Nuclear Decay Data for Radionuclides Occurring in Routine Releases from Nuclear Fuel Cycle Facilities

D. C. Kocher

Prepared for the U.S. Nuclear Regulatory Commission
Division of Safeguards, Fuel Cycle, and Environmental Protection
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**NUCLEAR DECAY DATA FOR RADIONUCLIDES OCCURRING
IN ROUTINE RELEASES FROM NUCLEAR FUEL CYCLE FACILITIES**

**Edited by D. C. Kocher
Health and Safety Research Division**

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ABSTRACT

This report gives tabulations of the atomic and nuclear radiations emitted by 240 radionuclides. Most of the radionuclides are those expected to occur in routine releases of effluents from nuclear fuel cycle facilities. For each radionuclide are given the half-life and recommended values for the energies, intensities, and equilibrium absorbed-dose constants for each of the atomic and nuclear radiations. Also given are the daughter radionuclides produced and recommended values for decay branching ratios, where applicable. The radioactivity decay chains and branching ratios are displayed in diagram form.

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*Prepared for the U. S. Nuclear Regulatory Commission Division of Safeguards, Fuel Cycle, and Environmental Research under Interagency Agreement ERDA 40-550-75.

I. INTRODUCTION

The calculation of radiation doses from exposure to radionuclides requires a knowledge of the energies and intensities of the atomic and nuclear radiations emitted during the decay process. The purpose of this report is to provide tabulations of decay data for radionuclides expected to occur in routine releases of effluents from nuclear fuel cycle facilities. Most of the decay data presented here are for the radionuclides given in Table A-3 of Ref. 1 and their radioactive daughter products. Data for 240 radionuclides are tabulated in this report.

The Analysis and Assessments Section of the Health and Safety Research Division at Oak Ridge National Laboratory (ORNL) has developed an extensive methodology for estimating radiation doses to man and biota following the release of radionuclides to the environment.² The radioactive decay data given in this report will be incorporated into an improved, up-to-date data base for use in the methodologies described in Ref. 2.

The preparation of the sets of radioactive decay data tabulated in this report has relied exclusively upon the formats and systems developed by the Nuclear Data Project of the Physics Division at ORNL. The cooperation and assistance of W. B. Ewbank and R. L. Haese of the Nuclear Data Project during the course of this work is gratefully acknowledged.

II. PREPARATION OF DATA SETS IN ENSDF FORMAT

The initial phase in generating the decay data tables in this report is the preparation of decay data sets on computer cards in the format of the Evaluated Nuclear Structure Data File³ (ENSDF) developed by the Nuclear Data Project. A separate data set is prepared for each type of decay (α , β^- , β^+ and EC, or IT). For most data sets the recommended values of the measured energies and intensities of the nuclear radiations are taken from the journal Nuclear Data Sheets*

*Prepared by the Nuclear Data Project and published by Academic Press, Inc., New York, New York.

or from existing data sets in ENSDF.* For a few radionuclides, the energies and intensities of the nuclear radiations are obtained from our own evaluation of experimental results published in the open literature.† Tables of recommended decay Q-values and computer codes maintained by the Nuclear Data Project are applied to the data sets to calculate internal conversion coefficients, normalization factors for obtaining absolute intensities for the nuclear radiations, and the energies and intensities of individual β groups.

III. COMPUTER CODE, MEDLIST, AND DESCRIPTION OF TABLE OF RADIOACTIVE DECAY DATA

Much of the discussion in this section and the one following is taken directly from Sections II–IV of a previous compilation of radioactive decay data⁴ by M. J. Martin of the Nuclear Data Project. Therefore, only a brief description of the decay data tables is given here.

The decay data tables in this report are generated by processing the decay data sets in ENSDF format with the computer code MEDLIST.⁴ The code calculates the energies and intensities of the atomic radiations (X-rays and Auger electrons). The code then combines the atomic radiations with the nuclear radiations, sorts them according to radiation type (α , β , γ , and ce), and, within each type, arranges and numerically labels them in order of increasing energy.†

*The following authors have prepared evaluations of data used in this work:

F. Ajzenberg-Selove, R. L. Auble, F. E. Bertrand, C. P. Browne, R. L. Bunting, T. W. Burrows, A. Buyrn, Y. A. Eliis, P. M. Endt, W. B. Ewbank, L. R. Greenwood, B. Harmatz, E. A. Henry, H. R. Hiddleston, G. E. Holland, D. J. Horen, Yu. I. Kharitonov, H. J. Kim, D. C. Kocher, L. A. Kroger, T. Lauritsen, J. F. Lemming, C. van der Leun, M. B. Lewis, C. C. Maples, M. J. Martin, L. R. Medsker, S. C. Pancholi, L. K. Peker, S. Raman, C. W. Reich, M. R. Schmorak, V. M. Sigalov, R. R. Todd, J. K. Tuli, P. P. Urone, and H. Verheul.

†Space limitations prohibit the inclusion of references for these publications. If documentation is required, it can be obtained by writing to the editor.

‡For a review of the radiation processes for the different types of decay, see Ref. 4.

Uncertainties in all experimental quantities are propagated consistently throughout the calculations. A 3% uncertainty is assigned to all theoretical internal conversion coefficients and is combined with the experimental uncertainties.

For each decay data set, the table contains data on atomic and nuclear radiations of the type Auger (K-, L-shell); X-ray ($K_{\alpha 1}$, $K_{\alpha 2}$, K_{β} , L); β^- ; β^+ ; α ; γ ; and ce (K-, L-, ... shell). The table lists all radiations with intensity greater than the variable low-intensity limit built into MEDLIST; for these tables, the low-intensity limit is 0.1 per 100 disintegrations. Immediately following the listings for α , β , and γ radiations, the code prints a comment giving the number of radiations omitted because of the intensity cutoff (provided that the summed intensity exceeds 0.01 per 100 disintegrations), the average energy of the omitted radiations, and their summed intensity. The average energy is calculated from the energies of the individual omitted radiations weighted by their respective intensities.* For those nuclei which decay by positron emission, the code prints a comment following the γ -ray list giving the maximum possible intensity of the annihilation radiation, calculated from $I(\gamma\pm) = 2ZI(\beta^+)$.

In each table the radiations are listed in the first column by type (for symbols and definitions, see Section V). Particle radiations (Auger, ce, α , β) are listed first, followed by electromagnetic radiations (X-ray, γ). Whenever more than one β group is present, an entry labeled "total β " gives the average energy and total intensity for the composite spectrum. The values of the average energy and total intensity include the contributions from the β groups omitted from the table because of the low-intensity cutoff limit.

*The average energy and summed intensity should be used with caution in applications such as radiation dosimetry and shielding. Depending upon the distributions in energy and intensity of the omitted radiations, effects calculated using the average energy and summed intensity may not accurately represent the effects calculated using the individual energies and intensities.

The second and third columns give the energy (in keV) and intensity (particles or photons per 100 disintegrations of the parent nucleus). For β groups, both the maximum and average energies are given.

The last column gives the equilibrium absorbed-dose constant (equal to the energy emitted per disintegration), Δ , in units of g-rad/ μ Ci-h. For an infinite, homogeneous medium in which a source is uniformly dispersed with a concentration of 1 μ Ci-h/g, Δ gives the absorbed dose in rads.⁵

The nuclei are listed in order of increasing mass number. Within a given mass number, the order is by increasing atomic number. The first entry in each table gives the title of the decay data set and the recommended half-life for the parent nucleus.

Each decay mode of a given radionuclide is tabulated separately. In those cases where a nucleus decays by more than one mode, comments are listed giving the decay branching ratio and a cross reference to alternate modes. For examples, see the separate data sets for ^{90}Rb IT Decay and ^{90}Rb β^- Decay (258 s). In the case of alternate decay modes, the radiations from each data set can simply be combined to obtain all radiations from the particular parent nucleus.

A common occurrence is a parent nucleus which decays to one or more radioactive descendants. In those cases, the decay data sets are tabulated separately for the parent and each descendant, and appropriate comments are given with the parent data set. For a simple example, see the data set for ^{89}Kr , which decays entirely to ^{89}Rb . A more complicated example is ^{91}Sr , which decays to both the ground state (56.51 d) and isomeric state (49.71 m) of ^{91}Y with the indicated branching ratios. An additional comment for the ^{91}Sr data set gives a cross reference to the data set for the isomeric decay. To correctly include contributions to the decay of a parent radionuclide when daughter radionuclides are produced, the radiations from each member of the decay chain must be combined using standard equations for parent-daughter activity relations and the feeding of each member of the chain (see Section IV). The comments at the beginning of the data sets also give branching ratios for alternate decay modes that

produce no radiations above the low-intensity cutoff limit (see ^{210}Pb β^- Decay), for daughter radionuclide decay modes producing no radiations above the lower cutoff limit (see ^{234}Th β^- Decay), and for spontaneous fission (see ^{232}U α Decay).

IV. PARENT-DAUGHTER ACTIVITY RATIOS

For the case of a radioactive parent (p) feeding a radioactive daughter (d) in a fraction (f) of the parent decays, the ratio of the daughter activity to that of the parent at time (t) is given by⁶

$$\frac{f T_{1/2}(p)}{T_{1/2}(p) - T_{1/2}(d)} \left[1 - e^{-(\lambda_d - \lambda_p)t} \right], \quad (1)$$

where $T_{1/2}(p)$ and $T_{1/2}(d)$ are the half-lives, and λ_p and λ_d are the decay constants ($\lambda = \ln 2/T_{1/2}$) of the parent and daughter, respectively. The activity of the daughter is assumed to be zero at time $t = 0$. For cases in which the daughter is short-lived compared with the parent, the parent-daughter activity ratio approaches a constant value with time. For a time large compared with $1/(\lambda_d - \lambda_p)$, Eq. (1) reduces to

$$\frac{f T_{1/2}(p)}{T_{1/2}(p) - T_{1/2}(d)}. \quad (2)$$

For example, ^{99}Mo decays to ^{99}Tc (6.02 h) with $T_{1/2}(p) = 66.02 \text{ h}$, $T_{1/2}(d) = 6.02 \text{ h}$, and $f = 0.8689$. For large t , the ratio of ^{99}Tc activity to that of ^{99}Mo is $(0.8689)(1.10036) = 0.95510$.^{*} Thus, to correctly account for all radiations from a ^{99}Mo source, the radiations from ^{99}Tc (6.02 h) should be multiplied by 0.95510 and combined with those from ^{99}Mo .

^{*}See Section V for the convention on writing a number and its uncertainty.

V. SYMBOLS AND DEFINITIONS

The following table gives the symbols appearing in the tables of radioactive decay data and their definitions. Some of these symbols are nonstandard (D rather than d for day, etc.); their form is dictated by the available symbols on the computer print train used to prepare the tables.

Auger-K, Auger-L	K-shell, L-shell Auger electron
avg	Average
ce-K-1, ce-L-2, etc.	K-shell conversion electron for γ ray 1, L-shell conversion electron for γ ray 2, etc.
Ci	Curie
D	Day
EC	Electron capture
H	Hour
IT	Isomeric transition
$K_{\alpha 1}$, $K_{\alpha 2}$, K_{β} , L	K X-rays; L X-ray
M	Minute
max	Maximum
rad	Unit of absorbed dose, equal to 6.25×10^7 MeV/g
S	Second
Y	Year
$\alpha 1$, $\alpha 2$, etc.	Alpha particle corresponding to transition 1, 2, etc.
$\beta 1$, $\beta 2$, etc.	Beta particle corresponding to transition 1, 2, etc.
$\gamma 1$, $\gamma 2$, etc.	Gamma ray corresponding to transition 1, 2, etc.
$\gamma^\pm$	Annihilation radiation
Δ	Equilibrium absorbed-dose constant
$\mu\text{Ci-h}$	Microcurie-hour
3.624 12	3.624 ± 0.012
3.6 H 12	3.6 ± 1.2 H
2.1E5 Y 2	$(2.1 \pm 0.2) \times 10^5$ Y

VI. DIAGRAMS OF RADIOACTIVE DECAY CHAINS

This section gives diagrams of the decay chains tabulated in this report which contain two or more radionuclides. The half-life, modes of decay, and decay branching ratios for each radionuclide in the decay chain are shown. Modes of decay with branching ratios less than 0.1% are omitted, as are the decay branches for spontaneous fission.

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Nucleon Number

 ^{208}Pb (4.200 y) ^{208}Pb (4.200 y) $\xrightarrow{\alpha}$ ^{204}Hg (4.200 y) ^{208}Pb (4.200 y) $\xrightarrow{\beta^-}$ ^{208}Bi (4.200 y) ^{208}Pb (4.200 y) $\xrightarrow{\beta^-}$ ^{208}Po (4.200 y) ^{208}Pb (4.200 y) $\xrightarrow{\beta^-}$ ^{208}At (4.200 y) ^{208}Pb (4.200 y) $\xrightarrow{\beta^-}$ ^{208}Rn (4.200 y) ^{208}Pb (4.200 y) $\xrightarrow{\beta^-}$ ^{208}Fr (4.200 y) ^{208}Pb (4.200 y) $\xrightarrow{\beta^-}$ ^{208}Ac (4.200 y) ^{208}Pb (4.200 y) $\xrightarrow{\beta^-}$ ^{208}Th (4.200 y) $\xrightarrow{\alpha}$ ^{204}Pb (4.200 y) ^{208}Pb (4.200 y) $\xrightarrow{\beta^-}$ ^{208}Pa (4.200 y) $\xrightarrow{\alpha}$ ^{204}Pb (4.200 y) ^{208}Pb (4.200 y) $\xrightarrow{\beta^-}$ ^{208}U (4.200 y) $\xrightarrow{\alpha}$ ^{204}Pb (4.200 y) ^{208}Pb (4.200 y) $\xrightarrow{\beta^-}$ ^{208}Np (4.200 y) $\xrightarrow{\alpha}$ ^{204}Pb (4.200 y) ^{208}Pb (4.200 y) $\xrightarrow{\beta^-}$ ^{208}Pu (4.200 y) $\xrightarrow{\alpha}$ ^{204}Pb (4.200 y) ^{208}Pb (4.200 y) $\xrightarrow{\beta^-}$ ^{208}Am (4.200 y) $\xrightarrow{\alpha}$ ^{204}Pb (4.200 y) ^{208}Pb (4.200 y) $\xrightarrow{\beta^-}$ ^{208}Cm (4.200 y) $\xrightarrow{\alpha}$ ^{204}Pb (4.200 y) ^{208}Pb (4.200 y) $\xrightarrow{\beta^-}$ ^{208}Bk (4.200 y) $\xrightarrow{\alpha}$ ^{204}Pb (4.200 y) ^{208}Pb (4.200 y) $\xrightarrow{\beta^-}$ ^{208}Cf (4.200 y) $\xrightarrow{\alpha}$ ^{204}Pb (4.200 y)

VII. INDEX TO TABLE OF RADIOACTIVE DECAY DATA

178 3- DECAY (12.35 Y 1)	115CD 0- DECAY (53.44 R 10)	107H 0- DECAY (23.9 R 1)
190E 9- DECAY (1.676 Y 2)	115CD 0- DECAY (64.6 D 3)	107HE 0- DECAY (52.10 Y 1)
194 9- DECAY (5.97 Y 2)	115H 1T DECAY (6.3 R 1)	207TL 0- DECAY (4.77 R 3)
196 0- DECAY (57.9 Y 0)	115H 0- DECAY (5.125 Y 0)	207TL 9- DECAY (3.07 R 2)
197 0- DECAY (109.74 R 0)	115H 0- DECAY (3.3 E 1)	209TL 0- DECAY (2.20 R 7)
208A 0- DECAY (2.602 Y 2)	123S 0- DECAY (129.2 D 0)	209PB 0- DECAY (3.31 R 3)
208A 0- DECAY (15.90 R 0)	124S 0- DECAY (64.20 D 3)	210PB 0- DECAY (22.3 Y 2)
220 0- DECAY (14.29 R 3)	125S 0- DECAY (6.64 D 3)	210BT 0- DECAY (5.612 D 9)
434A 9- DECAY (1.527 R 7)	125S 0- DECAY (2.77 Y 0)	210PO 0- DECAY (136.370 D 7)
434A 1C DECAY (1.485 Y 2)	125TE 1T DECAY (50 D 1)	210PB 0- DECAY (36.1 R 2)
465C 9- DECAY (83.00 D 3)	126S 9- DECAY (1.085 Y 87)	211BT 0- DECAY (2.13 R 2)
54CU 2C DECAY (27.700 D 2)	126S 0 1T DECAY (175.0 R 3)	211BT 0- DECAY (2.13 R 2)
54YB 2C DECAY (312.5 D 5)	126S 9- DECAY (12.0 D 1)	211PO 0- DECAY (6.56 S 0)
55PE 2C DECAY (2.7 Y 1)	126S 9- DECAY (179.0 R 3)	212PB 0- DECAY (170.04 R 7)
569B 0- DECAY (2.5705 R 6)	127S 9- DECAY (3.05 D 5)	212BT 0- DECAY (60.55 R 0)
57CO 2C DECAY (270.9 D 6)	127TE 1T DECAY (109 D 2)	212PO 0- DECAY (3.058-7 S 5)
58CO 2C DECAY (70.8 R 1)	127TE 0- DECAY (9.35 E 2)	213BT 0- DECAY (65.65 R 5)
59FE 2C DECAY (64.6 D 0)	127TE 1T DECAY (109 D 2)	213BT 0- DECAY (65.65 R 5)
59BT 2C DECAY (7.520 Y 13)	129TE 1T DECAY (33.6 D 1)	213PO 0- DECAY (9.27-6 S 0)
60CO 0- DECAY (5.271 Y 1)	129TE 0- DECAY (23.6 E 1)	214PB 0- DECAY (26.0 R 1)
63NI 0- DECAY (96 Y 4)	129T 0- DECAY (11.5787 Y 0)	214BT 0- DECAY (179.9 R 0)
64CU 0- DECAY (12.701 R 2)	130T 0- DECAY (12.36 R 1)	214PO 0- DECAY (1.6372-4 S 2)
64CU 0- DECAY (12.701 R 2)	131TE 1T DECAY (30 D 1)	215PO 0- DECAY (60.01790 S 0)
65NI 0- DECAY (2.520 Y 2)	131TE 3- DECAY (25.0 R 1)	216PO 0- DECAY (6.15 S 1)
65ZS 2C DECAY (204.1 D 2)	131TE 9- DECAY (70 D 2)	217BT 0- DECAY (60.023 S 0)
69FE 1T DECAY (13.76 R 3)	131T 0- DECAY (8.04 D 1)	219PO 0- DECAY (3.05 R 1)
69ZS 0- DECAY (57 R 1)	131TE 1T DECAY (11.9 D 1)	219BT 0- DECAY (3.96 S 1)
79FE 0- DECAY (65000 Y 1)	132TE 0- DECAY (70.2 R 0)	220BT 0- DECAY (55.6 S 1)
82ZS 0- DECAY (35.30 R 3)	132T 0- DECAY (2.30 R 3)	221PB 0- DECAY (9.0 R 1)
83PO 0- DECAY (2.35 R 2)	133TE 1T DECAY (55.4 R 0)	222BT 0- DECAY (3.025 D 3)
83W 1T DECAY (1.83 R 2)	133TE 9- DECAY (12.05 R 20)	223ZS 0- DECAY (21.0 R 0)
90BT 0- DECAY (31.00 R 0)	133T 0- DECAY (55.0 P 0)	223BA 0- DECAY (13.40 C 2)
90BT 9- DECAY (172 S 2)	133T 0- DECAY (20.0 R 1)	224BA 0- DECAY (3.64 R 0)
95W 1T DECAY (4.00 R 1)	133TE 1T DECAY (2.180 D 9)	225BA 0- DECAY (34.8 D 2)
95W 0- DECAY (140.72 Y 1)	133TE 0- DECAY (5.205 D 6)	225AC 0- DECAY (10.6 D 1)
95W 0- DECAY (14.40 R 1)	134TE 9- DECAY (41.0 R 0)	226BA 0- DECAY (1400 Y 7)
96PB 9- DECAY (10.66 D 2)	134T 9- DECAY (52.6 R 5)	227AC 0- DECAY (21.773 Y 3)
97W 0- DECAY (76.3 R 5)	134CS 1T DECAY (2.90 R 1)	227AC 0- DECAY (21.773 Y 3)
97ZS 9- DECAY (6.7290 Y 1)	134CS 9- DECAY (2.042 Y 5)	227TB 0- DECAY (18.710 D 5)
99YB 0- DECAY (2.06 R 2)	135T 9- DECAY (6.61 E 1)	229BA 0- DECAY (5.75 Y 3)
99ZS 0- DECAY (17.6 R 1)	135TE 1T DECAY (15.65 R 10)	229AC 0- DECAY (6.13 R 0)
99W 9- DECAY (3.17 R 2)	135TE 0- DECAY (9.003 R 13)	229TB 0- DECAY (1.9131 Y 9)
99ZS 9- DECAY (15.2 P 1)	135CS 9- DECAY (2.386 Y 3)	229TB 0- DECAY (1.3423 Y 16)
99ZS 0- DECAY (50.55 D 9)	136CS 9- DECAY (13.1 D 1)	230TB 0- DECAY (17.720 Y 2)
99ZS 0- DECAY (32.32 S 9)	137TE 0- DECAY (3.03 R 1)	231TB 0- DECAY (25.52 R 1)
99ZS 1T DECAY (250 S 5)	137CS 0- DECAY (30.17 Y 3)	231PB 0- DECAY (3.24020 Y 1)
99ZS 9- DECAY (153 S 3)	137PB 0- DECAY (22.552 R 2)	232TB 0- DECAY (11.405210 Y 6)
99ZS 0- DECAY (250 S 5)	138TE 0- DECAY (10.17 R 7)	232T 0- DECAY (71.7 Y 9)
99ZS 0- DECAY (28.5 Y 0)	139CS 0- DECAY (32.2 R 1)	233PB 0- DECAY (27.0 D 1)
99T 1T DECAY (3.19 R 1)	139CS 0- DECAY (9.40 R 12)	233T 0- DECAY (1.50585 Y 13)
99T 0- DECAY (64.0 P 1)	139BA 0- DECAY (62.7 P 2)	234TB 0- DECAY (26.10 D 1)
99ZS 0- DECAY (9.5 R 2)	140BA 0- DECAY (12.789 D 6)	234PB 0- DECAY (6.70 R 5)
99T 1T DECAY (49.71 R 0)	140ZS 0- DECAY (40.22 R 2)	234PB 0- DECAY (1.17 R 3)
99T 0- DECAY (50.51 D 6)	141BA 0- DECAY (10.27 R 7)	234T 0- DECAY (2.40525 Y 10)
99ZS 0- DECAY (2.71 R 1)	141LA 0- DECAY (3.93 R 6)	235T 0- DECAY (7.120 Y 3)
99T 0- DECAY (3.54 R 1)	141TE 0- DECAY (32.50 D 7)	236T 0- DECAY (2.301527 Y 10)
99T 0- DECAY (10.1 R 2)	142BA 9- DECAY (10.7 R 1)	236T 0- DECAY (2.051 Y 0)
99ZS 0- DECAY (1.5386 Y 10)	142LA 0- DECAY (92.7 R 7)	237T 0- DECAY (6.75 D 1)
99ZS 1T DECAY (73.6 Y 3)	143CE 0- DECAY (33.0 R 2)	237PB 0- DECAY (2.1024 Y 1)
99ZS 2C DECAY (3.583 Y 7)	143PP 0- DECAY (13.56 D 2)	238T 0- DECAY (4.04029 Y 3)
99ZS 0- DECAY (63.90 D 6)	144CE 0- DECAY (280.3 D 3)	238T 0- DECAY (2.117 D 2)
99ZS 1T DECAY (86.6 P 0)	144PP 1T DECAY (7.2 R 3)	239T 0- DECAY (97.75 Y 5)
99ZS 0- DECAY (35.15 D 3)	144PB 0- DECAY (17.20 R 3)	239PB 0- DECAY (2.355 D 0)
99ZS 0- DECAY (36.90 R 5)	147PD 0- DECAY (11.06 D 3)	239PB 0- DECAY (2.43920 Y 2)
99ZS 1T DECAY (60 S 1)	147PB 0- DECAY (2.6230 Y 2)	240T 0- DECAY (14.1 R 2)
99ZS 0- DECAY (72.1 R 7)	147S 0- DECAY (1.07211 Y 1)	240PB 0- DECAY (65 R 3)
99ZS 0- DECAY (66.02 R 1)	148PB 1T DECAY (61.3 D 1)	240PB 0- DECAY (7.0 R 2)
99ZS 1T DECAY (60.32 R 3)	149PB 0- DECAY (5.370 D 9)	240PB 0- DECAY (6.7 Y 10)
99ZS 0- DECAY (2.1325 Y 5)	149PB 0- DECAY (61.3 D 1)	241PB 0- DECAY (14.0 Y 2)
101TC 0- DECAY (10.2 R 1)	149PB 0- DECAY (53.08 R 5)	241T 0- DECAY (0.33 Y 2)
101ZS 0- DECAY (39.35 D 5)	151PB 0- DECAY (29.46 R 0)	242PB 0- DECAY (3.0725 Y 2)
101ZS 1T DECAY (56.12 Y 1)	151S 0- DECAY (90 D 6)	242PB 1T DECAY (15.2 Y 7)
105ZS 0- DECAY (6.44 R 5)	152BA 0- DECAY (13.0 Y 2)	242PB 0- DECAY (16.02 R 2)
105ZS 1T DECAY (45 S 1)	152TE 0- DECAY (13.6 Y 2)	242PB 9- DECAY (16.02 R 2)
105ZS 0- DECAY (35.36 R 5)	152TE 2C DECAY (9.32 R 2)	242T 0- DECAY (15.2 Y 7)
105ZS 0- DECAY (360.2 D 12)	152TE 0- DECAY (9.32 R 2)	242C 0- DECAY (163.2 D 0)
106PB 0- DECAY (29.9 S 1)	152GD 0- DECAY (1.1810 Y 1)	243T 0- DECAY (6.956 R 3)
107PD 0- DECAY (6.586 Y 3)	153S 0- DECAY (46.7 R 1)	243T 0- DECAY (7.390 Y 0)
107PD 0- DECAY (13.44 R 2)	154ZS 0- DECAY (0.6 Y 1)	243C 0- DECAY (70.5 Y 2)
109AC 1T DECAY (39.6 S 2)	155ZS 0- DECAY (40.96 Y 1)	244PB 0- DECAY (0.2627 Y 9)
110AC 1T DECAY (252.2 D 3)	156T 0- DECAY (15.19 D 6)	244C 0- DECAY (10.11 Y 2)
110AC 2C DECAY (20.6 S 2)	157T 0- DECAY (72.3 D 2)	245C 0- DECAY (1500 Y 100)
110AC 0- DECAY (20.6 S 2)	160PD 0- DECAY (26.80 R 2)	246C 0- DECAY (1730 Y 100)
110AC 0- DECAY (250.0 D 3)	160PD 0- DECAY (1.2083 Y 10)	247C 0- DECAY (1.5620 Y 5)
111Z 0- DECAY (7.05 D 1)	161T 0- DECAY (121.2 D 3)	248C 0- DECAY (3.3925 Y 3)
113CD 0- DECAY (5.3215 Y 19)	165B 0- DECAY (75.1 D 3)	252CP 0- DECAY (2.630 Y 10)
113CD 0- DECAY (13.6 Y 2)		

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34 B- DECAY (12.35 Y 1) I (NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(q\text{-rad}/\mu\text{Ci-h})$
β^- 1 max	18.600 20		
avg	5.600 10 100		0.0121

108E B- DECAY (1.686 Y 2) I (NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(q\text{-rad}/\mu\text{Ci-h})$
β^- 1 max	555.7 7		
avg	202.5 3 100		0.031

138 B- DECAY (9.97 H 2) I (NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(q\text{-rad}/\mu\text{Ci-h})$
Auger-X	0.26	0.170 10	=0
β^- 1 max	1198.5 4		
avg	491.8 4 99.820 10		1.05

Maximum γ -intensity = 199.64%

140 B- DECAY (5730 Y 40) I (NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(q\text{-rad}/\mu\text{Ci-h})$
β^- 1 max	156.478 9		
avg	49.478 3 100		0.105

147 B- DECAY (109.74 H 4) I (NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(q\text{-rad}/\mu\text{Ci-h})$
Auger-X	0.52	3.066 7	=0
β^- 1 max	633.7 6		
avg	249.9 3 96.73 17		0.515

Maximum γ -intensity = 993.46%

229A P+ DECAY (2.602 Y 2) I (NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(q\text{-rad}/\mu\text{Ci-h})$
Auger-X	0.82	9.20 4	0.0002
β^+ 1 max	545.5 5		
avg	215.54 21 99.84 9		0.012

1 weak β^+ 's omitted:

EB(ave) = 834.0; IIB = 0.06%

K X-ray	0.94	0.12 4	=0
γ 1	1274.540 20	99.940 20	2.71

Maximum γ -intensity = 179.80%

248A B- DECAY (15.00 H 4) I (NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(q\text{-rad}/\mu\text{Ci-h})$
β^- 1 max	1398.6 7		
avg	554.1 4 99.935 4		1.18

1 weak β^+ 's omitted:

EB(ave) = 89.0; IIB = 0.06%

γ 2	1368.53 5	99.99916	2.91
γ 3	2754.09 5	99.9992 5	5.86

4 weak γ 's omitted:E γ (ave) = 3023.6; I γ = 0.06%

32P B- DECAY (14.29 D 3) I (NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(q\text{-rad}/\mu\text{Ci-h})$
β^- 1 max	1710.3 6		
avg	694.8 3 100		1.48

41AB B- DECAY (1.027 H 7) I (NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(q\text{-rad}/\mu\text{Ci-h})$
β^- 1 max	1198.1 8		
avg	459.3 3 99.170 20		0.970
β^- 2 max	2491.8 8		
avg	1076.6 4 0.780 20		0.0179
total β^-	avg	464.0 3 100.00 3	0.988

1 weak β^+ 's omitted:

EB(ave) = 294.0; IIB = 0.05%

γ 1	1293.64 4	99.160 20	2.73
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1 weak γ 's omitted:E γ (ave) = 1677.0; I γ = 0.05%

41CA EC DECAY (1.025 Y 2) I (NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	Δ (q-rad/ μCi-h)
Auger-K	3	77.0 12	0.0049
K X-ray	3.31	12.3 12	0.0009

46SC B- DECAY (93.00 D 3) I (NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	Δ (q-rad/ μCi-h)
9- 1 max avg	357.3 11 112.0 4	99.9964	0.239
γ 1	809.25 3	99.9964	1.09
γ 2	1120.51 5	100.00 10	2.39

51CR EC DECAY (27.704 D 2) I (NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	Δ (q-rad/ μCi-h)
Auger-L	0.47	144.7 12	0.0014
Auger-K	0.30	66.5 7	0.0062
X-ray L	0.5	0.33 12	=0
X-ray K _α	0.90440	6.59 21	0.0037
X-ray K _β	0.95220	13.1 4	0.0014
X-ray K _β	5.43	2.62 9	0.0003
γ 1	320.078 8	9.80 10	0.0668

54Mn EC DECAY (312.5 D 5) I (NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	Δ (q-rad/ μCi-h)
Auger-L	0.54	142.0 12	0.0016
Auger-K	0.78	63.9 7	0.0065
X-ray L	0.57	0.37 13	=0
X-ray K _α	5.40551	7.43 21	0.0009
X-ray K _β	5.41472	14.7 4	0.0017
X-ray K _β	6	2.94 10	0.0004
γ 1	834.827 21	99.9760 2	1.78

55FE EC DECAY (2.7 Y 1) I (NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	Δ (q-rad/ μCi-h)
Auger-L	0.6	139 4	0.0018
Auger-K	5.19	60.7 22	0.0067
X-ray L	0.64	6.42 14	=0
X-ray K _α	5.88765	8.2 7	0.0010
X-ray K _β	5.89875	16.3 12	0.0020
X-ray K _β	6.49	3.3 3	0.0005

56Mn B- DECAY (2.5785 H 6) I (NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	Δ (q-rad/ μCi-h)
9- 1 max avg	324.8 12 98.8 5	1.16 3	0.0024
9- 2 max avg	734.6 12 254.8 5	14.6 4	0.0792
9- 3 max avg	1037.0 12 381.5 6	27.9 8	0.227
9- 4 max avg	2047.7 12 1216.3 6	56.3 9	1.46
total β- avg	829.4 9	100.1 13	1.77

3 weak β's omitted:
E_β(avg) = 396.2; I_β = 0.12%

γ 1	846.754 20	99.9 3	1.78
γ 4	1810.72 4	27.2 8	1.05
γ 5	2113.75 4	14.3 4	0.645
γ 6	2522.48 6	8.99 3	0.0531
γ 8	2657.05 5	0.653 20	0.0369
γ 9	2959.77 6	0.306 10	0.0193
γ 10	3369.60 7	0.168 10	0.0121

3 weak γ's omitted:
E_γ(avg) = 1350.0; I_γ = 0.16%

57CO EC DECAY (270.9 D 6) I (NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	Δ (q-rad/ μCi-h)
Auger-L	0.67	249 3	0.0036
Auger-K	5.62	105.5 14	0.0126
ce-K- 1	7.303 3	69.6 4	0.0108
ce-L- 1	13.569 3	7.79 22	0.0023
ce-KNO- 1	14.322 3	1.15 7	0.0004
ce-K- 2	114.951 4	1.87 10	0.0046
ce-L- 2	121.217 3	0.183 10	0.0005
ce-K- 3	129.364 4	1.40 12	0.0039
ce-L- 3	135.630 3	0.140 12	0.0004
X-ray L	0.7	0.8 3	=0
X-ray K _α	6.39064	16.6 5	0.0023
X-ray K _β	6.40384	32.8 8	0.0045
X-ray K _β	7	6.63 21	0.0010
γ 1	10.4147 25	9.50 13	0.0029
γ 2	122.063 3	85.59 19	0.223
γ 3	136.476 3	10.61 18	0.0309
γ 9	692.00 3	0.160 5	0.0024

6 weak γ's omitted:
E_γ(avg) = 536.0; I_γ = 0.03%

58CO EC DECAY (70.8 D 1) I (RTM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	0.67	116.5 13	0.0017
Auger-K	5.62	49.8 6	0.0059
β ⁺ 1 max	878.7 10		
β ⁺ 1 avg	201.1 6	18.90 10	0.0630
X-ray L	0.7	0.36 12	0
X-ray K _α	6.39384	7.79 21	0.0011
X-ray K _β	6.80384	15.8 8	0.0021
X-ray K _γ	7	3.15 10	0.0005
γ 1	810.750 20	99.450 10	1.72
γ 2	963.980 20	0.674 10	0.0128
γ 3	1676.73 8	0.517 10	0.0188

Maximum γx-intensity = 29.80%

59FE β⁻ DECAY (44.6 D 4) I (RTM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
β ⁻ 1 max	131.0 22		
β ⁻ 1 avg	35.8 7	1.29 6	0.0010
β ⁻ 2 max	273.6 22		
β ⁻ 2 avg	81.0 8	45.3 11	0.0782
β ⁻ 3 max	466.0 22		
β ⁻ 3 avg	109.3 9	53.1 11	0.164
β ⁻ 4 max	1565.2 22		
β ⁻ 4 avg	610.6 10	0.19 8	0.0028
total β ⁻ avg	117.6 10	100.0 16	0.250

1 weak β's omitted:
E_β(avg) = 22.1; I_β = 0.09%

γ 1	182.68 8	1.03 5	0.0031
γ 2	192.38 8	3.11 16	0.0127
γ 3	338.82 20	0.260 20	0.0019
γ 5	1099.22 25	6.5 10	1.32
γ 6	1291.54 3	43.2 10	1.19

2 weak γ's omitted:
E_γ(avg) = 1227.9; I_γ = 0.09%

59FE EC DECAY (7.520 Y 13) I (RTM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	0.75	138 5	0.0021
Auger-K	6	58.9 20	0.0071
X-ray L	0.78	0.47 17	0
X-ray K _α	6.91530	10.0 8	0.0015
X-ray K _β	6.93032	18.9 14	0.0029
X-ray K _γ	7.65	8.0 3	0.0007

60CO β⁻ DECAY (5.271 Y 1) I (RTM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
β ⁻ 1 max	317.93 12		
β ⁻ 1 avg	95.90 8	99.920 20	6.200

1 weak β's omitted:
E_β(avg) = 62.9; I_β = 0.04%

γ 1	1173.200 25	99.900 20	2.50
γ 2	1332.46 3	100	2.48

4 weak γ's omitted:
E_γ(avg) = 637.2; I_γ = 0.01%

63NI β⁻ DECAY (94 Y 4) I (RTM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
β ⁻ 1 max	65.87 15		
β ⁻ 1 avg	17.1 3	100	0.0365

64CU β⁻ DECAY (12.701 Y 2) I (RTM) = 0.10%
E (FC - β⁻) DECAY = 62.9 4
SEE ALSO 64CU β⁻ DECAY

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	0.94	70.1 21	0.0011
Auger-K	6.54	23.3 12	0.0033
β ⁻ 1 max	653.0 8		
β ⁻ 1 avg	274.2 8	17.84 13	0.106
X-ray L	0.94	0.23 9	0
X-ray K _α	7.46080	8.9 8	0.0008
X-ray K _β	7.87815	9.6 7	0.0015
X-ray K _γ	8.26	1.96 10	0.0003
γ 1	1285.4 3	0.84 8	0.0180

Maximum γx-intensity = 35.76%

64CU β⁻ DECAY (12.61 Y 2) I (RTM) = 0.10%
SE- DECAY = 37.2 4
SEE ALSO 64CU β⁻ DECAY

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
β ⁻ 1 max	577.7 16		
β ⁻ 1 avg	190.1 7	17.2 8	0.151

6528 D- DECAY (2.520 E 2) I(MIU) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(μ-rad/μCi-h)
β- 1 max	411.6 16		
avg	120.5 6	0.54 3	0.0015
β- 2 max	513.1 16		
avg	165.9 6	0.04 4	0.0030
β- 3 max	654.7 16		
avg	220.7 7	20.1 10	0.132
β- 4 max	1027.9 16		
avg	371.0 7	9.0 5	0.0776
β- 5 max	2136.5 16		
avg	875.5 6	60.7 10	1.13
total β- avg	632.1 11	100.0 10	1.35
γ 2	346.27 3	4.61 20	0.0359
γ 3	507.00 20	0.207 20	0.0031
γ 4	609.30 20	0.101 11	0.0010
γ 8	1115.53 4	10.8 6	0.352
γ 9	1001.04 5	23.5 8	0.702
γ 10	1623.02 6	0.475 23	0.0164
γ 11	1720.92 6	0.308 21	0.0142

0 weak γ's omitted:
 $I_{\gamma}(\text{avg}) = 0.10.0$; $I_{\gamma} = 0.17\%$

6528 EC DECAY (200.1 D 2) I(MIU) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(μ-rad/μCi-h)
Auger-L	0.92	126.7 10	0.0025
Auger-K	7	40.3 0	0.0072
β- 1 max	329.9 11		
avg	103.0 5	1.416 10	0.0043
X-ray L	0.93	0.57 20	0.0
X-ray M _K	0.027030	11.5 3	0.0020
X-ray M _K	0.007700	22.6 5	0.0039
X-ray M _K	9	0.61 13	0.0009
γ 3	1115.52 3	50.75 96	1.21

Maximum γ-intensity = 1.03%

6928 IT DECAY (13.76 E 3) I(MIU) = 0.10%

RT DECAY=99.947 3
 FEES 6928 (57 E)
 RT- DECAY=4.032 3

Radiation Type	Energy (keV)	Intensity (%)	A(μ-rad/μCi-h)
Auger-L	0.39	6.3 3	0.0001
Auger-K	7.33	2.29 10	0.0004
ce-K- 1	420.975 10	4.39 0	0.0001
ce-L- 1	437.040 10	0.513 9	0.0004
ce-M- 1	430.498 10	0.1699	0.0016
X-ray M _K	0.61570	0.63 5	0.0011
X-ray M _K	0.63000	1.23 0	0.0002
X-ray M _K	9.57	0.250 17	0.0
γ 1	830.634 10	90.09 15	0.007

6928 D- DECAY (57 9 1) I(MIU) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(μ-rad/μCi-h)
β- 1 max	905 3		
avg	320.9 13	99.99060	0.604

795E D- DECAY (65000 E 1) I(MIU) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(μ-rad/μCi-h)
β- 1 max	155 6		
avg	54.0 22	100	0.116

8200 D- DECAY (35.30 E 3) I(MIU) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(μ-rad/μCi-h)
β- 1 max	264.0 15		
avg	76.2 5	1.40 10	0.0023
β- 2 max	440.1 15		
avg	137.7 6	90.60 10	0.209
total β- avg	136.0 6	100.00 15	0.291
γ 1	92.104 0	0.75 5	0.0015
γ 4	137.00 20	0.10 3	0.0004
γ 6	229.05 3	2.25 9	0.0106
γ 7	273.05 3	0.79 5	0.0004
γ 12	550.320 20	70.6 9	0.030
γ 16	604.30 10	1.17 9	0.0151
γ 15	619.070 20	43.1 7	0.569
γ 17	690.330 20	27.9 6	0.416
γ 19	776.09 3	93.0 9	1.30
γ 20	827.01 3	20.2 4	0.026
γ 23	952.10 20	0.37 3	0.0070
γ 24	1007.57 9	1.31 4	0.0201
γ 25	1043.97 3	27.0 5	0.600
γ 27	1001.00 20	0.63 4	0.0104
γ 30	1317.67 5	26.9 5	0.756
γ 32	1426	9.11 5	0.0033
γ 33	1470.02 0	10.60 25	0.521
γ 34	1650.30 10	0.79 5	0.0279
γ 35	1779.60 20	0.117 17	0.0044

10 weak γ's omitted:
 $I_{\gamma}(\text{avg}) = 730.5$; $I_{\gamma} = 0.75\%$

6488 B- DECAY (2.39 H 2) I (RIM) = 0.10%
 8 FEEDING TO 6488 (1.83 H) = 99.975 %
 SEE ALSO 6488 IT DECAY (1.83 H)

Radiation Type	Energy (keV)	Intensity (%)	λ (q-rad/ μ Ci-h)
β^- 1 max	392.15		
avg	119.6	1.3	0.0033
β^- 2 max	921.15		
avg	324.7	94.6	0.600
total β^-			
avg	321.7	100.0	0.600

2 weak β^- 's omitted:
 $E\beta$ (avg) = 115.5; $II\beta$ = 0.11%

γ 6 529.5 3 1.2 4 0.1167

6 weak γ 's omitted:
 $E\gamma$ (avg) = 534.5; $II\gamma$ = 0.12%

6488 IT DECAY (1.83 H 2) I (RIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	λ (q-rad/ μ Ci-h)
Auger-L	1.5	165.2 17	0.0053
co-L-1	7.479 10	77.70 20	0.0124
co-P-1	9.112 10	12.70 10	0.0025
co-WO-1	9.376 10	4.220 10	0.0000
Auger-K	10.8	0.6 0	0.0020
co-K-2	17.034 20	24.30 10	0.0092
co-L-2	30.239 20	61.70 10	0.2397
co-P-2	31.072 20	10.40 10	0.0071
co-WO-2	32.136 20	3.450 10	0.0024
X-ray L	1.50	2.2 9	0
γ 1	9.400 10	5.42 16	0.0011
X-ray K_{α}	12.5900 20	4.57 23	0.0012
X-ray K_{β}	12.6490 20	0.9 5	0.0024
X-ray $K\beta$	10	2.26 12	0.0007

1 weak γ 's omitted:
 $E\gamma$ (avg) = 32.2; $II\gamma$ = 0.05%

6488 B- DECAY (31.80 H 0) I (RIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	λ (q-rad/ μ Ci-h)
β^- 1 max	400 30		
avg	152 10	0.22 5	0.0007
β^- 2 max	540 30		
avg	179 10	2.1 4	0.0000
β^- 3 max	590 30		
avg	191 10	0.49 7	0.0020
β^- 4 max	740 30		
avg	252 11	11.7 13	0.0620
β^- 5 max	790 30		
avg	272 11	0.29 4	0.0017
β^- 6 max	800 30		
avg	275 11	0.10 5	0.0011

Continued

6488 B- DECAY (31.80 H 0) (Continued)

Radiation Type	Energy (keV)	Intensity (%)	λ (q-rad/ μ Ci-h)
β^- 7 max	970 30		
avg	343 11	2.5 3	0.0103
β^- 8 max	1200 30		
avg	441 12	0.49 14	0.0046
β^- 9 max	1310 30		
avg	489 12	9.5 11	0.0909
β^- 10 max	1590 30		
avg	615 12	3.9 4	0.0517
β^- 11 max	1910 30		
avg	763 12	1.13 22	0.0150
β^- 12 max	1970 30		
avg	790 12	7.4 9	0.125
β^- 13 max	2050 30		
avg	825 12	1.9 3	0.0330
β^- 14 max	2100 30		
avg	807 13	0.34 7	0.0064
β^- 15 max	2330 30		
avg	954 13	1.6 4	0.0325
β^- 16 max	2770 30		
avg	1165 13	12.1 20	0.300
β^- 17 max	3790 30		
avg	1450 13	13.7 16	0.401
β^- 18 max	4670 30		
avg	2071 13	32 5	1.41
total β^-			
avg	1229 21	102 6	2.66

1 weak β^- 's omitted:
 $E\beta$ (avg) = 1194.0; $II\beta$ = 0.06%

γ 1	230.20 20	0.31 5	0.0015
γ 3	354.70 20	0.31 5	0.0023
γ 4	302.00 20	0.57 10	0.0046
γ 10	604.9 3	1.0 3	0.0220
γ 12	776.5 3	1.31 24	0.0205
γ 13	802.20 20	6.1 8	0.104
γ 14	801.60 10	42 4	0.792
γ 15	947.5 7	0.36 9	0.0072
γ 17	997.3 4	0.70 14	0.0164
γ 18	1005.7 7	0.46 14	0.0099
γ 19	1015.9 3	6.2 0	0.135
γ 20	1082.6 4	0.14 3	0.0033
γ 21	1119.1 4	0.14 3	0.0024
γ 23	1185.0 7	0.110 23	0.0020
γ 24	1213.30 20	2.6 4	0.0676
γ 27	1463.8 7	2.0 5	0.0610
γ 28	1534.7 6	0.101 23	0.0033
γ 29	1570.1 4	0.66 14	0.0221
γ 30	1607.6 4	0.40 7	0.0137
γ 31	1741.2 4	1.6 3	0.0610
γ 34	1810.7 4	0.24 5	0.0095
γ 35	1877.5 4	1.14 19	0.0456
γ 36	1897.60 20	14.9 19	0.604
γ 37	2029.6 5	2.1 5	0.0912
γ 38	2094.2 5	0.22 5	0.0046
γ 39	2200.7 4	1.10 20	0.0554
γ 41	2404.1 3	0.9 9	0.357
γ 42	2593.7 6	0.14 4	0.0077
γ 43	2622.9 5	0.30 7	0.0170
γ 44	2750.7 5	0.49 10	0.0290
γ 45	2824.1 4	1.14 19	0.0405
γ 46	2900.7 7	0.10 5	0.0113
γ 47	3045.4 4	2.5 5	0.164
γ 48	3202.1 7	0.21 5	0.0144
γ 49	3235.3 5	2.1 4	0.142
γ 50	3345.6 4	2.9 5	0.209
γ 51	3927.5 4	6.9 9	0.575
γ 52	4004.6 6	0.20 5	0.0242

15 weak γ 's omitted:
 $E\gamma$ (avg) = 1122.9; $II\gamma$ = 0.67%

958B B- DECAY (172 S 2) I (HIM) = 0.10%
FEEDS 958B (0.00 H)
SEE ALSO 958B IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
B- 1 max	1570100		
avg	610.50	1.10 20	0.0103
B- 2 max	1670100		
avg	640.50	1.30 20	0.0103
B- 3 max	2500100		
avg	1030.50	97.6 3	2.10
total B-			
avg	1020.50	100.0 5	2.17
γ 2	901.6 5	1.30 20	0.0222
γ 3	925.1 5	1.10 20	0.0217

958B IT DECAY (0.00 H 1) I (HIM) = 0.10%
SIT DECAY=21.1 6
FEEDS 958B (10.72 H)
SEE ALSO 958B B- DECAY (0.00 H)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	1.5	7.0 5	0.0002
Auger-K	10.9	2.09 20	0.0005
ce-K- 1	290.500 26	5.92 21	0.0106
ce-L- 1	302.909 20	0.90 4	0.0050
ce-KMO- 1	300.502 20	0.295 9	0.0019
X-ray L	1.59	0.10 4	n0
X-ray K _α	12.5900 20	1.11 7	0.0003
X-ray K _β	12.6490 20	2.16 13	0.0006
X-ray K _γ	10	0.55 4	0.0002
γ 1	300.070 20	10.0 5	0.0900

958B B- DECAY (10.72 γ 1) I (HIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
B- 1 max	173.0 20		
avg	47.5 6	0.437 11	0.0004
B- 2 max	607.0 20		
avg	251.0 0	99.563 11	0.533
total B-			
avg	250.5 0	100.000 16	0.530
γ 1	513.990 10	0.430 11	0.0000

958B B- DECAY (0.00 H 1) I (HIM) = 0.10%
B- DECAY=70.9 6
SEE ALSO 958B IT DECAY (0.00 H)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	1.60	3.69 10	0.0001
Auger-K	11.0	1.00 4	0.0002
ce-F- 2	135.900 10	3.02 7	0.0007
ce-L- 2	149.115 10	0.340 16	0.0011
B- 1 max	710.0 20		
avg	230.3 7	0.290 10	0.0015
B- 2 max	840.7 20		
avg	290.0 7	70.6 6	0.006
total B-			
avg	290.2 7	70.9 6	0.008

1 weak B's omitted:
ΣB (avg) = 70.6; IIB = 0.02%

X-ray K _α	13.33500 2	0.597 17	0.0002
X-ray K _β	13.39536 2	1.13 3	0.0003
X-ray K _γ	15	0.290 10	n0
γ 1	129.050 20	0.302 9	0.0000
γ 2	151.100 10	75.5 6	0.203

2 weak γ's omitted:
Σγ (avg) = 501.3; IIG = 0.02%

960B B- DECAY (10.66 B 2) I (HIM) = 0.10%
B- DECAY=99.9900 5
SIC DECAY=0.0052 5

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
B- 1 max	697.0 19		
avg	232.6 0	0.76 0	0.0030
B- 2 max	1770.0 19		
avg	709.3 9	91.20 0	1.30
total B-			
avg	667.5 10	100.00 12	1.02
γ 1	1076.63 10	0.76 0	0.201

970B B- DECAY (76.3 B 5) I (HIM) = 0.10%
FEEDS 970B

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	1.60	0.190 0	n0
ce-K- 2	307.370 20	0.170 6	0.0010
B- 1 max	501 6		
avg	180.1 23	0.56 3	0.0020
B- 2 max	835 6		
avg	207.9 25	0.110 10	0.0007

Continued

87PB 5- DECAY (76.3 $\pm$ 5)
 FEES 8729

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μ Ci-h)
β^- 3 max	929 6		
avg	326.9 25	8.8 3	0.0306
β^- 4 max	1079 6		
avg	390 3	0.50 3	0.0048
β^- 5 max	1335 6		
avg	501 3	9.5 3	0.101
β^- 6 max	1676 6		
avg	563 3	5.60 20	0.0672
β^- 7 max	1512 6		
avg	579 3	0.42 6	0.0052
β^- 8 max	2109 6		
avg	870 3	0.67 10	0.0124
β^- 9 max	2312 6		
avg	946 3	0.15 6	0.0032
β^- 10 max	2500 6		
avg	1034 3	0.120 10	0.0026
β^- 11 max	3045 6		
avg	1295 3	6.9 4	0.190
β^- 12 max	3487 6		
avg	1503 3	40.0 14	1.31
β^- 13 max	3890 6		
avg	1695 3	30.5 22	1.10
total β^-			
avg	1324 4	100 3	2.03
γ 2	402.578 20	49.5 16	0.424
γ 6	673.07 4	1.91 10	0.0274
γ 7	814.25 7	0.362 12	0.0029
γ 8	836.37 6	0.75 4	0.0134
γ 9	845.43 4	7.3 4	0.131
γ 12	946.64 15	0.139 11	0.0020
γ 15	1175.40 8	1.12 6	0.0281
γ 16	1337.96 8	0.65 4	0.0105
γ 17	1382.53 7	0.297 10	0.0085
γ 19	1389.91 16	0.124 11	0.0037
γ 20	1531.2 4	0.36 6	0.0116
γ 21	1577.99 14	0.129 11	0.0043
γ 22	1611.16 16	0.164 20	0.0036
γ 23	1740.52 8	2.05 10	0.0766
γ 24	1842.61 24	0.139 11	0.0054
γ 25	2011.00 12	2.90 14	0.124
γ 27	2400.50 20	0.213 17	0.0109
γ 28	2554.00 20	9.3 6	0.506
γ 29	2558.10 20	3.9 3	0.213
γ 31	2811.40 20	0.317 23	0.0190
γ 34	3300.50 20	0.450 25	0.0317

 13 weak γ 's omitted:
 $E_{\gamma}(\text{avg})=1620.1$; $I_{\gamma}=0.65\%$

 87PB 5- DECAY (4.7810 $\pm$ 1) $I(\text{BIB})=0.10\%$

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μ Ci-h)
β^- 1 max	273.3 19		
avg	70.0 7	100	0.160

 88PB 1- DECAY (2.04 $\pm$ 2)
 FEES 8880
 $I(\text{BIB})=0.10\%$

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μ Ci-h)
Isomer-L	1.68	15.0 4	0.0005
Isomer-R	11.4	4.04 25	0.0010
ce-R- 1	12.313 14	10.8 7	0.0028
ce-L- 1	25.448 14	1.25 9	0.0007
ce-R- 1	27.191 14	0.79 13	0.0001
ce-R- 2	150.78 4	0.21 3	0.0007
ce-R- 7	181.120 15	1.16 13	0.0045
ce-L- 7	194.255 15	0.137 18	0.0006
β^- 1 max	136 14		
avg	37 4	0.36 3	0.0003
β^- 2 max	359 14		
avg	107 5	2.60 19	0.0061
β^- 3 max	515 14		
avg	163 6	69 4	0.236
β^- 4 max	675 14		
avg	224 6	9.2 6	0.0439
β^- 5 max	818 14		
avg	201 4	0.14 3	0.0009
β^- 6 max	991 14		
avg	353 6	0.210 20	0.0016
β^- 7 max	1142 14		
avg	430 6	1.94 13	0.0101
β^- 8 max	1246 14		
avg	462 7	0.23 4	0.0023
β^- 9 max	1465 14		
avg	559 7	0.23 3	0.0027
β^- 10 max	1725 14		
avg	675 7	0.91 7	0.0131
β^- 11 max	1766 14		
avg	694 7	0.10 6	0.0015
β^- 12 max	2005 14		
avg	822 7	1.31 25	0.0229
β^- 13 max	2711 14		
avg	1933 7	1.90 25	0.0434
β^- 14 max	2907 14		
avg	1230 7	13 5	0.341
total β^-			
avg	344 11	100 7	0.734

 2 weak β 's omitted:
 $E_{\beta}(\text{avg})=231.8$; $I_{\beta}=0.10\%$

X-ray L	1.64	0.23 8	0.00
X-ray K_{α}	13.33500 2	2.37 14	0.0007
X-ray K_{β}	13.39530 2	4.6 3	0.0013
X-ray $K\beta$	15	1.21 8	0.0034
γ 1	27.513 14	2.09 13	0.0012
γ 3	122.27 4	0.199 14	0.0005
γ 4	165.90 4	3.14 18	0.0111
γ 7	196.320 15	26.3 16	0.110
γ 8	240.71 4	0.255 17	0.0013
γ 9	311.69 3	0.100 10	0.0007
γ 10	334.71 3	0.147 11	0.0010
γ 12	362.226 13	2.27 15	0.0176
γ 14	390.543 11	0.65 6	0.0050
γ 16	421.70 10	0.13 3	0.0012
γ 17	471.00 3	0.73 5	0.0074
γ 25	677.34 5	0.230 20	0.0034
γ 30	788.20 4	0.54 4	0.0091
γ 31	790.32 7	0.126 13	0.0021
γ 34	834.830 3	13.1 6	0.233
γ 35	850.34 5	0.175 15	0.0032

Continued

89SR B- DECAY (2.04 H 2) (Continued)
FEEDS 8908

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μ Ci-h)
γ 36	262.327 19	0.69 5	0.0125
γ 39	946.92 6	0.297 22	0.0060
γ 42	985.780 16	1.33 8	0.0279
γ 43	990.09 9	0.103 20	0.0030
γ 44	1039.59 3	0.49 6	0.0107
γ 45	1049.48 12	0.143 10	0.0032
γ 48	1101.33 6	1.30 8	0.0316
γ 49	1179.51 3	1.01 7	0.0253
γ 50	1180.95 6	0.70 5	0.0176
γ 51	1209.08 8	0.10 3	0.0037
γ 52	1212.7 17	0.10 5	0.0036
γ 53	1245.22 6	0.37 3	0.0097
γ 54	1250.67 6	1.13 7	0.0302
γ 57	1320.90 6	0.16 6	0.0045
γ 59	1352.32 11	0.161 23	0.0046
γ 60	1369.54 20	1.49 11	0.0036
γ 61	1406.94 10	0.120 22	0.0046
γ 62	1466.04 9	0.115 16	0.0036
γ 63	1510.39 3	2.10 10	0.0700
γ 64	1529.77 3	11.1 7	0.360
γ 65	1603.79 5	0.06 4	0.0150
γ 68	1685.6 6	0.57 9	0.0201
γ 72	1692.76 13	4.10 3	0.0056
γ 73	1900.7 6	0.101 16	0.0041
γ 74	2029.94 3	0.6 3	0.190
γ 75	2035.011 10	3.70 20	0.160
γ 76	2106.5 3	0.29 7	0.0135
γ 77	2195.042 7	13.3 8	0.620
γ 78	2231.772 21	3.43 21	0.163
γ 80	2352.00 6	0.70 5	0.0370
γ 82	2392.11 6	35.0 20	1.70
γ 83	2400.91 7	0.105 12	0.0054
γ 85	2540.48 3	0.43 6	0.0302
γ 86	2771.02 5	0.150 11	0.0909

36 weak γ 's omitted:
Er(aw)=1000.1; Ely= 1.91%

89SR B- DECAY (17.0 H 1) I (HEP)= 0.13%

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μ Ci-h)
β^- 1 max	405 6		
avg	152.0 20	0.67 6	0.0022
β^- 2 max	493 6		
avg	155.0 20	0.370 20	0.0012
β^- 3 max	595 6		
avg	193.0 20	0.104 10	0.0006
β^- 4 max	821 6		
avg	203.0 20	2.13 11	0.0120
β^- 5 max	920 6		
avg	320.0 20	0.211 17	0.0015
β^- 6 max	2120 6		
avg	855.0 20	0.90 6	0.0170
β^- 7 max	2600 6		
avg	1001.0 20	13.3 7	0.306
β^- 8 max	3542 6		
avg	1507.0 20	4.2 3	0.135
β^- 9 max	5330 6		
avg	2304.0 20	77.4 10	3.93
total β^-			
avg	2001 3	99.5 16	4.41

0 weak β 's omitted:
Er(aw)= 530.4; Ely= 0.06%

Continued

89SR B- DECAY (17.0 H 1) (Continued)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μ Ci-h)
γ 5	898.03 6	10.5 10	0.277
γ 6	1366.26 12	0.106 15	0.0031
γ 9	1302.39 5	0.77 6	0.0226
γ 11	1779.83 7	0.223 20	0.0005
γ 13	1836.00 5	22.1 15	0.060
γ 14	2111.22 12	0.122 10	0.0055
γ 15	2110.75 7	9.00 6	0.0196
γ 17	2577.1 6	0.196 15	0.0102
γ 18	2677.06 5	2.02 10	0.115
γ 19	2734.03 7	0.113 10	0.0066
γ 20	3009.43 7	0.252 19	0.0161
γ 22	3210.40 8	0.221 16	0.0152
γ 23	3406.46 9	0.135 10	0.0130
γ 26	4702.69 11	0.100 12	0.0150

13 weak γ 's omitted:
Er(aw)=1470.6; Ely= 0.10%

89SR B- DECAY (3.17 H 2) I (HEP)= 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μ Ci-h)
Auger-L	1.60	1.10 9	0.0
Auger-K	11.4	0.32 3	0.0
ce-K- 6	205.70 7	0.96 8	0.0002
ce-L- 6	210.03 7	0.116 10	0.0005
β^- 1 max	300 30		
avg	87 9	0.50 7	0.0011
β^- 2 max	440 30		
avg	137 10	0.56 5	0.0016
β^- 3 max	450 30		
avg	100 10	0.33 6	0.0010
β^- 4 max	530 30		
avg	167 10	0.10 3	0.0006
β^- 5 max	560 30		
avg	101 10	0.60 5	0.0023
β^- 6 max	590 30		
avg	191 10	0.220 20	0.0009
β^- 7 max	590 30		
avg	192 10	0.16 3	0.0007
β^- 8 max	620 30		
avg	200 10	0.10 3	0.0006
β^- 9 max	700 30		
avg	234 10	0.20 6	0.0010
β^- 10 max	710 30		
avg	239 10	0.190 20	0.0009
β^- 11 max	790 30		
avg	260 11	0.56 6	0.0032
β^- 12 max	850 30		
avg	294 11	0.70 7	0.0006
β^- 13 max	890 30		
avg	307 11	0.50 5	0.0033
β^- 14 max	950 30		
avg	336 11	0.45 6	0.0032
β^- 15 max	960 30		
avg	341 11	0.20 3	0.0015
β^- 16 max	1030 30		
avg	370 11	0.17 3	0.0013
β^- 17 max	1210 30		
avg	406 11	0.20 5	0.0032
β^- 18 max	1210 30		
avg	447 11	2.40 20	0.0229
β^- 19 max	1400 30		
avg	520 12	1.50 20	0.0169

Continued

ESRP E- DECAY (3.17 P 2)
EECS 098E

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	A(g-rad/ μCi-h)
β-20 max	1460 30		
avg	550 12	0.32 4	0.0030
β-21 max	1560 30		
avg	600 12	2.10 20	0.0260
β-22 max	1570 30		
avg	605 12	1.60 20	0.0206
β-23 max	1600 30		
avg	620 12	2.00 20	0.0264
β-24 max	1600 30		
avg	655 12	0.27 4	0.0034
β-25 max	1910 30		
avg	761 12	0.70 20	0.0113
β-26 max	2000 30		
avg	831 12	4.0 3	0.0700
β-27 max	2100 30		
avg	867 12	0.28 4	0.0052
β-28 max	2150 30		
avg	870 12	1.50 10	0.0270
β-29 max	2330 30		
avg	955 11	10.7 9	0.299
β-30 max	2530 30		
avg	1040 11	5.7 4	0.127
β-31 max	2540 30		
avg	1054 13	0.31 4	0.0070
β-32 max	2560 30		
avg	1064 13	0.20 3	0.0045
β-33 max	2710 30		
avg	1134 13	0.21 3	0.0046
β-34 max	2770 30		
avg	1161 13	3.2 3	0.0791
β-35 max	2930 30		
avg	1220 13	2.60 20	0.0606
β-36 max	3070 30		
avg	1301 13	0.44 6	0.0133
β-37 max	3110 30		
avg	1322 13	0.19 9	0.0051
β-39 max	3240 30		
avg	1383 13	10.3 9	0.303
β-39 max	3400 30		
avg	1461 13	2.9 3	0.0802
β-40 max	3590 30		
avg	1552 13	0.44 10	0.0212
β-41 max	3610 30		
avg	1559 13	3.7 4	0.123
β-42 max	3930 30		
avg	1716 13	1.3 3	0.0475
β-43 max	4000 30		
avg	1780 13	0.50 20	0.0106
β-44 max	4340 30		
avg	1913 14	2.20 10	0.0696
β-45 max	4350 30		
avg	1910 14	4.5 5	0.104
β-46 max	4430 30		
avg	1956 14	1.2 5	0.0500
β-47 max	4920 30		
avg	2196 14	21 4	0.992
total β-			
avg	1320 18	99 5	2.79

5 weak β's omitted:

E0 (avg) = 502.5; E10 = 0.33%

X-ray	Re _β	13.33500	2	0.196	16	0
X-ray	Re _β	13.39530	2	0.26	3	0.0001
γ	1	196.2	5	0.22	11	0.0009
γ	2	197.5	3	1.06	10	0.0070
γ	3	205.03	20	0.13	3	0.0006
γ	4	220.90	7	20.4	16	0.9960
γ	6	244.11	10	0.47	6	0.0030
γ	12	330.26	10	0.35	4	0.0025
γ	13	345.03	10	1.20	11	0.0080

Continued

ESRP E- DECAY (3.17 P 2)
EECS 098E

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	A(g-rad/ μCi-h)
γ 14	356.96	7	4.2 4
γ 15	364.00	10	0.52 0
γ 16	369.30	10	1.41 12
γ 19	402.25	20	0.32 4
γ 19	411.42	10	2.61 20
γ 21	430.08	10	0.58 4
γ 22	446.13	10	0.32 9
γ 24	490.76	20	0.33 5
γ 25	497.5	3	6.8 7
γ 26	490.6	4	1.34 22
γ 30	557.30	20	0.163 19
γ 31	576.56	10	5.0 5
γ 32	585.00	7	16.9 13
γ 35	626.20	10	0.41 6
γ 36	629.75	20	0.35 4
γ 40	665.72	20	0.116 19
γ 42	671.46	20	0.100 22
γ 43	670.11	20	0.20 3
γ 45	696.24	10	1.02 16
γ 46	707.01	20	0.51 5
γ 47	710.05	20	0.00 8
γ 48	729.63	20	0.30 4
γ 49	739.39	7	4.3 4
γ 50	747.4	3	0.12 3
γ 52	762.9	3	0.41 9
γ 53	762.9	3	0.94 14
γ 54	776.49	20	1.10 20
γ 56	826.75	10	0.78 8
γ 57	835.53	10	1.12 11
γ 58	857.37	15	0.29 3
γ 59	857.00	7	6.0 5
γ 60	870.42	20	0.163 21
γ 61	904.27	7	7.3 6
γ 63	930.95	10	0.61 5
γ 66	940.19	15	0.167 19
γ 67	953.10	20	0.190 18
γ 69	960.42	10	0.23 4
γ 71	974.39	10	1.00 9
γ 72	997.37	10	0.67 6
γ 73	1010.04	20	0.110 16
γ 75	1040.40	10	0.42 4
γ 80	1076.49	20	0.24 3
γ 81	1080.07	10	0.37 4
γ 83	1103.19	20	0.42 9
γ 84	1107.70	10	2.99 25
γ 85	1116.61	7	1.69 14
γ 96	1131.51	20	0.163 25
γ 88	1162.50	10	0.218 20
γ 90	1172.33	20	1.00 10
γ 91	1182.38	20	0.169 25
γ 92	1186.54	20	0.148 21
γ 96	1220.8	3	0.147 20
γ 97	1235.62	10	0.61 4
γ 101	1273.73	10	1.39 11
γ 104	1302.6	3	0.102 16
γ 106	1324.20	7	3.12 25
γ 107	1335.4	3	0.13 3
γ 108	1340.6	3	0.20 3
γ 109	1367.40	20	0.151 20
γ 110	1372.16	20	0.129 19
γ 112	1412.59	15	0.27 3
γ 113	1421.64	20	0.23 5
γ 117	1461.3	5	0.12 3
γ 118	1464.2	3	0.18 3
γ 119	1468.5	3	0.19 3
γ 120	1472.76	10	7.0 6
γ 123	1500.96	10	1.35 13
γ 124	1506.1	3	0.114 22
γ 125	1530.04	15	3.4 3
γ 126	1533.68	15	5.2 4
γ 127	1555.20	20	0.155 21

Continued

9908 R- DECAY (3.17 P 2)
FEES 0908

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	A (γ-rad/ μCi-h)
γ 120	1573.70 20	0.194 22	0.0065
γ 131	1638.06 10	0.04 8	0.0291
γ 132	1643.82 10	0.74 4	0.0121
γ 134	1647.51 20	0.131 16	0.0046
γ 135	1676.9 3	0.103 24	0.0051
γ 137	1683.0 4	0.13 3	0.0040
γ 138	1692.0 12	0.26 11	0.0394
γ 139	1693.70 10	0.5 4	0.161
γ 142	1721.25 15	0.22 23	0.0004
γ 146	1777.60 10	0.73 8	0.0294
γ 147	1780.2 3	0.130 19	0.0041
γ 150	1810.73 20	0.103 19	0.0055
γ 154	1837.5 4	0.12 3	0.0047
γ 155	1839.72 25	0.16 4	0.0140
γ 158	1848.47 25	0.203 22	0.0000
γ 159	1879.90 25	0.151 19	0.0065
γ 162	1903.40 10	1.05 12	0.0430
γ 165	1929.77 15	0.05 6	0.0270
γ 166	1966.55 20	0.135 16	0.0056
γ 169	1998.6 5	0.120 24	0.0051
γ 170	2012.23 10	1.59 14	0.0602
γ 171	2021.04 15	0.249 25	0.0107
γ 173	2046.47 15	0.267 25	0.0116
γ 176	2100.63 8	0.94 8	0.0429
γ 190	2160.02 9	0.50 5	0.0240
γ 193	2195.0 4	0.13 5	0.0061
γ 196	2240.2 3	0.21 5	0.0101
γ 198	2377.4 9	0.02 8	0.0013
γ 191	2400.99 9	0.73 4	0.0376
γ 201	2597.92 20	0.113 18	0.0061
γ 203	2645.26 15	0.07 4	0.0241
γ 209	2750.9 3	0.126 16	0.0074
γ 212	2782.11 10	0.70 9	0.0459
γ 214	2793.75 20	0.09 6	0.0013
γ 216	2819.59 25	0.135 19	0.0001
γ 217	2853.3 3	0.24 4	0.0149
γ 219	2866.23 10	1.77 14	0.100
γ 220	2870.60 25	0.33 4	0.0203
γ 224	3017.9 3	0.26 4	0.0167
γ 225	3029.16 25	0.20 3	0.0170
γ 228	3107.26 25	0.199 22	0.0131
γ 229	3140.26 20	1.06 10	0.0710
γ 232	3172.1 3	0.192 16	0.0069
γ 234	3215.80 20	0.00 4	0.0299
γ 243	3361.70 20	1.06 10	0.0760
γ 244	3371.1 4	0.03 7	0.0454
γ 245	3399.9 3	0.139 17	0.0190
γ 249	3532.00 20	1.37 11	0.103
γ 251	3583.9 3	0.263 25	0.0241
γ 258	3717.0 4	0.06 8	0.0670
γ 260	3732.5 6	0.14 6	0.0112
γ 262	3781.4 4	0.135 15	0.0100
γ 264	3827.4 4	0.141 10	0.0115
γ 266	3842.7 4	0.112 14	0.0392
γ 269	3901.7 4	0.137 22	0.0114
γ 270	3923.0 4	0.42 4	0.0353
γ 271	3965.5 4	0.212 26	0.0179
γ 272	3977.5 4	0.20 6	0.0233
γ 274	3996.0 4	0.105 15	0.0123
γ 277	4089.0 5	0.110 14	0.0102
γ 290	4341.1 6	0.106 12	0.0090
γ 295	4489.2 8	0.137 15	0.0131

159 weak γ's omitted:
Σγ (avg) = 2181.1; IIγ = 7.26%

9908 B- DECAY (15.2 H 1)
FEES 0908

I (RTM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (γ-rad/ μCi-h)
β- 1 max	977 12		
avg	346 5	1.55 13	0.0110
β- 2 max	1258 12		
avg	467 5	33 3	0.320
β- 3 max	1779 12		
avg	711 6	2.23 13	0.0330
β- 4 max	1936 12		
avg	741 5	3.1 9	0.0502
β- 5 max	2206 12		
avg	895 5	35 4	0.667
β- 6 max	2429 12		
avg	449 5	0.50 13	0.0106
β- 7 max	2478 12		
avg	1023 5	0.47 21	0.0102
β- 9 max	2546 12		
avg	1054 5	0.22 4	0.0049
β- 7 max	3013 12		
avg	1277 6	0.25 5	0.0060
β- 10 max	3054 12		
avg	1485 5	1 4	0.0316
β- 11 max	4486 12		
avg	1979 6	24 5	1.01
total β-			
avg	1091 7	102 4	2.17

7 weak β's omitted:

Σβ (avg) = 262.9; IIβ = 0.38%

γ 3	272.45 10	1.44 12	0.0004
γ 4	289.76 10	0.55 10	0.0030
γ 8	657.71 7	10.1 9	0.142
γ 10	766.79 15	0.165 21	0.0027
γ 14	947.69 7	9.4 8	0.199
γ 16	1025.3 5	0.23 9	0.0050
γ 17	1031.80 7	59 6	1.38
γ 23	1220.32 10	0.224 24	0.0050
γ 24	1220.40 15	0.124 20	0.0032
γ 26	1248.10 7	43 4	1.15
γ 29	1473.22 20	0.34 4	0.0113
γ 30	1501.07 20	0.201 23	0.0064
γ 31	1538.00 10	2.60 25	0.0950
γ 35	1940.2 3	0.34 4	0.0139
γ 37	2007.54 10	2.42 25	0.103
γ 34	2050.0 11	0.24 9	0.0103
γ 40	2146.00 15	13.6 13	0.635
γ 42	2280.06 10	0.183 22	0.0049
γ 45	2570.14 10	10.0 9	0.549
γ 49	2707.20 10	2.06 19	0.114
γ 57	3500.04 25	1.77 11	0.0073

41 weak γ's omitted:

Σγ (avg) = 1950.3; IIγ = 1.20%

9908 B- DECAY (50.55 D 9)

I (RTM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (γ-rad/ μCi-h)
β- 1 max	1442 4		
avg	583.4 15	99.905 5	1.24

1 weak β's omitted:

Σβ (avg) = 180.0; IIβ = 0.02%

7 weak γ's omitted:

Σγ (avg) = 909.1; IIγ = 0.02%

9098 B- DECAY (32.32 S) I(WIM) = 0.10%
 & FEEDING TO 9099 (153 S) = 07.9 15
 & FEEDING TO 9098 (250 S) = 12.2 15
 SEE ALSO 9098 IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A(μ-rad/μCi-h)
Auger-L	1.62	11 6	0.0000
Auger-K	11.4	3.8 19	0.0007
ce-K- 1	90.05 3	0.15 12	0.0003
ce-K- 3	105.72 3	0.7 5	0.0016
ce-F- 4	106.62 3	0 6	0.0179
ce-L- 4	119.75 3	1.1 8	0.0029
ce-R- 4	121.50 3	0.10 10	0.0005
ce-T- 9	224.99 3	0.23 12	0.0011
β- 1 max	510 30		
avg	161 12	0.140 20	0.0005
β- 2 max	690 30		
avg	220 12	0.16 4	0.0000
β- 3 max	760 30		
avg	260 12	0.1 3	0.0006
β- 4 max	1150 30		
avg	421 13	0.19 4	0.0017
β- 5 max	1300 30		
avg	480 10	0.60 9	0.0076
β- 6 max	1310 30		
avg	480 10	1.00 23	0.0195
β- 7 max	1960 30		
avg	701 14	0.30 5	0.0050
β- 9 max	2120 30		
avg	856 14	0.10 4	0.0010
β- 9 max	2260 30		
avg	923 14	2.3 3	0.0452
β-10 max	2890 30		
avg	1020 10	0.30 5	0.0075
β-11 max	2610 30		
avg	1006 15	64 8	1.00
β-12 max	2700 30		
avg	1129 15	0.17 4	0.0041
β-13 max	3060 30		
avg	1080 15	0.56 4	0.0177
β-14 max	3550 30		
avg	1533 15	0.15 6	0.0049
β-15 max	3650 30		
avg	1500 15	0.34 7	0.0114
β-16 max	3600 30		
avg	1593 15	0.19 4	0.0064
β-17 max	3710 30		
avg	1611 15	0.17 5	0.0059
β-18 max	3700 30		
avg	1640 15	0.20 9	0.0070
β-19 max	4390 30		
avg	1935 15	27 5	1.11
total β-			
avg	1299 17	99 10	2.75

4 weak β's omitted:
 E₀(avg) = 919.6; I₀ = 0.20%

X-ray L	1.69	0.17 11	0.0
X-ray K _α	13.33500 2	1.7 11	0.0005
X-ray K _β	13.39530 2	3.4 21	0.0010
X-ray K _γ	15	0.9 6	0.0003
γ 1	106.05 3	0.39 5	0.0009
γ 3	120.92 3	2.0 4	0.0072
γ 4	121.02 3	13 4	0.0053
γ 7	227.76 8	0.122 10	0.0006
γ 8	230.44 3	2.4 4	0.0120
γ 9	242.19 3	9.0 12	0.0506
γ 10	249.32 3	1.31 19	0.0070
γ 12	309.07 9	0.134 19	0.0009
γ 13	356.00 20	0.10 4	0.0000
γ 14	366.40 9	0.126 19	0.0010

Continued

9098 B- DECAY (32.32 S) (Continued)
 & FEEDING TO 9099 (153 S) = 07.8 15
 & FEEDING TO 9098 (250 S) = 12.2 15
 SEE ALSO 9098 IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A(μ-rad/μCi-h)
γ 17	419.12 5	0.31 4	0.0020
γ 19	429.92 10	0.15 4	0.0013
γ 19	433.47 5	1.28 15	0.0110
γ 22	470.34 8	0.23 3	0.0023
γ 23	492.63 5	1.19 14	0.0124
γ 24	498.54 12	0.149 21	0.0016
γ 26	539.49 4	30 4	2.347
γ 27	554.37 5	5.0 4	0.0506
γ 28	565.19 8	0.20 7	0.0024
γ 29	569.20 5	0.50 7	0.0072
γ 32	614.30 4	0.21 3	0.0027
γ 33	619.08 5	1.06 13	0.0140
γ 35	626.49 8	0.28 4	0.0037
γ 36	661.23 5	0.32 4	0.0046
γ 37	677.69 7	0.37 5	0.0054
γ 38	690.72 7	0.30 5	0.0057
γ 39	705.47 12	0.122 18	0.0019
γ 40	731.33 4	1.06 17	0.0227
γ 43	925.40 9	0.22 3	0.0003
γ 44	941.06 5	1.31 16	0.0263
γ 46	947.33 11	0.21 3	0.0043
γ 47	980.29 11	0.10 3	0.0030
γ 49	1039.11 8	0.41 5	0.0090
γ 50	1103.92 7	0.34 5	0.0079
γ 51	1110.63 5	30 5	0.910
γ 52	1165.56 6	0.01 10	0.0201
γ 53	1240.34 11	0.34 5	0.0091
γ 56	1341.31 22	0.15 3	0.0004
γ 57	1386.62 15	0.19 3	0.0054
γ 58	1423.77 6	2.4 4	0.0072
γ 60	1466.26 15	0.24 4	0.0075
γ 62	1527.05 5	0.5 11	0.310
γ 63	1552.10 6	2.15 25	0.0711
γ 64	1620.22 22	0.149 23	0.0051
γ 65	1650.10 6	1.30 15	0.0459
γ 69	1700.04 6	6.6 8	0.249
γ 71	1805.42 15	0.22 3	0.0009
γ 72	1844.61 16	0.19 3	0.0076
γ 73	1900.99 15	0.169 23	0.0071
γ 74	2006.00 10	0.115 23	0.0049
γ 75	2127.52 7	1.35 16	0.0611
γ 76	2149.51 10	0.27 4	0.0120
γ 78	2191.46 25	0.111 17	0.0052
γ 81	2417.33 23	0.19 3	0.0096
γ 83	2432.70 21	0.149 23	0.0077
γ 84	2460.56 11	0.46 7	0.0241
γ 87	2726.60 11	0.96 11	0.0497
γ 99	2855.4 3	0.32 7	0.0193
γ 90	2865.73 21	0.10 3	0.0112
γ 96	3304.3 3	0.111 20	0.0079

36 weak γ's omitted:
 E₀(avg) = 1020.0; I₀ = 1.74%

9098 IT DECAY (250 S) I(WIM) = 0.10%
 SIT DECAY = 4.3 8
 FEEDS 9098 (153 S)
 SEE ALSO 9098 B- DECAY (250 S)

Radiation Type	Energy (keV)	Intensity (%)	A(μ-rad/μCi-h)
Auger-L	1.60	0.2 7	0.0007
Auger-K	11.4	1.05 20	0.0003
ce-K- 1	91.72 15	3.2 6	0.0062

Continued

9088 IT DECAY (250 S 5) (Continued)
 KIT DECAY=4.3 0
 FEEDS 9088 (153 S)
 SEE ALSO 9088 9- DECAY (250 S)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
ce-1- 1	104.85 15	0.63 12	0.0010
ce-2- 1	106.60 15	0.100 20	0.0002
I-ray Ka	12.33500 2	0.62 12	0.0002
I-ray Kb	13.39570 2	1.79 23	0.0003
I-ray ED	15	0.31 6	0.0001
T 1	106.92 15	0.37 7	0.0000

9088 B- DECAY (153 S 3) I(HIB)= 0.104
 FEEDS 9088

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
B- 1 max	500 70		
avg	160 30	0.20 8	0.0007
B- 2 max	700 70		
avg	230 30	0.40 12	0.0022
B- 3 max	890 70		
avg	310 30	0.30 5	0.0022
B- 4 max	990 70		
avg	350 30	0.52 5	0.0019
B- 5 max	1070 70		
avg	390 30	1.02 13	0.0115
B- 6 max	1130 70		
avg	410 30	0.9 4	0.0020
B- 7 max	1350 70		
avg	500 30	0.60 10	0.0072
B- 8 max	1400 70		
avg	530 40	0.37 4	0.0002
B- 9 max	1530 70		
avg	590 40	0.16 4	0.0020
B-10 max	1630 70		
avg	630 40	0.140 22	0.0019
B-11 max	1670 70		
avg	650 40	3.1 3	0.0029
B-12 max	1700 70		
avg	680 40	0.36 6	0.0052
B-13 max	1950 70		
avg	700 40	10.2 12	0.236
B-14 max	2100 70		
avg	890 40	8.5 8	0.161
B-15 max	2200 70		
avg	930 40	1.35 13	0.0267
B-16 max	2900 70		
avg	1200 40	6.3 6	0.166
B-17 max	3200 70		
avg	1400 40	0.40 7	0.0103
B-18 max	3820 70		
avg	1640 40	0.15 8	0.0053
B-19 max	4430 70		
avg	1950 40	0.7 5	0.195
B-20 max	4640 70		
avg	2060 40	0.41 7	0.0100
B-21 max	5490 70		
avg	2460 40	10.3 16	0.702
B-22 max	6320 70		
avg	2860 40	37 5	2.25
total B- avg	1050 60	100 6	3.96

3 weak β's omitted:
 E_{β(max)}= 680.0; I_β= 0.23%

Continued

9088 B- DECAY (153 S 3) (Continued)
 FEEDS 9088

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
T 8	820.23 10	0.75 4	0.0132
T 9	831.69 5	13 3	0.578
T 10	997.05 6	0.51 5	0.0167
T 16	1030.63 7	0.35 3	0.0076
T 17	1060.70 4	7.8 7	0.176
T 19	1100.56 6	0.132 12	0.0032
T 23	1302.2 3	0.117 19	0.0033
T 20	1326.50 20	0.107 20	0.0041
T 25	1375.36 3	0.35 4	0.0102
T 32	1500.3 3	0.156 20	0.0053
T 33	1631.70 20	0.109 23	0.0066
T 34	1645.61 7	0.37 3	0.0130
T 35	1660.9 6	0.17 6	0.0059
T 39	1804.10 7	0.67 6	0.0250
T 40	1829.00 20	0.173 22	0.0067
T 43	1892.20 8	0.04 4	0.0177
T 48	2139.30 20	0.36 4	0.0165
T 49	2140.2 3	0.20 4	0.0112
T 50	2207.07 11	0.51 5	0.0230
T 51	2216.29 15	0.59 6	0.0277
T 52	2239.7 8	0.10 10	0.0006
T 57	2473.90 20	0.68 9	0.0359
T 58	2476.7 11	0.12 8	0.0060
T 60	2600.9 5	0.14 3	0.0070
T 61	2724.30 20	0.160 20	0.0093
T 62	2789.1 22	0.10 7	0.0060
T 64	2900.7 6	0.104 25	0.0066
T 66	3039.17 12	0.82 0	0.0530
T 67	3061.3 4	0.17 4	0.0113
T 69	3205.09 16	0.55 6	0.0370
T 69	3295.09 14	0.95 9	0.0660
T 70	3303.91 13	0.90 9	0.0693
T 71	3317.00 12	0.31 3	0.0221
T 72	3361.00 13	1.00 10	0.0770
T 73	3383.24 12	7.5 7	0.530
T 74	3530.24 13	0.5 4	0.336
T 75	3530.6 6	0.17 4	0.0130
T 76	3627.4 7	0.14 4	0.0100
T 78	3810.36 20	0.65 7	0.0520
T 82	4061.7 3	0.264 21	0.0220
T 83	4007.30 20	0.26 3	0.0207
T 84	4135.51 17	7.5 7	0.650
T 87	4332.17 20	0.43 4	0.0400
T 88	4355.00 20	0.69 5	0.0057
T 89	4365.90 10	0.8 8	0.022
T 91	4599.4 3	0.166 14	0.0163
T 93	4646.45 20	2.40 22	0.205
T 90	4970.1 3	0.220 25	0.0202
T 100	5070.2 3	0.160 13	0.0173
T 101	5107.40 20	1.29 12	0.102
T 102	5250.3 3	0.26 3	0.0200
T 100	5333.0 20	0.40 5	0.0500

53 weak γ's omitted:
 E_{γ(max)}=2020.3; I_γ= 2.59%

9088 B- DECAY (250 S 5) I(HIB)= 0.104
 ED- DECAY=95.7 0
 FEEDS 9088
 SEE ALSO 9088 IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
B- 1 max	600 70		
avg	190 30	1.20 20	0.0050
B- 2 max	640 70		
avg	210 30	0.35 10	0.0016

Continued

9090 D- DECAY (250 S 5) (Continued)
 SE- DECAY=95.7 4
 PERES 905R
 SEE ALSO 9080 IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	Δ (μ -rad/ μ ci-h)
B- 3 MAX	870 70		
AVG	300 30	0.50 6	0.0037
B- 4 MAX	1160 70		
AVG	420 30	1.63 11	0.0106
B- 5 MAX	1300 70		
AVG	500 30	1.34 10	0.0108
B- 6 MAX	1390 70		
AVG	520 40	6.1 3	0.0676
B- 7 MAX	1400 70		
AVG	530 40	0.52 7	0.0059
B- 8 MAX	1400 70		
AVG	560 40	0.50 10	0.0060
B- 9 MAX	1570 70		
AVG	610 40	0.35 7	0.0045
B-10 MAX	1620 70		
AVG	630 40	0.49 10	0.0066
B-11 MAX	1620 70		
AVG	630 40	0.45 5	0.0060
B-12 MAX	1620 70		
AVG	630 40	0.60 11	0.0091
B-13 MAX	2000 70		
AVG	800 40	0.90 13	0.0160
B-14 MAX	2020 70		
AVG	810 40	1.63 11	0.0201
B-15 MAX	2090 70		
AVG	840 40	9.4 4	0.160
B-16 MAX	2230 70		
AVG	910 40	0.66 7	0.0167
B-17 MAX	2280 70		
AVG	930 40	15.0 6	0.313
B-18 MAX	2470 70		
AVG	1020 40	0.79 22	0.0172
B-19 MAX	2860 70		
AVG	1190 40	10.5 10	0.360
B-20 MAX	2900 70		
AVG	1260 40	6.3 3	0.169
B-21 MAX	3200 70		
AVG	1400 40	0.29 6	0.0086
B-22 MAX	3390 70		
AVG	1460 40	1.01 10	0.0314
B-23 MAX	3500 70		
AVG	1510 40	1.06 13	0.0341
B-24 MAX	3860 70		
AVG	1600 40	1.35 12	0.0403
B-25 MAX	3900 70		
AVG	1700 40	2.05 11	0.0742
B-26 MAX	3930 70		
AVG	1710 40	0.96 12	0.0313
B-27 MAX	4220 70		
AVG	1850 40	3.7 10	0.146
B-28 MAX	4530 70		
AVG	2000 40	4.0 4	0.170
B-29 MAX	4770 70		
AVG	2120 40	2.2 5	0.0993
B-30 MAX	5600 70		
AVG	2510 40	15 3	0.802
total B- AVG	1310 60	96 4	2.69
Y 1	196.8 4	0.29 6	0.0012
Y 2	314.5 3	0.02 6	0.0055
Y 4	442.3 4	0.12 3	0.0011
Y 5	522.10 13	0.40 3	0.0045
Y 6	551.2 3	0.05 7	0.0100
Y 7	720.70 4	0.56 4	0.0005
Y 9	779.9 4	0.27 6	0.0005
Y 10	820.23 10	7.3 5	0.120
Y 11	831.69 5	91 4	1.62
Y 12	872.00 15	0.53 4	0.0090

Continued

SCHE 2- DECAY (250 S 5) (Continued)
 SE- DECAY=95.7 4
 PERES 965R
 SEE ALSO SCHE IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	Δ (μ -rad/ μ ci-h)
Y 13	921.20 20	0.23 4	0.0045
Y 14	952.04 7	1.70 8	0.0345
Y 17	1013.95 19	0.26 3	0.0055
Y 19	1027.1 4	0.14 3	0.0030
Y 20	1060.70 4	9.3 4	0.210
Y 22	1140.50 6	0.90 6	0.0195
Y 24	1242.80 4	3.06 20	0.0010
Y 25	1271.77 7	1.60 10	0.0033
Y 26	1298.5 5	0.20 4	0.0056
Y 27	1375.34 3	16.6 0	0.407
Y 28	1377.2 5	2.3 8	0.0670
Y 29	1391.6 3	0.04 8	0.0130
Y 30	1425.2 3	0.27 3	0.0003
Y 31	1456.7 3	0.26 7	0.0079
Y 32	1460.1 6	0.19 5	0.0060
Y 33	1485.6 7	0.21 7	0.0066
Y 34	1489.0 4	0.35 5	0.0110
Y 35	1576.5 7	0.12 4	0.0040
Y 36	1603.52 20	0.07 5	0.0159
Y 37	1650.9 3	0.44 6	0.0155
Y 38	1665.61 7	4.49 18	0.159
Y 39	1692.1 3	0.27 5	0.0099
Y 40	1696.16 7	1.66 8	0.0600
Y 41	1730.93 9	1.93 10	0.0714
Y 42	1747.3 3	0.26 4	0.0095
Y 44	1793.09 11	0.05 6	0.0324
Y 45	1830.15 14	0.23 6	0.0325
Y 46	1877.40 20	0.45 5	0.0179
Y 47	1892.20 8	0.64 7	0.0250
Y 48	1903.1 6	0.14 6	0.0056
Y 49	1941.81 17	0.62 6	0.0257
Y 50	2128.30 7	5.26 22	0.238
Y 51	2139.33 19	0.12 6	0.0054
Y 52	2200.9 3	0.40 6	0.0227
Y 53	2207.47 11	0.163 12	0.0076
Y 54	2245.2 9	0.29 10	0.0140
Y 55	2256.55 17	0.67 5	0.0320
Y 56	2290.1 9	0.37 20	0.0183
Y 57	2311.2 6	0.29 10	0.0144
Y 58	2335.2 10	0.21 9	0.0104
Y 59	2442.9 5	0.26 7	0.0130
Y 61	2497.27 15	0.72 8	0.0304
Y 62	2537.8 9	0.17 7	0.0090
Y 63	2543.9 3	0.56 7	0.0302
Y 64	2592.30 20	0.65 7	0.0350
Y 65	2617.8 3	0.62 9	0.0346
Y 66	2724.27 21	0.50 6	0.0291
Y 67	2741.2 12	0.15 8	0.0005
Y 68	2752.60 9	11.6 5	0.600
Y 69	2834.43 13	1.06 13	0.112
Y 70	2900.3 13	0.11 7	0.0060
Y 71	2911.7 11	0.13 7	0.0079
Y 72	3032.1 5	0.44 7	0.0203
Y 73	3039.17 12	0.266 22	0.0172
Y 74	3140.50 12	2.50 13	0.160
Y 75	3197.9 10	0.15 6	0.0100
Y 76	3214.5 11	0.14 6	0.0094
Y 77	3317.06 12	14.4 6	1.02
Y 78	3370.8 4	0.40 6	0.0200
Y 79	3383.24 12	0.420 19	0.0303
Y 80	3503.52 15	2.18 13	0.170
Y 82	3572.02 10	1.55 11	0.118
Y 83	3620.8 11	0.58 22	0.0051
Y 84	3627.4 7	0.9 4	0.0705
Y 85	3972.2 5	0.37 7	0.0309
Y 87	4115.6 4	0.36 6	0.0312
Y 88	4192.00 20	0.06 7	0.0746
Y 89	4209.5 3	0.91 9	0.0019
Y 90	4257.30 20	0.70 6	0.0671

Continued

90FE B- DECAY (258 ± 5) (Continued)
 90- DECAY=55.7 E
 FEELS 90SI
 SEE ALSO 90FE IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
γ 92	4454.07 21	1.19 9	0.113
γ 94	4726.1 7	0.11 3	0.0110

14 weak γ's omitted:
 E_γ(avg)=2082.8; I_γ= 0.40%

90SF B- DECAY (28.5 Y 0) I(HTW)= 0.10%
 FEELS 90Y (64.0 H)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
β- 1 max	546.0 20		
avg	195.8 0	100	0.417

90Y IT DECAY (3.19 H 1) I(HTW)= 0.10%
 FEELS 90Y (64.0 H)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	2	11.9 7	0.0005
Auger-K	12.7	2.9 4	0.0008
ce-K- 1	185.47 3	2.65 15	0.0105
ce-L- 1	200.14 3	0.309 20	0.0013
ce-K- 2	462.49 4	7.29 13	0.0718
ce-L- 2	477.16 4	1.025 19	0.0104
ce-MNO- 2	479.14 4	0.28574	0.0029
X-ray L	2	0.27 9	=0
X-ray K _α	14.80290 2	2.04 11	0.0006
X-ray K _β	14.95840 2	3.94 19	0.0013
X-ray K _γ	16.7	1.08 6	0.0004
γ 1	212.57 3	96.58 18	0.417
γ 2	479.53 4	99.71 7	0.927
γ 3	682	0.36 8	0.0053

90Y B- DECAY (64.0 H 1) I(HTW)= 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
β- 1 max	2276 3		
avg	931.0 12	99.984 3	1.98

1 weak β's omitted:
 E_β(avg)= 183.4; I_β= 0.02%

91SR B- DECAY (9.5 E 2) I(HTW)= 0.10%
 REFERRING TO 91Y (50.51 D)=42 2
 REFERRING TO 91Y (49.71 Y)=58 2
 SEE ALSO 91Y IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
β- 1 max	445 4		
avg	122.4 14	0.24 4	0.0006
β- 2 max	477 4		
avg	140.7 15	1.41 13	0.0045
β- 3 max	610 4		
avg	201.0 16	1.93 10	0.0083
β- 4 max	744 4		
avg	234.3 16	0.33 4	0.0016
β- 5 max	1104 4		
avg	390.0 17	35.0 8	0.297
β- 6 max	1130 4		
avg	413.4 18	1.92 12	0.0169
β- 7 max	1379 4		
avg	510.0 18	24.6 14	0.271
β- 9 max	1497 4		
avg	570.5 18	0.57 4	0.0049
β- 9 max	2431 4		
avg	812.9 19	3.6 10	0.0623
β-10 max	2604 4		
avg	1121.2 19	30.3 4	0.724
total β-			
avg	654.9 23	93.9 20	1.39

γ 1	118.50 20	0.144 11	0.0004
γ 2	267.20 20	0.44 3	0.0025
γ 3	272.7 4	0.167 24	0.0010
γ 4	274.70 20	1.14 8	0.0067
γ 6	390.0 10	0.20 7	0.0016
γ 9	593.1 5	0.111 17	0.0014
γ 10	620.10 10	1.74 11	0.0230
γ 11	631.30 10	0.54 4	0.0072
γ 12	652.3 3	2.9 7	0.0405
γ 13	652.90 20	7.7 7	0.107
γ 14	653.0 20	0.47 7	0.0045
γ 15	749.00 10	23.1 12	0.369
γ 16	761.30 10	0.54 4	0.0087
γ 18	879.4 4	0.167 24	0.0031
γ 20	941.6 6	0.10 4	0.0019
γ 21	925.80 20	3.94 16	0.0706
γ 24	1024.30 10	33.5 7	0.731
γ 25	1054.60 20	0.23 4	0.0053
γ 26	1140.4 5	0.114 21	0.0028
γ 27	1280.4 5	0.94 11	0.0254
γ 30	1413.40 10	0.92 7	0.0277
γ 31	1473.7 10	0.15 5	0.0047
γ 33	1651.4 5	0.37 7	0.0130
γ 34	1724.0 5	0.19 4	0.0071

11 weak γ's omitted:
 E_γ(avg)= 933.7; I_γ= 0.46%

91Y IT DECAY (49.71 H 4) I(HTW)= 0.10%
 FEELS 91Y (50.51 D)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	2	4.9 3	0.0002
Auger-K	12.7	1.20 13	0.0003
ce-K- 1	540.53 5	4.17 8	0.0480
ce-L- 1	555.20 5	0.561 10	0.0064
ce-MNO- 1	557.18 5	0.10544	0.0022
X-ray L	2	0.11 4	=0
X-ray K _α	14.80290 2	0.06 5	0.0003
X-ray K _β	14.95840 2	1.65 8	0.0005
X-ray K _γ	16.7	0.054 23	0.0002
γ 1	557.57 5	95.10 10	1.13

91Y B- DECAY (50.51 D 6) I (NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
β- 1 max	339.1 22		
avg	99.9 8	9.39 2	0.0006
β- 2 max	1543.0 20		
avg	603.0 9	99.7 3	1.28
total β-	avg	602.3 9	100.0 3
			1.28
γ 1	1204.9 8	9.39 3	0.0077

92Y B- DECAY (3.54 F 1) (Continued)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
γ 1	849.56 10	2.3 3	0.0223
γ 2	492.66 10	0.49 6	0.0051
γ 3	561.19 10	2.4 3	0.0297
γ 4	844.30 10	1.25 10	0.0225
γ 5	912.8 3	0.63 8	0.0122
γ 6	934.50 10	13.9 16	0.277
γ 8	1132.40 10	0.24 3	0.0059
γ 9	1405.40 10	4.8 6	0.143
γ 10	1847.30 10	0.36 4	0.0142

10 weak γ's omitted:
E_γ(avg) = 1647.4; I_γ = 9.15%

92Sr B- DECAY (2.71 B 1) I (NIM) = 0.10%
FEEDS 92Y

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
β- 1 max	550 30		
avg	174 12	96.4 4	0.357
β- 2 max	1040 30		
avg	371 13	0.21 6	0.0017
β- 3 max	1930 30		
avg	766 14	3.4 4	0.0507
total β-	avg	100.2 6	0.410
			0.410
γ 1	241.52 3	3.0 4	0.0153
γ 2	430.56 5	3.3 5	0.0305
γ 3	491.30 20	0.26 5	0.0027
γ 4	650.00 10	0.37 5	0.0051
γ 6	953.32 9	3.6 5	0.0731
γ 7	1142.30 10	2.9 4	0.0701
γ 8	1303.94 6	90 11	2.65

1 weak γ's omitted:
E_γ(avg) = 892.2; I_γ = 0.10%

93Y B- DECAY (10.1 F 2) I (NIM) = 0.10%
FEEDS 93Zr

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	2	0.15 3	0
ce-K- 1	240.07 5	0.15 3	0.0008
β- 1 max	432 20		
avg	132 8	0.19	0.0005
β- 2 max	705 20		
avg	235 8	1.6	0.0080
β- 3 max	1420 20		
avg	535 9	0.14	0.0016
β- 4 max	1840 20		
avg	544 9	0.37	0.0043
β- 5 max	1445 20		
avg	555 9	0.27	0.0032
β- 6 max	1943 20		
avg	771 10	2.5	0.0411
β- 7 max	2523 20		
avg	1007 10	4.5	0.104
β- 8 max	2896 20		
avg	1214 10	99.3	2.33
total β-	avg	100	2.50

5 weak β's omitted:
E_β(avg) = 342.3; I_β = 0.15%

92Y B- DECAY (3.54 B 1) I (NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
β- 1 max	814 16		
avg	278 7	0.100 10	0.0006
β- 2 max	1294 16		
avg	480 7	6.5 7	0.0665
β- 3 max	1567 16		
avg	601 8	0.24 3	0.0031
β- 4 max	1747 16		
avg	700 8	0.44 8	0.0066
β- 5 max	2138 16		
avg	869 8	1.20 20	0.0222
β- 6 max	2251 16		
avg	920 8	2.3 3	0.0451
β- 7 max	2700 16		
avg	1123 8	3.5 10	0.0037
β- 8 max	3634 16		
avg	1563 8	85.7 16	2.85
total β-	avg	100.0 21	3.00

4 weak β's omitted:
E_β(avg) = 183.4; I_β = 0.04%

Continued

93Zr B- DECAY (1.5326 Y 10) I (NIM) = 0.10%
FEEDS 93Nb (13.6 Y)
SEE ALSO 93Nb IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
β- 1 max	62.0 20		
avg	19.6 7	100	0.0417

9300 IT DECAY (13.6 Y 3)

I(HIM) = 9.10%

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	2.15	79.3 12	0.0036
ce-K- 1	11.4 3	14.5	0.0035
Auger-K	14	3.7 5	0.0011
ce-L- 1	27.7 3	66.5	0.0092
ce-E- 1	29.9 3	14.3	0.0091
ce-Kα- 1	34.3 3	4.72	0.0031
X-ray L	2.17	2.5 9	0.0001
X-ray Kα	16.52100 2	3.12 10	0.0011
X-ray Kβ	16.61510 2	6.0 3	0.0021
X-ray Kδ	18.6	1.72 0	0.0007

9300 EC DECAY (3.523 Y 7)

I(HIM) = 0.10%

FEEDS 9300 (13.6 Y)

SEE ALSO 9300 IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	2.15	98 5	0.0045
Auger-K	14	21 3	0.0063
X-ray L	2.17	3.9 11	0.0001
X-ray Kα	16.52100 2	10.1 9	0.0044
X-ray Kβ	16.61510 2	34.0 16	0.0123
X-ray Kδ	18.6	10.0 5	0.0040

9520 B- DECAY (63.90 D 6)

I(HIM) = 0.10%

% FEEDING TO 9500 (35.15 E)=99.30 6

% FEEDING TO 9500 (86.6 H)=0.70 6

SEE ALSO 9500 IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
β- 1 max	365 4		
avg	100.8 13	55.0 3	0.127
β- 2 max	390 4		
avg	120.0 13	44.6 6	0.114
β- 3 max	407 4		
avg	326.9 15	0.70 6	0.0049
total β- avg	115.3 14	100.3 7	0.246
γ 2	720.23 4	44.5 6	0.487
γ 3	756.70 4	55.0 3	0.487

9500 IT DECAY (86.6 H 8)

I(HIM) = 0.10%

FEEDS 9500 (35.15 B)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	2.15	71 4	0.0032
Auger-K	14	14.7 19	0.0044
ce-K- 1	215.71 14	30.4 5	0.269
ce-L- 1	232.00 14	11.70 10	0.0570
ce-Kα- 1	234.23 14	3.06 3	0.0193

Continued

9500 IT DECAY (86.6 H 8)

(Continued)

FEEDS 9500 (35.15 C)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
X-ray L	2.17	2.2 3	0.0001
X-ray Kα	16.52100 2	12.6 6	0.0044
X-ray Kβ	16.61510 2	24.2 11	0.0095
X-ray Kδ	18.6	6.9 4	0.0028
γ 1	234.70 14	26.1 6	0.130

9500 B- DECAY (35.15 D 3)

I(HIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
β- 1 max	159.7 5		
avg	43.33 15	100	0.0923
γ 1	765.83 4	100	1.63

9720 B- DECAY (16.90 H 5)

I(HIM) = 0.10%

% FEEDING TO 9700 (72.1 H)=5.4 9

% FEEDING TO 9700 (60 S)=94.6 9

SEE ALSO 9700 IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
β- 1 max	415 14		
avg	126 5	0.41 4	0.0011
β- 2 max	556 14		
avg	177 6	5.5 3	0.0207
β- 3 max	690 14		
avg	311 6	2.10 20	0.0139
β- 4 max	912 14		
avg	317 6	0.4 3	0.0027
β- 5 max	1009 14		
avg	357 6	0.120 20	0.0009
β- 6 max	1114 14		
avg	401 6	0.45 7	0.0030
β- 7 max	1114 14		
avg	402 6	0.65 7	0.0056
β- 8 max	1306 14		
avg	519 7	0.21 11	0.0023
β- 9 max	1411 14		
avg	530 7	4.1 5	0.0063
β-10 max	1919 14		
avg	759 7	86.0 7	1.39
total β- avg	699 8	99.9 10	1.49
γ 3	210.87 20	0.176 19	0.0008
γ 4	254.15 20	1.25 14	0.0040
γ 5	272.27 20	0.25 4	0.0015
γ 6	330.43 20	0.11 3	0.0008
γ 9	355.39 10	2.27 24	0.0172
γ 10	400.39 20	0.32 5	0.0020
γ 11	507.63 10	5.1 6	0.0547
γ 12	513.30 20	0.56 10	0.0061
γ 13	602.41 20	1.39 14	0.0179
γ 14	690.63 20	0.75 4	0.0037
γ 15	629.2 3	0.121 19	0.0010
γ 16	703.80 10	0.93 10	0.0139

Continued

972B 8- DECAY (16.96 h 5) (Continued)
 FEEDING TO 9783 (72.1 h 5)=5.4 %
 FEEDING TO 9783 (60 S)=98.6 %
 SEE ALSO 978B IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
γ 10	804.53 10	0.65 7	0.0111
γ 19	829.80 10	0.223 19	0.3939
γ 20	854.98 10	0.33 4	0.0061
γ 21	971.39 10	0.29 3	0.0059
γ 22	1021.3 3	1.34 10	0.0293
γ 23	1116.45 20	0.111 19	0.0026
γ 24	1167.95 10	2.6 3	0.0646
γ 25	1276.09 10	0.57 10	0.0265
γ 26	1362.56 10	1.34 14	0.0390
γ 27	1754.46 10	1.34 10	0.0501
γ 28	1851.55 10	0.35 4	0.0139

5 weak γ's omitted:
 $E_{\gamma}(\text{avg}) = 228.4$; $II_{\gamma} = 0.21\%$

978B 17- DECAY (60 S 1) I (RTM) = 0.10%
 FEEDS 978B (72.1 h)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	2.15	1.98 11	=0
Auger-F	15	0.44 6	0.0101
ce-F- 1	724.37 10	1.73 3	0.0240
ce-L- 1	700.66 10	0.225 4	0.0034
X-ray Fe _K	16.52100 2	0.374 10	0.0061
X-ray Fe _K	16.61510 2	0.72 4	0.0033
X-ray Fe _{Kβ}	18.4	0.206 11	=0
γ 1	743.34 10	97.96 6	1.55

978B 9- DECAY (72.1 h 7) I (RTM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	2.27	0.180 13	=0
ce-F- 5	637.92 10	0.192 6	0.0025
β- 1 max	298 20		
avg	86 7	0.120 20	0.0002
β- 2 max	411 20		
avg	125 7	0.170 20	0.0005
β- 3 max	658 20		
avg	215 8	0.210 20	0.0010
β- 4 max	903 20		
avg	312 9	1.10 10	0.0073
β- 5 max	1269 20		
avg	467 9	98.30 10	0.978
total β- avg	464 9	99.99 15	0.987

1 weak β's omitted:
 $E_{\beta}(\text{avg}) = 275.0$; $II_{\beta} = 0.09\%$

γ	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
γ 3	488.9	0.148 20	0.0015
γ 5	657.92 10	98.34 11	1.38
γ 12	1269.63 10	0.157 20	0.0043
γ 13	1515.64 20	0.119 20	0.0038

10 weak γ's omitted:
 $E_{\gamma}(\text{avg}) = 798.4$; $II_{\gamma} = 0.49\%$

997C 9- DECAY (6.02 h 1) I (RTM) = 0.13%
 FEEDING TO 997C (2.1325 h)=11.2 %
 FEEDING TO 997C (6.02 h)=96.8 %
 SEE ALSO 997C IT DECAY (6.02 h)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	2.17	6.2 5	0.0303
Auger-F	15.5	1.27 20	0.0004
ce-F- 2	119.5400 22	4.4 4	0.0310
ce-L- 2	117.5415 21	0.53 4	0.0094
ce-230- 2	40.6400 23	0.127 13	0.0001
ce-F- 3	119.045 3	0.56 5	0.0014
ce-F- 6	160.023 7	0.42 3	0.0020
ce-L- 6	170.024 7	0.123 5	0.0005

β- 1 max	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
avg	215.2 10		
β- 2 max	352.9 10		
avg	59.9 3	0.113 5	0.0001
β- 3 max	436.4 10		
avg	104.3 4	0.142 6	0.0003
β- 4 max	636.4 10		
avg	133.1 4	17.4 5	0.0499
β- 5 max	847.4 10		
avg	209.7 4	1.33 6	0.0022
β- 6 max	1214.3 10		
avg	442.0 4	90.7 9	0.751
total β- avg	305.1 5	99.9 10	0.820

5 weak β's omitted:
 $E_{\beta}(\text{avg}) = 194.6$; $II_{\beta} = 0.06\%$

X-ray L	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
X-ray Fe _K	2.42	0.29 10	=0
X-ray Fe _K	18.2500 2	1.28 9	0.0005
X-ray Fe _K	18.3671 0	2.45 17	0.0010
X-ray Fe _{Kβ}	20.6	0.74 6	0.0003
γ 2	40.5940 20	1.33 10	0.0012
γ 3	140.509 3	5.7 5	0.0071
γ 6	181.967 7	6.52 14	0.0252
γ 9	366.439 14	1.37 6	0.0107
γ 21	739.48 4	13.0 4	0.204
γ 23	777.88 3	4.62 19	0.0766
γ 24	922.90 3	0.140 6	0.0024
γ 26	960.69 3	0.101 5	0.0021

21 weak γ's omitted:
 $E_{\gamma}(\text{avg}) = 534.4$; $II_{\gamma} = 0.15\%$

997C 17- DECAY (6.02 h 7) I (RTM) = 0.10%
 FEEDS 997C (2.1325 h)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
ce-F- 1	1.638 5	86.82 5	0.0030
ce-F- 1	2.106 5	12.177 7	0.0005
Auger-L	2.17	10.4 6	0.0005
Auger-F	15.5	2.1 3	0.0067
ce-F- 2	119.045 3	8.78 4	0.0220
ce-F- 3	121.54 3	0.71 4	0.0010
ce-L- 2	137.466 3	1.058 10	0.0031
ce-L- 3	139.54 3	0.219 11	0.0007
ce-F- 2	139.965 4	0.1920 1	0.0006
X-ray L	2.42	0.49 17	=0
X-ray Fe _K	18.2500 8	2.12 10	0.0009
X-ray Fe _K	18.3671 0	4.03 18	0.0016
X-ray Fe _{Kβ}	20.6	1.22 6	0.0005
γ 2	140.509 3	48.9 3	0.266

2 weak γ's omitted:
 $E_{\gamma}(\text{avg}) = 102.6$; $II_{\gamma} = 0.02\%$

90TC B- DECAY (2.1385 Y 5) I(MIX) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(γ-rad/μCi-h)
B- 1 max	293.5 19		
avg	84.6 7	100	0.100

103TC B- DECAY (14.2 H 1) I(MIX) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(γ-rad/μCi-h)
Auger-L	2.53	1.86 15	0.0001
Auger-K	16.2	0.38 6	0.0001
co-K- 1	105.09 5	0.51 6	0.0011
co-K- 4	161.99 5	0.115 20	0.0004
co-K- 9	284.70 4	1.20 9	0.0073
co-L- 9	303.64 4	0.140 10	0.0009
B- 1 max	607 24		
avg	225 10	9.84 7	0.0040
B- 2 max	696 24		
avg	229 10	0.22 3	0.0011
B- 3 max	762 24		
avg	263 10	1.93 11	0.0103
B- 4 max	905 24		
avg	312 10	0.26 3	0.0017
B- 5 max	1080 24		
avg	305 11	6.4 6	0.0525
B- 6 max	1310 24		
avg	487 11	90 6	0.934
total B- avg	473 12	100 6	1.00

1 weak β's omitted:

E_β(avg) = 234.0; E_β = 0.02%

I-ray K _α	19.15040 2	0.41 3	0.0002
I-ray K _β	19.27920 2	0.79 6	0.0003
I-ray K _γ	21.7	0.241 17	0.0001
γ 1	127.21 5	2.55 21	0.0069
γ 3	179.59 5	0.55 5	0.0021
γ 4	184.11 5	1.54 13	0.0040
γ 5	233.70 10	0.26 3	0.0013
γ 6	238.30 10	0.27 3	0.0014
γ 7	238.30 20	0.202 11	0.0014
γ 9	304.04 4	0.0 6	0.575
γ 10	311.3 4	0.31 7	0.0020
γ 16	531.30 10	1.41 8	0.0115
γ 17	545.11 7	6.0 6	0.0695
γ 21	626.90 13	0.47 5	0.0062
γ 24	715.60 10	0.42 4	0.0094
γ 25	720.00 20	0.44 3	0.0034
γ 27	842.70 10	0.202 20	0.0036

16 weak γ's omitted:

E_γ(avg) = 603.6; E_γ = 0.06%103Ru B- DECAY (39.35 H 5) I(MIX) = 0.10%
REFERRING TO 103Rh (56.12 H) = 99.75 1
SEE ALSO 103Rh IT DECAY (56.12 H)

Radiation Type	Energy (keV)	Intensity (%)	A(γ-rad/μCi-h)
Auger-L	2.39	0.60 9	0.0
Auger-K	17	0.20 4	0.0
co-K- 3	30.065 5	0.64 7	0.0004
co-K- 13	473.040 10	0.396 12	0.0040

Continued

103Ru B- DECAY (39.35 H 5) (Continued)
REFERRING TO 103Rh (56.12 H) = 99.75 1
SEE ALSO 103Rh IT DECAY (56.12 H)

Radiation Type	Energy (keV)	Intensity (%)	A(γ-rad/μCi-h)
B- 1 max	113 4		
avg	29.0 10	6.0 3	0.0030
B- 2 max	226 4		
avg	63.2 12	87.1 15	0.117
B- 3 max	449 4		
avg	143.9 13	0.231 10	0.0007
B- 4 max	723 4		
avg	239.1 14	6 3	0.0326
total B- avg	72.6 14	100 4	0.154

3 weak β's omitted:

E_β(avg) = 39.0; E_β = 0.10%

I-ray K _α	20.07370 2	0.244 19	0.0001
I-ray K _β	20.21610 2	0.46 4	0.0002
I-ray K _γ	22.7	0.104 11	0.0
γ 3	53.285 5	0.36 4	0.0004
γ 9	294.980 10	0.242 11	0.0015
γ 12	443.040 10	0.311 11	0.0029
γ 13	497.080 10	86.4 24	0.915
γ 15	557.040 20	0.76 3	0.0090
γ 17	610.330 10	5.3 3	0.0605

13 weak γ's omitted:

E_γ(avg) = 406.0; E_γ = 0.12%

103Rh IT DECAY (56.12 H 1) I(MIX) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(γ-rad/μCi-h)
Auger-L	2.34	76.6 14	0.0039
co-K- 1	16.530 7	9.520 19	0.0034
Auger-K	17	1.8 3	0.0007
co-L- 1	36.330 7	71.30 19	0.0552
co-K- 1	39.323 7	10.40 10	0.0120
co-LK _α - 1	39.669 7	0.750 10	0.0040
I-ray L	2.7	0.0 13	0.0002
I-ray K _α	20.07370 2	2.20 9	0.0009
I-ray K _β	20.21610 2	4.10 17	0.0010
I-ray K _γ	22.7	1.30 6	0.0006

1 weak β's omitted:

E_β(avg) = 39.0; E_β = 0.07%105Ru B- DECAY (4.44 H 5) I(MIX) = 0.10%
REFERRING TO 105Rh (35.36 H) = 72 1
REFERRING TO 105Rh (45.5) = 70 1
SEE ALSO 105Rh IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A(γ-rad/μCi-h)
Auger-L	2.39	0.60 22	0.0
Auger-K	17	0.14 5	0.0
co-K- 3	62.7 3	0.15 23	0.0005
co-K- 6	125.90 20	0.222 17	0.0006
co-K- 12	239.40 20	0.160 9	0.0000

Continued

10500 B- DECAY (4.44 H 5) (Continued)
% FEEDING TO 10500 (35.36 H 72 1)
% FEEDING TO 10500 (45 S) = 20 1
SEE ALSO 10500 IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(q\text{-rad}/\mu\text{Ci-h})$
β^- 1 max	220 4		
avg	61.3 12	0.199 9	0.0001
β^- 2 max	431 4		
avg	130.8 13	0.340 17	0.0009
β^- 3 max	476 4		
avg	146.5 14	0.20 5	0.0006
β^- 4 max	541 4		
avg	170.0 14	1.32 5	0.0040
β^- 5 max	572 4		
avg	181.5 14	4.47 16	0.0173
β^- 6 max	596 4		
avg	190.7 14	0.500 25	0.0020
β^- 7 max	702 4		
avg	231.1 15	0.113 12	0.0006
β^- 8 max	940 4		
avg	329.3 16	5.22 24	0.0366
β^- 9 max	1110 4		
avg	375.6 16	20.0 8	0.169
β^- 10 max	1132 4		
avg	405.9 16	17.9 5	0.155
β^- 11 max	1154 4		
avg	418.1 16	0.24 3	0.0026
β^- 12 max	1193 4		
avg	432.1 16	50.0 20	0.460
total β^-			
avg	396.6 17	100.6 23	0.950

2 weak β 's omitted:
EF (avg) = 100.5; EEP = 0.168

X-ray K_{α}	20.07370 2	0.17 6	=0
X-ray K_{β}	20.21610 2	0.32 10	0.0001
X-ray K_{γ}	22.7	0.10 4	=0
γ 3	85.4 3	0.320 20	0.0006
γ 6	149.20 20	1.67 5	0.0053
γ 7	163.60 20	0.1 7	0.0005
γ 8	183.60 20	0.160 7	0.0004
γ 9	225.00 20	0.150 9	0.0007
γ 12	262.90 20	7.2 3	0.0403
γ 13	316.50 20	11.7 4	0.0789
γ 14	326.10 20	1.10 6	0.0002
γ 15	330.90 20	9.79 4	0.0056
γ 16	350 5	0.30 10	0.0022
γ 17	350.20 20	1.10 10	0.0002
γ 20	393.00 20	4.20 20	0.0352
γ 21	407.5 3	0.100 20	0.0016
γ 22	413.50 20	2.40 12	0.0210
γ 23	469.00 20	17.5 10	0.175
γ 24	470 3	1.30 20	0.0130
γ 25	489.60 20	0.59 3	0.0062
γ 26	499.20 20	2.40 12	0.0255
γ 27	500.4 4	0.39 5	0.0032
γ 28	513.70 20	0.36 4	0.0039
γ 29	539.2 3	0.13 4	0.0015
γ 31	575 5	0.13 5	0.0016
γ 32	575.30 20	1.07 5	0.0131
γ 35	632.30 20	0.230 20	0.0031
γ 36	634.60 20	0.29 3	0.0030
γ 37	652.60 20	0.350 20	0.0049
γ 38	656 8	0.20 5	0.0020
γ 39	656.10 20	2.00 9	0.0335
γ 40	670.40 20	16.7 7	0.261
γ 41	720.50 20	49.8 20	0.754
γ 45	822.10 20	0.190 10	0.0033
γ 46	845.90 20	9.73 3	0.0132
γ 47	875.00 20	3.40 10	0.0430
γ 49	907.70 20	0.59 3	0.0114
γ 51	969.40 20	2.34 9	0.0493
γ 52	1017.20 20	0.340 17	0.0074
γ 57	1321.10 20	0.230 10	0.0065

23 weak γ 's omitted:
E γ (avg) = 790.0; EEP = 1.138

10500 IT DECAY (35 S 1) I (BIM) = 0.108
FEEDS 10500 (35.36 H)

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(q\text{-rad}/\mu\text{Ci-h})$
Auger-L	2.34	70 4	0.0035
Auger-K	17	9.9 16	0.0036
ce-K-1	106.40 10	51.2 3	0.116
ce-L-1	126.29 10	23.07 20	0.0619
ce-M-1	129.07 10	4.49 3	0.0123
ce-NB-1	129.62 10	0.776 5	0.0021
X-ray L	2.7	3.7 12	0.0002
X-ray K_{α}	20.07370 2	11.9 5	0.0051
X-ray K_{β}	20.21610 2	22.5 9	0.0097
X-ray K_{γ}	22.7	7.0 3	0.0034
γ 1	129.70 10	20.5 5	0.0566

10500 B- DECAY (35.36 H 5) I (BIM) = 0.108

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(q\text{-rad}/\mu\text{Ci-h})$
Auger-L	2.5	0.37 3	=0
ce-K-1	14.42 7	0.110 20	=0
ce-M-1	294.55 10	0.206 6	0.0010
β^- 1 max	248 3		
avg	69.0 9	19.70 20	0.0293
β^- 2 max	261 3		
avg	73.9 10	5.22 20	0.0082
β^- 3 max	567 3		
avg	179.4 11	75.1 3	0.287
total β^-			
avg	152.1 12	100.1 5	0.325

1 weak β 's omitted:
EF (avg) = 33.1; EEP = 0.048

X-ray K_{α}	21.17710 2	0.179 12	=0
γ 2	260.10 20	0.167 10	0.0010
γ 3	306.10 20	5.13 20	0.0334
γ 4	310.90 10	19.20 20	0.130

2 weak γ 's omitted:
E γ (avg) = 300.2; EEP = 0.078

10600 B- DECAY (369.2 D 12) I (BIM) = 0.108
FEEDS 10600 (79.9 S)

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(q\text{-rad}/\mu\text{Ci-h})$
β^- 1 max	39.4 3		
avg	10.03 8	100	0.0274

10600 B- DECAY (29.9 S 1) I (BIM) = 0.108

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(q\text{-rad}/\mu\text{Ci-h})$
β^- 1 max	1539 9		
avg	502 4	0.413 21	0.0051
β^- 2 max	1970 9		
avg	779 5	1.70 9	0.0282

Continued

1068B B- DECAY (29.9 S T) (Continued)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
B- 3 max	2006 9		
avg	976 5	9.7 5	0.202
B- 4 max	2012 9		
avg	979 5	8.53 7	0.0111
B- 5 max	3020 9		
avg	1267 5	0.4 5	0.227
B- 6 max	3500 9		
avg	1500 5	70.9 7	2.53
total B-			
avg	1312 5	100.1 10	3.01

31 weak β's omitted:

E_B(avg)=353.1; I_B=0.035

γ 17	511.00 20	20.6 6	0.225
γ 32	616.2 3	0.79 7	0.0092
γ 33	621.0 3	9.0 5	0.130
γ 46	873.1 3	0.416 21	0.0077
γ 51	1050.1 3	1.06 0	0.0327
γ 55	1120.0 3	0.305 20	0.0093
γ 86	1562.0 5	0.106 0	0.0049

169 weak γ's omitted:

E_γ(avg)=1220.1; I_γ=0.698

1077B B- DECAY (6.526 Y T) I(MIM)=0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
B- 1 max	31 3		
avg	9.3 10	100	0.0190

1097B B- DECAY (13.46 H T) I(MIM)=0.10%
SPENDING TO 1098G (39.6 S)=99.952 %
SEE ALSO 1098G IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
B- 1 max	1020.0 20		
avg	361.0 9	99.007 10	0.760

11 weak β's omitted:

E_B(avg)=139.6; I_B=0.11%

30 weak γ's omitted:

E_γ(avg)=504.6; I_γ=0.13%

1098G IT DECAY (39.6 S T) I(MIM)=0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	2.6	79 3	0.0040
Auger-K	18.5	7.1 11	0.0020

Continued

1098S IT DECAY (39.6 S T) (Continued)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
ce-K- 1	62.5100 21	41.70 10	0.0555
ce-L- 1	64.2262 21	44.00 10	0.0709
ce-M- 1	87.3145 21	0.940 10	0.0066
ce-NOP- 1	87.9360 21	1.600 10	0.0030
X-ray L	3	5.3 10	0.0003
X-ray K _α	21.9903 3	9.9 0	0.0046
X-ray K _β	22.16290 1	10.7 6	0.0030
X-ray K _γ	20.9	6.03 22	0.0032
γ 1	80.0320 20	3.72 11	0.0070

1108S IT DECAY (252.2 D T) I(MIM)=0.10%

SIT DECAY=1.33 10

FEEDS 1108G (20.6 S)

SEE ALSO 1108G B- DECAY (250.0 H)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
ce-K- 1	0.56 10	1.11 5	0.0
ce-NOP- 1	1.10 10	0.215 17	0.0
Auger-L	2.6	1.11 0	0.0
Auger-K	18.5	0.100 20	0.0
ce-F- 2	90.97 5	0.93 7	0.0016
ce-L- 2	112.67 5	0.39 3	0.0009
X-ray K _α	21.9903 3	0.196 16	0.0
X-ray K _β	22.16290 1	0.37 3	0.0002
X-ray K _γ	20.9	0.119 10	0.0

1108S EC DECAY (20.6 S T) I(MIM)=0.10%

SEC DECAY=0.30 6

SEE ALSO 1108G B- DECAY (20.6 S)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	2.5	0.23 5	0.0
X-ray K _α	21.17710 2	0.115 20	0.0

1108G B- DECAY (20.6 S T) I(MIM)=0.10%

B- DECAY=99.70 6

SEE ALSO 1108G EC DECAY (20.6 S)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
B- 1 max	2230.9 20		
avg	890.0 10	0.0 3	0.0030
B- 2 max	2092.7 20		
avg	1199.3 10	95.2 3	2.43
total B-			
avg	1195.1 10	99.7 5	2.52

9 weak β's omitted:

E_B(avg)=107.0; I_B=0.09%

γ 2	657.740 10	4.50 23	0.0030
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12 weak γ's omitted:

E_γ(avg)=1040.0; I_γ=0.10%

110AS B- DECAY (250.0 D 3) I (RTM) = 0.10%
 RE- DECAY=98.67 10
 SEE ALSO 110AG IT DECAY (250.9 D)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
β- 1 max	82.5 20		
avg	21.5 6	67.5 9	0.0309
β- 2 max	132.8 20		
avg	35.3 6	0.400 12	0.0003
β- 3 max	529.3 20		
avg	165.1 8	30.7 8	0.109
total β- avg	66.3 14	98.9 12	0.146

4 weak β's omitted:
 E_β(avg) = 89.2; I_β = 0.19%

γ 12	365.841 15	0.106 9	0.0000
γ 17	446.797 8	3.69 9	0.0351
γ 23	620.346 11	2.79 8	0.0368
γ 24	626.246 10	0.235 7	0.0031
γ 26	657.749 10	34.65 16	1.33
γ 27	676.64 18	0.142 19	0.0020
γ 29	677.646 11	19.6 3	0.153
γ 29	686.908 11	6.47 14	0.0947
γ 30	706.670 13	16.4 4	0.247
γ 31	708.115 20	0.20 10	0.0043
γ 32	744.260 13	4.67 11	0.0740
γ 33	763.920 13	22.4 5	0.354
γ 35	818.016 12	7.30 17	0.127
γ 36	844.667 13	73.0 16	1.30
γ 37	937.470 13	34.4 8	0.687
γ 39	997.231 10	0.125 5	0.0027
γ 49	1334.304 17	0.131 10	0.0038
γ 50	1344.278 13	24.7 6	0.729
γ 52	1475.759 22	4.02 9	0.126
γ 53	1505.001 21	13.3 3	0.425
γ 54	1562.266 22	1.14 4	0.0397

40 weak γ's omitted:
 E_γ(avg) = 734.5; I_γ = 0.92%

111AS B- DECAY (7.45 D 1) I (RTM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
ce-β- 1	70.03 4	0.11 7	0.0002
β- 1 max	686 3		
avg	223.5 12	6.4 16	0.0305
β- 2 max	783 3		
avg	279.1 12	0.9 3	0.0054
β- 3 max	1828 3		
avg	360.4 13	92.7 14	0.712
total β- avg	350.9 13	100 3	0.747

2 weak β's omitted:
 E_β(avg) = 54.8; I_β = 0.02%

γ 1	96.74 4	0.13 5	0.0003
γ 2	245.39 3	1.1 4	0.0054
γ 4	342.21 5	6.8 15	0.0037

5 weak γ's omitted:
 E_γ(avg) = 628.9; I_γ = 0.62%

113CD B- DECAY (4.3E15 ± 19) I (RTM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
β- 1 max	322 6		
avg	93.3 20	100	0.199

113CD B- DECAY (13.6 Y 2) I (RTM) = 0.10%
 RE- DECAY=99.977
 SIT DECAY=0.023

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
β- 1 max	584 6		
avg	105.4 23	100	0.395

115CD B- DECAY (53.46 H 10) I (RTM) = 0.10%
 FEEDS 115IB (4.3 H)
 SEE ALSO 115IB IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	2.04	4.6 9	0.0003
ce-β- 1	7.69 5	4.2 10	0.0007
Auger-H	20	0.63 19	0.0003
ce-L- 1	31.39 5	1.04 24	0.0007
ce-H- 1	34.80 5	0.20 5	0.0002

β- 1 max	585 9		
avg	105 4	34.0 23	0.154
β- 2 max	621 9		
avg	190 4	5.0 15	0.0211
β- 3 max	852 9		
avg	208 4	1.4 4	0.0006
β- 4 max	1113 9		
avg	395 4	54.6 24	0.459
total β- avg	302 5	100 4	0.643

X-ray L	3.29	0.37 14	40
X-ray K _α	24.00200 2	1.02 23	0.0035
X-ray K _β	24.20970 2	1.9 5	0.0010
X-ray K _γ	27.3	0.64 15	0.0004
γ 1	35.63 5	0.46 11	0.0003
γ 2	231.47 10	0.82 14	0.0041
γ 3	260.00 6	2.2 3	0.0124
γ 6	492.14 6	19.2 9	0.107
γ 7	527.70 6	32.9 16	0.370

2 weak γ's omitted:
 E_γ(avg) = 267.1; I_γ = 0.07%

115CD B- DECAY (44.6 D 3) I(HIM) = 0.10%
 FEEDING TO 115IN (5.1815 Y) = 99.993
 FEEDING TO 115IN (4.3 H) = 0.007
 SIT DECAY FOR 115IN (4.3 H) = 96.3 0
 SE- DECAY FOR 115IN (4.3 H) = 3.7 0

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
β- 1 max	204 9		
avg	56 3	0.2	0.0002
β- 2 max	332 9		
avg	97 3	0.6	0.0013
β- 3 max	649 9		
avg	282 4	1.13	0.0050
β- 4 max	1622 9		
avg	616 5	90	1.29
total β- avg	607 5	100	1.29

4 weak β's omitted:
 E₀(avg) = 122.3; I₀ = 7.05%

γ 10	804.35 15	0.190 10	0.0021
γ 13	933.60 10	1.33	0.0260
γ 17	1290.50 10	0.60 4	0.0165

10 weak γ's omitted:
 E_γ(avg) = 990.1; I_γ = 0.10%

115ID IT DECAY (4.3 H 1) I(HIM) = 0.10%
 SIT DECAY = 96.3 0
 SEE ALSO 115IN B- DECAY (4.3 H)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	2.04	42 3	0.0025
Auger-K	20	5.9 12	0.0025
ce-K- 1	300.30 3	39.3 7	0.250
ce-L- 1	332.00 3	0.20 15	0.0506
ce-M- 1	335.42 3	1.69 4	0.0120
ce-NB- 1	336.12 3	0.370 7	0.0027
X-ray L	3.29	3.3 11	0.0002
X-ray K _α	24.00200 2	9.5 4	0.0049
X-ray K _β	24.26470 2	17.9 7	0.0092
X-ray K _γ	27.3	6.0 3	0.0035
γ 1	336.20 1 25	46.7 7	0.335

115IN B- DECAY (5.1815 Y 4) I(HIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
β- 1 max	494 0		
avg	152 3	100	0.320

115IN B- DECAY (4.3 H 1) I(HIM) = 0.10%
 SE- DECAY = 3.7 0
 SEE ALSO 115IN IT DECAY (4.3 H)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
β- 1 max	860 0		
avg	291 4	3.7 0	0.0229

7 weak β's omitted:
 E₀(avg) = 197.0; I₀ = 0.00%

123SU B- DECAY (129.2 D 4) I(HIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
β- 1 max	307 4		
avg	88.3 13	0.60 10	0.0011
β- 2 max	1396 4		
avg	522.7 17	90.37 11	1.11
total β- avg	519.9 10	100.00 15	1.11

4 weak β's omitted:
 E₀(avg) = 101.5; I₀ = 0.03%

γ 4	1008.64 10	0.60 10	0.0139
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8 weak γ's omitted:
 E_γ(avg) = 992.9; I_γ = 0.00%

124SB B- DECAY (60.20 D 3) I(HIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	3.19	0.301 23	0
ce-K- 12	570.91 4	0.411 8	0.0050
β- 1 max	129.7 19		
avg	30.5 6	0.530 10	0.0204
β- 2 max	203.0 19		
avg	55.0 6	0.560 10	0.0007
β- 3 max	210.9 19		
avg	50.2 6	0.80 20	0.0109
β- 4 max	303.2 19		
avg	113.2 7	0.130 10	0.0003
β- 5 max	421.3 19		
avg	126.1 7	0.670 10	0.0010
β- 6 max	610.9 19		
avg	193.9 7	52.0 10	0.215
β- 7 max	689.2 19		
avg	219.9 0	0.119 10	0.0005
β- 8 max	722.0 19		
avg	235.0 0	0.260 10	0.0013
β- 9 max	812.0 19		
avg	271.1 0	0.600 10	0.0039
β- 10 max	865.3 19		
avg	291.9 0	3.63 7	0.0226
β- 11 max	946.0 19		
avg	320.6 0	1.9 4	0.0131

Continued

124SB B- DECAY (60.20 D 3) (Continued)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
β-12 max	1579.1 19		
ave	593.2 9	5.39 11	0.0681
β-13 max	1656.1 19		
ave	627.2 9	2.05 5	0.0327
β-14 max	2301.9 19		
ave	918.5 9	22.5 5	0.002
total β- ave	302.4 10	99.9 13	0.010

7 weak β's omitted:
E_β(ave)=102.3; I_β=0.21%

γ-ray	Ke ₁	27.20170 2	0.102 9	0
γ-ray	Ke ₂	27.47230 2	0.191 8	0.0301
γ 5		400.03 6	0.53 8	0.0005
γ 6		443.99 5	0.35 3	0.0033
γ 11		525.50 10	0.313 20	0.0035
γ 12		602.72 8	97.92 5	1.26
γ 13		632.36 10	3.157 10	0.0021
γ 14		645.82 8	7.21 22	0.0991
γ 16		709.31 5	1.02 5	0.0215
γ 17		713.02 8	2.39 12	0.0363
γ 18		722.78 8	11.26 16	0.173
γ 19		735.05 15	0.127 10	0.0020
γ 22		790.78 6	0.700 10	0.0125
γ 26		968.25 6	1.93 5	0.0370
γ 29		1045.20 5	1.00 8	0.0010
γ 35		1325.09 7	1.01 3	0.0390
γ 36		1355.17 8	0.53 3	0.0269
γ 37		1368.23 6	2.35 5	0.0605
γ 38		1376.10 20	0.431 10	0.0126
γ 40		1436.66 9	1.02 3	0.0312
γ 41		1445.25 20	0.206 10	0.0063
γ 43		1489.03 20	0.55 3	0.0170
γ 44		1526.33 20	0.392 10	0.0127
γ 45		1579.90 20	0.196 10	0.0066
γ 47		1691.02 8	0.0 5	1.76
γ 53		2091.0 3	5.50 10	0.209

40 weak γ's omitted:
E_γ(ave)=1202.5; I_γ=1.23%

125SB B- DECAY (9.64 D 3) I(RIM)=0.10%
FEEDS 125SD

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
β- 1 max	67 7		
ave	17.4 19	0.23 6	0
β- 2 max	80 7		
ave	20.7 19	9.20 6	0
β- 3 max	102 7		
ave	26.7 20	0.12 3	0
β- 4 max	115 7		
ave	30.4 20	0.55 16	0.0004
β- 5 max	353 7		
ave	103.3 20	2.3 7	0.0051
β- 6 max	373 7		
ave	109.9 20	4.1 12	0.0096
β- 7 max	465 7		
ave	141.5 25	6.1 10	0.0180
β- 8 max	549 7		
ave	172 3	0.13 8	0.0005
β- 9 max	1006 7		
ave	349 3	0.32 9	0.0020

Continued

125SB B- DECAY (9.64 D 3) (Continued)
FEEDS 125SD

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
β-10 max	1266 7		
ave	458 3	2.0 9	0.0273
β-11 max	2355 7		
ave	940 8	93 5	1.65
total β- ave	810 6	99 6	1.72

3 weak β's omitted:
E_β(ave)=115.0; I_β=0.09%

γ 6		332.0 5	1.3 5	0.0090
γ 7		350.9 5	0.23 7	0.0017
γ 12		469.7 5	1.3 5	0.0130
γ 17		800.5 5	1.0 3	0.0167
γ 18		822.6 5	3.9 12	0.0606
γ 19		893.7 5	0.20 8	0.0046
γ 20		915.5 5	3.9 12	0.0760
γ 21		930.7 5	0.15 5	0.0030
γ 22		1017.1 5	0.27 8	0.0058
γ 23		1066.6 5	8.9 25	0.202
γ 24		1087.4 10	1.0 3	0.0227
γ 25		1088.9 10	0.2 13	0.0070
γ 28		1151.3 5	0.11 8	0.0026
γ 30		1173.2 5	0.20 6	0.0049
γ 30		1221.0 5	0.22 7	0.0050
γ 37		1619.5 5	0.48 15	0.0145
γ 40		1805.7 5	0.15 5	0.0050
γ 43		2001.7 5	2.1 7	0.0911
γ 46		2275.2 5	6.19 6	0.0991

27 weak γ's omitted:
E_γ(ave)=1090.1; I_γ=0.46%

125SB B- DECAY (2.77 Y 4) I(RIM)=0.10%
FEEDING TO 125TE (50 D)=23.0
SEE ALSO 125TE IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	3.19	50 8	0.0030
ce-K- 1	3.65 3	51.0 17	0.0000
Auger-F	22.7	6.5 15	0.0032
ce-L- 1	30.52 3	6.91 22	0.0004
ce-M- 1	38.45 3	1.35 5	0.0010
ce-BOP- 1	35.29 3	0.040 15	0.0003
ce-F- 8	100.476 20	0.00 10	0.0027
ce-L- 9	171.351 20	0.101 21	0.0005
ce-F- 17	396.09 20	9.32 3	0.0027
β- 1 max	95.4 20		
ave	25.0 6	13.5	0.0072
β- 2 max	120.8 20		
ave	33.1 6	5.7	0.0000
β- 3 max	130.8 20		
ave	30.0 6	10	0.0130
β- 4 max	201.8 20		
ave	67.6 7	1.5	0.0022
β- 5 max	303.5 20		
ave	87.0 7	00.2	0.0705
β- 6 max	405.9 20		
ave	130.6 7	7.2	0.0206
β- 7 max	622.2 20		
ave	215.6 8	13.5	0.0620
total β- ave	86.6 11	99.7	0.10%

Continued

12558 D- DECAY (2.77 Y 4) (Continued)
 REFERRING TO 12558 (50 D) = 23.0
 SEE ALSO 12558 IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μ Cl-h)
X-ray L	3.77	5.0 17	0.0004
X-ray K_{α}	27.20 170 2	13.2 7	0.0076
X-ray K_{β}	27.67230 2	24.6 12	0.0104
X-ray ED	31	8.5 5	0.0056
γ 1	35.46 3	4.31 12	0.0033
γ 5	116.94 5	0.33 4	0.0004
γ 7	172.60 5	0.26 3	0.0010
γ 8	176.290 20	6.7 3	0.0251
γ 11	204.07 4	0.27 3	0.0012
γ 12	230.00 20	0.106 10	0.0008
γ 13	227.70 20	0.115 12	0.0006
γ 14	321.00 20	0.45 5	0.0031
γ 15	300.50 20	1.50 9	0.0122
γ 16	400.00 20	0.133 15	0.0012
γ 17	427.90 20	29.5	0.269
γ 18	443.3 3	0.29 6	0.0020
γ 19	463.4 3	10.3 5	0.102
γ 21	600.60 20	17.4 8	0.226
γ 22	606.70 20	4.04 24	0.0625
γ 24	636.00 20	11.3 6	0.153
γ 25	671.50 20	1.72 9	0.0246

8 weak γ 's omitted:
 $E_{\gamma}(\text{avg}) = 171.2$; $I_{\gamma} = 0.028$

12558 IT DECAY (50 D 1) $I(\text{HIM}) = 0.108$

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μ Cl-h)
Auger-L	3.19	153 8	0.0104
ce-K- 1	3.65 3	80.10 20	0.0062
Auger-K	22.7	16 4	0.0004
ce-L- 1	33.52 3	10.50 10	0.0062
ce-K- 1	34.85 3	2.090 10	0.0015
ce-K00- 1	35.29 3	0.6900 2	0.0005
ce-K- 2	77.656 20	51.70 10	0.0053
ce-L- 2	104.331 20	37.20 10	0.0027
ce-K- 2	100.264 20	0.560 10	0.0197
ce-K00- 2	109.102 20	2.240 10	0.0052
X-ray L	3.77	15 5	0.0012
X-ray K_{α}	27.20 170 2	32.0 12	0.0190
X-ray K_{β}	27.67236 2	61.2 21	0.0350
X-ray ED	31	21.3 8	0.0104
γ 1	35.46 3	6.67 10	0.0050
γ 2	109.270 20	0.203 8	0.0007

12658 D- DECAY (1.025 Y 4P) $I(\text{HIM}) = 0.108$
 REFERS 12658 (19.0 D)
 SEE ALSO 12658 IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μ Cl-h)
Auger-L	3	120 7	0.0079
ce-K- 5	12.149 10	3.2 4	0.0004
ce-L- 2	16.952 10	2.1 3	0.0004
ce-L- 3	18.00 7	50 4	0.0222

Continued

12658 D- DECAY (1.025 Y 4P) (Continued)
 REFERS 12658 (19.0 D)
 SEE ALSO 12658 IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μ Cl-h)
ce-L- 4	18.502 10	32 4	0.0125
ce-K- 2	20.706 10	0.41 5	0.0002
ce-K00- 2	21.099 10	0.136 17	=0
ce-K- 3	21.76 7	12.4 9	0.0057
Auger-K	21.8	4.5 10	0.0021
ce-K- 4	22.336 10	6.3 8	0.0030
ce-K00- 3	22.55 7	4.1 3	0.0020
ce-K00- 4	23.120 10	2.06 25	0.0010
ce-K- 6	33.709 10	5.4 7	0.0039
ce-L- 5	37.942 10	0.41 6	0.0003
ce-K- 7	56.049 10	16.4 20	0.0197
ce-K- 8	57.079 10	8.9 7	0.0107
ce-L- 6	59.502 10	0.72 9	0.0009
ce-K- 5	61.336 10	0.100 10	0.0002
ce-L- 7	82.292 10	6.3 8	0.0111
ce-L- 8	82.072 10	1.13 8	0.0020
ce-K- 7	85.996 10	1.30 16	0.0024
ce-K- 8	86.626 10	0.221 16	0.0004
ce-K00- 7	86.708 10	0.20 4	0.0005

D- 1 max 350 30
 avg 182 10 100 6.217

X-ray L	3.6	11 4	0.0039
γ 2	21.650 10	1.24 16	0.0006
γ 4	23.200 10	6.4 8	0.0032
X-ray K_{α}	26.11000 2	0.3 7	0.0004
X-ray K_{β}	26.35910 2	15.6 12	0.0008
X-ray ED	29.7	5.3 4	0.0034
γ 5	42.600 10	0.50 7	0.0005
γ 6	64.200 10	9.6 12	0.0131
γ 7	86.940 10	0.9 11	0.0165
γ 8	87.570 10	37.0 25	0.0690

2 weak γ 's omitted:
 $E_{\gamma}(\text{avg}) = 22.7$; $I_{\gamma} = 0.108$

12658 IT DECAY (19.0 D 3) $I(\text{HIM}) = 0.108$
 REFERS 12658 (19.0 D)
 REFERS 12658 (12.0 D)
 SEE ALSO 12658 D- DECAY (19.0 D)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μ Cl-h)
Auger-L	3	10 3	0.0006
ce-L- 1	13.0 3	11 3	0.0029
ce-K- 1	16.0 3	2.5 8	0.0009
ce-K00- 1	17.5 3	0.05 25	0.0003
X-ray L	3.6	0.9 4	=0

12658 D- DECAY (12.0 D 1) $I(\text{HIM}) = 0.108$

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μ Cl-h)
Auger-L	3.19	1.49 9	0.0001
Auger-K	22.7	0.20 5	=0
ce-K- 5	302.99 20	1.020 10	0.0003

Continued

126SB B- DECAY (12.4 D 1) (Continued)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
ce-L- 5	449.06 20	0.149 3	0.0013
ce-K- 13	634.49 20	0.324 6	0.0044
ce-S- 15	663.19 20	0.291 5	0.0041
β- 1 max	90 40		
avg	24 9	0.5	0.0003
β- 2 max	120 40		
avg	38 9	2.9	0.0019
β- 3 max	370 40		
avg	110 11	32	0.0750
β- 4 max	390 40		
avg	117 11	6.2	0.0169
β- 5 max	500 40		
avg	152 12	9	0.0291
β- 6 max	500 40		
avg	181 12	4.3	0.0166
β- 7 max	750 40		
avg	245 13	9.3	0.0493
β- 8 max	800 40		
avg	266 13	5	0.0289
β- 9 max	1070 40		
avg	375 14	15.5	0.124
β-10 max	1790 40		
avg	607 15	16.6	0.243
total β-			
avg	269 20	102	0.505
X-ray L	3.77	0.15 5	0
X-ray K _α	27.20170 2	0.007 15	0.0002
X-ray K _β	27.47230 2	0.76 3	0.0004
γ-ray K _β	31	0.264 11	0.0002
γ 1	149.30 20	0.3	0.0010
γ 2	223.00 20	1.7	0.0001
γ 3	278.60 20	1.9	0.0112
γ 4	297.30 20	5	0.0322
γ 5	414.00 20	8.6732	0.757
γ 6	416.00 20	2	0.0176
γ 7	555.20 20	2	0.0247
γ 8	573.00 20	6.07370	0.0040
γ 9	593.00 20	9.76656	0.111
γ 10	620.20 20	1.3	0.0171
γ 11	639.70 20	1.5	0.0204
γ 12	656.30 20	2.5	0.0362
γ 13	666.30 20	99.62	1.41
γ 14	675.00 20	4.194	0.0602
γ 15	695.00 20	99.62	1.47
γ 16	697.00 20	31.0704	0.473
γ 17	720.50 20	57.70	0.807
γ 18	856.70 20	17	0.309
γ 19	954.00 20	1.4	0.0203
γ 20	959.40 20	0.5	0.0102
γ 21	989.30 20	6.77416	0.143
γ 22	1034.00 20	1	0.0242
γ 23	1061.30 20	0.4	0.0090
γ 24	1063.90 20	0.6	0.0135
γ 25	1213.00 20	2.3	0.0592
γ 26	1476.20 20	0.3	0.0094

126SB B- DECAY (19.0 H 3) I (BIB) = 0.10%
SE- DECAY=86 4
SEE ALSO 126SB IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	3.19	1.41 11	0
Auger-K	22.7	0.19 5	0

Continued

126SB B- DECAY (19.0 H 3) (Continued)

SE- DECAY=86 4
SEE ALSO 126SB IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
ce-K- 1	302.49 20	1.02 8	0.0063
ce-L- 1	449.56 20	0.149 11	0.0013
ce-K- 3	634.29 20	0.278 14	0.0038
ce-S- 4	663.0 3	0.240 18	0.0034
β- 1 max	750 40		
avg	245 13	0.80 20	0.0042
β- 2 max	800 40		
avg	290 13	1.3 3	0.0003
β- 3 max	1190 40		
avg	424 14	3.3 3	0.0290
β- 4 max	1810 40		
avg	695 15	92 5	1.21
total β-			
avg	675 16	87 5	1.26
X-ray L	3.77	0.14 5	0
X-ray K _α	27.20170 2	0.383 23	0.0002
X-ray K _β	27.47230 2	3.71 5	0.0004
X-ray K _β	31	0.249 16	0.0002
γ 1	414.50 20	46 6	0.756
γ 2	620.00 20	1.54 14	0.0204
γ 3	666.10 20	96 4	1.22
γ 4	694.9 3	42 6	1.22
γ 5	920.2 3	1.3 3	0.0254
γ 6	1034.90 20	1.00 19	0.0397
γ 7	1061.6 4	0.51 9	0.0116
γ 8	1476.1 6	0.34 4	0.0100

127SB B- DECAY (3.05 D 5) I (BIB) = 0.10%
SPEEDING TO 127TE (9.35 H)=86.1 8
SPEEDING TO 127P (109 D)=13.9 8
SEE ALSO 127TE IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	3.19	3.8 4	0.0003
Auger-K	22.7	0.52 13	0.0003
ce-F- 1	29.29 10	3.5 3	0.0022
ce-L- 1	56.16 10	0.46 4	0.0005
ce-K- 5	220.6 3	0.43 5	0.0020
ce-S- 16	441.2 4	9.226 17	0.0021
β- 1 max	258 5		
avg	72.5 16	0.20 10	0.0003
β- 2 max	291 5		
avg	92.9 17	0.77 22	0.0014
β- 3 max	426 5		
avg	127.7 18	0.9 3	0.0024
β- 4 max	439 5		
avg	132.3 18	1.54 18	0.0043
β- 5 max	504 5		
avg	155.0 18	5.40 16	0.0170
β- 6 max	657 5		
avg	216.9 20	1.3 3	0.0050
β- 7 max	795 5		
avg	244.1 20	4.56 16	0.0257
β- 8 max	797 5		
avg	265.0 20	17.0 5	0.100
β- 9 max	895 5		
avg	303.9 21	35.6 5	0.230
β-10 max	950 5		
avg	325.7 21	4.4 5	0.0312

Continued

12750 B- DECAY (13.05 D 5) (Continued)
 EFFECTING TO 12752 (9.35 H)=96.1 9
 EFFECTING TO 12752 (109 D)=13.9 9
 SEE ALSO 12752 IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
9-11 max	1300 5		
avg	390.9 21	23.2 10	0.193
9-12 max	1240 5		
avg	446.6 22	2.2 5	0.0209
9-13 max	1493 5		
avg	561.9 21	2.9 5	0.0239
total β-			
avg	308.8 22	100.1 16	0.658

2 weak β's omitted:
 E₀(avg)= 164.8; EIP= 9.14%

X-ray L	3.77	0.39 13	0
X-ray K _α	27.29170 2	1.93 8	0.0006
X-ray K _β	27.47230 2	1.92 15	0.0011
X-ray K _γ	31	0.67 6	0.0004
γ 1	61.10 10	1.03 12	0.0019
γ 4	154.3 5	0.15 8	0.0005
γ 5	252.4 3	0.5 8	0.0055
γ 6	280.4 5	0.66 15	0.0039
γ 7	290.8 5	2.01 12	0.0125
γ 8	293.3 9	0.29 15	0.0010
γ 9	310.0 7	0.26 11	0.0017
γ 10	391.0 5	0.95 8	0.0079
γ 11	412.1 5	3.2 8	0.0334
γ 12	441.0 9	0.7 8	0.0065
γ 12	445.1 5	0.32 13	0.0009
γ 14	451.0 7	0.10 8	0.0010
γ 15	456.0 10	0.11 8	0.0011
γ 16	473.0 4	25.7 9	0.250
γ 17	502.0 6	0.8 3	0.0002
γ 18	543.3 5	2.9 5	0.0339
γ 19	584.2 11	0.33 19	0.0041
γ 20	603.5 5	0.43 13	0.0549
γ 22	637.0 5	0.44 15	0.0060
γ 23	652.3 9	0.37 8	0.0051
γ 24	667.5 9	0.73 9	0.0104
γ 25	682.3 10	0.5 3	0.0000
γ 26	685.7 5	16.6 5	0.535
γ 27	698.5 5	3.62 9	0.0539
γ 28	722.2 5	1.87 12	0.0207
γ 30	783.7 5	15.0 4	0.251
γ 31	817.0 6	0.40 19	0.0070
γ 32	820.6 6	0.22 11	0.0038
γ 33	924.4 9	0.51 8	0.0101
γ 34	1141.6 8	0.37 8	0.0089
γ 36	1298.3 8	0.37 11	0.0101

6 weak γ's omitted:
 E_γ(avg)= 967.7; EIP= 0.25%

12752 IT DECAY (109 D 2) I(NIM)= 0.10%

9IT DECAY=97.6 2

FEES 12752 (9.35 H)

SEE ALSO 12752 B- DECAY (109 D)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	3.19	74 3	0.0050
Auger-K	27.7	5.2 12	0.0025
ce-K- 1	56.45 8	41.58 13	0.0500
ce-L- 1	83.32 8	33.04 14	0.0764
ce-M- 1	87.25 8	10.15 10	0.0109
ce-MDP- 1	88.09 8	2.704 12	0.0051
I-ray L	3.77	7.3 25	0.0006
I-ray K _α	27.29170 2	10.4 4	0.0060
I-ray K _β	27.47230 2	19.3 7	0.0113
I-ray S ₀	31	6.71 25	0.0044

1 weak γ's omitted:
 E_γ(avg)= 88.3; EIP= 0.09%

12752 B- DECAY (9.35 H 7) I(NIM)= 0.16%

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
β- 1 max	276 5		
avg	78.2 16	1.19	0.0020
β- 2 max	694 5		
avg	224.7 19	90.9	0.473
total β-			
avg	222.9 20	100	0.475

3 weak β's omitted:
 E₀(avg)= 148.3; EIP= 0.03%

γ 6	340.30 10	0.1346 1	0.0010
γ 9	417.90 10	0.99	0.0080

7 weak γ's omitted:
 E_γ(avg)= 172.7; EIP= 0.13%

12752 B- DECAY (109 D 2) I(NIM)= 0.10%

SE- DECAY=2.4 2

SEE ALSO 12752 IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
β- 1 max	725 5		
avg	253.0 19	2.4	0.0129

3 weak β's omitted:
 E₀(avg)= 29.1; EIP= 0.02%

5 weak γ's omitted:
 E_γ(avg)= 70.7; EIP= 0.01%

129TE IT DECAY (33.6 D 1) I(MIN) = 0.10%
 91T DECAY=66.4
 FEEDS 129TE (69.6 M)
 SEE ALSO 129TE B- DECAY (33.6 D)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	3.19	49.3	0.0033
Auger-K	22.7	4.5 10	0.0019
ce-K- 1	73.65 5	32.2 21	0.0505
ce-L- 1	100.56 5	24.4 16	0.0524
ce-M- 1	104.09 5	5.7 4	0.0126
ce-NOP- 1	105.33 5	1.49 10	0.0033
X-ray L	3.77	4.8 17	0.0004
X-ray K _α	27.20170 2	9.0 6	0.0046
X-ray K _β	27.47230 2	15.0 11	0.0090
X-ray K _γ	31	5.2 4	0.0034
γ 1	105.50 5	0.150 11	0.0003

129TE B- DECAY (69.6 H 2) I(MIN) = 0.10%
 FEEDS 129I

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	3.3	61 15	0.0043
ce-L- 1	22.582 20	67 16	0.0322
ce-M- 1	26.698 20	13.6 23	0.0077
ce-NOP- 1	27.584 20	4.6 8	0.0027
B- 1 max	392.4		
avg	116.1 12	0.95 10	0.0023
B- 2 max	674.4		
avg	217.2 14	0.223 25	0.0010
B- 3 max	944.4		
avg	323.1 15	0.24 3	0.0017
B- 4 max	1017.4		
avg	352.5 15	0.7 9	0.0053
B- 5 max	1226.4		
avg	439.5 15	0.59 7	0.0055
B- 6 max	1476.4		
avg	547.2 16	99.4	1.04
total B- avg	523.9 17	100.4	1.11

4 weak B's omitted:
 E_B(avg) = 66.5; I_B = 0.05%

X-ray L	4	6.3	0.0005
γ 1	27.770 20	16.3 23	0.0097
γ 2	209.90 5	0.195 20	0.0000
γ 3	250.65 5	0.40 5	0.0021
γ 5	270.43 5	0.57 6	0.0034
γ 6	281.16 5	0.149 17	0.0009
γ 9	459.60 5	7.1 7	0.0095
γ 10	487.39 5	1.35 14	0.0140
γ 19	802.17 5	0.194 22	0.0033
γ 26	1003.97 5	0.56 6	0.0130
γ 27	1111.74 5	0.220 23	0.0052

23 weak γ's omitted:
 E_γ(avg) = 672.9; I_γ = 0.38%

129TE B- DECAY (33.6 D 1) I(MIN) = 0.10%
 91T DECAY=36.4
 FEEDS 129I
 SEE ALSO 129TE IT DECAY (33.6 D)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	3.3	0.52 13	40
ce-L- 1	22.582 20	9.57 14	0.0003
ce-M- 1	26.698 20	0.115 19	40
B- 1 max	208.4		
avg	57.2 11	0.14	0.0002
B- 2 max	290.4		
avg	237.2 14	0.7	0.0045
B- 3 max	514.4		
avg	310.6 14	2.5 5	0.0192
B- 4 max	1610.4		
avg	609.8 15	13.4	0.423
total B- avg	576.9 16	36.4	0.448

3 weak B's omitted:
 E_B(avg) = 229.2; I_B = 0.09%

γ 1	27.770 20	0.13 18	40
γ 2	556.65 5	0.110 15	0.0013
γ 4	695.90 5	3.1 4	0.0454
γ 7	729.62 5	0.73 10	0.0113

11 weak γ's omitted:
 E_γ(avg) = 632.4; I_γ = 0.25%

129I B- DECAY (13.57E7 (4)) I(MIN) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	3.43	73.4	0.0054
ce-K- 1	5.02 3	78.60 10	0.0004
Auger-K	24.6	8.7 16	0.0046
ce-L- 1	34.13 3	10.90 10	0.0079
ce-M- 1	39.44 3	2.210 10	0.0010
ce-NOP- 1	35.37 3	0.7290 2	0.0006
B- 1 max	149.4		
avg	45.1 12	100	0.0454
X-ray L	4.1	0.2 25	0.0007
X-ray K _α	29.4500 10	19.9 6	0.0125
X-ray K _β	29.7790 10	36.9 9	0.0234
X-ray K _γ	33.6	13.1 4	0.0094
γ 1	39.58 3	7.54 21	0.0064

130I B- DECAY (12.36 H 1) I(MIN) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	3.43	1.35 9	40
Auger-K	24.6	0.19 4	40
ce-K- 9	303.449 20	0.47 5	0.0039

Continued

130I B- DECAY (12.36 H 1) (Continued)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
ce-K- 13	501.529 29	0.623 17	0.0067
ce-K- 19	633.979 10	0.341 10	0.0046
ce-K- 22	704.919 20	0.229 7	0.0034
β- 1 max	232 10		
avg	64 3	0.316 17	0.0004
β- 2 max	355 10		
avg	103 4	0.328 18	0.0007
β- 3 max	376 10		
avg	110 4	0.492 17	0.0012
β- 4 max	557 10		
avg	173 4	0.104 7	0.0007
β- 5 max	622 10		
avg	197 4	46.7 10	0.196
β- 6 max	812 10		
avg	270 4	2.13 6	0.0122
β- 7 max	902 10		
avg	304 4	0.173 16	0.0011
β- 8 max	1040 10		
avg	361 5	47.5 12	0.365
β- 9 max	1176 10		
avg	410 5	1.43 6	0.0127
total β- avg	279 5	99.5 16	0.591

5 weak β's omitted:

EP (avg) = 91.0; EIP = 0.27%

X-ray L	0.1	0.15 5	0
X-ray K _α	29.4580 10	0.422 17	0.0003
X-ray K _β	29.7790 10	0.70 3	0.0005
X-ray K _γ	33.6	0.270 12	0.0002
γ 9	410.010 20	34.2 7	0.304
γ 11	457.720 20	0.237 16	0.0023
γ 12	510.350 20	0.25 3	0.0093
γ 13	536.090 20	99.0 20	1.13
γ 14	539.10 3	1.40 3	0.0160
γ 15	553.900 10	0.462 21	0.0070
γ 16	586.050 20	1.69 4	0.0211
γ 17	603.530 10	0.615 25	0.0079
γ 19	660.540 10	96.1 21	1.37
γ 20	685.990 10	1.07 3	0.0156
γ 22	739.400 20	82.3 18	1.30
γ 25	800.23 3	0.101 6	0.0017
γ 26	808.290 20	0.236 8	0.0041
γ 31	877.35 4	0.191 9	0.0036
γ 34	967.020 20	0.277 22	0.0181
γ 38	1096.40 3	0.552 15	0.0129
γ 39	1122.15 3	0.253 10	0.0061
γ 40	1157.070 10	11.31 25	0.279
γ 41	1222.56 3	0.179 7	0.0047
γ 42	1272.120 20	0.748 19	0.0203
γ 44	1403.940 20	0.345 14	0.0103

31 weak γ's omitted:

EP (avg) = 825.6; EIP = 0.82%

131Ie IT DECAY (30 H 2) I(NEM) = 0.10%
SIT DECAY=22.2 16
FEEDS 131Ie (25.0 H)
SEE ALSO 131Ie B- DECAY (30 H)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	3.19	16.9 13	0.0011
Auger-K	22.7	1.8 5	0.0009
ce-K- 1	150.436 20	10.4 11	0.0062

Continued

131Ie IT DECAY (30 H 2) (Continued)
SIT DECAY=22.2 16
FEEDS 131Ie (25.0 H)
SEE ALSO 131Ie B- DECAY (30 H)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
ce-L- 1	177.311 20	5.4 4	0.0205
ce-S- 1	181.244 20	1.19 9	0.0046
ce-K _α - 1	182.002 20	0.304 22	0.0012
X-ray L	3.77	1.7 6	0.0001
X-ray K _α	27.20176 2	3.6 3	0.0021
X-ray K _β	27.47230 2	6.7 6	0.0039
X-ray K _γ	31	2.32 19	0.0015
γ 1	182.250 20	0.85 7	0.0033

131Ie B- DECAY (25.0 H 1) I(NEM) = 0.10%
FEEDS 131I

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	3.3	13.0 9	0.0010
Auger-K	23.6	1.7 5	0.0009
ce-K- 1	116.547 5	10.5 4	0.0359
ce-L- 3	140.520 5	1.27 4	0.0057
ce-K- 3	140.644 5	0.375 9	0.0012
ce-K- 22	419.1536 21	0.193 17	0.0017
β- 1 max	749 6		
avg	245.9 24	1.199 22	0.0063
β- 2 max	806 6		
avg	267.9 24	1.106 22	0.0060
β- 3 max	823 6		
avg	270.6 24	1.34 3	0.0070
β- 4 max	904 6		
avg	306.6 24	0.119 9	0.0008
β- 5 max	952 6		
avg	326.0 25	0.54 9	0.0037
β- 6 max	1103 6		
avg	380.1 25	9.90 16	0.0025
β- 7 max	1152 6		
avg	400 3	2.59 5	0.0225
β- 8 max	1373 6		
avg	503 3	1.177 23	0.0126
β- 9 max	1648 6		
avg	622 3	21.8 3	0.209
β-10 max	1757 6		
avg	671 3	0.70 5	0.0111
β-11 max	2100 6		
avg	825 3	59.2 16	1.04
total β- avg	696 4	100.1 17	1.48

5 weak β's omitted:

EP (avg) = 136.4; EIP = 0.21%

X-ray L	4	1.4 5	0.0001
X-ray K _α	28.3172 4	3.60 15	0.0022
X-ray K _β	28.6120 3	6.9 3	0.0042
X-ray K _γ	32.3	2.40 11	0.0017
γ 3	109.716 5	68.9 9	0.220
γ 4	151.10 10	0.17 7	0.0006
γ 13	342.945 4	0.703 12	0.0051
γ 17	380.059 3	0.896 10	0.0073
γ 22	452.3230 20	18.22 25	0.176
γ 26	492.640 10	4.84 7	0.0500
γ 27	544.000 10	0.427 15	0.0050
γ 29	567.33 4	0.103 7	0.0012

Continued

131TE B- DECAY (25.0 H 1)
FEEDS 131I

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
γ 31	602.039 3	0.20 6	0.0530
γ 32	605.550 20	0.117 7	0.0015
γ 33	650.260 10	1.530 25	0.0213
γ 34	696.190 20	0.179 14	0.0027
γ 3E	727.000 20	0.069 10	0.0073
γ 43	801.990 20	0.200 8	0.0036
γ 43	856.00 3	0.131 7	0.0024
γ 45	890.54 3	0.130 8	0.0026
γ 46	930.403 5	0.075 10	0.0170
γ 47	948.542 4	2.20 4	0.0057
γ 48	951.390 20	0.331 9	0.0067
γ 49	997.250 10	3.30 5	0.0710
γ 52	1007.960 10	0.799 13	0.0172
γ 55	1090.250 20	0.172 8	0.0040
γ 56	1106.960 10	4.96 7	0.121
γ 57	1100.51 6	0.119 7	0.0027
γ 63	1277.440 10	0.110 5	0.0032
γ 64	1290.300 20	0.062 10	0.0133
γ 68	1427.160 20	0.105 4	0.0032
γ 69	1500.62 3	0.115 4	0.0037

51 weak γ's omitted:
 E_γ(avg) = 699.6; I_γ = 1.18%

131TE B- DECAY (30 H 2) **I (MIS) = 0.10%**
SE- DECAY=77.0 16
FEEDS 131I
SEE ALSO 131TE IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	3.3	10.0 7	0.0000
Auger-F	23.6	1.4 4	0.0007
ce-K- 10	47.971 20	0.85 10	0.0050
ce-K- 21	68.091 10	0.93 10	0.0072
ce-L- 10	75.952 20	0.637 23	0.0010
ce-F- 10	80.069 20	0.127 5	0.0002
ce-L- 21	96.072 10	0.643 24	0.0013
ce-F- 21	108.908 10	0.129 5	0.0003
ce-F- 36	116.501 10	1.39 15	0.0027
ce-L- 36	140.522 10	0.139 19	0.0004
ce-K- 48	167.067 20	0.193 7	0.0007
ce-F- 50	207.761 10	0.110 4	0.0005
ce-F- 75	301.101 10	0.234 7	0.0015
ce-F-122	740.50 3	0.109 16	0.0017
β- 1 max	162 6		
avg	43.6 10	0.56 5	0.0005
β- 2 max	191 6		
avg	52.1 10	0.32 4	0.0004
β- 3 max	256 6		
avg	71.9 19	0.20 4	0.0003
β- 4 max	262 6		
avg	73.7 19	0.05 4	0.0007
β- 5 max	264 6		
avg	70.3 19	0.95 6	0.0015
β- 6 max	310 6		
avg	91.6 20	1.67 21	0.0033
β- 7 max	369 6		
avg	100.3 20	0.304 25	0.0008
β- 8 max	421 6		
avg	125.9 21	2.29 10	0.0061

Continued

131TE B- DECAY (30 H 2) **(Continued)**
SE- DECAY=77.0 16
FEEDS 131I
SEE ALSO 131TE IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
β- 9 max	431 6		
avg	129.4 21	5.5 4	0.0152
β-10 max	452 6		
avg	136.5 21	37.2 10	0.100
β-11 max	500 6		
avg	156.1 22	2.07 12	0.0069
β-12 max	533 6		
avg	165.2 22	16.7 6	0.0508
β-13 max	545 6		
avg	169.3 22	1.51 8	0.0054
β-14 max	635 6		
avg	202.6 23	0.7 3	0.0039
β-15 max	706 6		
avg	260.2 24	2.7 3	0.0150
β-16 max	1203 6		
avg	464 3	0.23 20	0.0023
β-17 max	1373 6		
avg	502 3	0.39 15	0.0042
β-18 max	1426 6		
avg	526 3	0.20 6	0.0022
β-19 max	2432 6		
avg	970 3	1.8 4	0.0785
total β- avg	189 3	70.1 15	0.316

6 weak β's omitted:
 E_β(avg) = 226.1; I_β = 0.27%

X-ray L	4	1.1 4	0.0000
X-ray K _α	20.3172 4	2.09 13	0.0017
X-ray K _β	20.6120 3	5.30 23	0.0033
X-ray K _γ	32.3	1.09 9	0.0013
γ 13	79.19 3	0.129 5	0.0002
γ 14	81.140 20	0.11 13	0.0071
γ 15	86.030 20	0.109 6	0.0003
γ 20	101.6 3	0.172 17	0.0004
γ 21	102.060 10	0.0 3	0.0174
γ 33	134.060 20	0.72 3	0.0021
γ 36	149.710 10	5.1 7	0.0163
γ 39	159.64 4	0.129 16	0.0004
γ 43	182.250 20	0.74 20	0.0029
γ 44	183.11 8	0.157 20	0.0006
γ 45	189.13 5	0.215 13	0.0009
γ 46	189.76 4	0.51 5	0.0021
γ 47	190.52 6	0.117 16	0.0005
γ 48	200.630 20	7.63 23	0.0326
γ 53	213.90 3	0.430 23	0.0020
γ 55	230.65 5	0.196 13	0.0010
γ 58	240.930 10	7.67 21	0.0390
γ 59	253.170 20	0.657 21	0.0035
γ 60	255.04 7	0.313 14	0.0017
γ 64	269.2 3	0.110 3	0.0006
γ 65	270.540 20	1.80 6	0.0107
γ 67	283.20 20	0.39 4	0.0024
γ 72	309.07 6	0.20 4	0.0025
γ 75	330.270 10	9.7 3	0.0600
γ 76	335.44 7	0.137 24	0.0010
γ 77	342.92 5	0.39 12	0.0029
γ 80	351.30 10	0.211 21	0.0016
γ 82	354.70 10	0.231 13	0.0017
γ 85	364.90 10	1.21 16	0.0090
γ 90	383.90 7	0.20 4	0.0017
γ 93	417.00 20	0.202 21	0.0025
γ 94	432.00 7	0.67 4	0.0062
γ 95	452.30 4	1.6 4	0.0151
γ 96	462.92 5	1.04 6	0.0101
γ 97	468.16 9	0.32 4	0.0032
γ 98	492.65 5	0.235 6	0.0025

Continued

1312E E- DECAY (11.9 D 1) (Continued)
 SE- DECAY=77.0 16
 FEELS 1311
 SEE ALSO 1312E IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
γ 100	520.00 10	0.137 16	0.0015
γ 101	530.70 10	0.136 20	0.0012
γ 102	501.00 10	0.113 20	0.0013
γ 107	506.30 3	2.00 10	0.0209
γ 109	602.09 0	0.31 12	0.0008
γ 110	609.00 10	2.10 16	0.0010
γ 113	665.05 3	0.38 16	0.0021
γ 115	695.70 10	0.157 13	0.0023
γ 116	695.62 0	0.00 0	0.0009
γ 117	702.50 7	0.395 22	0.0059
γ 118	713.30 4	1.05 16	0.0220
γ 120	740.20 0	1.60 6	0.0250
γ 122	773.67 3	19.5 11	0.636
γ 123	770.10 10	0.55 9	0.0090
γ 124	782.09 0	7.07 23	0.131
γ 125	793.75 3	10.0 0	0.237
γ 127	822.70 0	6.10 10	0.100
γ 128	840.90 20	0.16 0	0.0020
γ 130	852.21 3	0.29 20	0.0071
γ 131	852.21 3	20.9 7	0.379
γ 132	856.05 5	0.63 5	0.0110
γ 133	865.10 20	0.20 0	0.0036
γ 134	872.3 3	0.102 12	0.0019
γ 136	910.00 3	3.33 12	0.0605
γ 137	920.62 5	1.21 9	0.0230
γ 139	923.00 20	9.177 20	0.0027
γ 140	941.27 5	0.79 0	0.0150
γ 141	997.00 10	9.157 13	0.0033
γ 143	999.20 10	9.172 20	0.0037
γ 149	1035.00 20	0.106 9	0.0023
γ 149	1059.69 0	1.57 6	0.0353
γ 153	1125.46 0	11.5 0	0.277
γ 154	1127.96 6	0.84 0	0.0235
γ 156	1180.09 7	1.5 0	0.0373
γ 157	1180.09 7	0.430 11	0.0105
γ 159	1150.90 9	0.67 0	0.0163
γ 160	1165.50 10	0.101 13	0.0035
γ 162	1206.60 0	9.9 3	0.253
γ 166	1237.32 5	0.47 0	0.0175
γ 169	1315.16 0	0.70 0	0.0197
γ 172	1340.60 10	0.102 12	0.0029
γ 175	1390.83 0	2.110 9	0.0033
γ 179	1606.01 5	1.25 5	0.0039
γ 183	1807.70 7	1.37 6	0.0551
γ 187	2000.90 6	2.03 7	0.0067
γ 189	2168.50 9	0.352 22	0.0163
γ 189	2270.65 9	0.397 27	0.0187

107 weak γ's omitted:
 $E_{\gamma}(\text{avg}) = 627.6$; $I_{\gamma} = 3.62\%$

131I B- DECAY (15.0 D 1) I(BIM) = 0.10%
 SPECTRUM TO 131I (11.9 D 1)=1.006 13
 SEE ALSO 131I IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	3.03	5.0 3	0.0000
Auger-K	20.6	0.59 11	0.0003
ce-K- 1	85.622 10	3.53 9	0.0030
ce-L- 1	70.730 10	6.063 12	0.0007
ce-BB- 1	79.001 10	0.1176 2	0.0002
ce-K- 7	209.737 11	0.200 6	0.0013

Continued

131I B- DECAY (15.0 D 1) (Continued)
 SPECTRUM TO 131I (11.9 D 1)=1.006 13
 SEE ALSO 131I IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
ce-F- 10	329.919 11	1.50 0	0.0100
ce-L- 10	359.027 11	0.200 6	0.0019
β- 1 max	207.9 6		
avg	69.36 19	2.12 3	0.0031
β- 2 max	303.9 6		
avg	86.95 20	0.627 9	0.0012
β- 3 max	333.0 6		
avg	96.62 20	7.36 10	0.0151
β- 4 max	606.3 6		
avg	191.50 23	99.3 11	0.360
β- 5 max	806.9 6		
avg	203.25 23	0.020 20	0.0025
total β-			
avg	181.72 20	99.9 11	0.307

1 weak β's omitted:
 $E_{\beta}(\text{avg}) = 200.2$; $I_{\beta} = 0.07\%$

X-ray L	0.1	0.55 17	0.0000
X-ray K _α	29.0590 10	1.35 5	0.0000
X-ray K _β	29.7790 10	2.50 0	0.0016
X-ray K _γ	33.6	0.99 3	0.0006
γ 1	80.103 10	2.62 5	0.0005
γ 0	177.210 10	0.265 0	0.0010
γ 7	209.290 11	6.05 0	0.0066
γ 12	325.701 11	0.251 6	0.0017
γ 10	364.000 11	31.2 11	0.630
γ 16	502.991 11	0.361 4	0.0039
γ 17	636.973 10	7.26 10	0.0095
γ 19	642.703 11	0.220 0	0.0030
γ 19	722.093 10	1.003 25	0.0278

10 weak γ's omitted:
 $E_{\gamma}(\text{avg}) = 329.0$; $I_{\gamma} = 0.23\%$

131I IT DECAY (11.9 D 1) I(BIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	3.03	75 0	0.0055
Auger-K	20.6	6.8 13	0.0036
ce-F- 1	129.369 0	61.20 10	0.169
ce-L- 1	150.077 0	20.60 10	0.0065
ce-B- 1	162.700 0	6.590 10	0.0225
ce-BB- 1	163.722 0	1.700 10	0.0062
X-ray L	0.1	0 3	0.0007
X-ray K _α	29.0500 10	15.5 0	0.0097
X-ray K _β	29.7790 10	20.7 7	0.0102
X-ray K _γ	33.6	10.2 3	0.0073
γ 1	163.930 0	1.96 6	0.0060

132Te B- DECAY (70.2 D 0) I(BIM) = 0.10%
 PERDS 132I (2.30 D)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	3.3	75 6	0.0053
ce-K- 1	16.551 10	70 5	0.0200

Continued

132TE B- DECAY (79.2 ± 9)
PEEDS 132I (2.39 g)

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	A (γ-rad/ μCi-h)
Auger- γ	23.6	0.4 23	0.0007
ce-K- 1	44.532 10	9.1 7	0.0040
ce-K- 1	48.649 10	1.97 13	0.0019
ce-KG- 1	49.534 10	0.62 5	0.0007
ce-K- 2	78.55 8	0.09 9	0.0015
ce-K- 3	83.13 8	0.02 9	0.0015
ce-L- 2	106.57 8	0.115 12	0.0003
ce-L- 3	111.11 8	0.107 10	0.0003
ce-F- 4	198.99 6	7.12 13	0.0296
ce-L- 4	222.97 6	1.301 20	0.0064
ce-F- 4	227.09 6	0.278 5	0.0013
9- 1 max	215 4		
avg	59.4 12	100	0.127
I-ray L	4	8 3	0.0007
I-ray K α_1	20.3172 4	19.9 15	0.0120
I-ray K α_2	20.6120 3	37 3	0.0226
I-ray K β	32.3	13.0 10	0.0009
γ 1	49.728 10	18.4 10	0.0152
γ 2	111.76 8	1.95 10	0.0004
γ 3	116.30 8	1.94 10	0.0004
γ 4	220.16 6	80.20 20	0.029

132I B- DECAY (2.30 ± 3)

I(SIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (γ-rad/ μCi-h)
Auger-L	3.43	0.55 4	0
ce-K- 2a	408.09 9	0.130 17	0.0010
ce-K- 3a	633.13 8	0.351 6	0.0007
ce-K- 41	738.06 8	0.190 6	0.0030
0- 1 max	226 20		
avg	63 7	0.10 6	0.0001
0- 2 max	320 20		
avg	92 7	0.203 22	0.0006
0- 3 max	353 20		
avg	103 7	0.12 5	0.0003
0- 4 max	366 20		
avg	107 7	0.10 3	0.0002
0- 5 max	425 20		
avg	127 7	0.21 4	0.0006
0- 6 max	504 20		
avg	154 8	0.21 5	0.0007
0- 7 max	522 20		
avg	161 8	0.33 7	0.0011
0- 8 max	689 20		
avg	223 8	0.79 9	0.0030
0- 9 max	741 20		
avg	242 8	12.5 8	0.0644
0-10 max	760 20		
avg	242 8	1.96 10	0.0101
0-11 max	826 20		
avg	275 8	0.33 6	0.0019
0-12 max	910 20		
avg	309 8	3.55 10	0.0234
0-13 max	967 20		
avg	331 9	0.2 8	0.0070
0-14 max	991 20		
avg	342 9	2.87 15	0.0209
0-15 max	996 20		
avg	344 9	3.46 16	0.0254

Continued

132I B- DECAY (2.30 ± 3)

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	A (γ-rad/ μCi-h)
0-16 max	1155 20		
avg	449 4	2.57 7	0.0220
0-17 max	1165 20		
avg	422 4	10.8 7	0.169
0-19 max	1229 20		
avg	440 4	0.92 15	0.0077
0-19 max	1353 20		
avg	516 4	0.10 3	0.0011
0-20 max	1460 20		
avg	543 4	2.0 8	0.0231
0-21 max	1470 20		
avg	543 4	19.0 19	0.116
0-22 max	1617 20		
avg	600 4	12.6 7	0.163
0-23 max	2140 20		
avg	841 4	19.2 22	0.344
total 0-			
avg	440 11	101 3	1.96

9 weak γ 's omitted:E β (avg) = 134.1; I β = 0.32%

I-ray K α_1	29.4500 16	0.172 7	0.0001
I-ray K α_2	29.7796 10	0.319 12	0.0002
I-ray K β	33.5	0.113 5	0
γ 2	147.20 10	0.237 20	0.0007
γ 3	183.3	0.15792	0.0006
γ 4	254.40 20	0.19 3	0.0019
γ 5	262.70 10	1.04 9	0.0301
γ 7	264.80 10	0.79 7	0.0008
γ 10	306.6 4	0.11 4	0.0007
γ 12	316.5 4	0.16 8	0.0011
γ 15	343.5 4	0.09 10	0.0030
γ 16	347.0 4	0.17 3	0.0014
γ 17	415.6 4	0.46 9	0.0007
γ 18	431.9 4	0.05 9	0.0002
γ 19	446.0 4	0.47 9	0.0004
γ 20	473.4 7	0.27 5	0.0027
γ 22	497.5 7	0.18 5	0.0010
γ 23	505.90 15	5.03 20	0.0542
γ 24	522.65 9	16.1 6	0.179
γ 25	535.5 4	0.52 8	0.0060
γ 26	547.10 20	1.25 9	0.0146
γ 30	620.8 10	0.3948	0.0052
γ 31	621.2 10	1.5792 1	0.0209
γ 32	630.22 4	13.7 6	0.194
γ 33	650.60 20	2.66 20	0.0369
γ 34	667.49 8	99.70 10	1.40
γ 35	669.8 3	0.9 9	0.0704
γ 36	671.6 3	5.2 8	0.0749
γ 37	727	2.2 6	0.0336
γ 38	727.2 10	3.2 6	0.0409
γ 39	729.5 4	1.1 3	0.0169
γ 41	772.60 8	76.2 10	1.25
γ 42	780.2 3	1.23 6	0.0295
γ 43	784.5 4	0.42 5	0.0071
γ 45	809.00 20	2.9 3	0.0494
γ 46	812.20 20	5.6 5	0.0973
γ 47	863.30 20	0.59 5	0.0109
γ 48	876.00 20	1.08 5	0.0201
γ 50	910.30 20	0.92 5	0.0170
γ 51	927.6 3	0.04 8	0.0008
γ 53	954.55 9	18.1 6	0.367
γ 54	984.50 20	0.56 6	0.0118
γ 58	1634.70 20	0.57 5	0.0126
γ 64	1136.03 12	2.96 20	0.0716
γ 65	1138	0.2961	0.0072
γ 66	1143.40 20	1.30 10	0.0337
γ 67	1148.2 7	0.21 5	0.0051
γ 68	1173.20 20	1.09 10	0.0271
γ 71	1272.7 4	0.15 3	0.0004
γ 72	1290.7 3	1.14 6	0.0312

Continued

1321E B- DECAF (2.36 E 3)

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
γ 73	1255.3 3	1.97 10	0.0545
γ 74	1298.2 5	0.99 10	0.0246
γ 76	1317.1 7	0.118 20	0.0033
γ 77	1372.07 13	2.47 10	0.0721
γ 78	1398.57 10	7.1 3	0.212
γ 80	1432.56 10	1.42 6	0.0437
γ 92	1474.0 20	2.138 20	0.0043
γ 94	1757.56 20	0.36 3	0.0109
γ 101	1921.06 12	1.16 9	0.0405
γ 103	2002.39 12	1.09 10	0.0463
γ 104	2086.02 15	0.25 4	0.0710
γ 105	2172.60 15	0.19 3	0.0067
γ 107	2222.17 15	0.110 22	0.0056
γ 110	2390.40 15	0.160 20	0.0085

59 weak γ's omitted:

E_γ(sum)=1673.6; E_γ = 2.25%

1337S IT DECAF (55.4 E 4) I(NIM) = 0.10%

BIT DECAF=12 3

FEB25 1337E (12.45 E 3)

SEE ALSO 1337S B- DECAF (55.4 E 4)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	3.19	6.1 12	0.0004
Auger-K	22.7	0.73 24	0.0004
ce-K- 1	302.33 7	5.9 14	0.0377
ce-L- 1	329.20 7	1.4 4	0.0096
ce-N- 1	333.13 7	0.25 7	0.0020
I-ray E	3.77	0.60 24	0.0
I-ray E ₀₂	27.20170 2	1.5 4	0.0009
I-ray E ₀₁	27.67230 2	2.7 7	0.0016
I-ray E ₀₃	31	0.94 22	0.0006
γ 1	334.14 7	5.4 13	0.0307

1337E B- DECAF (12.45 E 20) I(NIM) = 0.10%

FEB25 1331

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	3.3	2.34 15	0.0002
Auger-K	23.6	0.30 7	0.0001
ce-K- 1	278.9 3	2.002 22	0.0124
ce-L- 1	306.9 3	0.30 5	0.0020
ce-N- 0	370.7 3	0.42 3	0.0034
B- 1 max	430 60		
avg	129 27	0.35 15	0.0010
B- 2 max	760 60		
avg	256 24	7.0 3	0.0099
B- 3 max	830 60		
avg	279 24	0.65 23	0.0051
B- 4 max	1250 60		
avg	450 30	9.7 7	0.0034
B- 5 max	1410 60		
avg	520 30	4.4 3	0.0087

Continued

1337E B- DECAF (12.45 E 20) (Continued)

FEB25 1331

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
B- 6 max	1400 60		
avg	400 30	1.0 3	0.0230
B- 7 max	1640 60		
avg	620 30	13.2 7	0.174
B- 8 max	1660 60		
avg	630 30	7.0 8	0.0939
B- 9 max	2100 60		
avg	860 30	1.3 9	0.0238
B- 10 max	2250 60		
avg	890 30	32.3 10	0.631
B- 11 max	2440 60		
avg	1002 30	27.3 12	0.620
total B-			
avg	810 40	100.6 23	1.72
I-ray E	4	0.25 9	0.0
I-ray E ₀₂	28.11172 4	0.620 24	0.1004
I-ray E ₀₁	28.6120 3	1.17 5	0.1067
I-ray E ₀₃	32.3	0.490 16	0.0003
γ 1	312.1 3	70.8 7	0.471
γ 2	394.6 5	0.29 7	0.0023
γ 3	392.9 6	0.57 22	0.0047
γ 4	407.4 3	30.1 7	0.241
γ 5	475.4 7	1.2 3	0.0122
γ 6	546.4 6	0.57 22	0.0066
γ 7	587.1 5	0.50 15	0.0062
γ 8	613.6 7	0.20 15	0.0037
γ 9	720.1 4	6.7 5	0.102
γ 10	787.4 5	5.6 5	0.0930
γ 11	844.5 6	3.3 3	0.0506
γ 12	931.1 5	4.5 6	0.0085
γ 13	1000.3 8	6.2 8	0.133
γ 14	1021.0 6	2.7 3	0.0585
γ 15	1061.8 4	1.27 22	0.0209
γ 16	1252.0 7	1.13 15	0.0302
γ 17	1307.7 8	0.9 3	0.0256
γ 18	1313.5 8	0.8 3	0.0210
γ 19	1333.4 5	9.9 6	0.202
γ 20	1405.4 9	0.57 15	0.0170
γ 21	1474.0 10	0.35 15	0.0111
γ 22	1510.6 8	0.50 7	0.0160
γ 23	1589.2 9	0.20 15	0.0096
γ 24	1717.5 6	3.4 3	0.124
γ 25	1825.1 10	0.57 22	0.0220
γ 26	1881.8 7	1.42 22	0.0560
γ 27	2134.5 12	0.20 7	0.0129
γ 28	2220.0 13	0.20 15	0.0134

1 weak γ omitted:

E_γ(sum)=2540.4; E_γ = 0.07%

1337E B- DECAF (55.4 E 4) I(NIM) = 0.10%

BIT DECAF=07 3

FEB25 1331

SEE ALSO 1337S IT DECAF

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
B- 1 max	1530 60		
avg	570 30	25	0.304
B- 2 max	1740 60		
avg	670 30	30	0.420
B- 3 max	2390 60		
avg	960 30	12	0.454
total B-			
avg	750 40	87	1.39

Continued

133TE B- DECAY (55.4 H 1) (Continued)
 8B- DECAY=87 J
 FEEDS 133I
 SEE ALSO 133TE IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
γ 1	74.10 20	0.496 20	0.0011
γ 2	81.50 20	0.496 20	0.0012
γ 3	88.36 20	2.41 9	0.0049
γ 4	98.90 20	5.22 10	0.0106
γ 5	168.34 9	1.39 5	0.0049
γ 6	168.07 9	10.4 4	0.0376
γ 7	177.10 20	1.39 5	0.0049
γ 8	178.20 20	0.07 3	0.0033
γ 9	184.45 10	0.240 12	0.0014
γ 10	193.22 10	1.04 4	0.0043
γ 11	198.20 20	0.522 10	0.0022
γ 12	213.36 8	3.45 13	0.0166
γ 13	220.94 13	0.435 15	0.0020
γ 14	224.03 13	0.360 12	0.0017
γ 15	244.28 10	0.409 23	0.0032
γ 16	251.49 10	0.522 10	0.0020
γ 17	257.64 9	0.07 3	0.0004
γ 18	261.55 7	12.2 5	0.0679
γ 19	344.50 20	1.35 5	0.0046
γ 20	347.22 9	1.13 4	0.0044
γ 21	355.57 14	0.522 10	0.0040
γ 22	362.01 15	0.36 4	0.0020
γ 23	376.03 14	0.522 10	0.0042
γ 24	396.96 9	1.40 5	0.0125
γ 25	429.02 11	2.13 11	0.0206
γ 26	444.90 9	2.03 10	0.0363
γ 27	462.11 16	2.96 11	0.0291
γ 28	471.05 9	2.00 7	0.0201
γ 29	478.59 10	1.27 6	0.0160
γ 30	519.40 20	0.435 15	0.0040
γ 31	534.65 11	1.70 6	0.0196
γ 32	574.04 10	3.13 11	0.0393
γ 33	622.03 16	1.39 5	0.0104
γ 34	647.00 8	29.6 11	0.400
γ 35	702.73 12	3.70 13	0.0560
γ 36	731.69 15	1.40 5	0.0231
γ 37	733.89 10	2.07 10	0.0449
γ 38	779.75 10	3.39 12	0.0564
γ 39	795.7 4	1.30 5	0.0221
γ 40	800.51 12	1.91 7	0.0326
γ 41	863.91 13	25.2 9	0.464
γ 42	882.03 12	4.19 15	0.0785
γ 43	897.7 4	0.435 15	0.0093
γ 44	912.50 10	07 3	1.69
γ 45	914.72 13	16.5 6	0.322
γ 46	934.4 3	1.30 5	0.0240
γ 47	970.19 9	9.1 3	0.169
γ 48	980.40 20	2.35 8	0.0691
γ 49	982.90 20	1.13 4	0.0237
γ 50	1029.00 20	1.57 6	0.0343
γ 51	1061.93 11	2.70 10	0.0619
γ 52	1340.90 20	2.52 9	0.0725
γ 53	1453.10 20	2.17 8	0.0676
γ 54	1516.1 3	0.90 4	0.0109
γ 55	1531.6 4	0.07 3	0.0204
γ 56	1537.00 20	1.11 7	0.0647
γ 57	1603.30 20	5.03 20	0.209
γ 58	1704.4 3	0.90 4	0.0347
γ 59	1805.7 3	1.13 4	0.0454
γ 60	2004.9 3	4.70 17	0.201
γ 61	2027.7 4	1.22 5	0.0524
γ 62	2049.2 4	1.40 5	0.0606

133I B- DECAY (20.8 H 1) T(HIN) = 0.10%
 FEEDING TO 133XE (5.245 H)=97.1 J
 FEEDING TO 133XB (2.108 H)=2.9 J
 SEE ALSO 133IE IT DECAY (2.25 D)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	3.43	0.57 9	40
Co-N- 13	445.320 12	0.70 9	0.6074
γ 1 max	170 30		
γ 1 ave	46 9	0.47 5	0.0005
γ 2 max	346 30		
γ 2 ave	104 11	0.5 3	0.0011
γ 3 max	370 30		
γ 3 ave	310 11	1.29 7	0.0030
γ 4 max	470 30		
γ 4 ave	122 11	0.290 20	0.0009
γ 5 max	440 30		
γ 5 ave	140 11	3.52 8	0.0105
γ 6 max	520 30		
γ 6 ave	162 12	3.11 8	0.0107
γ 7 max	710 30		
γ 7 ave	230 12	0.58 6	0.0028
γ 8 max	840 30		
γ 8 ave	299 12	3.8 5	0.0242
γ 9 max	1020 30		
γ 9 ave	352 13	1.74 9	0.0130
γ 10 max	1230 30		
γ 10 ave	441 13	03.6 3	0.705
γ 11 max	1530 30		
γ 11 ave	573 13	1.10 10	0.0134
total B-			
ave	406 15	100.0 7	0.965
X-ray Kα	29.4590 10	0.177 23	0.0001
X-ray Kβ	29.7790 10	0.33 5	0.0002
X-ray Kβ	33.6	0.117 15	40
γ 3	262.67 9	0.375 19	0.0021
γ 4	267.10 8	0.122 16	0.0007
γ 5	345.7 5	0.43 7	0.0031
γ 6	340.9 3	0.20 5	0.0015
γ 7	417.50 20	0.160 10	0.0012
γ 8	422.90 8	0.27 3	0.0028
γ 11	510.545 20	1.04 6	0.0200
γ 13	529.003 13	97.30 20	0.905
γ 15	617.94 3	0.533 10	0.0079
γ 19	670	0.12 3	0.0017
γ 19	680.31 4	0.62 4	0.0094
γ 20	706.666 25	1.47 5	0.0221
γ 21	768.36 4	0.15 3	0.0073
γ 23	870.61 5	0.148 9	0.0026
γ 25	856.361 25	1.19 5	0.0217
γ 27	875.370 25	0.40 11	0.0029
γ 28	949.92 10	0.244 10	0.0047
γ 30	1052.37 3	0.541 10	0.0121
γ 31	1060.17 5	0.740 9	0.0632
γ 32	1236.56 4	1.44 5	0.0379
γ 33	1290.33 3	2.27 7	0.0620
γ 34	1350.54 8	0.140 9	0.0040

12 weak γ's omitted:
 E_γ(ave) = 593.0; E_γ = 0.25%

133XE IT DECAY (2.100 D 0) T(HIN) = 0.10%
 FEEDS 133XB (5.24 D)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	3.43	70 4	0.0051

Continued

133Xe γ DECAY (2.100 D 4) (Continued)
FEEDS 133Xe (5.245 D)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μ ci-h)
Auger-X	24.6	7.8 13	0.9937
ce-K-1	198.62 4	63.30 20	0.268
ce-L-1	227.73 4	29.60 10	0.0999
ce-P-1	232.04 4	4.560 10	0.0225
ce-SOP-1	232.97 4	1.229 10	0.0061
X-ray L	4.1	7.8 24	0.0307
X-ray K_{α}	29.6500 10	16.8 5	0.0100
X-ray K_{β}	29.7790 10	24.7 8	0.0190
X-ray $K\beta$	33.6	19.6 3	0.0376
γ 1	233.10 4	10.3 3	0.0512

133Xe β^- DECAY (5.245 D 6) I(RIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μ ci-h)
Auger-L	3.55	50 5	0.0030
Auger-X	25.5	5.7 8	0.0031
ce-K-1	43.636 11	0.9 4	0.0000
ce-L-2	45.012 5	53 3	0.0509
ce-L-2	75.203 5	0.2 7	0.0131
ce-B-2	79.700 5	1.60 15	0.0029
ce-SOP-2	80.766 5	0.44 4	0.0007
β^- 1 max	206 3		
avg	75.0 10	1.0 0	0.0029
β^- 2 max	306 3		
avg	100.5 10	90.2 0	0.210
total β^- avg	100.0 10	100.0 12	0.213
X-ray L	4.29	6.2 10	0.0006
X-ray K_{α}	30.6251 3	13.7 12	0.0090
X-ray K_{β}	30.9720 3	25.5 22	0.0160
X-ray $K\beta$	35	9.1 0	0.0068
γ 1	79.621 11	0.6 3	0.0010
γ 2	89.997 5	37 3	0.0632

4 weak γ 's omitted:
By (max) = 177.0: I(γ) = 0.07%

134Xe β^- DECAY (41.0 D 8) I(RIM) = 0.10%
FEEDS 134I (52.6 W)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μ ci-h)
Auger-L	3.43	24.0 21	0.0020
Auger-X	23.6	0.7 10	0.0021
ce-L-1	24.3619 3	0.1305 2	0.0
ce-L-3	44.201 10	27.2 7	0.0260
ce-L-4	60.25 3	0.29 11	0.0004
ce-L-3	70.262 10	4.3 3	0.0060
ce-B-3	70.370 10	2.00 9	0.0015
ce-SOP-3	79.264 10	5.211 10	0.0006
ce-F-6	107.72 3	3.12 19	0.0090
ce-X-8	160.07 3	9.95 19	0.0030
ce-L-6	173.76 3	0.67 4	0.0025
ce-R-9	177.261 20	2.1 3	0.0077

Continued

134Xe β^- DECAY (41.0 D 8) (Continued)
FEEDS 134I (52.6 W)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μ ci-h)
ce-Y-6	179.02 3	0.130 8	0.0005
ce-L-8	196.05 3	0.16 6	0.0007
ce-L-4	205.202 20	0.35 11	0.0015
ce-S-11	240.701 20	0.07 6	0.0045
ce-L-11	272.762 20	0.132 25	0.0000
ce-F-12	401.09 5	0.217 22	0.0019
ce-F-13	427.02 3	0.199 11	0.0010
ce-S-15	532.02 3	0.111 15	0.0013
β^- 1 max	606300		
avg	190120	10.4 0	0.0503
β^- 2 max	900300		
avg	260120	42.4 15	0.230
β^- 3 max	900300		
avg	290130	42.4 12	0.262
total β^- avg	260130	30.4 21	0.551

X-ray L	4	3.6 13	0.0003
X-ray K_{α}	20.3172 4	0.9 0	0.0053
X-ray K_{β}	20.6120 3	16.3 7	0.0099
X-ray $K\beta$	32.3	5.72 25	0.0039
γ 2	76.230 20	0.20 3	0.0005
γ 3	79.450 10	20.9 5	0.0350
γ 4	101.42 3	0.23 6	0.0007
γ 5	131.05 20	0.15 3	0.0004
γ 6	180.09 3	17.9 10	0.0491
γ 7	193.05 13	0.6 3	0.0023
γ 9	201.70 3	0.7 7	0.0372
γ 9	210.474 20	21.5 10	0.0979
γ 10	259.59 15	0.40 9	0.0026
γ 11	277.950 20	21.2 10	0.126
γ 12	435.06 5	12.5 13	0.172
γ 13	440.99 3	10.8 7	0.106
γ 14	444.04 0	5.00 23	0.0503
γ 15	565.99 3	19.0 10	0.227
γ 16	636.26 9	2.1 3	0.0204
γ 17	645.05	1.017 17	0.0100
γ 18	712.97 6	0.10 17	0.0622
γ 19	782.59 3	10.7 7	0.232
γ 20	767.20 3	29.5 0	0.489
γ 21	844.06 0	1.2 5	0.0215
γ 22	896.02 9	0.10 6	0.0034
γ 23	925.55 0	1.64 19	0.0320
γ 24	1027.00 10	0.05 12	0.0190

134I β^- DECAY (52.6 D 5) I(RIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μ ci-h)
Auger-L	3.43	1.51 10	0.0001
Auger-X	24.6	0.19 4	0.0
ce-L-1	100.038 22	1.10 7	0.0025
ce-L-1	129.346 22	0.150 13	0.0000
ce-L-7	200.91 3	0.101 14	0.0006
ce-L-12	370.090 20	0.101 6	0.0000
ce-L-31	812.46 3	0.193 4	0.0033
ce-L-30	849.53 3	0.119 3	0.0022
β^- 1 max	770 60		
avg	255 20	1.00 9	0.0000
β^- 2 max	790 60		
avg	261 20	0.33 4	0.0010
β^- 3 max	840 62		
avg	279 20	0.153 19	0.0009

Continued

134I B- DECAZ (52.4 B 5)

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
0-4 MAX	1070.60		
avg	372.25	1.22 7	0.0097
0-5 MAX	1280.60		
avg	460.30	31.6 8	0.310
0-6 MAX	1380.60		
avg	560.30	0.53 6	0.0056
0-7 MAX	1500.60		
avg	550.30	9.1 5	0.0949
0-8 MAX	1560.60		
avg	580.30	16.3 5	0.201
0-9 MAX	1640.60		
avg	680.30	3.67 17	0.0469
0-10 MAX	1700.60		
avg	660.30	7.6 5	0.107
0-11 MAX	1800.60		
avg	690.30	11.2 7	0.165
0-12 MAX	1850.60		
avg	710.30	1.99 16	0.0301
0-13 MAX	2230.60		
avg	880.30	3.7 9	0.0694
0-14 MAX	2420.60		
avg	970.30	11.5 15	0.239
total 0-			
avg	610.00	39.6 23	1.29

4 weak p's omitted:

50 (avg) = 263.5; ETP = 0.23%

X-ray L	8.1	0.17 6	0.0003
X-ray K _α	29.3500 10	0.429 22	0.0005
X-ray K _β	29.7790 10	0.80 4	0.0002
X-ray K _γ	33.6	0.203 15	0.0100
γ 1	125.399 22	3.76 22	0.0020
γ 2	139.03 3	0.69 5	0.0003
γ 3	151.98 15	0.106 12	0.0009
γ 4	162.88 7	0.26 3	0.0020
γ 5	188.47 4	0.70 4	0.0011
γ 6	217.00 20	0.25 3	0.0100
γ 7	235.47 3	1.90 16	0.0008
γ 9	279.00 15	0.131 15	0.0035
γ 10	319.01 6	0.52 5	0.0037
γ 11	351.00 10	0.50 6	0.0638
γ 12	405.451 20	7.3 4	0.0053
γ 13	411.00 8	0.61 6	0.0307
γ 14	433.75 3	4.19 24	0.0127
γ 15	450.92 6	1.30 9	0.0036
γ 16	465.50 10	0.36 4	0.0167
γ 17	488.08 4	1.81 9	0.0256
γ 18	510.00 3	2.34 10	0.0001
γ 19	540.025 25	7.0 5	0.0106
γ 20	565.52 4	0.80 6	0.0026
γ 21	570.75 15	0.21 3	0.100
γ 22	595.362 20	11.4 6	0.100
γ 23	621.790 25	10.6 6	0.0316
γ 24	627.96 3	2.37 14	0.123
γ 25	677.34 3	0.5 5	0.0125
γ 26	706.45 10	0.13 6	0.0297
γ 27	730.74 4	1.91 12	0.0120
γ 28	739.18 8	0.76 8	0.0670
γ 29	766.69 4	0.1 3	0.0091
γ 30	816.38 7	0.52 5	1.72
γ 31	867.025 25	95.01 23	0.127
γ 32	857.20 3	6.96 20	0.0035
γ 33	884.9 3	0.19 3	1.23
γ 34	884.09 3	65.3 10	0.0020
γ 35	922.6 3	0.10 3	0.0015
γ 36	947.06 4	4.04 20	0.0073
γ 37	968.90 5	0.35 4	0.0071
γ 38	974.67 4	4.7 4	0.0023
γ 39	1040.25 10	1.91 19	0.349
γ 40	1072.55 3	15.3 8	0.0161
γ 41	1100.87 12	9.69 6	

Continued

134I E- DECAZ (52.4 B 5)

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
γ 46	1103.80 12	0.73 6	0.3170
γ 47	1136.86 4	4.7 5	0.236
γ 48	1159.70 8	0.35 3	0.0087
γ 49	1164.0 3	0.13 3	0.0033
γ 51	1190.63 8	0.35 3	0.0089
γ 53	1239.9 3	0.21 6	0.0055
γ 55	1269.49 5	0.56 4	0.0152
γ 56	1322.4 3	0.10 4	0.0030
γ 57	1336.00 20	0.14 3	0.0041
γ 58	1352.62 8	0.45 4	0.0129
γ 61	1414.3 5	0.22 6	0.0066
γ 62	1428.2 3	0.17 4	0.0052
γ 63	1431.35 25	0.17 4	0.0052
γ 64	1455.24 5	2.29 15	0.0710
γ 65	1470.60 7	0.77 5	0.0242
γ 66	1505.5 4	0.11 4	0.0037
γ 67	1541.51 7	0.51 4	0.0166
γ 68	1613.00 5	4.36 24	0.156
γ 69	1629.24 8	0.26 4	0.0009
γ 70	1644.25 7	0.40 5	0.0140
γ 71	1655.99 10	0.23 3	0.0081
γ 72	1741.44 5	2.67 19	0.0991
γ 73	1806.84 4	5.7 4	0.220
γ 76	1925.08 10	0.181 19	0.0074
γ 78	2020.6 3	0.172 19	0.0074
γ 79	2159.9 3	0.21 3	0.0097
γ 82	2312.40 20	0.24 3	0.0117
γ 85	2467.4 3	0.153 19	0.0090

22 weak γ's omitted:

E_γ(avg) = 1737.2; ETP = 1.33%134CS IT DECAZ (2.90 B 1)
FEEDS 134CS (2.062 Y)

I (BTR) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	3.55	133 5	0.0100
ce-L- 1	5.5457	4 77.1 4	0.0091
ce-M- 1	10.0424	4 15.77 13	0.0034
ce-NOP- 1	11.0292	4 5.23 3	0.0012
Auger-K	25.5	3.7 5	0.0020
ce-K- 2	91.4354	4 34.7 3	0.0676
ce-K- 3	102.6954	4 0.4 3	0.0010
ce-L- 2	121.7057	4 40.4 3	0.105
ce-N- 2	126.2029	4 4.01 6	0.0242
ce-NOP- 2	127.1892	4 2.272 14	0.0042
ce-L- 3	132.9657	4 0.27 17	0.0008
X-ray L	4.29	16 5	0.0015
γ 1	11.26	0.95 7	0.0392
X-ray K _α	30.6251	3 8.95 20	0.0050
X-ray K _β	30.9729	3 16.6 4	0.0109
X-ray K _γ	35	5.95 15	0.0044
γ 2	127.42	12.9 8	0.0350

130CS B- DECAY (2.062 Y 5) I(HIM) = 2.10E
 SE- DECAY=99.9997 1
 SEC DECAY=0.0003 1

Radiation Type	Energy (keV)	Intensity (%)	A (γ-rad/μCi-h)
Auger-L	3.67	0.66 5	0
ce-K- 5	531.874 15	0.1254 1	0.0014
ce-K- 6	567.258 15	0.091 9	0.0059
ce-K- 7	756.404 22	0.220 4	0.0036
β- 1 max	88.6 4		
avg	23.09 11	27.00 13	0.0135
β- 2 max	415.2 4		
avg	123.43 14	2.00 5	0.0065
β- 3 max	658.8 4		
avg	210.15 15	70.1 5	0.314
total β-			
avg	155.7 3	100.0 6	0.323
X-ray K _α	31.0171 3	0.214 0	0.0001
X-ray K _β	32.1936 3	0.396 13	0.0003
X-ray K _γ	34.4	0.104 6	0.0001
γ 3	475.35 5	1.06 4	0.0140
γ 4	563.227 15	0.30 5	0.101
γ 5	569.315 15	15.47 11	0.107
γ 6	684.699 15	97.5 3	1.26
γ 7	795.045 22	85.4 4	1.05
γ 8	801.932 22	0.73 4	0.109
γ 9	1038.57 3	1.000 10	0.0221
γ 10	1167.94 3	1.00 1	0.0040
γ 11	1255.15 3	3.04 4	0.0004

2 weak γ's omitted:
 E_γ(avg)= 275.9; I_γ= 0.04%

135I B- DECAY (6.61 H 1) I(HIM) = 3.10E
 SPEEDING TO 135XE (9.003 H) E_γ=0.1.6 6
 SPEEDING TO 135XE (15.65 H) E_γ=16.6 6
 SEE ALSO 135XE IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A (γ-rad/μCi-h)
Auger-L	3.43	0.220 17	0
ce-K- 7	105.941 15	0.150 14	0.0006
ce-K- 11	253.090 16	0.121 5	0.0007
β- 1 max	230 40		
avg	65 10	0.109 13	0.0002
β- 2 max	240 40		
avg	60 10	0.126 13	0.0002
β- 3 max	260 40		
avg	70 10	0.140 23	0.0002
β- 4 max	300 40		
avg	96 11	1.02 6	0.0019
β- 5 max	340 40		
avg	90 11	0.91 4	0.0019
β- 6 max	350 40		
avg	103 11	1.39 6	0.0030
β- 7 max	450 40		
avg	137 12	0.73 14	0.0130
β- 8 max	460 40		
avg	105 12	7.33 21	0.0226
β- 9 max	620 40		
avg	194 12	1.57 7	0.0046
β-10 max	660 40		
avg	212 12	1.10 5	0.0050
β-11 max	740 40		
avg	243 13	7.9 3	0.0200
β-12 max	920 40		
avg	271 13	0.61 4	0.0035

Continued

135I B- DECAY (6.61 H 1) (Continued):
 SPEEDING TO 135XE (9.003 H) E_γ=0.1.6 6
 SPEEDING TO 135XE (15.65 H) E_γ=16.6 6
 SEE ALSO 135XE IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A (γ-rad/μCi-h)
β-13 max	920 40		
avg	312 13	9.7 3	0.0570
β-14 max	1030 40		
avg	350 14	21.7 6	0.165
β-15 max	1140 40		
avg	405 14	9.0 3	0.0690
β-16 max	1250 40		
avg	450 14	7.4 3	0.0709
β-17 max	1260 40		
avg	454 14	0.11 5	0.0011
β-18 max	1450 40		
avg	535 14	23.6 10	0.269
β-19 max	1500 40		
avg	591 14	1.2 0	0.0151
β-20 max	2100 40		
avg	857 15	1.8 7	0.0329
total β-			
avg	340 17	99.6 10	0.702

4 weak β's omitted:
 E_β(avg)= 206.4; I_β= 0.15%

X-ray K _α	29.7798 10	0.127 0	0
γ 7	220.502 15	1.75 6	0.0002
γ 9	229.72 3	0.232 9	0.0011
γ 10	260.26 9	0.104 7	0.0010
γ 11	280.451 16	3.09 12	0.0190
γ 12	290.27 4	0.303 21	0.0019
γ 19	361.85 14	0.19 3	0.0013
γ 20	403.03 4	0.232 9	0.0020
γ 21	410.03 3	0.301 18	0.0027
γ 22	417.63 3	3.52 12	0.0313
γ 23	429.93 3	0.303 24	0.0020
γ 24	434.741 19	0.553 24	0.0051
γ 25	451.63 3	0.315 18	0.0030
γ 28	546.557 16	7.13 25	0.0030
γ 29	575.97 4	0.129 23	0.0016
γ 32	649.05 4	0.06 3	0.0063
γ 36	690.13 6	0.129 15	0.0019
γ 37	707.92 5	0.66 6	0.0099
γ 38	705.48 5	0.152 21	0.0025
γ 46	797.71 8	0.17 3	0.0029
γ 42	836.844 16	6.67 24	0.119
γ 44	961.44	0.15 3	0.0030
γ 45	972	0.09 6	0.0144
γ 46	972.6	1.20 6	0.0249
γ 47	995.09 10	0.15 3	0.0033
γ 48	1030.760 21	7.9 3	0.175
γ 50	1101.50 4	1.60 6	0.0376
γ 51	1120.00 4	3.61 12	0.0044
γ 52	1131.511 18	22.5 8	0.543
γ 54	1159.90 20	0.103 23	0.0025
γ 55	1169.04 4	0.07 4	0.0217
γ 58	1240.470 20	0.90 4	0.0230
γ 60	1260.409 17	20.6 10	0.769
γ 66	1367.09 4	0.61 4	0.0177
γ 68	1440.35 10	0.21 3	0.0097
γ 69	1457.54 3	0.6 3	0.260
γ 70	1502.79 4	1.07 5	0.0344
γ 72	1546.41 3	1.29 6	0.0439
γ 73	1670.03 3	9.5 4	0.341
γ 74	1766.44 3	2.09 10	0.109
γ 76	1731.29 3	7.70 25	0.294
γ 77	1830.69 4	0.50 3	0.0226
γ 79	1927.30 3	0.295 15	0.0121
γ 82	2045.80 4	0.07 4	0.0379
γ 87	2255.46 3	0.61 3	0.0294
γ 89	2490.65 4	0.95 5	0.0409

66 weak γ's omitted:
 E_γ(avg)=1973.4; I_γ= 1.50%

135Xe IT DECAY (15.65 Y 10) $I_{\text{BIB}} = 0.10\%$
 S.T. DECAY=99.9964
 FEEDS 135Xe (9.993 H)
 SF- DECAY=0.0035

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	3.43	14.9 8	0.0011
Auger-F	24.6	1.7 3	0.0009
ce-K- 1	492.000 17	15.2 4	0.159
ce-L- 1	521.088 17	2.89 7	0.0321
ce-P30- 1	525.019 17	9.952 23	0.0107
X-ray L	4.7	1.7 5	0.0021
X-ray K_{α}	29.0500 10	3.04 15	0.0020
X-ray K_{β}	29.7790 10	7.1 3	0.0045
X-ray K_{γ}	33.6	2.54 10	0.0010
γ 1	526.561 17	91.0 4	0.900

135Xe B- DECAY (9.093 H 13) $I_{\text{BIB}} = 0.10\%$
 FEEDS 135Cs (2.326 Y)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	3.55	5.3 3	0.0004
Auger-F	25.5	0.60 7	0.0003
ce-K- 3	213.009 15	5.60 7	0.0259
ce-L- 3	244.088 15	0.92 19	0.0040
ce-R- 3	249.577 15	0.19 5	0.0010
β - 1 max	96 4		
avg	25.0 25	9.123 4	0
β - 2 max	550 4		
avg	171 4	3.14 10	0.0114
β - 3 max	750 4		
avg	245 4	0.69 3	0.0035
β - 4 max	960 4		
avg	307 4	96.0 5	0.620
total β -			
avg	302 4	100.0 6	0.643

1 weak β 's omitted:
 $E_{\beta}(\text{avg}) = 49.0$; $I_{\beta} = 0.00\%$

X-ray L	4.29	0.66 19	0
X-ray K_{α}	30.4251 3	3.45 4	0.0009
X-ray K_{β}	30.9720 3	2.64 5	0.0015
X-ray K_{γ}	35	0.961 24	0.0027
γ 1	159.197 19	5.209 10	0.0010
γ 3	249.794 15	49.9 3	0.470
γ 4	350.39 4	0.220 9	0.0017
γ 6	407.990 20	0.350 13	0.0031
γ 8	408.185 16	2.89 4	0.0275

0 weak γ 's omitted:
 $E_{\gamma}(\text{avg}) = 684.3$; $I_{\gamma} = 0.21\%$

135Cs B- DECAY (2.326 Y 3) $I_{\text{BIB}} = 0.10\%$

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
β - 1 max	205 5		
avg	56.3 15	100	0.120

136Cs B- DECAY (13.1 D 7) $I_{\text{BIB}} = 0.10\%$

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	3.47	20.5 12	0.0016
Auger-F	26.4	1.9 5	0.0011
ce-K- 1	29.87 5	7.3 6	0.0046
ce-K- 2	40.05 5	1.95 10	0.0019
ce-L- 1	60.92 5	1.04 4	0.0014
ce-P- 1	65.62 5	0.212 18	0.0003
ce-P- 3	72.22 10	0.377 20	0.0006
ce-L- 2	80.30 5	3.254 13	0.0004
ce-L- 3	103.67 10	7.154 8	0.0003
ce-P- 4	115.70 5	2.35 7	0.0059
ce-P- 5	126.45 5	4.90 14	0.0130
ce-P- 7	139.12 5	0.551 13	0.0016
ce-L- 4	147.23 5	9.674 19	0.0021
ce-P- 8	151.93 5	0.104 4	0.0005
ce-L- 5	157.90 5	3.94 11	0.0130
ce-P- 5	162.60 5	0.951 25	0.0031
ce-P2P- 5	163.64 5	0.233 7	0.0006
ce-P- 10	236.21 4	0.153 4	0.0008
ce-P- 14	303.13 5	1.169 24	0.0075
ce-L- 14	334.58 5	0.201 4	0.0014
ce-P- 18	701.06 4	0.241 5	0.0040
ce-K- 14	1010.63 7	0.1125 2	0.0024

β - 1 max	174.4 20		
avg	47.2 6	1.74 4	0.0017
β - 2 max	191.6 20		
avg	52.3 6	9.21 3	0.0002
β - 3 max	341.0 20		
avg	90.8 7	93.5 19	0.197
β - 4 max	494.2 20		
avg	150.7 7	1.2 6	0.0039
β - 5 max	687.6 20		
avg	219.0 6	2.4 11	0.0112
total β -			
avg	101.3 8	99.0 22	0.214

X-ray L	4.47	2.0 9	0.0003
X-ray K_{α}	31.0171 3	4.90 23	0.0033
X-ray K_{β}	32.1936 3	9.0 4	0.0052
X-ray K_{γ}	36.4	3.20 16	0.0026
γ 1	66.91 5	12.5 10	0.0170
γ 2	86.29 5	6.3 3	0.0116
γ 3	109.66 10	0.409 20	0.0010
γ 4	153.22 5	7.47 16	0.0244
γ 5	163.09 5	4.62 10	0.0161
γ 6	166.53 10	0.63 3	0.0022
γ 7	176.56 5	13.56 20	0.0510
γ 8	187.25 10	0.60 6	0.0024
γ 10	273.65 4	12.86 20	0.0738
γ 14	340.57 5	44.8 5	0.339
γ 16	507.21 10	0.99 5	0.0106
γ 18	818.50 4	94.709 10	1.74
γ 19	1048.07 7	79.4 8	1.79
γ 20	1235.34 5	19.74 20	0.519

0 weak γ 's omitted:
 $E_{\gamma}(\text{avg}) = 769.8$; $I_{\gamma} = 0.45\%$

137Xe B- DECAY (3.83 H 1) $I_{\text{BIB}} = 0.10\%$
 FEEDS 137Cs

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	3.55	0.29 6	0
ce-K- 3	419.53 3	0.36 7	0.0032
Continued			

137Xe B- DECAY (3.63 H 1) (Continued)
FEEDS 137Cs

Radiation Type	Energy (keV)	Intensity (%)	A (e-rad/ μ Ci-h)
β^- 1 max	1043.23		
avg	553.10	0.59	0.0000
β^- 2 max	2275.23		
avg	901.11	0.11	0.0025
β^- 3 max	2426.23		
avg	970.11	0.12	0.0025
β^- 4 max	2560.23		
avg	1031.11	0.05	0.0009
β^- 5 max	2760.23		
avg	1127.11	0.10	0.0043
β^- 6 max	3090.23		
avg	1060.11	0.59	0.0100
β^- 7 max	3007.23		
avg	1640.11	20.0	1.03
β^- 8 max	4303.23		
avg	1862.11	50.2	2.70
total β^- avg	1777.12	100	3.79

11 weak β^- 's omitted:

$E\beta(\text{avg}) = 853.7$; $I\beta = 0.338$

X-ray K_{α}	39.0720	3	0.17	3	0.0001
γ 1	290.00	7	0.115	9	0.0007
γ 2	393.35	5	0.135	9	0.0011
γ 3	455.51	3	10.0	21	0.291
γ 12	809.00	0	0.62	0	0.0113
γ 16	902.10	6	0.196	12	0.0041
γ 23	1119.21	7	0.103	6	0.0025
γ 30	1273.10	10	0.106	15	0.0050
γ 43	1612.50	10	0.116	9	0.0040
γ 47	1703.42	0	0.393	20	0.0109
γ 63	2049.0	15	0.169	10	0.0102

59 weak γ 's omitted:

$E\gamma(\text{avg}) = 1030.7$; $I\gamma = 1.038$

137Cs B- DECAY (30.17 Y 3) $I(\text{BIB}) = 0.106$
SPREADING TO 137Ba (2.522 H)=90.6 %
SEE ALSO 137Ba IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	A (e-rad/ μ Ci-h)
β^- 1 max	511.6	9	
avg	156.0	7	0.316
β^- 2 max	1173.2	5	
avg	415.2	0	5.0 3
total β^- avg	170.0	0	100.0 5

137Ba IT DECAY (2.552 H 2) $I(\text{BIB}) = 0.105$

Radiation Type	Energy (keV)	Intensity (%)	A (e-rad/ μ Ci-h)
Auger-L	3.67	7.6	5
Auger-K	28.4	0.00	22

Continued

137Ba IT DECAY (2.552 H 2) $I(\text{BIB}) = 0.105$

Radiation Type	Energy (keV)	Intensity (%)	A (e-rad/ μ Ci-h)
Ce-K-1	620.200	9	7.09 22
Ce-L-1	655.656	9	1.06 0
Ce-M-1	660.352	9	0.001 13
X-ray L	0.07	1.6	3
X-ray K_{α}	31.0171	3	2.07 9
X-ray K_{β}	32.1936	3	1.02 16
γ -ray $\beta\beta$	36.3	1.29	6
γ 1	661.645	9	90.09 20

137Pm B- DECAY (14.17 H 7) $I(\text{BIB}) = 0.105$
FEEDS 137Cs (32.2 H)

Radiation Type	Energy (keV)	Intensity (%)	A (e-rad/ μ Ci-h)
Auger-L	3.55	09.3	25
Ce-K-1	3.63	5	32 5
Ce-MOP-1	4.62	5	10.6 17
Ce-L-2	5.10	5	51.2 20
Ce-M-2	9.63	5	10.4 0
Ce-MOP-2	10.62	5	3.00 10
Auger-K	25.5	0.02	5
Ce-K-5	117.77	3	1.61 25
Ce-L-5	149.00	3	0.30 16
Ce-K-7	206.50	5	0.201 11
Ce-K-9	222.33	5	1.90 9
Ce-L-9	252.60	5	0.29 6
Ce-K-10	360.05	5	0.130 13
Ce-K-17	390.51	5	0.27 0

β^- 1 max	230.50		
avg	60.16	0.227	17
β^- 2 max	250.50		
avg	70.15	0.06	0
β^- 3 max	400.50		
avg	119.17	3.06	12
β^- 4 max	400.50		
avg	105.10	9.5	0
β^- 5 max	710.50		
avg	231.20	32.6	13
β^- 6 max	720.50		
avg	233.20	0.20	3
β^- 7 max	950.50		
avg	323.21	0.23	3
β^- 8 max	1370.50		
avg	490.22	0.16	3
β^- 9 max	1530.50		
avg	571.22	0.19	0
β^- 10 max	1750.50		
avg	602.23	0.27	0
β^- 11 max	2290.50		
avg	900.23	20.1	9
β^- 12 max	2330.50		
avg	925.23	12.0	7
β^- 13 max	2080.50		
avg	996.23	5.1	10
β^- 14 max	2720.50		
avg	1107.23	9	7
β^- 15 max	2730.50		
avg	1109.23	5	5
total β^- avg	610.00	100	9

3 weak β^- 's omitted:

$E\beta(\text{avg}) = 637.2$; $I\beta = 0.178$

Continued

138Ce B- DECAY (14.17 ± 7) I(HIM) = 0.10%
PURCS 138CS (32.2 %)

Radiation Type	Energy (keV)	Intensity (%)	A(γ-rad/μCi-h)
X-ray L	4.29	6.1 17	0.0006
γ 1	4.85 5	0.14 3	0
γ 2	13.95 5	0.644 25	0.0002
K-ray Sm _g	30.6251 3	1.03 7	0.0007
K-ray Kα _g	30.9778 3	1.80 13	0.0013
K-ray Kβ	35	0.64 5	0.0005
γ 5	153.75 7	5.55 25	0.0195
γ 7	242.56 5	3.58 14	0.0181
γ 8	258.31 5	31.5 13	0.173
γ 9	282.51 6	0.429 20	0.0026
γ 12	335.20 9	0.107 11	0.0009
γ 13	371.84 5	0.50 3	0.0040
γ 14	396.43 5	6.2 3	0.0532
γ 15	461.36 5	2.17 13	0.0106
γ 17	434.45 5	27.3 9	0.149
γ 18	500.22 6	0.362 19	0.0039
γ 19	530.07 7	0.252 16	0.0020
γ 21	537.76 13	0.117 17	0.0013
γ 23	555.75 9	0.117 14	0.0014
γ 24	549.53 6	0.304 19	0.0037
γ 27	508.84 8	0.123 11	0.0015
γ 30	654.00 8	0.145 14	0.0020
γ 47	845.82 7	0.246 22	0.0055
γ 49	844.35 6	0.62 4	0.0115
γ 50	896.87 12	0.132 14	0.0025
γ 52	912.51 7	0.329 22	0.0044
γ 53	917.13 6	6.52 4	0.0100
γ 54	936.36 17	0.135 9	0.0027
γ 55	941.25 8	0.230 3	0.0046
γ 60	1093.87 9	0.41 1	0.0095
γ 61	1098.77 11	0.213 19	0.0050
γ 62	1102.74 17	0.107 14	0.0025
γ 63	1114.29 10	1.47 9	0.0350
γ 64	1141.64 7	0.11 1	0.0125
γ 65	1145.44 10	0.132 20	0.0032
γ 80	1571.84 16	0.26 3	0.0099
γ 82	1614.57 18	0.24 3	0.0091
γ 84	1749.24 13	16.7 7	0.630
γ 87	1812.54 18	0.190 20	0.0069
γ 88	1850.84 13	1.42 7	0.0561
γ 90	1925.34 14	0.56 4	0.0231
γ 91	2004.75 14	5.35 23	0.229
γ 92	2015.82 14	12.3 5	0.526
γ 94	2079.17 14	1.44 7	0.0639
γ 95	2252.26 14	2.29 11	0.110
γ 97	2321.90 14	0.62 4	0.0307
γ 99	2475.24 14	0.312 20	0.0164
γ 101	2497.56 17	0.173 14	0.0092

57 weak γ's omitted:
 E_γ(avg) = 1118.6; I_γ = 2.66%

138CS B- DECAY (32.2 ± 1) I(HIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(γ-rad/μCi-h)
Auger-L	3.47	1.01 12	0
Auger-F	26.4	0.11 3	0
ce-K- 2	100.64 6	0.58 10	0.0012
ce-L- 2	132.11 6	0.14 7	0.0008
ce-R- 6	149.32 6	0.133 4	0.0005
ce-R- 10	425.35 7	0.317 9	0.0029

Continued

138CS B- DECAY (32.2 ± 1) (Continued)

Radiation Type	Energy (keV)	Intensity (%)	A(γ-rad/μCi-h)
γ- 1 max	640 70		
avg	219 70	0.257 25	0.0011
γ- 2 max	770 70		
avg	240 30	0.163 14	0.0039
γ- 3 max	1050 70		
avg	340 30	0.163 9	0.0068
γ- 4 max	1210 70		
avg	430 30	0.14 3	0.0017
γ- 5 max	1350 70		
avg	490 30	0.40 6	0.0050
γ- 6 max	1370 70		
avg	500 30	0.204 24	0.0022
γ- 7 max	1600 70		
avg	600 30	0.30 3	0.0034
γ- 8 max	1640 70		
avg	620 30	0.43 7	0.0057
γ- 9 max	1920 70		
avg	740 40	0.227 13	0.0036
γ- 10 max	1950 70		
avg	750 40	0.171 20	0.0027
γ- 11 max	2050 70		
avg	800 40	0.273 20	0.0047
γ- 12 max	2130 70		
avg	830 40	0.34 3	0.0060
γ- 13 max	2240 70		
avg	880 40	0.164 24	0.0032
γ- 14 max	2300 70		
avg	910 40	0.64 4	0.0124
γ- 15 max	2360 70		
avg	940 40	0.20 4	0.0040
γ- 16 max	2410 70		
avg	960 40	0.37 20	0.0076
γ- 17 max	2440 70		
avg	970 40	0.20 5	0.0041
γ- 18 max	2510 70		
avg	1010 40	1.60 7	0.0344
γ- 19 max	2650 70		
avg	1070 40	8.75 24	0.199
γ- 20 max	2710 70		
avg	1100 40	1.67 8	0.0391
γ- 21 max	2840 70		
avg	1160 40	44.0 7	1.09
γ- 22 max	2370 70		
avg	1170 40	0.56 6	0.0164
γ- 23 max	2980 70		
avg	1220 40	7.3 3	0.190
γ- 24 max	3070 70		
avg	1270 40	12.9 4	0.349
γ- 25 max	3390 70		
avg	1410 40	13.7 7	0.411
γ- 26 max	3850 70		
avg	1630 40	4.3 18	0.149
total 0-			
avg	1200 40	99.9 22	2.55

6 weak β's omitted:
 E_β(avg) = 663.1; I_β = 0.29%

X-ray L	4.47	0.14 4	0
X-ray Kα _g	31.8171 3	0.24 3	0.0092
X-ray Kα _g	32.1936 3	0.53 5	0.0094
X-ray Kβ	36.4	0.194 18	0.0062
γ 1	112.60 13	0.130 23	0.0003
γ 2	138.10 6	1.49 9	0.0044
γ 3	191.96 6	0.50 4	0.0021
γ 4	193.89 8	0.328 23	0.0014
γ 5	212.32 8	0.175 14	0.0008
γ 6	227.74 6	1.51 4	0.0073
γ 7	324.90 8	0.290 19	0.0020
γ 9	342.92 9	0.24 13	0.0019
γ 10	365.29 13	0.191 23	0.0015

Continued

139CS B- DECAY (37.2 H 1) (Continued)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
γ 12	400.99 6	0.65 10	0.0006
γ 13	421.59 7	0.427 23	0.0030
γ 14	462.79 7	30.7 7	0.303
γ 15	516.74 12	0.43 5	0.0007
γ 16	546.94 7	19.76 24	0.125
γ 19	603.55 15	0.109 14	0.0016
γ 23	766.10 12	0.146 15	0.0024
γ 24	773.31 10	0.233 19	0.0030
γ 25	782.00 9	0.33 3	0.0055
γ 31	871.80 8	5.11 14	0.0949
γ 32	880.8 3	0.11 3	0.0021
γ 33	935.03 12	0.101 16	0.0036
γ 36	1009.70 8	29.0 7	0.642
γ 38	1054.32 15	0.150 19	0.0036
γ 39	1147.22 9	1.24 7	0.0304
γ 40	1199.15 24	0.17 3	0.0043
γ 41	1203.69 13	0.40 4	0.0102
γ 42	1264.94 16	0.137 17	0.0037
γ 43	1303.59 9	1.14 6	0.0328
γ 46	1415.60 13	0.37 3	0.0110
γ 47	1435.06 9	76.3 16	2.33
γ 48	1445.00 25	0.57 19	0.0290
γ 49	1495.63 23	0.10 4	0.0058
γ 50	1555.31 10	0.346 23	0.0121
γ 51	1614.09 26	0.137 23	0.0047
γ 52	1717.1 3	0.107 23	0.0039
γ 53	1727.60 18	0.111 13	0.0041
γ 55	1778.25 23	0.137 23	0.0052
γ 60	2023.93 20	0.119 16	0.0051
γ 61	2062.34 17	0.111 12	0.0049
γ 64	2210.7 4	0.21 7	0.0101
γ 65	2218.00 10	15.2 4	0.717
γ 67	2499.4 3	0.17 5	0.0009
γ 69	2503.15 13	0.239 16	0.0131
γ 71	2639.59 13	7.63 23	0.429
γ 72	2731.12 15	0.120 9	0.0070
γ 78	3339.01 25	0.151 10	0.0107
γ 90	3366.90 25	0.227 13	0.0163

39 weak γ's omitted:
E_γ(avg) = 1613.2; I_γ = 1.62%

139CS B- DECAY (9.40 H 12) I (BIB) = 0.10%
FEEDS 139Ba

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
β- 1 max	620 70		
avg	200 30	0.15 10	0.0006
β- 2 max	830 70		
avg	270 30	0.16 7	0.0009
β- 3 max	930 70		
avg	310 30	0.10 4	0.0007
β- 4 max	1290 70		
avg	479 30	0.13 8	0.0013
β- 5 max	1300 70		
avg	470 30	0.13 5	0.0013
β- 6 max	1440 70		
avg	530 30	0.10 7	0.0011
β- 7 max	1640 70		
avg	620 30	0.23 10	0.0030
β- 8 max	1680 70		
avg	630 30	0.56 21	0.0075
β- 9 max	1760 70		
avg	670 40	0.12 5	0.0017

Continued

139CS B- DECAY (9.40 H 12) (Continued)
FEEDS 139Ba

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
β- 10 max	1760 70		
avg	670 40	0.53 21	0.0076
β- 11 max	1910 70		
avg	730 40	0.15 6	0.0023
β- 12 max	1940 70		
avg	750 40	1.3 5	0.0200
β- 13 max	2070 70		
avg	810 40	0.10 4	0.0017
β- 14 max	2120 70		
avg	830 40	0.29 11	0.0051
β- 15 max	2180 70		
avg	860 40	0.9 3	0.0139
β- 16 max	2200 70		
avg	870 40	0.12 5	0.0022
β- 17 max	2250 70		
avg	890 40	0.21 9	0.0040
β- 19 max	2270 70		
avg	900 40	0.16 8	0.0031
β- 19 max	2340 70		
avg	930 40	0.27 11	0.0053
β- 20 max	2360 70		
avg	940 40	0.31 12	0.0062
β- 21 max	2410 70		
avg	960 40	0.36 14	0.0074
β- 22 max	2480 70		
avg	960 40	0.29 11	0.0059
β- 23 max	2480 70		
avg	970 40	0.12 5	0.0025
β- 24 max	2590 70		
avg	1040 40	0.15 6	0.0033
β- 25 max	2610 70		
avg	1050 40	0.45 17	0.0101
β- 26 max	2670 70		
avg	1080 40	0.38 15	0.0097
β- 27 max	2870 70		
avg	1170 40	0.38 16	0.0095
β- 29 max	2980 70		
avg	1220 40	0.24 10	0.0062
β- 29 max	3010 70		
avg	1240 40	6.3 24	0.166
β- 30 max	4290 70		
avg	1830 40	94 6	3.27
total β-			
avg	1690 50	100 7	3.60

31 weak β's omitted:
E_β(avg) = 559.8; I_β = 1.35%

γ 20	454.66 6	0.13 5	0.0013
γ 24	531.98 4	0.21 9	0.0024
γ 29	567.72 5	0.13 6	0.0016
γ 37	677.24 3	1.5 5	0.0206
γ 54	827.52 7	0.11 5	0.0019
γ 61	929.18 6	0.23 9	0.0046
γ 63	966.46 8	0.10 9	0.0020
γ 80	1190.42 6	0.10 7	0.0047
γ 84	1203.23 5	7 3	0.197
γ 85	1206.09 11	0.11 4	0.0029
γ 86	1308.13 6	0.37 15	0.0104
γ 88	1321.77 6	0.23 9	0.0066
γ 93	1410.50 7	0.15 6	0.0045
γ 94	1420.66 6	0.9 3	0.0242
γ 107	1620.74 6	0.42 14	0.0144
γ 109	1609.72 6	0.60 23	0.0217
γ 111	1690.66 7	0.10 7	0.0046
γ 122	1877.45 7	0.34 13	0.0136
γ 123	1887.57 7	0.22 9	0.0080
γ 124	1944.50 7	0.12 5	0.0050
γ 125	1923.40 7	0.24 10	0.0101
γ 130	2020.76 25	0.13 7	0.0054
γ 134	2099.91 9	0.14 6	0.0061

Continued

139CS B- DECAY (9.46 H 12) (Continued)
FEEDS 139Ba

Radiation Type	Energy (keV)	Intensity (%)	Δ (μ -rad/ μ Ci-h)
γ 136	2110.91 6	0.66 25	0.0293
γ 139	2173.93 7	0.20 8	0.0093
γ 147	2349.92 6	0.56 22	0.0281
γ 150	2390.66 7	0.19 8	0.0095
γ 155	2531.24 7	0.42 16	0.0225
γ 156	2605.75 6	0.24 10	0.0135
γ 157	2649.32 7	0.17 7	0.0094
γ 161	2847.63 8	0.19 7	0.0061
γ 172	3464.34 9	0.11 5	0.0090
γ 174	3665.61 9	0.14 10	0.0107

149 weak γ 's omitted:
 $E_{\gamma}(\text{avg})=1569.5$; $I_{\gamma}=3.97\%$

139Ba B- DECAY (22.7 H 2) $I(\text{BIB})=0.10\%$

Radiation Type	Energy (keV)	Intensity (%)	Δ (μ -rad/ μ Ci-h)
Auger-L	3.9	3.7 5	0.0003
Auger-K	27.4	0.40 13	0.0002
ce-F- 1	126.925 20	4.2 6	0.0115
ce-L- 1	159.584 20	0.57 9	0.0019
ce-K- 1	164.449 20	0.114 16	0.0004
β - 1 max	286 5		
avg	297.9 20	0.3490 2	0.0022
β - 2 max	2141 5		
avg	237.5 23	24 3	0.022
β - 3 max	2307 5		
avg	912.5 23	75 3	1.46
total β -			
avg	891.0 23	99 5	1.49

14 weak β 's omitted:
 $E_{\beta}(\text{avg})=307.3$; $I_{\beta}=0.07\%$

X-ray L	4.65	0.56 15	0
X-ray K_{α}	33.03410 2	1.09 15	0.0009
X-ray K_{β}	33.04180 2	2.0 3	0.0014
X-ray K_{β}	37.8	0.74 10	0.0006
γ 1	165.850 20	18.8 24	0.0664
γ 12	1420.50 20	0.3	0.0091

26 weak γ 's omitted:
 $E_{\gamma}(\text{avg})=1271.1$; $I_{\gamma}=0.12\%$

140Ba B- DECAY (12.789 D 6) $I(\text{BIB})=0.10\%$
FEEDS 140La

Radiation Type	Energy (keV)	Intensity (%)	Δ (μ -rad/ μ Ci-h)
Auger-L	3.9	100 17	0.0081
ce-L- 1	7.50 5	51 13	0.0083
ce-F- 1	12.49 5	11 3	0.0029
ce-KCF- 1	13.50 5	3.5 9	0.0010
ce-L- 2	23.70 5	62 15	0.0311
Auger-F	27.4	0.16 5	0

Continued

140Ba B- DECAY (12.789 D 6) (Continued)
FEEDS 140La

Radiation Type	Energy (keV)	Intensity (%)	Δ (μ -rad/ μ Ci-h)
ce-F- 2	28.61 5	13 3	0.0077
ce-KCF- 2	29.70 5	4.2 10	0.0027
ce-F- 5	123.72 5	1.24 22	0.0035
ce-L- 5	154.37 5	0.19 3	0.0006
ce-F- 6	265.91 4	9.151 25	0.0009
ce-F- 10	499.40 8	0.21 4	0.0022
β - 1 max	454 10		
avg	136 4	20 4	0.0579
β - 2 max	567 10		
avg	177 4	7.9 13	0.0299
β - 3 max	672 10		
avg	366 4	3.9 7	0.0254
β - 4 max	941 10		
avg	340 4	44 14	0.319
β - 5 max	1005 10		
avg	357 4	24 23	0.162
total β -			
avg	289 5	190 25	0.614
X-ray L	4.65	15 5	0.0015
γ 1	13.85 5	1.2 3	0.0004
γ 2	29.97 5	1.4 4	0.0091
X-ray K_{α}	33.03410 2	0.44 6	0.0003
X-ray K_{β}	33.04180 2	0.90 11	0.0006
X-ray K_{β}	37.8	0.30 4	0.0002
γ 4	132.44 12	0.16 3	0.0005
γ 5	162.64 5	5.6 9	0.0195
γ 6	344.83 6	3.4 6	0.0222
γ 7	423.41 8	2.5 5	0.0229
γ 9	437.60 3	1.5 3	0.0144
γ 9	467.57 5	0.119 21	0.0012
γ 10	537.32 8	2.9 4	0.227

1 weak γ 's omitted:
 $E_{\gamma}(\text{avg})=118.8$; $I_{\gamma}=0.04\%$

140La B- DECAY (40.22 H 2) $I(\text{BIB})=0.10\%$

Radiation Type	Energy (keV)	Intensity (%)	Δ (μ -rad/ μ Ci-h)
Auger-L	4	1.53 11	0.0001
ce-L- 1	18.0512 5	0.25 3	0
Auger-K	28.4	0.15 5	0
ce-F- 3	28.473 6	0.18 5	0.0001
ce-F- 4	68.975 7	0.159 12	0.0002
ce-F- 5	90.678 8	0.227 15	0.0004
ce-F- 10	288.325 12	0.73 3	0.0045
ce-K- 15	446.586 19	0.415 9	0.0040
β - 1 max	1213.0 20		
avg	430.3 9	0.63 3	0.0050
β - 2 max	1238.9 20		
avg	441.1 9	10.2 4	0.101
β - 3 max	1244.4 20		
avg	443.5 9	5.31 22	0.0502
β - 4 max	1279.3 20		
avg	458.2 9	1.13 10	0.0110
β - 5 max	1296.2 20		
avg	465.3 9	5.4 3	0.0535
β - 6 max	1348.2 20		
avg	487.4 9	41.4 9	0.430
β - 7 max	1410.5 20		
avg	513.9 9	0.19 7	0.0021

Continued

140La B- DECAY (60.22 H 2) (Continued)			
Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μ Ci-h)
β^- max	1412.3 20		
avg	510.7 9	4.00 21	0.0531
β^- 9 max	1677.0 20		
avg	629.5 9	20.0 7	0.274
β^- 10 max	2160.1 20		
avg	846.2 5	10.0 9	0.130
total β^-			
avg	540.6 10	100.3 16	1.16

5 weak β^- 's omitted:
 $Z\beta(\text{avg}) = 330.2$; $E\beta = 0.15\%$

X-ray L	4.90	0.23 6	0.00
X-ray $K_{\alpha 1}$	34.27090 2	0.000 21	0.0003
X-ray $K_{\alpha 2}$	34.71970 2	0.01 4	0.0006
X-ray $K_{\beta 1}$	37.3	0.303 15	0.0003
γ 4	109.618 7	0.209 15	0.0005
γ 5	131.121 8	0.00 3	0.0013
γ 6	173.550 11	0.120 23	0.0005
γ 7	241.966 12	0.39 3	0.0020
γ 8	266.551 10	0.07 3	0.0027
γ 10	320.769 12	15.5 6	0.110
γ 11	347.79 11	0.11 4	0.0009
γ 12	432.53 3	2.72 15	0.0251
γ 15	497.029 19	43.00 21	0.446
γ 17	751.83 8	4.20 20	0.0673
γ 18	815.05 7	22.5 7	0.390
γ 19	867.82 10	5.0 3	0.0529
γ 20	919.63 15	2.52 16	0.0494
γ 21	925.20 9	6.8 3	0.130
γ 23	951.0 4	0.53 3	0.0107
γ 24	1596.89 20	45.56 17	3.25
γ 26	2340.1 7	0.06 6	0.0030
γ 28	2521.7 5	3.00 19	0.185
γ 30	2547.5 6	0.105 7	0.0957

10 weak γ 's omitted:
 $E\gamma(\text{avg}) = 1305.9$; $E\gamma = 0.33\%$

141Ba B- DECAY (10.27 H 7) I (BIM) = 0.10% FEEDS 141La			
Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μ Ci-h)
Auger-L	3.0	6.3 7	0.0005
Auger-K	27.4	0.67 20	0.0003
ce-K- 4	151.30 8	7.2 7	0.0231
ce-L- 4	183.95 8	0.95 9	0.0037
ce-M- 4	189.06 8	0.197 18	0.0009
β^- 1 max	560 50		
avg	170 19	0.59 12	0.0022
β^- 2 max	590 50		
avg	185 19	0.23 5	0.0009
β^- 3 max	640 50		
avg	205 19	0.17 4	0.0007
β^- 4 max	650 50		
avg	208 19	0.77 16	0.0030
β^- 5 max	810 50		
avg	269 20	0.62 13	0.0036
β^- 6 max	850 50		
avg	283 20	0.50 11	0.0033
β^- 7 max	1100 50		
avg	306 21	2.2 3	0.0181
β^- 8 max	1160 50		
avg	400 21	6.0 7	0.0556

Continued

141Ba B- DECAY (10.27 H 7) FEEDS 141La (Continued)			
Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μ Ci-h)
β^- 9 max	1190 50		
avg	420 21	2.5 3	0.0220
β^- 10 max	1290 50		
avg	463 22	2.4 3	0.0237
β^- 11 max	1060 50		
avg	511 22	2.2 3	0.0239
β^- 12 max	1060 50		
avg	539 22	0.20 10	0.0023
β^- 13 max	1530 50		
avg	566 22	6.3 7	0.0760
β^- 14 max	1600 50		
avg	599 22	0.30 10	0.0030
β^- 15 max	1040 50		
avg	703 23	0.39 10	0.0045
β^- 16 max	1860 50		
avg	711 23	1.40 20	0.0212
β^- 17 max	1940 50		
avg	759 23	3.5 4	0.0565
β^- 18 max	2040 50		
avg	791 23	0.20 10	0.0030
β^- 19 max	2100 50		
avg	819 23	12.0 20	0.209
β^- 20 max	2200 50		
avg	863 23	2.00 20	0.0360
β^- 21 max	2200 50		
avg	656 23	0.50 10	0.0092
β^- 22 max	2300 50		
avg	907 23	23 3	0.460
β^- 23 max	2560 50		
avg	1029 23	19.0 20	0.395
β^- 24 max	2900 50		
avg	1156 23	12 3	0.295
β^- 25 max	3030 50		
avg	1200 20	5 5	0.132
total β^-			
avg	850 30	133 8	1.67

1 weak β^- 's omitted:
 $E\beta(\text{avg}) = 770.0$; $E\beta = 0.09\%$

X-ray L	4.65	0.90 20	0.00
X-ray $K_{\alpha 1}$	33.03010 2	1.05 16	0.0013
X-ray $K_{\alpha 2}$	33.44180 2	3.0 4	0.0024
X-ray $K_{\beta 1}$	37.0	1.25 12	0.0010
γ 1	112.90 9	0.53 9	0.0022
γ 2	162.96 12	0.04 5	0.0015
γ 3	190.50 9	0.09 5	0.0019
γ 4	190.22 8	0.06 4	0.146
γ 7	276.99 8	23.3 20	0.137
γ 9	300.24 8	25.2 22	0.163
γ 10	343.71 8	10.2 13	0.104
γ 11	309.35 20	0.29 6	0.0021
γ 12	360.30 10	0.50 6	0.0045
γ 13	381.31 22	0.115 25	0.0009
γ 14	389.78 9	1.32 12	0.0110
γ 16	457.58 8	0.02 5	0.0066
γ 17	462.15 8	0.02 5	0.0071
γ 18	467.26 9	5.5 5	0.0505
γ 20	522.19 19	0.43 7	0.0040
γ 21	520.20 20	0.40 7	0.0045
γ 22	527.02 13	0.30 5	0.0042
γ 26	572.09 19	0.25 4	0.0031
γ 27	572.09 19	0.25 4	0.0031
γ 29	599.20 19	0.23 4	0.0030
γ 30	608.91 18	0.24 4	0.0032
γ 31	625.23 8	3.3 3	0.0435
γ 32	636.05 20	0.20 5	0.0030
γ 33	641.30 16	0.36 6	0.0059
γ 34	647.00 8	5.6 5	0.0778
γ 35	670.04 20	0.10 4	0.0026
γ 36	670.2 10	0.11 11	0.0015

Continued

TABLE E- DECAY (10.27 H 7)
FEES 1011A

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
γ 37	685.7 6	0.13 6	0.0019
γ 39	687.8 7	0.10 5	0.0015
γ 39	698.5 4	0.28 12	0.0042
γ 40	700.0 5	0.21 12	0.0032
γ 41	704.80 14	0.30 4	0.0045
γ 42	739.10 8	0.3 4	0.0073
γ 45	762.2 4	0.14 4	0.0022
γ 46	770.2 5	0.11 4	0.0016
γ 49	826.34 19	0.33 5	0.0057
γ 50	831.72 9	1.51 14	0.0268
γ 51	832.6 8	0.16 19	0.0029
γ 53	867.9 4	0.15 4	0.0027
γ 54	876.29 8	3.4 3	0.0635
γ 55	888.6 3	0.29 5	0.0037
γ 57	904.4 6	7.12 5	0.0924
γ 58	929.47 10	0.69 7	0.0138
γ 59	943.25 12	0.73 4	0.0146
γ 61	981.63 13	0.79 4	0.0163
γ 62	996.6 4	0.12 4	0.0026
γ 63	1012.3 6	0.10 4	0.0022
γ 64	1034.49 24	0.29 5	0.0065
γ 66	1046.32 21	0.34 6	0.0077
γ 67	1094.0 3	0.22 5	0.0051
γ 68	1160.8 5	9.24 10	0.0059
γ 69	1160.94 9	0.92 11	0.0227
γ 70	1197.47 8	4.6 4	0.117
γ 71	1224.79 16	0.41 6	0.0107
γ 72	1235.5 4	0.14 4	0.0038
γ 73	1264.20 14	0.42 9	0.0220
γ 74	1273.64 19	0.52 7	0.0140
γ 75	1278.24 16	0.64 9	0.0179
γ 76	1359.1 7	9.23 12	0.0065
γ 77	1311.2 3	0.60 15	0.0167
γ 78	1323.72 10	9.54 4	0.0266
γ 79	1345.27 25	0.22 4	0.0063
γ 80	1376.99 14	0.79 3	0.0206
γ 81	1465.59 25	0.27 5	0.0081
γ 82	1436.94 13	0.82 9	0.0252
γ 83	1458.56 14	0.69 9	0.0210
γ 84	1501.82 21	0.31 5	0.0099
γ 86	1550.55 19	0.31 5	0.0102
γ 87	1568.81 25	0.25 5	0.0055
γ 92	1657.95 12	0.75 8	0.0263
γ 93	1682.35 10	1.34 13	0.0450
γ 94	1713.23 22	0.17 3	0.0062
γ 96	1735.6 4	0.18 4	0.0068
γ 97	1740.83 21	0.31 5	0.0116
γ 98	1795.85 18	0.49 6	0.0185
γ 102	1912.7 4	0.129 25	0.0052
γ 104	1990.3 3	0.18 3	0.0078
γ 105	2026.56 23	0.39 6	0.0163
γ 107	2136.7 4	0.110 20	0.0050
γ 108	2164.7 3	0.16 3	0.0072
γ 112	2469.0 4	0.18 4	0.0097

37 weak γ's omitted:
E_γ(avg)=1159.1; I_γ= 2.13%

TABLE B- DECAY (3.93 H 6)
FEES 101CE

I(BIB) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
β ⁻ 1 max	740 30		
avg	239 12	0.14	0.0007

Continued

TABLE B- DECAY (3.93 H 6)
FEES 101CF

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
β ⁻ 2 max	1080 30		
avg	373 11	2.6	0.0207
β ⁻ 3 max	2430 30		
avg	967 14	37	2.90
total β ⁻	avg	948 15	100
			2.92

9 weak β's omitted:
E_β(avg)= 105.9; I_β= 7.25%

γ 13	1354.52 4	2.69 14	0.0750
γ 14	1453.31 11	0.117 4	0.0042

24 weak γ's omitted:
E_γ(avg)=1494.3; I_γ= 0.31%

TABLE B- DECAY (32.50 D 7)

I(BIB) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	4	16.1 10	0.0014
Auger-F	29.4	1.6 5	0.0010
ce-K- 1	103.449 10	19.6 9	0.0410
ce-L- 1	134.605 10	2.57 11	0.0076
ce-M- 1	143.929 10	9.534 25	0.0016
ce-NOP- 1	145.135 10	0.148 7	0.0005
β ⁻ 1 max	434.8 15		
avg	129.7 6	70 3	0.193
β ⁻ 2 max	540.2 15		
avg	180.7 6	10 3	0.115
total β ⁻	avg	145.0 7	100 5
			0.304
I-ray L	5	2.6 4	0.0003
I-ray K _α	35.55020 2	4.2 3	0.0037
I-ray K _β	36.02830 2	8.4 5	0.0068
I-ray K _γ	40.7	3.33 14	0.0029
γ 1	145.440 10	48.0 20	0.149

TABLE B- DECAY (10.7 H 1)
FEES 1021A

I(BIB) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	3.8	19.1 12	0.0015
Auger-K	27.4	2.0 6	0.0012
ce-K- 3	30.63 10	21.6 4	0.0178
ce-L- 3	71.33 10	2.23 5	0.0044
ce-M- 3	76.24 10	0.606 11	0.0010
ce-NOP- 3	77.33 10	0.167 3	0.0003
β ⁻ 1 max	740100		
avg	240 40	14.6	0.0746
β ⁻ 2 max	920100		
avg	310 40	0.19	0.0013

Continued

102Ba B- DECAY (10.7 H 1) (Continued)
FEES 102Ba

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
β- 3 max	1000.100		
avg	340.40	46.2	0.335
β- 4 max	1120.100		
avg	370.50	20.6	0.171
β- 5 max	1330.100		
avg	400.50	0.52	0.0053
β- 6 max	1390.100		
avg	510.50	0.35	0.0030
β- 7 max	1410.100		
avg	510.50	0.92	0.0009
β- 9 max	1610.100		
avg	600.50	0.43	0.0055
β- 9 max	1700.100		
avg	670.50	5.3	0.0756
β-10 max	1770.100		
avg	670.50	3.6	0.0514
β-11 max	1900.100		
avg	730.50	0.3	0.0008
β-12 max	1940.100		
avg	750.50	1.8	0.0289
β-13 max	2120.100		
avg	830.50	6.4	0.113
total β- avg	410.50	101.12	0.079
X-ray L	4.65	2.8 7	0.0003
X-ray K _α	33.03410 2	5.56 21	0.0039
X-ray K _β	33.44100 2	10.2 4	0.0073
X-ray K _γ	37.8	3.76 15	0.0030
γ 1	69.4 3	0.412	0.0006
γ 2	76.0 6	1.03 9	0.0017
γ 3	77.60 10	11.124	0.0184
γ 4	122.89 8	1.07 15	0.0020
γ 5	154.22 9	0.60 9	0.0020
γ 6	162.00 20	0.12 9	0.0004
γ 7	176.82 8	1.71 21	0.0064
γ 8	216.30 10	0.23 7	0.0010
γ 9	222.60 10	0.31 7	0.0015
γ 10	231.52 4	11.8 17	0.0581
γ 11	242.70 20	0.19 9	0.0010
γ 12	255.12 4	20.6 19	0.112
γ 13	269.33 9	0.79 11	0.0045
γ 14	283.9 3	0.21 9	0.0012
γ 15	286.20 10	1.07 17	0.0065
γ 16	309.02 5	2.4 4	0.0172
γ 17	334.00 10	1.44 21	0.0103
γ 18	337.10 20	0.29 7	0.0021
γ 19	346.7 5	0.16 9	0.0012
γ 20	363.00 5	4.6 7	0.0354
γ 21	379.10 10	0.54 9	0.0043
γ 22	417.8 3	0.39 9	0.0035
γ 23	425.03 6	5.7 9	0.0513
γ 24	432.3 3	1.13 17	0.0104
γ 25	434.4 4	0.35 7	0.0032
γ 26	448.1 5	0.25 7	0.0024
γ 27	457.30 20	0.45 9	0.0044
γ 28	473.40 20	0.35 7	0.0035
γ 29	488.3 5	0.12 9	0.0013
γ 30	513.3 5	0.27 11	0.0029
γ 31	531.9 6	0.10 9	0.0012
γ 32	537.5 5	0.12 9	0.0010
γ 33	558.3 3	0.35 7	0.0042
γ 34	590.7 3	0.29 7	0.0036
γ 35	599.04 8	1.85 21	0.0237
γ 36	604.2 3	0.37 9	0.0040
γ 37	769.40 20	0.70 9	0.0115
γ 38	786.4 3	0.29 9	0.0040
γ 39	792.2 4	0.25 9	0.0042
γ 40	823.4 3	0.47 9	0.0083
γ 41	848.23 7	3.5 6	0.0627
γ 42	894.90 10	12.7 10	0.291

Continued

102Ba E- DECAY (10.7 H 1) (Continued)
FEES 102Ba

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
γ 43	948.75 6	10.3 15	0.208
γ 44	1000.06 5	9.1 10	0.193
γ 45	1032.8 3	9.56 4	0.0122
γ 46	1070.48 5	10.8 16	0.207
γ 47	1093.62 6	2.6 4	0.0595
γ 48	1122.4 3	0.35 7	0.0084
γ 49	1126.54 8	1.77 25	0.0025
γ 50	1148.3 3	0.45 7	0.0111
γ 51	1202.20 10	6.2 9	0.158
γ 52	1204.06 4	15.8 10	0.405
γ 53	1203.4 5	0.19 9	0.0051
γ 54	1379.90 10	3.9 6	0.116

102Ba B- DECAY (92.7 H 7) I(MIB) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	4	0.199 17	0
ce-K- 11	600.73 3	0.250 13	0.0032
β- 1 max	474 6		
avg	103.3 21	1.5 3	0.0036
β- 2 max	541 6		
avg	167.0 22	7.10 6	0.0090
β- 3 max	667 6		
avg	212.7 23	0.26 11	0.0012
β- 4 max	790 6		
avg	262.7 24	0.50 16	0.0032
β- 5 max	909 6		
avg	263.5 24	0.50 19	0.0033
β- 6 max	942 6		
avg	279.7 24	1.2 3	0.0071
β- 7 max	984 6		
avg	296.4 24	1.5 3	0.0095
β- 8 max	984 6		
avg	304.2 24	0.3 5	0.0279
β- 9 max	905 6		
avg	304.6 24	1.7 3	0.0110
β-10 max	1047 6		
avg	361.8 25	0.63 17	0.0049
β-11 max	1050 6		
avg	366.1 25	1.9 4	0.0140
β-12 max	1097 6		
avg	382.1 25	2.5 4	0.0203
β-13 max	1517 6		
avg	560 3	1.36 24	0.0162
β-14 max	1776 6		
avg	673 3	1.31 25	0.0108
β-15 max	1821 6		
avg	693 3	0.1 7	0.120
β-16 max	1850 6		
avg	706 3	3.7 4	0.0556
β-17 max	1974 6		
avg	761 3	20.1 19	0.326
β-18 max	2119 6		
avg	826 3	21.7 21	0.382
β-19 max	2153 6		
avg	841 3	2.0 4	0.0350
β-20 max	2330 6		
avg	921 3	6.9 10	0.135
β-21 max	2513 6		
avg	1004 3	2.1 5	0.0449
β-22 max	2864 6		
avg	1165 3	0.8 7	0.0199

Continued

102La 3- DECAY (92.7 h 7)

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	A (1-rad/ μCi-h)
β-23 max	2961 6		
avg	1219 3	3.0 12	0.3779
β-24 max	3876 6		
avg	1638 3	5.2 17	0.101
β-25 max	4517 6		
avg	1910 3	7 5	0.295
total β- avg	888 8	190 7	1.90
γ-ray	KeV		
γ 1	196.1 8	0.123 7	0.0008
γ 2	178.1 4	0.10 6	0.0038
γ 3	367.36 20	0.10 6	0.0009
γ 4	393.7 3	0.10 6	0.0009
γ 5	420.80 10	0.26 11	0.0029
γ 6	433.38 7	0.42 16	0.0039
γ 7	518.7 3	0.16 11	0.0017
γ 8	532.00 20	0.16 11	0.0018
γ 9	578.04 8	1.16 22	0.0168
γ 10	619.59 10	0.16 6	0.0021
γ 11	681.17 3	52.5 25	0.717
γ 12	861.57 7	2.0 8	0.0036
γ 13	878.2 3	0.21 11	0.0039
γ 14	898.85 8	9.4 12	0.179
γ 15	948.5 3	0.10 6	0.0021
γ 16	962.2 15	0.42 16	0.0006
γ 17	991.2 3	0.10 6	0.0022
γ 18	1006.70 20	0.26 11	0.0056
γ 19	1011.30 6	8.8 6	0.0939
γ 20	1039.2 3	0.10 6	0.0023
γ 21	1083.60 7	3.0 8	0.0677
γ 22	1081.80 20	0.16 11	0.0036
γ 23	1070.3 3	0.16 11	0.0036
γ 24	1078.2 3	0.10 6	0.0028
γ 25	1086.90 15	0.26 11	0.0061
γ 26	1112.6 3	0.10 6	0.0025
γ 27	1116.7 3	0.10 6	0.0025
γ 28	1130.60 15	0.52 16	0.0126
γ 29	1188.50 20	0.16 11	0.0039
γ 30	1160.16 6	1.5 3	0.0089
γ 31	1178.3 3	0.16 11	0.0039
γ 32	1190.90 20	0.42 16	0.0107
γ 33	1231.5 5	0.31 11	0.0083
γ 34	1233.11 8	2.0 8	0.0538
γ 35	1282.3 3	0.21 11	0.0056
γ 36	1268.7 3	0.10 6	0.0028
γ 37	1270.1 8	0.10 6	0.0028
γ 38	1288.0 3	0.10 6	0.0029
γ 39	1323.20 20	0.37 11	0.0108
γ 40	1332.3 8	0.10 6	0.0030
γ 41	1358.6 5	0.10 6	0.0030
γ 42	1362.95 5	2.8 8	0.0686
γ 43	1373.6 7	0.21 11	0.0061
γ 44	1389.30 10	0.47 16	0.0180
γ 45	1395.30 20	0.21 11	0.0062
γ 46	1402.20 20	0.16 11	0.0047
γ 47	1485.5 3	0.16 11	0.0048
γ 48	1455.1 3	0.10 6	0.0033
γ 49	1493.70 20	0.16 11	0.0050
γ 50	1516.30 20	0.47 16	0.0153
γ 51	1535.5 3	0.26 11	0.0086
γ 52	1540.20 15	0.52 11	0.0172
γ 53	1545.80 10	3.3 5	0.109
γ 54	1618.20 20	0.31 11	0.0109
γ 55	1651.8 3	0.21 11	0.0078
γ 56	1688.1 3	0.26 11	0.0098
γ 57	1722.90 15	1.7 3	0.0517
γ 58	1752.8 7	0.10 6	0.0039
γ 59	1756.42 7	3.3 5	0.128
γ 60	1768.0 5	0.21 11	0.0079
γ 61	1771.0 5	0.21 11	0.0079
γ 62	1793.8 8	0.10 6	0.0080

Continued

102La E- DECAY (92.7 h 7)

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	A (1-rad/ μCi-h)
γ 63	1806.3 5	3.16 11	0.3981
γ 64	1817.1 6	3.10 6	0.3981
γ 65	1885.8 7	0.58 16	0.0232
γ 66	1901.32 9	8.7 9	0.351
γ 67	1923.0 3	0.26 11	0.0108
γ 68	1933.5 5	0.46 11	0.0965
γ 69	1948.2 8	0.52 16	0.0218
γ 70	1968.8 5	0.46 11	0.0566
γ 71	2008.20 15	1.05 22	0.0888
γ 72	2025.50 18	1.36 22	0.0589
γ 73	2038.70 26	1.10 22	0.3878
γ 74	2050.80 20	0.52 16	0.0229
γ 75	2055.17 7	2.8 8	0.129
γ 76	2076.90 20	0.73 17	0.0325
γ 77	2086.10 20	0.42 16	0.0187
γ 78	2100.80 20	1.05 22	0.0870
γ 79	2126.2 3	0.37 11	0.0168
γ 80	2138.30 20	0.58 16	0.0261
γ 81	2180.30 20	0.58 16	0.0268
γ 82	2187.20 10	5.8 8	0.271
γ 83	2290.5 5	0.37 16	0.0179
γ 84	2359.80 20	0.88 17	0.0822
γ 85	2368.8 3	0.47 16	0.0238
γ 86	2377.72 10	16.8 18	0.659
γ 87	2389.5 8	0.21 11	0.0109
γ 88	2459.8 8	0.42 16	0.0220
γ 89	2513.2 6	0.16 11	0.0208
γ 90	2532.3 7	0.10 6	0.0057
γ 91	2539.8 5	0.37 17	0.0826
γ 92	2582.65 8	11.2 16	0.408
γ 93	2663.5 3	0.79 17	0.0887
γ 94	2666.80 15	1.8 3	0.107
γ 95	2672.6 8	0.21 11	0.0120
γ 96	2782.3 8	0.31 11	0.0137
γ 97	2800.8 8	0.63 16	0.0376
γ 98	2818.10 10	0.88 22	0.0508
γ 99	2828.60 20	0.26 11	0.0158
γ 100	2870.0 7	0.79 17	0.0898
γ 101	2972.00 20	3.3 8	0.209
γ 102	2991.7 5	0.10 6	0.0067
γ 103	2999.90 20	0.52 16	0.0335
γ 104	3007.1 5	0.21 11	0.0135
γ 105	3012.90 20	0.73 17	0.0872
γ 106	3022.3 7	0.10 6	0.0068
γ 107	3038.30 20	0.58 16	0.0373
γ 108	3046.90 20	0.42 16	0.0273
γ 109	3075.9 3	0.16 11	0.0103
γ 110	3155.0 3	0.21 11	0.0181
γ 111	3181.0 3	0.31 11	0.0213
γ 112	3236.70 20	0.31 11	0.0217
γ 113	3282.8 3	0.21 11	0.0185
γ 114	3273.2 3	0.16 11	0.0110
γ 115	3318.70 20	1.36 22	0.0968
γ 116	3401.9 3	0.31 11	0.0229
γ 117	3459.30 20	0.37 16	0.0271
γ 118	3612.10 20	0.89 22	0.0697
γ 119	3632.70 20	1.15 22	0.0898
γ 120	3719.10 20	0.31 11	0.0250
γ 121	3950.8 3	0.26 11	0.0215

103Ce 8- DECAY (33.0 d 2)
PREDS 103PR

I (MIN) = 0.108

Radiation Type	Energy (keV)	Intensity (%)	A (1-rad/ μCi-h)
Auger-L	8	59 5	0.0851
ce-K- 1	15.364 9	65 5	0.0218

Continued

143CS 9- DECAY (13.0 D 2)
FEEDS 143PB

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(\text{e-rad}/\mu\text{Ci-h})$
Auger-E	29.4	5.3 18	0.0036
ce-L- 1	59.520 9	9.2 7	0.0099
ce-P- 1	55.844 8	1.95 10	0.0023
ce-NOT- 1	57.053 9	3.57 8	0.0006
ce-F- 5	189.572 6	7.207 22	0.0004
ce-H- 6	251.270 15	2.27 11	0.0122
ce-L- 6	286.826 15	0.353 17	0.0022
0-1 nar	291.4		
avg	82.5 12	0.50 3	0.0009
0-2 nar	391.4		
avg	115.0 12	0.162 11	0.0004
0-3 nar	514.4		
avg	157.0 13	1.40 7	0.0047
0-4 nar	730.4		
avg	236.1 14	13.6 7	1.0694
0-5 nar	1107.4		
avg	383.2 15	40.9 23	0.399
0-6 nar	1394.4		
avg	506.0 16	75 5	0.377
total 0-			
avg	400.6 17	100 6	0.851

9 weak γ 's omitted:B γ (avg)= 151.4; I γ = 0.22%

X-ray L	5	9.6 16	0.0010
X-ray Fe α	35.55020 2	17.6 14	0.0134
X-ray Fe β	36.02630 2	32.3 24	0.0240
X-ray K β	40.7	12.1 10	0.0105
γ 1	57.355 9	11.7 9	0.0143
γ 5	231.563 6	2.09 12	0.0103
γ 6	293.261 15	43.4 20	0.271
γ 7	350.610 16	3.25 17	0.0243
γ 11	432.967 16	0.161 11	0.0015
γ 15	490.356 16	2.16 12	0.0225
γ 20	587.101 22	0.269 14	0.0034
γ 22	644.554 16	5.0 3	0.0014
γ 27	721.911 16	5.5 3	0.0041
γ 35	880.439 16	1.05 6	0.0190
γ 45	1103.170 25	0.423 22	0.0099

37 weak γ 's omitted:B γ (avg)= 629.4; I γ = 0.68%

143PB 0- DECAY (13.56 D 2)

I(WIMP) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(\text{e-rad}/\mu\text{Ci-h})$
0-1 nar	933.2 19		
avg	314.0 8	100	0.671

143CS 0- DECAY (208.3 D 3)
FEEDING TO 143PB (17.29 D)=99.80 9
FEEDING TO 144PB (7.2 D)=1.20 9
SEE ALSO 144PB IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(\text{e-rad}/\mu\text{Ci-h})$
Auger-L	4	11.3 7	0.0010
ce-E- 8	12.42 5	0.02 9	0.0002

Continued

143CS 0- DECAY (208.3 D 3) (Continued)
FEEDING TO 144PB (17.29 D)=99.80 9
FEEDING TO 144PB (7.2 D)=1.20 9
SEE ALSO 144PB IT DECAY

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(\text{e-rad}/\mu\text{Ci-h})$
ce-L- 1	26.74 3	0.93 11	0.0005
Auger-E	29.4	0.9 3	0.0006
ce-N- 1	32.06 3	0.196 22	0.0001
ce-L- 2	34.10 3	1.0 3	0.0007
ce-E- 7	36.13 3	1.5 3	0.0020
ce-N- 2	39.42 3	0.21 6	0.0002
ce-E- 8	46.50 5	0.61 15	0.0005
ce-L- 2	46.59 5	0.114 12	0.0001
ce-P- 9	49.0 20	0.53 13	0.0006
ce-L- 7	73.29 3	0.49 5	0.0009
ce-N- 7	79.61 3	0.101 9	0.0002
ce-L- 8	79.6652 5	0.29 21	0.0005
ce-L- 9	84.2 20	0.22 17	0.0004
ce-P- 17	91.54 3	5.3 4	0.0104
ce-L- 11	126.70 3	0.73 5	0.0020
ce-N- 11	132.02 3	0.153 11	0.0004

0-1 nar	181.9 15		
avg	49.3 5	19.6 13	0.0266
0-2 nar	235.3 15		
avg	65.3 5	4.6 5	0.0044
0-3 nar	315.4 15		
avg	90.2 5	75.9 12	0.146
total 0-			
avg	81.0 6	100.1 19	0.173

X-ray L	5	1.0 3	0.0002
γ 1	33.57 3	0.25 3	0.0002
X-ray Fe α	35.55020 2	2.00 16	0.0021
X-ray Fe β	36.02630 2	5.1 3	0.0039
X-ray K β	40.7	1.93 11	0.0017
γ 2	40.93 3	0.49 14	0.0004
γ 4	53.47 5	0.139 13	0.0001
γ 7	90.12 3	1.64 14	0.0020
γ 9	84.5	0.25 9	0.0006
γ 9	91.0 20	0.35 7	0.0007
γ 11	133.53 3	10.0 7	0.0307

5 weak γ 's omitted:B γ (avg)= 30.4; I γ = 0.09%144PB IT DECAY (7.2 D 3)
SEE DECAY=99.94 4
FEEDS 144PB (17.20 D)
SEE DECAY=0.06 4

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(\text{e-rad}/\mu\text{Ci-h})$
Auger-L	4	50.1 20	0.0059
ce-N- 1	17.04 3	33.30 10	0.0121
Auger-E	29.4	2.0 9	0.0010
ce-L- 1	32.20 3	50.17 11	0.0550
ce-P- 1	57.52 3	12.49 10	0.0153
ce-NOT- 1	58.73 3	3.020 11	0.0040
X-ray L	5	11.1 16	0.0012
X-ray Fe α	35.55020 2	8.7 3	0.0064
X-ray Fe β	36.02630 2	15.9 5	0.0122
X-ray K β	40.7	5.97 20	0.0052

1 weak γ 's omitted:B γ (avg)= 59.0; I γ = 0.00%

16400 B- DECAY (17.28 D 3) I (RTM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
0-1 max	811 3		
avg	266.7 12	1.08 5	0.0061
0-2 max	2300 3		
avg	894.5 13	1.17 5	0.0223
0-3 max	2096 3		
avg	9221.5 14	97.74 10	2.54
total 0-			
avg	1207.3 15	100.06 13	2.57
γ 3	694.490 20	1.49 6	0.0220
γ 7	1089.15 5	0.300 16	0.0095
γ 8	2105.70 6	0.77 5	0.0369

7 weak γ's omitted:
By (avg) = 1020.6; ITP = 0.02%

16720 B- DECAY (11.04 D 3) I (RTM) = 0.10%
PEPDS 16720

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	0.30	31.2 21	0.0030
Auger-R	31.5	3.7 12	0.0025
ce-B- 3	85.9210 22	49.3 12	0.0072
ce-B- 4	75.30 5	0.31 4	0.0005
ce-L- 3	83.6771 22	7.09 10	0.0126
ce-B- 3	89.456 6	1.50 4	0.0021
ce-BOP- 3	90.775 6	0.027 11	0.0000
ce-B- 17	274.227 10	0.196 7	0.0006
ce-B- 20	485.832 22	0.175 11	0.0009
0-1 max	210.5 9		
avg	57.7 3	2.21 9	0.0027
0-2 max	365.4 9		
avg	104.2 3	15.3 8	0.0304
0-3 max	407.1 9		
avg	120.1 3	0.81 7	0.0021
0-4 max	485.9 9		
avg	146.9 4	0.50 16	0.0010
0-5 max	845.2 9		
avg	264.3 4	91.1 15	0.057
total 0-			
avg	233.6 5	100.1 10	0.090

1 weak p's omitted:
By (avg) = 59.4; ITP = 0.07%

X-ray L	5.43	7.9 17	0.0005
X-ray K _α	30.1712 5	12.0 5	0.0100
X-ray K _β	30.7247 5	23.3 9	0.0193
X-ray K _γ	83.0	7.0 4	0.0004
γ 3	91.1050 20	27.5 5	0.0541
γ 4	120.40 5	0.40 5	0.0010
γ 19	190.64 4	0.200 10	0.0009
γ 15	275.370 15	0.80 6	0.0007
γ 17	319.613 16	1.95 12	0.0133
γ 21	390.155 20	0.07 6	0.0070
γ 23	410.40 3	0.139 9	0.0012
γ 24	439.095 22	1.20 9	0.0112
γ 27	489.24 3	0.153 9	0.0016
γ 20	531.018 22	13.1 8	0.040
γ 30	590.803 3	0.245 10	0.0030
γ 33	685.90 4	0.01 4	0.0119

21 weak γ's omitted:
By (avg) = 614.6; ITP = 0.07%

16720 B- DECAY (2.6234 Y 2) I (RTM) = 0.10%
PEPDS 16750

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
0-1 max	224.8 4		
avg	61.94 12	100	0.132

16750 A DECAY (1.0721 Y 1) I (RTM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
α 1	2247.0 15	100	4.79

16920 IT DECAY (41.3 D 1) I (RTM) = 0.10%
B12 DECAY=0.9 6
PEPDS 16920 (5.179 D)
SEE ALSO 16920 B- DECAY (41.3 D)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	0.30	5.7 5	0.0005
ce-B- 2	30.52 10	3.2 4	0.0021
Auger-R	31.5	0.25 9	0.0002
ce-L- 1	54.07 30	3.6 5	0.0041
ce-B- 1	54.85 10	1.02 13	0.0013
ce-BOP- 1	61.17 10	0.20 4	0.0000
ce-L- 2	60.27 10	0.46 6	0.0007
X-ray L	5.43	1.09 17	0.0001
X-ray K _α	30.1712 5	0.05 11	0.0007
X-ray K _β	30.7247 5	1.54 20	0.0013
X-ray K _γ	83.0	0.59 8	0.0006
γ 2	75.70 10	1.09 14	0.0010

16920 B- DECAY (5.370 D 9) I (RTM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	0.33	0.137 10	0
ce-B- 1	503.37 5	0.192 10	0.0021
0-1 max	999 9		
avg	340 4	35.0 9	0.259
0-2 max	1914 9		
avg	729 4	9.9 11	0.154
0-3 max	2464 9		
avg	975 4	34.3 14	1.13
total 0-			
avg	723 5	100.0 20	1.50
γ 1	550.20 5	23.3 11	0.273
γ 2	611.26 5	1.12 8	0.0106
γ 3	914	12.5 6	0.264
γ 4	1065.1 3	22.2 5	0.692

149PM B- DECAY (41.3 D 1) I (HEU) = 0.10%
 RE- DECAY=55.1 6
 SEE ALSO 149PM IT DECAY (41.3 D)

Radiation Type	Energy (MeV)	Intensity (%)	A(q-rad/ μCi-h)
Kα ₁ -L	4.53	7.1 4	0.0007
Kα ₂ -L	32.6	0.42 20	0.0004
ce-B- 1	51.57 10	5.04 23	0.0014
ce-L- 1	90.64 10	0.02 3	0.0016
ce-B- 1	96.50 10	0.175 7	0.0004
ce-B- 2	102.77 20	0.299 13	0.0009
ce-B- 3	201.07 20	0.96 3	0.0009
ce-L- 3	200.36 20	0.133 5	0.0000
ce-B- 5	367.3 3	0.106 4	0.0000
ce-B- 9	503.37 5	0.770 21	0.0003
ce-L- 8	542.06 5	0.129 4	0.0015
ce-B- 11	583.07 5	0.526 14	0.0045
ce-B- 12	670.07 10	0.139 4	0.0020

0- 1 max	407 9		
avg	120 3	56.1 10	0.143
0- 2 max	506 9		
avg	154 4	16.5 7	0.0541
0- 3 max	695 9		
avg	222 4	21.5 8	0.102
0- 4 max	1007 9		
avg	343 4	1.0 6	0.0073
total 0-			
avg	151 4	95.1 16	0.306

X-ray L	5.64	1.05 19	0.0002
X-ray Kα ₁	39.5224 3	2.29 4	0.0019
X-ray Kα ₂	40.1101 3	0.10 15	0.0035
X-ray Kβ	45.4	1.40 7	0.0016
γ 1	90.40 10	3.01 12	0.0000
γ 2	109.40 20	1.24 5	0.0050
γ 3	207.90 20	12.4 4	0.0759
γ 4	311.50 10	3.97 12	0.0263
γ 5	414.1 3	10.5 6	0.163
γ 6	432.60 10	5.65 20	0.0520
γ 7	501.30 10	6.00 20	0.0735
γ 8	550.20 5	94.2 15	1.10
γ 9	599.50 20	12.4 4	0.150
γ 10	611.24 5	5.53 22	0.0720
γ 11	629.90 5	89.3 10	1.19
γ 12	725.70 10	32.7 8	2.504
γ 13	915	10.9 6	0.369
γ 14	1013.00 20	27.4 6	0.049

149PM B- DECAY (53.00 D 5) I (HEU) = 0.10%

Radiation Type	Energy (MeV)	Intensity (%)	A(q-rad/ μCi-h)
Kα ₁ -L	4.53	0.204 10	~0
ce-L- 1	10.75 10	0.130 9	~0
ce-B- 7	239.07 5	0.204 17	0.0013
0- 1 max	196.5 21		
avg	51.0 6	0.126 10	0.0001
0- 2 max	706.5 20		
avg	256.6 8	3.39 22	0.0195
0- 3 max	1072.0 20		
avg	369.6 9	94.23 25	0.750
total 0-			
avg	360.0 9	100.0 4	0.777

6 week β's omitted:
 20 (avg) = 135.2; ETP = 0.15%

Continued

149PM B- DECAY (53.00 D 5) (Continued)

Radiation Type	Energy (MeV)	Intensity (%)	A(q-rad/ μCi-h)
X-ray Kα ₁	40.1101 3	0.117 9	0.0001
γ 7	205.90 5	3.10 20	0.0189
γ 24	859.0 5	0.192 17	0.0019

23 weak γ's omitted:
 Eγ (avg) = 590.9; ETP = 0.30%

151PM B- DECAY (20.40 D 4) I (HEU) = 0.10%
 PREDS 151SD

Radiation Type	Energy (MeV)	Intensity (%)	A(q-rad/ μCi-h)
ce-B- 1	3.098 4	37.1 13	0.0025
ce-BGP- 1	4.075 4	12.4 5	0.0012
Kα ₁ -L	4.53	27.0 25	0.0026
ce-B- 6	16.006 20	0.170 14	~0
ce-L- 2	17.96 4	1.06 13	0.0006
ce-B- 7	18.046 20	9.7 9	0.0037
ce-B- 8	18.996 20	5.4 5	0.0022
ce-B- 9	22.056 20	2.01 20	0.0010
ce-B- 2	23.90 4	0.21 3	0.0002
ce-BGP- 2	25.35 4	0.103 9	~0
ce-L- 3	27.41 5	0.601 17	0.0004
ce-B- 10	29.376 20	0.65 4	0.0003
Kα ₂ -L	32.6	2.1 7	0.0015
ce-B- 3	33.43 5	0.130 4	~0
ce-B- 16	53.166 20	3.7 3	0.0042
ce-B- 10	55.076 20	0.205 20	0.0003
ce-L- 7	57.143 20	1.50 17	0.0010
ce-B- 20	57.906 20	4.4 4	0.0055
ce-L- 8	58.093 20	1.3 4	0.0016
ce-L- 9	61.953 20	0.35 4	0.0005
ce-B- 7	63.157 20	0.32 4	0.0004
ce-B- 8	64.107 20	0.30 9	0.0004
ce-L- 10	69.473 20	0.65 6	0.0009
ce-B- 10	70.407 20	0.150 13	0.0002
ce-L- 16	92.263 20	0.52 4	0.0010
ce-B- 31	92.45 3	0.214 19	0.0004
ce-L- 20	97.003 20	0.65 5	0.0013
ce-B- 16	98.277 20	0.109 9	0.0002
ce-B- 20	103.097 20	0.139 11	0.0003
ce-B- 02	116.724 20	0.54 5	0.0013
ce-B- 03	123.096 20	0.45 4	0.0012
ce-B- 00	121.55 5	0.20 3	0.0007
ce-B- 06	130.316 20	1.04 6	0.0024
ce-B- 55	162.2 3	0.30 3	0.0010
ce-L- 06	169.813 20	0.104 11	0.0005
ce-B- 60	185.59 3	0.142 13	0.0006
ce-B- 70	220.37 3	0.101 10	0.0005
ce-B- 94	293.75 4	0.205 6	0.0013

0- 1 max	224 10		
avg	62 3	0.150 11	0.0002
0- 2 max	235 10		
avg	65 3	0.92 5	0.0013
0- 3 max	301 10		
avg	85 4	0.33 4	0.0004
0- 4 max	310 10		
avg	88 4	2.15 10	0.0040
0- 5 max	364 10		
avg	104 4	6.0 4	0.0135
0- 6 max	414 10		
avg	122 4	1.09 7	0.0020
0- 7 max	447 10		
avg	133 4	1.00 10	0.0005

Continued

151PR B- DECAY (28.40 H 4)
 REES 151SB

I (BIB) = 0.10%

Radiation Type	Energy (MeV)	Intensity (%)	A(q-rad/ μCi-h)
0-8 max	525 10		
avg	160 4	0.255 19	0.0009
0-9 max	540 17		
avg	175 4	0.112 10	0.0004
0-10 max	667 10		
avg	212 4	0.75 5	0.0034
0-11 max	690 10		
avg	223 4	0.003 25	0.0021
0-12 max	742 10		
avg	240 4	7.0 4	0.0350
0-13 max	772 10		
avg	251 4	0.16 3	0.0009
0-14 max	792 10		
avg	259 4	1.95 10	0.0102
0-15 max	843 10		
avg	278 4	40.6 12	0.240
0-16 max	864 10		
avg	287 4	3.23 16	0.0197
0-17 max	881 10		
avg	293 4	1.69 13	0.0105
0-18 max	885 10		
avg	295 4	0.10 7	0.0011
0-19 max	979 10		
avg	332 4	2.15 20	0.0152
0-20 max	1028 10		
avg	348 4	1.39 23	0.0102
0-21 max	1020 10		
avg	340 4	7.7 9	0.0571
0-22 max	1003 10		
avg	374 4	3.9 9	0.0303
0-23 max	1110 10		
avg	384 4	3.1 13	0.0256
0-24 max	1000 10		
avg	417 5	11.0 10	0.0977
total 0-			
avg	261 5	99 3	0.593

7 weak 0's omitted:

E₀(avg) = 145.6; I₀ = 0.16%

X-ray L	Energy (MeV)	Intensity (%)	A(q-rad/ μCi-h)
2	25.70 4	0.52 9	0.0007
X-ray K _α	39.5224 3	7.8 4	0.0066
X-ray K _β	40.1191 3	14.1 7	0.0120
X-ray K _γ	45.4 3	5.5 3	0.0053
γ 6	62.920 20	0.212 17	0.0003
γ 7	64.890 20	1.92 17	0.0027
γ 9	65.838 20	1.14 10	0.0016
γ 9	69.690 20	0.49 5	0.0007
γ 10	76.710 20	0.205 17	0.0003
γ 14	98.04 3	0.34 3	0.0007
γ 16	100.000 20	2.52 19	0.0054
γ 18	101.910 20	1.20 11	0.0020
γ 20	104.820 20	3.5 3	0.0070
γ 31	139.20 3	0.47 4	0.0014
γ 33	143.46 3	0.212 19	0.0006
γ 36	147.51 6	0.150 14	0.0005
γ 40	156.10 5	0.107 14	0.0005
γ 41	162.920 20	0.94 7	0.0029
γ 42	163.540 20	1.49 12	0.0052
γ 43	167.730 20	7.9 7	0.0279
γ 44	168.30 5	0.83 10	0.0030
γ 45	176.54 5	0.95 7	0.0032
γ 46	177.150 20	3.6 3	0.0135
γ 47	184.57 4	0.165 14	0.0007
γ 50	201.95 3	0.85 7	0.0036
γ 51	204.19 5	0.134 12	0.0004
γ 54	209.0 3	1.63 14	0.0077
γ 57	227.15 5	0.31 3	0.0015
γ 60	232.42 3	1.03 10	0.0051
γ 63	236.60 20	0.150 14	0.0006

Continued

 151PR E- DECAY (28.40 H 4)
 REES 151SP

Continued

Radiation Type	Energy (MeV)	Intensity (%)	A(q-rad/ μCi-h)
γ 64	236.70 20	0.17 5	0.0010
γ 65	237.10 20	0.51 3	0.0026
γ 66	240.08 3	3.6 3	0.0184
γ 70	254.22 6	0.101 14	0.0009
γ 71	258.09 5	0.54 5	0.0030
γ 74	275.20 3	4.6 6	0.0306
γ 77	280.09 5	0.236 21	0.0014
γ 78	290.72 4	0.74 7	0.0049
γ 87	306.74 6	0.243 21	0.0016
γ 94	323.92 4	1.22 11	0.0004
γ 96	325.60 10	0.105 14	0.0007
γ 98	329.72 6	0.232 21	0.0016
γ 99	340.00 4	22.3 5	0.162
γ 101	344.89 4	2.10 19	0.0154
γ 104	349.77 6	0.112 14	0.0010
γ 106	353.32 10	0.111 12	0.0008
γ 114	379.78 6	0.54 7	0.0076
γ 121	406.97 5	0.107 14	0.0016
γ 130	440.82 5	1.49 14	0.0140
γ 122	445.65 5	4.9 4	0.0379
γ 134	451.33 7	0.29 3	0.0027
γ 144	490.21 9	0.127 14	0.0013
γ 155	516.15 8	0.190 19	0.0021
γ 162	544.93 5	0.35 4	0.0042
γ 165	570.97 7	0.119 12	0.0014
γ 179	636.00 6	1.36 12	0.0104
γ 180	654.16 8	0.234 21	0.0033
γ 185	668.70 26	0.35 4	0.0050
γ 186	669.20 20	0.28 4	0.0040
γ 187	671.19 6	0.87 7	0.0124
γ 190	704.09 9	0.32 4	0.0049
γ 191	709.12 15	0.127 14	0.0019
γ 194	717.60 5	4.0 4	0.0607
γ 197	736.01 6	0.46 5	0.0072
γ 199	752.67 5	1.23 12	0.0197
γ 203	772.64 6	0.93 7	0.0136
γ 204	784.95 9	0.203 19	0.0034
γ 207	807.04 7	0.479 23	0.0082
γ 204	817.650 20	0.17 4	0.0029
γ 212	840.63 9	0.269 23	0.0040
γ 229	940.54 9	0.32 3	0.0064

165 weak γ's omitted:

E_γ(avg) = 444.7; I_γ = 4.47%

151SB 0- DECAY (20 Y 6)

I (BIB) = 0.10%

Radiation Type	Energy (MeV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	4.69	0.54 5	0
ce-L- 1	13.480 6	0.64 5	0.0602
ce-K- 1	19.740 6	0.142 11	0
0-1 max	54.5 6		
avg	13.94 16	0.89 6	0.0003
0-2 max	75.1 6		
avg	19.60 16	39.12 6	0.0415
total 0-			
avg	14.63 16	100.00 9	0.0418
X-ray L	5.05	0.119 16	0

1 weak γ's omitted:

E_γ(avg) = 21.5; I_γ = 0.03%

1522W RC DECAT (13.6 Y 2) I(BIM) = 0.108
 9 (EC + β^+) DECAT = 72.10 20
 SEE ALSO 1522W B- DECAT (13.6 Y)

Radiation Type	Energy (keV)	Intensity (%)	A(g-rad/ μ Cl-h)
Auger-L	0.53	70.4	0.0031
Auger-F	37.6	5.7 19	0.0009
co-K- 1	70.940 4	19.4 5	0.0310
co-L- 1	110.645 4	10.62 23	0.0250
co-M- 1	120.059 4	2.43 6	0.0062
co-NOT- 1	121.436 4	0.667 15	0.0017
co-F- 11	197.060 7	0.600 13	0.0026
co-L- 11	236.957 7	0.156 4	0.0000
X-ray L	5.64	15.1 19	0.0010
X-ray K α_1	39.5224 3	20.9 7	0.0176
X-ray K α_2	40.1101 3	37.9 11	0.0320
X-ray K β	45.8	10.7 5	0.0102
γ 1	121.762 4	20.4 4	0.0336
γ 11	204.694 7	7.00 9	0.0390
γ 19	295.930 17	0.426 6	0.0027
γ 21	329.35 5	0.120 11	0.0009
γ 29	415.943 13	0.101 8	0.0009
γ 31	443.930 10	2.01 5	0.0265
γ 32	443.90 5	0.30 4	0.0029
γ 35	490.44 3	0.035 9	0.0002
γ 44	564.03 6	0.002 11	0.0000
γ 45	566.410 10	0.129 4	0.0016
γ 50	656.440 10	0.102 4	0.0020
γ 53	670.610 20	0.100 24	0.0021
γ 55	680.630 20	0.023 12	0.0121
γ 57	719.33 7	0.265 19	0.0041
γ 61	810.430 10	0.310 6	0.0053
γ 63	841.500 20	0.160 5	0.0029
γ 64	867.320 10	0.07 6	0.0751
γ 60	919.310 10	0.001 7	0.0070
γ 69	926.250 10	0.255 6	0.0050
γ 71	963.36 8	0.114 16	0.0023
γ 72	964.01 4	10.42 15	0.296
γ 74	1005.17	0.622 12	0.0133
γ 77	1004.91 4	0.246 6	0.0057
γ 78	1005.700 10	9.76 15	0.226
γ 79	1112.020 10	13.23 14	0.313
γ 84	1212.042 15	1.379 21	0.0356
γ 85	1249.00 11	0.170 5	0.0047
γ 86	1292.670 20	0.101 4	0.0020
γ 91	1407.954 10	20.72 21	0.621
γ 94	1457.540 20	0.092 9	0.0150
γ 95	1528.07 7	0.257 14	0.0004

50 weak γ 's omitted:
 $\Sigma \gamma$ (avg) = 685.0; $\Sigma I \gamma$ = 0.078

1522W B- DECAT (13.6 Y 2) I(BIM) = 0.108
 SE- DECAT = 27.06 20
 FEES 15260
 SEE ALSO 1522W RC DECAT (13.6 Y)

Radiation Type	Energy (keV)	Intensity (%)	A(g-rad/ μ Cl-h)
Auger-L	0.53	0.71 4	n0
co-K- 7	294.033 7	0.073 16	0.0052
co-L- 7	335.096 7	0.190 4	0.0013
B- 1 max	176 4		
avg	47.6 10	1.70 3	0.0010
B- 2 max	305 4		
avg	112.5 11	2.16 3	0.0057

Continued

1522W B- DECAT (13.6 Y 2) (Continued)
 SE- DECAT = 27.06 20
 FEES 15260
 SEE ALSO 1522W RC DECAT (13.6 Y)

Radiation Type	Energy (keV)	Intensity (%)	A(g-rad/ μ Cl-h)
γ 3 max	696 4		
avg	221.9 13	13.04 15	0.0635
B- 4 max	710 4		
avg	227.1 13	9.23 4	0.0011
B- 5 max	899 4		
avg	295.3 13	0.302 14	0.0019
B- 6 max	1364 4		
avg	364.9 14	0.922 25	0.0072
B- 7 max	1475 4		
avg	535.7 14	9.54 12	0.0970
total B-			
avg	302.6 19	27.76 21	0.179

6 weak β 's omitted:
 $\Sigma \beta$ (avg) = 74.3; $\Sigma I \beta$ = 0.198

X-ray L	6	0.167 19	n0
X-ray K α_1	42.3000 3	0.219 8	0.0002
X-ray K α_2	42.9962 3	0.794 13	0.0004
X-ray K β	48.7	0.156 6	0.0002
γ 7	304.272 7	26.46 21	0.194
γ 9	367.710 10	0.604 13	0.0066
γ 10	411.645 9	2.21 3	0.0190
γ 13	503.305 12	0.151 4	0.0016
γ 19	506.26 3	0.452 12	0.0956
γ 22	670.500 10	0.455 9	0.0065
γ 25	760.000 20	0.168 7	0.0027
γ 26	770.070 10	12.62 15	0.269
γ 32	1009.400 10	1.677 25	0.0309
γ 33	1109.07 24	0.17 4	0.0039
γ 36	1299.04 3	1.603 25	0.0404

29 weak γ 's omitted:
 $\Sigma \gamma$ (avg) = 632.9; $\Sigma I \gamma$ = 0.718

1522W RC DECAT (9.32 B 2) I(BIM) = 0.108
 8 (EC + β^+) DECAT = 20 3
 SEE ALSO 1522W B- DECAT (9.32 B)

Radiation Type	Energy (keV)	Intensity (%)	A(g-rad/ μ Cl-h)
Auger-L	0.53	25.3 22	0.0020
Auger-F	37.6	2.0 7	0.0014
co-K- 1	70.940 4	5.0 6	0.0079
co-L- 1	110.640 4	2.7 3	0.0066
co-M- 1	120.054 4	0.62 7	0.0016
co-NOT- 1	121.431 4	0.170 20	0.0004
X-ray L	5.64	5.2 8	0.0006
X-ray K α_1	39.5224 3	7.4 7	0.0363
X-ray K α_2	40.1101 3	13.5 13	0.0115
X-ray K β	45.8	5.2 5	0.0051
γ 1	121.777 4	7.2 9	0.0189
γ 11	562.920 10	0.227 25	0.0027
γ 17	841.63 6	10.7 16	0.263
γ 19	961.06 22	0.205 25	0.0042
γ 20	963.30 6	12.1 14	0.240

20 weak γ 's omitted:
 $\Sigma \gamma$ (avg) = 770.7; $\Sigma I \gamma$ = 0.368

15220 B- DECAY (9.32 E 2) I (NIB) = 0.10%
 CE- DECAY=72 J
 FEES 15260
 SEE ALSO 15220 EC DECAY (9.32 M)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
β- 1 max	550 a		
avg	160.4 12	1.63 14	0.0059
β- 2 max	817 a		
avg	267.5 13	0.109 13	0.0006
β- 3 max	1521 a		
avg	550.2 14	1.73 20	0.0204
β- 4 max	1865 a		
avg	784.2 15	69 3	1.03
total β- avg	687.4 16	73 3	1.06

2 weak β's omitted:
 E0 (avg) = 96.9; E10 = 0.06%

γ 5	340.273 9	2.4 3	0.0179
γ 10	978.30 3	0.60 7	0.0125
γ 16	1318.670 10	0.96 11	0.0260

16 weak γ's omitted:
 Eγ (avg) = 676.6; E1γ = 0.31%

15260 A DECAY (1.1214 Y) I (NIB) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
α 1	2149 a	100	6.59

15350 B- DECAY (46.7 E 1) I (NIB) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	4.69	54.2 24	0.0050
ce-L- 1	11.768 20	0.328 6	0.0106
ce-E- 4	21.1530 21	23.5 12	0.0106
Auger-K	33.7	4.5 10	0.0032
ce-F- 6	34.848 3	0.50 8	0.0004
ce-F- 7	46.965 a	0.37 5	0.0003
ce-F- 9	48.911 3	0.198 7	0.0002
ce-F- 10	54.6600 21	40.8 12	0.0074
ce-L- 8	61.6208 21	3.85 20	0.0051
ce-F- 2	67.8720 21	0.83 5	0.0012
ce-POF- 4	69.3110 22	0.236 12	0.0003
ce-L- 6	75.315 3	0.24 4	0.0004
ce-L- 13	95.1270 21	6.17 17	0.0125
ce-F- 10	103.3790 21	1.34 4	0.0029
ce-POF- 10	102.8180 22	0.375 11	0.0008
β- 1 max	634 a		
avg	199.1 12	34.7 16	0.147
β- 2 max	793 a		
avg	224.0 12	43.5 23	0.208
β- 3 max	789 a		
avg	227.0 12	0.54 6	0.0026
β- 4 max	807 a		
avg	263.9 13	20.6 17	0.117
total β- avg	223.7 13	100 a	0.476

11 weak β's omitted:
 E0 (avg) = 93.7; E10 = 7.27%

Continued

15350 B- DECAY (46.7 E 1) (Continued)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
X-ray L	5.55	11.4 14	0.0015
X-ray Fe _K	40.9034 3	17.3 6	0.0151
X-ray Fe _K	47.5422 3	31.3 19	0.0277
X-ray Fe _K	47	12.2 5	0.0123
γ 4	69.6720 20	5.25 25	0.0070
γ 5	75.421 3	0.140 20	0.0003
γ 6	83.367 3	9.21 3	0.0064
γ 7	89.444 a	0.170 20	0.0003
γ 8	97.410 3	0.731 20	0.0015
γ 10	103.1790 20	29.3 6	0.0622

59 weak γ's omitted:
 Eγ (avg) = 412.1; E1γ = 0.31%

15420 B- DECAY (0.6 Y 1) I (NIB) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	4.84	32.5 15	0.0034
Auger-K	34.9	1.8 6	0.0013
ce-E- 3	72.90 a	26.8 10	0.0016
ce-L- 3	114.76 a	16.8 6	0.0010
ce-F- 3	121.26 a	3.90 14	0.0101
ce-POF- 3	122.76 a	1.69 a	0.0029
ce-E- 20	147.80 a	0.536 19	0.0023
ce-L- 20	239.66 a	0.143 6	0.0008

β- 1 max	255 a		
avg	71.1 11	27.7 9	0.0419
β- 2 max	318 a		
avg	89.3 12	0.78 3	0.0015
β- 3 max	329 a		
avg	94.1 12	0.150 6	0.0003
β- 4 max	357 a		
avg	103.2 12	1.37 5	0.0030
β- 5 max	415 a		
avg	122.3 12	0.128 5	0.0003
β- 6 max	443 a		
avg	131.8 12	0.300 17	0.0009
β- 7 max	556 a		
avg	171.0 13	0.119 6	0.0004
β- 8 max	577 a		
avg	178.4 13	16.3 12	0.139
β- 9 max	711 a		
avg	227.3 13	6.413 22	0.0030
β- 10 max	723 a		
avg	231.0 14	7.244 12	0.0012
β- 11 max	847 a		
avg	279.0 14	16.9 6	0.106
β- 12 max	978 a		
avg	330.5 14	2.1 6	0.0148
β- 13 max	1159 a		
avg	403.5 15	0.27 7	0.0023
β- 14 max	1638 a		
avg	590.6 15	0.30 19	0.0043
β- 15 max	1851 a		
avg	698.3 16	12.1 20	0.180
total β- avg	232.7 20	100 3	0.496

12 weak β's omitted:
 E0 (avg) = 130.9; E10 = 0.26%

X-ray L	6	7.6 9	0.0010
X-ray Fe _K	42.3089 3	7.3 4	0.0045

Continued

154Eu D- DECAY (0.6 Y 1) (Continued)

Radiation Type	Energy (keV)	Intensity (%)	A (c-rad/ μCi-h)
X-ray Fe _K	42.9962	3 13.1 6	0.0120
X-ray Fe	48.7	5.17 24	0.0054
γ 3	123.14	4 40.5 13	0.106
γ 13	189.22	5 9.229 11	0.0049
γ 20	248.04	4 6.59 21	0.0340
γ 43	401.30	5 0.210 9	0.0018
γ 47	444.00	5 0.503 20	0.0040
γ 51	478.26	5 0.215 9	0.0012
γ 63	557.56	5 0.254 10	0.0013
γ 65	582.90	5 0.04 4	0.0134
γ 66	591.70	5 0.44 16	0.0618
γ 73	625.22	5 0.330 13	0.0041
γ 90	676.59	5 0.100 6	0.0020
γ 92	692.41	5 1.70 6	0.0251
γ 94	715.76	5 0.175 8	0.0027
γ 95	723.36	4 19.7 7	0.304
γ 97	756.87	5 4.30 14	0.0700
γ 92	815.55	5 0.465 10	0.0001
γ 94	845.39	5 0.550 22	0.0099
γ 95	950.64	5 0.230 9	0.0002
γ 96	873.15	5 11.5 4	0.214
γ 90	892.73	5 0.460 10	0.0007
γ 100	904.05	5 0.02 4	0.0159
γ 100	946.32	4 10.3 4	0.219
γ 109	1004.76	4 17.4 6	0.372
γ 117	1110.50	10 0.103 4	0.0025
γ 119	1128.00	10 0.267 11	0.0044
γ 121	1140.90	10 0.216 9	0.0052
γ 127	1241.60	20 0.130 5	0.0034
γ 128	1244.60	20 0.70 3	0.0105
γ 129	1274.45	9 35.5 11	0.964
γ 142	1494.60	20 0.65 3	0.0287
γ 148	1596.00	20 1.67 6	0.0540

123 weak γ's omitted:
Σγ (avg) = 722.5; I_γ = 1.72%

155Eu D- DECAY (0.06 Y 1) I (HEU) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (c-rad/ μCi-h)
ce-L- 1	2.024 29	1.29 13	=0
Auger-L	4.04	34 3	0.0035
ce-B- 1	0.519 20	0.26 3	=0
ce-B- 9	9.7709 21	0.5 9	0.0010
ce-L- 3	10.40 4	14 3	0.0030
ce-L- 4	12.644 20	0.95 8	0.0003
ce-B- 3	16.90 4	3.1 6	0.0011
ce-L- 5	18.137 21	0.49 4	0.0002
ce-P00- 3	18.40 4	1.03 19	0.0044
ce-B- 4	19.139 20	0.220 10	=0
ce-L- 6	23.05 5	0.40 14	0.0042
ce-B- 5	24.632 21	0.107 8	=0
Auger-E	34.9	1.6 6	0.0012
ce-B- 10	35.823 5	0.40 5	0.0003
ce-B- 17	36.3039 21	11.2 8	0.0006
ce-L- 7	36.9724 21	0.40 4	0.0003
ce-L- 9	51.6304 21	1.71 10	0.0019
ce-B- 12	55.069 3	4.4 3	0.0052
ce-B- 9	58.1292 21	0.30 4	0.0005
ce-P00- 9	59.6302 22	0.197 12	0.0041
ce-L- 11	70.1670 21	1.72 11	0.0025
ce-B- 11	80.6422 21	0.370 20	0.0007
ce-P00- 11	96.1672 22	0.104 7	0.0002
ce-L- 12	96.932 3	0.66 5	0.0014
ce-B- 12	103.027 3	0.142 10	0.0003

Continued

155Eu D- DECAY (0.06 Y 1) (Continued)

Radiation Type	Energy (keV)	Intensity (%)	A (c-rad/ μCi-h)
B- 1 max	100 3		
avg	26.1 8	0.72 9	0.0004
B- 2 max	129 3		
avg	33.9 9	2.2 5	0.0016
B- 3 max	141 3		
avg	37.4 9	46 5	0.0366
B- 4 max	159 3		
avg	42.0 9	25 4	0.0220
B- 5 max	186 3		
avg	50.4 9	9.2 11	0.0008
B- 6 max	246 3		
avg	60.3 9	10 5	0.0262
total B-			
avg	45.2 10	100 9	0.0964
X-ray L	6	9.0 11	0.0010
γ 5	24.513 21	0.317 24	0.0002
X-ray Fe _K	42.9962	3 6.5 4	0.0059
X-ray Fe _K	42.9962	3 11.7 7	0.0107
γ 7	45.2900 20	1.20 9	0.0012
X-ray Fe	48.7	0.6 3	0.0008
γ 9	60.0100 20	1.14 12	0.0015
γ 10	66.262 5	0.151 10	0.0003
γ 11	84.5430 20	30.2 19	0.0540
γ 12	105.300 3	20.5 13	0.0469

7 weak γ's omitted:
Σγ (avg) = 69.8; I_γ = 0.19%

156Eu D- DECAY (15.19 D 4) I (HEU) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (c-rad/ μCi-h)
Auger-L	4.04	23.2 20	0.0020
Auger-E	34.9	1.0 4	0.0007
ce-E- 1	38.7204 25	14.3 16	0.0110
ce-L- 1	40.5001 25	16.4 10	0.0201
ce-B- 1	47.0029 25	3.0 5	0.0071
ce-P00- 1	48.5079 25	1.07 12	0.0020
ce-E- 5	148.971 10	0.125 8	0.0004

B- 1 max	103 9		
avg	50 3	4.59 10	0.0009
B- 2 max	249 9		
avg	69 3	2.42 15	0.0036
B- 3 max	250 9		
avg	69 3	0.16 4	0.0002
B- 4 max	266 9		
avg	75 3	11.3 6	0.0101
B- 5 max	332 9		
avg	95 3	0.127 13	0.0003
B- 6 max	426 9		
avg	126 3	6.0 3	0.0161
B- 7 max	487 9		
avg	147 4	32.1 10	0.101
B- 8 max	501 9		
avg	152 4	0.95 6	0.0031
B- 9 max	506 9		
avg	153 4	0.255 20	0.0009
B- 10 max	1007 9		
avg	370 4	2.37 21	0.0109
B- 11 max	1221 9		
avg	425 4	5.1 9	0.0062
B- 12 max	1285 9		
avg	456 4	4.5 5	0.0037

Continued

15629 B- DECAY (15.19 D 5)

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
0-13 max	1804 9		
avg	505 4	1.44 12	0.0155
0-16 max	2453 9		
avg	966 4	27 6	0.556
total 0-			
avg	394 9	99 7	0.827

5 weak 0's omitted:

E₀(avg) = 94.6; I₀ = 0.20%

X-ray L	6	5.4 9	0.0027
X-ray K _α	42.3089 3	3.0 5	0.0035
X-ray K _β	42.9962 3	6.9 8	0.0063
X-ray K _γ	48.7	2.7 3	0.0028
γ 1	88.9637 24	9.0 10	0.0171
γ 5	199.210 10	0.79 5	0.0034
γ 14	434.40 9	0.220 13	0.0020
γ 15	472.70 4	0.107 10	0.0015
γ 16	490.34 6	0.102 14	0.0019
γ 21	599.47 5	2.31 15	0.0295
γ 23	646.29 5	7.1 4	0.0976
γ 25	709.06 5	0.92 6	0.0130
γ 26	723.47 5	6.02 10	0.0920
γ 27	797.73 4	0.110 14	0.0019
γ 30	811.77 5	10.4 3	0.180
γ 31	829.36 5	0.160 12	0.0020
γ 34	841.16 10	0.23 3	0.0040
γ 35	858.36 12	0.126 13	0.0023
γ 36	865.98 12	0.16 4	0.0029
γ 37	867.01 8	1.40 14	0.0259
γ 40	907 3	0.40 10	0.0076
γ 43	940.35 7	1.39 10	0.0290
γ 44	947.46 15	0.31 10	0.0063
γ 45	960.50 8	1.62 12	0.0332
γ 46	961.0 6	0.16 4	0.0032
γ 47	969.03 6	0.307 22	0.0080
γ 49	985.00 20	0.340 23	0.0071
γ 49	1011.07 5	0.340 23	0.0073
γ 51	1027.39 8	0.120 11	0.0026
γ 53	1040.44 7	0.53 4	0.0110
γ 55	1065.14 5	5.2 3	0.119
γ 56	1075.99 20	0.37 7	0.0086
γ 57	1079.16 5	4.9 5	0.112
γ 60	1129.07 7	0.132 12	0.0034
γ 61	1140.51 5	0.296 22	0.0072
γ 62	1153.47 5	7.2 9	0.176
γ 63	1154.09 5	5.3 5	0.130
γ 64	1156.0 3	0.180 22	0.0035
γ 66	1169.12 5	0.293 23	0.0073
γ 69	1230.71 6	0.9 4	0.234
γ 70	1242.027 24	6.0 4	0.179
γ 72	1277.03 5	3.21 16	0.0074
γ 73	1364.41 5	1.76 9	0.0512
γ 75	1602.11 23	0.39 5	0.0100
γ 76	1857.42 11	0.255 20	0.0101
γ 77	1877.03 14	1.73 9	0.0690
γ 78	1937.68 10	2.14 12	0.0084
γ 79	1946.34 13	0.189 15	0.0078
γ 80	1965.95 12	4.20 22	0.176
γ 81	2026.61 10	3.50 15	0.153
γ 82	2032.51 12	0.130 12	0.0054
γ 83	2097.68 10	4.27 20	0.191
γ 85	2116.49 13	0.126 9	0.0057
γ 88	2180.91 11	2.43 13	0.113
γ 89	2186.71 11	4.0 5	0.184
γ 90	2205.38 13	1.00 5	0.0469
γ 94	2249.90 12	1.12 6	0.0543

45 weak γ's omitted:

E_γ(avg) = 1102.7; I_γ = 1.59%

16018 B- DECAY (72.3 D 2)

I(β₁) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	5.16	39.9 19	0.0044
ce-K- 1	32.9395 21	20.5 11	0.0147
Auger-K	37.2	1.3 4	0.0011
ce-L- 1	77.7422 21	31.3 16	0.0519
ce-K- 1	94.7812 21	7.5 4	0.0135
ce-K _β - 1	86.3717 21	2.05 11	0.0030
ce-F- 4	143.247 7	0.46 4	0.0026
ce-F- 5	161.060 8	0.133 6	0.0005
ce-L- 4	167.999 7	0.331 14	0.0015
ce-F- 10	234.786 4	0.401 17	0.0021

0- 1 max	302.2 20		
avg	85.6 7	0.227 14	0.0004
0- 2 max	430.4 20		
avg	129.9 7	4.49 15	0.0124
0- 3 max	459.9 20		
avg	130.1 7	0.94 4	0.0027
0- 4 max	478.7 20		
avg	143.6 7	9.9 4	0.0303
0- 5 max	559.6 20		
avg	169.6 7	3.35 12	0.0120
0- 6 max	572.6 20		
avg	176.4 8	46.5 16	0.175
0- 7 max	681.0 20		
avg	215.0 8	0.20 4	0.0009
0- 8 max	709.2 20		
avg	255.7 8	6.4 4	0.0349
0- 9 max	871.2 20		
avg	287.5 8	26.5 12	0.162
0-10 max	1553.5 20		
avg	566.9 9	0.46 17	0.0056
total 0-			
avg	206.9 9	39.0 21	0.436

1 weak β's omitted:

E_β(avg) = 169.0; I_β = 0.01%

X-ray L	6.5	10.6 11	0.0015
X-ray K _α	45.2578 4	6.0 3	0.0050
X-ray K _β	45.9984 4	10.7 6	0.0105
X-ray K _γ	52	4.29 23	0.0040
γ 1	86.7800 20	13.2 7	0.0203
γ 4	137.035 7	5.15 19	0.0216
γ 5	215.648 8	3.95 15	0.0101
γ 10	298.575 4	26.9 11	0.171
γ 11	309.561 15	0.85 4	0.0056
γ 12	327.327 19	0.324 14	0.0023
γ 15	392.500 15	1.34 5	0.0112
γ 18	452.31 4	0.57 4	0.0003
γ 19	465.20 4	2.00 8	0.0327
γ 20	472.33 6	0.21 3	0.0030
γ 21	479.362 14	29.5 9	0.552
γ 22	462.302 19	9.0 4	0.201
γ 23	466.155 16	25.0 9	0.515
γ 24	1002.88 4	1.02 5	0.0210
γ 27	1102.60 3	0.530 25	0.0125
γ 28	1115.12 3	1.53 6	0.0364
γ 29	1177.938 18	15.2 6	0.302
γ 30	1199.09 3	2.32 9	0.0592
γ 32	1271.061 19	7.5 3	0.202
γ 35	1312.14 4	2.92 11	0.0815

15 weak γ's omitted:

E_γ(avg) = 712.7; I_γ = 0.61%

166MO B- DECAY (26.00 ± 2) I (BIB) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	5.5	25.7 13	0.0030
ce-K- 1	23.000 0	10.6 6	0.0052
Auger-F	39.7	0.54 23	0.0005
ce-L- 1	70.023 0	24.5 13	0.0069
ce-P- 1	78.367 0	5.9 3	0.0099
ce-SOP- 1	80.125 0	1.62 9	0.0020
β- 1 max	190.1 14		
avg	52.7 5	0.297 12	0.0003
β- 2 max	356.5 14		
avg	115.0 5	0.95 5	0.0023
β- 3 max	1775.9 14		
avg	652.0 6	47.7 24	0.662
β- 4 max	1856.5 14		
avg	694.0 6	51.0 20	0.755
total β- avg	666.7 7	100 4	1.42

2 weak β's omitted:

E_β(avg)= 77.5; I_β= 0.00%

X-ray L	7	7.7 8	0.0011
X-ray K _α	48.2211 4	2.06 17	0.0029
X-ray K _β	49.1277 4	5.1 3	0.0053
X-ray K _γ	55.7	2.07 13	0.0025
γ 1	80.574 0	6.2 3	0.0104
γ 5	1379.43 6	0.93 5	0.0275
γ 6	1581.09 0	0.191 3	0.0061
γ 7	1662.44 8	0.116 5	0.0041

5 weak γ's omitted:

E_γ(avg)=1104.1; I_γ= 0.09%

166MO B- DECAY (1.20E3 ± 14) I (BIB) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	5.5	72 4	0.0004
ce-K- 1	23.000 0	21.8 16	0.0107
ce-K- 2	37.16 3	0.41 4	0.0003
Auger-F	39.7	2.3 9	0.0019
ce-S- 3	61.55 3	0.20 8	0.0003
ce-K- 4	63.67 3	0.179 23	0.0002
ce-L- 1	70.023 0	50 4	0.0760
ce-P- 1	78.367 0	12.2 9	0.0204
ce-SOP- 1	80.125 0	3.34 24	0.0057
ce-L- 4	111.41 3	0.160 21	0.0004
ce-S- 9	126.922 15	15.5 12	0.0019
ce-K- 12	159.39 3	0.35 4	0.0012
ce-L- 9	174.656 15	7.3 6	0.0270
ce-P- 9	182.200 15	1.72 13	0.0067
ce-SOP- 9	193.950 15	0.52 4	0.0020
ce-L- 12	206.13 3	0.135 13	0.0006
ce-K- 15	222.970 20	1.07 14	0.0009
ce-K- 16	243.250 20	0.193 14	0.0010
ce-L- 15	270.795 20	0.56 4	0.0032
ce-P- 15	278.249 20	0.131 10	0.0008
ce-F- 22	472.32 3	0.119 9	0.0012
ce-F- 30	654.20 4	0.135 10	0.0019
ce-K- 34	752.02 4	0.270 20	0.0005
β- 1 max	34.0 14		
avg	0.6 7	10.8 12	0.0034
β- 2 max	74.6 14		
avg	19.2 7	80 5	0.0327
total β- avg	17.2 0	99 6	0.0362

Continued

166MO B- DECAY (1.20E3 ± 14) (Continued)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
X-ray L	7	21.4 21	0.0032
X-ray K _α	48.2211 4	11.1 6	0.0114
X-ray K _β	49.1277 4	19.7 11	0.0206
X-ray K _γ	55.7	9.0 5	0.0095
γ 1	80.574 0	12.7 9	0.0219
γ 2	94.65 3	0.143 13	0.0003
γ 3	119.04 3	0.104 23	0.0005
γ 4	121.16 3	0.27 4	0.0007
γ 5	135.24 4	0.102 12	0.0003
γ 8	161.75 5	0.112 12	0.0004
γ 9	184.407 15	75 6	0.293
γ 10	193.711 25	0.224 24	0.0009
γ 11	214.76 5	0.55 8	0.0026
γ 12	215.00 3	2.65 25	0.0122
γ 13	231.20 4	0.245 24	0.0012
γ 14	259.716 20	1.12 9	0.0062
γ 15	280.456 20	10.4 22	0.132
γ 16	300.744 20	3.0 3	0.0245
γ 17	339.70 0	0.173 22	0.0013
γ 18	365.739 25	2.57 19	0.0200
γ 19	410.941 25	11.8 5	0.104
γ 20	451.524 25	3.12 22	0.0300
γ 21	464.03 4	1.25 11	0.0124
γ 22	529.01 3	10.4 8	0.117
γ 23	571.00 3	5.5 5	0.0713
γ 24	594.37 3	0.71 6	0.0090
γ 25	611.52 7	1.42 11	0.0105
γ 26	639.77 6	0.16 6	0.0022
γ 27	644.45 10	0.104 23	0.0025
γ 28	670.51 4	5.9 5	0.0041
γ 29	691.21 5	1.56 12	0.0230
γ 30	711.69 4	60 5	0.943
γ 31	736.67 8	0.10 4	0.0016
γ 32	752.27 4	13.4 10	0.214
γ 33	770.32 4	3.37 24	0.0550
γ 34	810.31 4	64 5	1.10
γ 35	830.54 4	10.8 8	0.191
γ 36	875.44 5	0.81 9	0.0150
γ 37	950.94 6	3.10 22	0.0620
γ 39	1120.31 7	0.235 24	0.0056
γ 40	1146.02 7	0.224 24	0.0055
γ 41	1241.44 6	1.02 8	0.0270
γ 42	1282.12 7	0.235 24	0.0064
γ 43	1403.72 9	0.56 5	0.0167
γ 44	1427.05 8	0.60 5	0.0103

3 weak γ's omitted:

E_γ(avg)= 487.7; I_γ= 0.24%

161B EC DECAY (121.2 ± 3) I (BIB) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
ce-P- 1	3.50 3	25 6	0.0010
ce-SOP- 1	5.44 3	8.7 18	0.0010
Auger-L	6.35	50 6	0.0070
Auger-F	46.2	3.0 14	0.0030
ce-K- 3	85.1 3	0.107 12	0.0002
γ 1	6.21 3	0.97 22	0.0001
X-ray L	0.15	22 3	0.0039
X-ray K _α	56.2770 10	18.9 20	0.0227
X-ray K _β	57.5320 10	33 4	0.0405
X-ray K _γ	65.2	13.9 15	0.0193

2 weak γ's omitted:

E_γ(avg)= 147.7; I_γ= 0.14%

197M B- DECAY (75.1 D 3)

I (NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
β ⁻ 1 max	432.3 10		
avg	126.7 4	99.921 11	0.270

1 weak β's omitted:

E₀(avg) = 96.9; IIB = 0.08%

1 weak γ's omitted:

E_γ(avg) = 125.4; IIG = 0.02%197M B- DECAY (23.9 H 1)
PERMS 187BE

I (NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
ce-S- 7	0.394 10	0.5 4	0.0001
ce-P- 1	4.2183 4	1.56 22	0.0001
ce-BOP- 1	6.5250 4	3.55 8	0.0001
Auger-L	6.7	19.9 13	0.0027
ce-L- 3	16.70 3	0.15 6	0.0001
ce-L- 4	23.8533 4	0.12 5	0.0001
ce-L- 6	31.13 6	0.13 14	0.0001
ce-R- 13	42.074 20	0.15 3	0.0001
Auger-R	47	1.1 5	0.0011
ce-L- 7	59.533 10	1.65 9	0.0021
ce-R- 15	62.544 10	17.5 7	0.0234
ce-T- 7	69.128 10	0.175 17	0.0006
ce-BOP- 7	71.435 10	0.199 5	0.0002
ce-L- 15	121.693 10	2.99 13	0.0078
ce-R- 15	131.288 10	0.69 3	0.0019
ce-BOP- 15	133.595 10	0.210 10	0.0006
ce-R- 21	134.60 3	0.197 20	0.0011
ce-F- 10	407.854 10	0.428 19	0.0037
ce-L- 30	467.003 10	0.109 5	0.0011
ce-R- 41	506.694 10	0.204 9	0.0024

β ⁻ 1 max	433.5 19		
avg	127.1 6	0.499 19	0.0013
β ⁻ 2 max	448.4 10		
avg	132.1 4	0.69 5	0.0019
β ⁻ 3 max	540.0 10		
avg	163.1 7	4.3 3	0.0149
β ⁻ 4 max	627.1 10		
avg	193.6 7	50.9 22	0.243
β ⁻ 5 max	687.4 10		
avg	215.2 7	3.7 4	0.0170
β ⁻ 6 max	694.5 10		
avg	217.0 7	4.9 4	0.0227
β ⁻ 7 max	801.1 10		
avg	257.0 7	0.15 4	0.0008
β ⁻ 8 max	1178.7 10		
avg	401.9 7	2.3 9	0.0197
β ⁻ 9 max	1312.9 10		
avg	457.3 8	25.1 24	0.244
total β ⁻			
avg	244.2 9	101 4	0.566

7 weak β's omitted:

E₀(avg) = 55.8; IIB = 0.02%

X-ray L	8.45	8.5 10	0.0016
X-ray K _α	59.7179 6	7.5 3	0.0096
X-ray K _β	51.1803 6	13.0 5	0.0170
X-ray K _γ	69.3	5.50 22	0.0082
γ 7	72.040 10	11.9 5	0.0183
γ 15	134.220 10	9.4 4	0.0270

Continued

197M B- DECAY (23.9 H 1)
FEEDS 187BE

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
γ 21	206.20 3	0.153 7	0.0007
γ 24	245.180 10	0.129 7	0.0007
γ 30	479.530 10	23.4 10	0.239
γ 33	511.760 10	0.69 3	0.0075
γ 34	551.550 10	5.45 22	0.0646
γ 39	589.04 3	0.130 6	0.0016
γ 41	610.370 10	5.7 3	0.0086
γ 42	625.520 10	1.17 5	0.0155
γ 47	685.810 10	29.2 12	0.427
γ 50	745.210 20	0.114 14	0.0051
γ 52	772.800 20	4.41 18	0.0726
γ 57	864.540 10	0.350 15	0.0066
γ 59	879.43 5	0.152 7	0.0028

50 weak γ's omitted:

E_γ(avg) = 307.7; IIG = 0.42%

187BE B- DECAY (52.10 Y 1)

I (NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
β ⁻ 1 max	2.64 4		
avg	0.663 10 170		0.0014

207Tl B- DECAY (4.77 H 3)

I (NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
β ⁻ 1 max	524 6		
avg	156.4 21	0.25 4	0.0008
β ⁻ 2 max	1422 6		
avg	494.1 25	99.75 4	1.05
total β ⁻			
avg	493 3	100.00 6	1.05
γ 1	897.60 20	0.24 4	0.0046

208Tl B- DECAY (3.07 H 2)

I (NIM) = 9.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	0	4.2 4	0.0007
Auger-R	56.7	0.24 10	0.0003
ce-R- 1	123.5 6	0.162 20	0.0004
ce-R- 2	145.36 15	0.145 15	0.0005
ce-R- 3	164.61 10	0.46 3	0.0016
ce-R- 4	189.35 6	3.05 15	0.0123
ce-L- 4	261.49 6	0.524 25	0.0029
ce-R- 4	273.50 6	0.123 6	0.0007
ce-R- 6	422.80 8	1.94 8	0.0165
ce-L- 6	494.94 8	0.310 14	0.0033
ce-F- 7	495.14 20	1.30 4	0.0138

Continued

209Tl B- DECAY (3.07 H 2)

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
ce-L- 7	567.20 20	0.357 11	0.0943
ce-BEC- 7	579.29 20	0.119 3	0.0015
ce-F- 15	772.37 0	0.269 11	0.0040
ce-F- 25	2526.60 10	0.160 3	0.0006
β- 1 max	812 0		
avg	258.0 15	0.222 16	0.0012
β- 2 max	867 0		
avg	276.3 15	0.164 13	0.0010
β- 3 max	1031 0		
avg	340.3 16	3.12 13	0.0226
β- 4 max	1073 0		
avg	356.1 16	0.58 5	0.0044
β- 5 max	1204 0		
avg	430.9 16	22.9 10	0.210
β- 6 max	1517 0		
avg	532.7 17	22.1 7	0.251
β- 7 max	1795 0		
avg	646.7 17	51.0 20	0.703
total β- avg	560.6 18	100 3	1.20

6 weak β's omitted:
E₀(avg)= 222.6; I₀= 0.21%

X-ray L	10.6	2.9 3	0.0007
X-ray K _α	72.0042 9	2.00 7	0.0032
X-ray K _β	78.9690 9	3.52 10	0.0056
X-ray K _γ	80.9	1.56 5	0.0020
γ 1	211.5 6	0.170 20	0.0000
γ 2	233.36 15	0.31 3	0.0015
γ 3	252.61 10	0.00 5	0.0003
γ 4	277.35 6	6.8 3	0.0491
γ 6	510.00 0	21.6 9	0.235
γ 7	583.30 20	85.0 20	1.07
γ 11	722.00 12	0.203 10	0.0031
γ 13	763.13 8	1.64 9	0.0265
γ 15	860.37 0	12.0 0	0.219
γ 17	927.60 20	0.125 11	0.0025
γ 18	982.70 20	0.197 15	0.0041
γ 19	1093.10 10	0.37 0	0.0006
γ 25	2614.60 10	99.790 10	5.56

12 weak γ's omitted:
E_γ(avg)= 835.5; I_γ= 9.35%

209Tl B- DECAY (2.20 H 7)
FEEDS 209Pb

I (HID) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	0	12.0 9	0.0021
ce-K- 1	29.0 10	10.0 0	0.0110
Auger-K	56.7	0.7 3	0.0000
ce-L- 1	101.1 10	3.20 6	0.0069
ce-B- 1	113.1 10	0.032 16	0.0020
ce-BEC- 1	116.1 10	0.267 5	0.0007
ce-E- 2	377.0 10	2.36 0	0.0109
ce-L- 2	409.1 10	0.799 10	0.0076
ce-B- 2	461.1 10	0.799 0	0.0020
ce-E- 3	1470.0 20	0.230 0	0.0070
β- 1 max	1823 16		
avg	650 7	100	1.40

Continued

209Tl B- DECAY (2.20 H 7)
FEEDS 209Pb

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
X-ray L	10.6	0.6 9	0.0019
X-ray K _α	72.0042 9	5.91 15	0.0092
X-ray K _β	78.9690 9	9.90 23	0.0159
X-ray K _γ	80.9	0.43 12	0.0000
γ 1	117.0 10	77.0 5	0.192
γ 2	465.0 10	96.60 10	0.957
γ 3	1566.0 20	99.7	3.33

209Pb B- DECAY (3.31 H 3)

I (HID) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
β- 1 max	644.6 12		
avg	197.6 5	100	0.421

210Pb B- DECAY (22.3 Y 2)

I (HID) = 0.10%

Fe- DECAY=99.9999900 6
FEEDS 210Bi (5.012 D)
γ1 DECAY=0.0000020 6

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	0.15	33.5 25	0.0950
ce-L- 1	36.113 20	57.0 16	0.0371
ce-F- 1	42.501 20	13.6 0	0.0123
ce-BEC- 1	45.562 20	0.50 12	0.0040
β- 1 max	16.5 5		
avg	0.15 13	00 3	0.0071
β- 2 max	63.0 5		
avg	16.13 10	20 3	0.0069
total β- avg	6.55 10	100 0	0.0139
X-ray L	19.0	20.3 20	0.0056
γ 1	46.500 20	4.05 0	0.0040

210Bi B- DECAY (5.012 D 9)

I (HID) = 0.10%

Fe- DECAY=99.99907 1
FEEDS 210Po
γ1 DECAY=0.00013 1

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
β- 1 max	1161.5 10		
avg	309.0 0	99.999070	0.329

210PO A DECAY (138.370 D 7) I(HIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
α 1	5306.88 10	99.996930	11.30

211PB B- DECAY (36.1 H 2) I(HIM) = 0.10%
FEEDS 211BI

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	0.15	9.35 4	0.0002
ce-L- 1	49.118 8	0.16 12	0.0023
ce-K- 9	314.31 8	0.34 10	0.0015
ce-K- 10	336.46 8	0.29 6	
β- 1 max	264 6		
avg	72.9 10	0.56 17	0.0009
β- 2 max	541 6		
avg	161.9 21	4.8 14	0.0166
β- 3 max	607 6		
avg	184.3 21	0.22 10	0.0009
β- 4 max	968 6		
avg	315.6 23	1.4 5	0.0094
β- 5 max	1373 6		
avg	473.3 24	93.0 20	0.938
total β- avg	453 3	100 3	0.965

4 weak β's omitted:

E_β(avg) = 78.3; I_β = 0.08%

X-ray L	10.8	0.25 7	0.0002
X-ray K _α	74.8148 10	0.15 8	0.0004
X-ray K _β	77.1079 10	0.26 6	0.0002
X-ray K _γ	87.3	0.115 25	0.00258
γ 9	404.84 8	3.0 9	0.0126
γ 10	426.99 8	1.4 4	0.0050
γ 16	704.20 20	0.33 10	0.0080
γ 17	766.34 7	0.49 15	0.0099
γ 18	831.83 4	2.8 9	

22 weak γ's omitted:

E_γ(avg) = 626.3; I_γ = 0.38%

211PO A DECAY (2.13 H 2) I(HIM) = 0.10%

SA DECAY=99.72 1

FEEDS 207TL

SEE ALSO 211BI B- DECAY

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	7.78	1.49 12	0.0002
ce-K- 1	265.47 10	2.52 10	0.0142
ce-L- 1	335.65 10	0.437 18	0.0031
ce-B- 1	347.30 10	0.102 4	0.0008
α 1	6277.5 7	15.94 20	2.13
α 2	6422.2 7	83.76 20	11.82
X-ray L	10.3	0.99 11	0.0002
X-ray K _α	70.8219 9	0.71 4	0.0011
X-ray K _β	72.8715 9	1.20 6	0.0019
X-ray K _γ	82.6	0.530 25	0.0009
γ 1	351.00 10	12.2 5	0.0914

211BI B- DECAY (2.13 H 2) I(HIM) = 0.10%
SE- DECAY=0.28 1
FEEDS 211PO (0.56 S 4)
SEE ALSO 211BI A DECAY

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
β- 1 max	579 6		
avg	174.6 21	0.280 10	0.0010

211PO A DECAY (0.56 S 4) I(HIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
α 1	6570.0 25	0.54 3	0.0756
α 2	6891.5 18	0.56 3	0.0822
α 3	7048.0 14	93.90 3	15.69
γ 1	549.670 20	0.55 3	0.0967
γ 2	897.60 29	0.53 3	0.0101

212PB B- DECAY (10.64 H 1) I(HIM) = 0.10%
FEEDS 212BI

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	0.15	21.4 17	0.0037
ce-K- 1	24.649 7	3.49 12	0.0018
Auger-K	59.2	1.2 6	0.0015
ce-L- 1	98.788 7	0.614 22	0.0013
ce-K- 1	111.17 7	0.143 5	0.0003
ce-K- 3	148.900 5	13.1 10	0.104
ce-K- 4	209.564 20	1.34 5	0.0060
ce-L- 3	222.239 5	5.71 17	0.0270
ce-K- 3	234.627 5	1.35 4	0.0067
ce-K _β - 3	237.688 5	0.451 13	0.0023
ce-L- 4	283.702 20	0.232 6	0.0014

β- 1 max	158 4		
avg	41.9 11	5.22 15	0.0047
β- 2 max	334 4		
avg	94.5 12	85.0 20	0.171
β- 3 max	573 4		
avg	172.7 13	9.9 20	0.0364
total β- avg	99.5 13	100 3	0.212

X-ray L	10.8	15.5 16	0.0336
X-ray K _α	74.8148 10	10.7 4	0.0170
X-ray K _β	77.1079 10	18.0 6	0.0294
X-ray K _γ	87.3	8.0 3	0.0149
γ 1	115.175 7	0.602 18	0.0015
γ 3	238.626 5	44.6 10	0.227
γ 4	300.090 20	3.41 10	0.0218

2 weak γ's omitted:

E_γ(avg) = 237.0; I_γ = 0.07%

212BI A α -DECAY (66.55 H 4) I(NIV) = 0.10%
 ECAY=35.93 6
 FEEDS 209TL
 SEE ALSO 212BI B- DECAY

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μ Ci-h)
Auger-L	7.78	12.2 9	0.0020
ce-L- 1	24.510 5	20.2 5	0.0106
ce-M- 1	36.753 5	8.72 11	0.0036
ce-POM- 1	39.011 5	1.56 4	0.0013
ce-K- 8	202.55 6	9.126 5	0.0005
α 1	5607.1 3	0.0624	0.0081
α 2	5768.1 3	9.600 9	0.0737
α 3	6050.77 7	25.22 9	1.25
α 4	6090.06 8	9.63 8	1.25

4 weak α 's omitted:
 $E_{\alpha}(\text{avg})=5672.4$; $II_{\alpha}=0.06\%$

X-ray L	10.3	0.1 9	0.0018
γ 1	39.957 5	1.008 16	0.0009
γ 4	288.08 6	0.138 12	0.0021
γ 6	327.96 10	9.139 11	0.0010
γ 8	452.83 10	9.352 12	0.0034

5 weak γ 's omitted:
 $E_{\gamma}(\text{avg})=390.4$; $II_{\gamma}=0.10\%$

212BI B- DECAY (66.55 H 4) I(NIV) = 0.10%
 SE- DECAY=64.07 6
 FEEDS 212FC
 SEE ALSO 212BI A DECAY

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μ Ci-h)
ce-F- 1	634.06 4	0.127 4	0.0017
3 weak α 's omitted: $E_{\alpha}(\text{avg})=40367.3$; $II_{\alpha}=0.01\%$			
β - 1 max	445 4		
avg	129.1 13	1.19 7	0.0032
β - 2 max	567 4		
avg	170.4 14	0.44 3	0.0016
β - 3 max	625 4		
avg	190.6 14	3.44 10	0.0140
β - 4 max	733 4		
avg	228.7 15	2.65 9	0.0124
β - 5 max	1519 4		
avg	530.7 17	7.9 3	0.0093
β - 6 max	2246 4		
avg	831.6 17	48.4 3	0.857
total β -			
avg	717.0 21	64.1 5	0.978

1 weak β 's omitted:
 $E_{\beta}(\text{avg})=129.6$; $II_{\beta}=0.05\%$

γ 1	727.17 4	11.4 3	0.103
γ 2	785.42 6	1.99 7	0.0334
γ 3	893.39 7	0.659 20	0.0125
γ 4	952.10 10	0.313 20	0.0064
γ 6	1070.62 10	0.97 6	0.0222
γ 7	1512.75 10	0.57 4	0.0103
γ 8	1620.56 7	2.75 10	0.0949
γ 9	1679.8 4	0.128 20	0.0046
γ 11	1806.0 4	0.21 4	0.0001

2 weak γ 's omitted:
 $E_{\gamma}(\text{avg})=1070.0$; $II_{\gamma}=0.03\%$

212PO A DECAY (3.05E-7 S 5) I(NIV) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μ Ci-h)
α 1	4794.9 3	100	18.71

213BI A DECAY (45.65 H 5) I(NIV) = 0.10%
 SE- DECAY=2.16 11
 FEEDS 209TL
 SEE ALSO 213BI B- DECAY

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μ Ci-h)
α 1	5549 10	0.16 4	0.0189
α 2	5870 5	2.90 11	0.250
γ 1	324.5 15	0.13 3	0.0009

213BI B- DECAY (45.65 H 5) I(NIV) = 0.10%
 SE- DECAY=97.04 11
 FEEDS 213FC
 SEE ALSO 213BI A DECAY

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μ Ci-h)
Auger-L	9.33	2.3 3	0.0004
Auger-K	59.7	0.13 7	0.0002
ce-F- 2	346.4 4	4.2 4	0.0309
ce-L- 2	422.8 4	0.73 7	0.0065
ce-P- 2	435.6 4	0.171 16	0.0016
β - 1 max	320 10		
avg	90 4	0.79 10	0.0015
β - 2 max	980 10		
avg	320 4	32 3	0.221
β - 3 max	1128 10		
avg	376 4	0.14 6	0.0011
β - 4 max	1420 10		
avg	491 4	66.0 20	0.690
total β -			
avg	432 5	99 4	0.914
X-ray L	11	1.75 22	0.0804
X-ray K_{α}	76.862 5	1.10 11	0.0019
X-ray K_{β}	79.290 5	1.90 19	0.0033
X-ray $K\beta$	89.8	0.89 9	0.0017
γ 1	292.3	0.44 6	0.0031
γ 2	439.7 4	27.3 25	0.256
γ 4	806.6 10	0.35 5	0.0060
γ 5	1101.0 10	0.39 8	0.0092

1 weak γ 's omitted:
 $E_{\gamma}(\text{avg})=659.0$; $II_{\gamma}=0.05\%$

Entity	Year	Value
Entity	1975	17.94
Entity	1976	17.94
Entity	1977	17.94
Entity	1978	17.94
Entity	1979	17.94
Entity	1980	17.94
Entity	1981	17.94
Entity	1982	17.94
Entity	1983	17.94
Entity	1984	17.94
Entity	1985	17.94
Entity	1986	17.94
Entity	1987	17.94
Entity	1988	17.94
Entity	1989	17.94
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Entity	2013	17.94
Entity	2014	17.94
Entity	2015	17.94
Entity	2016	17.94
Entity	2017	17.94
Entity	2018	17.94
Entity	2019	17.94
Entity	2020	17.94
Entity	2021	17.94
Entity	2022	17.94
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Entity	2024	17.94
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Entity	2065	17.94
Entity	2066	17.94
Entity	2067	17.94
Entity	2068	17.94
Entity	2069	17.94
Entity	2070	17.94
Entity	2071	17.94
Entity	2072	17.94
Entity	2073	17.94
Entity	2074	17.94
Entity	2075	17.94
Entity	2076	17.94
Entity	2077	17.94
Entity	2078	17.94
Entity	2079	17.94
Entity	2080	17.94
Entity	2081	17.94
Entity	2082	17.94
Entity	2083	17.94
Entity	2084	17.94
Entity	2085	17.94
Entity	2086	17.94
Entity	2087	17.94
Entity	2088	17.94
Entity	2089	17.94
Entity	2090	17.94

Type	Energy (eV)	Intensity (%)	A(γ-ray/ μCi-hr)
Zraps B-DECAT (26.8 m)			I (BIB) = 0.104
PREFS Zraps I			

[illegible][illegible]

214Pb α DECAY (19.9 h $\pm$ 4)
 λ_B DECAY=99.970
 FEEDS 214Po
 λ_B DECAY=0.021

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	Δ (μ -rad/ μ Ci-h)
X-ray L	??	0.52 6	0.0001
X-ray $K_{\alpha 1}$	76.862 5	0.358 11	0.0006
X-ray $K_{\alpha 2}$	78.290 5	0.600 17	0.0010
X-ray K_{β}	89.8	0.269 9	0.0005
γ 8	273.7 4	0.19 3	0.0010
γ 16	387.0 3	0.36 6	0.0030
γ 17	389.1 3	0.41 5	0.0030
γ 20	405.74 3	0.367 11	0.0014
γ 21	425.5 5	0.11 3	0.0010
γ 23	451.77 12	0.319 15	0.0031
γ 24	461.80 10	0.218 13	0.0021
γ 25	469.69 12	0.133 9	0.0019
γ 27	474.38 10	0.118 12	0.0012
γ 30	511.00 10	0.147 20	0.0016
γ 39	609.318 20	46.1 9	0.559
γ 48	665.453 22	1.56 6	0.0221
γ 53	783.11 4	0.472 22	0.0071
γ 55	719.36 3	0.463 21	0.0062
γ 60	752.84 3	0.133 10	0.0021
γ 61	768.361 18	4.88 13	0.0799
γ 62	786.1 4	0.31 10	0.0053
γ 64	806.174 18	1.23 4	0.0211
γ 66	821.88 3	0.150 15	0.0026
γ 70	904.25 25	0.105 11	0.0020
γ 72	934.052 20	3.15 9	0.0630
γ 74	964.08 3	0.393 21	0.0079
γ 82	1051.96 3	0.115 15	0.0071
γ 84	1069.96 9	0.285 21	0.0065
γ 87	1120.276 22	15.0 4	0.359
γ 89	1133.66 3	0.255 19	0.0061
γ 90	1155.190 20	1.69 6	0.0415
γ 93	1207.68 3	0.460 20	0.0119
γ 96	1239.11 3	5.92 12	0.156
γ 97	1280.460 20	1.47 6	0.0402
γ 98	1303.76 8	0.121 11	0.0030
γ 103	1377.65 3	4.02 12	0.118
γ 104	1385.31 3	0.78 4	0.0229
γ 106	1401.50 1	1.39 5	0.0414
γ 107	1407.98 4	2.48 6	0.0743
γ 112	1509.14 4	2.19 7	0.0705
γ 113	1538.50 6	0.41 6	0.0135
γ 114	1543.32 6	0.35 5	0.0116
γ 115	1583.22 4	0.72 4	0.0242
γ 116	1594.73 9	0.265 21	0.0090
γ 117	1599.31 6	0.234 21	0.0114
γ 120	1661.28 6	1.15 5	0.0407
γ 121	1683.99 4	0.236 20	0.0095
γ 122	1729.60 5	3.05 8	0.112
γ 123	1764.51 5	15.9 4	0.598
γ 126	1838.36 5	0.383 21	0.0150
γ 127	1847.44 5	2.12 8	0.0835
γ 128	1873.16 6	0.226 20	0.0090
γ 130	1896.3 3	0.177 20	0.0071
γ 142	2118.54 8	1.21 4	0.0345
γ 146	2204.12 7	4.99 13	0.234
γ 152	2243.36 12	0.324 21	0.0150
γ 161	2447.71 10	1.25 4	0.1010

139 weak γ 's omitted:

$E_{\gamma}(\text{avg})=1084.3$; $\Sigma I_{\gamma}=3.67\%$

214Po α DECAY (1.637E-4 s $\pm$ 2) $I(\text{NIM})=0.10\%$
 FEEDS 214Pb

Radiation Type	Energy (keV)	Intensity (%)	Δ (μ -rad/ μ Ci-h)
α 1	7687.09 6	99.986 4	16.37

1 weak α 's omitted:

$E_{\alpha}(\text{avg})=6994.0$; $\Sigma I_{\alpha}=0.01\%$

1 weak γ 's omitted:

$E_{\gamma}(\text{avg})=792.9$; $\Sigma I_{\gamma}=0.01\%$

215Po α DECAY (0.001780 s $\pm$ 4) $I(\text{NIM})=0.10\%$
 λ_B DECAY=99.99977 2
 FEEDS 215Pb
 λ_B DECAY=0.00023 2

Radiation Type	Energy (keV)	Intensity (%)	Δ (μ -rad/ μ Ci-h)
α 1	7386.4 8	99.943770	15.72

2 weak α 's omitted:

$E_{\alpha}(\text{avg})=6954.1$; $\Sigma I_{\alpha}=0.06\%$

216Po α DECAY (0.15 s $\pm$ 1) $I(\text{NIM})=0.10\%$
 FEEDS 216Pb

Radiation Type	Energy (keV)	Intensity (%)	Δ (μ -rad/ μ Ci-h)
α 1	6778.5 5	99.9979	14.44

217At α DECAY (0.0323 s $\pm$ 4) $I(\text{NIM})=0.10\%$
 FEEDS 217Bi

Radiation Type	Energy (keV)	Intensity (%)	Δ (μ -rad/ μ Ci-h)
α 1	7067.0 20	99.929 20	15.04

3 weak α 's omitted:

$E_{\alpha}(\text{avg})=6665.9$; $\Sigma I_{\alpha}=0.08\%$

4 weak γ 's omitted:

$E_{\gamma}(\text{avg})=471.7$; $\Sigma I_{\gamma}=0.06\%$

218Po α DECAY (3.05 h $\pm$ 1) $I(\text{NIM})=0.10\%$
 λ_B DECAY=99.990 2
 FEEDS 218Pb
 λ_B DECAY=0.020 2

Radiation Type	Energy (keV)	Intensity (%)	Δ (μ -rad/ μ Ci-h)
α 1	6002.55 9	99.9789 4	12.78

21925 A DECAY (3.96 S 1)
FEEDS 215PC

I (MIN) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(I\text{-rad}/\mu\text{Ci-h})$
Auger-L	8.33	1.33 12	0.0042
ce-K- 2	37.56 8	9.83 5	0.0003
ce-L- 2	113.73 8	0.119 12	0.0003
ce-K- 4	178.12 5	1.15 10	0.0046
ce-L- 4	254.29 5	0.68 8	0.0037
ce-M- 4	267.08 5	0.174 9	0.0010
ce-K- 12	328.67 9	0.233 15	0.0015
ce-L- 12	384.84 8	0.102 7	0.0008

a 1	6424.7	7.5 5	1.03
a 2	6509	9.12	0.0167
a 3	6552.9	12.2 7	1.70
a 4	6819.3 3	80.9 10	11.75

4 weak a's omitted:
Ea (avg) = 6230.7; E/a = 0.09%

X-ray L	11	1.93 11	0.0002
X-ray K _α	76.862 5	0.51 8	0.0009
X-ray K _β	79.250 5	0.86 6	0.0014
X-ray K _δ	89.9	0.38 3	0.0007
γ 2	130.67 8	0.125 11	0.0003
γ 4	271.23 5	0.9 5	0.0572
γ 12	401.78 9	6.6 4	0.0563

19 weak γ's omitted:
Eγ (avg) = 394.1; E/γ = 0.23%

22094 A DECAY (55.6 S 1)
FEEDS 216PC

I (MIN) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(I\text{-rad}/\mu\text{Ci-h})$
a 1	6248.29 10	99.930 20	13.38

1 weak a's omitted:
Ea (avg) = 5747.0; E/a = 0.07%

γ 1	549.7 5	0.10 4	0.0012
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22199 A DECAY (4.8 M 1)
FEEDS 217AT

I (MIN) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(I\text{-rad}/\mu\text{Ci-h})$
ce-K- 1	3.77 20	0.64 18	0.0
Auger-L	8.52	2.7 3	0.0005
ce-K- 2	22.47 20	0.26 13	0.0001
ce-L- 1	82.01 21	0.57 10	0.0010
ce-M- 1	95.18 20	0.15 3	0.0003
ce-K- 5	121.87 20	1.75 7	0.0045
ce-L- 5	200.11 21	2.17 8	0.0093
ce-M- 5	213.28 20	0.575 21	0.0026
ce-NOP- 5	216.56 20	0.196 8	0.0009

Continued

22199 A DECAY (4.9 M 1)
FEEDS 217AT

Continued:

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(I\text{-rad}/\mu\text{Ci-h})$
a 1	5938.0 20	0.150 10	0.0190
a 2	6079.0 20	0.499 20	0.0611
a 3	6075.0 20	0.167 20	0.0181
a 4	6125.0 20	15.10 20	1.97
a 5	6242.0 20	1.35 5	0.179
a 6	6339.8 17	93.8 9	11.26

4 weak a's omitted:
Ea (avg) = 5857.3; E/a = 0.19%

X-ray L	11.4	2.2 3	0.0005
X-ray K _α	74.950 10	0.75 7	0.0013
X-ray K _β	81.520 10	1.25 11	0.0022
X-ray K _δ	92.3	0.57 5	0.0011
γ 1	99.50 20	0.140 20	0.0003
γ 5	217.60 20	12.5 4	0.0579
γ 10	409.5 19	0.12 3	0.0010

7 weak γ's omitted:
Eγ (avg) = 253.6; E/γ = 0.28%

22294 A DECAY (3.8235 S 1)
FEEDS 218PC

I (MIN) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(I\text{-rad}/\mu\text{Ci-h})$
a 1	5449.7 3	99.920 10	11.58

2 weak a's omitted:
Ea (avg) = 4996.0; E/a = 0.09%

1 weak γ's omitted:
Eγ (avg) = 512.0; E/γ = 0.08%

22199 B- DECAY (27.8 M 4)
%B- DECAY = 99.994
FEEDS 223RA
%A DECAY = 0.006

I (MIN) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(I\text{-rad}/\mu\text{Ci-h})$
ce-L- 2	1.03 10	5.0 16	0.0001
Auger-L	9	26 1	0.0050
ce-L- 1	10.34 10	2.46 21	0.0005
ce-L- 4	10.67 3	12.2 11	0.0028
ce-L- 5	12.383 11	1.13 10	0.0003
ce-M- 2	15.45 10	1.3 4	0.0014
ce-NOP- 2	19.06 10	0.43 13	0.0002
ce-M- 3	24.76 10	0.59 5	0.0003
ce-M- 4	25.09 3	3.2 3	0.0017
ce-M- 5	26.798 11	0.30 3	0.0002
ce-NOP- 3	28.37 10	0.124 17	0.0001
ce-NOP- 4	29.70 3	1.05 9	0.0006
ce-NOP- 5	30.412 11	0.100 9	0.0
ce-L- 6	30.64 10	0.5 4	0.0003
ce-L- 7	31.0 10	19.1 17	0.0126

Continued

23300 2- DECAT (23.4 4 4)
 86- DECAT=99.994
 23300 23300
 94 DECAT=0.004

(Continued)

23300 2 DECAT (17.434 0 2)
 23300 23300

E(0.01) = 0.10%

Position Type	Energy (keV)	Intensity (%)	$\Delta(I-\text{rad}/\mu\text{Ci-h})$
Co-1- 4	42.2733 15	0.62 4	0.0004
Co-2- 6	45.06 10	0.12 3	0.0001
Co-3- 7	45.8 10	4.7 2	0.0005
Co-40P- 7	49.0 10	1.57 14	0.0015
Co-1- 3	49.54 17	1.37 11	0.0014
Co-2- 9	56.4840 15	0.119 11	0.0001
Co-1- 10	60.53 5	2.5 3	0.0019
Co-2- 2	63.94 10	0.11 3	0.0005
Co-40P- 9	65.4	0.16 19	0.0002
Co-40P- 9	67.59 10	0.119 10	0.0002
Co-4- 13	69.53 15	3.104 14	0.0002
Co-4- 10	74.95 4	0.16 7	0.0004
Co-40P- 10	74.54 6	0.123 21	0.0002
Co-1- 11	91.06 10	1.57 14	0.0019
Co-2- 11	95.44 10	0.43 4	0.0009
Co-40P- 11	99.94 10	0.155 14	0.0003
Co-4- 15	101.08 10	1.7 5	0.0019
Co-4- 16	110.94 20	4.2 4	0.0119
Co-1- 15	145.74 10	0.32 9	0.0011
Co-1- 16	215.64 20	0.74 7	0.0016
Co-2- 16	230.04 20	0.149 16	0.0009

4- 1 40X	221 3		
40X	40.1 9	0.112 10	0.0001
4- 2 40X	322 3		
40X	90.1 5	0.51 7	0.0010
4- 3 40X	344 3		
40X	97.0 9	0.122 14	0.0003
4- 4 40X	778 3		
40X	243.1 10	1.66 14	0.0006
4- 5 40X	918 3		
40X	257.4 11	0.17 4	0.0009
4- 6 40X	913 3		
40X	291.9 11	12.2 11	0.0759
4- 7 40X	1017 3		
40X	330.8 11	4.2 4	0.0206
4- 9 40X	1069 3		
40X	349.9 11	10.1 25	0.120
4- 9 40X	1097 3		
40X	361.0 11	44 6	0.492
40P 11 4-			
40X	344.6 14	24 7	0.710

14 weak α 's omitted:
 $E_{\alpha}(\text{avg}) = 196.4$; $E_{\alpha} = 0.17\%$

X-ray L	12.1	26 3	0.0067
X-ray 2	20.27 10	0.9 3	0.0004
X-ray 6	49.89 10	0.9 7	0.0010
X-ray 7	50.2 10	16 3	0.0385
X-ray 10	79.77 4	9.7 17	0.0165
X-ray $K_{\alpha 1}$	85.430 10	1.75 14	0.0032
X-ray $K_{\alpha 2}$	88.470 10	2.9 3	0.0054
X-ray K_{β}	102	1.32 13	0.0028
X-ray 11	100.30 10	0.225 17	0.0005
X-ray 12	134.50 10	0.59 8	0.0017
X-ray 13	173.45 15	0.144 19	0.0001
X-ray 14	184.70 26	0.32 5	0.0011
X-ray 15	205.00 10	1.0 3	0.0044
X-ray 16	234.90 27	3.6 3	0.0180
X-ray 21	249.5 7	0.23 9	0.0019
X-ray 26	310.26 11	0.67 9	0.0341
X-ray 31	369.40 20	0.115 15	0.0009
X-ray 39	775.30 20	0.44 6	0.0073

40 weak γ 's omitted:
 $E_{\gamma}(\text{avg}) = 492.5$; $E_{\gamma} = 1.03\%$

Position Type	Energy (keV)	Intensity (%)	$\Delta(I-\text{rad}/\mu\text{Ci-h})$
Co-40P- 1	3.333 5	56.4	0.0040
Co-2- 2	5.528 5	4.5377	0.0011
Co-4- 4	8.32 12	0.26 3	0.0002
Co-40P- 2	8.7	24 3	0.0051
Co-40P- 2	9.573 5	3.15	0.0034
Co-4- 3	9.938 5	4.6	0.0020
Co-40P- 3	13.323 5	3.1872	0.0009
Co-1- 4	13.55 11	0.154 3	0.0003
Co-4- 3	21.48 7	7.19 11	0.0039
Co-4- 11	45.80 5	12.6 3	0.0123
Co-4- 12	55.79 4	14.2 5	0.0216
Co-4- 13	60.22 5	2.06 6	0.0026
Co-40P- 4	62.7	1.5 4	0.0020
Co-4- 14	91.27 12	0.251 21	0.0004
Co-1- 7	92.77 9	0.180 16	0.0004
Co-1- 9	104.26 4	1.14 3	0.0011
Co-4- 9	117.43 4	0.330 6	0.0009
Co-40P- 9	121.21 6	0.1150 2	0.0003
Co-1- 11	126.15 6	2.14 5	0.0063
Co-1- 12	136.14 5	3.24 9	0.0095
Co-4- 11	139.72 4	0.557 16	0.0017
Co-4- 13	140.57 6	0.179 10	0.0011
Co-40P- 11	143.10 4	1.95 5	0.0059
Co-4- 12	149.71 3	0.783 20	0.0025
Co-40P- 12	153.09 3	0.272 7	0.0009
Co-4- 24	171.01 4	9.1 3	0.0330
Co-4- 10	225.49 5	1.57 5	0.0075
Co-4- 11	239.42 7	1.07 4	0.0052
Co-1- 24	251.38 5	1.66 5	0.0089
Co-4- 24	264.93 3	0.332 11	0.0022
Co-40P- 24	269.31 3	0.135 4	0.0008
Co-4- 14	273.44 4	0.114 5	0.0004
Co-1- 10	305.44 6	0.285 3	0.0019
Co-1- 11	320.27 8	0.192 6	0.0012
Co-4- 44	346.54 6	0.147 10	0.0015

X 1	5247.3 10	0.15	0.0169
X 2	5318.7 10	0.11	0.0149
X 3	5345.6 10	0.13	0.0149
X 4	5433.6 5	2.27 20	0.263
X 5	5501.6 10	1.00 15	0.117
X 6	5540.0 10	0.2 3	1.08
X 7	5606.2 3	24.2 4	2.43
X 8	5716.4 3	52.5 4	6.13
X 9	5747.2 4	9.5 6	1.16
X 10	5847.5 10	0.12 4	0.0199
X 11	5971.6 10	0.45 4	0.106

15 weak α 's omitted:
 $E_{\alpha}(\text{avg}) = 5348.2$; $E_{\alpha} = 0.20\%$

X-ray L	11.7	24 3	0.0061
X-ray $K_{\alpha 1}$	81.070 20	15.0 4	0.0259
X-ray $K_{\alpha 2}$	83.740 20	24.9 6	0.0445
X-ray K_{β}	94.9	11.3 3	0.0228
X-ray 9	122.31 6	1.147 20	0.0031
X-ray 11	144.20 4	3.26 7	0.0100
X-ray 12	154.19 3	5.53 10	0.0184
X-ray 13	158.62 4	0.648 13	0.0023
X-ray 14	179.67 12	0.153 12	0.0006
X-ray 28	269.41 3	13.6 3	0.0780
X-ray 29	288.17 12	0.154 6	0.0009
X-ray 30	323.89 4	3.90 3	0.0269
X-ray 31	324.50 6	0.148 10	0.0018
X-ray 33	334.32 6	2.14 7	0.0200
X-ray 34	342.90 7	0.20 3	0.0015
X-ray 38	371.44 4	0.440 12	0.0039
X-ray 44	444.94 5	1.27 6	0.0120

19 weak γ 's omitted:
 $E_{\gamma}(\text{avg}) = 137.1$; $E_{\gamma} = 0.40\%$

2249A & DECAY (3.45 D 4)
FEEDS 2209A

I(NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	Δ (μ -rad/ μ ci-h)
Auger-L	8.7	0.44 19	m0
ce-K-1	142.60 10	0.44 13	0.0013
ce-L-1	222.95 11	0.49 14	0.0023
ce-M-1	236.52 16	0.11 4	0.0006
a 1	5449	4.9 4	0.564
a 2	5685.56 20	95.1 4	11.52

3 weak a's omitted:
 $E_a(\text{avg}) = 5093.6$; $\Sigma I_a = 0.92\%$

X-ray L	11.7	0.39 3	m0
X-ray K_{α}	81.070 20	0.12 4	0.0002
X-ray K_{β}	83.780 20	0.21 6	0.0004
γ 1	241.02 10	3.9 11	0.0200

3 weak γ 's omitted:
 $E_{\gamma}(\text{avg}) = 440.1$; $\Sigma I_{\gamma} = 0.02\%$

2258A & DECAY (14.8 D 2)
FEEDS 2258C

I(NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	Δ (μ -rad/ μ ci-h)
Auger-L	9.24	10.2 15	0.0024
ce-L-1	20.2 10	28.9 5	0.0124
ce-M-1	35.0 10	7.11 13	0.0053
ce-NOP-1	18.7 10	2.35 4	0.0014
β -1 max	322 12		
avg	40 4	67.3	0.124
β -2 max	162 12		
avg	103 4	32.7	0.0717
total β -avg	94 4	100	0.201
X-ray L	12.7	18.7 15	0.0040
γ 1	40.0 10	29	0.0247

2258C & DECAY (10.0 D 1)
FEEDS 2219F

I(NIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	Δ (μ -rad/ μ ci-h)
ce-K-20	7.06 10	1.9 3	0.0003
ce-L-1	7.26 11	1.67526	0.0003
Auger-L	8.9	17.7 21	0.0034
ce-L-2	17.96 11	13.3 17	0.0051
ce-L-3	19.46 11	6.4 9	0.0027
ce-M-1	21.25 10	0.44719	0.0002
ce-K-23	23.26 20	0.10 7	m0
ce-NOP-1	24.75 10	0.147	m0
ce-M-2	31.95 10	3.6 5	0.0024
ce-M-3	33.85 10	1.71 23	0.0012
ce-NOP-2	35.45 10	1.17 15	0.0004
ce-NOP-3	37.35 10	0.57 4	0.0004

Continued

2258C & DECAY (10.0 D 1)
FEEDS 2219F

Continued

Radiation Type	Energy (keV)	Intensity (%)	Δ (μ -rad/ μ ci-h)
ce-L-4	44.21 11	3.7 5	0.0034
ce-L-5	45.54 11	0.7 3	0.0006
ce-M-27	48.78 20	0.104 15	0.0001
ce-L-6	50.44 11	0.25 4	0.0003
ce-L-7	52.46 11	0.51 10	0.0006
ce-L-8	54.86 11	0.532 10	0.0006
ce-L-10	55.78 21	0.22 12	0.0003
ce-M-24	56.08 20	1.03 12	0.0012
ce-L-11	56.24 21	0.28 14	0.0003
ce-M-4	58.20 10	0.87 11	0.0011
ce-M-5	59.55 10	0.17 7	0.0002
ce-NOP-4	61.70 10	0.31 4	0.0004
ce-L-12	64.26 4	0.54 16	0.0008
ce-M-7	66.95 10	0.14 3	0.0002
ce-L-13	68.68 21	1.03 4	0.0015
ce-M-4	68.85 10	0.1422 2	0.0002
ce-L-14	75.96 11	0.34 5	0.0006
ce-L-15	77.44 11	0.106 14	0.0002
ce-M-12	78.244 5	0.14 4	0.0002
ce-L-16	80.76 11	1.45 25	0.0025
ce-L-17	81.06 11	0.29 16	0.0005
ce-M-13	82.65 20	0.246 4	0.0004
ce-L-21	84.56 11	0.42 10	0.0012
ce-M-33	94.4 4	0.162 22	0.0003
ce-M-16	94.75 10	0.35 6	0.0007
ce-NOP-16	98.25 10	0.123 21	0.0003
ce-M-22	103.55 10	0.15 3	0.0003
ce-L-24	108.56 21	0.23 3	0.0007
a 1	5244 3	0.230 10	0.0259
a 2	5443 1	0.140 10	0.0162
a 3	5553 4	0.10	0.0118
a 4	5579.0 20	1.20 10	0.143
a 5	5604 3	1.10 10	0.131
a 6	5617.0 20	4.35 20	0.522
a 7	5641.0 10	1.30 20	0.157
a 8	5723.0 20	3.2 4	0.390
a 9	5731.0 20	10	1.23
a 10	5740.5	8.6	1.06
a 11	5752.5	18.1 20	2.23
a 12	5829.0 10	50.65	6.29

14 weak a's omitted:
 $E_a(\text{avg}) = 5443.7$; $\Sigma I_a = 0.34\%$

X-ray L	12	17.0 20	0.0043
γ 4	62.45 10	0.42 5	0.0006
γ 9	71.70 10	0.44 24	0.0009
γ 12	82.9	0.15 4	0.0003
X-ray K_{α}	83.210 20	0.41 11	0.0016
X-ray K_{β}	86.100 20	1.53 11	0.0024
γ 13	87.30 20	0.308 10	0.0006
γ 14	94.60 10	0.130 20	0.0003
X-ray K_{β}	97.5	0.70 4	0.0015
γ 16	99.40 10	0.60 10	0.0013
γ 17	99.70 10	3.5 14	0.0074
γ 20	108.20 10	0.25 4	0.0005
γ 21	111.4	0.32 5	0.0004
γ 25	138.2	0.20 10	0.0006
γ 26	144.70 20	0.13 3	0.0004
γ 27	149.90 20	0.71 10	0.0023
γ 28	153.7	0.17 3	0.0006
γ 29	157.20 20	0.35 4	0.0012
γ 32	187.70 20	0.55 5	0.0022
γ 33	195.5 4	0.150 20	0.0006
γ 35	216.2	0.34 10	0.0016
γ 36	224.5	0.1	0.0005
γ 39	253.6 3	0.13 3	0.0007
γ 43	453	0.11 4	0.0011

26 weak γ 's omitted:
 $E_{\gamma}(\text{avg}) = 178.2$; $\Sigma I_{\gamma} = 0.63\%$

226Ra & DECAY (1600 Y 7)
FEEDS 222Rn

I (WIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (γ-rad/ μCi-h)
Auger-L	5.7	0.91 4	0.0002
ce-K-1	87.59 5	0.633 13	0.0012
ce-L-1	107.98 6	1.207 24	0.0043
ce-E-1	101.51 4	0.321 7	0.0012
ce-NOP-1	104.05 4	0.1118 2	0.0004
α 1	4671.9 5	5.55 5	0.504
α 2	4784.50 25	94.45 5	9.63
X-ray L	11.7	0.81 9	0.0002
X-ray K _α	81.070 20	0.190 5	0.0003
X-ray K _β	83.780 20	0.209 8	0.0005
X-ray K _γ	94.9	0.136 4	0.0003
γ 1	195.99 4	3.20 3	0.0130

227Ac & DECAY (21.773 Y 3)
SA DECAY=1.30 4
FEEDS 223Fr
SEE ALSO 227Ac B- DECAY

I (WIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (γ-rad/ μCi-h)
ce-K-1	9.048 5	0.414 24	0
ce-NOP-1	11.547 5	0.138 8	0
α 1	4939.1 20	0.52 4	0.0552
α 2	4950.5 20	0.65 4	0.0694

17 weak α's omitted:
Σ E (avg) = 4439.7; Σ Iα = 0.19%32 weak γ's omitted:
Σ E (avg) = 116.4; Σ Iγ = 0.10%227Ac B- DECAY (21.773 Y 3)
BR- DECAY = 96.62 4
FEEDS 227Th
SEE ALSO 227Ac A DECAY

I (WIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (γ-rad/ μCi-h)
ce-L-3	4.03 20	0.74 15	0
ce-K-1	4.12 10	33 7	0.0029
ce-NOP-1	7.97 10	10.8 23	0.0018
Auger-L	9.48	0.36 8	0
ce-K-2	10.02 10	6.7 15	0.0014
ce-NOP-2	13.47 10	2.2 5	0.0007
ce-K-3	19.32 20	0.19 4	0
β-1 max	19.2 20		
avg	4.8 5	10	0.0010
β-2 max	38.4 20		
avg	8.7 6	35	0.0065
β-3 max	43.7 20		
avg	11.1 6	54	0.0128
total β- avg	9.4 7	94	0.0203
X-ray L	13	0.39 9	0.0001

3 weak γ's omitted:
Σ E (avg) = 16.0; Σ Iγ = 0.04%227Th & DECAY (18.718 D 5)
FEEDS 223Ra

I (WIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (γ-rad/ μCi-h)
ce-L-5	1.03 10	1.2 5	0
ce-K-2	3.10 20	2.6 6	0.0002
ce-NOP-2	6.79 20	0.85 17	0.0003
Auger-L	9	41 4	0.0090
ce-K-59	9.29 6	0.16 4	0
ce-L-8	10.34 10	0.53 11	0.0001
ce-L-4	10.67 3	41 15	0.0094
ce-L-10	12.38 11	16 5	0.0042
ce-K-5	15.45 10	0.30 11	0
ce-L-15	24.56 10	0.19 5	0
ce-K-9	24.76 10	0.13 3	0
ce-L-16	24.80 10	0.7 3	0.0003
ce-K-9	25.09 3	11 4	0.0050
ce-L-18	25.19 3	0.35 19	0.0022
ce-K-10	26.79 11	4.1 13	0.0023
ce-NOP-9	28.70 3	3.4 13	0.0022
ce-L-20	29.06 10	2.3 6	0.0014
ce-NOP-10	30.42 11	1.3 5	0.0009
ce-L-22	30.64 10	0.35 8	0.0002
ce-L-23	30.96 10	4.5 10	0.0030
ce-L-24	31.64 10	0.7 4	0.0005
ce-L-26	34.96 13 15	0.119 24	0
ce-L-28	37.31 10	0.27 6	0.0002
ce-K-16	39.30 10	0.17 9	0.0001
ce-L-10	42.27 10	5.7 19	0.0052
ce-L-33	43.5 3	0.10 3	0
ce-K-20	43.48 10	0.62 14	0.0006
ce-K-23	45.30 10	1.10 23	0.0011
ce-K-24	45.06 10	0.17 9	0.0002
ce-NOP-20	47.09 10	0.21 5	0.0002
ce-NOP-23	48.49 10	0.37 9	0.0004
ce-L-39	49.56 10	0.53 17	0.0006
ce-L-40	53.66 10	0.5 4	0.0006
ce-L-41	54.46 10	0.50 13	0.0004
ce-K-30	56.69 10	1.6 5	0.0019
ce-NOP-30	60.30 10	0.56 18	0.0007
ce-L-43	60.53 6	0.32 7	0.0004
ce-K-39	63.98 10	0.14 5	0.0002
Auger-K	65.9	0.13 8	0.0002
ce-K-40	68.09 10	0.14 11	0.0002
ce-K-41	69.08 10	0.14 4	0.0002
ce-L-45	74.76 6	0.14 3	0.0002
ce-L-46	75.76 10	0.11 3	0.0002
ce-L-50	81.06 10	0.60 14	0.0019
ce-L-57	93.46 6	0.60 24	0.0012
ce-K-50	95.48 10	0.15 4	0.0003
ce-K-41	101.08 10	0.26 8	0.0006
ce-K-57	108.38 6	0.16 7	0.0004
ce-K-91	130.98 20	0.53 13	0.0015
ce-K-92	132.08 8	0.55 14	0.0016
ce-K-96	146.28 10	0.12 4	0.0004
ce-K-97	146.48 20	0.11 4	0.0004
ce-K-99	148.62 15	0.11 3	0.0003
ce-K-100	152.37 5	0.67 15	0.0022
ce-K-106	159.08 10	0.21 10	0.0006
ce-K-113	192.23 6	0.89 19	0.0035
ce-K-117	192.68 10	0.27 6	0.0011
ce-K-120	200.52 13	0.57 14	0.0025
ce-K-123	208.74 13	0.26 6	0.0011
ce-L-92	216.76 8	0.104 22	0.0005
ce-K-131	230.48 14	0.35 8	0.0017
ce-L-100	237.01 5	0.77 17	0.0039
ce-K-100	251.43 5	0.21 5	0.0011
ce-L-113	265.91 4	0.19 4	0.0010
ce-L-120	285.20 3	0.11 3	0.0007
α 1	5585.9 16	0.176 6	0.0209
α 2	5600.6 18	0.170 17	0.0203
α 3	5613.3 16	0.214 8	0.0258
α 4	5668.0 15	2.06 12	0.249
α 5	5693.0 16	1.50 10	0.182

Continued

227Th & DECAY (18.710 D 5)
FEEDS 223Ra

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	A(γ-rad/ μCi-h)
α 6	5700.8 16	3.63 20	0.441
α 7	5709.0 16	9.2 3	0.997
α 9	5713.2 16	4.99 20	0.595
α 9	5757.06 15	20.3 10	2.49
α 10	5762.3 15	0.229 10	0.0280
α 11	5795.5 15	9.311 5	0.0390
α 12	5807.5 15	1.270 20	0.157
α 13	5866.6 15	2.42 10	0.302
α 14	5909.9 15	0.174 9	0.0219
α 15	5916.0 15	0.78 3	0.0903
α 16	5959.7 15	3.00 15	0.381
α 17	5977.92 10	23.4 10	2.99
α 18	6000.01 15	2.90 15	0.371
α 19	6030.21 15	24.5 10	3.15

25 weak α's omitted:

E_γ(avg)=5563.3; I_γ= 0.20%

γ 2	8.00 20	0.14 3	0.0
γ-ray L	12.3	41 9	0.0108
γ 5	20.27 10	3.20 9	0.0
γ 9	29.91 3	0.10 4	0.0
γ 15	43.80 10	0.23 6	0.0002
γ 22	49.88 10	0.65 10	0.0007
γ 23	50.20 10	9.5 19	0.0091
γ 32	62.50 20	0.24 6	0.0003
γ 43	79.77 6	2.1 5	0.0036
γ-ray K _α	85.430 10	1.44 12	0.0027
γ-ray K _β	98.470 10	2.44 14	0.0046
γ 45	94.00 6	1.4 3	0.0028
γ-ray K _β	109	1.12 3	0.0024
γ 57	113.20 6	0.15 6	0.0004
γ 58	113.20 6	0.46 13	0.0014
γ 59	117.20 7	0.17 4	0.0004
γ 66	141.30 7	0.13 3	0.0004
γ 90	204.30 10	0.23 6	0.0010
γ 91	205.00 10	0.15 5	0.0007
γ 92	206.10 10	0.23 5	0.0010
γ 94	210.65 10	1.13 24	0.0051
γ 91	234.90 20	0.45 11	0.0023
γ 92	236.00 9	11.2 24	0.0563
γ 95	250.20 10	0.37 12	0.0020
γ 97	250.80 20	0.13 4	0.0007
γ 94	252.55 15	0.11 3	0.0006
γ 99	254.70 20	0.80 14	0.0043
γ 100	256.25 5	6.4 15	0.0371
γ 101	262.80 10	0.100 23	0.0006
γ 106	273.00 10	0.49 11	0.0024
γ 110	281.40 7	0.16 4	0.0010
γ 113	286.15 6	1.6 4	0.0096
γ 117	296.60 10	0.43 10	0.0027
γ 114	299.90 13	2.0 5	0.0128
γ 119	300.30 20	0.20 9	0.0013
γ 120	304.44 13	1.05 25	0.0068
γ 123	312.66 13	0.44 11	0.0032
γ 125	314.86 11	0.46 11	0.0031
γ 130	329.82 10	2.4 6	0.0193
γ 131	334.40 10	1.00 23	0.0071
γ 133	342.45 6	0.35 9	0.0026
γ 136	350.50 10	0.112 25	0.0009

202 weak γ's omitted:

E_γ(avg)= 194.8; I_γ= 1.79%229Ra B- DECAY (5.75 Y 3)
FEEDS 228Ac

I (BIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(γ-rad/ μCi-h)
ce-β- 2	1.669 5 75		0.0027
ce-β- 2	5.401 5 25		0.0029
β- 1 max	38.4 10		
avg	9.9 3 100		0.0211

228Ac B- DECAY (16.13 H 3)
FEEDS 228Th

I (BIM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(γ-rad/ μCi-h)
Auger-L	9.48	36 5	0.0073
ce-β- 3	19.6 3	0.76 23	0.0063
ce-L- 1	37.29 6	57.4 25	0.0456
ce-β- 7	44.5 3	0.11 4	0.0007
ce-β- 1	52.58 6	15.6 7	0.0175
ce-β- 1	56.43 6	5.8 3	0.0070
Auger-L	69.2	0.14 14	0.0003
ce-β- 4	74.9 8	5 4	0.0070
ce-L- 2	78.98 9	4.0 16	0.0068
ce-β- 2	94.27 8	1.0 4	0.0019
ce-β- 2	94.72 8	0.36 14	0.0007
ce-β- 13	99.7 3	0.30 9	0.0006
ce-L- 3	105.6 3	7.2 22	0.0167
ce-β- 3	123.9 3	2.0 6	0.0052
ce-β- 3	127.8 3	0.74 22	0.0020
ce-β- 14	160.6 3	0.14 3	0.0005
ce-L- 9	164.1 8	1.2 9	0.0041
ce-β- 19	169.3 10	0.19 6	0.0007
ce-β- 25	228.7 3	0.27 6	0.0013
ce-β- 26	231.2 12	0.11 10	0.0006
ce-β- 38	353.3 3	0.141 15	0.0011
ce-β- 77	685.1 3	0.15 10	0.0022
ce-β- 90	801.42 3	0.251 9	0.0043
ce-β- 94	859.2 5	0.136 15	0.0025
β- 1 max	127 7		
avg	33.3 20	0.125 21	0.0001
β- 2 max	192 7		
avg	51.6 21	0.23 13	0.0003
β- 3 max	237 7		
avg	64.6 21	0.126 20	0.0002
β- 4 max	243 7		
avg	66.5 21	0.113 17	0.0002
β- 5 max	377 7		
avg	107.2 23	0.217 25	0.0005
β- 6 max	393 7		
avg	112.3 23	0.37 5	0.0001
β- 7 max	402 7		
avg	114.4 23	0.159 21	0.0004
β- 9 max	413 7		
avg	118.5 23	1.52 20	0.0038
β- 9 max	449 7		
avg	130.0 23	2.42 10	0.0067
β-10 max	454 7		
avg	131.7 23	1.55 13	0.0043
β-11 max	491 7		
avg	143.4 24	4.9 6	0.0150
β-12 max	494 7		
avg	144.4 23	0.76 7	0.0023
β-13 max	499 7		
avg	146.3 24	1.22 15	0.0040

Continued

228Ac B- DECAY (6.13 E)
PEELS 2207E

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
β-14 max	599 7		
avg	179.7 24	3.26 7	0.0010
β-15 max	606 7		
avg	192.0 24	9 3	0.0310
β-16 max	687 7		
avg	209.9 25	0.21 7	0.0009
β-17 max	793 7		
avg	247 3	0.14 3	0.0007
β-18 max	910 7		
avg	290 3	0.02 12	0.0051
β-19 max	962 7		
avg	309 3	0.21 4	0.0014
β-20 max	969 7		
avg	311 3	3.4 4	0.0225
β-21 max	983 7		
avg	317 3	7 4	0.0073
β-22 max	1014 7		
avg	320 3	6.6 7	0.0061
β-23 max	1046 7		
avg	340 3	0.27 22	0.0020
β-24 max	1115 7		
avg	366 3	3.5 7	0.0273
β-25 max	1121 7		
avg	369 3	0.06 9	0.0036
β-26 max	1150 7		
avg	382 3	0.21 4	0.0017
β-27 max	1360 7		
avg	386 3	31 5	0.255
β-28 max	1193 7		
avg	396 3	0.15 4	0.0013
β-29 max	1610 7		
avg	530 3	0.12 11	0.0014
β-30 max	1741 7		
avg	611 3	12 3	0.156
β-31 max	1759 7		
avg	618 3	0.13 7	0.0017
β-32 max	2079 7		
avg	740 3	0 6	0.127
total β- avg	376 4	96 10	0.772

2 weak β's omitted:
E₀(avg)= 79.0; I₀= 0.11%

X-ray L	13	39 5	0.0109
γ 1	57.76 6	0.503 20	0.0006
X-ray K _α	89.9530 20	2.1 9	0.0041
X-ray K _β	93.3580 20	3.5 15	0.0070
γ 2	99.05 8	1.3 5	0.0020
X-ray K _β	105	1.6 7	0.0036
γ 3	129.1 3	2.2 9	0.0077
γ 6	145.9 5	0.21 6	0.0007
γ 7	154.2 3	0.9 3	0.0031
γ 10	191.5 6	0.12 4	0.0005
γ 11	199.5 5	0.34 12	0.0014
γ 12	204.1 6	0.16 6	0.0007
γ 13	209.4 3	4.0 14	0.0195
γ 18	270.3 3	3.6 8	0.0200
γ 19	279.0 10	0.22 7	0.0013
γ 21	321.7 4	0.24 5	0.0017
γ 22	329.8 3	3.2 7	0.0225
γ 24	332.4 5	0.05 9	0.0032
γ 25	338.4 3	11.5 24	0.0030
γ 26	340.9 12	0.00 12	0.0029
γ 33	409.4 5	2.14 23	0.0187
γ 36	440.3 8	0.14 3	0.0013
γ 38	463.0 3	4.4 5	0.0039
γ 41	478.2 8	0.23 5	0.0024
γ 43	503.7 8	0.21 5	0.0022
γ 44	509.6 10	0.47 12	0.0051
γ 47	523.0 10	0.12 3	0.0013

Continued

228Ac E- DECAY (6.13 E)
PEELS 2207E

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
γ 49	546.3 3	0.21 5	0.0025
γ 51	562.3 5	0.95 15	0.0113
γ 52	570.7 10	0.13 6	0.0022
γ 53	572.1 10	0.14 5	0.0019
γ 54	583.20 20	0.14 5	0.0018
γ 69	701.5 8	0.19 4	0.0020
γ 69	707.3 10	0.15 5	0.0023
γ 70	727.0 8	0.76 23	0.0110
γ 72	755.2 5	1.06 17	0.0170
γ 73	772.1 5	1.56 23	0.0256
γ 75	782.0 5	0.52 8	0.0067
γ 77	794.0 3	4.6 5	0.0706
γ 81	830.4 5	0.59 6	0.0105
γ 92	435.6 5	1.75 19	0.0311
γ 83	840.2 5	0.95 10	0.0169
γ 99	904.2 5	0.93 9	0.0161
γ 90	911.07 3	27.8 8	0.539
γ 94	940.1 8	0.103 20	0.0021
γ 95	940.0 8	0.117 23	0.0020
γ 96	950.5 5	0.30 7	0.0062
γ 97	964.6 5	5.2 6	0.167
γ 99	968.9 5	16.7 18	0.345
γ 101	980.1 5	0.19 3	0.0039
γ 106	1033.1 5	0.22 4	0.0040
γ 110	1065.1 5	0.142 23	0.0032
γ 111	1095.7 5	0.128 20	0.0030
γ 113	1110.6 5	0.33 5	0.0379
γ 119	1153.6 5	0.153 23	0.0030
γ 123	1247.1 5	0.54 6	0.0144
γ 126	1287.5 5	0.114 17	0.0031
γ 137	1459.2 5	1.00 16	0.0310
γ 140	1455.0 5	1.01 11	0.0321
γ 141	1501.5 5	0.56 4	0.0170
γ 146	1556.9 6	0.19 4	0.0065
γ 149	1580.2 5	0.68 11	0.0229
γ 149	1587.9 4	3.4 6	0.120
γ 151	1624.7 5	0.31 7	0.0106
γ 152	1630.4 4	1.27 6	0.0645
γ 153	1630.0 5	0.52 11	0.0181
γ 154	1666.4 6	0.25 4	0.0071
γ 156	1685.9 4	2.170 20	0.0036
γ 170	1887.4 6	0.106 22	0.0042

109 weak γ's omitted:
E_γ(avg)= 937.3; I_γ= 3.81%

228Ac A DECAY (1.9131 E)
PEELS 2208AI (E₀) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	9	9.6 23	0.0019
ce-L- 1	45.16 5	19 4	0.0265
ce-M- 1	79.58 5	5.2 11	0.0088
ce-NOP- 1	83.19 5	1.9 4	0.0033
α 1	5175	0.19	0.0198
α 2	5212	0.36	0.0400
α 3	5340.54 15	26.70 20	3.04
α 4	5423.33 22	72.7	8.40

1 weak α's omitted:
E_α(avg)=5139.0; I_α= 0.05%

Continued

229Th & DECAY (7.413 Y 9)
FEEDS 229Ra

(Continued)

Decay Type	Energy (keV)	Intensity (%)	A(g-rad/ μCi-h)
X-ray L	12.3	9.6 23	0.0025
γ 1	84.80 5	1.2 3	0.0022
γ 2	131.62 20	9.114 19	0.0003
γ 5	215.94 8	0.278 16	0.0013

2 weak γ's omitted:

Σγ(avg) = 176.5; ΣIγ = 0.118

229Th & DECAY (7.3423 Y 16)
FEEDS 229Ra

I(BTH) = 0.108

Decay Type	Energy (keV)	Intensity (%)	A(g-rad/ μCi-h)
ce-K-17	3.25 5	8.94 16	0.0006
ce-L-3	6.153 20	44.8 9	0.0059
ce-R-1	6.2700 15	7.5	0.0010
Auger-L	9	98 9	0.0171
ce-RDP-1	9.8916 16	2.5	0.0005
ce-L-8	11.06 10	9.94 18	0.0023
ce-L-6	12.06 20	16.0 3	0.0041
ce-R-2	12.54 3	17.7 3	0.0047
ce-RDP-2	16.15 3	5.91 10	0.0020
ce-L-7	18.56 10	3.16 6	0.0013
ce-R-3	20.568 20	12.72 22	0.0056
ce-R-18	20.58 10	6.03 11	0.0026
ce-R-19	20.78 10	6.01 11	0.0027
ce-L-3	23.52 3	9.16 15	0.0041
ce-RDP-3	24.182 20	4.20 9	0.0022
ce-R-8	25.48 10	2.57 5	0.0018
ce-R-6	26.48 20	3.99 7	0.0023
ce-R-20	28.05 5	1.92 4	0.0011
ce-R-21	28.69 10	3.201 4	0.0011
ce-RDP-4	29.09 10	0.846 15	0.0005
ce-RDP-6	30.04 20	1.316 23	0.0008
ce-R-23	31.79 7	0.299 6	0.0002
ce-R-7	32.98 10	0.781 14	0.0005
ce-R-24	33.11 6	6.49 12	0.0046
ce-L-10	33.96 10	2.4 24	0.0017
ce-RDP-7	35.59 10	0.253 5	0.0002
ce-L-11	37.36 3	4.19 9	0.0033
ce-R-9	37.94 3	2.07 4	0.0017
ce-R-25	39.03 10	2.01 4	0.0017
ce-RDP-8	41.55 3	0.694 12	0.0006
ce-R-29	44.38 20	0.296 4	0.0002
ce-R-29	46.3 3	0.15 20	0.0002
ce-R-31	47.7 3	0.1012 1	0.0001
ce-R-10	48.38 10	0.6 7	0.0006
ce-L-12	48.94 7	1.119 20	0.0012
ce-L-13	49.66 4	4.56 9	0.0048
ce-R-32	50.48 7	2.50 5	0.0027
ce-R-11	51.78 3	1.002 18	0.0011
ce-RDP-10	51.99 10	0.23 25	0.0003
ce-R-33	52.56 4	4.09 7	0.0044
ce-R-34	54.59 7	0.209 4	0.0002
ce-RDP-11	55.39 3	0.355 7	0.0004
ce-L-14	55.96 7	13.92 25	0.0166
ce-R-12	63.36 7	0.279 5	0.0004
ce-R-13	64.08 4	1.232 22	0.0017
Auger-R	65.9	1.4 9	0.0020
ce-L-15	67.06 10	2.16 4	0.0031
ce-L-16	67.20 5	10.99 19	0.0157
ce-RDP-13	67.69 4	0.443 9	0.0006
ce-R-17	68.99 10	0.6 6	0.0009

Continued

229Th & DECAY (7.3423 Y 16)
FEEDS 229Ra

(Continued)

Decay Type	Energy (keV)	Intensity (%)	A(g-rad/ μCi-h)
ce-R-14	70.38 7	3.72 7	0.0057
ce-RDP-14	73.94 7	1.357 24	0.0021
ce-R-19	80.04 10	0.139 6	0.0006
ce-R-15	81.48 10	0.574 10	0.0019
ce-R-16	81.62 5	2.61 5	0.0046
ce-RDP-15	85.09 10	0.206 4	0.0004
ce-RDP-16	85.22 5	7.940 17	0.0017
ce-R-49	86.28 20	0.1006 1	0.0002
ce-L-17	87.93 5	1.87 4	0.0035
ce-R-41	89.71 6	0.53 15	0.0163
ce-R-17	102.35 5	0.455 4	0.0010
ce-L-18	105.26 10	1.122 20	0.0025
ce-L-19	105.46 10	1.122 20	0.0025
ce-RDP-17	105.96 5	0.163 3	0.0004
ce-R-44	107.05 10	4.43 9	0.0112
ce-L-20	112.73 5	0.358 7	0.0009
ce-R-45	114.18 20	0.203 4	0.0005
ce-L-23	116.47 7	1.74 3	0.0043
ce-L-24	117.74 6	1.212 21	0.0030
ce-R-18	119.64 10	0.269 5	0.0007
ce-R-19	119.88 10	0.264 5	0.0007
ce-L-25	123.73 10	0.374 7	0.0010
ce-R-23	130.94 7	0.373 3	0.0013
ce-R-24	132.21 6	0.294 5	0.0009
ce-RDP-23	134.50 7	0.172 3	0.0005
ce-L-32	135.16 7	0.464 9	0.0013
ce-RDP-24	135.42 6	0.1139 1	0.0003
ce-L-13	137.24 4	0.757 14	0.0022
ce-R-47	138.7 3	0.15 14	0.0004
ce-R-32	149.56 7	0.1111 2	0.0004
ce-R-33	151.66 4	0.181 4	0.0006
ce-L-17	153.66 10	0.224 12	0.0007
ce-L-19	160.56 20	0.215 4	0.0007
ce-L-19	164.76 10	0.1424 2	0.0005
ce-L-41	174.39 6	1.54 3	0.0059
ce-R-41	180.81 6	0.178 7	0.0015
ce-L-44	191.73 10	0.914 16	0.0037
ce-RDP-41	192.42 6	0.1136 2	0.0005
ce-R-44	206.15 10	0.213 4	0.0010

α 1	4648	0.15	0.0150
α 2	4741	0.63	0.0639
α 3	4797.2 12	1.27	0.130
α 4	4809	0.22	0.0225
α 5	4814.0 12	4.4	0.461
α 6	4833	0.24	0.0299
α 7	4837	4.9	0.495
α 8	4844.7 12	56.2	5.90
α 9	4861	0.14	0.0146
α 10	4900.4 12	10.9	1.13
α 11	4927	0.1	0.0115
α 12	4966.9 12	6.4	0.677
α 13	4977.9 12	3.2	0.339
α 14	5033	0.24	0.0257
α 15	5050	5.2	0.559
α 16	5052	1.6	0.172

12 weak α's omitted:

Σα(avg) = 4764.3; ΣIα = 0.274

X-ray L	12.1	98 9	0.0231
γ 2	17.36 3	0.17	0.0057
γ 6	21.30 20	9.6	0.0023
γ 7	37.40 10	2.6	0.0001
γ 8	42.76 3	0.15	0.0004
γ 11	46.60 3	0.32	0.0001
γ 12	69.18 7	0.10	0.0002
γ 13	69.90 4	0.1	0.0003
γ 14	75.20 7	0.5	0.0241
X-ray K _α	85.430 10	15.5 4	0.0241

Continued

229TH & DECAY (7.34E3 Y 16) (Continued)
FEEDS 22510

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
γ 15	86.30 10	0.20	0.0004
γ 16	86.40 5	2.9	0.0053
X-ray K _α	88.470 10	25.5 6	0.0400
X-ray Kβ	100	11.7 3	0.0200
γ 17	107.17 5	0.06	0.0020
γ 18	124.50 10	0.05	0.0023
γ 19	124.70 10	0.05	0.0023
γ 20	131.97 5	0.32	0.0009
γ 23	135.71 7	1	0.0029
γ 24	137.03 6	1.2	0.0035
γ 25	142.95 10	0.02	0.0013
γ 28	146.30 20	1.4	0.0044
γ 32	150.40 7	0.65	0.0021
γ 33	156.40 4	1	0.0037
γ 37	172.90 10	0.4	0.0015
γ 38	179.00 20	0.43	0.0016
γ 39	184.00 10	0.32	0.0013
γ 41	193.63 6	0.2	0.0017
γ 42	204.9 3	1.2	0.0052
γ 44	210.97 10	3	0.0139
γ 45	210.90 20	0.14	0.0007
γ 47	242.6 3	0.25 29	0.0013
γ 51	290.0 5	0.26	0.0016

22 weak γ's omitted:
E_γ(avg) = 151.1; I_γ = 0.56%

230TH & DECAY (7.72E4 Y 2) I (NIM) = 0.10%
FEEDS 2268A
8 SPONTANEOUS FISSION LE 58-11

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	9	0.5 11	0.0016
ce-L- 1	48.5633 15	17.0 14	0.0176
ce-H- 1	62.9700 15	4.6 4	0.0062
ce-POP- 1	66.5916 16	1.66 14	0.0024
α 1	4473	0.15	0.0143
α 2	4617.5 15	23.4	2.30
α 3	4680.0 15	76.3	7.61

1 weak α's omitted:
E_α(avg) = 4430.0; I_α = 0.01%

X-ray L	12.3	0.5 11	0.0022
γ 1	67.0	0.30 3	0.0005

7 weak γ's omitted:
E_γ(avg) = 174.2; I_γ = 0.07%

231TH B- DECAY (25.52 H 1) I (NIM) = 0.10%
FEEDS 231PA

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
ce-H- 1	3.9331 16	0.40 4	0
ce-L- 5	5.535 20	56 7	0.0066
ce-POP- 1	7.9129 18	0.133 14	0
Auger-L	9.60	70 11	0.0162
ce-H- 5	21.273 20	14.5 17	0.0066
ce-L- 6	21.70 20	0.136 16	0

Continued

231TH B- DECAY (25.52 H 1) (Continued)
FEEDS 231PA

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
ce-H- 27	23.07 5	0.4 4	0.0002
ce-POP- 5	25.253 20	4.0 6	0.0026
ce-H- 30	33.40 16	0.101 12	0
ce-L- 8	37.495 11	65 10	0.0516
ce-L- 9	37.8954 10	35 4	0.0202
ce-L- 10	42.9954 10	0.22 16	0.0002
ce-L- 11	47.3954 10	0.30 4	0.0003
ce-H- 31	50.56 6	0.06 16	0.0009
ce-L- 12	51.71 3	0.130 16	0.0001
ce-H- 8	53.233 11	10 3	0.0202
ce-H- 9	53.6331 16	9.6 10	0.0110
ce-POP- 8	57.213 11	6.4 10	0.0000
ce-POP- 9	57.6129 10	3.6 4	0.0004
ce-L- 14	60.00 10	7.3 9	0.0090
ce-L- 15	61.00 10	2.5 4	0.0037
ce-L- 16	63.135 11	1.15 14	0.0016
ce-L- 17	68.04 5	0.152 25	0.0002
ce-H- 14	75.83 10	1.03 21	0.0029
ce-H- 15	76.73 10	0.70 9	0.0011
ce-L- 19	78.20 5	0.69 15	0.0012
ce-H- 16	78.073 11	0.20 4	0.0005
ce-POP- 14	79.81 10	0.67 8	0.0011
ce-POP- 15	80.71 10	0.26 4	0.0004
ce-H- 19	93.93 5	0.17 4	0.0003
ce-L- 27	114.57 5	0.10 5	0.0005
ce-L- 31	142.06 6	0.17 4	0.0005

β- 1 max	143 4		
avg	37.6 10	2.6 5	0.0021
β- 2 max	172 4		
avg	45.0 10	0.139 16	0.0001
β- 3 max	206 4		
avg	55.7 10	16.1 10	0.0191
β- 4 max	216 4		
avg	50.4 11	2.4 3	0.0030
β- 5 max	306 4		
avg	45.1 11	70 7	0.141
β- 6 max	312 4		
avg	87.0 11	0.46 5	0.0099
total β-			
avg	70.4 12	100 0	0.167

3 weak β's omitted:
E_β(avg) = 17.5; I_β = 0.09%

X-ray L	13.3	92 11	0.0261
γ 5	26.640 20	10.7 22	0.0106
γ 6	42.00 20	0.156 10	0.0001
γ 8	58.600 10	0.56 9	0.0007
γ 9	59	0.31 4	0.0004
γ 12	72.01 3	0.62 9	0.0010
γ 14	81.20 10	1.01 12	0.0010
γ 15	82.10 10	0.48 6	0.0008
γ 16	84.240 10	0.0 10	0.0163
γ 17	89.94 5	1.25 21	0.0024
X-ray K _α	92.2870 20	0.39 12	0.0000
X-ray K _β	95.0600 20	0.63 19	0.0013
γ 19	99.30 5	0.17 4	0.0004
γ 20	102.31 3	0.51 7	0.0011
X-ray K _β	108	0.29 9	0.0007
γ 27	135.67 5	0.101 12	0.0003
γ 31	163.16 6	0.20 4	0.0007

34 weak γ's omitted:
E_γ(avg) = 109.0; I_γ = 0.46%

231Pa A DECAY (3.248E+ Y 11) I (BIM) = 0.10%
FEEDS 227Ac
% SPONTANEOUS FISSION=3E-10

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
ce-L- 10	8.06 11	0.659 12	=0
ce-L- 11	5.70 7	19.69 20	0.0017
ce-L- 13	7.520 21	25.1 5	0.0040
Auger-L	9.20	81 5	0.0001
ce-L- 14	10.11 3	20.2 21	0.0004
ce-R- 5	11.50 10	1.65 22	0.0000
ce-R- 7	13.090 5	39.2 12	0.0116
ce-NOP- 5	15.23 10	0.56 9	0.0002
ce-NOP- 7	17.631 5	12.9 8	0.0009
ce-L- 14	18.36 3	0.0 9	0.0031
ce-R- 10	19.70 10	0.161 3	=0
ce-R- 11	20.50 6	3.29 6	0.0010
ce-R- 13	22.350 12	6.35 11	0.0030
ce-NOP- 11	24.27 6	1.090 19	0.0006
ce-L- 20	24.32 3	1.70 22	0.0109
ce-R- 14	24.900 21	5.2 6	0.0020
ce-NOP- 13	26.091 12	2.09 4	0.0012
ce-L- 25	26.53 3	0.109 3	=0
ce-NOP- 10	28.601 21	1.72 17	0.0011
ce-L- 27	32.90 3	1.50 17	0.0011
ce-R- 19	33.190 21	1.95 20	0.0010
ce-NOP- 19	36.931 21	0.64 7	0.0005
ce-L- 30	37.35 4	8.3 5	0.0030
ce-R- 20	39.150 21	0.43 5	0.0004
ce-NOP- 20	42.891 21	0.142 17	0.0001
ce-L- 32	43.83 4	3.3 4	0.0031
ce-R- 27	47.730 21	0.36 4	0.0004
ce-NOP- 27	51.471 21	0.131 14	0.0001
ce-R- 30	52.19 3	1.17 13	0.0013
ce-L- 36	54.30 5	0.79 10	0.0009
ce-NOP- 30	55.92 3	0.02 5	0.0005
ce-L- 37	57.52 4	0.39 5	0.0005
ce-R- 32	58.67 3	0.09 4	0.0011
ce-NOP- 32	62.40 3	0.32 4	0.0004
ce-R- 36	69.18 4	0.22 3	0.0003
ce-L- 40	77.00 4	0.79 3	0.0013
ce-L- 41	81.00 5	0.24 4	0.0004
ce-L- 42	82.7 4	0.30 11	0.0005
ce-R- 40	93.09 3	0.215 23	0.0004
ce-R- 53	153.46 8	0.113 9	0.0004
ce-R- 50	193.32 6	1.51 7	0.0062
ce-R- 65	223.315 6	0.66 11	0.0031
ce-L- 50	280.20 7	0.291 14	0.0017
ce-L- 65	310.230 10	0.122 19	0.0008

a 1	4631.0 20	0.10	0.0099
a 2	4602.0 20	0.10	0.0099
a 3	4680.0 20	1.5	0.150
a 4	4712.0 20	1	0.100
a 5	4736.0 20	0.4	0.047
a 6	4851.0 20	1.4	0.145
a 7	4933.0 20	1	0.115
a 9	4950	22.9	2.40
a 9	4974.0 20	0.4	0.0420
a 10	4980.0 20	1.4	0.144
a 11	5011.0 20	25.0	2.71
a 12	5020	20	2.14
a 13	5030.5 20	2.5	0.269
a 14	5057.3 20	11	1.18

4 weak a's omitted:
E_T(avg)=4706.2; E_I=0.07%

X-ray L	12.7	43 5	0.0115
γ 6	16.50 10	0.63 9	0.0002
γ 7	18.9	0.840 10	0.0002
γ 13	27.360 10	0.3	0.0050
γ 19	38.200 20	0.143 15	0.0031
γ 25	44.370 20	0.2090 2	0.0062
X-ray K _α	87.670 10	0.6 4	0.0012

Continued

231Pa A DECAY (3.248E+ Y 11) (Continued)
FEEDS 227Ac
% SPONTANEOUS FISSION=3E-10

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
X-ray K _α	90.900 6	1.67 7	0.0021
X-ray K _β	102	0.89 3	0.0011
γ 51	255.00 7	0.101 6	0.0006
γ 53	263.22 8	0.173 11	0.0010
γ 56	283.67 6	1.50 10	0.0097
γ 58	300.00 6	2.30 10	0.0147
γ 60	302.67 6	2.30 10	0.0149
γ 65	330	1.30 23	0.0091
γ 64	340.01 7	0.165 9	0.0012
γ 69	357.16 7	0.173 10	0.0013

81 weak γ's omitted:
E_T(avg)= 165.5; E_I= 1.02%

232Th A DECAY (1.40E10 Y 6) I (BIM) = 0.10%
FEEDS 228Ra

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	9	9.2 16	0.0016
ce-L- 1	39.8 10	17 3	0.0141
ce-R- 1	56.2 10	8.5 8	0.0052
ce-NOP- 1	57.8 10	1.6 3	0.0020
ce-L- 2	107 5	0.10 5	0.0002
a 1	3830	0.20 4	0.0163
a 2	3953	23 3	1.94
a 3	4010 5	77 3	6.56
X-ray L	12.3	9.4 16	0.0022
γ 1	59.0 10	0.19 3	0.0002

1 weak γ's omitted:
E_T(avg)= 126.0; E_I= 5.04%

232Th A DECAY (71.7 Y 9) I (BIM) = 0.10%
FEEDS 228Tl
% SPONTANEOUS FISSION=1E-10

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	9.40	11.6 13	0.0023
ce-L- 1	37.2279	5 23.9 5	0.0190
ce-R- 1	52.5177	3 6.57 12	0.0070
ce-NOP- 1	56.3705	4 2.01 5	0.0024
ce-L- 2	108.53 20	0.222 11	0.0005
a 1	5139.0 20	0.240 20	0.0306
a 2	5243.50 4	19.2 4	1.50
a 3	5320.30 10	69.6 4	7.77
X-ray L	13	12.4 13	0.0035
γ 1	57.7	0.2	0.0003

6 weak γ's omitted:
E_T(avg)= 142.1; E_I= 0.09%

233PA B- DECAY (27.0 D 1) I(MTM) = 0.10%
PEPES 233B

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
ce-L- 2	6.7e26	3 23.7 8	0.0030
Auger-L	9.89	39 6	0.0082
ce-P- 1	11.7120	8 1.284	0.0003
ce-NOP- 1	15.8192	8 0.428	0.0001
ce-L- 3	18.59	5 10.86 19	0.0043
ce-P- 2	22.9920	8 6.02 11	0.0029
ce-NOP- 2	27.0992	8 1.90 8	0.0011
ce-P- 3	34.80	5 2.94 5	0.0022
ce-NOP- 3	38.91	5 0.970 17	0.0008
ce-L- 9	53.523 20	9.70 17	0.0111
ce-L- 9	54.833 20	10.76 18	0.0139
ce-P- 9	69.732 20	2.36 8	0.0035
Auger-P	72.6	0.7 6	0.0011
ce-NOP- 9	73.839 20	0.857 15	0.0011
ce-P- 9	81.042 20	2.85 5	0.0042
ce-L- 11	82.107 10	1.36 11	0.0038
ce-NOP- 9	85.149 20	0.993 16	0.0016
ce-P- 11	98.316 10	0.84 3	0.0010
ce-NOP- 11	102.823 20	0.175 10	0.0004
ce-P- 15	108.510 20	8.9 3	0.0191
ce-P- 17	196.291 11	25.6 5	0.107
ce-P- 19	224.864 20	2.33 13	0.0111
ce-L- 18	249.62 8	0.105 6	0.0006
ce-L- 15	278.367 20	0.95 6	0.0056
ce-L- 17	290.130 10	8.99 9	0.0308
ce-P- 15	294.576 20	0.229 13	0.0014
ce-P- 22	300.178 20	0.157 9	0.0010
ce-P- 17	306.339 10	1.203 21	0.0079
ce-NOP- 17	310.446 10	0.438 8	0.0029
ce-L- 19	318.713 20	0.450 25	0.0031
ce-P- 19	334.922 20	0.109 6	0.0008

B- 1 max			
avg	156.6 20		
B- 2 max	41.5 7	21.43 20	0.0190
avg	173.8 20		
B- 3 max	46.3 7	14.97 7	0.0149
avg	231.8 20		
B- 4 max	63.0 7	36.3 8	0.0227
avg	260.4 20		
B- 5 max	71.4 8	16.88 19	0.0257
avg	532.0 20		
B- 6 max	160.6 8	1.2 7	0.0041
avg	572.3 20		
B- 7 max	170.3 8	9.2 8	0.0334
avg	170.3 8		
total B-	68.3 9	100.0 12	0.106

X-ray L	13.6	50 6	0.0140
γ 8	75.280 20	1.1458	0.0019
γ 9	86.590 20	1.786	0.0033
X-ray K _α	74.6650 20	9.6 3	0.0193
X-ray K _β	98.4390 20	15.5 4	0.0325
γ 11	103.864 10	0.59 3	0.0013
X-ray K _γ	111	7.22 21	0.0171
γ 14	271.58 8	0.84 5	0.0049
γ 15	300.124 20	5.8 3	0.0368
γ 17	311.807 10	33.7	0.224
γ 19	340.470 20	3.99 21	0.0291
γ 20	375.40 5	0.59 3	0.0047
γ 21	398.390 20	1.29 7	0.0109
γ 22	415.780 20	1.59 8	0.0141

12 weak γ's omitted:
E_γ(avg) = 88.8; E_γ = 0.19%

233C A DECAY (1.56525 Y 19) I(MTM) = 0.10%
PEPES 229TR

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
ce-L- 2	8.53 10	1.93 11	0.0004
Auger-L	9.68	5.8 7	0.0012
ce-L- 4	21.93 10	9.0 5	0.0042
ce-P- 2	23.62 10	0.464 25	0.0002
ce-NOP- 2	27.67 10	0.153 3	0.0001
ce-L- 6	34.22 10	0.76 4	0.0006
ce-P- 4	41.22 10	2.36 12	0.0019
ce-NOP- 4	41.07 10	0.78 4	0.0007
ce-P- 6	49.51 10	0.190 11	0.0002
ce-L- 13	51.41 5	0.134 7	0.0001
ce-L- 22	76.74 10	0.265 14	0.0004
α 1	4729	1.6	0.162
α 2	4754	0.163	0.0165
α 3	4782.9 12	13.23	1.35
α 4	4796	0.20	0.0206
α 5	4824.0 10	90.4	8.67

27 weak α's omitted:
E_α(avg) = 4673.6; E_α = 0.29%

X-ray L	13	6.3 7	0.0017
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94 weak γ's omitted:
E_γ(avg) = 110.9; E_γ = 0.26%

233TH B- DECAY (24.10 D 1) I(MTM) = 0.10%
PEPES 234PA (1.17 M)
SIT DECAY POW 234PA (1.17 M) = 0.13 3

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
ce-L- 2	8.385 20	8.9 7	0.0009
Auger-L	9.68	8.3 11	0.0017
ce-P- 1	14.653 20	2.5 4	0.0008
ce-NOP- 1	18.633 20	0.95 11	0.0003
ce-P- 2	24.123 20	1.38 19	0.0007
ce-NOP- 2	28.103 20	0.44 6	0.0003
ce-L- 4	41.755 20	0.40 9	0.0004
ce-L- 5	42.177 3	1.21 10	0.0011
ce-P- 7	52.815 20	0.33 3	0.0004
ce-P- 8	57.493 20	0.103 23	0.0001
ce-P- 5	57.915 3	0.299 25	0.0004
ce-NOP- 5	61.895 3	0.104 9	0.0001
ce-L- 12	71.262 6	10.9 10	0.0165
ce-L- 13	71.607 6	0.34 3	0.0005
ce-P- 12	87.000 6	2.62 23	0.0049
ce-NOP- 12	90.980 6	0.57 9	0.0019

B- 1 max	80.3 21		
avg	20.7 6	3.8 5	0.0017
B- 2 max	89.7 21		
avg	23.2 6	0.49 5	0.0002
B- 3 max	100.3 21		
avg	26.0 6	5.5 6	0.0033
B- 4 max	100.7 21		
avg	26.1 6	17.6 16	0.0098
B- 5 max	101.1 21		
avg	51.8 6	72.5 20	0.0900

Continued

236TR B- DECAY (24.10 D) (Continued)
 FEEDS 236PA (1.17 h)
 NET DECAY FOR 236PA (1.17 h) = 0.13 J

Radiation Type	Energy (keV)	Intensity (%)	A (γ-rad/ μCi-h)
total 9- avg	40.5 J	100 J	0.0948
1 weak β's omitted: $\beta_0(\text{avg}) = 15.4; \text{I}\beta = 0.09\%$			
γ-ray L	13.3	9.9 11	0.0028
γ 5	63.2520 20	3.9 4	0.0053
γ 12	92.367 5	2.57 23	0.0051
γ 13	92.792 5	3.9 3	0.0059
γ 17	112.01 5	0.249 21	0.0006

15 weak γ's omitted:
 $\Sigma\gamma(\text{avg}) = 76.0; \text{I}\gamma = 0.29\%$

236PA B- DECAY (6.70 H 5) I (EEM) = 0.10%
 FEEDS 236U

Radiation Type	Energy (keV)	Intensity (%)	A (γ-rad/ μCi-h)
ce-R- 11	9.69 20	0.24 9	0
Auger-L	9.89	90 10	0.0189
ce-L- 1	12.5426 3	5.0 21	0.0015
ce-R- 12	15.67 10	4.1 10	0.0014
ce-R- 13	18.7639 16	1.7 6	0.0007
ce-L- 2	21.69 5	63 21	0.0289
ce-L- 3	23.4326 3	4.3 17	0.0021
ce-R- 15	24.69 20	2.9 7	0.0015
ce-R- 16	26.49 20	1.3 13	0.0008
ce-R- 1	28.7520 4	1.6 6	0.0010
ce-NOP- 1	32.4592 4	0.52 19	0.0004
ce-L- 4	36.4426 3	1.1 4	0.0009
ce-R- 18	37.09 10	1.6 4	0.0012
ce-R- 2	37.90 5	17 6	0.0139
ce-R- 3	39.6420 4	1.2 5	0.0010
ce-L- 5	41.44 20	1.00 24	0.0009
ce-NOP- 2	42.01 5	5.7 20	0.0051
ce-NOP- 3	43.7492 4	0.39 15	0.0004
ce-L- 6	45.3426 3	2.1 8	0.0020
ce-R- 4	52.6520 4	0.30 12	0.0003
ce-R- 21	55.19 10	2.0 5	0.0023
ce-NOP- 4	56.7592 4	0.11 5	0.0001
ce-R- 5	57.65 20	0.25 6	0.0003
ce-L- 8	58.7 5	10.7 24	0.0134
ce-R- 22	59.0 3	0.4 4	0.0005
ce-R- 6	61.5520 4	0.58 22	0.0008
ce-NOP- 6	65.6592 4	0.22 9	0.0003
ce-R- 23	70.39 20	6.2 15	0.0093
Auger-R	72.6	1.2 9	0.0018
ce-R- 8	75.0 5	3.0 7	0.0047
ce-L- 9	77.94 10	47 18	0.0791
ce-R- 24	78.0 3	1.5 4	0.0026
ce-NOP- 9	79.1 5	1.11 25	0.0019
ce-R- 25	80.9 10	0.10 10	0.0002
ce-L- 10	81.6526 3	1.0 4	0.0017
ce-R- 26	84.0939 16	2.0 8	0.0035
ce-R- 27	85.19 20	0.17 4	0.0003
ce-R- 28	87.3 3	1.0 4	0.0018
ce-R- 9	94.15 10	13 5	0.0261
ce-R- 10	97.8620 4	0.29 11	0.0006
ce-NOP- 9	100.26 10	4.9 18	0.0102
ce-NOP- 10	101.9692 4	0.10 5	0.0002
ce-L- 11	103.54 20	3.8 14	0.0043
ce-R- 30	104.6 6	0.45 19	0.0010

Continued

236PA B- DECAY (6.70 H 5) (Continued)
 FEEDS 236U

Radiation Type	Energy (keV)	Intensity (%)	A (γ-rad/ μCi-h)
ce-L- 12	109.52 10	0.92 21	0.0021
ce-R- 32	111.26 10	12 3	0.0202
ce-R- 33	111.26 10	4.4 11	0.0104
ce-L- 13	112.6126 3	0.13 12	0.0009
ce-L- 15	118.54 20	1.7 4	0.0043
ce-R- 11	119.75 20	1.0 4	0.0027
ce-L- 16	122.34 20	0.61 19	0.0016
ce-NOP- 11	123.86 20	0.39 14	0.0010
ce-R- 12	125.73 10	0.22 5	0.0006
ce-L- 17	128.4426 3	0.36 7	0.0008
ce-R- 34	129.79 20	1.3 5	0.0036
ce-L- 19	130.94 10	10.2 24	0.0205
ce-R- 35	133.29 20	0.15 4	0.0004
ce-R- 15	134.75 20	0.45 11	0.0013
ce-R- 16	138.55 20	0.16 5	0.0005
ce-NOP- 15	138.86 20	0.17 4	0.0005
ce-R- 14	147.15 10	2.4 7	0.0009
ce-L- 21	149.04 10	0.38 10	0.0012
ce-NOP- 18	151.26 10	1.06 25	0.0034
ce-L- 22	152.8 3	0.14 5	0.0005
ce-R- 17	156.49 20	1.3 4	0.0044
ce-L- 23	164.24 20	1.2 3	0.0043
ce-L- 24	171.8 3	0.30 7	0.0011
ce-L- 26	177.9426 3	0.34 15	0.0015
ce-R- 41	178.09 20	2.3 6	0.0007
ce-L- 27	179.04 20	0.47 11	0.0018
ce-R- 23	180.45 20	0.29 7	0.0011
ce-L- 28	181.1 3	0.50 16	0.0019
ce-NOP- 23	184.56 20	0.107 25	0.0004
ce-R- 27	195.25 20	0.13 3	0.0005
ce-R- 43	196.8439 16	0.12 11	0.0005
ce-R- 28	197.4 3	0.13 5	0.0005
ce-L- 32	205.11 10	2.3 4	0.0101
ce-L- 33	205.11 10	1.2 3	0.0053
ce-R- 49	214.7 5	0.3 3	0.0015
ce-R- 33	221.32 10	0.31 8	0.0014
ce-R- 32	221.32 10	0.16 11	0.0026
ce-L- 34	223.64 20	0.25 8	0.0012
ce-NOP- 33	225.43 10	0.11 3	0.0005
ce-NOP- 32	225.43 10	0.20 5	0.0010
ce-L- 37	250.34 20	0.25 6	0.0014
ce-R- 50	254.0 3	1.4 4	0.0074
ce-R- 51	256.6 3	0.69 19	0.0030
ce-L- 41	271.94 20	0.50 13	0.0029
ce-R- 41	288.15 20	0.12 3	0.0008
ce-R- 57	343.0 3	0.17 4	0.0012
ce-L- 50	347.8 3	0.26 7	0.0019
ce-L- 51	350.4 3	0.13 4	0.0010
ce-R- 66	397.99 20	0.13 13	0.0011
ce-R- 74	450.9 6	0.25 8	0.0024
ce-R- 77	453.65 10	0.47 17	0.0045
ce-R- 76	453.65 10	1.6 4	0.0151
ce-L- 76	547.50 10	0.30 8	0.0035
ce-R- 101	576.9 5	0.11 5	0.0014
ce-R- 102	583.5 3	0.23 19	0.0029
ce-R- 105	617.39 20	0.4 3	0.0052
ce-R- 120	680.6 5	0.13 10	0.0018
ce-R- 124	694.4 10	0.15 6	0.0022
ce-R- 129	709.1 5	0.12 9	0.0019
ce-R- 135	764.91 4	0.12 8	0.0019
ce-R- 137	767.63 4	0.13 3	0.0021
ce-R- 142	811.1 5	0.119 25	0.0019
ce-R- 145	833.4 10	0.19 13	0.0033

R- 1 max	64 5		
avg	16.3 14	0.59 16	0.0002
R- 2 max	327 5		
avg	99.3 16	1.3 4	0.0025
R- 3 max	397 5		
avg	113.1 14	1.1 3	0.0026

Continued

230Pa E- RECAP (6.7C H 5) (Continued)
FEELS 230C

Radiation Type	Energy (keV)	Intensity (%)	A(g-rad/ μ Ci-h)
5-4 max	426.5		
avg	122.4 16	4.8 10	0.0104
5-5 max	446.5		
avg	128.9 16	1.9 7	0.0049
5-6 max	471.5		
avg	136.9 17	2.2 7	0.0064
5-7 max	485.5		
avg	141.5 17	11 3	0.0332
5-8 max	486.5		
avg	141.6 17	27 7	0.0814
5-9 max	510.5		
avg	151.0 17	0.9 22	0.0283
5-10 max	620.5		
avg	166.2 17	0.7 4	0.0028
5-11 max	656.5		
avg	199.5 18	16 4	0.0676
5-12 max	933.5		
avg	256.9 19	1.00 20	0.0063
5-13 max	1013.5		
avg	317.1 17	2.6 18	0.0176
5-14 max	993.5		
avg	319.0 19	0.35 10	0.0024
5-15 max	1116.5		
avg	364.5 19	1.2 6	0.0093
5-16 max	1138.5		
avg	373.0 19	10 4	0.0794
5-17 max	1219.5		
avg	388.3 18	5.3 16	0.0438
5-18 max	1184.5		
avg	390.3 19	2.6 15	0.0216
5-19 max	1240.5		
avg	411.6 19	1.2 9	0.0105
5-20 max	1285.5		
avg	413.6 19	0.7 4	0.0062
total 5-			
avg	206.6 22	99 11	0.438
X-ray L	43.6	114 20	0.0331
2	43.45 5	0.12 4	0.0001
5	63.20 20	3.1 9	0.0042
7	69.9	0.23 5	0.0003
8	80.5 5	0.39 9	0.0007
X-ray K α	30.4650 20	15.5 13	0.0313
X-ray K β	92.4390 20	25.1 20	0.0527
9	99.70 10	4.7 14	0.0100
10	103.4	0.12 5	0.0003
X-ray K β	111	11.7 10	0.0277
11	125.30 20	1.1 4	0.0024
12	131.29 10	20 5	0.0548
13	134.37	0.21 9	0.0026
14	137.7 5	7.15 4	0.0004
15	140.30 20	0.93 22	0.0028
16	144.10 20	0.38 10	0.0012
17	150.2	0.20 5	0.0006
18	152.70 10	7.2 17	0.0233
19	159.30 20	0.73 17	0.0625
21	170.80 10	0.48 12	0.0017
22	174.6 3	0.19 7	0.0007
23	186.00 20	1.9 5	0.0077
24	193.6 3	0.54 13	0.0022
26	199.7	0.7 3	0.0032
27	200.80 20	1.08 25	0.0046
28	202.9 3	1.1 4	0.0049
30	220.2 6	0.23 10	0.0011
32	226.87 10	6.5 15	0.0313
33	226.87 10	3.8 10	0.0195
34	245.40 20	0.9 3	0.0046
35	248.90 20	3.1 8	0.0166
36	267.1 8	0.17 4	0.0004
37	272.10 20	1.2 3	0.0068

Continued

230Pa E- RECAP (6.7C H 5) (Continued)
FEELS 230C

Radiation Type	Energy (keV)	Intensity (%)	A(g-rad/ μ Ci-h)
39	286.1 8	0.14 3	0.0008
40	289.6 9	0.108 25	0.0007
41	293.79 20	3.2 8	0.0202
43	312.5	0.29 7	0.0020
44	316.3 8	0.12 3	0.0008
45	320.7 8	0.12 3	0.0009
46	328.3	0.29 7	0.0021
47	328.3	0.29 7	0.0021
48	330.3 5	0.08 22	0.0062
49	351.8 3	0.57 16	0.0043
50	369.6 3	2.9 7	0.0223
51	372.2 3	1.5 4	0.0117
52	409.8 4	0.36 19	0.0032
54	426.9 4	7.39 22	0.0036
56	446.9 5	0.12 3	0.0011
57	458.6 3	1.5 4	0.0144
58	461.8 10	0.16 4	0.0015
59	467.5 10	0.28 13	0.0030
60	472.1 10	0.24 6	0.0024
61	473.5 10	0.18 4	0.0019
62	480.0 7	0.29 12	0.0036
63	482.5 7	0.29 12	0.0036
65	506.8 5	1.4 5	0.0148
66	513.60 20	1.2 5	0.0129
68	520.6 4	1.2 5	0.0130
69	521.6 5	1.2 5	0.0131
70	528.0 5	0.39 22	0.0044
71	533.2 10	7.20 5	0.0022
72	537.1 10	0.16 4	0.0018
73	557.0 10	0.25 6	0.0030
74	566.5 6	1.7 5	0.0201
76	569.26 10	10.4 25	0.126
77	569.26 10	3.1 12	0.0380
78	573.0 10	2.0 5	0.0240
79	584.1 8	0.15 4	0.0018
80	596.5 5	0.6 4	0.0075
81	602.0 4	1.3 5	0.0164
82	611.4 10	0.8 5	0.0102
93	616.2 5	0.20 5	0.0026
84	623.5 3	1.0 5	0.0130
85	627.5 5	0.68 16	0.0090
86	630.6 10	0.41 10	0.0055
87	634.5 10	0.29 7	0.0040
88	639.7 10	0.21 5	0.0028
39	633.2 10	0.22 5	0.0030
90	646.2 10	0.22 5	0.0030
91	653.2 8	1.3 7	0.0177
92	655.0 8	0.61 14	0.0085
93	660.6 10	0.29 7	0.0041
94	664.6 10	1.5 6	0.0208
95	666.7 6	1.5 6	0.0209
97	669.8 5	1.5 6	0.0210
98	683.3 8	7.24 6	0.0034
100	685.5 10	0.27 7	0.0040
101	692.5 5	1.3 6	0.0188
102	699.1 3	4.6 15	0.0686
103	706.00 20	3.7 10	0.0486
104	711.2 4	0.16 6	0.0024
105	733.00 20	2.5 21	0.133
106	738.4 4	0.8 5	0.0123
108	742.914 22	3.0 9	0.0481
109	746.5 15	0.9 5	0.0140
110	754.8 6	1.4 5	0.0221
111	760.0 10	0.16 4	0.0025
112	766.358 20	0.8 6	0.0128
113	766.358 20	0.20 11	0.0032
114	768.7 3	0.55 13	0.0690
115	777.9 10	0.20 4	0.0032
116	780.4 3	1.6 6	0.0261
117	783.7 10	0.49 11	0.0042

Continued

230PA E- DECAY (6.7C H 5) (Continued)
FEEDS 230C

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(\gamma\text{-rad}/\mu\text{Ci-h})$
γ 118	786.272 22	1.6 6	0.0263
γ 119	793.6 10	1.5 8	0.0248
γ 120	796.2 5	3.8 10	0.0582
γ 121	804.5 10	0.39 9	0.0067
γ 122	805.5 5	3.3 9	0.0572
γ 123	808.15 20	8.9 22	0.0843
γ 125	812.5 15	0.44 11	0.0085
γ 127	819.4 5	2.2 7	0.0376
γ 129	824.7 5	3.6 9	0.0637
γ 129	826.3 8	3.2 8	0.0569
γ 130	831.1 5	5.6 15	0.0989
γ 131	841.9 10	0.14 3	0.0025
γ 132	844.8 5	0.59 24	0.0106
γ 133	872.9 10	0.12 3	0.0022
γ 134	876.7 7	2.7 13	0.0512
γ 135	880.51 8	4.1 11	0.0772
γ 136	880.51 8	5.5 16	0.121
γ 137	883.24 8	12 3	0.229
γ 138	898.6 5	4.0 12	0.0769
γ 139	904.8 5	0.49 23	0.0094
γ 140	920	0.39 22	0.0077
γ 141	924.6 10	2.8 7	0.0560
γ 142	926.7 5	11 3	0.224
γ 143	926.7 5	5.1 12	0.101
γ 144	946.00 3	20 5	0.395
γ 145	949.0 10	7.8 18	0.158
γ 149	978.9 10	1.4 3	0.0286
γ 149	978.8 10	1.4 3	0.0286
γ 150	980.5 5	2.2 6	0.0450
γ 151	980.5 5	1.5 4	0.0307
γ 152	983.4 10	2.4 6	0.0493
γ 153	1022.7 8	0.36 9	0.0079
γ 154	1028.3 4	0.77 18	0.0170
γ 155	1034.9	0.49 11	0.0109
γ 156	1074.4 10	0.17 6	0.0038
γ 157	1082.5 6	0.76 20	0.0176
γ 158	1108.5 6	0.29 12	0.0069
γ 159	1122.3 6	0.49 15	0.0117
γ 160	1126.0 6	0.78 21	0.0188
γ 161	1153.1 6	0.23 7	0.0055
γ 162	1171.3 8	0.25 11	0.0064
γ 163	1208	0.23 7	0.0076
γ 164	1217.5 8	0.38 11	0.0099
γ 165	1240.9 8	0.21 7	0.0054
γ 166	1251	0.29 7	0.0078
γ 167	1277.1 8	0.13 6	0.0035
γ 168	1292.8 8	0.69 19	0.0189
γ 169	1353.0 6	1.7 4	0.0443
γ 170	1358.4 10	0.20 11	0.0057
γ 171	1394.1 5	3.9 9	0.115
γ 172	1399.7 10	0.21 7	0.0061
γ 173	1427.0 10	0.21 6	0.0063
γ 174	1436.1 8	0.56 14	0.0172
γ 175	1452.6 15	1.2 3	0.0364
γ 176	1460	0.29 7	0.0091
γ 177	1493.7 10	0.21 9	0.0065
γ 178	1516	0.39 9	0.0127
γ 180	1580.1 10	0.16 3	0.0053
γ 181	1585.4 10	0.16 4	0.0053
γ 182	1593.8 8	0.39 14	0.0133
γ 183	1628.0 10	0.13 4	0.0044
γ 184	1638.2 10	0.25 7	0.0099
γ 185	1654	0.15 4	0.0052
γ 186	1668.5 8	1.06 25	0.0376
γ 187	1686.3 10	0.19 14	0.0141
γ 188	1694.0 8	1.3 6	0.0460
γ 189	1699.8	0.15 6	0.0053
γ 194	1756	0.24 6	0.0092
γ 196	1772.2 15	0.15 4	0.0055
γ 197	1796.9 10	0.29 7	0.0113
γ 202	1891.1 10	0.19 3	0.0075
γ 203	1897.5 10	0.16 6	0.0053
γ 204	1905	0.27 7	0.0111
γ 205	1926.5 6	0.44 12	0.0181

16 weak γ 's omitted:
 $E_{\gamma}(\text{avg})=1006.1$; $II_{\gamma}=1.49\%$

230PA B- DECAY (1.17 H 3) I (RTM) = 0.10%
FEEDS 230C
230P DECAY=0.13 3

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(\gamma\text{-rad}/\mu\text{Ci-h})$
Auger-L	9.44	0.35 9	0
ce-L- 1	21.6426 3	0.44 16	0.0092
ce-N- 1	37.9620 4	0.13 5	0.0001
ce-F- 55	694.4 15	0.34932	0.0059
α 1 max	1233 4		
α 1 avg	408.9 20	0.7389 2	0.0064
α 2 max	1457 5		
α 2 avg	499.3 20	0.592 4	0.0063
α 3 max	2277 4		
α 3 avg	828.0 21	94.66 22	1.73
total α - avg	617.7 21	100.21 22	1.75

14 weak β 's omitted:
 $E_{\beta}(\text{avg})=204.2$; $II_{\beta}=0.21\%$

X-ray L	13.6	0.44 17	0.0001
X-ray K α	94.6650 20	0.1157 2	0.0002
X-ray K β	98.4390 20	0.185 4	0.0004
γ 50	366.354 20	0.207 4	0.0034
γ 73	1001.025 22	0.58423	0.0136

117 weak γ 's omitted:
 $E_{\gamma}(\text{avg})=930.5$; $II_{\gamma}=0.37\%$

230A DECAY (2.445E5 Y 10) I (RTM) = 0.10%
FEEDS 230TH
% SPONTANEOUS FISSION=1E-9

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(\gamma\text{-rad}/\mu\text{Ci-h})$
Auger-L	9.44	0.6 13	0.0019
ce-L- 1	32.744 20	15.4 18	0.0139
ce-N- 1	48.034 20	5.5 5	0.0056
ce-NOP- 1	51.640 20	2.01 14	0.0022
ce-L- 2	100.428 20	0.133 14	0.0003
α 1	4604.7 20	0.74 3	0.0235
α 2	4721.7 20	27.4 15	2.76
α 3	4775.8 20	72.4 20	7.36
γ -ray L	13	10.4 14	0.0029
γ 1	53.220 20	0.119 10	0.0001

5 weak γ 's omitted:
 $E_{\gamma}(\text{avg})=127.4$; $II_{\gamma}=0.04\%$

235U A DECAY (7.125 Y 31) I (RTM) = 0.10%
FEEDS 231TP

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(\gamma\text{-rad}/\mu\text{Ci-h})$
Auger-L	9.44	27 13	0.0155
ce-L- 2	11.12 14	18 17	0.0042
ce-L- 4	21.63 10	13 13	0.0084
ce-N- 2	24.41 14	5 5	0.0027
ce-NOP- 2	30.26 14	1.6 16	0.0010
ce-L- 5	11.2 4	6.2 14	0.0042

Continued

2350 A DECAY (7.1E8 Y 3) (Continued)
FEEDS 231TH

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
ce-K- 16	36.119 20	1.71 14	9.0012
ce-N- 4	36.92 10	5 5	0.0039
ce-NOP- 4	40.77 10	1.6 17	0.0014
ce-K- 17	41.29 3	0.20 19	0.0002
ce-N- 5	46.5 4	1.7 4	0.0017
ce-NOP- 5	50.4 4	0.63 14	0.0007
ce-L- 7	52.23 20	4.15 9	0.0046
ce-K- 18	53.709 20	0.58 7	0.0007
ce-N- 7	67.52 20	1.133 20	0.0016
Auger-F	69.2	0.23 16	0.0003
ce-NOP- 7	71.37 20	0.419 8	0.0006
ce-K- 21	73.05 20	0.6 6	0.0010
ce-L- 10	75.6279 5	0.97 12	0.0014
ce-K- 22	76.069 20	4.23 9	0.0078
ce-N- 10	90.9177 3	0.24 3	0.0005
ce-F- 25	92.469 20	1.1 11	0.0022
ce-K- 26	95.659 20	0.33 4	0.0007
ce-L- 16	123.298 20	0.37 4	0.0010
ce-L- 18	142.998 20	0.120 13	0.0004
ce-L- 21	162.23 20	0.23 5	0.0008
ce-L- 22	165.218 20	0.977 17	0.0034
ce-N- 22	180.538 20	0.235 4	0.0009
ce-L- 25	181.648 20	0.38 5	0.0015
a 1	4145 6	0.90 20	0.0795
a 2	4209 4	5.7 6	0.511
a 3	4219 6	0.9	0.0809
a 4	4322 4	4.7 5	0.433
a 5	4358 4	17.0 20	1.58
a 6	4392 3	54 3	5.05
a 7	4411 5	2.10 20	0.197
a 8	4435 5	0.7	0.0661
a 9	4501 4	1.70 20	0.163
a 10	4555 3	4.5 5	0.437
a 11	4597 3	5.4 5	0.529
X-ray L	13	29 14	0.0082
γ 7	72.70 20	0.1	0.0002
X-ray Kα	89.9530 20	2.7 4	0.0052
X-ray Kβ	93.3500 20	4.4 6	0.0088
X-ray Kβ	105	2.0 3	0.0046
γ 11	109.25 5	1.40 20	0.0033
γ 15	140.80 8	0.21 3	0.0006
γ 16	143.770 20	10.5 11	0.0322
γ 18	163.360 20	4.8 5	0.0167
γ 21	182.70 20	0.42 9	0.0016
γ 22	185.720 20	54	0.214
γ 23	194.940 20	0.59 6	0.0024
γ 25	202.120 20	1.61 10	0.0043
γ 26	205.310 20	4.7 5	0.0206
γ 28	221.380 20	0.110 10	0.0005

31 weak γ's omitted:
E_γ(avg) = 192.9; I_γ = 0.78%

2360 A DECAY (2.3415E7 Y 14) I(NIM) = 0.10%
FEEDS 232TH
% SPONTANEOUS FISSION=1.2E-7

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	9.48	9.1 17	0.0018
ce-L- 1	28.897 9	19 3	0.0117
ce-N- 1	44.187 9	5.2 8	0.0049
ce-NOP- 1	48.039 9	1.7 3	0.0017

Continued

2360 A DECAY (2.3415E7 Y 14) (Continued)
FEEDS 232TH
% SPONTANEOUS FISSION=1.2E-7

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
a 1	4332 8	0.260 10	0.0240
a 2	4445 5	26 4	2.46
a 3	4494 3	74 4	7.08
X-ray L	13	9.9 18	0.0027

2 weak γ's omitted:
E_γ(avg) = 51.0; I_γ = 0.08%

2360U A DECAY (2.851 Y 8) I(NIM) = 0.10%
FEEDS 232U
% SPONTANEOUS FISSION=8E-8

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	9.89	8.9 19	0.0019
ce-L- 1	25.84 10	20 3	0.0111
ce-N- 1	42.05 10	5.6 4	0.0050
ce-NOP- 1	46.16 10	1.2 3	0.0018
ce-L- 2	87.24 10	0.1190 2	0.0002

a 1	5614	0.18	0.0215
a 2	5720	30.9 5	3.76
a 3	5767	68.9 5	8.46

X-ray L	13.6	11.3 22	0.0033
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7 weak γ's omitted:
E_γ(avg) = 66.2; I_γ = 0.08%

2370 B- DECAY (6.75 D 1) I(NIM) = 0.10%
FEEDS 237HF

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
ce-L- 2	3.921 10	7.7 8	0.0006
ce-N- 1	8.087 21	42 4	0.0072
Auger-L	10	42 7	0.0089
ce-L- 3	10.768 11	16 8	0.0036
ce-NOP- 1	12.309 20	13.9 14	0.0037
ce-N- 2	20.625 11	2.01 21	0.0009
ce-L- 5	20.996 20	4.2 6	0.0019
ce-NOP- 2	24.847 10	0.66 7	0.0004
ce-N- 3	27.472 12	3.9 19	0.0023
ce-L- 6	28.58 7	0.13 6	0
ce-NOP- 3	31.694 11	1.3 6	0.0009
ce-L- 7	37.116 15	13.8 14	0.0109
ce-N- 5	37.700 21	1.12 16	0.0009
ce-NOP- 5	41.922 20	0.37 6	0.0003
ce-L- 8	42.403 20	0.38 4	0.0003
ce-F- 10	45.93 4	0.392 14	0.0004
ce-N- 7	53.820 16	3.4 4	0.0039
ce-NOP- 7	58.042 15	1.20 13	0.0015
Auger-K	74.3	1.1 9	0.0018
ce-K- 11	89.33 4	54 4	0.102
ce-K- 13	115.72 6	0.123 9	0.0003

Continued

2370 B- DECAY (6.75 D 1)
FEEDS 237MP

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(q\text{-rad}/\mu\text{Ci-h})$
ce-L- 10	142.103 20	2.21 8	0.0067
ce-K- 14	148.06 6	0.60 4	0.0019
ce-N- 10	158.087 21	0.609 22	0.0021
ce-POP-10	163.109 20	0.232 9	0.0008
ce-L- 11	185.578 23	11.56 14	0.0457
ce-N- 11	202.282 24	2.843 24	0.0122
ce-POP-11	206.504 23	1.058 5	0.0047
ce-L- 14	245.11 4	0.191 16	0.0010
B- 1 max			
avg	148.2 11		
B- 2 max	39.1 3	0.196 14	0.0002
avg	150.5 11		
B- 3 max	39.8 3	0.268 14	0.0002
avg	186.7 11		
B- 4 max	50.0 4	3.6 3	0.0038
avg	237.8 11		
B- 5 max	64.7 4	56 5	0.0772
avg	251.6 11		
total B- avg	68.7 4	42 7	0.0615
total B- avg	65.7 4	102 9	0.143
gamma 1			
gamma 1	13.910 20	0.108 5	0.0
X-ray L	13.9	57 8	0.0170
gamma 2	26.348 10	2.41 24	0.0014
gamma 3	33.195 11	0.11 5	0.0
gamma 6	51.01 3	0.22 10	0.0002
gamma 7	59.543 15	36 4	0.0457
gamma 8	64.830 20	1.25 13	0.0017
X-ray K α	97.08 4	15.9 11	0.0328
X-ray K β	101.07 4	25.7 17	0.0552
X-ray K β	114	12.0 9	0.0292
gamma 10	164.610 20	1.97 5	0.0069
gamma 11	208.005 23	23.3	0.103
gamma 14	267.54 4	0.765 14	0.0044
gamma 16	332.36 4	1.29 5	0.0091
gamma 17	335.38 4	0.102 7	0.0007
gamma 20	370.94 4	0.119 7	0.0009

8 weak γ 's omitted: $E_{\gamma}(\text{avg}) = 239.8$; $\Sigma I_{\gamma} = 0.14\%$

237MP A DECAY (2.14E6 Y 1)
FEEDS 233PA

I (RTM) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(q\text{-rad}/\mu\text{Ci-h})$
ce-K- 12	5.119 21	1.83 10	0.0002
ce-L- 2	8.270 20	22.9 13	0.0040
Auger-L	9.68	50 8	0.0104
ce-K- 14	21.679 21	0.3 3	0.0001
ce-N- 2	24.008 20	5.8 4	0.0030
ce-POP- 2	27.988 20	1.92 11	0.0011
ce-K- 15	30.649 11	2.92 16	0.0019
ce-L- 4	36.007 20	55 6	0.0419
ce-K- 17	38.809 11	1.24 7	0.0010
ce-L- 5	41.7954 18	9 7	0.0084
ce-L- 6	49.8954 18	14 9	0.0143
ce-N- 4	51.745 20	15.0 15	0.0166
ce-POP- 4	55.725 20	5.6 6	0.0066
ce-N- 5	57.5331 16	2.6 20	0.0032
ce-POP- 5	61.5129 18	0.9 8	0.0012
ce-L- 7	65.381 11	1.77 10	0.0025

Continued

237MP A DECAY (2.14E6 Y 1)
FEEDS 233PA

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(q\text{-rad}/\mu\text{Ci-h})$
ce-N- 6	65.6131 16	4 3	0.0052
ce-POP- 6	69.6129 18	1.3 10	0.0020
Auger-K	70.8	9.14 11	0.0002
ce-N- 7	81.119 11	0.432 25	0.0007
ce-POP- 7	85.099 11	0.152 4	0.0003
ce-L- 10	85.20 20	0.72 4	0.0013
ce-L- 12	96.615 20	0.414 22	0.0004
ce-N- 10	100.93 20	0.198 10	0.0004
ce-N- 12	112.353 20	0.103 6	0.0002
ce-L- 14	113.175 20	0.75 4	0.0024
ce-L- 15	122.145 11	0.57 3	0.0015
ce-L- 17	130.305 11	0.274 15	0.0008
ce-N- 15	137.883 11	0.136 8	0.0004
alpha 1			
alpha 1	4572.7 20	0.10	0.0097
alpha 2	4580.0 20	0.40 4	0.0390
alpha 3	4597.6 20	0.34 4	0.0333
alpha 4	4618 5	0.2	0.0197
alpha 5	4622 5	0.10	0.0098
alpha 6	4629 3	0.3	0.1296
alpha 7	4638.4 20	6.18 12	0.611
alpha 8	4650.1 20	0.7	0.0695
alpha 9	4663.0 20	3.32 10	0.330
alpha 10	4678 3	0.2	0.0199
alpha 11	4687 5	0.10	0.0100
alpha 12	4693.4 20	0.44 20	0.0480
alpha 13	4707.3 20	1.13 14	0.113
alpha 14	4716 3	0.10	0.0100
alpha 15	4740.3 20	0.10	0.0101
alpha 16	4764.7 20	0.1	0.112
alpha 17	4769.8 20	25 9	2.54
alpha 18	4777 5	0.4	0.0916
alpha 19	4787.5 15	47 9	4.79
alpha 20	4802.3 20	3	0.307
alpha 21	4816.3 20	2.5 4	0.256
alpha 22	4824 5	0.5	0.0514
alpha 23	4832 3	0.4	0.0412
alpha 24	4854 3	0.4	0.0414
alpha 25	4861.8 20	0.6	0.0621
alpha 26	4863 3	0.30 10	0.0311
alpha 27	4872.3 20	2.60 20	0.270

10 weak α 's omitted: $E_{\alpha}(\text{avg}) = 4577.2$; $\Sigma I_{\alpha} = 0.56\%$

Radiation Type	Energy (keV)	Intensity (%)	$\Delta(q\text{-rad}/\mu\text{Ci-h})$
X-ray L	13.3	59 4	0.0167
gamma 2	29.375 20	9.8 5	0.0061
gamma 3	46.46 10	0.140 20	0.0001
gamma 4	57.112 20	0.42 4	0.0005
gamma 5	62.9	0.2	0.0003
gamma 6	71	0.5	0.0008
gamma 7	86.486 10	13.1 7	0.0241
gamma 8	88.07 10	0.160 20	0.0003
X-ray K α	92.2870 20	1.82 11	0.0036
gamma 9	94.66 10	0.44 8	0.0017
X-ray K α	95.8680 20	2.96 18	0.0060
gamma 10	106.30 20	0.105 5	0.0002
X-ray K β	108	1.37 9	0.0032
gamma 12	117.720 20	0.184 9	0.0005
gamma 15	143.250 10	0.473 24	0.0014
gamma 16	149.5	0.10	0.0003
gamma 17	151.410 10	0.263 13	0.0008
gamma 18	155.250 20	0.105 5	0.0003
gamma 28	194.97 20	0.210 20	0.0009
gamma 35	212.330 20	0.184 9	0.0008

30 weak γ 's omitted: $E_{\gamma}(\text{avg}) = 186.8$; $\Sigma I_{\gamma} = 0.76\%$

238U A DECAY (4.468E9 Y 3) I(HIM) = 0.10%
FEEDS 234TH
% SPONTANEOUS FISSION=4.55E-5

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	9.48	8.1 14	0.0016
ce-L- 1	29.08 6	16.8 22	0.0104
ce-M- 1	44.37 6	4.6 6	0.0043
ce-NOP- 1	48.22 6	1.50 20	0.0015
α 1	4042 5	6.23 7	0.0198
α 2	4150 5	23 4	2.03
α 3	4200 5	77 4	6.89
X-ray L	13	8.7 15	0.0024

1 weak γ's omitted:
E_γ(avg) = 49.6; I_γ = 0.07%

238UP B- DECAY (2.117 D 2) I(HIM) = 0.10%
FEEDS 238PU

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	10.3	25 4	0.0055
ce-L- 1	20.98 3	60 4	0.0267
ce-M- 1	38.15 3	16.6 10	0.0135
ce-NOP- 1	42.52 3	5.5 3	0.0050
ce-L- 2	78.783 20	2.24 9	0.0038
ce-M- 2	95.747 20	0.626 24	0.0013
ce-L- 4	97.04 5	0.37 12	0.0008
ce-NOP- 2	100.321 20	0.241 10	0.0005
ce-K- 26	862.63 5	0.228 7	0.0042
ce-K- 26	906.72 5	0.153 9	0.0030
β- 1 max	90 3		
avg	23.3 8	0.65 17	0.0003
β- 2 max	223 3		
avg	60.4 9	10.8 5	0.0139
β- 3 max	264 3		
avg	72.5 9	42.3 14	0.0653
β- 4 max	308 3		
avg	85.4 9	0.50 3	0.0009
β- 5 max	330 3		
avg	92.3 10	1.22 6	0.0024
β- 6 max	1249 3		
avg	412.8 12	45 4	0.396
total β- avg	223.5 19	101 5	0.479

4 weak β's omitted:
E_β(avg) = 160.0; I_β = 0.18%

X-ray L	13.3	38 5	0.0114
γ 1	44.08 3	0.102 6	0.0002
X-ray K _α	99.55 5	0.111 5	0.0002
γ 2	101.880 20	0.209 8	0.0005
X-ray K _β	103.76 5	0.178 7	0.0004
γ 13	561.15 7	0.102 6	0.0012
γ 17	882.63 3	0.76 5	0.0143
γ 18	918.69 4	0.51 3	0.0101
γ 19	923.980 20	2.48 14	0.0407
γ 21	936.61 6	0.331 19	0.0066
γ 23	941.38 5	0.45 3	0.0091
γ 24	962.77 3	0.61 4	0.0125
γ 26	984.450 20	23.8 6	0.499
γ 27	1025.870 20	8.2 5	0.179
γ 28	1028.540 20	17.3 10	0.378

16 weak γ's omitted:
E_γ(avg) = 503.9; I_γ = 0.54%

238PU A DECAY (87.75 Y 5) I(HIM) = 0.10%
FEEDS 234U
% SPONTANEOUS FISSION=1.7E-7

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	9.09	9.1 13	0.0019
ce-L- 1	21.733 10	20.7 4	0.0096
ce-M- 1	37.942 10	5.69 21	0.0046
ce-NOP- 1	42.049 10	1.88 7	0.0017
α 1	5357.7	0.10 3	0.0114
α 2	5456.5 4	28.3 6	3.29
α 3	5499.21 20	71.6 6	8.39
X-ray L	13.6	11.6 14	0.0334

25 weak γ's omitted:
E_γ(avg) = 55.5; I_γ = 0.05%

239UP B- DECAY (2.355 D 4) I(HIM) = 0.10%
FEEDS 239PU

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
ce-M- 1	1.9171 14	49 4	0.0020
ce-NOP- 1	6.2914 4	16.5 14	0.0022
Auger-L	10.3	37 6	0.0002
ce-L- 2	21.553 20	6.6 17	0.0030
ce-L- 3	26.313 20	12.2 19	0.0069
ce-L- 4	30.163 20	15 4	0.0108
ce-L- 5	38.383 5	0.34 6	0.0003
ce-M- 2	38.717 20	1.7 5	0.0014
ce-NOP- 2	43.091 20	0.56 14	0.0005
ce-M- 3	43.477 20	3.2 5	0.0030
ce-L- 6	44.78 3	6.5 17	0.0062
ce-NOP- 3	47.851 20	1.07 17	0.0011
ce-M- 4	51.327 20	4.1 11	0.0045
ce-NOP- 4	55.701 20	1.6 4	0.0019
ce-F- 11	59.89 8	0.46 6	0.0006
ce-M- 6	61.95 3	1.8 5	0.0024
ce-NOP- 5	66.32 3	0.69 18	0.0010
Auger-K	76	1.0 11	0.0017
ce-L- 8	83.033 11	1.96 12	0.0035
ce-L- 9	83.37 4	0.42 8	0.0007
ce-K- 12	87.93 5	8.9 7	0.0166
ce-M- 8	100.197 10	0.48 3	0.0010
ce-M- 9	100.54 4	0.117 21	0.0003
ce-NOP- 8	104.571 10	0.173 11	0.0004
ce-K- 13	104.60 10	1.40 21	0.0031
ce-K- 14	106.37 5	23.1 15	0.0524
ce-K- 15	132.59 10	0.16 3	0.0004
ce-K- 16	151.02 9	0.102 14	0.0003
ce-K- 17	155.78 6	17.2 5	0.0571
ce-L- 12	186.653 11	1.78 14	0.0071
ce-L- 13	203.32 8	0.28 5	0.0012
ce-M- 12	203.817 10	0.43 4	0.0019
ce-L- 14	205.093 11	4.6 3	0.0202
ce-NOP-12	208.191 10	0.161 13	0.0007
ce-M- 14	222.257 10	1.13 7	0.0053
ce-NOP-14	226.631 10	0.42 3	0.0020
ce-L- 17	254.50 3	3.47 10	0.0188
ce-M- 17	271.67 3	0.847 25	0.0049
ce-NOP-17	276.04 3	0.316 9	0.0019
β- 1 max	209.9 19		
avg	56.6 6	3.1 4	0.0037
β- 2 max	330.1 19		
avg	92.2 6	30.5 16	0.0599
β- 3 max	391.6 19		
avg	111.3 6	7.5 23	0.0178

Continued

239Pu B- DECAY (2.355 D 4) (Continued)
FEEDS 239Pu

Radiation Type	Energy (keV)	Intensity (%)	Δ (q-rad/ μ Ci-h)
B- 4 max	436.3 19		
avg	125.4 6	55 4	0.147
B- 5 max	713.9 19		
avg	217.9 7	4.0 20	0.0106
total B- avg	115.8 7	100 6	0.247
X-ray L	14.3	56 7	0.0171
γ 3	49.410 20	0.152 23	0.0002
γ 5	61.480 4	0.96 15	0.0013
X-ray K α	99.55 5	15.0 6	0.0117
X-ray K β	103.76 5	24.0 10	0.0211
γ 8	106.130 10	22.7 13	0.0513
X-ray K β	117	11.3 5	0.0202
γ 11	181.71 6	0.111 15	0.0004
γ 12	209.750 10	3.24 25	0.0145
γ 13	226.42 8	0.63 10	0.0031
γ 14	228.190 10	10.7 7	0.0521
γ 15	254.41 8	0.190 16	0.0055
γ 17	277.60 3	14.1 4	0.0034
γ 18	285.41 3	0.70 8	0.0047
γ 19	315.09 4	1.59 11	0.0107
γ 20	334.19 5	2.03 18	0.0145

8 weak γ 's omitted:
E γ (avg)= 107.2; I γ = 0.42%

239Pu A DECAY (2.439E4 Y 2) I(RIM) = 0.10%
FEEDS 235U
% SPONTANEOUS FISSION=4.5E-10

Radiation Type	Energy (keV)	Intensity (%)	Δ (q-rad/ μ Ci-h)
ce-K- 2	7.3920 4	14.3 6	0.0023
ce-L- 3	8.33 10	0.18 16	0
Auger-L	9.89	3.5 6	0.0007
ce-NOP- 2	11.4992 4	4.77 19	0.0012
ce-L- 4	16.93 3	2.8 5	0.0010
ce-L- 6	24.46 5	0.11 10	0
ce-L- 8	29.86 3	4.78 18	0.0030
ce-K- 4	33.14 3	0.76 14	0.0005
ce-NOP- 4	37.25 3	0.25 5	0.0002
ce-K- 8	46.07 3	1.32 5	0.0013
ce-NOP- 8	50.18 3	0.493 18	0.0005
α 1	5104.6 10	11.50 20	1.25
α 2	5142.9 8	15.10 20	1.65
α 3	5155.4 7	73.3 7	8.05

20 weak α 's omitted:
E α (avg)=5030.0; I α = 0.14%

X-ray L 13.6 4.4 6 0.0013

146 weak γ 's omitted:
E γ (avg)= 113.2; I γ = 0.05%

240Pu B- DECAY (14.1 H 2) I(RIM) = 0.10%
FEEDS 240Pu (7.4 4)
GIT DECAY POP 240Pu (7.4 4)=0.113

Radiation Type	Energy (keV)	Intensity (%)	Δ (q-rad/ μ Ci-h)
Auger-L	10	32 6	0.0069
ce-L- 2	21.67 7	76 10	0.0352
ce-K- 2	30.38 7	18.6 23	0.0152
ce-NOP- 2	42.60 7	6.1 8	0.0055
B- 1 max	360		
avg	102 16	100	0.217
X-ray L	13.9	44 7	0.0131
γ 2	44.10 7	1.69 20	0.0016

240Pu B- DECAY (65 H 3) I(RIM) = 0.10%
FEEDS 240Pu

Radiation Type	Energy (keV)	Intensity (%)	Δ (q-rad/ μ Ci-h)
Auger-L	10.3	93 14	0.0183
ce-L- 1	19.7028 16	84.5 15	0.0355
ce-K- 4	25.38 5	6 6	0.0032
ce-K- 5	30.38 11	1.29 4	0.0012
ce-N- 1	36.8671 14	23.4 4	0.0184
ce-NOP- 1	41.2414 8	7.75 14	0.0068
ce-K- 8	70.9 3	14 13	0.0208
ce-L- 2	75.8028 16	71.0 13	0.115
Auger-K	76	0.7 8	0.0011
ce-N- 2	92.9671 14	19.8 4	0.0392
ce-NOP- 2	97.3414 8	7.62 14	0.0158
ce-L- 4	124.1028 16	2.7 4	0.0072
ce-L- 5	129.10 10	16.3 3	0.0447
ce-N- 4	143.2671 14	0.72 16	0.0022
ce-NOP- 4	145.6414 8	0.27 7	0.0008
ce-N- 5	146.27 10	4.53 8	0.0141
ce-K- 9	149.0 3	7 6	0.0216
ce-NOP- 5	150.64 10	1.73 3	0.0055
ce-L- 8	169.6 3	5.0 4	0.0180
ce-K- 10	173.18 5	0.4 4	0.0015
ce-N- 8	186.8 3	1.295 8	0.0052
ce-NOP- 8	191.1 3	0.490 7	0.0020
ce-L- 9	247.7 3	2.0 6	0.0105
ce-N- 9	248.9 3	0.50 12	0.0028
ce-NOP- 9	269.2 3	0.19 4	0.0011
ce-L- 10	271.9028 16	0.12 4	0.0007
ce-K- 12	326.4 3	0.272 5	0.0019
ce-K- 16	444.58 21	3.0 25	0.0208
ce-K- 17	479.28 5	0.189 4	0.0019
ce-L- 16	543.30 20	0.7 4	0.0001
ce-NOP- 16	560.47 20	0.23 13	0.0028
ce-K- 27	866.18 5	0.13 9	0.0024

B- 1 max
avg 861.5 269.84 100 0.575

X-ray L	14.3	125 15	0.0380
γ 1	42.8	0.126	0.0001
γ 2	98.9	5.775	0.0122
X-ray K α	99.55 5	9 5	0.0201
X-ray K β	103.76 5	15 8	0.0337
X-ray K β	117	7 4	0.0179
γ 3	134.6	0.42	0.0012
γ 4	147.2	1.575	0.0049
γ 5	152.20 10	9.45	0.0306
γ 6	175	6.825	0.0254
γ 7	182.6		0.0041

Continued

240BP B- DECAY (6.5 H 3)
FEEDS 240PO

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
γ 4	192.7 3	7.665	0.0315
γ 4	270.8 3	9.45	0.4545
γ 10	295	0.735	0.0046
γ 11	307	1.575	0.0103
γ 12	448.2 3	18.9	0.180
γ 13	462.2	1.575	0.0155
γ 14	467.4	2.3	0.0230
γ 15	507.20 10	2	0.0227
γ 16	546.40 20	30.45	0.367
γ 17	601	23	0.296
γ 19	606.10 10	1.795	0.0230
γ 19	847	5.25	0.0947
γ 20	867.40 20	9.45	0.175
γ 21	884.9	4.2	0.0792
γ 22	890.6	1.26	0.0239
γ 23	896.5 5	14.7	0.241
γ 24	915.2	1.575	0.0307
γ 25	950.7	2.625	0.0536
γ 26	973.90 20	24.15	0.501
γ 27	988	5.25	0.110
γ 28	1074.4	1	0.0240
γ 29	1131.0	0.735	0.0177
γ 30	1163	0.735	0.0182
γ 31	1167.6 6	5.25	0.131
γ 32	1179	0.735	0.0185

240BP B- DECAY (7.4 H 2)
FE- DECAY=99.807
FEEDS 240PO
FIT DECAY=0.113

I (FIT) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	10.3	23 9	0.0051
ce-L- 1	19.727 9	54 21	0.0234
ce-N- 1	36.891 9	15 6	0.0121
ce-NOP- 1	41.265 8	5.1 19	0.0045
ce-L- 3	75.763 20	2.1 4	0.0034
ce-N- 3	92.927 20	0.58 11	0.0012
ce-NOP- 3	97.301 20	0.22 4	0.0005
ce-L- 4	166.40 10	0.260 22	0.0009
ce-K- 18	432.78 9	0.217 12	0.0020
ce-K- 19	475.58 9	0.104 6	0.0010
ce-K- 29	738.88 5	0.140 12	0.0022

β- 1 max	546.7		
avg	161.25	0.235 20	0.0008
β- 2 max	621		
avg	186	0.342 24	0.0014
β- 3 max	640.3		
avg	192.64	2.22 13	0.0091
β- 4 max	654		
avg	197.3	0.205 22	0.0009
β- 5 max	692		
avg	210.29	0.57 4	0.0026
β- 6 max	741.5		
avg	227.47	0.376 24	0.0018
β- 7 max	769.2		
avg	237.16	0.211 25	0.0011
β- 8 max	1090.3		
avg	353.27	0.62 5	0.0047
β- 9 max	1221.1		
avg	402.25	1.19 7	0.0102
β-10 max	1242		
avg	410.1	1.45 6	0.0127

Continued

240BP B- DECAY (7.4 H 2)
FE- DECAY=99.807
FEEDS 240PO
FIT DECAY=0.113

(Continued)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
β-11 max	1279.7		
avg	424.45	3.50 13	0.0316
β-12 max	1319.3		
avg	439.53	2.66 11	0.0249
β-13 max	1502.6		
avg	541.28	31.9 13	0.362
β-14 max	2137.1765		
avg	761.65	52 3	0.444
total α- avg	631	98 4	1.31

7 weak β's omitted:

E_β(avg)=238.6; I_β=0.33%

X-ray L	14.3	35 13	0.0107
γ 2	66.50 10	0.27 3	0.0004
γ 3	98.860 20	0.17 3	0.0004
X-ray K _α	49.55 5	0.133 6	0.0003
X-ray K _β	103.76 5	0.214 10	0.0005
X-ray K _β	117	0.101 5	0.0003
γ 4	189.50 10	0.250 20	0.0010
γ 5	251.46 7	0.96 7	0.0051
γ 6	263.35 7	1.17 8	0.0066
γ 10	302.98 7	1.12 6	0.0072
γ 16	507.20 10	0.79 4	0.0085
γ 18	554.60 7	22.4 11	0.264
γ 19	597.40 7	12.5 6	0.159
γ 20	606.10 7	0.74 5	0.0095
γ 22	758.62 8	1.19 6	0.0192
γ 23	789.59 10	0.210 20	0.0035
γ 24	913.43 14	0.211 25	0.0037
γ 25	817.84 11	1.24 6	0.0216
γ 27	841.11 10	0.166 12	0.0030
γ 28	857.46 10	0.47 3	0.0086
γ 32	900.46 11	0.130 20	0.0025
γ 33	910.09 10	0.170 20	0.0033
γ 34	915.98 9	1.04 6	0.0203
γ 35	928.59 10	0.170 20	0.0034
γ 36	938.04 10	1.24 5	0.0257
γ 37	942.37 11	0.110 20	0.0022
γ 39	961.64 11	0.144 10	0.0029
γ 63	1445.30 10	0.26 3	0.0111
γ 65	1488.20 10	0.210 20	0.0066
γ 66	1496.90 10	1.31 7	0.0417
γ 68	1539.54 4	0.79 10	0.0259
γ 75	1633.26 10	0.144 15	0.0050

53 weak γ's omitted:

E_γ(avg)=1012.7; I_γ=1.28%

240BP A DECAY (6537 Y 10)
FEEDS 236P
% SPONTANEOUS FISSION=4.9E-6

I (FIT) = 0.10%

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	9.89	8.7 12	0.0018
ce-L- 1	23.485	19.7 4	0.0098
ce-N- 1	39.694 6	5.40 12	0.0046
ce-NOP- 1	43.801 6	1.79 4	0.0017

Continued

240Pu A DECAY (6537 Y 10) (Continued)
FEEDS 236U
% SPONTANEOUS FISSION=4.9E-6

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
α 1	5123.43 23	26.5 4	2.09
α 2	5160.30 15	73.4 9	0.00

3 weak α's omitted:
E_α(avg)=5010.4; I_α= 0.09%

X-ray L	13.6	11.0 12	0.0037
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9 weak γ's omitted:
E_γ(avg)= 54.3; I_γ= 0.05%

241Pu B- DECAY (14.4 Y 2) I (NIM) = 0.10%
%B- DECAY =99.99755 %
FEEDS 241Am
%A DECAY=0.00245 %

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
β- 1 max	20.80 20		
avg	5.23 5	99.99755	0.0111

241Am A DECAY (433 Y 2) I (NIM) = 0.10%
FEEDS 237Np
% SPONTANEOUS FISSION=3.8E-10

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
ce-L- 1	3.9182 14	0.3 8	0.0007
Auger-L	10	20 3	0.0043
ce-L- 3	10.773 10	15.0 3	0.0034
ce-N- 1	20.622 4	2.15 19	0.0009
ce-L- 5	20.993 20	4.2 4	0.0041
ce-NOP- 1	24.8443 13	0.71 7	0.0004
ce-N- 3	27.477 11	3.74 8	0.0022
ce-NOP- 3	31.699 10	1.23 3	0.0008
ce-L- 6	33.113 20	0.976 20	0.0007
ce-L- 7	37.1102 14	13.4 3	0.0110
ce-N- 5	37.697 21	2.43 24	0.0019
ce-NOP- 5	41.919 20	0.80 8	0.0007
ce-N- 6	49.817 21	0.259 6	0.0003
ce-N- 7	53.814 4	3.43 7	0.0039
ce-NOP- 7	58.0363 13	1.205 25	0.0015
ce-L- 13	76.50 3	0.23 4	0.0004
α 1	5387.0 10	1.5 3	0.172
α 2	5442.98 13	12.3 6	1.43
α 3	5485.74 12	85.6 10	10.00
α 4	5511.0 10	0.21 5	0.0247
α 5	5543.0 10	0.35 8	0.0413

23 weak α's omitted:
E_α(avg)=5301.6; I_α= 0.03%

X-ray L	13.9	28 3	0.0082
γ 1	26.3450 10	2.58 22	0.0014
γ 3	33.200 10	0.1125 1	0.0
γ 7	59.5370 10	36.3 4	0.0460

101 weak γ's omitted:
E_γ(avg)= 72.8; I_γ= 0.17%

242Pu A DECAY (3.87E5 Y 7) I (NIM) = 0.10%
FEEDS 238U
% SPONTANEOUS FISSION=5.40E-4 5

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	4.49	6.9 10	0.0014
ce-L- 1	23.156 13	15.5 3	0.0076
ce-N- 1	39.365 13	4.27 8	0.0036
ce-NOP- 1	43.472 13	1.409 25	0.0013

α 1	4856.3 12	21	2.18
α 2	4900.6 12	79.9	9.24

X-ray L	13.4	8.7 10	0.0025
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3 weak γ's omitted:
E_γ(avg)= 56.4; I_γ= 0.04%

242Am IT DECAY (152 Y 7) I (NIM) = 0.10%
%IT DECAY=99.5 2
FEEDS 242Am (16.02 H)
SEE ALSO 242Am A DECAY (152 Y)
% SPONTANEOUS FISSION=1.6E-8

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	10.5	18 3	0.0041
ce-L- 1	24.86 5	48.26 10	0.0256
ce-N- 1	42.51 5	34.51 8	0.0349
ce-NOP- 1	47.01 5	12.74 3	0.0128
X-ray L	14.6	30 3	0.0093

242Am B+ DECAY (16.02 H 2) I (NIM) = 0.10%
%B+ DECAY=17.3 3
FEEDS 242Pu
SEE ALSO 242Am B- DECAY (16.02 H)

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ μCi-h)
Auger-L	10.3	8.5 13	0.0019
ce-L- 1	21.40 6	7.90 20	0.0036
ce-N- 1	38.57 6	2.20 6	0.0018
ce-NOP- 1	42.94 6	0.725 18	0.0007
Auger-N	76	0.3 3	0.0004
X-ray L	14.3	12.8 13	0.0039
X-ray K _α	99.55 5	3.66 9	0.0078
X-ray K _β	103.76 5	5.89 13	0.0130
X-ray K _γ	117	2.77 8	0.0069

1 weak γ's omitted:
E_γ(avg)= 44.5; I_γ= 0.11%

242AM B- DECAY (16.02 H 2) I(HIM) = 0.10%
 1B- DECAY=2.7 3
 FEEDS 242CM
 SEE ALSO 242AM B+ DECAY (16.02 H)

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	10.7	10.5 25	0.0033
ce-L- 1	17.60 6	40.3 8	0.0151
ce-M- 1	35.81 6	11.31 20	0.0086
ce-NOP- 1	40.46 6	3.72 7	0.0032
β- 1 max	623 4		
avg	186.1 14	45.5	0.180
β- 2 max	665 4		
avg	200.3 14	37.2	0.159
total β- avg	192.5 14	82.7	0.339
X-ray L		25.8 25	=0

1 weak γ's omitted:
 E_γ(avg)= 42.1; I_γ= 0.05%

242AM A DECAY (152 T 7) I(HIM) = 0.10%
 5A DECAY=0.476 14
 FEEDS 238PU
 SEE ALSO 242AM IT DECAY
 % SPONTANEOUS FISSION=1.6E-8

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	10	0.28 10	=0
ce-L- 3	26.8732 9	0.123 5	=0
ce-L- 5	45.4732 9	0.30 21	0.0003
ce-L- 8	64.2732 9	0.237 8	0.0003
α 1	5205	0.424 13	0.0070

10 weak α's omitted:
 E_α(avg)=5227.5; I_α= 0.05%

X-ray L	13.9	0.39 13	0.0001
γ 3	49.3	0.195 6	0.0002

18 weak γ's omitted:
 E_γ(avg)= 108.4; I_γ= 0.16%

242CM A DECAY (163.2 D 4) I(HIM) = 0.10%
 FEEDS 238PU
 % SPONTANEOUS FISSION=6.8E-6

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	10.3	7.7 14	0.0017
ce-L- 1	20.98 3	19.2 18	0.0086
ce-M- 1	38.15 3	5.3 5	0.0043
ce-NOP- 1	42.52 3	1.77 17	0.0016

Continued

242CM A DECAY (163.2 D 4) (Continued)
 FEEDS 238PU
 % SPONTANEOUS FISSION=6.8E-6

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
α 1	6069.63 12	26.0 5	3.36
α 2	6112.92 8	74.0 5	9.64

6 weak α's omitted:
 E_α(avg)=5948.5; I_α= 0.04%

X-ray L	14.3	11.5 16	0.0035
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* weak γ's omitted:
 E_γ(avg)= 59.2; I_γ= 0.04%

243PU B- DECAY (4.956 H 3) I(HIM) = 0.10%
 FEEDS 243AM

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
ce-L- 2	10.2271 20	0.52 5	0.0001
Auger-L	10.5	6.7 15	0.0015
ce-L- 3	18.03 20	0.77 10	0.0003
ce-L- 4	18.4 5	9.0 8	0.0035
ce-M- 2	27.800 8	0.144 13	=0
ce-L- 5	30.2271 20	3 3	0.0019
ce-M- 3	35.68 20	0.194 25	0.0001
ce-M- 4	36.1 5	2.36 21	0.0018
ce-NOP- 4	40.6 5	0.78 7	0.0007
ce-M- 5	47.880 8	0.9 7	0.0009
ce-NOP- 5	52.3829 11	0.3 3	0.0004
ce-L- 7	60.23 20	3.7 4	0.0048
ce-L- 8	72.6 4	0.21 4	0.0003
ce-M- 7	77.88 20	0.93 9	0.0015
ce-NOP- 7	82.38 20	0.33 3	0.0006
ce-K- 14	256.7 3	0.32 4	0.0017

β- 1 max	50 4		
avg	12.6 10	0.23 5	=0
β- 2 max	116 4		
avg	30.4 10	1.24 14	0.0008
β- 3 max	473 4		
avg	136.9 12	0.24 17	0.0007
β- 4 max	486 4		
avg	141.1 12	4 4	0.0132
β- 5 max	498 4		
avg	145.1 12	29 3	0.0896
β- 6 max	540 4		
avg	158.8 12	6 4	0.0203
β- 7 max	582 4		
avg	172.7 12	59 4	0.217
total β- avg	160.3 13	100 8	0.347

X-ray L	14.6	10.9 20	0.0034
γ 3	41.80 20	0.76 10	0.0007
γ 6	67	0.23 12	0.0003
γ 7	84.00 20	23.0 20	0.0412
X-ray K _α	106.52 6	0.147 19	0.0003
γ 10	109.30 20	0.161 22	0.0004
γ 13	356.4 3	0.131 17	0.0010
γ 14	381.7 3	0.55 7	0.0045

13 weak γ's omitted:
 E_γ(avg)= 137.6; I_γ= 0.18%

243AM A DECAY (7380 Y 40) I (NIM) = 0.10%
FEEDS 239WP

Radiation Type	Energy (keV)	Intensity (%)	Δ (q-rad/ μ Ci-h)
ce-L- 1	8.67 15	9.2 10	0.0017
Auger-L	10	12.1 18	0.0026
ce-L- 3	21.10 15	4.8 5	0.0022
ce-H- 1	25.38 15	2.23 23	0.0012
ce-NOP- 1	29.60 15	0.73 8	0.0005
ce-L- 5	32.9732 9	0.85 5	0.0006
ce-H- 3	37.81 15	1.21 11	0.0010
ce-NOP- 3	42.03 15	0.40 4	0.0004
ce-H- 5	49.677 4	0.230 12	0.0002
ce-L- 6	52.24 15	13.9 7	0.0154
ce-H- 6	68.95 15	3.42 17	0.0050
ce-NOP- 6	73.17 15	1.21 6	0.0019
ce-L- 8	76.0732 9	0.106 6	0.0002
α 1	5181.0 10	1	0.121
α 2	5233.5 10	10.6	1.18
α 3	5275.4 10	87.9	9.88
α 4	5321.0 10	0.12	0.0136
α 5	5350.0 10	0.16	0.0182

8 weak α 's omitted:
 $E_{\alpha}(\text{avg})=5032.0$; $\Sigma I_{\alpha}=0.02\%$

X-ra L	13.9	14.7 19	0.0050
γ 3	43.53 15	5.5 5	0.0051
γ 6	74.67 15	66 3	0.105
γ 7	86.79 15	0.34 4	0.0006
γ 9	117.60 15	0.55 4	0.0014
γ 10	142.18 15	0.125 15	0.0004

12 weak γ 's omitted:
 $E_{\gamma}(\text{avg})=52.0$; $\Sigma I_{\gamma}=0.10\%$

243Ch A DECAY (28.5 Y 2) I (NIM) = 0.10%
%A DECAY=99.76
FEEDS 239WP
%EC DECAY=0.24

Radiation Type	Energy (keV)	Intensity (%)	Δ (q-rad/ μ Ci-h)
ce-H- 1	1.927 4	53.1222	0.0022
ce-NOP- 1	6.301 4	17.7	0.0024
Auger-L	10.3	41 7	0.0099
ce-L- 2	21.556 6	8.7 15	0.0040
ce-L- 1	26.315 5	7.2 16	0.0040
ce-L- 4	34.176 5	22.9 17	0.0167
ce-H- 2	38.730 6	2.2 4	0.0018
ce-NOP- 2	43.104 5	0.74 13	0.0007
ce-L- 3	43.479 5	1.9 5	0.0018
ce-L- 6	44.78 3	14.5 3	0.0138
ce-NOP- 3	47.853 4	0.63 14	0.0006
ce-H- 4	51.340 5	6.4 5	0.0070
ce-NOP- 4	55.718 4	2.43 18	0.0029
ce-H- 6	61.95 3	4.05 7	0.0053
ce-NOP- 6	66.32 3	1.54 3	0.0022
Auger-K	76	1.0 10	0.0016
ce-H- 10	87.94 5	9.0 4	0.0168
ce-H- 11	106.37 5	22.8 8	0.0518
ce-H- 12	132.59 10	0.174 17	0.0005
ce-H- 13	151.05 10	0.105 14	0.0003
ce-H- 14	175.51 5	17.0 6	0.0565
ce-L- 10	186.663 11	1.60 7	0.0072
ce-H- 10	203.827 10	0.438 16	0.0019
ce-L- 11	205.093 11	4.57 16	0.0200

Continued

243Ch A DECAY (28.5 Y 2) (Continued)
%A DECAY=99.76
FEEDS 239WP
%EC DECAY=0.24

Radiation Type	Energy (keV)	Intensity (%)	Δ (q-rad/ μ Ci-h)
ce-NOP-10	208.201 10	0.164 6	0.0007
ce-H- 11	222.257 10	1.11 4	0.0053
ce-NOP-11	225.531 10	0.415 14	0.0020
ce-L- 14	254.533 11	3.44 12	0.0186
ce-H- 14	271.697 10	0.84 3	0.0049
ce-NOP-14	276.071 10	0.373 11	0.0018
α 1	5639 3	0.14	0.0168
α 2	5682 3	0.2	0.0241
α 3	5686 3	1.6	0.193
α 4	5741.6 10	11.4724	1.40
α 5	5784.5 10	73.3236	9.03
α 6	5876 3	0.6	0.0749
α 7	5993 3	5.58656	0.713
α 8	6010 3	1.0	0.128
α 9	6057 3	4.69872	0.605
α 10	6067 3	1.5	0.193

20 weak α 's omitted:
 $E_{\alpha}(\text{avg})=5700.1$; $\Sigma I_{\alpha}=0.34\%$

X-ray L	14.3	61 7	0.0186
γ 2	44.663 5	0.120 20	0.0001
γ 4	57.273 4	0.140 10	0.0002
γ 6	67.38 3	0.2	0.0007
X-ray K α_1	49.55 5	14.3 5	0.0304
X-ray K α_2	103.76 5	23.0 7	0.0509
γ 8	106.130 10	0.259 20	0.0006
X-ray K β	117	10.8 4	0.0270
γ 10	209.760 10	3.29 10	0.0147
γ 11	228.190 10	10.6 3	0.0514
γ 12	254.41 5	0.110 10	0.0006
γ 14	277.630 10	14.0 4	0.0826
γ 15	285.42 4	0.728 20	0.0044

15 weak γ 's omitted:
 $E_{\gamma}(\text{avg})=198.5$; $\Sigma I_{\gamma}=0.24\%$

244Pu A DECAY (8.26*7 Y 9) I (NIM) = 0.10%
%A DECAY=99.875 6
FEEDS 240U
% SPONTANEOUS FISSION=0.125 6

Radiation Type	Energy (keV)	Intensity (%)	Δ (q-rad/ μ Ci-h)
Auger-L	9.89	6.7 9	0.0013
ce-L- 1	21.2 10	14.1 6	0.0063
ce-H- 1	37.5 10	3.85 17	0.0031
ce-NOP- 1	41.6 10	1.27 6	0.0011
α 1	4546.0 10	19.2 8	1.98
α 2	4549.0 10	90.5 8	7.37
X-ray L	13.6	7.8 9	0.0023

1 weak γ 's omitted:
 $E_{\gamma}(\text{avg})=43.0$; $\Sigma I_{\gamma}=0.02\%$

244CM A DECAY (18.11 Y 2) I (NIM) = 0.10%
FEEDS 240PU
% SPONTANEOUS FISSION=1.347E-4 2

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	10.3	7.0 11	0.0015
ce-L- 1	19.727 9	17.4 8	0.0073
ce-M- 1	36.891 9	4.84 21	0.0038
ce-WOP- 1	41.265 8	1.60 7	0.0014
α 1	5762.84 3	23.60 20	2.90
α 2	5804.96 5	76.40 20	9.45

6 weak α's omitted:
E_α(avg)=5633.0; II_α= 0.03%

X-ray L	14.2	10.5 12	0.0432
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1 weak γ's omitted:
E_γ(avg)= 42.8; II_γ= 0.03%

245CM A DECAY (8500 Y 100) I (NIM) = 0.10%
FEEDS 241PU

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	10.3	41 16	0.0089
ce-K- 2	11.2 10	30 40	0.0079
ce-L- 1	18.0028 16	40 22	0.0152
ce-M- 1	35.1671 14	13 7	0.0095
ce-WOP- 1	39.5414 8	4.2 23	0.0035
ce-K- 3	52.2 10	16 16	0.0176
Auger-K	76	1.0 13	0.0016
ce-L- 2	109.9 10	17 7	0.0394
ce-M- 2	127.1 10	4.4 20	0.0119
ce-WOP- 2	131.4 10	1.7 8	0.0047
ce-L- 3	150.9 10	6.2 21	0.0200
ce-M- 3	168.1 10	1.6 6	0.0058
ce-WOP- 3	172.4 10	0.61 22	0.0023
α 1	5234.6	0.32	0.0357
α 2	5303.8	5	0.541
α 3	5362	93.18	10.64
α 4	5488.7	0.83	0.0970
α 5	5529.2	0.58	0.0683

5 weak α's omitted:
E_α(avg)=5318.9; II_α= 0.12%

X-ray L	14.3	61 23	0.0185
γ 1	41	0.11 10	0
γ-ray K _α	99.55 5	14 11	0.0302
X-ray K _α	103.76 5	23 18	0.0505
X-ray K _β	117	11 8	0.0268
γ 2	133.0 10	6.5 23	0.0183
γ 3	174.0 10	6.6 22	0.0245

246CM A DECAY (4730 Y 100) I (NIM) = 0.10%
% A DECAY=99.97346 5
FEEDS 242PU
% SPONTANEOUS FISSION=0.02614 5

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
Auger-L	10.3	6.2 11	0.0014
ce-L- 1	21.448 10	15.5 12	0.0071
ce-M- 1	38.612 10	4.3 4	0.0035
ce-WOP- 1	42.986 9	1.42 11	0.0013
α 1	5343 3	21.0 10	2.39
α 2	5386 3	79.0 10	9.04

X-ray L	14.3	9.3 12	0.0028
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1 weak γ's omitted:
E_γ(avg)= 44.5; II_γ= 0.03%

247CM A DECAY (1.56E+7 Y 5) I (NIM) = 0.10%
FEEDS 243PU

Radiation Type	Energy (keV)	Intensity (%)	A(q-rad/ μCi-h)
ce-K- 5	2.58 5	0.17 7	0
Auger-L	10.3	7.1 22	0.0016
ce-L- 3	33.3028 14	9 5	0.0066
ce-M- 3	50.4671 14	2.6 12	0.0028
ce-WOP- 3	54.8414 8	1.0 5	0.0011
ce-L- 5	101.3028 16	4.3 17	0.0092
ce-M- 5	118.4671 14	1.2 5	0.0030
ce-WOP- 5	122.8414 8	0.46 19	0.0012
ce-F- 9	156.2 8	0.13 3	0.0004
ce-K- 9	165.7 7	2.3 4	0.0080
ce-K- 10	208 6	0.4 4	0.0019
ce-L- 9	264.4 7	0.45 7	0.0025
ce-K- 14	280.6 5	1.29 11	0.0077
ce-M- 9	281.6 7	0.110 17	0.0007
ce-L- 10	307 6	0.11 4	0.0007
ce-L- 14	379.3 5	0.246 21	0.0020

α 1	4818 4	4.7 3	0.482
α 2	4868 4	71.0 10	7.36
α 3	4941 4	1.60 20	0.168
α 4	4983 4	2.00 20	0.212
α 5	5145 4	1.20 20	0.132
α 6	5210 4	5.7 5	0.633
α 7	5265 4	13.8 7	1.55

X-ray L	14.3	11 3	0.0033
X-ray K _α	99.55 5	1.24 16	0.0026
X-ray K _β	103.76 5	2.00 25	0.0044
X-ray K _β	117	0.94 12	0.0023
γ 5	124.4	1.0 4	0.0026
γ 8	278.0 4	3.4 7	0.0201
γ 9	287.5 7	2.0 3	0.0122
γ 10	330 6	1	0.0070
γ 12	346.0 8	1.3	0.0096
γ 13	398	4.6	0.0390
γ 14	402.4 5	72 6	0.617

7 weak γ's omitted:
E_γ(avg)= 104.3; II_γ= 0.13%

240CH A DECAY (3.39P5 Y 3) I (HIM) = 0.10%
 %A DECAY=91.74 3
 FEEDS 244Pu
 % SPONTANEOUS FISSION=0.26 3

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ pCi-h)
Auger-L	10.3	8.7 9	0.0010
ce-L- 1	20.9 20	11.9 11	0.0053
ce-M- 1	30.1 20	3.3 3	0.0027
ce-NOP- 1	42.4 20	1.09 10	0.0010
a 1	5034.0 20	16.6 12	1.78
a 2	5070.0 20	75.1 12	8.13
X-ray L	10.3	7.1 10	0.0022

1 weak γ 's omitted:
 $E_{\gamma}(\text{ave}) = 44.0$; $II_{\gamma} = 0.02\%$

252CF A DECAY (2.63P Y 10) I (HIM) = 0.10%
 %A DECAY=96.999 4
 FEEDS 244Pu
 % SPONTANEOUS FISSION=3.002 9

Radiation Type	Energy (keV)	Intensity (%)	A (q-rad/ pCi-h)
Auger-L	10.7	8.1 7	0.0009
ce-L- 1	18.076 25	11.2 5	0.0045
ce-M- 1	37.086 25	3.15 14	0.0025
ce-NOP- 1	41.735 25	1.04 5	0.0009
ce-L- 2	75.677	0.16 3	0.0003
a 1	5976.6	0.23 4	0.0246
a 2	6075.7 5	15.2 3	1.97
a 3	6110.3 5	91.6 3	10.63
X-ray L	15	7.3 8	0.0023

2 weak γ 's omitted:
 $E_{\gamma}(\text{ave}) = 60.0$; $II_{\gamma} = 0.03\%$