	7	0	0	28
SSW	3	6	3	2	0	0	14
SW	2	16	14	1	0	0	33
WSW	0	4	8	1	0	0	13
W	2	1	6	1	1	0	11
WNW	0	0	7	2	1	0	10
NW	0	5	5	0	0	0	10
NNW	0	2	5	1	0	0	8
TOTAL	12	66	69	24	2	0	173

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 246
VARIABLE DIRECTION : 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: B **10 Meter Height** **Quarter: 3**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	3	4	3	0	0	0	10
NNE	0	7	9	0	0	0	16
NE	2	10	2	0	0	0	14
ENE	5	7	0	0	0	0	12
E	2	5	0	0	0	0	7
ESE	4	3	0	0	0	0	7
SE	3	8	1	0	0	0	12
SSE	1	4	1	0	0	0	6
S	6	5	7	3	0	0	21
SSW	2	3	7	2	0	0	14
SW	3	6	7	0	0	0	16
WSW	0	4	4	1	0	0	9
W	0	5	2	0	0	0	7
WNW	0	6	1	0	0	0	7
NW	1	4	2	0	0	0	7
NNW	0	2	1	0	0	0	3
TOTAL	32	83	47	6	0	0	168

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 23
VARIABLE DIRECTION : 0

Stability Class: B **10 Meter Height** **Quarter: 4**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	1	0	14	1	0	0	16
NNE	0	3	2	2	0	0	7
NE	0	3	2	3	1	0	9
ENE	0	2	5	1	0	0	8
E	1	3	4	1	0	0	9
ESE	1	0	0	0	0	0	1
SE	1	1	1	2	0	0	5
SSE	1	0	1	1	0	0	3
S	1	2	4	0	1	0	8
SSW	0	5	5	0	1	0	11
SW	0	2	11	5	1	0	19
WSW	0	1	6	10	1	0	18
W	0	0	1	5	0	0	6
WNW	1	1	1	1	0	0	4
NW	0	4	1	0	3	0	8
NNW	0	7	7	1	0	0	15
TOTAL	7	34	65	33	8	0	147

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 206
VARIABLE DIRECTION : 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: C **10 Meter Height** **Quarter: 1**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	0	2	4	0	0	6
NNE	1	1	3	0	1	0	6
NE	1	3	7	8	5	0	24
ENE	0	3	3	0	0	0	6
E	0	4	0	0	0	0	4
ESE	0	4	0	0	0	0	4
SE	1	2	1	3	0	0	7
SSE	0	1	0	2	1	0	4
S	0	2	4	6	1	0	13
SSW	1	1	5	5	0	0	12
SW	0	1	8	0	0	0	9
WSW	0	0	5	0	6	0	11
W	0	0	7	6	2	1	16
WNW	1	2	9	9	3	0	24
NW	0	1	2	0	2	0	5
NNW	1	3	5	3	1	0	13
TOTAL	6	28	61	46	22	1	164

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 77
VARIABLE DIRECTION : 0

Stability Class: C **10 Meter Height** **Quarter: 2**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	2	4	0	0	0	6
NNE	0	0	3	1	3	0	7
NE	1	3	4	1	0	0	9
ENE	1	1	1	0	0	0	3
E	2	2	1	0	0	0	5
ESE	0	0	1	0	0	0	1
SE	1	4	1	3	0	0	9
SSE	2	6	8	1	0	0	17
S	1	3	4	2	2	0	12
SSW	1	3	2	1	0	0	7
SW	2	6	2	2	1	0	13
WSW	0	0	3	2	0	0	5
W	0	2	4	2	0	0	8
WNW	2	3	3	5	0	0	13
NW	0	0	6	3	0	0	9
NNW	0	2	5	2	0	0	9
TOTAL	13	37	52	25	6	0	133

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 246
VARIABLE DIRECTION : 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: C **10 Meter Height** **Quarter: 3**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	1	6	4	0	0	0	11
NNE	1	1	2	0	0	0	4
NE	0	8	2	0	0	0	10
ENE	1	1	0	0	0	0	2
E	1	4	1	0	0	0	6
ESE	2	2	0	0	0	0	4
SE	3	2	1	0	0	0	6
SSE	1	4	1	0	0	0	6
S	1	4	7	0	1	0	13
SSW	1	1	2	2	0	0	6
SW	4	4	4	0	0	0	12
WSW	1	5	5	0	0	0	11
W	1	2	1	0	0	0	4
WNW	1	1	0	0	0	0	2
NW	2	4	3	0	0	0	9
NNW	1	1	2	0	0	0	4
TOTAL	22	50	35	2	1	0	110

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 23
VARIABLE DIRECTION : 0

Stability Class: C **10 Meter Height** **Quarter: 4**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	8	7	1	0	0	16
NNE	1	4	4	4	1	0	14
NE	0	1	1	5	0	0	7
ENE	0	1	2	0	0	0	3
E	0	4	1	0	0	0	5
ESE	0	0	0	0	0	0	0
SE	2	1	0	1	0	0	4
SSE	2	2	0	1	0	0	5
S	0	3	5	2	0	0	10
SSW	1	4	4	0	0	0	9
SW	0	6	6	2	0	0	14
WSW	1	4	3	4	3	0	15
W	0	1	0	6	0	0	7
WNW	1	1	4	2	1	0	9
NW	2	5	8	2	1	0	18
NNW	0	5	3	1	0	0	9
TOTAL	10	50	48	31	6	0	145

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 206
VARIABLE DIRECTION : 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: D **10 Meter Height** **Quarter: 1**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	2	10	19	13	0	0	44
NNE	0	6	10	10	2	0	28
NE	1	14	8	19	3	0	45
ENE	1	18	5	1	0	0	25
E	2	14	8	0	0	0	24
ESE	1	6	2	0	0	0	9
SE	0	18	15	3	0	0	36
SSE	0	6	30	16	1	0	53
S	1	8	32	26	7	0	74
SSW	1	8	46	34	2	0	91
SW	2	9	23	3	1	0	38
WSW	4	7	7	16	10	0	44
W	0	16	20	44	14	4	98
WNW	0	6	19	35	8	0	68
NW	2	13	21	16	2	0	54
NNW	2	9	37	10	1	0	59
TOTAL	19	168	302	246	51	4	790

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 77
VARIABLE DIRECTION : 0

Stability Class: D **10 Meter Height** **Quarter: 2**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	2	16	16	15	1	0	50
NNE	0	12	8	5	2	0	27
NE	3	12	28	7	1	0	51
ENE	2	12	11	1	0	0	26
E	6	18	1	0	0	0	25
ESE	3	6	5	0	0	0	14
SE	0	13	12	1	0	0	26
SSE	3	20	27	3	0	0	53
S	1	13	30	18	9	0	71
SSW	2	9	23	20	0	0	54
SW	1	13	16	10	0	0	40
WSW	0	4	12	4	0	0	20
W	0	5	9	5	1	0	20
WNW	2	6	11	6	0	0	25
NW	0	5	22	11	4	0	42
NNW	0	11	14	5	1	0	31
TOTAL	25	175	245	111	19	0	575

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 246
VARIABLE DIRECTION : 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: D **10 Meter Height** **Quarter: 3**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	2	19	19	4	0	0	44
NNE	5	28	17	1	0	0	51
NE	2	36	13	0	0	0	51
ENE	4	21	3	0	0	0	28
E	6	9	6	0	0	0	21
ESE	3	5	1	0	0	0	9
SE	3	17	2	0	0	0	22
SSE	3	14	11	0	0	0	28
S	1	4	27	4	0	0	36
SSW	5	13	45	7	0	0	70
SW	5	17	15	1	0	0	38
WSW	3	11	3	3	0	0	20
W	3	9	1	0	0	0	13
WNW	4	8	5	0	0	0	17
NW	6	8	1	0	0	0	15
NNW	1	8	5	2	0	0	16
TOTAL	56	227	174	22	0	0	479

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 23
VARIABLE DIRECTION : 0

Stability Class: D **10 Meter Height** **Quarter: 4**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	2	27	44	4	1	0	78
NNE	2	23	30	20	0	0	75
NE	3	28	21	10	0	0	62
ENE	0	32	28	1	0	0	61
E	1	8	15	0	0	0	24
ESE	0	2	12	0	0	0	14
SE	0	8	13	2	0	0	23
SSE	1	3	25	4	1	0	34
S	1	5	10	3	0	0	19
SSW	1	16	32	25	3	0	77
SW	4	20	19	9	0	0	52
WSW	2	7	13	21	0	0	43
W	1	17	51	25	6	0	100
WNW	1	21	23	10	0	2	57
NW	0	32	44	12	1	3	92
NNW	2	26	28	14	0	0	70
TOTAL	21	275	408	160	12	5	881

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 206
VARIABLE DIRECTION : 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: E **10 Meter Height** **Quarter: 1**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	10	0	0	0	0	10
NNE	2	1	2	0	0	0	5
NE	4	0	0	0	0	0	4
ENE	0	3	0	0	0	0	3
E	2	3	0	0	0	0	5
ESE	4	13	0	0	0	0	17
SE	3	17	16	1	0	0	37
SSE	4	21	30	7	2	0	64
S	3	14	32	27	7	0	83
SSW	3	32	70	16	0	0	121
SW	6	31	28	11	0	0	76
WSW	3	20	20	5	0	0	48
W	1	6	17	3	0	0	27
WNW	3	14	12	0	0	0	29
NW	1	13	5	0	0	0	19
NNW	2	7	2	0	0	0	11
TOTAL	41	205	234	70	9	0	559

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 77
VARIABLE DIRECTION : 0

Stability Class: E **10 Meter Height** **Quarter: 2**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	2	8	4	0	0	0	14
NNE	5	7	2	0	0	0	14
NE	5	12	0	0	0	0	17
ENE	4	14	2	0	0	0	20
E	7	13	1	0	0	0	21
ESE	6	16	2	0	0	0	24
SE	9	27	12	0	0	0	48
SSE	4	64	18	0	0	0	86
S	6	36	34	15	3	0	94
SSW	10	31	24	10	0	0	75
SW	4	17	7	0	0	0	28
WSW	2	8	6	0	0	0	16
W	6	11	12	0	0	0	29
WNW	1	12	9	0	0	0	22
NW	0	6	1	0	0	0	7
NNW	1	5	3	0	0	0	9
TOTAL	72	287	137	25	3	0	524

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 246
VARIABLE DIRECTION : 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: E **10 Meter Height** **Quarter: 3**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	3	10	5	0	0	0	18
NNE	6	27	4	0	0	0	37
NE	11	54	1	0	0	0	66
ENE	7	27	0	0	0	0	34
E	18	4	0	0	0	0	22
ESE	9	18	0	0	0	0	27
SE	5	14	0	0	0	0	19
SSE	4	42	7	0	0	0	53
S	1	46	21	1	0	0	69
SSW	6	38	21	1	0	0	66
SW	6	18	7	0	0	0	31
WSW	3	15	3	1	0	0	22
W	5	5	0	0	0	0	10
WNW	4	1	0	0	0	0	5
NW	3	3	1	0	0	0	7
NNW	3	5	1	0	0	0	9
TOTAL	94	327	71	3	0	0	495

PERIODS OF CALM (HOURS): 0 HOURS OF MISSING DATA: 23
VARIABLE DIRECTION: 0

Stability Class: E **10 Meter Height** **Quarter: 4**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	2	6	12	0	0	0	20
NNE	2	7	13	1	0	0	23
NE	2	11	3	0	0	0	16
ENE	1	2	1	0	0	0	4
E	3	4	0	0	0	0	7
ESE	4	4	0	0	0	0	8
SE	4	8	7	0	0	0	19
SSE	3	12	15	3	2	0	35
S	5	24	18	7	0	0	54
SSW	4	10	30	10	0	0	54
SW	3	9	26	7	1	0	46
WSW	7	23	20	7	0	0	57
W	3	4	17	8	0	0	32
WNW	3	10	2	3	0	0	18
NW	2	21	6	0	0	0	29
NNW	0	14	8	0	0	0	22
TOTAL	48	169	178	46	3	0	444

PERIODS OF CALM (HOURS): 0 HOURS OF MISSING DATA: 206
VARIABLE DIRECTION: 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: F **10 Meter Height** **Quarter: 1**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	5	0	0	0	0	5
NNE	0	1	0	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	1	1	0	0	0	0	2
ESE	1	2	0	0	0	0	3
SE	0	6	2	0	0	0	8
SSE	2	7	2	0	0	0	11
S	5	5	4	0	0	0	14
SSW	3	12	8	0	0	0	23
SW	0	11	0	0	0	0	11
WSW	2	14	8	0	0	0	24
W	3	7	3	0	0	0	13
WNW	3	2	2	0	0	0	7
NW	0	7	1	0	0	0	8
NNW	0	4	0	0	0	0	4
TOTAL	20	84	30	0	0	0	134

PERIODS OF CALM (HOURS): 0 HOURS OF MISSING DATA: 77
VARIABLE DIRECTION: 0

Stability Class: F **10 Meter Height** **Quarter: 2**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	1	1	0	0	0	0	2
NNE	6	4	0	0	0	0	10
NE	5	7	0	0	0	0	12
ENE	7	4	0	0	0	0	11
E	2	2	0	0	0	0	4
ESE	6	3	0	0	0	0	9
SE	9	17	1	0	0	0	27
SSE	6	8	3	0	0	0	17
S	10	12	5	0	0	0	27
SSW	3	17	0	0	0	0	20
SW	6	10	0	0	0	0	16
WSW	5	5	0	0	0	0	10
W	2	5	0	0	0	0	7
WNW	2	2	0	0	0	0	4
NW	1	3	0	0	0	0	4
NNW	1	0	0	0	0	0	1
TOTAL	72	100	9	0	0	0	181

PERIODS OF CALM (HOURS): 0 HOURS OF MISSING DATA: 246
VARIABLE DIRECTION: 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: F **10 Meter Height** **Quarter: 3**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	4	3	0	0	0	0	7
NNE	10	26	1	0	0	0	37
NE	26	38	0	0	0	0	64
ENE	16	8	0	0	0	0	24
E	18	3	0	0	0	0	21
ESE	13	4	0	0	0	0	17
SE	6	9	0	0	0	0	15
SSE	6	4	0	0	0	0	10
S	4	1	0	0	0	0	5
SSW	5	3	1	0	0	0	9
SW	9	6	0	0	0	0	15
WSW	14	4	1	0	0	0	19
W	11	0	0	0	0	0	11
WNW	9	1	0	0	0	0	10
NW	6	3	0	0	0	0	9
NNW	2	1	0	0	0	0	3
TOTAL	159	114	3	0	0	0	276

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 23
VARIABLE DIRECTION : 0

Stability Class: F **10 Meter Height** **Quarter: 4**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	3	8	0	0	0	0	11
NNE	4	4	0	0	0	0	8
NE	5	7	0	0	0	0	12
ENE	10	3	0	0	0	0	13
E	3	1	0	0	0	0	4
ESE	8	0	0	0	0	0	8
SE	4	4	0	0	0	0	8
SSE	3	2	0	0	0	0	5
S	9	11	0	0	0	0	20
SSW	6	5	1	0	0	0	12
SW	1	9	0	0	0	0	10
WSW	4	13	1	0	0	0	18
W	0	1	3	0	0	0	4
WNW	2	3	0	0	0	0	5
NW	1	4	1	0	0	0	6
NNW	3	3	0	0	0	0	6
TOTAL	66	78	6	0	0	0	150

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 206
VARIABLE DIRECTION : 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: G **10 Meter Height** **Quarter: 1**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	1	0	0	0	0	1
NNE	0	5	1	0	0	0	6
NE	0	3	0	0	0	0	3
ENE	0	0	0	0	0	0	0
E	1	0	0	0	0	0	1
ESE	0	0	0	0	0	0	0
SE	0	4	0	0	0	0	4
SSE	0	1	0	0	0	0	1
S	1	1	0	0	0	0	2
SSW	1	3	0	0	0	0	4
SW	0	1	1	0	0	0	2
WSW	1	0	0	0	0	0	1
W	2	0	0	0	0	0	2
WNW	0	0	0	0	0	0	0
NW	0	3	2	0	0	0	5
NNW	1	0	0	0	0	0	1
TOTAL	7	22	4	0	0	0	33

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 77
VARIABLE DIRECTION : 0

Stability Class: G **10 Meter Height** **Quarter: 2**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	2	0	0	0	0	2
NNE	2	0	0	0	0	0	2
NE	3	1	0	0	0	0	4
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	3	0	0	0	0	0	3
SE	3	1	0	0	0	0	4
SSE	6	0	0	0	0	0	6
S	1	0	0	0	0	0	1
SSW	5	2	0	0	0	0	7
SW	4	1	0	0	0	0	5
WSW	5	2	0	0	0	0	7
W	1	0	0	0	0	0	1
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
TOTAL	33	9	0	0	0	0	42

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 246
VARIABLE DIRECTION : 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: G **10 Meter Height** **Quarter: 3**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	10	4	0	0	0	0	14
NNE	37	25	0	0	0	0	62
NE	54	20	0	0	0	0	74
ENE	15	2	0	0	0	0	17
E	13	1	0	0	0	0	14
ESE	7	1	0	0	0	0	8
SE	5	2	0	0	0	0	7
SSE	1	1	0	0	0	0	2
S	2	0	0	0	0	0	2
SSW	2	0	0	0	0	0	2
SW	2	4	0	0	0	0	6
WSW	1	0	0	0	0	0	1
W	3	0	0	0	0	0	3
WNW	12	0	0	0	0	0	12
NW	2	3	0	0	0	0	5
NNW	7	0	0	0	0	0	7
TOTAL	173	63	0	0	0	0	236

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 23
VARIABLE DIRECTION : 0

Stability Class: G **10 Meter Height** **Quarter: 4**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	1	0	0	0	0	0	1
NNE	3	2	0	0	0	0	5
NE	15	11	0	0	0	0	26
ENE	5	2	0	0	0	0	7
E	4	0	0	0	0	0	4
ESE	2	0	0	0	0	0	2
SE	1	4	0	0	0	0	5
SSE	3	1	0	0	0	0	4
S	1	1	0	0	0	0	2
SSW	2	5	0	0	0	0	7
SW	4	9	0	0	0	0	13
WSW	1	4	0	0	0	0	5
W	1	0	0	0	0	0	1
WNW	0	1	0	0	0	0	1
NW	0	2	0	0	0	0	2
NNW	0	0	0	0	0	0	0
TOTAL	43	42	0	0	0	0	85

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 206
VARIABLE DIRECTION : 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: A **60 Meter Height** **Quarter: 1**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	0	3	7	0	0	10
NNE	0	1	1	0	0	0	2
NE	0	1	0	4	5	1	11
ENE	1	0	1	2	1	0	5
E	0	0	1	3	0	0	4
ESE	0	1	0	0	0	0	1
SE	0	5	2	0	0	0	7
SSE	2	5	2	2	6	7	24
S	0	4	6	9	10	0	29
SSW	0	2	3	25	12	0	42
SW	1	0	5	12	5	0	23
WSW	0	2	1	5	0	1	9
W	0	0	4	14	18	7	43
WNW	0	1	4	6	11	3	25
NW	0	0	9	5	2	2	18
NNW	0	1	4	2	4	6	17
TOTAL	4	23	46	96	74	27	270

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 33
VARIABLE DIRECTION : 0

Stability Class: A **60 Meter Height** **Quarter: 2**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	0	2	3	0	0	5
NNE	0	0	0	2	0	0	2
NE	0	1	1	8	0	0	10
ENE	0	6	5	1	0	0	12
E	0	4	4	1	0	0	9
ESE	0	9	7	2	0	0	18
SE	2	9	12	8	0	0	31
SSE	0	7	2	11	2	0	22
S	0	9	8	10	9	7	43
SSW	0	7	11	17	4	1	40
SW	0	5	15	7	3	0	30
WSW	0	1	3	7	0	0	11
W	0	0	2	4	3	3	12
WNW	0	0	3	6	7	1	17
NW	0	0	10	10	5	0	25
NNW	0	1	13	9	0	0	23
TOTAL	2	59	98	106	33	12	310

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 245
VARIABLE DIRECTION : 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: A **60 Meter Height** **Quarter: 3**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	2	7	1	0	0	10
NNE	1	2	8	4	0	0	15
NE	1	7	16	29	2	0	55
ENE	2	8	10	6	0	0	26
E	2	12	5	3	0	0	22
ESE	11	12	0	0	0	0	23
SE	11	15	0	0	0	0	26
SSE	5	13	7	0	0	0	25
S	2	15	12	5	2	0	36
SSW	1	14	20	18	4	0	57
SW	0	10	26	5	0	0	41
WSW	0	8	17	6	0	0	31
W	0	5	10	2	0	0	17
WNW	0	5	3	1	0	0	9
NW	1	1	1	1	0	0	4
NNW	0	1	5	0	0	0	6
TOTAL	37	130	147	81	8	0	403

PERIODS OF CALM (HOURS): 0 HOURS OF MISSING DATA: 172
VARIABLE DIRECTION: 0

Stability Class: A **60 Meter Height** **Quarter: 4**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	3	1	3	0	0	7
NNE	0	0	3	1	0	0	4
NE	0	0	4	2	1	0	7
ENE	0	1	3	5	3	0	12
E	0	1	7	3	1	0	12
ESE	1	0	2	0	0	0	3
SE	0	0	5	0	0	0	5
SSE	0	1	3	0	0	0	4
S	0	3	5	2	0	0	10
SSW	0	3	3	0	1	3	10
SW	0	1	5	10	1	0	17
WSW	0	4	1	6	4	0	15
W	1	2	0	5	0	0	8
WNW	0	4	0	5	0	0	9
NW	0	1	10	1	0	1	13
NNW	0	2	4	6	2	0	14
TOTAL	2	26	56	49	13	4	150

PERIODS OF CALM (HOURS): 0 HOURS OF MISSING DATA: 206
VARIABLE DIRECTION: 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: B **60 Meter Height** **Quarter: 1**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	0	2	4	0	0	6
NNE	0	1	1	0	0	0	2
NE	1	5	6	0	4	0	16
ENE	0	1	1	1	0	0	3
E	1	0	2	1	0	0	4
ESE	0	1	0	0	0	0	1
SE	0	0	1	0	1	0	2
SSE	0	0	0	2	3	2	7
S	0	0	4	5	5	1	15
SSW	0	0	0	6	8	0	14
SW	0	0	5	7	1	0	13
WSW	0	1	5	2	2	1	11
W	1	2	6	4	7	3	23
WNW	0	2	4	5	5	2	18
NW	0	2	1	3	0	0	6
NNW	0	0	4	1	1	1	7
TOTAL	3	15	42	41	37	10	148

PERIODS OF CALM (HOURS): 0 HOURS OF MISSING DATA: 33
VARIABLE DIRECTION: 0

Stability Class: B **60 Meter Height** **Quarter: 2**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	1	4	1	0	0	6
NNE	0	3	2	0	0	0	5
NE	0	0	1	0	4	1	6
ENE	1	0	0	1	0	0	2
E	0	1	1	1	0	1	4
ESE	1	1	0	0	0	1	3
SE	0	1	2	0	0	0	3
SSE	0	5	9	0	2	0	16
S	1	9	7	6	1	2	26
SSW	1	9	1	3	4	0	18
SW	2	12	13	3	0	0	30
WSW	0	2	9	3	1	0	15
W	1	1	3	4	0	1	10
WNW	0	0	3	2	0	1	6
NW	1	1	1	6	0	0	9
NNW	0	4	9	1	0	0	14
TOTAL	8	50	65	31	12	7	173

PERIODS OF CALM (HOURS): 0 HOURS OF MISSING DATA: 245
VARIABLE DIRECTION: 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: B **60 Meter Height** **Quarter: 3**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	1	4	4	1	0	0	10
NNE	0	3	5	2	0	0	10
NE	1	1	8	2	0	0	12
ENE	1	7	3	0	0	0	11
E	2	3	2	0	0	0	7
ESE	1	8	0	0	0	0	9
SE	2	4	0	0	0	0	6
SSE	5	1	3	1	0	0	10
S	3	5	3	6	1	0	18
SSW	4	2	4	8	1	0	19
SW	0	4	5	6	0	0	15
WSW	1	3	0	3	0	0	7
W	0	6	3	0	0	0	9
WNW	0	1	1	1	0	0	3
NW	2	4	0	1	0	0	7
NNW	0	1	2	0	0	0	3
TOTAL	23	57	43	31	2	0	156

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 172
VARIABLE DIRECTION : 0

Stability Class: B **60 Meter Height** **Quarter: 4**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	1	0	8	7	0	0	16
NNE	0	0	4	1	1	0	6
NE	0	1	2	2	2	3	10
ENE	0	0	2	5	1	0	8
E	1	3	0	4	1	0	9
ESE	1	0	0	0	0	0	1
SE	1	0	2	0	0	0	3
SSE	0	0	0	2	2	0	4
S	1	3	3	0	0	1	8
SSW	0	0	6	5	0	1	12
SW	0	2	6	8	3	1	20
WSW	0	1	1	12	4	0	18
W	0	0	0	4	1	0	5
WNW	1	2	0	2	0	0	5
NW	0	1	2	1	0	2	6
NNW	0	3	9	3	0	1	16
TOTAL	6	16	45	56	15	9	147

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 206
VARIABLE DIRECTION : 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: C **60 Meter Height** **Quarter: 1**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	3	1	5	0	0	9
NNE	1	1	3	0	0	0	5
NE	0	4	1	5	8	7	25
ENE	0	1	0	3	1	0	5
E	0	1	4	0	0	0	5
ESE	0	3	1	0	0	0	4
SE	1	2	0	1	2	0	6
SSE	0	1	0	0	2	1	4
S	0	0	3	3	2	1	9
SSW	1	1	2	6	3	1	14
SW	0	1	5	6	0	0	12
WSW	0	0	4	0	3	3	10
W	0	0	6	2	7	3	18
WNW	0	0	5	8	3	1	17
NW	1	2	3	2	3	2	13
NNW	1	1	2	5	1	1	11
TOTAL	5	21	40	46	35	20	167

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 33
VARIABLE DIRECTION : 0

Stability Class: C **60 Meter Height** **Quarter: 2**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	1	3	2	0	0	6
NNE	0	0	0	1	0	3	4
NE	1	1	1	4	1	1	9
ENE	0	3	0	1	0	0	4
E	1	1	0	1	0	0	3
ESE	2	0	1	1	0	0	4
SE	1	2	1	1	0	1	6
SSE	0	5	1	7	1	0	14
S	0	5	2	5	3	2	17
SSW	2	1	3	2	1	0	9
SW	0	4	3	2	1	1	11
WSW	0	2	2	2	0	0	6
W	0	2	3	3	3	0	11
WNW	1	0	0	2	1	0	4
NW	1	1	5	6	1	0	14
NNW	0	0	7	3	1	0	11
TOTAL	9	28	32	43	13	8	133

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 245
VARIABLE DIRECTION : 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: C **60 Meter Height** **Quarter: 3**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	2	6	1	0	0	9
NNE	0	2	2	1	0	0	5
NE	0	2	2	2	0	0	6
ENE	1	0	1	0	0	0	2
E	0	3	2	1	0	0	6
ESE	1	3	0	0	0	0	4
SE	2	1	0	0	0	0	3
SSE	0	4	3	0	0	0	7
S	1	0	5	7	1	0	14
SSW	1	1	3	2	1	0	8
SW	3	4	3	4	0	0	14
WSW	0	4	4	1	0	0	9
W	1	1	0	0	0	0	2
WNW	1	1	0	0	0	0	2
NW	0	2	0	1	0	0	3
NNW	0	1	2	0	0	0	3
TOTAL	11	31	33	20	2	0	97

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 172
VARIABLE DIRECTION : 0

Stability Class: C **60 Meter Height** **Quarter: 4**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	5	9	3	0	0	17
NNE	1	1	5	4	1	1	13
NE	0	0	2	0	3	3	8
ENE	0	0	0	2	1	0	3
E	1	2	1	1	1	0	6
ESE	0	0	0	0	0	0	0
SE	2	0	0	0	0	0	2
SSE	0	4	0	0	2	0	6
S	0	0	5	1	1	1	8
SSW	0	2	4	3	0	0	9
SW	1	3	6	5	1	0	16
WSW	0	2	4	2	5	2	15
W	1	1	0	0	6	0	8
WNW	2	1	1	4	1	0	9
NW	0	2	7	3	1	2	15
NNW	1	2	3	3	0	1	10
TOTAL	9	25	47	31	23	10	145

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 206
VARIABLE DIRECTION : 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: D **60 Meter Height** **Quarter: 1**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	4	4	17	25	6	0	56
NNE	1	4	5	11	5	0	26
NE	0	1	12	6	17	7	43
ENE	1	4	3	5	3	0	16
E	1	5	13	17	1	0	37
ESE	0	2	4	1	0	0	7
SE	0	4	17	7	0	0	28
SSE	0	2	2	16	15	4	39
S	0	2	11	32	31	9	85
SSW	1	2	9	50	29	6	97
SW	0	3	10	27	3	1	44
WSW	1	3	14	6	18	6	48
W	2	5	18	13	37	15	90
WNW	0	2	14	24	26	2	68
NW	0	3	11	25	24	3	66
NNW	1	9	26	26	2	2	66
TOTAL	12	55	186	291	217	55	816

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 33
VARIABLE DIRECTION : 0

Stability Class: D **60 Meter Height** **Quarter: 2**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	4	21	18	10	1	54
NNE	0	3	6	5	3	2	19
NE	1	7	3	18	17	3	49
ENE	0	0	4	20	5	1	30
E	0	5	11	9	0	0	25
ESE	2	8	4	4	0	0	18
SE	0	4	9	9	2	0	24
SSE	1	3	19	15	6	1	45
S	0	5	15	27	16	11	74
SSW	2	8	8	26	13	6	63
SW	0	9	7	16	11	0	43
WSW	0	0	6	11	3	0	20
W	0	0	6	8	3	1	18
WNW	2	2	5	6	0	1	16
NW	0	5	10	15	12	3	45
NNW	0	5	15	10	2	1	33
TOTAL	8	68	149	217	103	31	576

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 245
VARIABLE DIRECTION : 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: D **60 Meter Height** **Quarter: 3**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	1	5	15	12	5	0	38
NNE	0	10	23	4	3	0	40
NE	2	6	21	20	1	0	50
ENE	1	3	12	13	0	0	29
E	1	2	8	3	4	0	18
ESE	1	4	0	1	0	0	6
SE	2	2	9	0	0	0	13
SSE	2	6	10	8	0	0	26
S	0	1	9	28	7	0	45
SSW	0	4	16	41	7	0	68
SW	4	10	15	9	1	0	39
WSW	0	4	10	0	3	0	17
W	3	1	3	1	0	0	8
WNW	1	4	7	0	0	0	12
NW	5	6	3	2	0	0	16
NNW	1	2	5	2	2	0	12
TOTAL	24	70	166	144	33	0	437

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 172
VARIABLE DIRECTION : 0

Stability Class: D **60 Meter Height** **Quarter: 4**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	1	13	32	30	4	0	80
NNE	1	10	18	22	17	0	68
NE	1	4	20	24	12	2	63
ENE	0	0	15	37	11	0	63
E	0	1	2	16	8	0	27
ESE	0	1	0	11	2	0	14
SE	0	2	3	2	1	1	9
SSE	0	3	6	22	4	4	39
S	1	2	10	11	2	3	29
SSW	1	11	13	27	26	4	82
SW	1	8	15	15	10	0	49
WSW	1	5	6	11	16	2	41
W	0	9	25	33	25	3	95
WNW	0	9	12	22	6	0	49
NW	0	11	32	26	7	6	82
NNW	0	9	33	38	10	1	91
TOTAL	7	98	242	347	161	26	881

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 206
VARIABLE DIRECTION : 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: E **60 Meter Height** **Quarter: 1**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	2	4	8	4	0	0	18
NNE	1	2	2	2	0	0	7
NE	1	2	1	0	0	0	4
ENE	0	1	1	0	0	0	2
E	0	2	0	1	0	0	3
ESE	0	5	6	1	0	0	12
SE	0	5	7	3	6	0	21
SSE	0	2	8	21	10	3	44
S	0	3	15	26	28	15	87
SSW	1	6	12	60	41	2	122
SW	0	1	22	46	19	0	88
WSW	1	2	21	28	10	0	62
W	0	2	9	17	4	0	32
WNW	1	2	5	8	0	0	16
NW	0	3	13	11	0	0	27
NNW	0	3	10	1	0	0	14
TOTAL	7	45	140	229	118	20	559

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 33
VARIABLE DIRECTION : 0

Stability Class: E **60 Meter Height** **Quarter: 2**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	3	8	6	0	0	17
NNE	1	2	4	2	0	0	9
NE	0	3	7	4	0	0	14
ENE	0	1	8	4	0	0	13
E	1	4	5	18	1	0	29
ESE	0	6	12	1	0	0	19
SE	0	8	18	10	3	0	39
SSE	0	8	37	33	6	0	84
S	0	5	33	37	24	5	104
SSW	1	7	16	29	18	1	72
SW	0	4	14	19	2	0	39
WSW	1	3	7	13	0	0	24
W	0	2	3	17	0	0	22
WNW	0	1	8	7	0	0	16
NW	0	1	5	6	0	0	12
NNW	0	2	5	4	0	0	11
TOTAL	4	60	190	210	54	6	524

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 245
VARIABLE DIRECTION : 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: E **60 Meter Height** **Quarter: 3**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	4	0	5	6	0	0	15
NNE	1	4	7	11	0	0	23
NE	1	1	19	36	0	0	57
ENE	0	4	14	15	0	0	33
E	1	6	12	6	0	0	25
ESE	0	13	2	0	0	0	15
SE	0	9	14	1	0	0	24
SSE	0	2	16	22	0	0	40
S	0	3	34	42	1	0	80
SSW	0	4	19	38	4	0	65
SW	1	5	16	14	0	0	36
WSW	0	4	6	6	1	0	17
W	0	1	2	1	0	0	4
WNW	0	2	2	0	0	0	4
NW	0	4	3	0	0	0	7
NNW	1	4	0	3	0	0	8
TOTAL	9	66	171	201	6	0	453

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 172
VARIABLE DIRECTION : 0

Stability Class: E **60 Meter Height** **Quarter: 4**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	1	2	5	16	0	0	24
NNE	0	0	5	16	2	0	23
NE	2	2	3	3	2	0	12
ENE	0	0	1	7	1	0	9
E	0	0	4	1	0	0	5
ESE	0	2	1	0	0	0	3
SE	1	7	5	3	1	0	17
SSE	1	4	9	6	4	1	25
S	2	6	16	23	11	5	63
SSW	0	5	7	26	15	1	54
SW	0	4	6	28	18	4	60
WSW	1	4	11	22	11	0	49
W	0	4	5	14	10	0	33
WNW	0	4	3	4	3	0	14
NW	0	3	18	5	0	0	26
NNW	1	4	16	6	0	0	27
TOTAL	9	51	115	180	78	11	444

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 206
VARIABLE DIRECTION : 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: F **60 Meter Height** **Quarter: 1**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	1	1	6	3	0	0	11
NNE	0	0	1	1	0	0	2
NE	0	0	1	0	0	0	1
ENE	0	1	0	0	0	0	1
E	1	0	0	0	0	0	1
ESE	1	2	2	0	0	0	5
SE	0	0	1	2	1	0	4
SSE	0	0	1	3	1	0	5
S	0	0	5	6	2	0	13
SSW	0	2	4	7	5	0	18
SW	1	0	6	8	2	0	17
WSW	0	2	6	12	1	0	21
W	0	0	4	12	0	0	16
WNW	0	0	1	5	0	0	6
NW	0	3	2	2	0	0	7
NNW	0	0	3	3	0	0	6
TOTAL	4	11	43	64	12	0	134

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 33
VARIABLE DIRECTION : 0

Stability Class: F **60 Meter Height** **Quarter: 2**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	2	3	3	0	0	0	8
NNE	0	0	3	0	0	0	3
NE	1	1	8	0	0	0	10
ENE	0	1	3	6	0	0	10
E	2	2	5	5	0	0	14
ESE	0	4	1	0	0	0	5
SE	0	4	5	2	1	0	12
SSE	0	0	17	5	3	0	25
S	0	2	16	9	0	0	27
SSW	1	2	11	8	0	0	22
SW	0	1	8	13	0	0	22
WSW	0	0	5	3	0	0	8
W	1	0	4	2	0	0	7
WNW	0	1	2	1	0	0	4
NW	2	0	0	0	0	0	2
NNW	0	0	2	0	0	0	2
TOTAL	9	21	93	54	4	0	181

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 245
VARIABLE DIRECTION : 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: F **60 Meter Height** **Quarter: 3**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	2	2	1	0	0	5
NNE	0	0	2	7	0	0	9
NE	0	6	12	47	1	0	66
ENE	1	2	8	15	0	0	26
E	0	2	11	13	0	0	26
ESE	1	13	4	0	0	0	18
SE	0	5	11	0	0	0	16
SSE	0	1	9	0	0	0	10
S	1	4	8	0	0	0	13
SSW	0	1	4	2	0	0	7
SW	1	4	6	5	0	0	16
WSW	0	4	9	3	0	0	16
W	0	3	9	0	0	0	12
WNW	0	7	0	0	0	0	7
NW	0	2	3	1	0	0	6
NNW	1	1	3	0	0	0	5
TOTAL	5	57	101	94	1	0	258

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 172
VARIABLE DIRECTION : 0

Stability Class: F **60 Meter Height** **Quarter: 4**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	3	6	5	0	0	14
NNE	2	0	3	4	0	0	9
NE	0	2	1	2	1	0	6
ENE	0	1	1	3	1	0	6
E	0	2	3	4	0	0	9
ESE	1	4	2	0	0	0	7
SE	0	8	1	0	0	0	9
SSE	0	2	3	1	0	0	6
S	1	5	8	1	0	0	15
SSW	0	6	10	6	0	0	22
SW	1	0	5	5	0	0	11
WSW	0	1	1	11	0	0	13
W	0	2	1	9	0	0	12
WNW	0	0	0	2	0	0	2
NW	1	0	0	3	0	0	4
NNW	0	1	2	2	0	0	5
TOTAL	6	37	47	58	2	0	150

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 206
VARIABLE DIRECTION : 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: G **60 Meter Height** **Quarter: 1**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	0	2	0	0	0	2
NNE	0	1	0	1	0	0	2
NE	0	1	2	0	0	0	3
ENE	1	1	0	0	0	0	2
E	0	1	0	0	0	0	1
ESE	1	0	0	0	0	0	1
SE	0	0	0	0	0	0	0
SSE	0	1	3	2	0	0	6
S	0	0	1	1	0	0	2
SSW	0	1	1	0	0	0	2
SW	1	0	1	2	0	0	4
WSW	0	1	0	2	0	0	3
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	2	0	0	0	2
NNW	0	0	0	3	0	0	3
TOTAL	3	7	12	11	0	0	33

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 33
VARIABLE DIRECTION : 0

Stability Class: G **60 Meter Height** **Quarter: 2**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	0	1	0	0	0	1
NNE	0	1	0	0	0	0	1
NE	0	0	1	0	0	0	1
ENE	0	0	2	0	0	0	2
E	0	2	0	0	0	0	2
ESE	0	1	0	0	0	0	1
SE	0	0	0	0	0	0	0
SSE	0	0	4	0	0	0	4
S	1	0	7	0	0	0	8
SSW	0	0	4	2	0	0	6
SW	0	4	1	1	0	0	6
WSW	0	0	2	3	0	0	5
W	0	0	2	0	0	0	2
WNW	0	0	0	0	0	0	0
NW	1	0	1	0	0	0	2
NNW	1	0	0	0	0	0	1
TOTAL	3	8	25	6	0	0	42

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 245
VARIABLE DIRECTION : 0

TABLE 18 (continued)

JOINT WIND FREQUENCY DISTRIBUTION BY STABILITY CLASS

Stability Class: G **60 Meter Height** **Quarter: 3**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	1	2	3	4	0	0	10
NNE	1	4	6	3	0	0	14
NE	3	5	6	16	1	0	31
ENE	1	3	17	23	0	0	44
E	0	11	25	13	0	0	49
ESE	7	9	5	0	0	0	21
SE	1	3	3	0	0	0	7
SSE	0	2	4	0	0	0	6
S	3	2	5	0	0	0	10
SSW	3	2	2	0	0	0	7
SW	1	2	3	3	0	0	9
WSW	1	1	0	0	0	0	2
W	0	1	0	0	0	0	1
WNW	0	4	0	0	0	0	4
NW	2	6	1	0	0	0	9
NNW	1	2	4	1	0	0	8
TOTAL	25	59	84	63	1	0	232

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 172
VARIABLE DIRECTION : 0

Stability Class: G **60 Meter Height** **Quarter: 4**

WIND DIRECTION	WIND SPEED (MPH) 1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	TOTAL
N	0	1	0	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	1	0	0	1
ENE	0	1	3	11	0	0	15
E	0	0	6	3	0	0	9
ESE	1	2	1	0	0	0	4
SE	1	5	0	0	0	0	6
SSE	0	5	3	0	0	0	8
S	0	2	1	1	0	0	4
SSW	0	1	8	1	0	0	10
SW	0	0	3	8	0	0	11
WSW	0	0	3	4	0	0	7
W	0	1	2	3	0	0	6
WNW	0	0	0	0	0	0	0
NW	0	0	0	1	0	0	1
NNW	0	0	1	1	0	0	2
TOTAL	2	18	31	34	0	0	85

PERIODS OF CALM (HOURS) : 0 HOURS OF MISSING DATA : 206
VARIABLE DIRECTION : 0

ODCM OPERATIONAL REMEDIAL REQUIREMENT REPORTS

SECTION 8

ODCM OPERATIONAL REMEDIAL REQUIREMENT REPORTS

In accordance with CPS ODCM section[s] 2.7.1 and 3.9.2, INOPERABLE radioactive liquid and gaseous effluent monitoring instrumentation channels remaining in an INOPERABLE condition for greater than 30 days shall be reported in the Annual Radioactive Effluent Release Report.

During the course of 2002, there were zero (Ø) instances when either a radioactive liquid or gaseous effluent instrumentation channel[s] were INOPERABLE for greater than any 30 day period.

CHANGES TO RADIOACTIVE WASTE TREATMENT SYSTEMS

SECTION 9

CHANGES TO RADIOACTIVE WASTE TREATMENT SYSTEMS

In accordance with Section 7.2 of the CPS ODCM, licensee-initiated changes to the liquid, gaseous or solid radioactive waste treatment systems shall be reported in the Annual Radioactive Effluent Release Report.

The following change to the Waste Treatment Systems was implemented during the course of the 2002 reporting period.

Chem-Nuclear Inc. (CNSI) processes, systems, and procedures have been evaluated through the CNSI Dewatering Topical Report and implementing procedures. The process Topical Report was reviewed and found acceptable for referencing in plant license applications by the Nuclear Regulatory Commission's Standardization and Special Projects Branch Division of Licensing on 11 June 1985. The process was proven by use at other stations providing a suitable product for offsite shipment and disposal complying with station Process Control Procedure [PCP] requirements. The process provides for in-container processing of waste that is transferred from plant systems removing liquid from the waste to meet disposal requirements. The disposal container is placed in a cask or process shield and a remote fill-head is attached to the container providing all the necessary connections for processing. Once the container is filled, liquid is extracted from the container through rigid filters and a positive displacement pump. The container undergoes a series of timed pump downs in which the number of cycles is dependent upon the waste in the container. A final verification is conducted to assure that the container meets disposal site criteria for acceptance at disposal. The system is designed to accept the station delivery flows for the waste at a maximum station delivery of 100 GPM. Normally, station delivery flow ranges from 50-80 GPM depending on the waste stream being delivered. Level in the container is monitored with a CCTV camera and installed container level probes provide additional indication of the waste level within the container. A float assembly is incorporated as additional backup protection into the container fill-head and provides for automatic closure of the Waste Inlet valve upon abnormally high waste level during transfer evolutions. The process control requirements have been reviewed to assure suitability with CPS Waste Streams. The CNSI Process Control Implementing Procedures contain verifications that are sufficient to detect free-standing water in the waste. If free-standing water is detected above the acceptance requirements, then additional dewatering and re-verification[s] are performed until the product meets acceptance criteria.

The following are the specific changes that occur with the implementation of the CNSI PCP implementing procedures:

- High Integrity Containers [HIC] and their internal filtration system are changed
- Use of a remote fill-head on the HIC for radiological dose reduction
- Procedures for receiving, dewatering and verification acceptance requirements are changed
- Procedure for HIC Handling is changed to be compatible with the new HIC's that are used

SECTION 9

CHANGES TO RADIOACTIVE WASTE TREATMENT SYSTEMS [continued]

The following items have not changed in regards to the PCP:

- Packaging and Shipping Procedures
- Waste Streams
- Sampling Methodology
- Delivery System
- Update Safety Analysis Report [USAR]
- Record Requirements

Per Operational Requirement Manual [ORM] requirement 6.13, the change to the CNSI Dewatering Process will maintain the overall conformance of the waste product to existing requirements of Federal, State, or other applicable regulations.

NEW LOCATIONS FOR DOSE CALCULATION AND / OR ENVIRONMENTAL MONITORING

SECTION 10

NEW LOCATIONS FOR DOSE CALCULATION AND / OR ENVIRONMENTAL MONITORING

The following is a summary of the 2002 Annual Land Use Census. It shows changes in locations for dose calculations and / or environmental monitoring identified by the Annual Land Use Census. The distance of the receptor is being listed in the report in lieu of the name of the resident. This is being done to maintain and respect the privacy of the residents.

1.0 Nearest Residence

The nearest residents identified in each of the sixteen (16) sectors are shown below. An asterisk notes any changes from the previous year below (*)

SECTOR	2002 RESIDENT (miles)	AGE GROUP	2001 RESIDENT (miles)	AGE GROUP
N	0.9	T, A	0.9	T, A
NNE	1.0	A	1.0	A
NE	1.3	T, A	1.3	T, A
ENE	1.8	A	1.8	A
E	1.0	A	1.0	A
ESE	3.2	A	3.2	A
SE	2.8	A	2.8	A
* SSE	2.4	A	1.8	A
S	3.0	A	3.0	A
SSW	2.9	A	2.9	A
SW	0.7	A	0.7	A
WSW	1.6	A	1.6	A
W	1.6	T, A	1.6	T, A
WNW	1.6	A	1.6	A
NW	1.6	A	1.6	T, A
NNW	1.7	A	1.7	A

(I)nfant (C)hild (T)een (A)dult

2.0 Broadleaf Garden Census

Fifty-three (53) gardens within a five (5) mile radius were located in the sixteen (16) geographical sectors surrounding CPS that contained broad leaf vegetation, which were specifically identified for this report. Although other crops were identified within these areas, they are not addressed as part of this report.

The nearest gardens identified in each of the sixteen (16) geographical sectors are shown below. An asterisk notes any changes from the previous year below (*).

	SECTOR	2002 GARDENS (miles)	AGE GROUPS	2001 GARDENS (miles)	AGE GROUPS
	N	0.9	T, A	0.9	T, A
	NNE	2.9	A	2.9	A
	NE	2.1	T, A	2.1	T, A
*	ENE	1.8	A	2.6	A
	E	1.0	A	1.0	A
	ESE	3.3	T, A	3.3	T, A
	SE	4.4	C, T, A	4.4	C, T, A
*	SSE	2.7	A	2.8	A
*	S	4.1	A	3.0	A
	SSW	> 5	N/A	> 5	N/A
*	SW	> 5	N/A	3.6	A
*	WSW	2.3	C, A	2.2	A
	W	2.1	T, A	2.1	A
	WNW	1.6	A	1.6	A
*	NW	> 5	A	2.9	C, A
*	NNW	1.3	T, A	> 5	N/A

(I)nfant (C)hild (T)een (A)dult

3.0 Milking Animal Census

There were ten (10) milking animals within the sixteen (16) geographical sectors located within five (5) miles surrounding CPS. These milking animals were either used for the nursing of their offspring or used for meat production for their own personal use and sold commercially. There were no residents that milked their animals for human consumption.

Milking animals were specifically identified for this report. Although other livestock were identified within these areas, they are not addressed as part of this report.

The nearest milking animals identified in each of the sixteen (16) geographical sectors are shown below. An asterisk notes any changes from the previous year below (*).

	SECTOR	2002 MILKING ANIMALS (miles)	AGE GROUPS	2001 MILKING ANIMALS (miles)	AGE GROUPS
	N	0.9	T,A	0.9	T,A
	NNE	1.3	A	1.3	A
	NE	3.4	A	3.4	A
*	ENE	> 5	N/A	4.8	A
	E	1.0	A	1.0	A
	ESE	> 5	N/A	> 5	N/A
	SE	4.4	C,T,A	4.4	C,T,A
	SSE	> 5	N/A	> 5	N/A
	S	> 5	N/A	> 5	N/A
	SSW	3.4	A	3.4	A
	SW	3.6	A	3.6	A
	WSW	3.4	A	3.4	A
	W	2.1	T,A	2.1	T,A
	WNW	> 5	N/A	> 5	N/A
*	NW	> 5	N/A	2.4	A
	NNW	1.3	A	1.3	A

(I)nfant (C)hild (T)een (A)dult

CORRECTIONS TO DATA REPORTED IN PREVIOUS REPORTS

SECTION 11

CORRECTIONS TO DATA REPORTED IN PREVIOUS REPORTS

The following administrative changes were submitted on 30 May 2002 against the 1999 and 2000 Annual Effluent Release Report[s].

1999 Annual Radiological Environmental Operating Report

Page B-3 Replace 517 with 518 under the Number of Sample Collected and the Number of Samples Analyzed for the Sample Type of Air Particulate.

Page B-8 Replace .015 - .077 pCi/g/dry with .010 - .077 pCi/g/dry under the Shoreline Sediment / All Indicator Locations column.

Page D-5 Add TLD CL-99 as Exception #14 that occurred during the 2nd Quarter 1999 as this TLD was lost in the field when attempted to retrieve.

2000 Annual Radiological Environmental Operating Report

Page D-3 Add Air Sample CL-6 as Exception #8 that occurred on 19 January 2000 as no sample was available.

CHANGES TO THE OFFSITE DOSE CALCULATION MANAUL

SECTION 12

CHANGES TO THE OFFSITE DOSE CALCULATION MANUAL

CPS is required to report any changes to the Offsite Dose Calculation Manual. As such, there was no revision[s] made to the CPS ODCM in 2002, which has been included in this section.