From: "Greg Babineau" <Babineau@yankeerowe.com>
To: <thy@nrc.gov>, <jbh@nrc.gov>
Date: 01/24/2007 8:56:15 AM
Subject: RE: Yankee Rowe FSSR OOL-08-03 Information

Tom,

We scanned the two documents and burned them to a CD. They will be going out via fedex today, addressed to you and John. To avoid any confusion during your review, please note that when these documents were generated in 1998, they were in support of the LTP we were developing to implement a NUREG 5849 FSS. We terminated that project in the 1999 timeframe. Hence the documents refer to assumed GLV's, etc. However, the deposition evaluation and the background measurements performed and evaluated remain valid.

Greg

-----Original Message-----
From: Alice Carson [mailto:acarson1967@comcast.net]
Sent: Tuesday, January 23, 2007 1:17 PM
To: 'Greg Babineau'
Subject: FW: Yankee Rowe FSSR OOL-08-03 Information

I'll call you in a few to discuss the request.

-----Original Message-----
From: Thomas Youngblood [mailto:THY@nrc.gov]
Sent: Tuesday, January 23, 2007 12:00 PM
To: Alice Carson
Cc: John Hickman
Subject: Yankee Rowe FSSR OOL-08-03 Information

Alice,

The final status survey report OOL-08-03 has a Technical Evaluation YA-EVAL-00-002-06 on Sr-90 identified in soil samples, and the evaluation refers to two additional documents that contain information on environmental Sr-90 levels.

Could you provide a copy of the referenced reports: YRC-1178 and RP 98-72? I have checked a CD with YNPS Historical Site Assessment, Master Reference List information, and the CD contains similar reports, but not these specific reports.

John Hickman is on sick leave today, but hopefully will be back at work soon.

Regards,
Tom Youngblood
Health Physicist
US NRC
301-415-5875

CC: "'Alice Carson'" <acarson1967@comcast.net>

Mail Envelope Properties (45B7656C.003 : 16 : 61443)

Subject:	RE: Yankee Rowe FSSR OOL-08-03 Information
Creation Date	01/24/2007 8:55:40 AM
From:	"Greg Babineau" <Babineau@yankeerowe.com>
Created By:	Babineau@yankeerowe.com

Recipients

nrc.gov
OWGWPO04.HQGWDO01
JBH (John Hickman)

nrc.gov
TWGWPO04.HQGWDO01
THY (Thomas Youngblood)

comcast.net
acarson1967 CC ('Alice Carson')

Post Office	Route
OWGWPO04.HQGWDO01	nrc.gov
TWGWPO04.HQGWDO01	nrc.gov
	comcast.net

Files	Size	Date & Time
MESSAGE	1593	01/24/2007 8:55:40 AM
Mime.822	2923	

Options

Expiration Date:	None
Priority:	Standard
ReplyRequested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

Junk Mail Handling Evaluation Results

Message is eligible for Junk Mail handling
This message was not classified as Junk Mail

Junk Mail settings when this message was delivered

Junk Mail handling disabled by User

Junk Mail handling disabled by Administrator
Junk List is not enabled
Junk Mail using personal address books is not enabled
Block List is not enabled

1510

MEMORANDUM

To: File
From: Edward Cumming ERC
Subject: Technical Basis Document for Background Sr-90 in Soil, Rev. 1

Date: June 22, 1998
File: RP 98-72

Reference

1. Memorandum RPG 98-011, Rev. 1, C.B. Martel to E.M. Heath, "Background Strontium-90 Concentration in Soil," dated June 18, 1998.

2. Memorandum RPG 98-011, C.B. Martel to E.M. Heath, "Background Strontium-90 Concentration in Soil," dated May 29, 1998.

3. Procedure AP-8800, Rev. 2, "Final Status Survey Organization, Training and Technical Basis Documents."

This memorandum, along with the attached DE&S memorandum (Reference 1), constitutes a Technical Basis Document (TBD) for background concentrations of Strontium-90 in soils surrounding the Yankee Nuclear Power Station. The attached DE&S memorandum is a revision to the original DE&S memorandum (Reference 2), and contains corrections to several typographical errors. Preparation and review have been done in accordance with the TBD requirements of Procedure AP-8800 (Reference 3).

cc: FSS TBD File
RP File
S.Roberts
J.Thompson
B.Yetter
E.Heath
G.Babineau
K.Heider
K.Corbett
D.Trudeau

MEMORANDUM

DE&S - BOLTON

1511

To	E. M. Heath	**Date**	June 18, 1998
		Group #	RPG 98-011 Rev. 1
From	C. B. Martel	**W.O.#**	00468.00.0004.16.00000
Subject	Background Strontium-90 Concentration in Soil	**I.M.S.#**	A13.01.08 RT 07.C02.018
		File #	SR90BAC1.WPD

Reference

1. YRC-1180, "Background Concentrations of Cesium-137 in Soil and Sediment to Support YNPS," 2/98

2. YRC-1179, "Yankee Rowe Site-Specific Derived Concentration Guideline Values for Residual Radioactivity in Soil," 3/98

3. YAEL Procedure 368, "Determination of Strontium-89, 90 in Environmental Media via Cerenkov Counting," Rev. 4, 7/7/97.

4. YNPS License Termination Plan, Appendix A, "Final Status Survey Plan for Site Release," Rev. 1, 5/97

5. NUREG-5849, "Manual for Conducting Radiological Surveys in Support of License Termination," USNRC, 3/92

Purpose and Background

The purpose of this memo is to present a background concentration value for Strontium-90 in soils related to decommissioning work at the Yankee Nuclear Power Station (YNPS). This value is specifically for use in support of the Final Status Survey at the YNPS. Like Cesium-137, Strontium-90 is a radionuclide that is present in background, and which was also produced and released to the environment by operations at YNPS. A background value for Cesium-137 is the subject of another report (Reference 1) entitled, "Background Concentrations in Soil and Sediment to Support the Yankee Nuclear Power Station Decommissioning Project."

The Strontium-90 value presented is calculated based on guidance in NUREG-5849 and is intended as input to help establish that radioactivity release limits are met for any residual radioactive materials remaining on-site after decommissioning. This regulatory guidance establishes a method to determine values for the background level of a given radionuclide by averaging results of sample analyses and establishing with 95% certainty, that the calculated background level for a radionuclide is correct.

The number of samples required to provide a valid average value is determined by a statistical procedure. For a given number of samples collected, a mean radionuclide concentration value is valid if the 95% upper level bound of variations in individual analyses results are less than 10% of the Guideline Value (GLV) used for Final Status Survey.

Methodology

Soil samples that were analyzed for Strontium-90 were selected from those previously collected and analyzed for Cesium-137, as described in Reference 1. The rationale for the location from which the soil samples were obtained, the method used to collect the soil, and its preparation for analysis, is presented in Reference 1. Strontium analyses were performed on 30 soil samples selected from four background reference locations. Selection was made to assure that samples were representative of each background area.

For Strontium analyses the process for soil sample preparation was different from that done for samples analyzed for Cesium-137. Aliquots of soil were taken from those samples which had been dried and homogenized by the Duke Engineering & Services Laboratory for the Cesium-137 analyses. The aliquots of soil were processed and analyzed according to Reference 3. The 95% upper level bound on the average concentration was calculated as described in Section 5.2.3 of Reference 4, using Equation 5-4.

Results and Conclusions

Results of the analyses are presented in the attached Table. The average Strontium-90 concentration for the 30 samples is 0.274 $\pm$ 0.310 pCi/gm. The GLV for Strontium-90 that will be applied to the Final Status Survey at YNPS is 5.7 pCi/gm (Reference 2). The 95% upper bound on the average concentration is 6.8% of the GLV, which is less than the 10% prescribed by NUREG-5849 (Reference 5) for significance. Therefore, no further soil samples are required to further refine this value since the variations in background are not significant and need not be determined.

C.B. Martel

Prepared by: C. B. Martel

E.R. Cumming

Reviewed by: E. R. Cumming

F.X. Bellini

Reviewed by: F. X. Bellini

1513

Attachment

c:
J. Grant
R. Marcello
J. Jacobson
P. Littlefield
D. McCurdy
W. Riethle
E. Cumming
F. Bellini
E. Dayotas (EED/SC File)

Strontium-90 Concentration in Background Soils at YNPS

Sample No.	Sr-90 Concentration (pCi/gm)
TS-01A	0.235
TS-11A	-0.09
TS-12A	-0.018
TS-14A	0.31
TS-15A	-0.049
TS-16A	0.244
TS-20A	0.326
TS-01B	-0.18
TS-11B	0.069
TS-12B	-0.02
TS-15B	-0.146
TS-16B	0.188
TS-17B	0.684
TS-18B	0.23
TS-13B	-0.02
TS-20B	-0.002
TS-11C	0.624
TS-16C	0.072
TS-17C	-0.003
TS-14C	0.496
TS-18C	0.857
TS-12C	0.371
TS-13C	0.413
TS-20C	0.464
TS-1D	0.952
TS-11D	0.75
TS-13D	0.649
TS-14D	0.173
TS-15D	0.148
TS-16D	0.506
Ave	0.274
SD	0.310
95% level upper bound	0.390

Main	17
Att. A	38
App. A	33
Total	88

QA Record?

Yes ✔

No ___

IMS NO N02.01.04/ N02.03.03

RECORD TYPE 07.C16.004/

W.O./P.O. NO. 00468.00.0004.17.00000

DUKE ENGINEERING & SERVICES
ENVIRONMENTAL HEALTH & SAFETY DEPARTMENT

ANALYSIS/CALCULATION FOR

TITLE Radionuclide Soil Concentrations Surrounding YNPS Resulting from Gaseous Releases during Plant Operation

PLANT Yankee Nuclear Power Station

CALCULATION NUMBER YRC-1178

(Nonsafety-Related)

	PREPARED BY/ DATE	REVIEWED BY/ DATE	APPROVED BY/ DATE	REVIEW LEVEL ASSIGNED
ORIGINAL	3/24/98	3/26/98	3/26/98	1
REVISION 1				1
REVISION 2				1
REVISION 3				1

Level of Review Required:
1 = Review in Detail
2 = General Review for Reasonableness
3 = Review Not Required

KEYWORDS Meteorology, Atmospheric Deposition, Dose Assessment, AEOLUS-2, Reg Guide 1.109.

Computer Codes: LOTUS 1-2-3, rev.5, Quattro Pro, v.6.0

Table of Contents

I Calculation Objective

The objective of this calculation is to calculate the maximum soil concentrations of radionuclides deposited off-site as the result of gaseous releases from the Yanked Nuclear Power Station (YNPS) during its period of operation, 1960 through 1992. This information was requested by Service Request 98-001, dated 01/08/98. This information is necessary to support the "non-impacted area" classification, as described in Revision 0 of the YNPS Final Status Survey Plan. This calculation is intended to evaluate the data from all recorded radioactive gaseous releases from the plant.

II Method of Solution

The method of solution is to: 1) determine the radionuclide distribution and quantity, released as a gaseous effluent, during each year from 1960 through 1992; 2) decay each annual release, by individual radionuclide, to 01/01/98; 3) apply a conservative atmospheric deposition factor (D/Q value) to each particulate radionuclide released to determine the surface concentration of each radionuclide; and 4) apply proper regulatory guidance to determine a maximum soil concentration for each particulate radionuclide.

Although the distribution and quantity of all reported radionuclides are calculated herein, only the particulates are considered as candidates for deposition. The strictly gaseous effluents like Krypton, Xenon, and Argon are dispersed in the atmosphere without deposition potential, and largely have half-lives measured in days (or less), with the exception of KR-85. The three isotopes of Iodine, while particulate in form, all have half-lives less than 8 days, and are of no significance for long term deposition. Tritium activity released as Hydrogen gas, or as water vapor, would not have any potential to concentrate in the soil. Carbon 14 is listed as being released is the gaseous state. It most likely existed as carbon dioxide when released and also has no potential to concentrate in the soil.

III Inputs and Assumptions

The source of information on gaseous releases is contained in the Semi-annual Effluent Reports commencing in 1972. The individual radionuclides are listed as Fission Gases, Iodines, Particulates, Tritium, and unidentified. The data is tabulated, by quarter in each report, for both continuous and batch releases. This data was directly transcribed by others to Lotus spreadsheets. The annual summing, without regard to decay, was performed in the spreadsheet for the period.

Prior to 1972, gaseous release data was reported, for the prior year, in the January Monthly Operating Report for the next year. The early data was reported as "gross beta-gamma" curies or millicuries. In order to estimate annual releases by radionuclide, for these early years, a previous EPA study was used (Ref 1). This study consisted of a sampling and analysis program at the plant in the years 1968 through 1970. The study analyzed for 10 gases and 6 particulates in gaseous discharges. The quantity and distribution reported by the EPA was assumed to represent the best data available. The annual releases reported by Yankee for the years 1969 and 1970 were averaged and compared to the value the EPA estimated was released. The EPA distribution fractions were calculated and applied to the Yankee reported release total ratioed to the EPA release total to estimate the annual release of the radionuclides reported by the EPA. This methodology was applied to the gaseous release data for the years 1960 through 1971. The first reported release of Tritium was in the March, 1965 Monthly Operating Report, when instrumentation capable of detection tritium became available. Estimates for previous years, 1960 through 1964, were assumed to be the same as reported in 1965.

The annual releases were assumed to occur on the last day of the year and decayed to the beginning of 1998. Thus, for 1960, decay commenced in 1961 and ended at the end of 1987; a total of 37 years

As a check of data transfer correctness, the releases as reported in monthly and semiannual reports for each fourth year, commencing with 1960 and ending with 1988 was compared with the values transcribed to the spreadsheets. No transcription errors were detected. As another check, the results were manually scanned after the calculations were performed to see if any data seemed to be anomalous. In the case of CS-137, it was noted that 84% of the undecayed activity reported to be released between 1972 and 1992 was released during the second quarter of 1982. Typical Cesium ratios are 3:1 Cs-137 to Cs-134. The Semiannual Report for that period was re-checked and it was found the reported value for April, 1982 for gaseous Cs-137 was $1.50e^{-04}$ and the reported value for May, 1982 was $8.11e^{-05}$. One might expect the Cs-137 value to be in the range of $2.3e^{-05}$, rather than $2.3e^{-04}$, for the quarter While this quarterly total is suspect, it is assumed to be correct, lacking any other information. In another instance, it was noted that in the third quarter of 1973, $9.54e^{-05}$ Ci of Ag-110m was reported as being released. On the surface, this value appears about a factor of 100 too high. In both cases, assuming the higher values do not affect the final conclusions of this calculation.

As an aside, it was noted in the February, 1964 Monthly Operating Report, that the incinerator was shutdown pending a review of elevated activity detected in the discharge filter. No record was found in which the incinerator was ever restarted. It can be assumed from this that any releases from the incinerator were minor with respect to the other gaseous releases documented in this calculation.

IV Calculation and Analysis

Table 1

DATA FROM EPA REPORT[1]		
NUCLIDE	EPA EST. RELEASE	PERCENT OF TOTAL
	(CI)	
FISSION GASES		
KR-85	3.0e+00	61.72%
KR-85m	2.0e-02	0.41%
KR-87	2.0e-02	0.41%
KR-88	3.0e-02	4.90%
XE-133	1.0e-01	2.06%
XE-135	2.0e-01	4.11%
XE-135m	2.4e-01	4.90%
XE-138	8.5e-01	17.49%
XE-133m	1.0e-01	0.06%
AR-41	4.0e-01	8.23%
C-14	3.0e-01	--
TOTAL	4.9e+00	100.00%
IODINES		
I-131	3.0e-04	100.00%
I-133		0.00%
I-135		0.00%
TOTAL	3.0e-04	100.00%
PARTICULATES		
SR-89	4.0e-05	7.40%
SR-90	2.0e-04	37.02%
CS-134		
CS-137	2.0e-07	0.04%
CO-60	2.0e-04	37.02%
MN-54	1.0e-04	18.51%
TOTAL	5.4e-04	99.99%
H-3	1.3e+01	

A. Estimation of 1960-1971 Release Distribution

The data in the Table 1 was extracted directly from section 3.3.8 of an EPA report[1], and represents the "best estimate" of radionuclide distribution for the period up through 1971.

B. Decay Equation

The general equation for radioactive decay is:

$$Q_t = Q_0 e^{-\lambda \Delta t}$$

Where:

Q_t = Activity at time, t
Q_0 = Activity at time zero
λ = decay constant,
where λ is ln2 divided by half-life, in years, and
Δ t is decay time in years

C. Decay Calculation Application

For this calculation, Q_0 is the activity of the specific radionuclide at the end of the year in which it was released. Time, t, is January 1, 1998. Each radionuclide in each year of release is decayed to January 1. 1998, using the lambda values from Appendix A, Item.1. and the number of years from the release year to 1998. For example, 1.17e-08 curie of Co-60 was released in 1960, thus, the quantity remaining on 01/01/98 is:

Q_0=1.17e-08
decay time (years)=37 (1961 through 1997)
λ, for Co-60 = 1.318e-01

$$Q_t = 1.17e\text{-}08\ e^{-(1.318e\text{-}01)(37)}$$

$$Q_t = 1.736e\text{-}10 \text{ curies}$$

The spreadsheets are set up to: 1) perform quarterly summations to determine annual releases, by radionuclide; 2) decay each annual released radionuclide to January 1, 1998; and, 3) sum each decayed quantity to determine the total activity over the 37 year operating period, by radionuclide.

D. Application of Atmospheric Deposition Factor

A long term average atmospheric deposition factor (D/Q) has been calculated by others and is indicated in Section VII as Attachment A to this calculation. The details for determining the appropriateness of this factor can be found in this Attachment A. This deposition factor is applied to the decay corrected released activity to determine the maximum remaining deposition on an area extending 100-200 m beyond the owner controlled area. The units on D/Q is: $1/m^2$. The maximum long term average deposition factor, from Attachment A is:

$$D/Q=8.79e\text{-}08\ 1/m^2$$

The desired result is individual radionuclide surface distribution, in units of: pCi/m^2. Thus multiplying the historical released activity, (decay corrected to Jan 1, 1998), in units of pCi, by D/Q gives the desired result. Unit conversion from curie to picocurie is: (Ci) (1e+12) = picocurie Therefore;

Surface Conc.(Co-60 from 1960) = 1.73e-10 Ci*1e+12*8.79e-08 $1/m^2$ = 1.53e-05 $\rho Ci/m^2$

E. Soil Concentration

Guidance on calculating volume concentration from surface concentration is provided in Regulatory Guide 1.109 (Ref. 2). Table E-15 defines the effective surface density of the soil as 240 kg/m^2. The assumption provided is that this represents a 15 cm deep plow layer. It is assumed that the deposited activity is captured and retained within a 15 cm depth. This is considered conservative for this application, given that this deposition occurred over a thirty year period, with snow and rain serving to further disperse the activity. Dividing surface concentration (pCi/m^2) by 240 kg/m^2 results in estimated soil concentrations of residual radioactivity from past plant gaseous releases (pCi/kg)

Continuing the example of Co-60, the summation of all the annual gaseous releases decayed to January 1, 1998 is: 3.5803-04 Ci. Multiplying the result by 8.79e-08 (D/Q), and 1e+12 (pCi/Ci) gives a surface concentration of 3.147e+01 pCi/m^2.Dividing by 240 kg/m^2 provides the estimated soil concentration of Co-60 of 1.311e-01 pCi/kg

V. Results and Conclusions

In the Summary Table, below are listed the total releases, decayed to January 1,1998. In this summary table, if the decayed activity was less than $1x\ e^{-10}$, it was not listed. In the case of Kr-85, C-14 and H^3. The releases are assumed to be in gaseous form and would not be deposited on the ground surface The complete results are listed in Appendix A, Item 2,

Of all the radionuclides listed as having been released in the gaseous effluent, six particulates have the potential to be present, as of January, 1998, in concentrations greater than 10^{-06} pCi/Kg. These are: Sr-90, Cs-134, Cs-137, Co-60, Mn-54, and Sb-125. Three of these are calculated to be present in the range of 10^{-01} pCi/Kg. Even these calculated concentrations are several orders of magnitude below the current levels of detection and are masked by natural occurring radionuclides.

The YNPS Final Status Survey Plan defines "non-impacted areas" as areas of YNPS property outside of the "unaffected area" that have not been impacted by plant operations. The "unaffected area" essentially extends from the "affected area" (which is centered around the vapor container) to a 20-meter wide buffer zone outside of the owner controlled area fence. (See Attachment A, for details and references).

This calculation demonstrates that, under conservative assumptions of atmospheric deposition, no area exists outside the "affected area" would be expected to have detectable residual radioactivity from past plant routine (licensed) gaseous effluents.

Table 2

SUMMARY TABLE OF SOIL ACTIVITY RESULTING FROM GASEOUS RELEASES			
NUCLIDE	DECAYED ACT	SURFACE CONC	SOIL CONC
	(Ci)	(pCi/m^2)	(pCi/kg)
FISSION GASES			
KR-85	3.626e+01	--	--
I-135	<1e-10	--	--
PARTICULATES			
SR-89	<1e-10	--	--
SR-90	7.000e-04	6.153e+01	2.564e-01
CS-134	1.343e-06	1.180e-01	4.918e-04
CS-137	2.763e-04	2.429e+01	1.012e-01
BA/LA-140	<1e-10	--	--
ZN-65	<1e-10	--	--
CO-58	<1e-10	--	--
CO-60	3.580e-04	3.147e+01	1.311e-01
FE-59	<1e-10	--	--
CR-51	<1e-10	--	--
ZR/NB-95	<1e-10	--	--
CE-141	<1e-10	--	--
CE-144	1.141e-09	--	--
SB-124	<1e-10	--	--
MN-54	2.371e-08	2.084e-03	8.682e-06
AG-110m	<1e-10	--	--
SE-75	<1e-10	--	--
MO-99	<1e-10	--	--
RU-103	<1e-10	--	--
SB-125	5.020e-07	4.413e-02	1.839e-04
TE-132	<1e-10	--	--

VI. List of References

1. "RD-71-1 RADIOLOGICAL SURVEILLANCE STUDIES AT A PRESSURIZED WATER NUCLEAR POWER REACTOR", U. S. Environmental Protection Agency, National Environmental Research Center, Cincinnati, Ohio, August, 1971

2. "Regulatory Guide 1.109, CALCULATION OF ANNUAL DOSES TO MAN FROM ROUTINE RELEASES OF REACTOR EFFLUENTS FOR THE PURPOSE OF EVALUATING COMPLIANCE WITH 10 CFR PART50, APPENDIX I, rev 1", U.S. Nuclear Regulatory Commission, October, 1977.

3. Spreadsheet Data Files

The following files contain the data used in this calculation. Lotus 1-2-3 rev.5 and Quattro Pro rev. 6 use these files interchangeably

1. YRGASEF.WB2
2. g71-75.wk3
3. g76-80.wk3
4. g81-85.wk3
5. g86-90.wk3
6. g91-92.wk3
7 DECAY. wk3

VII. List of Attachments

1. Attachment A., Calculation of Atmospheric Deposition Factors

VIII Review Sheet

(See Next Page.)

REVIEW FORM

CALCULATION NO: YRC-1178 REVISION NO: 0

TITLE: Radionuclide Soil Concentrations Surrounding YNPS Resulting From Gaseous Releases During Plant Operations

COMMENTS	RESOLUTION
(1) Verification of calculations done for annual released radioactivity, decay corrected to 1998, including projected surface area deposition and projected soil concentrations. In part, these checks were performed for the identified principle radionuclide remaining, i.e. Co 60; by creation of a separate (independent) spreadsheet. [See Attached sheet.] These checks are found to be identical with the preparers own spreadsheets.	No Action Required.

Comments Provided By: Mark J. Stum 3/24/98
Reviewer / Date

Resolutions By: E.C. Barnum 3/24/98
Preparer / Date

Concur with Resolutions: Mark J. Stum 3/24/98
Reviewer / Date

Form: YA-EED-700.2
Revision : 0

Review Form
2 of 2

DATE
PAGE NO. 16
CALC. NO. YRC-1178

	Independent Check of Activity Buildup & Decay				
lamda (yrs-1) for Co-60	0.1318		D/Q deposition Soil A-density=	8.79E-08 240	(1/m2) (kg/m2)
Year	# Yrs to decay (t)	Co-60 undecayed released Ci.	Decayed to 1998 (Ci)	1998 decayed surface Act. pCi/m2	1998 decayed vol. conc. pCi/kg
1960	37	1.17E-08	8.92E-11	7.84E-06	3.27E-08
1961	36	3.68E-08	3.20E-10	2.81E-05	1.17E-07
1962	35	4.21E-04	4.18E-06	3.67E-01	1.53E-03
1963	34	1.43E-04	1.62E-06	1.42E-01	5.93E-04
1964	33	1.98E-05	2.56E-07	2.25E-02	9.37E-05
1965	32	2.50E-05	3.68E-07	3.24E-02	1.35E-04
1966	31	4.57E-05	7.68E-07	6.75E-02	2.81E-04
1967	30	4.48E-05	8.59E-07	7.55E-02	3.15E-04
1968	29	1.25E-05	2.73E-07	2.40E-02	1.00E-04
1969	28	8.00E-05	2.00E-06	1.76E-01	7.31E-04
1970	27	3.20E-04	9.11E-06	8.01E-01	3.34E-03
1971	26	2.38E-04	7.73E-06	6.80E-01	2.83E-03
1972	25	1.02E-04	3.78E-06	3.32E-01	1.38E-03
1973	24	1.83E-04	7.74E-06	6.80E-01	2.83E-03
1974	23	2.18E-03	1.05E-04	9.25E+00	3.85E-02
1975	22	3.12E-03	1.72E-04	1.51E+01	6.29E-02
1976	21	9.44E-06	5.93E-07	5.21E-02	2.17E-04
1977	20	2.20E-07	1.58E-08	1.39E-03	5.77E-06
1978	19	2.42E-05	1.98E-06	1.74E-01	7.24E-04
1979	18	2.20E-05	2.05E-06	1.80E-01	7.51E-04
1980	17	1.18E-05	1.26E-06	1.10E-01	4.60E-04
1981	16	1.06E-05	1.29E-06	1.13E-01	4.71E-04
1982	15	1.75E-06	2.42E-07	2.13E-02	8.88E-05
1983	14	5.87E-06	9.27E-07	8.15E-02	3.40E-04
1984	13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1985	12	4.39E-06	9.03E-07	7.94E-02	3.31E-04
1986	11	9.65E-06	2.26E-06	1.99E-01	8.29E-04
1987	10	9.35E-06	2.50E-06	2.20E-01	9.17E-04
1988	9	6.98E-06	2.13E-06	1.87E-01	7.81E-04
1989	8	3.20E-05	1.11E-05	9.80E-01	4.08E-03
1990	7	1.83E-05	7.27E-06	6.39E-01	2.66E-03
1991	6	8.81E-06	4.00E-06	3.51E-01	1.46E-03
1992	5	7.51E-06	3.89E-06	3.42E-01	1.42E-03
	Totals =	7.12E-03	3.58E-04	3.15E+01	1.31E-01
		(Ci)	(Ci)	(pCi/M2)	(pCi/kg)
rowegas.wk3					

① Decay Corrected Act. $= A_0 e^{-\lambda t}$ = C12 * e Exp(-B$5 * B12) = D12 = Q_t ✓
= 1.17(-8) · $e^{-(0.1318 \times 37)}$ = 8.92E-11 (Ci) ✓

② Surface Activity (decayed) = Q_t (Ci) * 1E12 ($\frac{pCi}{Ci}$) * D/Q_c ($\frac{1}{m^2}$) = D12 * 1E12 * E$5 = E12 ✓
= 8.92 E-11 * 1E+12 * 8.79 E-8 = 7.84 E-6 (pCi/m^2) = A_t ✓

③ Vol. conc. decayed = A_t (pCi/m^2) / ρ (Kg/m^3) = E12/E$6 = F12 ✓
= 3.27 E-8 (pCi/Kg)

Appendix A., Spreadsheet Printouts

1. Selected Nuclide Properties	(YRGASEF.WB2, SH. G)
2. Gaseous Release Summary & Soil Concentrations	(YRGASEF.WB2, SH. F)
3. Estimated Annual Undecayed Releases-1960 through 1971	(YRGASEF.WB2, SH. B)
4. Reported Annual Undecayed Releases-1972 through 1992	(YRGASEF.WB2, SH. C)
5. Estimated Annual Decayed Releases-1960 through 1971	(YRGASEF.WB2, SH. D)
6. Reported Annual Decayed Releases-1972 through 1992	(YRGASEF.WB2, SH. E)
7. Detail of Annual Releases-1972 through 1975	(G71-75.WK3)
8. Detail of Annual Releases-1976 through 1980	(G76-80.WK3)
9. Detail of Annual Releases-1981 through 1985	(G81-85.WK3)
10. Detail of Annual Releases-1986 through 1990	(G86-90.WK3)
11. Detail of Annual Releases-1991 through 1992	(G91-92.WK3)

ATTACHMENT A

Calculation of Atmospheric Deposition Factors

Prepared by: *RB Harvey, Jr.* RBH

Reviewed by: JLM

Calculation of Atmospheric Deposition Factors

1.0 CALCULATION OBJECTIVE

Generate an atmospheric deposition factor (D/Q value) which can be used to estimate the maximum possible concentrations of radionuclide contaminants in the soil surrounding YNPS based on primary vent stack releases from plant start-up to present. This effort pertains to information required to support the "non-impacted area" classification as described in Rev. 0 of the YNPS Final Status Survey Plan (Reference 1).

The YNPS Final Status Survey Plan defines "non-impacted areas" as areas of YNPS property outside of the "unaffected area" that have not been impacted by plant operations.[a] The "unaffected area" essentially extends from the "affected area" (which is centered around the vapor container) to a 20-meter wide buffer zone outside of the owner controlled area fence[b] as shown in Exhibit A-1.

Note that this D/Q calculation differs from previous calculations of atmospheric dispersion factors for YNPS (e.g., YRC-437, YRC-501, and YRC-830) in that the previous calculations were concerned with identifying the highest atmospheric dispersion factors which occurred beyond the site boundary (which extends 450-2400m downwind; see Exhibit A-3) whereas this calculation is concerned with identifying the highest atmospheric dispersion factors which occurred beyond the owner controlled area (which extends 100-200m downwind; see Exhibit A-1).

[a]Section 4.1.2 of Reference 1.

[b]Section 4.2 of Reference 1.

Prepared by: *RB Harvey, Jr.* (10/97) Reviewed by: JAM

2.0 METHOD OF SOLUTION

The required atmospheric deposition factor (D/Q value) was calculated using the DE&S computer code AEOLUS2 (Reference 2). AEOLUS2 is approved for use in non-safety calculations per YA-REG-200. The use of AEOLUS2 is appropriate for this application since it was developed to fulfill the RG 1.111 (Reference 3) criteria for estimating atmospheric transport and dispersion for routine releases from nuclear power facilities. There are currently no open software problem reports applicable to AEOLUS2.

The current set of atmospheric dispersion factors in the ODCM were calculated in YRC-501 (Reference 4). In order to account for wind channeling effects through the valley, the ODCM atmospheric dispersion factors were determined assuming seven downwind sectors (SSE clockwise through WNW) formed the valley. If a particular receptor location was in one of these valley sectors, the contribution from the other six valley sectors was also included. The effective valley width was assumed to be twice the width of a 22.5° sector. Consequently, the SSE clockwise through WNW sector dispersion factors were added together and divided by two. This "valley model" was applied for distances greater than 500 m from the stack where valley effects were assumed to cause channeling (see Exhibit A-2).

For the purposes of this analysis, the primary area of interest lies within the YNPS site boundary where stack-high terrain is generally encountered downwind in the "non-impacted area" before reaching the site boundary (as shown in Exhibit A-3). As such, it was decided for this analysis to run AEOLUS2 as a straight-line trajectory model and not account for wind channeling effects. Receptors were placed downwind at increments of 100 m in each sector starting at 100 m until a terrain height exceeding the maximum effective plume height of 120.8 m was encountered.[c]

AEOLUS2 was executed using five years of YNPS on-site meteorological data, from January 1987 through December 1991.[d] The meteorological data base was obtained by merging the Software Control Library files YRMET87, YRMET88, YRMET89, YRMET90, and YRMET91.

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[c]The maximum effective plume height h_e (release height h_s plus plume rise h_{pr} expressed in meters above plant grade) occurs with a maximum plume rise which happens during unstable conditions with light winds. Maximum plume rise can be predicted utilizing the following equation (Equation 4.40 of the AEOLUS2 Technical Manual) assuming a primary vent stack exit velocity w_o of 10.5 m/sec (representing 20,000 cfm being exhausted through a diameter stack d of 1.07 m) and a 0.447 m/sec (1 mph) wind speed

$$h_{pr} = 3\,(w_o/u)\,d = 3\,(10.5/0.447)\,1.07 = 75.4\ m$$

Consequently, the predicted maximum effective plume height above plant grade is:

$$h_e = h_s + h_{pr} = 45.4\ m + 75.4\ m = 120.8\ m$$

[d]These five years were chosen because they represent the last five years of plant operation.

Prepared by: *RB Harvey, Jr.* RBH

Reviewed by: JDM

3.0 INPUTS AND ASSUMPTIONS

The following assumptions were used in executing AEOLUS2 for this analysis:

- Sector average D/Q values (which are applicable to long-term releases) were generated.
- All releases were assumed to occur through the primary vent stack. This release pathway was modeled as a RG 1.111 (Reference 3) mix-mode release since the primary vent stack release height is at the height of the adjacent vapor container. A normal stack exit flow rate of 20,000 cfm (indicative of the operation of one stack fan) was assumed for the determination of plume entrainment and plume rise.
- In accordance with guidance from the XOQDOQ User's Manual (Reference 7), lower level wind data were provided as input. These data were used "as is" to disperse the ground-mode portion of the plume and were extrapolated up to the PVS release height for evaluating plume entrainment effects and for determining plume rise and dispersion for the elevated-mode portion of the plume.
- Upper level wind direction data were provided to the code to determine plume transport. The lower level wind direction sensor is often affected by localized nocturnal drainage flowing down the east and south slopes of the river valley within the plant vicinity. Consequently, the upper level wind direction measurements are generally considered to be more representative of general flow conditions within the valley.
- The RG 1.111 depletion/deposition model was used to determine the D/Q values. Wet depletion/deposition and decay-in-transit effects were not considered.

Specific plant and receptor data input requirements for AEOLUS2 are listed in Attachment B to Reference 2. A listing of the inputs used is provided in Exhibit A-4; most of the inputs were derived from YRC-830 (Reference 5). An actual listing of the input deck is provided as part of the output listing provided in Exhibit A-6.

Prepared by: *RB Harvey, Jr.* (RBH) Reviewed by: JAM

4.0 CALCULATION/ANALYSIS

A partial listing of the AEOLUS2 output which includes all relevant program inputs and outputs is provided in Exhibit A-6.

Page 84 of the AEOLUS2 output shows that the highest calculated D/Q value is 8.79E-8 $1/m^2$, located at 500 m downwind in the SSW sector. (Note: that the highest offsite D/Q value calculated in YRC-501 for use in the YNPS ODCM is .02E-8 $1/m^2$, located at the site boundary 800 m SSE)

Prepared by: *RB Harvey, Jr.* RBH

Reviewed by: Jam

5.0 RESULTS/CONCLUSION

An appropriate atmospheric deposition factor (D/Q value) for use in estimating the maximum possible concentrations of radionuclide contaminants in the soil in the "non-impacted area" surrounding YNPS is 8.79E-8 $1/m^2$.

Prepared by: *RB Harvey, Jr.* **Reviewed by:**

6.0 REFERENCES

1. YAEC-1933, "Final Status Survey Plan for Site Release," Rev. 0.

2. YNSD Calculation YC-329, "Computer Code Documentation Package, AEOLUS-2, Mod 6," Rev. 0.

3. US Nuclear Regulatory Commission, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors," Regulatory Guide 1.111, Rev. 1, July 1977.

4. YNSD Calculation YRC-501, "Rowe ODCM Dose Conversion Factors," Rev. 0.

5. YNSD Calculation YRC-830, "Yankee Nuclear Power Station ODCM Atmospheric Dispersion/Deposition Factors," Rev. 1.

6. YNSD Calculation YRC-678, "Yankee Rowe Terrain Data," Rev. 0.

7. JF Sagendorf, JT Goll, and WF Sandusky, "XOQDOQ: Computer Program for the Meteorological Evaluation of Routine Effluent Releases at Nuclear Power Stations," NUREG/CR-2919, Pacific Northwest Laboratory, September 1982.

Prepared by: *RB Harvey, Jr.* Reviewed by: JGH

EXHIBIT A-1

YNPS Final Status Survey Plan
Location of Unaffected and Non-impacted Areas

YNPS FINAL STATUS SURVEY PLAN REVISION 0

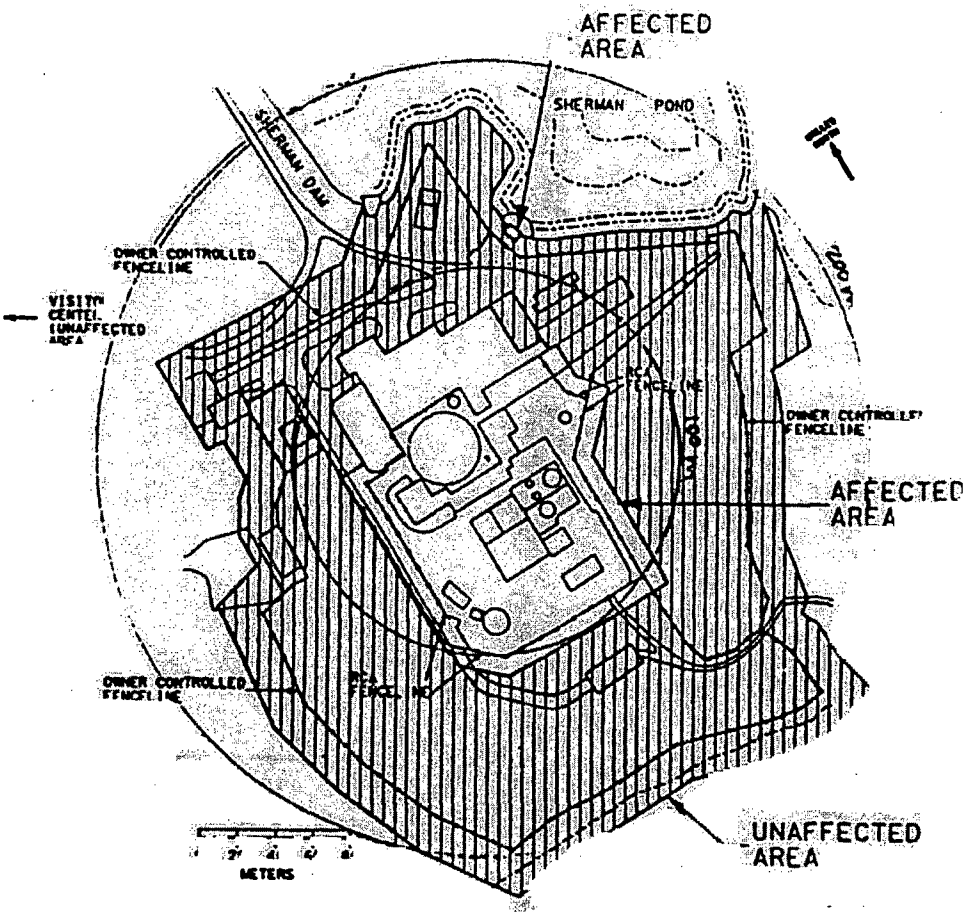


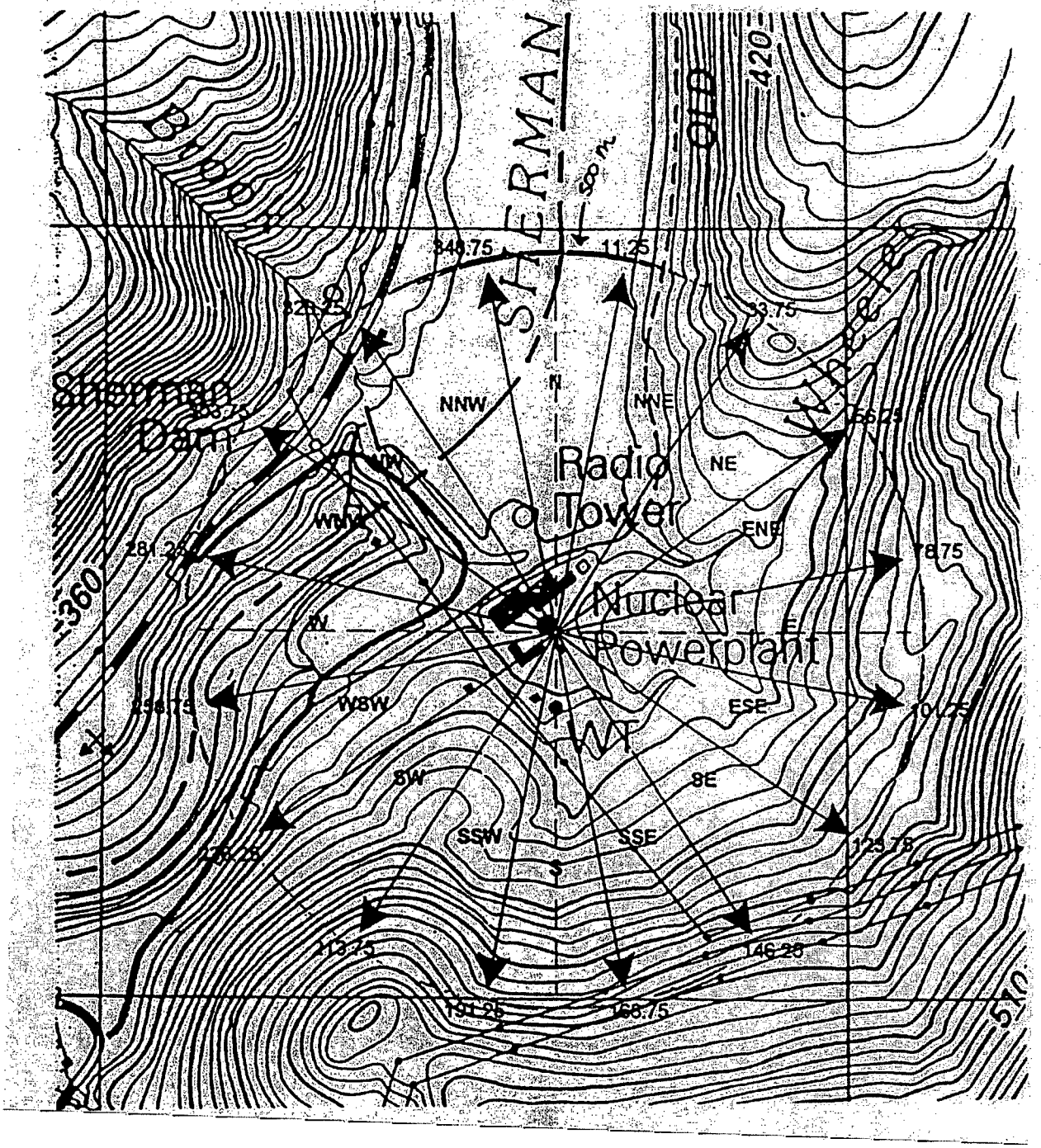
FIGURE 2.3

Initial Classification of YNPS Site

Prepared by: *RB Harvey, Jr.* Reviewed by: JTM

EXHIBIT A-2

YNPS Site Topographic Map



Prepared by: *RB Harvey, Jr.* Reviewed by: Jam

EXHIBIT A-3

YNPS Site Boundary

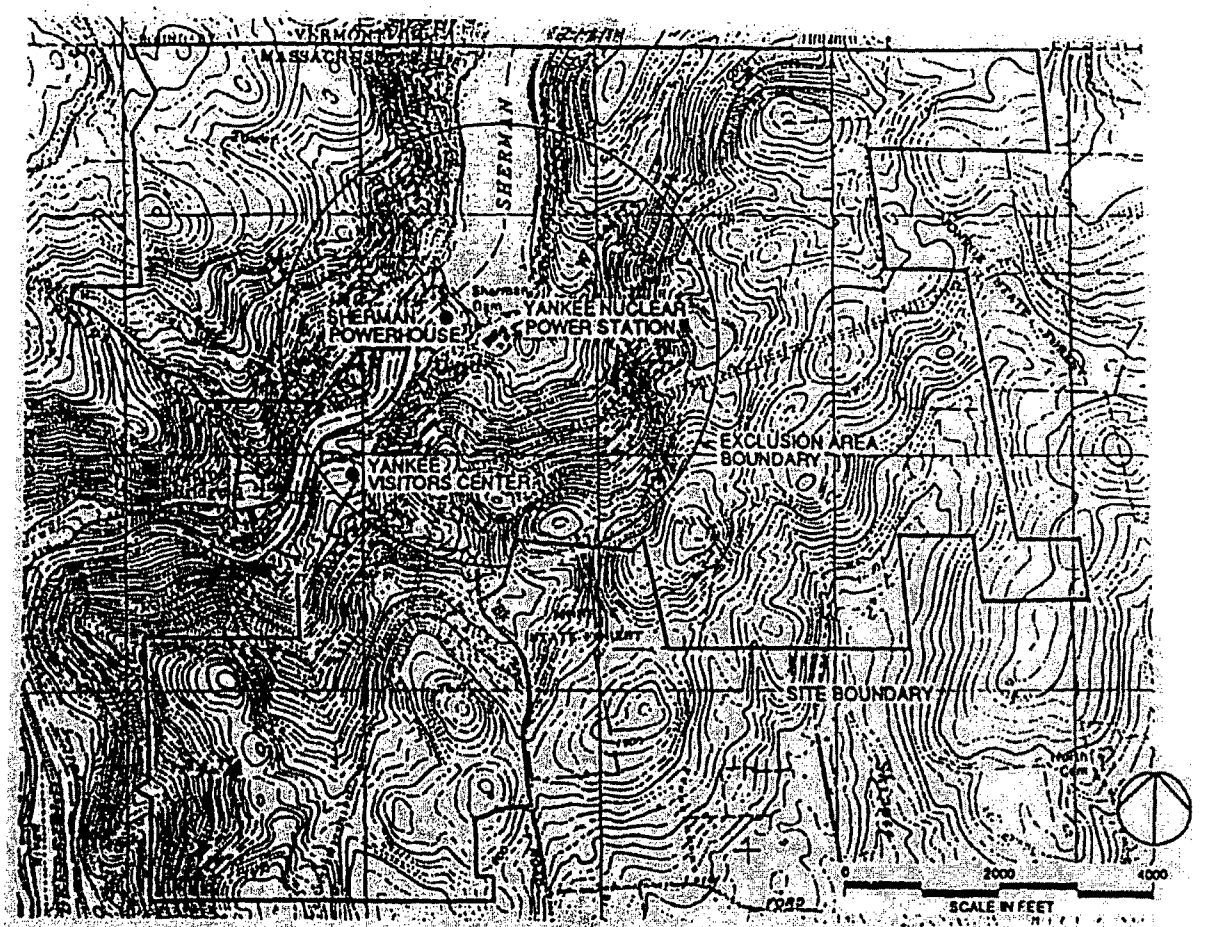


FIGURE 1-1
YANKEE NUCLEAR POWER STATION
SITE BOUNDARY LINES

Prepared by: *RB Harvey, Jr.* Reviewed by: JGM

EXHIBIT A-4

Lists of Plant and Receptor Inputs to AEOLUS2(c)

Input Line 1		Run Title
TITLE		YNPS NON-IMPACT AREA D/Q VALUES
Input Line 2		Program Control Options
KPRINT	0	Set printout control option to short printout
KTP7	1	Set the control option for transferring information to tape7 to sector average CHI/Q and D/Q values
KMN	0	Set meander control option to exclude plume meander consideration in the plume centerline CHI/Q
KCF	0	Set control option for recirculation correction to no correction
KWEXP	1	Set wind speed extrapolation control option to use the built-in extrapolation coefficients from XOQDOQ
KGX	0	Set the gamma CHI/Q control option to bypass this calculation
KSIG	1	Set the model selection control option for the dispersion coefficients to the Eimutis/Konicek model in XOQDOQ
KVORS	0	Set the seabreeze/valley model option selection to open terrain analysis
KDEPL	0	Set the depletion model control option to the RG 1.111 depletion and deposition curves
KRAIN	0	Set the wet deposition control option to not evaluate wet deposition effects
NWSIN	12	Set the number of wind speed groups to twelve

(c)The plant and receptor data input requirements for AEOLUS2 are listed in Attachment B to Reference 2. Most of the inputs listed here were derived from YRC-830 (Reference 5).

Prepared by: *RB Harvey, Jr.* 2/8/94 Reviewed by: JAM

EXHIBIT A-4

NEG	0	Set the number of gamma energy groups in the user-specified spectrum to zero
INTERM	{ }	Leave the duration of intermittent releases blank
IPCT	{ }	Leave the hourly value exceedance probability for intermittent releases blank
NMONTH	60	Set the number of monthly records in the met data base which will be analyzed to 60 (5 years)

Input Line Set 3 — Wind Speed Group Definitions

Input Line Set 3A

WSLIM(2)	0.42	Set the upper wind speed in the first wind speed group to 0.42 m/sec (This is the minimum wind speed acceptable as a valid observation and corresponds to an assumed anemometer/wind vane starting speed of 0.95 mph)
WSLIM(3)	0.92	Set the upper wind speed in the second wind speed group to 0.92 m/sec
WSLIM(4)	1.59	Set the upper wind speed in the third wind speed group to 1.59 m/sec
WSLIM(5)	3.37	Set the upper wind speed in the fourth wind speed group to 3.37 m/sec
WSLIM(6)	5.61	Set the upper wind speed in the fifth wind speed group to 5.61 m/sec
WSLIM(7)	8.29	Set the upper wind speed in the sixth wind speed group to 8.29 m/sec
WSLIM(8)	10.97	Set the upper wind speed in the seventh wind speed group to 10.97 m/sec
WSLIM(9)	14.10	Set the upper wind speed in the eighth wind speed group to 14.10 m/sec

Input Line Set 3B

WSLIM(10)	17.23	Set the upper wind speed in the ninth wind speed group to 17.23 m/sec
WSLIM(11)	20.81	Set the upper wind speed in the tenth wind speed group to 20.81 m/sec

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EXHIBIT A-4

WSLIM(12)	24.38	Set the upper wind speed in the eleventh wind speed group to 24.38 m/sec
WSLIM(13)	40.23	Set the upper wind speed in the twelfth wind speed group to 40.23 m/sec (This corresponds to the maximum wind speed acceptable as a valid observation, 90 mph)

Input Line 4 Wind Speed Extrapolation Data

Omit this input line since the AEOLUS-2 built-in extrapolation coefficients will be used

Input Line 5 Release Point Data

HREL	45.41	Set the height of release to the primary vent stack height of 45.41 m above plant grade (0.01m higher than the adjacent building height to ensure a mix-mode release)
HBLD	45.4	Set the height of the building adjacent to the release point causing the building wake effects to the vapor container height of 45.4 m above plant grade
BAREA	1575.	Set the cross-sectional area of the building adjacent to the release point causing building wake effects to the vapor container cross-sectional area of 1575 m^2
DIAMTR	1.07	Set the effluent vent effective internal diameter to the primary vent stack diameter of 1.07 m
VFLOW	20000.	Set the effluent vent flow rate to the primary vent stack flow rate of 20,000 cfm
QH	0.	Set the stack effluent heat content to zero to ignore buoyant plume rise

Input Line 6 General Site Data

HINV	950.	Set the annual average height of the inversion layer to the YNPS annual mixing layer height of 950 m.
HFMX	950.	Set the maximum allowed plume centerline height to the annual average inversion layer height of 950 m

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EXHIBIT A-4

THLFNG	0.	Set the noble gas half-life for decay-in-transit analysis to zero (e.g., do not consider decay-in-transit)
THLFNG	0.	Set the iodine half-life for decay-in-transit analysis to zero (e.g., do not consider decay-in-transit)
SCAVCF(1)	{ }	Leave the first coefficient in the rainfall scavenging rate equation blank (e.g., do not consider wet deposition)
SCAVCF(2)	{ }	Leave the second coefficient in the rainfall scavenging rate equation blank (e.g., do not consider wet deposition)

Input Lines 7-9 Gamma Energy Spectra Data

Omit these input lines since gamma CHI/Q values will not be generated

Input Line Set 10 Deposition Velocity/Atmospheric Stability Correlations

Omit these input lines since the RG 1.111 depletion and deposition curves are used to generate the deposition factors

Input Line 11 Meteorological Data Input Format

IMT (4F2.0,F3.1,16X,F3.0,6X,F4.1,28X,2F3.2)

Format for input of year, month, day, hour, lower wind speed data, upper wind direction data, delta-temperature data, precipitation data, and solar radiation data

Input Line 12 Meteorological Data Sequence

ID(1)	1	Sequence number of year in IMT
ID(2)	2	Sequence number of month in IMT
ID(3)	3	Sequence number of day in IMT
ID(4)	4	Sequence number of hour in IMT
ID(5)	6	Sequence number of wind direction data in IMT

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EXHIBIT A-4

ID(6)	5	Sequence number of wind speed data in IMT
ID(7)	7	Sequence number of delta-temperature data in IMT
ID(8)	9	Sequence number of solar radiation data in IMT
ID(9)	8	Sequence number of precipitation data in IMT
KPRMET	12	Set the printout control option for the hourly meteorological data to print the first 12 hourly meteorological data records in each month
KPRJFD	1	Set the printout control option for the joint frequency distributions to include the distributions in the printout
Input Line 13		Meteorological Data Base Entries
WDMAX	540.	Set the maximum wind direction value acceptable as a valid observation to 540° (values of 999 in the data base indicate missing data)
WSMAX	90.	Set the maximum wind speed value acceptable as a valid observation to 90 mph (values of 99.9 in the data base indicate missing data)
DTMAX	15.	Set the maximum delta-temperature value acceptable as a valid observation to 15°F (values of 999.9 in the data base indicate missing data)
SUNMAX	2.0	Set the maximum solar radiation value acceptable as a valid observation to 2.0 langley/min (values of 9.99 in the data base indicate missing data)
RAINMX	5.0	Set the maximum precipitation value acceptable as a valid observation to 5.0 inches (values of 9.99 in the data base indicate missing data)
Input Line 14		Meteorological Data Conversion Factors
WSCONV	0.447	Set the conversion factor to convert the data base wind speed data from mph to m/sec to 0.447
DTCONV	0.556	Set the conversion factor to convert the data base delta-temperature data from mph to m/sec to 0.447

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EXHIBIT A-4

SUNCON	1.	Set the conversion factor to convert the data base solar radiation data from langley/min to cal/cm^2-min to 1.0 (langley = cal/cm^2)
RAINCV	25.4	Set the conversion factor to convert the data base precipitation data from inches to mm to 25.4
WSCALM	0.21	Set the wind speed assigned to calms to 0.21 m/sec, one-half the assumed anemometer/wind speed starting speed of 0.42 m/sec (0.95 mph)
WSHITE	10.	Set the height of the wind speed measurement to 10 m above plant grade
DH	50.	Set the delta-temperature sensor separation on the meteorological tower to 50 m (197 ft - 33 ft = 164 ft = 50 m)
WDVAR	888.	Set the variable wind direction identifier to 888° (not used)

Input Lines 15-19 Seabreeze Data

Omit these input lines since the seabreeze model option is not being executed

Input Lines 20-21 Valley Data

Omit these input lines since the valley model option is not being executed

Input Line 22 Start of Receptor Deck

TITL START OF RECEPTOR DECK

Input Line Set 23-xx Receptor Data

The remaining input lines which provide receptor data are listed in Exhibit A-3

Input Line 23A-xxA Receptor Distances

DIST	*	Provide receptor distances (in meters) for each sector starting at 100 m and increasing in 100 m increments until the terrain height in all sectors exceeds 115 m
RIDENT	*	Set the receptor identifier to the downwind distance

Prepared by: *RB Harvey, Jr.* (RBH) Reviewed by: JAM

EXHIBIT A-4

Input Line 23B-xxB		Receptor Data
ISCT	*	List each downwind sector until the terrain height for that sector exceeds 115 m
KPRT	0	Set the printout control option to suppress the printout for all receptors
IVALOC	0	Set the valley location identifier for all receptors to indicate that each receptor is in open terrain
HTERN	*	Set the receptor terrain height to the maximum terrain height between the release point and the receptor as listed in YRC-678 (Reference 6)
RCF	0.	Set the recirculation correction factors for all receptors to zero
VWIDTH	0.	Set the valley width for all receptors to zero
VSLOPE	0.	Set the valley slope for all receptors to zero
VDIST	{ }	Leave the receptor distance along the valley blank for all receptors
DESCR	*	Set the receptor identifier to the receptor's downwind distance and sector

Prepared by: *RB Harvey, Jr.* RBH

Reviewed by: Jam

EXHIBIT A-5

Receptor Data

DIST	RIDENT	ISCT	KPRT	IVALOC	HTERN	RCF	VWIDTH	VSLOPE	VDIST	DESCR
100.	100M	N	0		0.00	0.				100M N
		NNE	0		0.00	0.				100M NNE
		NE	0		12.19	0.				100M NE
		ENE	0		18.29	0.				100M ENE
		E	0		18.29	0.				100M E
		ESE	0		18.29	0.				100M ESE
		SE	0		6.10	0.				100M SE
		SSE	0		12.19	0.				100M SSE
		S	0		24.38	0.				100M S
		SSW	0		24.38	0.				100M SSW
		SW	0		0.00	0.				100M SW
		WSW	0		12.19	0.				100M WSW
		W	0		0.00	0.				100M W
		WNW	0		0.00	0.				100M WNW
		NW	0		0.00	0.				100M NW
		NNW	0		0.00	0.				100M NNW
200.	200M	N	0		0.00	0.				200M N
		NNE	0		0.00	0.				200M NNE
		NE	0		12.19	0.				200M NE
		ENE	0		18.29	0.				200M ENE
		E	0		18.29	0.				200M E
		ESE	0		18.29	0.				200M ESE
		SE	0		12.19	0.				200M SE
		SSE	0		18.29	0.				200M SSE
		S	0		36.58	0.				200M S
		SSW	0		42.67	0.				200M SSW
		SW	0		42.67	0.				200M SW

Prepared by: *RB Harvey, Jr.* Reviewed by: JAM

EXHIBIT A-5

DIST	RIDENT	ISCT	KPRT	IVALOC	HTERN	RCF	VWIDTH	VSLOPE	VDIST	DESCR
		WSW	0	0	12.19	0.	0.			200M WSW
		W	0	0	0.00	0.	0.			200M W
		WNW	0	0	0.00	0.	0.			200M WNW
		NW	0	0	0.00	0.	0.			200M NW
		NNW	0	0	0.00	0.	0.			200M NNW
300.	300M	N	0	0	0.00	0.	0.			300M N
		NNE	0	0	6.10	0.	0.			300M NNE
		NE	0	0	18.29	0	0			300M NE
		ENE	0	0	18.29	0	0			300M ENE
		E	0	0	18.29	0.	0.			300M E
		ESE	0	0	30.48	0.	0.			300M ESE
		SE	0	0	42.67	0	0.			300M SE
		SSE	0	0	48.77	0.	0.			300M SSE
		S	0	0	48.77	0	0.			300M S
		SSW	0	0	60.96	0.	0.			300M SSW
		SW	0	0	60.96	0	0			300M SW
		WSW	0	0	24.38	0	0			300M WSW
		W	0	0	0.00	0.	0.			300M W
		WNW	0	0	0.00	0.	0.			300M WNW
		NW	0	0	0.00	0.	0.			300M NW
		NNW	0	0	0.00	0.	0.			300M NNW
400.	400M	N	0	0	0.00	0.	0.			400M N
		NNE	0	0	30.48	0.	0.			400M NNE
		NE	0	0	36.58	0.	0.			400M NE
		ENE	0	0	30.48	0.	0.			400M ENE
		E	0	0	36.58	0.	0.			400M E
		ESE	0	0	48.77	0.	0.			400M ESE
		SE	0	0	73.15	0.	0.			400M SE

Prepared by: *RB Harvey, Jr.* RBH

Reviewed by: JAM

EXHIBIT A-5

DIST	RIDENT	ISCT	KPRT	IVALOC	HTERN	RCF	VWIDTH	VSLOPE	VDIST	DESCR
		SSE			79.25	0.				400M SSE
		S			85.35	0.				400M S
		SSW			91.44	0.				400M SSW
		SW			91.44	0.				400M SW
		WSW			24.38	0.				400M WSW
		W			0.00	0.				400M W
		WNW			0.00	0.				400M WNW
		NW			6.10	0.				400M NW
		NNW			0.00	0.				400M NNW
500.	500M	N			0.00	0.				500M N
		NNE			48.77	0.				500M NNE
		NE			48.77	0.				500M NE
		ENE			60.96	0.				500M ENE
		E			73.15	0.				500M E
		ESE			73.15	0.				500M ESE
		SE			103.63	0.				500M SE
		SSE			115.83	0.				500M SSE
		S			121.92	0.				500M S
		SSW			128.02	0.				500M SSW
		SW			115.83	0.				500M SW
		WSW			24.38	0.				500M WSW
		W		0	0.00	0.	0.			500M W
		WNW		0	12.19	0.	0.			500M WNW
		NW		0	30.48	0.	0.			500M NW
		NNW		0	12.19	0.	0.			500M NNW
600.	600M	N		0	0.00	0.	0.			600M N
		NNE		0	67.06	0.	0.			600M NNE
		NE		0	73.15	0.	0.			600M NE

Prepared by: *RB Harvey, Jr.* (RBH)

Reviewed by: JAM

EXHIBIT A-5

DIST	RIDENT	ISCT	KPRT	IVALVC	HTERN	RCF	VWIDTH	VSLOPE	VDIST	DESCR
		ENE			97.54	0.				600M ENE
		E			128.02	0.				600M E
		ESE			128.02	0.				600M ESE
		SE			134.11	0.				600M SE
		SSE			152.40	0.				600M SSE
		SW			121.92	0.				600M SW
		WSW			24.38	0.				600M WSW
		W			24.38	0.				600M W
		WNW			67.06	0.				600M WNW
		NW			85.35	0.				600M NW
		NNW			30.48	0.				600M NNW
700.	700M	N			0.00	0.				700M N
		NNE			85.35	0.				700M NNE
		NE			97.54	0.				700M NE
		ENE			146.31	0.				700M ENE
		WSW			24.38	0.				700M WSW
		W			67.06	0.				700M W
		WNW			121.92	0.				700M WNW
		NW			134.11	0.				700M NW
		NNW			73.15	0.				700M NNW
800.	800M	N			12.19	0.				800M N
		NNE			109.73	0.				800M NNE
		NE	0	0	121.92	0.	0.			800M NE
		WSW	0	0	24.38	0.	0.			800M WSW
		W	0	0	85.35	0.	0.			800M W
		NNW	0	0	115.83	0.	0.			800M NNW
900.	900M	N	0	0	12.19	0.	0.			900M N
		NNE	0	0	121.92	0.	0.			900M NNE

Prepared by: *RB Harvey, Jr.* (RBH) Reviewed by: Jan

EXHIBIT A-5

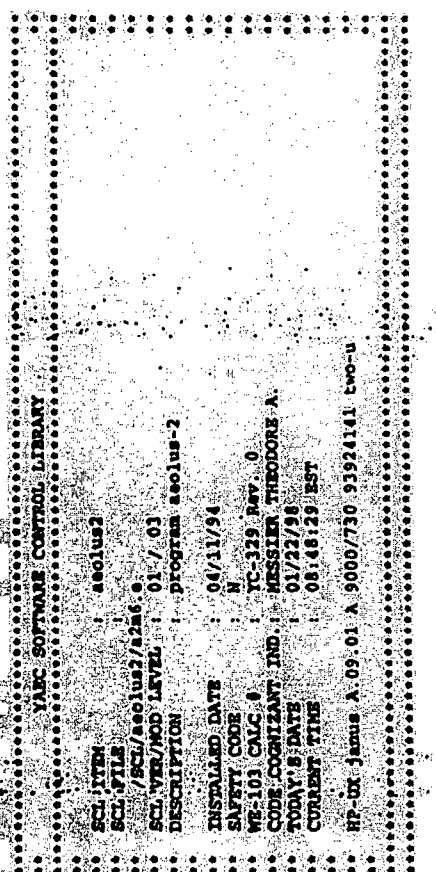
DIST	RIDENT	ISCT	KPRT	IVALOC	HTERN	RCF	VWIDTH	VSLOPE	VDIST	DESCR
		WSW			36.58	0.				900M WSW
		W			109.73	0.				900M W
		NNW			152.40	0.				900M NNW
1000.	1000M	N			12.19	0.				1000M N
		WSW			79.25	0.				1000M WSW
		W			134.11	0.				1000M W
1100.	1100M	N			24.38	0.				1100M N
		WSW			109.73	0.				1100M WSW
1200.	1200M	N			30.48	0.				1200M N
		WSW			109.73	0.				1200M WSW
1300.	1300M	N			48.77	0.				1300M N
		WSW			109.73	0.				1300M WSW
1400.	1400M	N			85.35	0.				1400M N
		WSW			109.73	0.				1400M WSW
1500.	1500M	N			140.21	0.				1500M N
		WSW			152.40	0.				1500M WSW

Prepared by: *RB Harvey, Jr.*

Reviewed by: JGM

EXHIBIT A-6

Partial Listing of the AEOLUS2 Program Output



```
1
                YRC SOFTWARE CONTROL LIBRARY

        SCI.TITE  : aeolus2
        SCI.FILE  :
        SCI.VER/MOD LEVEL : /SCL/aeolus2/a254.0
        DESCRIPTION : 01 / 03
                    : program aeolus-2
        INSTALLED DATE : 04/11/94
        SAFETY CODE : N
        WE-101 CALC # : TC-329 Rev. 0
        CODE COGNIZANT IND. : HESSLER, THEODORE A.
        TODAY'S DATE : 01/22/98
        CURRENT TIME : 08:48:29 EST
        HP-UX jamus A.09.01 A 9000/730 93924141 two-u
```

Prepared by: *RB Harvey, Jr.* (RBH)

Reviewed by: Jam

ARCLUS-2 (ATMOS. DISPERSION & FINITE CLOUD MODELING) - YAEC/ENTECH ENG. INC - (MOD 06 - 03/29/94) 98/01/22. PAGE 1

TAPE 4 INPUT DATA LISTING

```
CARD          1         2         3         4         5         6         7         8
SEQ      12345678901234567890123456789012345678901234567890123456789012345678901234567890
  1      YNPS NON-IMPACTED AREA D/Q VALUES
  2          0    1    0    0    1    0    1    0    0    0   12    0              60
  3      0.42      0.92      1.59      3.37      5.61      8.29      10.97     14.10
  4      17.23     20.81     24.38     40.23
  5      45.41     45.4      1575.     1.07      20000.    0.
  6      950.      950.      0.        0.
  7      (4F2.0,F3.1,16X,F3.0,6X,F4.1,28X,2F3.2)
  8          1    2    3    4    6    5    7    9    8   12    1
  9      540.      90.       15.       2.0       5.0
 10      0.447     0.556     1.        25.4      0.21      10.       50.       888.
 11      START OF RECEPTOR DECK
 12      100.                                                                  100M
 13      N   0     0       0.00      0.0       0.0       0.0             100M N
 14      NNE 0     0       0.00      0.0       0.0       0.0             100M NNE
 15      NE  0     0      12.19      0.0       0.0       0.0             100M NE
 16      ENE 0     0      18.29      0.0       0.0       0.0             100M ENE
 17      E   0     0      18.29      0.0       0.0       0.0             100M E
 18      ESE 0     0      18.29      0.0       0.0       0.0             100M ESE
 19      SE  0     0       6.10      0.0       0.0       0.0             100M SE
 20      SSE 0     0      12.19      0.0       0.0       0.0             100M SSE
 21      S   0     0      24.38      0.0       0.0       0.0             100M S
 22      SSW 0     0      24.38      0.0       0.0       0.0             100M SSW
 23      SW  0     0       0.00      0.0       0.0       0.0             100M SW
 24      WSW 0     0      12.19      0.0       0.0       0.0             100M WSW
 25      W   0     0       0.00      0.0       0.0       0.0             100M W
 26      WNW 0     0       0.00      0.0       0.0       0.0             100M WNW
 27      NW  0     0       0.00      0.0       0.0       0.0             100M NW
 28      NNW 0     0       0.00      0.0       0.0       0.0             100M NNW
 29      200.                                                                  200M
 30      N   0     0       0.00      0.0       0.0       0.0             200M N
 31      NNE 0     0       0.00      0.0       0.0       0.0             200M NNE
 32      NE  0     0      12.19      0.0       0.0       0.0             200M NE
 33      ENE 0     0      18.29      0.0       0.0       0.0             200M ENE
 34      E   0     0      18.29      0.0       0.0       0.0             200M E
 35      ESE 0     0      18.29      0.0       0.0       0.0             200M ESE
 36      SE  0     0      12.19      0.0       0.0       0.0             200M SE
 37      SSE 0     0      18.29      0.0       0.0       0.0             200M SSE
 38      S   0     0      36.58      0.0       0.0       0.0             200M S
 39      SSW 0     0      42.67      0.0       0.0       0.0             200M SSW
 40      SW  0     0      42.67      0.0       0.0       0.0             200M SW
 41      WSW 0     0      12.19      0.0       0.0       0.0             200M WSW
 42      W   0     0       0.00      0.0       0.0       0.0             200M W
 43      WNW 0     0       0.00      0.0       0.0       0.0             200M WNW
 44      NW  0     0       0.00      0.0       0.0       0.0             200M NW
 45      NNW 0     0       0.00      0.0       0.0       0.0             200M NNW
 46      300.                                                                  300M
 47      N   0     0       0.00      0.0       0.0       0.0             300M N
```

Prepared by: RB Harvey, Jr. (RBH)

Reviewed by: [signature]

TAPE 4 INPUT DATA LISTING

CARD SEQ.	1 2345678901	2 2345678901	3 2345678901	4 2345678901	5 2345678901	6 2345678901	7 2345678901	8 234567890
48	NNE	0	0	6.10	0.0	0.0	0.0	300M NNE
49	NE	0	0	18.29	0.0	0.0	0.0	300M NE
50	ENE	0	0	18.29	0.0	0.0	0.0	300M ENE
51	E	0	0	18.29	0.0	0.0	0.0	300M E
52	ESE	0	0	30.48	0.0	0.0	0.0	300M ESE
53	SE	0	0	42.67	0.0	0.0	0.0	300M SE
54	SSE	0	0	48.77	0.0	0.0	0.0	300M SSE
55	S	0	0	48.77	0.0	0.0	0.0	300M S
56	SSW	0	0	60.96	0.0	0.0	0.0	300M SSW
57	SW	0	0	60.96	0.0	0.0	0.0	300M SW
58	WSW	0	0	24.38	0.0	0.0	0.0	300M WSW
59	W	0	0	0.00	0.0	0.0	0.0	300M W
60	WNW	0	0	0.00	0.0	0.0	0.0	300M WNW
61	NW	0	0	0.00	0.0	0.0	0.0	300M NW
62	NNW	0	0	0.00	0.0	0.0	0.0	300M NNW
63	400.							400M
64	N	0	0	0.00	0.0	0.0	0.0	400M N
65	NNE	0	0	30.48	0.0	0.0	0.0	400M NNE
66	NE	0	0	36.58	0.0	0.0	0.0	400M NE
67	ENE	0	0	30.48	0.0	0.0	0.0	400M ENE
68	E	0	0	36.58	0.0	0.0	0.0	400M E
69	ESE	0	0	48.77	0.0	0.0	0.0	400M ESE
70	SE	0	0	73.15	0.0	0.0	0.0	400M SE
71	SSE	0	0	79.25	0.0	0.0	0.0	400M SSE
72	S	0	0	85.35	0.0	0.0	0.0	400M S
73	SSW	0	0	91.44	0.0	0.0	0.0	400M SSW
74	SW	0	0	91.44	0.0	0.0	0.0	400M SW
75	WSW	0	0	24.38	0.0	0.0	0.0	400M WSW
76	W	0	0	0.00	0.0	0.0	0.0	400M W
77	WNW	0	0	0.00	0.0	0.0	0.0	400M WNW
78	NW	0	0	6.10	0.0	0.0	0.0	400M NW
79	NNW	0	0	0.00	0.0	0.0	0.0	400M NNW
80	500.							500M
81	N	0	0	0.00	0.0	0.0	0.0	500M N
82	NNE	0	0	48.77	0.0	0.0	0.0	500M NNE
83	NE	0	0	48.77	0.0	0.0	0.0	500M NE
84	ENE	0	0	60.96	0.0	0.0	0.0	500M ENE
85	E	0	0	73.15	0.0	0.0	0.0	500M E
86	ESE	0	0	73.15	0.0	0.0	0.0	500M ESE
87	SE	0	0	103.63	0.0	0.0	0.0	500M SE
88	SSE	0	0	115.83	0.0	0.0	0.0	500M SSE
89	S	0	0	121.92	0.0	0.0	0.0	500M S
90	SSW	0	0	128.02	0.0	0.0	0.0	500M SSW
91	SW	0	0	115.83	0.0	0.0	0.0	500M SW
92	WSW	0	0	24.38	0.0	0.0	0.0	500M WSW
93	W	0	0	0.00	0.0	0.0	0.0	500M W
94	WNW	0	0	12.19	0.0	0.0	0.0	500M WNW

TAPE 4 INPUT DATA LISTING

CARD SEQ.	1 2 3 4 5 6 7 8 12345678901234567890123456789012345678901234567890123456789012345678901234567890						
95	NW	0	0	30.48	0.0	0.0	0.0	500M NW
96	NNW	0	0	12.19	0.0	0.0	0.0	500M NNW
97	600.							600M
98	N	0	0	0.00	0.0	0.0	0.0	600M N
99	NNE	0	0	67.06	0.0	0.0	0.0	600M NNE
100	NE	0	0	73.15	0.0	0.0	0.0	600M NE
101	ENE	0	0	97.54	0.0	0.0	0.0	600M ENE
102	E	0	0	128.02	0.0	0.0	0.0	600M E
103	ESE	0	0	128.02	0.0	0.0	0.0	600M ESE
104	SE	0	0	134.11	0.0	0.0	0.0	600M SE
105	SSE	0	0	152.40	0.0	0.0	0.0	600M SSE
106	SW	0	0	121.92	0.0	0.0	0.0	600M SW
107	WSW	0	0	24.38	0.0	0.0	0.0	600M WSW
108	W	0	0	24.38	0.0	0.0	0.0	600M W
109	WNW	0	0	67.06	0.0	0.0	0.0	600M WNW
110	NW	0	0	85.35	0.0	0.0	0.0	600M NW
111	NNW	0	0	30.48	0.0	0.0	0.0	600M NNW
112	700.							700M
113	N	0	0	0.00	0.0	0.0	0.0	700M N
114	NNE	0	0	85.35	0.0	0.0	0.0	700M NNE
115	NE	0	0	97.54	0.0	0.0	0.0	700M NE
116	ENE	0	0	146.31	0.0	0.0	0.0	700M ENE
117	WSW	0	0	24.38	0.0	0.0	0.0	700M WSW
118	W	0	0	67.06	0.0	0.0	0.0	700M W
119	WNW	0	0	121.92	0.0	0.0	0.0	700M WNW
120	NW	0	0	134.11	0.0	0.0	0.0	700M NW
121	NNW	0	0	73.15	0.0	0.0	0.0	700M NNW
122	800.							800M
123	N	0	0	12.19	0.0	0.0	0.0	800M N
124	NNE	0	0	109.73	0.0	0.0	0.0	800M NNE
125	NE	0	0	121.92	0.0	0.0	0.0	800M NE
126	WSW	0	0	24.38	0.0	0.0	0.0	800M WSW
127	W	0	0	85.35	0.0	0.0	0.0	800M W
128	NNW	0	0	115.83	0.0	0.0	0.0	800M NNW
129	900.							900M
130	N	0	0	12.19	0.0	0.0	0.0	900M N
131	NNE	0	0	121.92	0.0	0.0	0.0	900M NNE
132	WSW	0	0	36.58	0.0	0.0	0.0	900M WSW
133	W	0	0	109.73	0.0	0.0	0.0	900M W
134	NNW	0	0	152.40	0.0	0.0	0.0	900M NNW
135	1000.							1000M
136	N	0	0	12.19	0.0	0.0	0.0	1000M N
137	WSW	0	0	79.25	0.0	0.0	0.0	1000M WSW
138	W	0	0	134.11	0.0	0.0	0.0	1000M W
139	1100.							1100M
140	N	0	0	24.38	0.0	0.0	0.0	1100M N
141	WSW	0	0	109.73	0.0	0.0	0.0	1100M WSW

Prepared by: RB Harvey Jr. (RBH)

Reviewed by: JLM

EXHIBIT A-6

Attachment A

YRC-1178, Page A26

TAPE 4 INPUT DATA LISTING

```
CARD                1         2         3         4         5         6         7         8
SEQ.      1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890

142       1200.                                                                      1200M
143       N    0    0     30.48      0.0       0.0       0.0          1200M N
144       WSW  0    0    109.73      0.0       0.0       0.0          1200M WSW
145       1300.                                                                      1300M
146       N    0    0     48.77      0.0       0.0       0.0          1300M N
147       WSW  0    0    109.73      0.0       0.0       0.0          1300M WSW
148       1400.                                                                      1400M
149       N    0    0     85.35      0.0       0.0       0.0          1400M N
150       WSW  0    0    109.73      0.0       0.0       0.0          1400M WSW
151       1500.                                                                      1500M
152       N    0    0    140.21      0.0       0.0       0.0          1500M N
153       WSW  0    0    152.40      0.0       0.0       0.0          1500M WSW
```

Prepared by: RB Harvey, Jr. (RBH)

Reviewed by: JAM

ABOLUS-2 (ATMOS. DISPERSION & FINITE CLOUD MODELING) - YAEC/ENTECH ENG. INC - (MOD 06 - 03/29/94) 98/01/22. PAGE

TAPE10 INPUT DATA LISTING

```
CARD        1         2         3         4         5         6         7         8
SEQ.  12345678901234567890123456789012345678901234567890123456789012345678901234567890

    1  744
    2  87 1 1 0 26 44 43 8527 4444 12 7   44    4  44 162  44  44 113  44  44  0  0999991
    3  87 1 1 1 36 54 54 7832 5456 2012  54    0  54 152  54  54 100  54  54  0  0999991
    4  87 1 1 2 37 45 58 8422 4545 1614  45    2  45 123  45  45  88  45  45  0  0999991
    5  87 1 1 3 36 39 43 7333 3939 2714  39    3  39 121  39  39  70  39  39  0  0999991
    6  87 1 1 4 45 74 72 5430 7474 19 7  74   -1  74  96  74  74  60  74  74  0  0999991
    7  87 1 1 5 27 45 51 8532 4545 1913  45    0  45  86  45  45  57  45  45  0  0999991
    8  87 1 1 6 32 51 62 8723 5151 2012  51   -2  51  80  51  51  41  51  51  0  0999991
    9  87 1 1 7 44 64 65 6132 6464 2813  64   -1  64  73  64  64  48  64  64  0  1999991
   10  87 1 1 8 67 70 61  717 7070 27 7   70  -10  70  85  70  70  53  70  70  0  7999991
   11  87 1 1 9 63 58 48  815 5858 3116  58   -8  58  99  58  58  63  58  58  0 25999991
   12  87 1 110 31 25 18 3026 2525 7012  25   -4  25 133  25  25  90  25  25  0 46999991
   13  87 1 111 29 20 19 1615 2020 4716  20   -4  20 188  20  20 102  20  20  0 47999991
   14  87 1 112 17 15 1712012 1515 1433  15    0  15 239  15  15 113  15  15  0 47999991
   15  87 1 113 28 29 3120222 292924331  29   -1  29 295  29  29 147  29  29  0 32999991
   16  87 1 114 40 49 47 9730 494910720  49   -9  49 313  49  49 153  49  49  0 25999991
   17  87 1 115 33 36 36 9821 3636 9130  36   -7  36 304  36  36 151  36  36  0 10999991
   18  87 1 116 23 28 3031850 282831826  28   -6  28 297  28  28 157  28  28  0  2999991
   19  87 1 117 23 35 4710426 3535-1211  35   -1  35 282  35  35 166  35  35  0  0999991
   20  87 1 118 25 40 44 9931 4040 2312  40   -2  40 279  40  40 185  40  40  0  0999991
   21  87 1 119 33 36 49 9514 3636 4114  36   -2  36 278  36  36 180  36  36  0  0999991
   22  87 1 120 21 23 3213515 2323 2316  23   -1  23 270  23  23 181  23  23  0  0999991
   23  87 1 121 23 35 47 9931 3535 2111  35   -2  35 282  35  35 190  35  35  0  0999991
   24  87 1 122 52 65 69 2523 6565 23 5   65   -5  65 284  65  65 187  65  65  0  0999991
   25  87 1 123 63 71 76 1516 7171 1310  71   -7  71 286  71  71 194  71  71  0  0999991
   26  87 1 2 0117121114350 812198 15 6 121   -6 121 273 121 121 213 121 121  0  0999991
   27  87 1 2 1 58 67 75 3025 6767 1412  67   -5  67 274  67  67 230  67  67  0  0999991
   28  87 1 2 2 53 73 81-2424 7373 1211  73   -4  73 280  73  73 239  73  73  0  0999991
   29  87 1 2 3 971051063541210598 1711 105   -7 105 292 105 105 240 105 105  0  0999991

                    (***** ETC ** ETC ** ETC *****)
```

Prepared by: RB Harvey, Jr.

Reviewed by: JLM

YNPS NON-IMPACTED AREA D/Q VALUES (CONTINUOUS-RELEASE OPTION)

CONTINUOUS-RELEASE OPTION

PRINT CONTROL OPTION =	0
TAPE 7 PRINTOUT CONTROL OPTION =	1
PLUME MEANDER CONTROL OPTION =	0
RECIRCULATION CORRECTION CONTROL OPTION =	0
WIND SPEED EXTRAPOLATION CONTROL OPTION =	1
FINITE CLOUD GAMMA X/Q CONTROL OPTION =	0
DISPERSION COEFFICIENT CONTROL OPTION =	1
SEABREEZE ANALYSIS CONTROL OPTION =	0
VALLEY-SITE CONTROL OPTION =	0
DEPLETION/DEPOSITION CONTROL OPTION =	0
WET DEPOSITION ANALYSIS CONTROL OPTION =	0

STABILITY-DEPENDENT WIND-SPEED EXTRAPOLATION COEFFICIENTS

PASQUILL STABILITY	A	B	C	D	F	G
EXTRAPOLATION COEF	.250	.250	.250	.250	.500	.500

RELEASE HEIGHT (M ABOVE REL. POINT GRADE) =	45.41
HEIGHT OF ADJACENT BUILDING (M) =	45.40
ADJACENT BUILDING CROSS-SECTIONAL AREA (M**2) =	1575.00
EFFLUENT VENT EFFECTIVE DIAMETER (M) =	1.070
EFFLUENT VENT FLOW (CFM) =	20000.00
VENT EXIT VELOCITY (M/SEC) =	10.497
EFFLUENT HEAT CONTENT (CAL/SEC) =	.000E+00
HEIGHT OF INVERSION LAYER (M ABOVE REL. POINT GRADE) =	950.00
MAX. ALLOWABLE EFFECTIVE PLUME HEIGHT (M) =	950.00
NOBLE GAS HALF-LIFE FOR IN-TRANSIT DECAY (DAYS) =	.00
IODINE HALF-LIFE FOR IN-TRANSIT DECAY (DAYS) =	.00

DEPLETION AND DEPOSITION ANALYSES WILL BE BASED ON THE MODELS AND DATA IN REGULATORY GUIDE 1.111

Prepared by: RB Harvey, Jr.

Reviewed by: JAM

YNPS NON-IMPACTED AREA D/Q VALUES (CONTINUOUS-RELEASE OPTION)

METEOROLOGICAL DATA INPUT FORMAT (4F2.0,F3.1,16X,F3.0,6X,F4.1,28X,2F3.2)

METEOROLOGICAL DATA INPUT SEQUENCE NUMBERS

YEAR	1
MONTH	2
DAY	3
HOUR	4
WIND DIRECTION	6
WIND SPEED	5
TEMPERATURE DIFFERENCE	7
SOLAR RADIATION	0
PRECIPITATION	0

MAXIMUM INPUT DATA VALUES ACCEPTABLE AS VALID OBSERVATIONS

WIND DIRECTION	540.00
WIND SPEED	90.00
TEMPERATURE DIFFERENCE	15.00
SOLAR RADIATION	2.00
PRECIPITATION	5.00

VARIABLE WIND DIRECTIONS IDENTIFIED AS 888.0

FACTORS TO CONVERT INPUT DATA TO THE DESIGNATED UNITS

WIND SPEED (M/SEC)	.4470
TEMPERATURE DIF. (DEG. C)	.5560
SOLAR RADIATION (CAL/MIN/SQ.CM)	1.0000
PRECIPITATION (MM OF WATER)	25.4000

ANEMOMETER/WIND VANE THRESHOLD (M/SEC) =	.4200
WIND SPEED ASSIGNED TO CALMS (M/SEC) =	.2100
WIND-SPEED MEASUREMENT HT (M ABOVE REL. POINT GRADE) =	10.00
TEMPERATURE SENSOR SEPARATION (METERS) =	50.00

Prepared by: RB Harvey, Jr.

Reviewed by:

Attachment A

EXHIBIT A-6

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INPS NON-IMPACTED AREA D/Q VALUES (CONTINUOUS-RELEASE OPTION)

NUMBER OF HOURLY RECORDS INPUT 43824

TOTAL NUMBER OF VALID OBSERVATIONS IN THE INPUT DATA

WIND DIRECTION (EXCLUDING CALMS)	43549
WIND SPEED (EXCLUDING CALMS)	43338
CALM OBSERVATIONS	4
TEMPERATURE DIFFERENCE	42387
SOLAR RADIATION	0
PRECIPITATION	0

TOTAL NUMBER OF SEABREEZE OCCURENCES (WITH VALID OBS) 0
TOTAL NUMBER OF VALLEY-FLOW OCCURENCES (EXCLUDING CALMS) 0

SEQUENCE	CLASS	DELTA T. OBS.
1.	A	981
2	B	1224
3	C	2043
4	D	20195
5	E	14151
6	F	2758
7.	G	1035

DISTRIBUTION OF VALID WIND DIRECTION OBSERVATIONS
(EXCLUDING CALMS)

WIND FROM	OCCURENCES
W	6106
WNW	9388
NW	2820
NNW	1092
N	798
NNE	803
NE	909
ENE	1204
E	1973
ESE	3430
SE	5207
SSE	3729
S	1853
SSW	1103
SW	1291
WSW	1843
TOTAL	43549

Prepared by: RB Harvey, Jr.

Reviewed by: JAM

Attachment A
EXHIBIT A-6
YRC-1178, Page A31

YNPS NON-IMPACTED AREA D/Q VALUES (CONTINUOUS-RELEASE OPTION)

***** BASIC METEOROLOGICAL DATA *****

FREQUENCY DISTRIBUTION IN TERMS OF WIND-SPEED AND DIRECTION (WIND FROM) ATMOSPHERIC STABILITY: A

MPS	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
.21	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
.67	1.0	.0	.0	.0	3.0	.0	.0	.0	1.0	.0	.0	.0	1.0	.0	.0	.0	6.0
1.26	2.0	11.0	9.0	5.0	2.0	.0	2.0	9.0	4.0	7.0	3.0	4.0	3.0	.0	.0	4.0	65.0
2.48	6.0	9.0	3.0	1.0	5.0	2.0	15.0	32.0	80.0	118.0	241.0	94.0	26.0	8.0	3.0	7.0	650.0
4.49	5.0	5.0	.0	.0	.0	.0	.0	1.0	15.0	13.0	128.0	67.0	8.0	2.0	1.0	.0	245.0
6.95	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	4.0	3.0	.0	.0	.0	.0	7.0
9.63	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12.54	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
15.67	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19.02	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
22.60	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
32.51	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
TOTAL	14.0	25.0	12.0	6.0	10.0	2.0	17.0	42.0	100.0	138.0	376.0	168.0	38.0	10.0	4.0	11.0	973.0

FREQUENCY DISTRIBUTION IN TERMS OF WIND-SPEED AND DIRECTION (WIND FROM) ATMOSPHERIC STABILITY: B

MPS	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
.21	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
.67	2.0	.0	2.0	3.0	.0	.0	1.0	.0	1.0	.0	.0	.0	.0	.0	.0	.0	9.0
1.26	7.0	10.0	5.0	5.0	5.0	4.0	3.0	2.0	7.0	11.0	5.0	9.0	4.0	3.0	6.0	2.0	88.0
2.48	40.0	27.0	13.0	6.0	6.0	10.0	29.0	46.0	66.0	95.0	187.0	132.0	43.0	32.0	21.0	25.0	778.0
4.49	35.0	23.0	.0	.0	0	.0	.0	1.0	7.0	15.0	109.0	82.0	22.0	8.0	7.0	15.0	324.0
6.95	5.0	7.0	.0	.0	.0	.0	.0	.0	.0	.0	2.0	4.0	.0	.0	.0	.0	18.0
9.63	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12.54	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
15.67	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19.02	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
22.60	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
32.51	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
TOTAL	89.0	67.0	20.0	14.0	11.0	14.0	33.0	49.0	81.0	121.0	303.0	227.0	69.0	43.0	34.0	42.0	1217.0

Prepared by: RB Harvey, Jr. (RBH)

Reviewed by: JAM

YNPS NON-IMPACTED AREA D/Q VALUES (CONTINUOUS-RELEASE OPTION)

***** BASIC METEOROLOGICAL DATA *****

FREQUENCY DISTRIBUTION IN TERMS OF WIND-SPEED AND DIRECTION (WIND FROM) ATMOSPHERIC STABILITY: C

MPS	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
.21	.0	.0	.0	.0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
.67	1.0	3.0	.0	1.0	1.0	2.0	.0	.0	1.0	.0	.0	.0	.0	.0	1.0	1.0	11.0
1.26	11.0	22.0	16.0	8.0	13.0	5.0	5.0	8.0	11.0	8.0	14.0	12.0	6.0	2.0	2.0	2.0	145.0
2.48	132.0	93.0	24.0	11.0	13.0	21.0	21.0	49.0	72.0	112.0	262.0	157.0	75.0	37.0	45.0	64.0	1188.0
4.49	154.0	105.0	1.0	.0	.0	1.0	.0	1.0	7.0	18.0	107.0	126.0	42.0	12.0	18.0	43.0	635.0
6.95	16.0	16.0	.0	.0	.0	.0	.0	.0	.0	.0	2.0	10.0	.0	1.0	.0	1.0	46.0
9.63	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12.54	.0	.0	.0	.0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
15.67	.0	.0	.0	.0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19.02	.0	.0	.0	.0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
22.60	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
32.11	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
TOTAL	314.0	239.0	41.0	20.0	27.0	29.0	26.0	58.0	91.0	138.0	385.0	305.0	123.0	52.0	66.0	111.0	2025.0

FREQUENCY DISTRIBUTION IN TERMS OF WIND-SPEED AND DIRECTION (WIND FROM) ATMOSPHERIC STABILITY: D

MPS	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
.21	.2	.2	.1	.1	.0	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0	.1	1.0
.67	165.0	190.0	98.0	47.0	37.0	27.0	28.0	32.0	29.0	45.0	54.0	44.0	34.0	24.0	25.0	50.0	929.0
1.26	434.0	781.0	293.0	144.0	90.0	99.0	106.0	143.0	229.0	300.0	399.0	291.0	132.0	98.0	112.0	132.0	3783.0
2.48	1374.0	1700.0	506.0	176.0	111.0	134.0	147.0	248.0	521.0	1091.0	1425.0	1148.0	695.0	428.0	505.0	585.0	10794.0
4.49	1096.0	979.0	53.0	10.0	1.0	2.0	2.0	1.0	12.0	139.0	441.0	662.0	214.0	98.0	137.0	295.0	4142.0
6.95	190.0	127.0	1.0	.0	.0	.0	.0	.0	.0	1.0	41.0	47.0	1.0	2.0	1.0	2.0	413.0
9.63	2.0	6.0	.0	.0	.0	.0	.0	.0	.0	.0	1.0	1.0	.0	.0	.0	.0	10.0
12.54	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
15.67	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19.02	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
22.60	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
32.11	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
TOTAL	3261.2	3783.2	951.1	377.1	239.0	262.0	283.0	424.0	791.0	1576.0	2361.1	2193.0	1076.0	650.0	780.0	1064.1	20072.0

Prepared by: RB Harvey, Jr.

Reviewed by:

Attachment A
EXHIBIT A-6
YRC-1178, Page A33

EXHIBIT A-6

Prepared by: RB Harvey, Jr.

Reviewed by: JM

YMPS NON-IMPACTED AREA D/Q VALUES (CONTINUOUS-RELEASE OPTION)

***** BASIC METEOROLOGICAL DATA *****

FREQUENCY DISTRIBUTION IN TERMS OF WIND-SPEED AND DIRECTION (WIND FROM) ATMOSPHERIC STABILITY: E

MPS	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
.21	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
.67	592.0	893.0	277.0	123.0	86.0	71.0	87.0	85.0	105.0	166.0	218.0	137.0	90.0	73.0	91.0	173.0	3273.0
1.26	1126.0	2629.0	758.0	284.0	181.0	172.0	180.0	205.0	305.0	429.0	593.0	299.0	196.0	127.0	133.0	219.0	7836.0
2.48	206.0	633.0	247.0	62.0	41.0	44.0	47.0	93.0	175.0	345.0	407.0	133.0	84.0	50.0	50.0	71.0	2670.0
4.49	41.0	47.0	5.0	.0	.0	.0	.0	1.0	1.0	18.0	66.0	12.0	5.0	2.0	3.0	4.0	205.0
6.95	4.0	8.0	.0	1.0	.0	.0	.0	.0	.0	.0	15.0	.0	.0	.0	.0	1.0	29.0
9.63	.0	1.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	1.0
12.54	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
15.67	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19.02	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
22.60	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
32.31	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
TOTAL	1969.0	4211.0	1287.0	450.0	308.0	293.0	314.0	386.0	586.0	958.0	1299.0	581.0	375.0	252.0	277.0	468.0	14014.0

FREQUENCY DISTRIBUTION IN TERMS OF WIND-SPEED AND DIRECTION (WIND FROM) ATMOSPHERIC STABILITY: F

MPS	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
.21	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
.67	57.0	113.0	81.0	41.0	36.0	46.0	36.0	36.0	44.0	57.0	87.0	38.0	33.0	19.0	18.0	25.0	767.0
1.26	112.0	324.0	218.0	95.0	79.0	77.0	92.0	78.0	88.0	141.0	128.0	88.0	53.0	26.0	44.0	47.0	1690.0
2.48	14.0	33.0	24.0	8.0	10.0	9.0	10.0	12.0	28.0	40.0	39.0	10.0	11.0	7.0	6.0	10.0	271.0
4.49	.0	.0	.0	.0	.0	.0	.0	.0	.0	1.0	1.0	1.0	.0	.0	.0	.0	3.0
6.95	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9.63	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12.54	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
15.67	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19.02	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
22.60	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
32.31	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
TOTAL	183.0	470.0	323.0	144.0	125.0	132.0	138.0	126.0	160.0	239.0	255.0	137.0	97.0	52.0	68.0	82.0	2731.0

YNPS NON-IMPACTED AREA D/Q VALUES

(CONTINUOUS-RELEASE OPTION)

***** BASIC METEOROLOGICAL DATA *****

FREQUENCY DISTRIBUTION IN TERMS OF WIND-SPEED AND DIRECTION (WIND FROM) ATMOSPHERIC STABILITY: G

MPS	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
.21	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
.67	8.0	9.0	4.0	7.0	7.0	10.0	14.0	17.0	19.0	17.0	20.0	16.0	6.0	5.0	5.0	2.0	166.0
1.86	33.0	102.0	63.0	38.0	44.0	36.0	52.0	60.0	62.0	85.0	53.0	23.0	14.0	10.0	17.0	12.0	704.0
2.48	6.0	13.0	6.0	8.0	3.0	5.0	9.0	14.0	21.0	33.0	17.0	6.0	7.0	6.0	2.0	5.0	161.0
4.49	.0	.0	.0	.0	.0	.0	.0	.0	1.0	.0	.0	.0	.0	.0	.0	.0	1.0
6.95	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9.63	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12.54	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
15.67	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19.02	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
22.60	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
32.31	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
TOTAL	47.0	124.0	73.0	53.0	54.0	51.0	75.0	91.0	103.0	135.0	90.0	45.0	27.0	21.0	24.0	19.0	1032.0

OVERALL DISTRIBUTION WITH WIND DIRECTION

MPS	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
TOTAL	5877.2	8919.2	2707.1	1064.1	774.0	783.0	886.0	1176.0	1912.0	3305.0	5069.1	3656.0	1805.0	1080.0	1253.0	1797.1	42064.0

Prepared by: RB Harvey Jr.

Reviewed by: Jam

Attachment A
EXHIBIT A-6
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YNPS NON-IMPACTED AREA D/Q VALUES (CONTINUOUS-RELEASE OPTION)

STABILITY-DEPENDENT EFFECTIVE WIND SPEEDS AT GROUND LEVEL (M/SEC)

WS(MPS)	STABILITY A	STABILITY B	STABILITY C	STABILITY D	STABILITY E	STABILITY F	STABILITY G
.21	2.100E-01	2.100E-01	2.100E-01	2.100E-01	2.100E-01	2.100E-01	2.100E-01
.67	7.897E-01	8.145E-01	8.127E-01	7.869E-01	7.962E-01	8.003E-01	8.181E-01
1.26	1.311E+00	1.310E+00	1.308E+00	1.268E+00	1.172E+00	1.155E+00	1.193E+00
2.48	2.537E+00	2.553E+00	2.540E+00	2.379E+00	2.085E+00	1.974E+00	1.953E+00
4.49	3.985E+00	4.058E+00	4.136E+00	4.157E+00	4.084E+00	4.291E+00	3.576E+00
6.95	5.862E+00	6.203E+00	6.185E+00	6.288E+00	6.531E+00	6.950E+00	6.950E+00
9.63	9.630E+00	9.630E+00	9.630E+00	8.542E+00	8.985E+00	9.630E+00	9.630E+00
12.54	1.254E+01	1.254E+01	1.254E+01	1.254E+01	1.254E+01	1.254E+01	1.254E+01
15.67	1.567E+01	1.567E+01	1.567E+01	1.567E+01	1.567E+01	1.567E+01	1.567E+01
19.02	1.902E+01	1.902E+01	1.902E+01	1.902E+01	1.902E+01	1.902E+01	1.902E+01
22.60	2.260E+01	2.260E+01	2.260E+01	2.260E+01	2.260E+01	2.260E+01	2.260E+01
32.31	3.231E+01	3.231E+01	3.231E+01	3.231E+01	3.231E+01	3.231E+01	3.231E+01

STABILITY-DEPENDENT EFFECTIVE WIND SPEEDS AT THE RELEASE-POINT ELEVATION (M/SEC)

WS(MPS)	STABILITY A	STABILITY B	STABILITY C	STABILITY D	STABILITY E	STABILITY F	STABILITY G
.21	3.066E-01	3.066E-01	3.066E-01	3.066E-01	4.475E-01	4.475E-01	4.475E-01
.67	1.153E+00	1.189E+00	1.186E+00	1.149E+00	1.697E+00	1.706E+00	1.743E+00
1.26	1.913E+00	1.912E+00	1.910E+00	1.851E+00	2.497E+00	2.462E+00	2.542E+00
2.48	3.704E+00	3.727E+00	3.708E+00	3.473E+00	4.443E+00	4.206E+00	4.163E+00
4.49	5.817E+00	5.924E+00	6.038E+00	6.069E+00	8.702E+00	9.144E+00	7.620E+00
6.95	8.557E+00	9.056E+00	9.029E+00	9.179E+00	1.392E+01	1.481E+01	1.481E+01
9.63	1.406E+01	1.406E+01	1.406E+01	1.247E+01	1.915E+01	2.052E+01	2.052E+01
12.54	1.830E+01	1.830E+01	1.830E+01	1.830E+01	2.671E+01	2.671E+01	2.671E+01
15.67	2.287E+01	2.287E+01	2.287E+01	2.287E+01	3.338E+01	3.338E+01	3.338E+01
19.02	2.777E+01	2.777E+01	2.777E+01	2.777E+01	4.053E+01	4.053E+01	4.053E+01
22.60	3.298E+01	3.298E+01	3.298E+01	3.298E+01	4.815E+01	4.815E+01	4.815E+01
32.31	4.716E+01	4.716E+01	4.716E+01	4.716E+01	6.884E+01	6.884E+01	6.884E+01

Prepared by: RB Harvey, Jr.

Reviewed by: JAM

YNPS: NON-IMPACTED AREA D/Q VALUES (CONTINUOUS-RELEASE OPTION)

PLUME ENTRAINMENT AT THE POINT OF RELEASE (0=ELEVATED, 1=GRND LEVEL; 0-1=MIXED MODE)

WS(MPS)	STABILITY A	STABILITY B	STABILITY C	STABILITY D	STABILITY E	STABILITY F	STABILITY G
		.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
.21	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
.67	.000E+00	.000E+00	.000E+00	.000E+00	4.772E-02	4.415E-02	5.224E-02
1.26	.000E+00	1.310E-01	1.101E-01	1.187E-01	1.582E-01	1.503E-01	1.487E-01
2.48	1.300E-01	1.917E-01	1.957E-01	1.962E-01	6.742E-01	7.663E-01	4.016E-01
4.49	1.917E-01	7.485E-01	7.431E-01	7.732E-01	1.000E+00	1.000E+00	1.000E+00
6.95	6.419E-01	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
9.63	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
12.54	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
15.67	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
19.02	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
22.60	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00

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Prepared by: RB Harvey, Jr.

EXHIBIT A-6

YRC-1178, Page A37

Prepared by: RB Harvey, Jr.

Reviewed by: JLM

AEOLUS-2 (ATMOS. DISPERSION & FINITE CLOUD MODELING) - YARC/ENTECH ENG. INC - (MOD 06 - 03/29/94) 98/01/22. PAGE 84

YNPS NON-IMPACTED AREA D/Q VALUES (CONTINUOUS-RELEASE OPTION)

SECTOR-AVERAGE DEPOSITION FACTORS (1/M2) - (REG. GUIDE 1.111 MODEL)

DOWNWIND SECTOR	RECEPTOR IDENTIFIER 100M	200M	300M	400M	500M	600M	700M	800M
N	1.461E-08	7.260E-09	5.147E-09	4.205E-09	3.616E-09	2.918E-09	2.544E-09	2.544E-09
NNE	2.988E-08	1.416E-08	1.015E-08	1.105E-08	1.244E-08	1.290E-08	1.230E-08	1.543E-08
NE	6.004E-08	3.169E-08	2.426E-08	2.489E-08	2.359E-08	2.385E-08	2.436E-08	2.356E-08
ENE	4.666E-08	2.507E-08	1.813E-08	1.753E-08	2.194E-08	2.298E-08	2.111E-08	.000E+00
E	1.891E-08	9.777E-09	7.080E-09	7.798E-09	1.090E-08	1.336E-08	.000E+00	.000E+00
ESE	1.039E-08	5.226E-09	4.401E-09	5.279E-09	6.184E-09	8.014E-09	.000E+00	.000E+00
SE	1.164E-08	5.677E-09	6.006E-09	8.716E-09	9.862E-09	9.313E-09	.000E+00	.000E+00
SSE	1.780E-08	9.008E-09	9.906E-09	1.330E-08	1.750E-08	1.334E-08	.000E+00	.000E+00
S	7.190E-08	3.825E-08	3.193E-08	4.327E-08	5.781E-08	.000E+00	.000E+00	.000E+00
SSW	8.260E-08	4.334E-08	3.961E-08	5.186E-08	8.791E-08	.000E+00	.000E+00	.000E+00
SW	1.650E-08	8.691E-09	8.507E-09	1.236E-08	2.630E-08	2.011E-08	.000E+00	.000E+00
WSW	5.346E-09	2.415E-09	1.855E-09	1.576E-09	1.366E-09	1.219E-09	1.098E-09	9.928E-10
W	3.799E-09	1.740E-09	1.181E-09	9.480E-10	7.788E-10	9.050E-10	1.457E-09	1.535E-09
WNW	4.167E-09	1.913E-09	1.287E-09	1.022E-09	9.559E-10	1.886E-09	4.574E-09	.000E+00
NW	4.940E-09	2.371E-09	1.648E-09	1.407E-09	1.553E-09	2.670E-09	5.148E-09	.000E+00
NNW	7.855E-09	3.911E-09	2.781E-09	2.275E-09	2.084E-09	2.223E-09	3.157E-09	5.532E-09

DOWNWIND SECTOR	RECEPTOR IDENTIFIER 900M	1000M	1100M	1200M	1300M	1400M	1500M
N	2.259E-09	2.011E-09	2.024E-09	1.902E-09	1.963E-09	2.603E-09	3.142E-09
NNE	1.278E-08	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
NE	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
ENE	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
E	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
ESE	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
SE	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
SSE	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
S	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
SSW	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
SW	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
WSW	1.066E-09	1.497E-09	3.180E-09	2.794E-09	2.476E-09	2.210E-09	1.759E-09
W	3.064E-09	2.527E-09	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
WNW	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
NW	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
NNW	4.534E-09	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00

END OF ANALYSIS

DECAY	A	B	C	D	E	F	G
1						RC-1178, REV.0	
2						age A-1	
3							
4	SELECTED RADIONUCLIDE PROPERTIES						
5							
6	NUCLIDE	HALF LIFE	LAMBDA	half life	units		
7	FIS GAS	(YRS)					
8							
9	KR-85	1.076E+01	6.442E-02	10.76	yr		
10	KR-85m	5.019E-04	1.381E+03	4.40	hr		
11	KR-87	1.445E-04	4.797E+03	76.00	mn		
12	KR-88	3.183E-04	2.178E+03	2.79	hr		
13	XE-133	1.443E-02	4.804E+01	5.27	da		
14	XE-135	1.045E-03	6.633E+02	9.16	hr		
15	XE-135m	2.985E-05	2.322E+04	15.70	mn		
16	XE-138	2.700E-05	2.567E+04	14.20	mn		
17	XE-133m	6.166E-03	1.120E+02	2.26	da		
18	AR-37	9.582E-02	7.233E+00	35.00	da		
19	AR-41	2.088E-04	3.320E+03	1.83	hr		
20	C-14	5.730E+03	1.210E-04	5730.00	yr		
21	XE-131m	3.274E-02	2.117E+01	11.96	da		
22	RB-88	3.365E-05	2.060E+04	17.70	mn		
23							
24	IODINES						
25	I-131	2.207E-02	3.141E+01	8.06	da		
26	I-133	2.373E-03	2.921E+02	20.80	hr		
27	I-135	7.643E-04	9.069E+02	6.70	hr		
28							
29	PARTICULATES						
30	SR-89	1.391E-01	4.984E+00	50.80	da		
31	SR-90	2.890E+01	2.398E-02	28.90	yr		
32	CS-134	2.060E+00	3.365E-01	2.06	yr		
33	CS-137	3.020E+01	2.295E-02	30.20	yr		
34	BA/LA-140	4.589E-03	1.510E+02	40.23	hr		
35	ZN-65	6.672E-01	1.039E+00	243.70	da		
36	CO-58	1.955E-01	3.546E+00	71.40	da		
37	CO-60	5.258E+00	1.318E-01	5.26	yr		
38	FE-59	1.232E-01	5.626E+00	45.00	da		
39	CR-51	7.611E-02	9.107E+00	27.80	da		
40	ZR/NB-95	1.793E-01	3.865E+00	65.50	da		
41	CE-141	8.906E-02	7.783E+00	32.53	da		
42	CE-144	7.786E-01	8.902E-01	284.40	da		
43	SB-124	1.648E-01	4.206E+00	60.20	da		
44	MN-54	8.569E-01	8.089E-01	313.00	da		
45	AG-110m	6.927E-01	1.001E+00	253.00	da		
46	SE-75	3.296E-01	2.103E+00	120.40	da		
47	MO-99	7.506E-03	9.123E+01	66.60	hr		
48	RU-103	1.090E-01	6.361E+00	39.80	da		
49	SSB-125	2.730E+00	2.539E-01	2.73	yr		
50	TTE-132	8.896E-03	7.790E+01	78.00	hr		
51							
52	H-3	1.233E+01	5.622E-02	12.33	yr		
53						YRGASEF.WB2, SH. 0	

F	A	B	C	D	E	F	G	H
6							YRC-1178 REV. 0	
7							Page A-2	
8								
9			GASEOUS RELEASE SUMMARY					
10			&					
11			SOIL CONCENTRATIONS					
12								
13					d(kg/m2)=	240		
14		Ci	Ci	Tot Ann Ci	D/Q (1/m2)=	8.79E-06		
15	Nuclide	72-92	60-71	Releases				
16		Decayed	Decayed	Decayed	Area Conc	Vol Conc		
17		to 1998	to 1998	to 1998	(pci/m2)	(pci/kg)		
18	KR-85	3.448E+01	2.916E+00					
19	KR-85m	0.000E+00	0.000E+00					
20	KR-87	0.000E+00	0.000E+00					
21	KR-88	0.000E+00	0.000E+00					
22	XE-133	2.219E-124	0.000E+00					
23	XE-135	0.000E+00	0.000E+00					
24	XE-135m	0.000E+00	0.000E+00					
25	XE-138	0.000E+00	0.000E+00					
26	XE-133m	4.850E-293	0.000E+00					
27	AR-37	7.699E-20	0.000E+00					
28	AR-41	0.000E+00	0.000E+00					
29	C-14	5.909E+01	2.017E+00					
30	XE-131m	5.294E-157	0.000E+00					
31	RB-88	0.000E+00	0.000E+00					
32								
33								
34								
35								
36	I-131	3.478E-87	0.000E+00	3.478E-87	3.057E-82	1.273E-84		
37	I-133	0.000E+00	0.000E+00					
38	I-135	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
39								
40								
41								
42	SR-89	3.795E-26	2.539E-61	3.795E-26	3.336E-21	1.390E-23		
43	SR-90	1.136E-04	6.514E-04	7.651E-04	6.726E+01	2.802E-01		
44	CS-134	3.535E-06	0.000E+00	3.535E-06	3.107E-01	1.295E-03		
45	CS-137	3.427E-05	6.720E-07	3.494E-05	3.071E+00	1.280E-02		
46	BA-LA-140	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
47	ZN-65	2.215E-09	0.000E+00	2.215E-09	1.947E-04	8.113E-07		
48	CO-58	1.553E-13	0.000E+00	1.553E-13	1.365E-08	5.687E-11		
49	CO-60	2.951E-04	2.717E-05	3.223E-04	2.833E+01	1.180E-01		
50	FE-59	4.454E-24	0.000E+00	4.454E-24	3.915E-19	1.631E-21		
51	CR-51	3.931E-35	0.000E+00	3.931E-35	3.455E-30	1.440E-32		
52	ZR-NB-95	4.730E-20	0.000E+00	4.730E-20	4.157E-15	1.732E-17		
53	CE-141	1.274E-33	0.000E+00	1.274E-33	1.120E-28	4.667E-31		
54	CE-144	5.614E-09	0.000E+00	5.614E-09	4.935E-04	2.056E-06		
55	SB-124	7.279E-19	0.000E+00	7.279E-19	6.398E-14	2.666E-16		
56	MN-54	4.268E-10	1.474E-13	4.269E-10	3.753E-05	1.564E-07		
57	AG-110M	8.087E-15	0.000E+00	8.087E-15	7.109E-10	2.962E-12		
58	SE-75	8.082E-26	0.000E+00	8.082E-26	7.104E-21	2.960E-23		
59	MO-99	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
60	RU-103	5.531E-42	0.000E+00	5.531E-42	4.862E-37	2.026E-39		
61	SB-125	5.937E-07	0.000E+00	5.937E-07	5.218E-02	2.174E-04		
62	TE-132	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
63								
64	H-3	1.051E+01	2.517E+01	3.568E+01	3.136E+06	1.307E+04		
65					(file YRGASEF.WB2, SH:F)			

B	A	B	C	D	F	G	H	I	J	K
10									YRC-1178, REV. 0	
11									Page A-3	
12				ESTIMATED ANNUAL RELEASES (UNDECAYED CURIES)						
13	RADIONUCLIDE		EPA Ref.	% Total						
14			Est. Annual	Estimated	1960	1961	1962	1963	1964	1965
15	I. FISSION GASES		Release							
16										
17	KR-85		3.0E+00	61.72%	1.76E-04	5.52E-04	6.31E+00	2.15E+00	2.97E-01	3.75E-01
18	KR-85M		2.0E-02	0.41%	1.17E-06	3.68E-06	4.21E-02	1.43E-02	1.98E-03	2.50E-03
19	KR-87		2.0E-02	0.41%	1.17E-06	3.68E-06	4.21E-02	1.43E-02	1.98E-03	2.50E-03
20	KR-88		3.0E-02	0.62%	1.76E-06	5.52E-06	6.31E-02	2.15E-02	2.97E-03	3.75E-03
21	XE-133		1.0E-01	2.06%	5.87E-06	1.84E-05	2.10E-01	7.15E-02	9.88E-03	1.25E-02
22	XE-135		2.0E-01	4.11%	1.17E-05	3.68E-05	4.21E-01	1.43E-01	1.98E-02	2.50E-02
23	XE-135M		2.4E-01	4.90%	1.40E-05	4.38E-05	5.00E-01	1.70E-01	2.35E-02	2.98E-02
24	XE-138		8.5E-01	17.49%	4.99E-05	1.56E-04	1.79E+00	6.08E-01	8.40E-02	1.06E-01
25	XE-133M		3.0E-03	0.06%	1.76E-07	5.52E-07	6.31E-03	2.15E-03	2.97E-04	3.75E-04
26	AR-37									
27	AR-41		4.0E-01		2.35E-05	7.36E-05	8.41E-01	2.86E-01	3.95E-02	5.00E-02
28	C-14		3.0E-01		1.76E-05	5.52E-05	6.31E-01	2.15E-01	2.97E-02	3.75E-02
29	XE-131M									
30	Rb-88									
31										
32	UNIDENTIFIED									
33										
34	II. IODINES									
35	I-131		3.0E-04	1	1.76E-08	5.52E-08	6.31E-04	2.15E-04	2.97E-05	3.75E-05
36	I-133									
37	I-135									
38										
39	III. PARTICULATES									
40										
41	SR-89		4.0E-05	7.40%	2.35E-09	7.36E-09	8.41E-05	2.86E-05	3.95E-06	5.00E-06
42	SR-90		2.0E-04	37.02%	1.17E-08	3.68E-08	4.21E-04	1.43E-04	1.98E-05	2.50E-05
43	CS-134									
44	CS-137		2.0E-07	0.04%	1.17E-11	3.68E-11	4.21E-07	1.43E-07	1.98E-08	2.50E-08
45	BA-LA-140									
46	ZN-65									
47	CO-58									
48	CO-60		2.0E-04	37.02%	1.17E-08	3.68E-08	4.21E-04	1.43E-04	1.98E-05	2.50E-05
49	FE-59									
50	CR-51									
51	ZR-NB-95									
52	CE-141									
53	CE-144									
54	SB-124									
55	MN-54		1.0E-04	18.51%	5.87E-09	1.84E-08	2.10E-04	7.15E-05	9.88E-06	1.25E-05
56	AG-110M									
57	SE-75									
58	MO-99									
59	RU-103									
60	SB-125									
61	TE-132									
63										
64	UNIDENTIFIED									
65										
66	H-3		1.3E+01		16	16	16	16	16	16
67										
68										
69	Total Noble Gas:		4.9E+00		2.85E-04	8.95E-04	1.02E+01	3.48E+00	4.80E-01	6.08E-01
70										
71	Total Iodine:		3.0E-04		1.76E-08	5.52E-08	6.31E-04	2.15E-04	2.97E-05	3.75E-05
72										
73	Total Particulate:		5.4E-04		3.17E-08	9.95E-08	1.14E-03	3.86E-04	5.34E-05	6.75E-05
74										
75										
76	Plant reported									
77	Total B-G				6.06E-04	1.90E-03	2.17E+01	7.38E+00	1.02E+00	1.29E+00
78									YRGASEF.WB2, SH. 6, PG. 1	

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ESTIMATED ANNUAL RELEASES (UNDECAYED CURIES)

RADIONUCLIDE	EPA Ref. Est. Annual Release	% Total Estimated	1966	1967	1968	1969	1970	1971
I. FISSION GASES								
KR-85	3.0E+00	61.72%	6.86E-01	6.72E-01	1.87E-01	1.20E+00	4.80E+00	3.58E+00
KR-85M	2.0E-02	0.41%	4.57E-03	4.48E-03	1.25E-03	8.00E-03	3.20E-02	2.38E-02
KR-87	2.0E-02	0.41%	4.57E-03	4.48E-03	1.25E-03	8.00E-03	3.20E-02	2.38E-02
KR-88	3.0E-02	0.62%	6.86E-03	6.72E-03	1.87E-03	1.20E-02	4.80E-02	3.58E-02
XE-133	1.0E-01	2.06%	2.29E-02	2.24E-02	6.24E-03	4.00E-02	1.60E-01	1.19E-01
XE-135	2.0E-01	4.11%	4.57E-02	4.48E-02	1.25E-02	8.00E-02	3.20E-01	2.38E-01
XE-135M	2.4E-01	4.90%	5.44E-02	5.33E-02	1.49E-02	9.52E-02	3.81E-01	2.84E-01
XE-138	8.5E-01	17.49%	1.94E-01	1.90E-01	5.30E-02	3.40E-01	1.36E+00	1.01E+00
XE-133M	3.0E-03	0.06%	6.86E-04	6.72E-04	1.87E-04	1.20E-03	4.80E-03	3.58E-03
AR-37								
AR-41	4.0E-01		9.15E-02	8.95E-02	2.50E-02	1.60E-01	6.40E-01	4.77E-01
C-14	3.0E-01		6.86E-02	6.72E-02	1.87E-02	1.20E-01	4.80E-01	3.58E-01
XE-131M								
Rb-88								
UNIDENTIFIED								
II. IODINES								
I-131	3.0E-04	1	6.86E-05	6.72E-05	1.87E-05	1.20E-04	4.80E-04	3.58E-04
I-133								
I-135								
III. PARTICULATES								
SR-89	4.0E-05	7.40%	9.15E-06	8.95E-06	2.50E-06	1.60E-05	6.40E-05	4.77E-05
SR-90	2.0E-04	37.02%	4.57E-05	4.48E-05	1.25E-05	8.00E-05	3.20E-04	2.38E-04
CS-134								
CS-137	2.0E-07	0.04%	4.57E-08	4.48E-08	1.25E-08	8.00E-08	3.20E-07	2.38E-07
BA-LA-140								
ZN-65								
CO-58								
CO-60	2.0E-04	37.02%	4.57E-05	4.48E-05	1.25E-05	8.00E-05	3.20E-04	2.38E-04
FE-59								
CR-51								
ZR-NB-95								
CE-141								
CE-144								
SB-124								
MN-54	1.0E-04	18.51%	2.29E-05	2.24E-05	6.24E-06	4.00E-05	1.60E-04	1.19E-04
AG-110M								
SE-75								
MO-99								
RU-103								
SB-125								
TE-132								
UNIDENTIFIED								
H-3	1.3E+01		11	15.1	6.04	10.1	9.01	4.06
Total Noble Gas:	4.9E+00		1.11E+00	1.09E+00	3.03E-01	1.95E+00	7.77E+00	5.79E+00
Total Iodine:	3.0E-04		6.86E-05	6.72E-05	1.87E-05	1.20E-04	4.80E-04	3.58E-04
Total Particulate:	5.4E-04		1.24E-04	1.21E-04	3.37E-05	2.16E-04	8.64E-04	6.44E-04
Plant reported Total GP			2.36E+00	2.31E+00	6.44E-01	4.13E+00	1.65E+01	1.23E+01

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C	A	C	D	E	F	G	H	I
8							YRC-1178, REV. 0	
9							Page A-5	
10								
11				REPORTED ANNUAL RELEASES (UNDECAYED CURIES)				
12								
13	RADIONUCLIDE	1972	1973	1974	1975	1976	1977	1978
14								
15	I. FISSION GASE							
16								
17	KR-85	1.68E+00	2.55E-01	1.48E+00	2.71E+00	7.49E-02	1.30E+00	7.58E+00
18	KR-85M	5.45E-03	1.52E-01	5.60E-02	1.30E-01	2.58E-01	1.05E+00	7.68E+00
19	KR-87		-	1.59E-02	9.50E-02	1.60E-01	5.10E-01	5.36E+00
20	KR-88	4.00E-03	7.84E-02	6.66E-02	2.04E-01	3.95E-01	1.40E+00	1.12E+01
21	XE-133	1.12E+01	3.34E+01	6.07E+01	1.45E+01	1.91E+01	9.78E+01	5.23E+02
22	XE-135	1.94E+00	6.52E+00	1.15E+00	1.64E+00	3.40E+00	1.37E+01	7.10E+01
23	XE-135M		-	6.18E-04	1.45E+00	1.21E+00	4.67E+00	1.06E+01
24	XE-138		-	5.41E-04	3.30E-02	2.59E-02	5.81E-02	5.61E-01
25	XE-133M	5.47E-02	7.81E-02	3.78E-02	1.66E-01	3.79E-01	1.43E+00	8.72E+00
26	AR-37	6.49E+00	6.60E-02	5.01E-01	5.35E-01	4.34E-01	9.41E-01	5.69E-01
27	AR-41	1.63E+00	3.01E+00	8.50E-01	9.30E-01	2.98E-01	4.66E-01	1.79E+00
28	C-14	9.78E-01	1.95E-01	5.27E-01	1.58E+00	1.29E-01	2.39E-01	3.31E-01
29	XE-131M		4.41E-02	2.07E-02	-	3.47E-02	6.20E-01	7.63E+00
30	Rb-86			-	5.08E-01	1.25E+00	6.84E-01	-
31								
32	UNIDENTIFIED	-	-	-				-
33								
34	II. IODINES							
35	I-131	2.17E-04	2.69E-03	7.11E-04	1.67E-03	2.55E-05	4.94E-05	1.57E-04
36	I-133		-	2.87E-04	9.37E-04	4.66E-05	6.73E-05	1.37E-04
37	I-135		-	3.84E-04	1.13E-04	5.92E-05	5.47E-05	7.90E-05
38								
39	III. PARTICULATE							
40								
41	SR-89		-	-	5.50E-06	-	-	3.08E-07
42	SR-90	6.00E-06	1.54E-06	6.91E-05	7.04E-07	2.83E-06	1.56E-06	-
43	CS-134		4.00E-06	3.73E-06	7.56E-05	4.56E-07	1.15E-07	2.44E-06
44	CS-137	2.00E-06	3.55E-06	1.15E-05	7.17E-06	4.08E-07	7.12E-07	2.70E-06
45	BA-LA-140		-	-	7.28E-07	-	-	-
46	ZN-65		1.00E-06	-	-	-	-	-
47	CO-58	3.30E-05	6.97E-06	9.49E-04	1.30E-03	1.82E-06	2.79E-07	8.96E-06
48	CO-60	1.02E-04	1.63E-04	2.18E-03	3.12E-03	9.44E-06	2.20E-07	2.42E-05
49	FE-59	1.00E-06	-	-	4.12E-04	1.67E-06	3.36E-07	6.12E-06
50	CR-51		-	5.00E-04	2.32E-03	2.24E-06	-	1.77E-05
51	ZR-NB 95		-	1.18E-06	2.58E-04	4.54E-06	2.18E-07	8.38E-07
52	CE-141		-	-	-	-	2.16E-07	-
53	CE-144		-	-	-	-	7.96E-07	1.42E-06
54	SB-124		-	4.07E-07	6.47E-05	1.75E-07	-	-
55	MN-54	4.00E-05	3.78E-05	4.06E-04	4.36E-04	5.46E-07	-	2.34E-06
56	AG-110M		1.03E-04	3.80E-06	4.56E-06	4.52E-07	3.75E-07	2.84E-07
57	SE-75	1.10E-05	2.00E-06	-	9.96E-06	0.00E+00	-	-
58	MO-99		-	-	-	-	-	-
59	RU-103		-	-	0.00E+00	-	-	-
60	SB-125		-	-	-	-	-	-
61	TE-132		-	-	-	-	-	-
62								
63								
64	UNIDENTIFIED		-	2.82E-06	-	-	-	-
65								
66	H-3	8.83E+00	8.39E+00	3.84E+00	1.95E+00	2.02E+00	3.27E+00	2.89E+00
67								
68								
69	Total Noble Gas:	2.30E+01	4.35E+01	6.49E+01	2.24E+01	2.57E+01	1.22E+02	6.48E+02
70								
71	Total Iodine:	2.17E-04	2.69E-03	1.39E-03	2.72E-03	1.34E-04	1.71E-04	3.73E-04
72								
73	Total Particulate:	1.95E-04	3.30E-04	4.13E-03	8.01E-03	1.75E-05	3.28E-06	8.73E-05
74								

C	A	J	K	L	M	N	O	P	Q
8								YRC-1178, REV. 0	
9								Page A-6	
10									
11									
12									
13	RADIONUCLIDE	1979	1980	1981	1982	1983	1984	1985	1986
14									
15	I. FISSION GASE								
16									
17	KR-85	1.64E+00	1.23E+00	6.53E+00	8.89E-01	9.79E-01	7.92E+00	1.13E+01	2.84E+00
18	KR-85M	1.69E+00	7.45E-01	1.44E+00	1.85E+00	8.26E+00	1.79E+01	1.98E+01	4.49E+00
19	KR-87	1.35E+00	7.11E-01	1.52E+00	2.16E+00	6.79E+00	1.66E+01	1.98E+01	3.85E+00
20	KR-88	2.52E+00	1.26E+00	2.48E+00	3.41E+00	1.38E+01	2.68E+01	3.13E+01	6.73E+00
21	XE-133	1.17E+02	3.22E+01	8.03E+01	5.35E+01	4.66E+02	1.09E+03	9.38E+02	3.09E+02
22	XE-135	2.55E+01	1.30E+01	2.90E+01	3.52E+01	1.47E+02	2.85E+02	2.06E+02	7.73E+01
23	XE-135M	2.21E+01	1.85E+01	4.55E+01	4.69E+01	2.01E+02	2.57E+02	1.89E+02	9.39E+01
24	XE-138	7.48E-01	3.66E-01	1.40E+00	4.17E+00	7.33E+00	1.25E+01	1.47E+01	1.43E+00
25	XE-133M	1.86E+00	9.47E-02	8.10E-01	9.27E-01	8.34E+00	1.74E+01	1.91E+01	5.27E+00
26	AR-37	2.17E+00	4.13E-01	5.96E-01	6.26E-01	6.50E+00	1.23E+01	3.77E+00	5.70E-01
27	AR-41	2.21E+00	9.19E-01	1.33E+00	2.13E+00	1.71E+00	2.43E+00	2.86E+00	3.61E-01
28	C-14	2.06E-01	1.50E-01	4.71E-01	1.24E+00	4.31E-01	3.10E+00	1.53E+00	6.58E-01
29	XE-131M	3.21E+00	1.05E+00	1.16E+00	2.34E+00	9.01E+00	1.79E+01	1.35E+01	4.26E+00
30	Rb-88	-	-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
31									
32	UNIDENTIFIED	-	-	-	-	-	-	-	-
33									
34	II. IODINES								
35	I-131	1.75E-04	6.32E-05	1.68E-04	2.83E-04	3.09E-03	6.21E-03	6.63E-04	1.69E-04
36	I-133	7.65E-05	-	4.61E-05	4.99E-05	1.24E-03	2.99E-03	6.20E-05	5.01E-05
37	I-135	1.03E-04	-	7.78E-05	1.78E-05	2.05E-03	5.16E-04	2.35E-06	1.51E-06
38									
39	III. PARTICULATE								
40									
41	SR-89	3.03E-07	3.04E-07	1.24E-06	1.26E-05	1.53E-06	1.25E-05	-	-
42	SR-90	2.10E-07	1.20E-07	1.02E-06	1.62E-06	1.98E-07	2.72E-06	4.21E-06	-
43	CS-134	4.93E-06	3.04E-06	7.91E-07	7.51E-07	2.46E-06	8.72E-05	4.19E-06	1.14E-06
44	CS-137	7.90E-06	6.48E-06	2.00E-06	2.31E-04	5.39E-06	9.53E-05	2.62E-07	1.29E-06
45	BA-LA-140	1.03E-06	-	-	-	-	7.93E-06	4.48E-07	-
46	ZN-65	-	-	-	-	-	-	-	-
47	CO-58	4.02E-06	1.28E-06	8.64E-06	6.35E-06	-	1.31E-06	3.27E-06	1.16E-07
48	CO-60	2.20E-05	1.18E-05	1.06E-05	1.75E-06	5.87E-06	-	4.39E-06	9.65E-06
49	FE-59	3.49E-07	-	3.97E-07	1.69E-06	-	-	-	-
50	CR-51	-	-	5.80E-06	9.49E-06	-	-	-	-
51	ZR-NB-95	2.43E-07	-	2.63E-07	9.05E-07	-	1.77E-06	5.44E-06	-
52	CE-141	-	-	-	-	-	5.06E-07	-	7.95E-09
53	CE-144	-	-	-	-	-	-	4.62E-07	-
54	SB-124	-	-	-	-	-	-	-	-
55	MN-54	3.40E-06	8.26E-06	9.61E-06	5.57E-06	4.49E-06	9.66E-06	3.76E-07	7.09E-07
56	AG-110M	-	-	-	2.16E-07	-	-	-	-
57	SE-75	-	-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
58	MO-99	-	-	-	-	-	-	-	-
59	RU-103	-	-	-	-	-	3.97E-07	-	9.83E-09
60	SB-125	-	1.40E-06	4.00E-06	2.80E-06	6.50E-06	4.52E-06	-	-
61	TE-132	-	-	-	-	-	1.56E-05	-	-
62									
63									
64	UNIDENTIFIED	-	-	-	-	-	-	-	-
65									
66	H-3	3.57E+00	1.47E+00	3.07E+00	5.37E+00	5.13E+00	9.45E+00	5.26E+00	1.03E+01
67									
68									
69	Total Noble Gas:	1.79E+02	6.84E+01	1.71E+02	1.52E+02	8.70E+02	1.72E+03	1.46E+03	5.06E+02
70									
71	Total Iodine:	3.54E-04	6.32E-05	2.92E-04	3.51E-04	6.38E-03	9.72E-03	7.27E-04	2.40E-04
72									
73	Total Particulate:	7.50E-05	3.26E-05	4.44E-05	2.75E-04	2.64E-05	2.40E-04	6.11E-06	1.29E-05
74								YRGASEF.WB3, SHLC, PG. 2	

C	A	R	S	T	U	V	W
8					YRC-1178, REV. 0		
9					Page A-7		
10							
11							
12							
13	RADIONUCLIDE	1987	1988	1989	1990	1991	1992
14							
15	I. FISSION GASE						
16							
17	KR-85	7.72E+00	4.10E+00	1.05E+00	5.12E+00	7.48E+00	
18	KR-85M	4.18E+00	1.94E+00	1.19E+00	1.00E+00	1.64E+00	
19	KR-87	3.99E+00	1.68E+00	1.31E+00	1.22E+00	1.64E+00	
20	KR-88	8.18E+00	3.51E+00	2.07E+00	2.12E+00	3.37E+00	
21	XE-133	2.20E+02	1.02E+02	4.46E+01	3.86E+01	1.20E+02	
22	XE-135	6.23E+01	3.69E+01	2.65E+01	2.53E+01	3.37E+01	
23	XE-135M	6.31E+01	4.75E+01	4.09E+01	3.88E+01	4.08E+01	
24	XE-136	2.47E+00	8.08E-01	7.26E-01	1.28E+00	7.23E-01	-
25	XE-133M	4.26E+00	2.07E+00	9.98E-01	4.20E-01	2.14E+00	-
26	AR-37	8.20E-01	7.11E-01	1.66E-01	7.71E-02	3.40E-01	-
27	AR-41	1.33E+00	8.59E-01	1.12E+00	6.52E-01	5.41E-01	-
28	C-14	1.32E+00	6.41E-01	2.07E-01	1.75E+00	1.74E+00	-
29	XE-131M	4.12E+00	1.10E+00	1.97E-01	2.89E-01	9.80E-01	-
30	Rb-88	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
31							
32	UNIDENTIFIED	-	-	-	-	-	0.00E+00
33							
34	II. IODINES						
35	I-131	2.81E-05	5.04E-05	8.73E-05	1.34E-04	2.03E-05	-
36	I-133	1.63E-05	1.61E-05	8.20E-06	1.14E-05	2.45E-05	-
37	I-135	-	-	6.30E-07	7.79E-07	1.49E-06	-
38							
39	III. PARTICULATE						
40							
41	SR-89	-	-	5.06E-07	-	-	-
42	SR-90	-	-	7.86E-09	-		-
43	CS-134	9.48E-07	2.61E-06	6.18E-07	3.75E-07	-	-
44	CS-137	2.24E-06	1.50E-06	3.57E-06	1.94E-06	5.32E-07	1.95E-07
45	BA-LA-140			9.62E-07	1.06E-06		-
46	ZN-65			-	-		-
47	CO-58	-		5.20E-06	1.34E-06	-	-
48	CO-60	9.35E-06	6.98E-06	3.20E-05	1.83E-05	8.81E-06	7.51E-06
49	FE-59	-		1.15E-06	3.05E-07		-
50	CR-51	8.14E-06		2.28E-05	4.83E-07		-
51	ZR-NB-95	1.99E-06		6.07E-06	1.90E-07		-
52	CE-141	4.15E-06		1.27E-06	-		-
53	CE-144	-	-	1.40E-06	-	-	-
54	SB-124	-		6.95E-06	-	-	-
55	MN-54	1.83E-07		8.26E-06	2.93E-06	2.09E-06	-
56	AG-110M	-		2.51E-07	-		-
57	SE-75	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
58	MO-99	-	-	-	-	-	-
59	RU-103			2.74E-06	-		-
60	SB-125	-	-	-	-	-	-
61	TE-132				-		-
62							
63							
64	UNIDENTIFIED	-	-		-	-	-
65							
66	H-3	4.48E+00	4.58E+00	6.64E+00	3.74E+00	6.25E+00	2.93E+00
67							
68							
69	Total Noble Gas:	3.79E+02	2.04E+02	1.21E+02	1.13E+02	2.13E+02	0.00E+00
70							
71	Total Iodine:	4.44E-05	6.65E-05	9.81E-05	1.48E-04	4.52E-05	0.00E+00
72							
73	Total Particulate:	1.29E-05	8.50E-06	9.38E-05	2.69E-05	9.38E-06	7.71E-06
74						YRGASEF.WB2, BKC, PG. 3	

D	A	B	C	D	E	F	G	H	I	J
7									YRC-1178 REV. 0	
8									Page A=8	
9										
10					RELEASED ACTIVITY DECAYED TO 01/01/98					
11		Yrs to 1998	37	3.	35	34	33	32	31	30
12	Nuclide	Lambda	1960	19	1962	1963	1964	1965	1966	1967
13	KR-85	6.440E-02	1.626E-05	5.437E-05	6.622E-01	2.402E-01	3.541E-02	4.776E-02	9.318E-02	9.727E-02
14	KR-85M	1.361E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
15	KR-87	4.797E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
16	KR-88	2.178E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
17	XE-133	4.804E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
18	XE-135	6.633E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
19	XE-135M	2.322E+04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
20	XE-138	2.567E+04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
21	XE-133M	1.120E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
22	AR-37	7.233E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
23	AR-41	3.320E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
24	C-14	1.210E-04	1.754E-05	5.499E-05	6.261E-01	2.137E-01	2.953E-02	3.736E-02	6.835E-02	6.691E-02
25	XE-131M	2.117E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
26	Rb-88	2.061E+04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
27										
28	UNIDENTIFIED									
29										
30	II. IODINES									
31	I-131	3.141E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
32	I-133	2.921E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
33	I-135	9.069E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
34										
35	III. PARTICULATES									
36										
37	SR-89	4.984E+00	1.921E-89	6.798E-87	1.467E-80	7.288E-79	1.471E-77	2.718E-75	7.262E-73	1.038E-70
38	SR-90	2.398E-02	4.836E-09	1.553E-08	1.817E-04	6.329E-05	8.959E-06	1.161E-05	2.175E-05	2.180E-05
39	CS-134	3.365E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
40	CS-137	2.295E-02	5.024E-12	1.612E-11	1.883E-07	6.554E-08	9.269E-09	1.199E-08	2.245E-08	2.249E-08
41	BA-LA-140	1.510E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
42	ZN-65	1.039E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
43	CO-58	3.546E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
44	CO-60	1.318E-01	8.952E-11	3.202E-10	4.173E-06	1.619E-06	2.563E-07	3.683E-07	7.686E-07	8.585E-07
45	FE-59	5.626E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
46	CR-51	9.107E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
47	ZR-NB-95	3.865E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
48	CE-141	7.783E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
49	CE-144	8.902E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50	SB-124	4.206E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
51	MN-54	8.089E-01	5.897E-22	4.152E-21	1.085E-16	8.131E-17	2.523E-17	7.166E-17	2.944E-16	6.470E-16
52	AG-110M	1.001E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
53	SE-75	2.103E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
54	MO-99	9.123E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
55	RU-103	6.361E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
56	SB-125	2.539E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
57	TE-132	7.790E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
58										
59	H-3	5.622E-02	1.999E+00	2.114E+00	2.236E+00	2.366E+00	2.503E+00	2.647E+00	1.925E+00	2.798E+00
60									YRGASEF.WB2, SH. D, PG. 1	

D	A	B	K	L	M	N	O	P
7							YRC-1178 REV. 0	
8							Page A=9	
9								
10								
11		Yrs to 1998	29	28	27	26		60-71 Decayed
12	Nuclide	Lambda	1968	1969	1970	1971		to 1998
13	KR-85	6.440E-02	2.892E-02	1.978E-01	8.429E-01	6.701E-01		2.916E+00
14	KR-85M	1.381E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
15	KR-87	4.797E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
16	KR-88	2.178E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
17	XE-133	4.804E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
18	XE-135	6.633E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
19	XE-135M	2.322E+04	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
20	XE-138	2.567E+04	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
21	XE-133M	1.120E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
22	AR-37	7.233E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
23	AR-41	3.320E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
24	C-14	1.210E-04	1.868E-02	1.197E-01	4.781E-01	3.564E-01		2.017E+00
25	XE-131M	2.117E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
26	Rb-88	2.061E+04	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
27								
28	UNIDENTIFIED							
29								
30	II. IODINES							
31	I-131	3.141E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
32	I-133	2.921E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
33	I-135	9.089E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
34								
35	III. PARTICULATES							
36								
37	SR-89	4.964E+00	4.227E-69	3.980E-66	2.311E-63	2.516E-61		2.539E-61
38	SR-90	2.398E-02	6.226E-06	4.090E-05	1.674E-04	1.278E-04		6.514E-04
39	CS-134	3.365E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
40	CS-137	2.295E-02	6.415E-09	4.209E-08	1.721E-07	1.313E-07		6.720E-07
41	BA-LA-140	1.510E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
42	ZN-65	1.039E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
43	CO-58	3.546E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
44	CO-60	1.318E-01	2.731E-07	1.998E-06	9.107E-06	7.745E-06		2.717E-05
45	FE-59	5.626E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
46	CR-51	9.107E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
47	ZR-NB-95	3.865E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
48	CE-141	7.783E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
49	CE-144	8.902E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
50	SB-124	4.206E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
51	MN-54	8.089E-01	4.050E-16	5.632E-15	5.232E-14	8.758E-14		1.474E-13
52	AG-110M	1.001E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
53	SE-75	2.103E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
54	MO-99	9.123E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
55	RU-103	6.361E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
56	SB-125	2.539E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
57	TE-132	7.790E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
58								
59	H-3	5.622E-02	1.575E+00	2.093E+00	1.975E+00	9.459E-01		2.517E+01
60							YRGASEF.WB2, SH. D, PG. 2	

E	A	B	C	D	E	F	G	H	I
7								YRC-1178 REV. 0	
8								Page A-10	
9									
10					ANNUAL RELEASED ACTIVITY DECAYED TO 01/01/98				
11		YEAR	1972	1973	1974	1975	1976	1977	1978
12		Yrs to 1998	25	24	23	22	21	20	19
13									
14	Nuclide	Lambda							
15	KR-85	6.440E-02	3.353E-01	5.442E-02	3.372E-01	6.577E-01	1.936E-02	3.592E-01	2.231E+00
16	KR-85m	1.381E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
17	KR-87	4.797E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
18	KR-88	2.178E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
19	XE-133	4.804E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
20	XE-135	6.633E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
21	XE-135m	2.322E+04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
22	XE-138	2.567E+04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
23	XE-133m	1.120E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
24	AR-37	7.233E+00	1.906E-78	2.690E-77	2.823E-73	4.176E-70	4.691E-67	1.407E-63	1.179E-60
25	AR-41	3.320E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
26	C-14	1.210E-04	9.755E-01	1.943E-01	5.256E-01	1.573E+00	1.268E-01	2.389E-01	3.301E-01
27	XE-131m	2.117E+01	0.000E+00	9.723E-223	7.136E-214	0.000E+00	2.924E-195	8.168E-185	1.570E-174
28	RB-88	2.081E+04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
29									
30									
31									
32									
33	I-131	3.141E+01	0.000E+00	0.000E+00	0.000E+00	1.310E-303	8.751E-292	7.413E-278	1.034E-263
34	I-133	2.921E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
35	I-135	9.069E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
36									
37									
38									
39	SR-89	4.984E+00	0.000E+00	0.000E+00	0.000E+00	1.321E-53	0.000E+00	0.000E+00	2.305E-48
40	SR-90	2.396E-02	3.295E-06	8.684E-07	3.979E-05	4.153E-07	1.710E-08	9.657E-09	0.000E+00
41	CS-134	3.365E-01	0.000E+00	1.244E-11	1.624E-09	4.605E-08	3.908E-10	1.374E-10	4.077E-09
42	CS-137	2.295E-02	1.127E-06	2.047E-06	6.779E-06	4.326E-06	2.506E-07	4.499E-07	1.749E-06
43	BA-LA-140	1.510E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
44	ZN-65	1.039E+00	0.000E+00	1.481E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
45	CO-58	3.546E+00	1.043E-43	7.639E-43	3.606E-39	1.712E-37	8.307E-39	4.420E-38	4.922E-35
46	CO-60	1.318E-01	3.781E-06	7.718E-06	1.052E-04	1.717E-04	5.930E-07	1.576E-06	1.978E-06
47	FE-59	5.626E+00	8.251E-68	0.000E+00	0.000E+00	7.268E-58	9.151E-58	4.566E-56	2.307E-52
48	CR-51	9.107E+00	0.000E+00	0.000E+00	5.385E-95	2.253E-90	1.960E-89	0.000E+00	1.261E-80
49	ZR-NB-95	3.665E+00	0.000E+00	0.000E+00	2.919E-45	3.044E-41	2.556E-43	5.855E-41	1.074E-38
50	CE-141	7.783E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.397E-75	0.000E+00
51	CE-144	6.902E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.479E-14	6.408E-14
52	SB-124	4.206E+00	0.000E+00	0.000E+00	3.952E-49	4.215E-45	7.639E-46	0.000E+00	0.000E+00
53	MN-54	8.089E-01	6.600E-14	1.400E-13	3.391E-12	8.141E-12	2.291E-14	0.000E+00	4.949E-13
54	AG-110M	1.001E+00	0.000E+00	3.807E-15	3.611E-16	1.245E-15	3.356E-16	7.576E-16	1.561E-15
55	SE-75	2.103E+00	1.618E-28	2.406E-28	0.000E+00	8.042E-26	0.000E+00	0.000E+00	0.000E+00
56	MO-99	9.123E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
57	RU-103	6.361E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
58	SB-125	2.539E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
59	TE-132	7.790E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
60									
61	H-3	5.622E-02	2.166E+00	2.178E+00	1.055E+00	5.675E-01	6.205E-01	1.061E+00	9.941E-01
62								TRGASEF.WB2, SH. E, PG. 1	

E	A	B	J	K	L	M	N	O	P	Q
7									YRC-1178 REV. 0	
8									Page A-11	
9										
10										
11		YEAR	1979	1980	1981	1982	1983	1984	1985	1986
12		Yrs to 1998	18	17	16	15	14	13	12	11
13										
14	Nuclide	Lambda								
15	KR-85	6.440E-02	5.140E-01	4.104E-01	5.150E-01	7.059E-01	3.354E+00	7.757E+00	9.143E+00	2.212E+00
16	KR-85m	1.361E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
17	KR-87	4.797E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
18	KR-88	2.178E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
19	XE-133	4.604E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.195E-290	1.577E-269	8.942E-249	2.453E-228
20	XE-135	6.633E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
21	XE-135m	2.322E+04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
22	XE-138	2.567E+04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
23	XE-133m	1.120E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
24	AR-37	7.233E+00	6.224E-57	1.641E-54	7.319E-51	1.620E-47	1.796E-44	3.542E-41	5.766E-38	1.008E-35
25	AR-41	3.320E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
26	C-14	1.210E-04	2.075E-01	1.499E-01	1.175E+00	2.333E+00	8.997E+00	1.791E+01	1.343E+01	4.251E+00
27	XE-131m	2.117E+01	1.033E-165	5.294E-157	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
28	RB-86	2.061E+04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
29										
30										
31										
32										
33	I-131	3.141E+01	5.018E-250	7.949E-237	2.538E-223	1.203E-209	1.314E-194	1.383E-180	1.253E-166	4.431E-155
34	I-133	2.921E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
35	I-135	9.099E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
36										
37										
38										
39	SR-89	4.984E+00	3.315E-46	4.848E-44	2.371E-41	5.522E-39	9.663E-36	1.974E-34	4.463E-34	0.000E+00
40	SR-90	2.398E-02	1.362E-07	8.009E-08	5.389E-07	5.241E-07	1.758E-06	6.384E-05	3.142E-08	8.725E-07
41	CS-134	3.365E-01	1.153E-06	9.978E-09	9.183E-09	1.485E-06	4.848E-06	1.200E-06	4.618E-09	3.186E-06
42	CS-137	2.295E-02	5.227E-06	4.387E-06	0.000E+00	0.000E+00	0.000E+00	5.884E-06	3.403E-07	0.000E+00
43	BA-LA-140	1.510E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
44	ZN-65	1.039E+00	0.000E+00	0.000E+00	5.210E-13	1.082E-12	0.000E+00	1.782E-12	1.258E-13	1.260E-12
45	CO-58	3.546E+00	7.661E-34	8.474E-33	2.428E-30	1.390E-29	1.616E-27	0.000E+00	1.453E-24	1.108E-22
46	CO-60	1.318E-01	2.052E-06	1.260E-06	4.819E-06	2.340E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00
47	FE-59	5.626E+00	3.653E-51	0.000E+00	4.677E-45	2.124E-42	0.000E+00	0.000E+00	0.000E+00	0.000E+00
48	CR-51	9.107E+00	0.000E+00	0.000E+00	1.374E-70	4.264E-66	0.000E+00	6.787E-58	1.880E-55	0.000E+00
49	ZR-NB-95	3.865E+00	1.485E-37	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.639E-29	0.000E+00	2.731E-27
50	CE-141	7.763E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.268E-47	0.000E+00
51	CE-144	8.902E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
52	SB-124	4.206E+00	0.000E+00	0.000E+00	5.710E-35	2.219E-33	1.199E-31	1.790E-29	4.519E-29	5.722E-27
53	MN-54	8.069E-01	1.616E-11	8.629E-12	0.000E+00	1.172E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00
54	AG-110M	1.001E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
55	SE-75	2.103E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
56	MO-99	9.123E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
57	RU-103	6.361E+00	0.000E+00	0.000E+00	2.521E-50	1.021E-47	1.372E-44	5.517E-42	0.000E+00	0.000E+00
58	SB-125	2.539E-01	0.000E+00	1.669E-06	0.000E+00	0.000E+00	0.000E+00	5.750E-07	0.000E+00	0.000E+00
59	TE-132	7.790E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
60										
61	H-3	5.622E-02	1.299E+00	5.668E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
62									TRGASEF.WB2, SH. E, PG. 2	

E	A	B	R	S	T	U	V	W	X	Y
7								YRC-1178 REV. 0		
8								Page A-12		
9										
10										
11		YEAR	1987	1988	1989	1990	1991	1992		1972-92 TOTAL
12		Yrs to 1998	10	9	8	7	6	5		DECAYED
13										TO 01/01/98
14	Nuclide	Lambda								
15	KR-85	6.440E-02	2.193E+00	1.085E+00	7.119E-01	6.368E-01	1.252E+00	0.000E+00		3.448E+01
16	KR-85m	1.361E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
17	KR-87	4.797E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
18	KR-88	2.178E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
19	XE-133	4.804E+01	1.444E-207	6.590E-187	3.275E-166	2.104E-145	2.219E-124	0.000E+00		2.219E-124
20	XE-135	6.633E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
21	XE-135m	2.322E+04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
22	XE-138	2.567E+04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
23	XE-133m	1.120E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.850E-293	0.000E+00		4.850E-293
24	AR-37	7.233E+00	5.160E-32	4.599E-29	8.322E-26	6.668E-23	7.692E-20	0.000E+00		7.699E-20
25	AR-41	3.320E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
26	C-14	1.210E-04	4.111E+00	1.095E+00	1.963E-01	2.890E-01	9.794E-01	0.000E+00		5.909E+01
27	XE-131m	2.117E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		5.294E-157
28	RB-88	2.061E+04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
29										
30										
31										
32										
33	I-131	3.141E+01	6.314E-142	2.735E-128	6.086E-115	3.698E-101	3.478E-87	0.000E+00		3.478E-87
34	I-133	2.921E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
35	I-135	9.089E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
36										
37										
38										
39	SR-89	4.964E+00	0.000E+00	0.000E+00	3.795E-26	0.000E+00	0.000E+00	0.000E+00		3.795E-26
40	SR-90	2.398E-02	7.455E-07	2.103E-06	5.101E-07	3.171E-07	0.000E+00	0.000E+00		1.136E-04
41	CS-134	3.365E-01	7.726E-06	7.234E-06	2.416E-07	1.840E-07	7.068E-06	3.621E-06		3.535E-06
42	CS-137	2.295E-02	0.000E+00	0.000E+00	8.006E-07	9.027E-07	0.000E+00	0.000E+00		3.427E-05
43	BA-LA-140	1.510E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
44	ZN-65	1.039E+00	0.000E+00	0.000E+00	1.278E-09	9.328E-10	0.000E+00	0.000E+00		2.215E-09
45	CO-58	3.546E+00	3.722E-21	9.628E-20	1.531E-17	3.030E-16	5.066E-15	1.499E-13		1.553E-13
46	CO-60	1.318E-01	0.000E+00	0.000E+00	4.007E-07	1.212E-07	0.000E+00	0.000E+00		2.951E-04
47	FE-59	5.626E+00	3.001E-32	0.000E+00	6.472E-25	3.807E-24	0.000E+00	0.000E+00		4.454E-24
48	CR-51	9.107E+00	5.593E-46	0.000E+00	1.366E-37	3.917E-35	0.000E+00	0.000E+00		3.931E-35
49	ZR-NB-95	3.865E+00	6.801E-25	0.000E+00	4.730E-20	0.000E+00	0.000E+00	0.000E+00		4.730E-20
50	CE-141	7.783E+00	0.000E+00	0.000E+00	1.274E-33	0.000E+00	0.000E+00	0.000E+00		1.274E-33
51	CE-144	8.902E-01	0.000E+00	0.000E+00	5.614E-09	0.000E+00	0.000E+00	0.000E+00		5.614E-09
52	SB-124	4.206E+00	9.882E-26	0.000E+00	2.013E-20	4.785E-19	2.292E-19	0.000E+00		7.279E-19
53	MN-54	8.089E-01	0.000E+00	0.000E+00	3.884E-10	0.000E+00	0.000E+00	0.000E+00		4.268E-10
54	AG-110M	1.001E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		8.087E-15
55	SE-75	2.103E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		8.082E-26
56	MO-99	9.123E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
57	RU-103	6.361E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		5.531E-42
58	SB-125	2.539E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		5.937E-07
59	TE-132	7.790E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		0.000E+00
60										
61	H-3	5.622E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		1.051E+01
62								TRGASEF.WB3, SH. E, PG. 3		

A51

A	H	I	J	K	L	M	N	O	P
1	Yankee Atomic Electric Co.							YRC 1178, REV. 0	
2	TOTAL GASEOUS RELEASES (Curies)							Page A-13	
3								(file G71-75.WK3)	
4									
5									Total Act
6	RADIONUCLIDE				1972			Total All	by group
7	I. FISSION GASES			1	2	3	4	Releases Ci	Ci
8									
9	KR-85			6.45E-02	1.19E-02	7.00E-03	1.59E+00	1.68E+00	
10	KR-85M			4.50E-04	-	2.00E-03	3.00E-03	5.45E-03	
11	KR-87			-	-	-	-	-	
12	KR-88			-	-	-	4.00E-03	4.00E-03	
13	XE-133			3.38E-01	6.68E-01	2.33E+00	7.84E+00	1.12E+01	
14	XE-135			3.23E-02	7.11E-02	6.60E-01	1.18E+00	1.94E+00	
15	XE-135M			-	-	-	-	-	
16	XE-138			-	-	-	-	-	
17	XE-133M			-	7.70E-03	6.00E-03	4.10E-02	5.47E-02	
18	AR-37			3.21E-01	4.65E+00	5.00E-03	1.51E+00	6.49E+00	
19	AR-41			3.35E-02	7.93E-01	7.50E-01	5.20E-02	1.63E+00	
20	C-14			4.93E-01	1.47E-03	3.00E-03	4.81E-01	9.78E-01	
21	XE-131M			-	-	-	-	-	
22	Rb-88			-	-	-	-	-	
23									
24	UNIDENTIFIED			-	-	-	-	-	
25									2.40E+01
26	II. IODINES						-		
27	I-131			-	-	4.40E-05	1.73E-04	2.17E-04	
28	I-133			-	-	-	-	-	
29	I-135			-	-	-	-	-	
30									2.17E-04
31	III. PARTICULATES								
32									
33	SR-89			-	-	-	-	-	
34	SR-90			-	-	3.00E-06	3.00E-06	6.00E-06	
35	CS-134			-	-	-	-	-	
36	CS-137			-	-	2.00E-06	-	2.00E-06	
37	BA-LA-140			-	-	-	-	-	
38	ZN-65			-	-	-	-	-	
39	CO-58			-	-	8.00E-06	2.50E-05	3.30E-05	
40	CO-60			-	-	2.50E-05	7.70E-05	1.02E-04	
41	FE-59			-	-	1.00E-06	-	1.00E-06	
42	CR-51			-	-	-	-	-	
43	ZR-NB-95			-	-	-	-	-	
44	CE-141			-	-	-	-	-	
45	CE-144			-	-	-	-	-	
46	SB-124			-	-	-	-	-	
47	MN-54			-	-	9.00E-06	3.10E-05	4.00E-05	
48	AG-110M			-	-	-	-	-	
49	SE-75			-	-	3.00E-06	8.00E-06	1.10E-05	
50	MO-99			-	-	-	-	-	
51	RU-103			-	-	-	-	-	
52	SB-125			-	-	-	-	-	
53	TE-132			-	-	-	-	-	
54	UNIDENTIFIED			-	-	-	-	-	
55									1.95E-04
56	H-3			2.66E+00	1.65E+00	7.80E-04	4.52E+00	8.83E+00	

A	Q	R	S	T	U	V	W	X	Y
1	Yankee Atomic Electric Co.							YRC 1178, REV. 0	
2	TOTAL GASEOUS RELEASES (Curies)							Page A-14	
3								(file G71-75.WK3)	
4									
5									Total Act
6					1973			Total All	by group
7	I. FISSION GASES			1	2	3	4	Releases Ci	Ci
8									
9	KR-85			-	1.81E-02	4.63E-02	1.91E-01	2.55E-01	
10	KR-85M			-	4.49E-02	3.24E-02	7.48E-02	1.52E-01	
11	KR-87			-	-	-	-	-	
12	KR-88			-	2.41E-02	3.06E-02	2.36E-02	7.84E-02	
13	XE-133			-	1.17E+01	1.38E+01	7.87E+00	3.34E+01	
14	XE-135			-	2.86E+00	2.71E+00	9.50E-01	6.52E+00	
15	XE-135M			-	-	-	-	-	
16	XE-138			-	-	-	-	-	
17	XE-133M			-	-	1.90E-02	5.91E-02	7.81E-02	
18	AR-37			-	8.35E-03	1.44E-02	4.33E-02	6.60E-02	
19	AR-41			-	-	2.45E+00	5.58E-01	3.01E+00	
20	C-14			-	1.34E-02	3.47E-03	1.78E-01	1.95E-01	
21	XE-131M			-	5.50E-03	1.88E-02	1.98E-02	4.41E-02	
22	Rb-88			-	-	-	-	-	
23									
24	UNIDENTIFIED							-	
25									4.37E+01
26	II. IODINES								
27	I-131			-	7.43E-04	1.24E-03	7.11E-04	2.69E-03	
28	I-133			-	-	-	-	-	
29	I-135			-	-	-	-	-	
30									2.69E-03
31	III. PARTICULATES								
32									
33	SR-89			-	-	-	-	-	
34	SR-90			1.00E-06	-	1.20E-07	4.24E-07	1.54E-06	
35	CS-134			-	-	-	4.00E-08	4.00E-08	
36	CS-137			1.00E-06	-	5.80E-07	1.97E-06	3.55E-06	
37	BA-LA-140			-	-	-	-	-	
38	ZN-65			1.00E-06	-	-	-	1.00E-06	
39	CO-58			2.00E-06	4.00E-06	5.10E-07	4.60E-07	6.97E-06	
40	CO-60			2.10E-05	9.30E-05	1.56E-05	5.29E-05	1.83E-04	
41	FE-59			-	-	-	-	-	
42	CR-51			-	-	-	-	-	
43	ZR-NB-95			-	-	-	-	-	
44	CE-141			-	-	-	-	-	
45	CE-144			-	-	-	-	-	
46	SB-124			-	-	-	-	-	
47	MN-54			7.00E-06	2.10E-05	2.59E-06	7.19E-06	3.78E-05	
48	AG-110M			2.00E-06	5.00E-06	9.54E-05	9.50E-07	1.03E-04	
49	SE-75			1.00E-06	1.00E-06	-	-	2.00E-06	
50	MO-99			-	-	-	-	-	
51	RU-103			-	-	-	-	-	
52	SB-125			-	-	-	-	-	
53	TE-132			-	-	-	-	-	
54	UNIDENTIFIED			-	-	-	-	-	
55									3.39E-04
56	H-3			5.00E+00	2.23E+00	9.20E-01	2.44E-01	8.39E+00	

A	Z	AA	AB	AC	AD	AE	AF	AG	AH
1	Yankee Atomic Electric Co.							YRC 1178, REV. 0	
2	TOTAL GASEOUS RELEASES (Curies)							Page A-15	
3								(file G71-75.WK3)	
4									
5									Total Act
6					1974			Total All	by group
7	I. FISSION GASES			1	2	3	4	Releases Ci	Ci
8									
9	KR-85			3.60E-02	8.97E-01	5.11E-01	3.84E-02	1.48E+00	
10	KR-85M			9.10E-04	4.78E-04	4.24E-02	1.12E-02	5.50E-02	
11	KR-87			-	-	9.90E-03	6.00E-03	1.59E-02	
12	KR-88			1.80E-04	1.80E-04	1.88E-02	6.96E-02	8.88E-02	
13	XE-133			3.06E+00	5.47E+01	7.73E-01	2.14E+00	6.07E+01	
14	XE-135			9.21E-01	1.03E+01	-	1.29E-01	1.15E+00	
15	XE-135M			-	-	1.88E-04	4.30E-04	6.18E-04	
16	XE-138			-	-	1.64E-04	3.77E-04	5.41E-04	
17	XE-133M			-	-	1.04E-02	2.74E-02	3.78E-02	
18	AR-37			6.18E-03	4.25E-01	5.60E-02	1.38E-02	5.01E-01	
19	AR-41			3.16E-03	3.09E-02	6.40E-01	1.76E-01	8.50E-01	
20	C-14			7.78E-03	1.38E-01	3.58E-01	2.38E-02	5.27E-01	
21	XE-131M			6.25E-03	1.44E-02	-	-	2.07E-02	
22	Rb-88			-	-	-	-	-	
23									
24	UNIDENTIFIED			-	-	-	-	-	
25									6.54E+01
26	II. IODINES								
27	I-131			1.60E-05	5.88E-04	1.81E-05	8.60E-05	7.11E-04	
28	I-133			-	3.03E-05	2.92E-05	2.28E-04	2.87E-04	
29	I-135			-	-	4.38E-05	3.40E-04	3.84E-04	
30									1.38E-03
31	III. PARTICULATES								
32									
33	SR-89			-	-	-	-	-	
34	SR-90			3.78E-08	3.00E-08	-	6.90E-05	6.91E-05	
35	CS-134			8.70E-07	2.40E-06	-	4.60E-07	3.73E-06	
36	CS-137			7.33E-06	3.40E-06	2.20E-07	5.40E-07	1.15E-05	
37	BA-LA-140			-	-	-	-	-	
38	ZN-65			-	-	-	-	-	
39	CO-58			1.94E-06	8.00E-04	1.30E-04	1.69E-05	9.49E-04	
40	CO-60			2.57E-05	2.01E-03	9.20E-05	4.95E-05	2.18E-03	
41	FE-59			-	-	-	-	-	
42	CR-51			-	5.00E-04	-	-	5.00E-04	
43	ZR-NB-95			-	-	3.00E-07	8.80E-07	1.18E-06	
44	CE-141			-	-	-	-	-	
45	CE-144			-	-	-	-	-	
46	SB-124			-	-	8.70E-08	3.20E-07	4.07E-07	
47	MN-54			2.77E-06	2.95E-04	8.60E-05	2.38E-05	4.08E-04	
48	AG-110M			-	-	2.60E-06	1.20E-06	3.80E-06	
49	SE-75			-	-	-	-	-	
50	MO-99			-	-	-	-	-	
51	RU-103			-	-	-	-	-	
52	SB-125			-	-	-	-	-	
53	TE-132			-	-	-	-	-	
54	UNIDENTIFIED			-	-	1.44E-06	1.18E-06	2.62E-06	
55									4.13E-03
56	H-3			2.87E-01	1.36E+00	1.84E+00	3.56E-01	3.84E+00	

A	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
1	Yankee Atomic Electric Co.							YRC 1178, REV. 0	
2	CONTINUOUS GASEOUS RELEASES (Curies)							Page A-16	
3								(file G71-75.WK3)	
4									
5									Total Act
6					1975			Total All	by group
7	I. FISSION GASES			1	2	3	4	Releases Ci	Ci
8									
9	KR-85			-	2.20E-02	1.97E-02	6.08E-03	4.78E-02	
10	KR-85M			1.60E-02	3.50E-02	4.51E-02	8.54E-03	1.05E-01	
11	KR-87			1.20E-02	2.30E-02	3.42E-02	1.41E-02	8.33E-02	
12	KR-88			2.10E-02	5.30E-02	6.66E-02	1.48E-02	1.55E-01	
13	XE-133			2.00E+00	5.40E+00	3.72E+00	1.29E+00	1.24E+01	
14	XE-135			1.50E-01	6.00E-01	6.67E-01	1.35E-01	1.55E+00	
15	XE-135M			9.60E-04	7.40E-01	6.11E-01	9.36E-02	1.45E+00	
16	XE-138			-	1.10E-02	1.34E-02	3.65E-03	2.81E-02	
17	XE-133M			2.10E-02	6.80E-02	5.46E-02	3.19E-02	1.76E-01	
18	AR-37			3.20E-03	5.40E-04	9.24E-05	8.16E-04	4.65E-03	
19	AR-41			1.50E-01	3.00E-01	2.98E-01	5.09E-02	7.99E-01	
20	C-14			7.60E-03	5.20E-03	1.14E-03	1.63E-03	1.56E-02	
21	XE-131M			-	-	-	-	-	
22	Rb-88			6.50E-02	1.20E-01	2.02E-01	8.94E-02	4.76E-01	
23									
24	UNIDENTIFIED			-	-	-	-	-	
25									1.73E+01
26	II. IODINES								
27	I-131			5.80E-05	2.70E-04	1.87E-04	4.60E-04	9.75E-04	
28	I-133			1.80E-04	2.20E-04	4.05E-04	3.92E-05	8.44E-04	
29	I-135			-	2.90E-05	7.50E-05	2.96E-06	1.07E-04	
30									1.93E-03
31	III. PARTICULATES								
32									
33	SR-89			1.40E-07	-	9.11E-07	1.78E-06	2.83E-06	
34	SR-90			5.90E-08	3.90E-08	4.77E-08	2.22E-07	3.68E-07	
35	CS-134			-	-	-	4.72E-06	4.72E-06	
36	CS-137			4.70E-07	4.50E-07	-	2.44E-06	3.36E-06	
37	BA-LA-140			-	-	-	7.28E-07	7.28E-07	
38	ZN-65			-	-	-	-	-	
39	CO-58			4.60E-06	2.90E-06	1.37E-06	5.16E-04	5.25E-04	
40	CO-60			2.60E-05	4.20E-05	7.01E-05	1.19E-03	1.33E-03	
41	FE-59			-	-	-	1.65E-04	1.65E-04	
42	CR-51			-	-	1.82E-06	9.28E-04	9.30E-04	
43	ZR-NB-95			-	-	7.77E-07	1.03E-04	1.04E-04	
44	CE-141			-	-	-	-	-	
45	CE-144			-	-	-	-	-	
46	SB-124			-	-	-	2.59E-05	2.59E-05	
47	MN-54			8.40E-06	1.00E-05	1.20E-05	1.62E-04	1.92E-04	
48	AG-110M			-	-	4.47E-06	-	4.47E-06	
49	SE-75			-	-	2.29E-07	3.89E-06	4.12E-06	
50	MO-99			-	-	-	-	-	
51	RU-103			-	-	-	-	-	
52	SB-125			-	-	-	-	-	
53	TE-132			-	-	-	-	-	
54	UNIDENTIFIED			-	-	-	-	-	
55									3.29E-03
56	H-3			4.73E-01	5.48E-01	1.04E-01	3.27E-01	1.45E+00	

A	A B	C	D	E	F	G	H	I
172	Yankee Atomic Electric Co						YRC-1178	
173	Total Continuous + Batch Releases (Curies)						Page A-17	
174							(file G76-80.WK3	
175								
176				1976			Total All	Total Act
177	I. FISSION GASES		1	2	3	4	Releases Ci	by group Ci
178								
179	KR-85		1.36E-03	2.46E-02	3.31E-02	1.58E-02	7.49E-02	
180	KR-85M		9.00E-03	5.80E-02	9.37E-02	9.77E-02	2.58E-01	
181	KR-87		4.77E-03	5.97E-02	4.18E-02	5.37E-02	1.60E-01	
182	KR-88		1.22E-02	1.25E-01	1.22E-01	1.36E-01	3.95E-01	
183	XE-133		2.14E-01	3.35E+00	8.96E+00	6.53E+00	1.91E+01	
184	XE-135		1.38E-01	5.27E-01	1.45E+00	1.28E+00	3.40E+00	
185	XE-135M		1.36E-01	1.29E-01	3.86E-01	5.59E-01	1.21E+00	
186	XE-138		2.46E-03	8.62E-03	9.83E-04	1.38E-02	2.59E-02	
187	XE-133M		4.63E-03	7.99E-02	1.68E-01	1.26E-01	3.79E-01	
188	AR-37		8.73E-02	3.15E-01	8.94E-03	2.28E-02	4.34E-01	
189	AR-41		9.65E-02	5.02E-02	5.66E-02	9.27E-02	2.96E-01	
190	C-14		1.42E-03	1.18E-01	4.06E-03	5.60E-03	1.29E-01	
191	XE-131M		-	-	-	3.47E-02	3.47E-02	
192	Rb-88		4.99E-02	1.25E-01	5.96E-01	4.84E-01	1.25E+00	
193								
194	UNIDENTIFIED		-	-	-	-	-	
195								2.71E+01
196	II. IODINES							
197	I-131		1.09E-06	1.03E-05	1.34E-06	1.28E-05	2.55E-05	
198	I-133		1.24E-05	6.29E-06	4.35E-06	2.58E-05	4.88E-05	
199	I-135		1.35E-05	8.03E-06	7.93E-06	2.97E-05	5.92E-05	
200								1.34E-04
201	III. PARTICULATES							
202								
203	SR-89		-	-	-	-	-	
204	SR-90		-	-	2.83E-08	-	2.83E-08	
205	CS-134		-	-	4.26E-07	3.20E-08	4.58E-07	
206	CS-137		-	3.77E-08	1.10E-07	2.58E-07	4.06E-07	
207	BA-LA-140		-	-	-	-	-	
208	ZN-65		-	-	-	-	-	
209	CO-58		6.47E-07	3.10E-07	6.14E-07	2.47E-07	1.82E-06	
210	CO-60		3.10E-06	1.84E-06	4.31E-06	1.93E-07	9.44E-06	
211	FE-59		1.76E-07	9.41E-08	1.18E-06	4.19E-07	1.87E-06	
212	CR-51		-	7.78E-07	-	1.46E-06	2.24E-06	
213	ZR-NB-95		-	4.54E-08	-	-	4.54E-08	
214	CE-141		-	-	-	-	-	
215	CE-144		-	-	-	-	-	
216	SB-124		-	8.35E-08	-	9.13E-08	1.75E-07	
217	MN-54		3.62E-08	-	5.10E-07	-	5.46E-07	
218	AG-110M		-	-	3.81E-07	7.09E-08	4.52E-07	
219	SE-75							
220	MO-99		-	-	-	-	-	
221	RU-103		-	-	-	-	-	
222	SB-125		-	-	-	-	-	
223								
224	UNIDENTIFIED		-	-	-	-	-	
225								1.75E-05
226	H-3		5.77E-02	4.74E-01	9.26E-01	5.63E-01	2.02E+00	

A	J	K	L	M	N	O	P	Q	R
172	Yankee Atomic Electric Co							YRC-1178	
173	Total Continuous + Batch Releases (Curies)							Page A-18	
174								(file G76-80.WK3)	
175									
176					1977			Total All	Total Act
177	I. FISSION GASES			1	2	3	4	Releases Ci	by group
178									Ci
179	KR-85			8.28E-02	1.03E+00	1.46E-02	1.75E-01	1.30E+00	
180	KR-85M			1.33E-01	1.09E-01	1.03E-01	7.01E-01	1.05E+00	
181	KR-87			7.47E-02	9.51E-02	6.16E-02	2.79E-01	5.10E-01	
182	KR-88			1.83E-01	1.41E-01	1.48E-01	9.26E-01	1.40E+00	
183	XE-133			1.06E+01	1.87E+01	6.01E+00	6.25E+01	9.78E+01	
184	XE-135			1.84E+00	1.41E+00	1.54E+00	8.90E+00	1.37E+01	
185	XE-135M			8.37E-01	5.44E-01	1.09E+00	2.20E+00	4.67E+00	
186	XE-138			8.64E-03	2.40E-02	1.15E-03	2.43E-02	5.81E-02	
187	XE-133M			1.83E-01	1.07E-01	1.26E-01	1.01E+00	1.43E+00	
188	AR-37			7.05E-02	8.54E-01	2.66E-03	1.35E-02	9.41E-01	
189	AR-41			1.78E-01	2.15E-01	2.89E-02	6.44E-02	4.86E-01	
190	C-14			3.74E-03	2.28E-01	1.86E-03	5.85E-03	2.39E-01	
191	XE-131M			9.03E-02	1.20E-01	3.17E-02	3.78E-01	6.20E-01	
192	Rb-88			3.24E-01	3.60E-01	-	-	6.84E-01	
193									
194	UNIDENTIFIED			-	-	-	-	-	
195									1.25E+02
196	II. IODINES								
197	I-131			2.21E-06	2.60E-05	-	2.12E-05	4.94E-05	
198	I-133			2.29E-05	-	-	4.44E-05	6.73E-05	
199	I-135			2.62E-05	-	-	2.85E-05	5.47E-05	
200									1.71E-04
201	III. PARTICULATES								
202									
203	SR-89			-	-	-	-	-	
204	SR-90			1.56E-08	-	-	-	1.56E-08	
205	CS-134			-	-	-	1.15E-07	1.15E-07	
206	CS-137			2.18E-07	1.43E-07	2.19E-07	1.32E-07	7.12E-07	
207	BA-LA-140			-	-	-	-	-	
208	ZN-65			-	-	-	-	-	
209	CO-58			-	-	2.79E-07	-	2.79E-07	
210	CO-60			-	-	2.20E-07	-	2.20E-07	
211	FE-59			1.55E-07	-	-	1.81E-07	3.36E-07	
212	CR-51			-	-	-	-	-	
213	ZR-NB-95			-	-	-	2.18E-07	2.18E-07	
214	CE-141			-	-	2.16E-07	-	2.16E-07	
215	CE-144			-	-	7.98E-07	-	7.98E-07	
216	SB-124			-	-	-	-	-	
217	MN-54			-	-	-	-	-	
218	AG-110M			-	1.72E-07	-	2.03E-07	3.75E-07	
219	SE-75			-	-	-	-	-	
220	MO-99			-	-	-	-	-	
221	RU-103			-	-	-	-	-	
222	SB-125			-	-	-	-	-	
223									
224	UNIDENTIFIED			-	-	-	-	-	
225									3.28E-06
226	H-3			1.55E+00	2.14E-01	4.91E-01	1.01E+00	3.27E+00	

A	S	T	U	V	W	X	Y	Z	AA
172	Yankee Atomic Electric Co							YRC-1178	
173	Total Continuous + Batch Releases (Curies)							Page A-19	
174								(file G76-80.WK3)	
175									
176					1978			Total All	Total Act
177	I. FISSION GASES			1	2	3	4	Releases Ci	by group Ci
178									
179	KR-85			6.61E-01	4.16E-01	5.06E-01	6.00E+00	7.58E+00	
180	KR-85M			1.30E+00	2.19E+00	2.68E+00	1.51E+00	7.68E+00	
181	KR-87			7.25E-01	1.62E+00	1.83E+00	1.20E+00	5.38E+00	
182	KR-88			1.69E+00	3.21E+00	3.93E+00	2.40E+00	1.12E+01	
183	XE-133			8.39E+01	1.34E+02	1.64E+02	1.41E+02	5.23E+02	
184	XE-135			1.36E+01	2.17E+01	2.32E+01	1.25E+01	7.10E+01	
185	XE-135M			2.95E+00	4.18E+00	2.19E+00	1.25E+00	1.06E+01	
186	XE-138			7.86E-02	2.90E-01	1.58E-01	3.40E-02	5.61E-01	
187	XE-133M			1.45E+00	2.21E+00	2.51E+00	2.55E+00	8.72E+00	
188	AR-37			3.56E-02	5.95E-02	1.02E-01	3.72E-01	5.69E-01	
189	AR-41			1.39E-01	3.27E-01	7.27E-01	5.96E-01	1.79E+00	
190	C-14			8.39E-02	4.68E-03	2.30E-03	2.40E-01	3.31E-01	
191	XE-131M			3.02E-01	8.13E-01	1.55E+00	4.96E+00	7.63E+00	
192	Rb-88			-	-	-	-	-	
193									
194	UNIDENTIFIED			-	-	-	-	-	
195									6.56E+02
196	II. IODINES								
197	I-131			7.50E-05	1.71E-05	6.33E-06	5.90E-05	1.57E-04	
198	I-133			6.50E-05	3.01E-05	2.65E-05	1.53E-05	1.37E-04	
199	I-135			3.79E-05	1.34E-05	1.64E-05	1.13E-05	7.90E-05	
200									3.73E-04
201	III. PARTICULATES								
202									
203	SR-89			1.23E-07	1.85E-07	-	-	3.08E-07	
204	SR-90			-	-	-	-	-	
205	CS-134			8.16E-07	1.08E-07	1.84E-07	1.33E-06	2.44E-06	
206	CS-137			2.38E-06	8.75E-08	2.37E-07	-	2.70E-06	
207	BA-LA-140			-	-	-	-	-	
208	ZN-65			-	-	-	-	-	
209	CO-58			-	-	-	8.96E-06	8.96E-06	
210	CO-60			-	-	-	2.42E-05	2.42E-05	
211	FE-59			-	-	5.87E-07	5.53E-06	6.12E-06	
212	CR-51			-	-	-	1.77E-05	1.77E-05	
213	ZR-NB-95			-	1.38E-07	-	7.00E-07	8.38E-07	
214	CE-141			-	-	-	-	-	
215	CE-144			-	-	-	1.42E-06	1.42E-06	
216	SB-124			-	-	-	-	-	
217	MN-54			-	-	-	2.34E-06	2.34E-06	
218	AG-110M			-	-	-	2.84E-07	2.84E-07	
219	SE-75			-	-	-	-	-	
220	MO-99			-	-	-	-	-	
221	RU-103			-	-	-	-	-	
222	SB-125			-	-	-	-	-	
223									
224	UNIDENTIFIED			-	-	-	-	-	
225									6.73E-05
226	H-3			7.06E-01	5.36E-01	6.84E-01	9.67E-01	2.89E+00	

A	AB	AC	AD	AE	AF	AG	AH	AI	AJ
172	Yankee Atomic Electric Co							YRC-1178	
173	Total Continuous + Batch Releases (Curies)							Page A-20	
174								(file G76-80.WK3)	
175									
176					1979			Total All	Total Act
177	I. FISSION GASES			1	2	3	4	Releases Ci	by group Ci
178									
179	KR-85			5.24E-02	1.14E+00	7.38E-02	3.72E-01	1.64E+00	
180	KR-85M			2.51E-01	5.83E-01	5.50E-01	3.10E-01	1.69E+00	
181	KR-87			1.45E-01	4.97E-01	4.29E-01	2.77E-01	1.35E+00	
182	KR-88			3.49E-01	9.35E-01	7.36E-01	4.97E-01	2.52E+00	
183	XE-133			4.02E+01	2.13E+01	4.41E+01	1.12E+01	1.17E+02	
184	XE-135			3.14E+00	8.58E+00	8.53E+00	5.27E+00	2.55E+01	
185	XE-135M			1.83E+00	6.96E+00	7.54E+00	5.81E+00	2.21E+01	
186	XE-138			3.49E-02	2.42E-01	3.15E-01	1.56E-01	7.48E-01	
187	XE-133M			4.61E-01	3.67E-01	7.58E-01	2.78E-01	1.86E+00	
188	AR-37			1.61E+00	5.69E-02	3.79E-01	1.25E-01	2.17E+00	
189	AR-41			7.36E-01	2.33E-01	2.36E-01	1.00E+00	2.21E+00	
190	C-14			7.57E-03	1.32E-01	6.17E-02	6.64E-03	2.08E-01	
191	XE-131M			2.28E+00	3.28E-01	1.79E-01	4.23E-01	3.21E+00	
192	Rb-88			-	-	-	-	-	
193									
194	UNIDENTIFIED			-	-	-	-	-	
195									1.82E+02
196	II. IODINES								
197	I-131			1.40E-04	2.85E-06	3.17E-05	-	1.75E-04	
198	I-133			2.48E-05	3.54E-05	1.38E-05	2.47E-06	7.65E-05	
199	I-135			3.10E-05	5.51E-05	1.28E-05	4.51E-06	1.03E-04	
200									3.54E-04
201	III. PARTICULATES								
202									
203	SR-89			-	2.46E-07	5.73E-08	-	3.03E-07	
204	SR-90			-	6.76E-09	-	2.03E-07	2.10E-07	
205	CS-134			5.43E-07	2.11E-06	2.23E-07	2.05E-06	4.93E-06	
206	CS-137			4.40E-07	4.09E-06	6.00E-07	2.77E-06	7.90E-06	
207	BA-LA-140			1.03E-06	-	-	-	1.03E-06	
208	ZN-65			-	-	-	-	-	
209	CO-58			1.63E-06	1.70E-06	-	6.92E-07	4.02E-06	
210	CO-60			5.39E-06	3.71E-06	-	1.29E-05	2.20E-05	
211	FE-59			3.49E-07	-	-	-	3.49E-07	
212	CR-51			-	-	-	-	-	
213	ZR-NB-95			-	2.43E-07	-	-	2.43E-07	
214	CE-141			-	-	-	-	-	
215	CE-144			-	-	-	-	-	
216	SB-124			-	-	-	-	-	
217	MN-54			1.76E-06	1.39E-05	2.46E-06	1.59E-05	3.40E-05	
218	AG-110M			-	-	-	-	-	
219	SE-75			-	-	-	-	-	
220	MO-99			-	-	-	-	-	
221	RU-103			-	-	-	-	-	
222	SB-125			-	-	-	-	-	
223									
224	UNIDENTIFIED			-	-	-	-	-	
225									7.50E-05
226	H-3			7.12E-01	1.03E+00	1.03E+00	8.01E-01	3.57E+00	

A	AK AL AM	AI	AO	AP	AQ	AR	AS
172	Yankee Atomic Electric Co					YRC-1178	
173	Total Continuous + Batch Releases (Curies)					Page A-21	
174						(file G76-80.WK3)	
175							
176			1980			Total All	Total Act
177	I. FISSION GASES	1	2	3	4	Releases	by group
178							Ci
179	KR-85	1.51E-02	9.28E-03	1.19E+00	1.22E-02	1.23E+00	
180	KR-85M	1.21E-01	-	-	6.24E-01	7.45E-01	
181	KR-87	1.09E-01	-	-	6.02E-01	7.11E-01	
182	KR-88	1.72E-01	-	-	1.09E+00	1.26E+00	
183	XE-133	1.01E+01	2.38E-05	-	2.21E+01	3.22E+01	
184	XE-135	2.21E+00	-	-	1.08E+01	1.30E+01	
185	XE-135M	2.48E+00	-	-	1.60E+01	1.85E+01	
186	XE-138	4.79E-02	-	-	3.18E-01	3.66E-01	
187	XE-133M	1.34E-02	-	-	8.13E-02	9.47E-02	
188	AR-37	3.33E-01	8.68E-04	6.22E-03	7.33E-02	4.13E-01	
189	AR-41	2.10E-01	-	-	7.09E-01	9.19E-01	
190	C-14	1.36E-02	2.13E-02	1.10E-01	5.31E-03	1.50E-01	
191	XE-131M	7.16E-01	4.87E-05	-	3.36E-01	1.05E+00	
192	Rb-88	-	-	-	-	-	
193							
194	UNIDENTIFIED	-	-	-	-	-	
195							7.06E+01
196	II. IODINES						
197	I-131	6.06E-05	-	-	2.57E-06	6.32E-05	
198	I-133	-	-	-	-	-	
199	I-135	-	-	-	-	-	
200							6.32E-05
201	III. PARTICULATES						
202							
203	SR-89	5.06E-08	1.74E-07	7.91E-08	-	3.04E-07	
204	SR-90	1.65E-08	2.67E-08	6.80E-09	7.04E-08	1.20E-07	
205	CS-134	6.07E-07	5.27E-07	-	1.91E-06	3.04E-06	
206	CS-137	7.78E-07	7.12E-07	-	4.99E-06	6.48E-06	
207	BA-LA-140	-	-	-	-	-	
208	ZN-65	-	-	-	-	-	
209	CO-58	1.86E-07	7.89E-07	-	3.08E-07	1.28E-06	
210	CO-60	1.41E-06	1.68E-06	-	8.75E-06	1.18E-05	
211	FE-59	-	-	-	-	-	
212	CR-51	-	-	-	-	-	
213	ZR-NB-95	-	-	-	-	-	
214	CE-141	-	-	-	-	-	
215	CE-144	-	-	-	-	-	
216	SB-124	-	-	-	-	-	
217	MN-54	1.09E-06	1.83E-06	-	5.36E-06	8.28E-06	
218	AG-110M	-	-	-	-	-	
219	SE-75	-	-	-	-	-	
220	MO-99	-	-	-	-	-	
221	RU-103	-	-	-	-	-	
222	SB-125	-	-	-	1.40E-06	1.40E-06	
223							
224	UNIDENTIFIED	-	-	-	-	-	
225							3.28E-05
226	H-3	7.30E-01	3.30E-01	1.80E-01	2.34E-01	1.47E+00	

A	A	B	C	D	E	F	G	H	I
171	Yankee Atomic Electric Co.							YRC-1178, REV. 0	
172	Total Continuous + Batch Releases (C ries)							Page A-22	
173								(file G81-85.WK3)	
174									Total Act
175					1981			Total All	by group
176	I. FISSION GASES			1	2	3	4	Releases Ci	Ci
177									
178	KR-85			2.90E-02	2.70E-01	6.22E+00	1.23E-02	6.53E+00	
179	KR-85M			6.95E-01	1.53E-01	2.80E-01	3.15E-01	1.44E+00	
180	KR-87			7.40E-01	1.50E-01	2.78E-01	3.48E-01	1.52E+00	
181	KR-88			1.20E+00	2.59E-01	4.73E-01	5.44E-01	2.48E+00	
182	XE-133			2.80E+01	3.15E+01	8.59E+00	1.22E+01	8.03E+01	
183	XE-135			1.21E+01	3.86E+00	5.95E+00	7.05E+00	2.90E+01	
184	XE-135M			1.96E+01	4.27E+00	9.30E+00	1.23E+01	4.55E+01	
185	XE-138			5.90E-01	1.21E-01	2.26E-01	4.61E-01	1.40E+00	
186	XE-133M			3.42E-01	4.49E-01	-	1.92E-02	8.10E-01	
187	AR-37			1.45E-01	3.50E-01	5.25E-02	4.82E-02	5.96E-01	
188	AR-41			6.59E-01	1.08E-01	3.65E-01	2.00E-01	1.33E+00	
189	C-14			1.26E-02	8.73E-02	3.65E-01	5.62E-03	4.71E-01	
190	XE-131M			6.79E-02	5.91E-01	2.24E-01	2.94E-01	1.18E+00	
191	RB-88								
192									
193	UNIDENTIFIED			-	-	-	-	-	
194									1.72E+02
195	II. IODINES								
196	I-131			6.03E-05	8.49E-05	2.11E-05	2.18E-06	1.68E-04	
197	I-133			-	1.89E-06	4.42E-05	-	4.61E-05	
198	I-135			-	-	7.78E-05	-	7.78E-05	
199									2.92E-04
200	III. PARTICULATES								
201									
202	SR-89			4.29E-07	7.03E-07	1.10E-07	-	1.24E-06	
203	SR-90			4.76E-07	-	5.41E-07	-	1.02E-06	
204	CS-134			3.92E-07	-	3.99E-07	-	7.91E-07	
205	CS-137			8.51E-07	-	1.15E-06	-	2.00E-06	
206	BA-LA-140			-	-	-	-	-	
207	ZN-65			-	-	-	-	-	
208	CO-58			-	3.92E-06	4.35E-06	3.70E-07	8.64E-06	
209	CO-60			3.53E-06	2.44E-06	4.63E-06	-	1.06E-05	
210	FE-59			-	-	3.97E-07	-	3.97E-07	
211	CR-51			-	5.80E-06	-	-	5.80E-06	
212	ZR-NB-95			2.63E-07	-	-	-	2.63E-07	
213	CE-141			-	-	-	-	-	
214	CE-144			-	-	-	-	-	
215	SB-124			-	-	-	-	-	
216	MN-54			6.73E-07	2.40E-06	5.68E-06	8.61E-07	9.61E-06	
217	AG-110M			-	-	-	-	-	
218	SE-75								
219	MO-99			-	-	-	-	-	
220	RU-103			-	-	-	-	-	
221	SB-125			-	-	3.08E-06	9.23E-07	4.00E-06	
222	TE-132			-	-	-	-	-	
223	FE-55								
224									
225	UNIDENTIFIED			-	-	-	-	-	
226									4.44E-05
227	H-3			3.85E-01	9.63E-01	5.08E-01	1.21E+00	3.07E+00	

A	J	K	L	M	N	O	P	Q	R
171	Yankee Atomic Electric Co.							YRC-1178, REV. 0	
172	Total Continuous + Batch Releases (Curies)							Page A-23	
173								(file G81-85.WK3)	
174									Total Act
175					1982			Total All	by group
176	I. FISSION GASES			1	2	3	4	Releases Ci	Ci
177									
178	KR-85			1.67E-02	1.82E-02	4.92E-01	3.62E-01	8.89E-01	
179	KR-85M			4.48E-01	6.04E-01	7.21E-01	8.18E-02	1.85E+00	
180	KR-87			5.04E-01	6.39E-01	9.57E-01	5.97E-02	2.16E+00	
181	KR-88			7.78E-01	1.10E+00	1.40E+00	1.31E-01	3.41E+00	
182	XE-133			1.76E+01	1.70E+01	1.72E+01	1.72E+00	5.35E+01	
183	XE-135			9.06E+00	1.22E+01	1.24E+01	1.56E+00	3.52E+01	
184	XE-135M			1.55E+01	1.77E+01	1.08E+01	2.88E+00	4.69E+01	
185	XE-138			7.28E-01	1.06E+00	2.38E+00	3.23E-03	4.17E+00	
186	XE-133M			8.77E-02	3.19E-02	8.07E-01	-	9.27E-01	
187	AR-37			7.16E-02	1.37E-01	3.68E-01	4.96E-02	6.26E-01	
188	AR-41			3.74E-01	6.43E-01	1.07E+00	4.23E-02	2.13E+00	
189	C-14			8.19E-03	7.90E-03	1.14E+00	8.82E-02	1.24E+00	
190	XE-131M			9.19E-01	1.33E+00	6.41E-02	2.40E-02	2.34E+00	
191	Rb-88								
192									
193	UNIDENTIFIED			-	-	-	-	-	
194									1.55E+02
195	II. IODINES								
196	I-131			-	-	2.44E-04	3.94E-05	2.83E-04	
197	I-133			-	-	4.99E-05	-	4.99E-05	
198	I-135			-	-	1.78E-05	-	1.78E-05	
199									3.51E-04
200	III. PARTICULATES								
201									
202	SR-89			-	1.26E-05	-	-	1.26E-05	
203	SR-90			-	1.54E-06	-	8.16E-08	1.62E-06	
204	CS-134			-	7.51E-07	-	-	7.51E-07	
205	CS-137			-	2.31E-04	-	1.69E-07	2.31E-04	
206	BA-LA-140			-	-	-	-	-	
207	ZN-65			-	-	-	-	-	
208	CO-58			-	-	3.96E-06	2.39E-06	6.35E-06	
209	CO-60			-	-	-	1.75E-06	1.75E-06	
210	FE-59			-	-	1.69E-06	-	1.69E-06	
211	CR-51			-	-	9.49E-06	-	9.49E-06	
212	ZR-NB-95			-	-	9.05E-07	-	9.05E-07	
213	CE-141			-	-	-	-	-	
214	CE-144			-	-	-	-	-	
215	SB-124			-	-	-	-	-	
216	MN-54			8.32E-07	9.67E-07	1.90E-06	1.87E-06	5.57E-06	
217	AG-110M			-	2.18E-07	-	-	2.18E-07	
218	SE-75								
219	MO-99			-	-	-	-	-	
220	RU-103			-	-	-	-	-	
221	SB-125			-	-	2.80E-06	-	2.80E-06	
222	TE-132			-	-	-	-	-	
223	FE-55								
224									
225	UNIDENTIFIED			-	-	-	-	-	
226									2.75E-04
227	H-3			1.96E+00	1.26E+00	1.19E+00	9.55E-01	5.37E+00	

A	S	T	U	V	W	X	Y	Z	AA
171	Yankee Atomic Electric Co.							YRC-1178, REV. 0	
172	Total Continuous + Batch Releases (Curies)							Page A-24	
173								(file G81-85.WK3)	
174									Total Act
175					1983			Total All	by group
176	I. FISSION GASES			1	2	3	4	Releases Ci	Ci
177									
178	KR-85			1.25E-02	1.30E-01	6.58E-01	1.78E-01	9.79E-01	
179	KR-85M			9.72E-01	1.32E+00	2.37E+00	3.60E+00	8.26E+00	
180	KR-87			8.12E-01	1.19E+00	2.53E+00	4.26E+00	8.79E+00	
181	KR-88			1.56E+00	2.13E+00	3.94E+00	6.18E+00	1.38E+01	
182	XE-133			3.54E+01	6.98E+01	2.29E+02	1.32E+02	4.66E+02	
183	XE-135			1.66E+01	2.80E+01	4.50E+01	5.71E+01	1.47E+02	
184	XE-135M			2.61E+01	3.82E+01	5.51E+01	8.18E+01	2.01E+02	
185	XE-138			1.56E-01	6.08E-01	2.11E+00	4.46E+00	7.33E+00	
186	XE-133M			3.22E-01	9.62E-01	4.67E+00	2.39E+00	8.34E+00	
187	AR-37			5.58E-02	1.06E+00	5.24E+00	1.44E-01	6.50E+00	
188	AR-41			2.31E-01	1.81E-01	5.00E-01	7.93E-01	1.71E+00	
189	C-14			5.39E-03	1.04E-01	2.44E-01	7.74E-02	4.31E-01	
190	XE-131M			3.10E-02	2.01E-01	8.78E+00	-	9.01E+00	
191	Rb-88								
192									
193	UNIDENTIFIED			-	-	-	-	-	
194									8.79E+02
195	II. IODINES								
196	I-131			4.75E-05	2.49E-04	2.60E-03	1.91E-04	3.09E-03	
197	I-133			8.52E-05	2.38E-04	8.62E-04	5.96E-05	1.24E-03	
198	I-135			1.18E-04	3.21E-04	1.50E-03	1.13E-04	2.05E-03	
199									6.38E-03
200	III. PARTICULATES								
201									
202	SR-89			-	2.71E-07	1.26E-06	-	1.53E-06	
203	SR-90			-	-	1.57E-07	4.13E-08	1.98E-07	
204	CS-134			2.15E-07	-	1.62E-06	6.24E-07	2.46E-06	
205	CS-137			2.69E-07	-	4.10E-06	1.02E-06	5.39E-06	
206	BA-LA-140			-	-	-	-	-	
207	ZN-65			-	-	-	-	-	
208	CO-58			-	-	-	-	-	
209	CO-60			-	-	5.87E-06	-	5.87E-06	
210	FE-59			-	-	-	-	-	
211	CR-51			-	-	-	-	-	
212	ZR-NB-95			-	-	-	-	-	
213	CE-141			-	-	-	-	-	
214	CE-144			-	-	-	-	-	
215	SB-124			-	-	-	-	-	
216	MN-54			1.09E-06	2.24E-07	2.57E-06	6.03E-07	4.49E-06	
217	AG-110M			-	-	-	-	-	
218	SE-75								
219	MO-99			-	-	-	-	-	
220	RU-103			-	-	-	-	-	
221	SB-125			-	1.45E-06	5.05E-06	-	6.50E-06	
222	TE-132			-	-	-	-	-	
223	FE-55								
224									
225	UNIDENTIFIED			-	-	-	-	-	
226									2.64E-05
227	H-3			9.29E-01	1.78E+00	1.63E+00	7.94E-01	5.13E+00	

A	AB	AC	AD	AE	AF	AG	AH	AI	AJ
171	Yankee Atomic Electric Co.							YRC-1178, REV. 0	
172	Total Continuous + Batch Releases (Curies)							Page A-25	
173								(file G81-85.WK3)	
174									Total Act
175					1984			Total All	by group
176	I. FISSION GASES			1	2	3	4	Releases	Ci
177									
178	KR-85			2.34E+00	4.12E+00	1.38E+00	7.32E-02	7.92E+00	
179	KR-85M			5.24E+00	9.38E-01	4.81E+00	6.93E+00	1.79E+01	
180	KR-87			6.02E+00	7.96E-01	3.53E+00	6.50E+00	1.68E+01	
181	KR-88			9.33E+00	1.35E+00	5.99E+00	1.01E+01	2.68E+01	
182	XE-133			3.31E+02	1.56E+02	2.84E+02	3.16E+02	1.09E+03	
183	XE-135			9.37E+01	2.29E+01	6.65E+01	8.21E+01	2.65E+02	
184	XE-135M			9.87E+01	2.15E+01	6.34E+01	7.31E+01	2.57E+02	
185	XE-138			4.91E+00	3.41E-01	2.12E+00	5.11E+00	1.25E+01	
186	XE-133M			6.94E+00	2.77E+00	1.97E+00	5.67E+00	1.74E+01	
187	AR-37			3.01E+00	5.61E+00	3.55E+00	8.84E-02	1.23E+01	
188	AR-41			1.08E+00	1.83E-01	2.96E-01	8.66E-01	2.43E+00	
189	C-14			1.02E+00	1.79E+00	2.60E-01	3.18E-02	3.10E+00	
190	XE-131M			1.11E+01	4.66E+00	2.06E+00	1.20E-01	1.79E+01	
191	Rb-88								
192									
193	UNIDENTIFIED			-	-	-	-	-	
194									1.74E+03
195	II. IODINES								
196	I-131			7.50E-04	1.42E-03	4.04E-03	-	6.21E-03	
197	I-133			1.11E-04	2.23E-04	2.66E-03	-	2.99E-03	
198	I-135			5.80E-05	1.56E-04	3.02E-04	-	5.16E-04	
199									9.72E-03
200	III. PARTICULATES								
201									
202	SR-89			5.00E-07	-	8.81E-07	1.11E-05	1.25E-05	
203	SR-90			4.18E-08	-	2.54E-08	2.65E-06	2.72E-06	
204	CS-134			1.27E-06	2.19E-06	6.35E-07	8.31E-05	8.72E-05	
205	CS-137			1.19E-06	1.77E-06	1.09E-06	9.12E-05	9.53E-05	
206	BA-LA-140			7.93E-06	-	-	-	7.93E-06	
207	ZN-65			-	-	-	-	-	
208	CO-58			9.54E-07	2.27E-07	1.28E-07	-	1.31E-06	
209	CO-60			-	-	-	-	-	
210	FE-59			-	-	-	-	-	
211	CR-51			-	-	-	-	-	
212	ZR-NB-95			1.08E-06	6.91E-07	-	-	1.77E-06	
213	CE-141			5.06E-07	-	-	-	5.06E-07	
214	CE-144			-	-	-	-	-	
215	SB-124			-	-	-	-	-	
216	MN-54			2.13E-06	9.29E-07	4.17E-06	2.75E-06	9.98E-06	
217	AG-110M			-	-	-	-	-	
218	SE-75								
219	MO-99			-	-	-	-	-	
220	RU-103			3.97E-07	-	-	-	3.97E-07	
221	SB-125			1.92E-06	2.60E-06	-	-	4.52E-06	
222	TE-132			1.56E-05	-	-	-	1.56E-05	
223	FE-55								
224									
225	UNIDENTIFIED			-	-	-	-	-	
226									2.40E-04
227	H-3			7.08E-01	1.04E+00	1.95E+00	5.75E+00	9.45E+00	

A	AK	AL	AM	AN	AO	AP	AQ	AR	AS
171	Yankee Atomic Electric Co.							YRC-1178, REV. 0	
172	Total Continuous + Batch Releases (Curies)							Page A-26	
173								(file G81-85.WK3)	
174									Total Act
175					1985			Total All	by group
176	I. FISSION GASES			1	2	3	4	Releases Ci	Ci
177									
178	KR-85			5.90E-02	1.11E-01	7.12E-02	1.10E+01	1.13E+01	
179	KR-85M			6.81E+00	7.12E+00	4.41E+00	1.46E+00	1.98E+01	
180	KR-87			6.88E+00	7.30E+00	4.20E+00	1.37E+00	1.98E+01	
181	KR-88			1.05E+01	1.12E+01	6.94E+00	2.67E+00	3.13E+01	
182	XE-133			2.72E+02	2.50E+02	1.75E+02	2.41E+02	9.38E+02	
183	XE-135			7.56E+01	7.88E+01	4.42E+01	7.48E+00	2.06E+02	
184	XE-135M			6.72E+01	6.01E+01	4.14E+01	2.03E+01	1.89E+02	
185	XE-138			5.38E+00	4.59E+00	3.44E+00	1.33E+00	1.47E+01	
186	XE-133M			5.37E+00	5.68E+00	3.81E+00	4.24E+00	1.91E+01	
187	AR-37			1.90E-03	1.04E-01	1.19E-01	3.55E+00	3.77E+00	
188	AR-41			9.19E-01	7.39E-01	9.32E-01	2.67E-01	2.86E+00	
189	C-14			9.83E-03	1.86E-02	1.26E-02	1.49E+00	1.53E+00	
190	XE-131M			7.28E+00	4.60E+00	3.42E-02	1.54E+00	1.35E+01	
191	Rb-88								
192									
193	UNIDENTIFIED			-	-	-	-	-	
194									1.47E+03
195	II. IODINES								
196	I-131			-	1.14E-09	4.05E-06	6.59E-04	6.63E-04	
197	I-133			-	-	-	6.20E-05	6.20E-05	
198	I-135			-	-	-	2.35E-06	2.35E-06	
199									7.27E-04
200	III. PARTICULATES								
201									
202	SR-89			-	-	-	-	-	
203	SR-90			-	4.21E-08	-	-	4.21E-08	
204	CS-134			-	-	-	4.19E-08	4.19E-08	
205	CS-137			-	-	1.38E-07	1.24E-07	2.62E-07	
206	BA-LA-140			-	-	4.48E-07	-	4.48E-07	
207	ZN-65			-	-	-	-	-	
208	CO-58			-	-	-	3.27E-08	3.27E-08	
209	CO-60			-	1.89E-06	7.02E-07	1.80E-06	4.39E-06	
210	FE-59			-	-	-	-	-	
211	CR-51			-	-	-	-	-	
212	ZR-NB-95			-	-	-	5.44E-08	5.44E-08	
213	CE-141			-	-	-	-	-	
214	CE-144			-	2.70E-07	1.92E-07	-	4.62E-07	
215	SB-124			-	-	-	-	-	
216	MN-54			-	2.25E-07	1.04E-07	4.63E-08	3.76E-07	
217	AG-110M			-	-	-	-	-	
218	SE-75								
219	MO-99			-	-	-	-	-	
220	RU-103			-	-	-	-	-	
221	SB-125			-	-	-	-	-	
222	TE-132			-	-	-	-	-	
223	FE-55								
224									
225	UNIDENTIFIED			-	-	-	-	-	
226									6.11E-06
227	H-3			1.75E+00	1.33E+00	8.97E-01	1.28E+00	5.26E+00	

A	A	B	C	D	E	F	G	H	I
106	Yankee Atomic Electric Co.							YRC-1178, REV. 0	
107	Total Continuous + Batch Releases (Curies)							Page A-27	
108								(file G86-90:WK3)	
109									Total Act
110	RADIONUCLIDE				1986			Total All	by group
111	I. FISSION GASES			1	2	3	4	Releases Ci	Ci
112									
113	KR-85			4.91E-02	2.70E+00	3.93E-02	4.66E-02	2.84E+00	
114	KR-85M			8.97E-01	4.94E-01	1.71E+00	1.39E+00	4.49E+00	
115	KR-87			5.30E-01	4.76E-01	1.58E+00	1.26E+00	3.85E+00	
116	KR-88			1.38E+00	8.23E-01	1.90E+00	2.63E+00	6.73E+00	
117	XE-133			6.93E+01	1.07E+02	7.38E+01	5.86E+01	3.09E+02	
118	XE-135			1.42E+01	1.14E+01	2.96E+01	2.21E+01	7.73E+01	
119	XE-135M			1.36E+01	1.86E+01	3.80E+01	2.37E+01	9.39E+01	
120	XE-138			2.17E-01	8.05E-02	4.48E-01	6.89E-01	1.43E+00	
121	XE-133M			1.47E+00	1.62E+00	9.25E-01	1.25E+00	5.27E+00	
122	AR-37			1.33E-02	5.26E-01	1.68E-02	1.43E-02	5.70E-01	
123	AR-41			2.98E-02	7.09E-02	1.03E-01	1.57E-01	3.61E-01	
124	C-14			5.28E-03	6.40E-01	5.61E-03	6.66E-03	6.58E-01	
125	XE-131M			5.78E-01	1.55E+00	9.06E-01	1.22E+00	4.26E+00	
126	UNIDENTIFIED			-	-	-	-	-	
127									5.11E+02
128	II. IODINES								
129	I-131			1.07E-06	6.78E-05	1.18E-04	1.88E-06	1.89E-04	
130	I-133			3.56E-06	1.02E-05	2.91E-05	7.21E-06	5.01E-05	
131	I-135			-	1.51E-06	-	-	1.51E-06	
132									2.40E-04
133	III. PARTICULATES								
134	SR-89			-	-	-	-	-	
135	SR-90			-	-	-	-	-	
136	CS-134			2.59E-08	-	-	1.11E-06	1.14E-06	
137	CS-137			3.43E-08	2.72E-08	4.89E-08	1.18E-06	1.29E-06	
138	BA-LA-140			-	-	-	-	-	
139	ZN-65			-	-	-	-	-	
140	CO-58			2.51E-08	2.04E-08	7.03E-08	-	1.16E-07	
141	CO-60			1.85E-06	4.41E-06	1.16E-06	2.23E-06	9.65E-06	
142	FE-59			-	-	-	-	-	
143	CR-51			-	-	-	-	-	
144	ZR-NB-95			-	-	-	-	-	
145	CE-141			-	-	-	7.95E-09	7.95E-09	
146	CE-144			-	-	-	-	-	
147	SB-124			-	-	-	-	-	
148	MN-54			1.36E-07	4.37E-07	1.07E-07	2.90E-08	7.09E-07	
149	AG-110M			-	-	-	-	-	
150	MO-99			-	-	-	-	-	
151	RU-103			-	9.83E-09	-	-	9.83E-09	
152	SB-125			-	-	-	-	-	
153	TE-132			-	-	-	-	-	
154	UNIDENTIFIED			-	-	-	-	-	
155									1.29E-05
156	H-3			6.54E-01	5.22E+00	2.88E+00	1.59E+00	1.03E+01	

A	J	K	L	M	N	O	P	Q	R
106	Yankee Atomic Electric Co.							YRC-1178, REV. 0	
107	Total Continuous + Batch Releases (Curies)							Page A-28	
108								(file G86-90.WK3)	
109									Total Act
110	RADIONUCLIDE				1987			Total All	by group
111	I. FISSION GASES			1	2	3	4	Releases Ci	Ci
112									
113	KR-85			4.80E-02	7.64E+00	2.09E-02	1.36E-02	7.72E+00	
114	KR-85M			1.67E+00	8.35E-01	8.68E-01	8.02E-01	4.18E+00	
115	KR-87			1.66E+00	7.68E-01	7.51E-01	8.09E-01	3.99E+00	
116	KR-88			3.47E+00	1.59E+00	1.54E+00	1.58E+00	8.18E+00	
117	XE-133			5.56E+01	8.94E+01	4.06E+01	3.48E+01	2.20E+02	
118	XE-135			2.04E+01	1.31E+01	1.52E+01	1.36E+01	6.23E+01	
119	XE-135M			2.16E+01	6.89E+00	1.61E+01	1.85E+01	6.31E+01	
120	XE-138			1.00E+00	4.56E-01	4.83E-01	5.26E-01	2.47E+00	
121	XE-133M			1.30E+00	1.63E+00	8.68E-01	4.63E-01	4.26E+00	
122	AR-37			1.72E-02	7.43E-01	3.38E-02	2.55E-02	8.20E-01	
123	AR-41			3.76E-01	1.61E-01	4.62E-01	3.35E-01	1.33E+00	
124	C-14			9.06E-03	1.30E+00	3.60E-03	2.34E-03	1.32E+00	
125	XE-131M			1.40E+00	1.92E+00	5.21E-01	2.78E-01	4.12E+00	
126	UNIDENTIFIED			-	-	-	-	-	
127									3.84E+02
128	II. IODINES								
129	I-131			3.65E-08	2.86E-06	2.10E-05	4.25E-06	2.81E-05	
130	I-133			-	-	1.63E-05	-	1.63E-05	
131	I-135			-	-	-	-	-	
132									4.44E-05
133	III. PARTICULATES								
134	SR-89			-	-	-	-	-	
135	SR-90			-	-	-	-	-	
136	CS-134			4.10E-07	3.36E-07	9.75E-08	1.04E-07	9.48E-07	
137	CS-137			8.75E-07	3.81E-07	4.05E-07	5.75E-07	2.24E-06	
138	BA-LA-140			-	-	-	-	-	
139	ZN-65			-	-	-	-	-	
140	CO-58			-	-	-	-	-	
141	CO-60			2.83E-06	2.43E-06	2.06E-06	2.03E-06	9.35E-06	
142	FE-59			-	-	-	-	-	
143	CR-51			-	-	8.14E-08	-	8.14E-08	
144	ZR-NB-95			-	-	1.99E-08	-	1.99E-08	
145	CE-141			-	4.15E-08	-	-	4.15E-08	
146	CE-144			-	-	-	-	-	
147	SB-124			-	-	-	-	-	
148	MN-54			1.01E-07	5.75E-08	2.40E-08	-	1.83E-07	
149	AG-110M			-	-	-	-	-	
150	MO-99			-	-	-	-	-	
151	RU-103			-	-	-	-	-	
152	SB-125			-	-	-	-	-	
153	TE-132			-	-	-	-	-	
154	UNIDENTIFIED			-	-	-	-	-	
155									1.29E-05
156	H-3			1.26E+00	8.10E-01	9.42E-01	1.47E+00	4.48E+00	

A	S	T	U	V	W	X	Y	Z	AA
106	Yankee Atomic Electric Co.							YRC-1178, REV. 0	
107	Total Continuous + Batch Releases (Curies)							Page A-29	
108								(file G86-90.WK3)	
109									Total Act
110	RADIONUCLIDE				1988			Total All	by group
111	I. FISSION GASES			1	2	3	4	Releases	Ci
112									
113	KR-85			2.96E-02	3.74E-02	2.89E-02	4.01E+00	4.10E+00	
114	KR-85M			5.59E-01	6.61E-01	6.12E-01	1.04E-01	1.94E+00	
115	KR-87			5.15E-01	5.58E-01	5.10E-01	9.34E-02	1.68E+00	
116	KR-88			1.02E+00	1.22E+00	1.09E+00	1.83E-01	3.51E+00	
117	XE-133			2.47E+01	2.36E+01	2.71E+01	2.61E+01	1.02E+02	
118	XE-135			1.16E+01	1.30E+01	1.17E+01	2.65E+00	3.89E+01	
119	XE-135M			1.61E+01	1.68E+01	1.15E+01	3.14E+00	4.75E+01	
120	XE-138			1.48E-01	3.75E-01	2.65E-01	1.95E-02	8.08E-01	
121	XE-133M			4.89E-01	7.25E-01	6.12E-01	2.46E-01	2.07E+00	
122	AR-37			4.92E-02	6.01E-02	9.16E-02	5.10E-01	7.11E-01	
123	AR-41			2.02E-01	2.68E-01	3.33E-01	5.58E-02	8.59E-01	
124	C-14			6.10E-03	7.71E-03	5.05E-03	6.22E-01	6.41E-01	
125	XE-131M			3.91E-01	5.80E-01	6.55E-03	1.19E-01	1.10E+00	
126	UNIDENTIFIED			-	-	-	-	-	
127									2.05E+02
128	II. IODINES								
129	I-131			1.12E-06	3.28E-06	5.91E-06	4.01E-05	5.04E-05	
130	I-133			6.30E-07	2.58E-06	1.16E-05	1.32E-06	1.61E-05	
131	I-135			-	-	-	-	-	
132									6.65E-05
133	III. PARTICULATES								
134	SR-89			-	-	-	-	-	
135	SR-90			-	-	-	-	-	
136	CS-134			2.61E-08	-	-	-	2.61E-08	
137	CS-137			4.13E-07	3.13E-07	4.17E-07	3.52E-07	1.50E-06	
138	BA-LA-140			-	-	-	-	-	
139	ZN-65			-	-	-	-	-	
140	CO-58			-	-	-	-	-	
141	CO-60			1.09E-06	1.62E-06	3.30E-06	9.66E-07	6.98E-06	
142	FE-59			-	-	-	-	-	
143	CR-51			-	-	-	-	-	
144	ZR-NB-95			-	-	-	-	-	
145	CE-141			-	-	-	-	-	
146	CE-144			-	-	-	-	-	
147	SB-124			-	-	-	-	-	
148	MN-54			-	-	-	-	-	
149	AG-110M			-	-	-	-	-	
150	MO-99			-	-	-	-	-	
151	RU-103			-	-	-	-	-	
152	SB-125			-	-	-	-	-	
153	TE-132			-	-	-	-	-	
154	UNIDENTIFIED			-	-	-	-	-	
155									8.50E-06
156	H-3			1.37E+00	1.18E+00	9.40E-01	1.09E+00	4.58E+00	

A	AB	AC	AD	AE	AF	AG	AH	AI	AJ
106	Yankee Atomic Electric Co.							YRC-1178, REV. 0	
107	Total Continuous + Batch Releases (Curies)							Page A-30	
108								(file G86-90.WK3)	
109									Total Act
110	RADIONUCLIDE				1989			Total All	by group
111	I. FISSION GASES			1	2	3	4	Releases	Ci
112									
113	KR-85			3.35E-03	4.22E-03	1.04E+00	7.58E-03	1.05E+00	
114	KR-85M			1.02E-01	2.19E-01	3.73E-01	4.98E-01	1.19E+00	
115	KR-87			1.27E-01	2.50E-01	3.76E-01	5.58E-01	1.31E+00	
116	KR-88			2.14E-01	4.24E-01	7.18E-01	7.17E-01	2.07E+00	
117	XE-133			2.00E+00	5.52E+00	2.17E+01	1.54E+01	4.46E+01	
118	XE-135			2.86E+00	5.20E+00	7.54E+00	1.09E+01	2.65E+01	
119	XE-135M			4.59E+00	7.58E+00	1.00E+01	1.87E+01	4.09E+01	
120	XE-138			5.42E-02	1.67E-01	1.71E-01	3.36E-01	7.28E-01	
121	XE-133M			3.92E-02	1.08E-01	4.47E-01	4.04E-01	9.98E-01	
122	AR-37			1.28E-02	3.17E-02	1.34E-01	6.99E-03	1.86E-01	
123	AR-41			2.49E-01	3.24E-01	2.74E-01	2.76E-01	1.12E+00	
124	C-14			6.72E-04	8.44E-04	2.04E-01	1.52E-03	2.07E-01	
125	XE-131M			6.30E-03	1.74E-02	1.24E-01	4.85E-02	1.97E-01	
126	UNIDENTIFIED			-	-	-	-	-	
127									1.21E+02
128	II. IODINES								
129	I-131			-	4.17E-07	8.56E-05	1.29E-06	8.73E-05	
130	I-133			-	-	8.20E-06	-	8.20E-06	
131	I-135			-	-	6.30E-07	-	6.30E-07	
132									9.61E-05
133	III. PARTICULATES								
134	SR-89			5.06E-07	-	-	-	5.06E-07	
135	SR-90			7.86E-09	-	-	-	7.86E-09	
136	CS-134			6.18E-07	-	-	-	6.18E-07	
137	CS-137			1.10E-06	6.81E-07	1.50E-06	2.86E-07	3.57E-06	
138	BA-LA-140			-	-	9.62E-07	-	9.62E-07	
139	ZN-65			-	-	-	-	-	
140	CO-58			3.37E-06	3.25E-08	1.80E-06	-	5.20E-06	
141	CO-60			1.66E-05	4.20E-06	6.94E-06	4.26E-06	3.20E-05	
142	FE-59			1.15E-06	-	-	-	1.15E-06	
143	CR-51			3.49E-06	-	1.90E-05	3.01E-07	2.28E-05	
144	ZR-NB-95			3.64E-06	-	2.22E-06	2.14E-07	6.07E-06	
145	CE-141			8.21E-07	-	3.98E-07	4.93E-08	1.27E-06	
146	CE-144			1.40E-06	-	-	-	1.40E-06	
147	SB-124			-	-	6.70E-06	2.53E-07	6.95E-06	
148	MN-54			3.38E-06	5.60E-08	4.26E-06	5.64E-07	8.26E-06	
149	AG-110M			-	-	2.51E-07	-	2.51E-07	
150	MO-99			-	-	-	-	-	
151	RU-103			5.34E-07	-	2.21E-06	-	2.74E-06	
152	SB-125			-	-	-	-	-	
153	TE-132			-	-	-	-	-	
154	UNIDENTIFIED			-	-	-	-	-	
155									9.38E-05
156	H-3			2.51E+00	1.22E+00	1.78E+00	1.13E+00	6.64E+00	

A	AK	AL	AM	AN	AO	AP	AQ	AR	AS
106	Yankee Atomic Electric Co.							YRC-1178, REV. 0	
107	Total Continuous + Batch Releases (Curies)							Page A-31	
108								(file G86-90.WK3)	
109									Total Act
110	RADIONUCLIDE				1990			Total All	by group
111	I. FISSION GASES			1	2	3	4	Releases	Ci
112									
113	KR-85			1.26E-02	2.10E+00	1.82E+00	1.18E+00	5.12E+00	
114	KR-85M			4.02E-01	4.80E-01	-	1.21E-01	1.00E+00	
115	KR-87			4.76E-01	5.82E-01	-	1.65E-01	1.22E+00	
116	KR-88			8.46E-01	1.00E+00	-	2.75E-01	2.12E+00	
117	XE-133			1.42E+01	2.07E+01	2.25E+00	1.48E+00	3.86E+01	
118	XE-135			9.75E+00	1.03E+01	-	3.26E+00	2.33E+01	
119	XE-135M			1.70E+01	1.61E+01	-	5.70E+00	3.88E+01	
120	XE-138			4.90E-01	7.86E-01	-	8.64E-03	1.28E+00	
121	XE-133M			1.14E-02	3.75E-01	3.37E-02	-	4.20E-01	
122	AR-37			2.45E-02	2.71E-02	9.90E-03	1.56E-02	7.71E-02	
123	AR-41			2.21E-01	2.38E-01	-	1.93E-01	6.52E-01	
124	C-14			2.52E-03	6.59E-01	3.61E-01	7.25E-01	1.75E+00	
125	XE-131M			4.47E-02	2.13E-01	2.69E-02	4.66E-03	2.89E-01	
126	UNIDENTIFIED			-	-	-	-	-	
127									1.15E+02
128	II. IODINES								
129	I-131			-	2.40E-05	1.10E-04	1.18E-07	1.34E-04	
130	I-133			-	1.14E-05	-	-	1.14E-05	
131	I-135			-	7.79E-07	-	-	7.79E-07	
132									1.46E-04
133	III. PARTICULATES								
134	SR-89			-	-	-	-	-	
135	SR-90			-	-	-	-	-	
136	CS-134			-	-	3.75E-07	-	3.75E-07	
137	CS-137			2.16E-07	1.33E-07	6.28E-07	9.63E-07	1.94E-06	
138	BA-LA-140			-	-	1.06E-06	-	1.06E-06	
139	ZN-65			-	-	-	-	-	
140	CO-58			-	-	1.04E-06	3.04E-07	1.34E-06	
141	CO-60			1.37E-06	1.66E-06	5.13E-06	1.01E-05	1.83E-05	
142	FE-59			-	-	3.05E-07	-	3.05E-07	
143	CR-51			-	-	4.83E-07	-	4.83E-07	
144	ZR-NB-95			-	-	-	1.90E-07	1.90E-07	
145	CE-141			-	-	-	-	-	
146	CE-144			-	-	-	-	-	
147	SB-124			-	-	-	-	-	
148	MN-54			-	2.27E-07	1.57E-06	1.13E-06	2.93E-06	
149	AG-110M			-	-	-	-	-	
150	MO-99			-	-	-	-	-	
151	RU-103			-	-	-	-	-	
152	SB-125			-	-	-	-	-	
153	TE-132			-	-	-	-	-	
154	UNIDENTIFIED			-	-	-	-	-	
155									2.69E-05
156	H-3			1.16E+00	8.27E-01	1.23E+00	5.24E-01	3.74E+00	

A	A	B	C	D	E	F	G	H	I
171	Yankee Atomic Electric							YRC-1178, REV. 0	
172	Total Continuous + Batch Releases (Curies)							Pge A-32	
173								(file G91-92.WK3)	
174									Total Act
175					1991			Total All	by group
176	I. FISSION GASES			1*	2	3	4	Releases	Ci
177									
178	KR-85			9.35E-03	5.16E-01	1.16E-02	6.94E+00	7.48E+00	
179	KR-85M			4.02E-01	6.97E-01	6.95E-01	4.88E-02	1.84E+00	
180	KR-87			4.76E-01	5.07E-01	6.09E-01	4.50E-02	1.64E+00	
181	KR-88			8.46E-01	1.12E+00	1.31E+00	9.36E-02	3.37E+00	
182	XE-133			1.42E+01	5.15E+01	2.53E+01	2.92E+01	1.20E+02	
183	XE-135			9.75E+00	1.16E+01	1.11E+01	1.17E+00	3.37E+01	
184	XE-135M			1.70E+01	1.01E+01	1.27E+01	9.73E-01	4.08E+01	
185	XE-138			4.90E-01	2.80E-02	1.67E-01	3.79E-02	7.23E-01	
186	XE-133M			1.14E-02	1.02E+00	6.96E-01	4.07E-01	2.14E+00	
187	AR-37			1.85E-02	1.22E-01	2.12E-02	1.78E-01	3.40E-01	
188	AR-41			2.21E-01	1.23E-01	1.85E-01	1.23E-02	5.41E-01	
189	C-14			1.87E-03	3.85E-01	2.32E-03	1.35E+00	1.74E+00	
190	XE-131M			4.47E-02	4.07E-01	7.84E-02	4.50E-01	9.80E-01	
191	Rb-88								
192									
193	UNIDENTIFIED			-	-	-	-	-	
194									2.15E+02
195	II. IODINES								
196	I-131			-	3.84E-06	1.38E-05	2.67E-06	2.03E-05	
197	I-133			-	4.24E-07	2.32E-05	8.19E-07	2.45E-05	
198	I-135			-	5.97E-08	1.43E-06	-	1.49E-06	
199									4.62E-05
200	III. PARTICULATES								
201									
202	SR-89			-	-	-	-	-	
203	SR-90			-	-	-	-	-	
204	CS-134			-	-	-	-	-	
205	CS-137			7.02E-08	1.98E-07	1.54E-08	2.49E-07	5.32E-07	
206	BA-LA-140			-	-	-	-	-	
207	ZN-65			-	-	-	-	-	
208	CO-58			-	-	-	-	-	
209	CO-60			3.00E-06	2.39E-06	1.07E-06	2.35E-06	8.81E-06	
210	FE-59			-	-	-	-	-	
211	CR-51			-	-	-	-	-	
212	ZR-NB-95			-	-	-	-	-	
213	CE-141			-	-	-	-	-	
214	CE-144			-	-	-	-	-	
215	SB-124			-	-	-	-	-	
216	MN-54			2.09E-08	-	-	-	2.09E-08	
217	AG-110M			-	-	-	-	-	
218	SE-75								
219	MO-99			-	-	-	-	-	
220	RU-103			-	-	-	-	-	
221	SB-125			-	-	-	-	-	
222	TE-132			-	-	-	-	-	
223	FE-55								
224									
225	UNIDENTIFIED			-	-	-	-	-	
226									9.36E-06
227	H-3			1.18E+00	1.49E+00	1.33E+00	2.25E+00	6.25E+00	

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A	J	K	L	M	N	O	P	Q	R
171	Yankee Atomic Electric							YRC-1178, REV. 0	
172	Total Continuous + Batch Releases							Pge A-33	
173								(file G91-92.WK3)	
174									Total Act
175					1992			Total All	by group
176	I. FISSION GASES			1*	2*	3	4	Releases	Ci
177									
178	KR-85			-	-	-	-	-	
179	KR-85M			-	-	-	-	-	
180	KR-87			-	-	-	-	-	
181	KR-88			-	-	-	-	-	
182	XE-133			-	-	-	-	-	
183	XE-135			-	-	-	-	-	
184	XE-135M			-	-	-	-	-	
185	XE-138			-	-	-	-	-	
186	XE-133M			-	-	-	-	-	
187	AR-37			-	-	-	-	-	
188	AR-41			-	-	-	-	-	
189	C-14			-	-	-	-	-	
190	XE-131M			-	-	-	-	-	
191	Rb-88								
192									
193	UNIDENTIFIED								
194									0.00E+00
195	II. IODINES			-	-	-	-	-	
196	I-131			-	-	-	-	-	
197	I-133			-	-	-	-	-	
198	I-135			-	-	-	-	-	
199									0.00E+00
200	III. PARTICULATES								
201									
202	SR-89			-	-	-	-	-	
203	SR-90			-	-	-	-	-	
204	CS-134			-	-	-	-	-	
205	CS-137			3.18E-08	1.04E-07	2.23E-08	3.67E-08	1.95E-07	
206	BA-LA-140			-	-	-	-	-	
207	ZN-65			-	-	-	-	-	
208	CO-58			-	-	-	-	-	
209	CO-60			4.26E-06	1.76E-06	1.13E-06	3.63E-07	7.51E-06	
210	FE-59			-	-	-	-	-	
211	CR-51			-	-	-	-	-	
212	ZR-NB-95			-	-	-	-	-	
213	CE-141			-	-	-	-	-	
214	CE-144			-	-	-	-	-	
215	SB-124			-	-	-	-	-	
216	MN-54			-	-	-	-	-	
217	AG-110M			-	-	-	-	-	
218	SE-75								
219	MO-99			-	-	-	-	-	
220	RU-103			-	-	-	-	-	
221	SB-125			-	-	-	-	-	
222	TE-132			-	-	-	-	-	
223	FE-55								
224									
225	UNIDENTIFIED			-	-	-	-	-	
226									7.71E-06
227	H-3			1.16E+00	8.59E-01	5.91E-01	3.20E-01	2.93E+00	