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R.A. Forrest

# The European Activation File: biological, clearance and transport libraries

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# The European Activation File: biological, clearance and transport libraries

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**The European Activation File: EAF-2005  
biological, clearance and transport  
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## **Abstract**

The European Activation System (EASY) includes as the source of nuclear data the European Activation File (EAF). A new version of EAF, EAF-2005, has been developed, and this report gives details of the EAF biological, clearance and transport libraries. The sources of data and the methodology of approximate calculation are described, while the bulk of the report is devoted to a listing of the biological, clearance and transport coefficients of all the 1929 radionuclides contained in the libraries.

The properties listed are: specific activity, committed effective doses per unit uptake for ingestion and inhalation, the source of the biological data, the transport coefficient ( $A_2$ ), the source of the  $A_2$  value, the clearance level value and the source of the clearance level value.



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## Introduction

Activation of materials will occur in D-T fusion power plants due to the interaction of the neutrons with the materials making up the device. Several parameters are used to assess the relevance of the activation to safety and waste disposal issues, the most important of which are activity, contact  $\gamma$ -dose rate, decay power and potential biological hazard. The latter covers the effect on humans of the ingestion or inhalation of radionuclides. When activated materials contain activity below a clearance index it may be possible to dispose of (or clear) the material with no special precautions.

Neutron-induced transmutation accompanying the irradiation of materials is calculated by an inventory code that uses libraries of decay data and cross sections to calculate the numbers of atoms of the various nuclides present after a particular exposure history. In order to calculate the potential biological hazards a further data library is required, containing, for each radionuclide, suitable coefficients to convert activity into dose following ingestion or inhalation.

The European Activation System (EASY) [1] uses nuclear data from the European Activation File (EAF) as input to the FISPACT inventory code. This report gives details of the libraries of biological hazard coefficients (EAF\_HAZ-2005), the legal transport data (EAF\_A2-2005) and the clearance values (EAF\_CLEAR-2005) in the current release of EAF: EAF-2005.

The present work extends the previous work on biological hazard coefficients for use with EAF-3 [2]. The previous work used a methodology for the calculation of approximate coefficients for nuclides that had not been treated by the standard methods. This methodology is repeated here with emphasis on how the method is embedded in the SAFEPAQ-II [3] processing system.

The required coefficients are termed ‘committed effective doses per unit uptake’ and the symbols  $e^{ing}$  and  $e^{inh}$  are used to refer to the coefficients for ingestion and inhalation respectively. The coefficient  $e^{ing}$  is used to convert the activity (Bq) of an ingested radionuclide into the dose (Sv) received by the average person over a 50 year period and has the units  $\text{SvBq}^{-1}$ . A similar definition applies to the coefficient  $e^{inh}$  for inhalation. In FISPACT [4] the potential radiological hazards,  $H^{ing}$  and  $H^{inh}$  for a particular sample of irradiated material are calculated as follows:

$$H^{ing} = \sum_i A_i e_i^{ing} \quad (1a)$$

$$H^{inh} = \sum_i A_i e_i^{inh} \quad (1b)$$

where  $A_i$  is the activity of nuclide  $i$  (Bq) and  $H^{ing}$  and  $H^{inh}$  have units of Sv.

The regulation of transport of radioactive material is based upon guidelines set out by the IAEA [5]: the relevant quantity used in FISPACT calculations is the  $A_2$  coefficient. Each radionuclide has an  $A_2$  value; for safe transport of that material in a standard shipping flask the amount is regulated such that its activity is less than or equal to  $A_2$ . Rules are given in the guidelines for combinations of radionuclides and these are applied in the FISPACT output so that effective  $A_2$  values for a mixture of nuclides can be calculated. Data are given for about 370 radionuclides, for the rest standard values are used that depend on the decay mode.

Materials in devices that have been activated through exposure to neutrons become waste following decommissioning, unless recycled. The fate of waste materials depends on the length of time since shutdown, the type of material and the amount of neutron flux. For materials with low activation, disposal with no special precautions is possible. The clearance of a radioactive material depends on the clearance index for that material being less than 1. A clearance index, based on IAEA guidelines [6], is calculated from the clearance level value for each radioactive nuclide, and the radioactive inventory. EAF\_CLEAR-2005 contains the required clearance level values needed to make such calculations.

## ***Dosimetric data***

Many of the radionuclides for which biological hazard data are required are included in the handbooks published by the ICRP and these have been the primary source for the current library. The most recent guidance is contained in the ICRP 68 and 72 publications [7,16]. The National Radiological Protection Board (NRPB) also publishes data [8] for a range of nuclides using a similar computational method [9]. A few fusion specific nuclides not covered in existing ICRP or NRPB reports have been specially calculated with the NRPB methodology by Kendall [10]. Recently a further study of nuclides important for fusion applications was funded; data for these nuclides are available in a report [11]. Data in these references often allow for the radionuclide to be ingested or inhaled in various chemical forms and for some elements this can make a

substantial difference to the values of the coefficients. In all cases except nickel and cobalt (where the maximum impact chemical form is judged unreasonable for fusion applications) the maximum values of the coefficients are used in the current library.

Although many of the nuclides relevant to fusion applications are represented by data in the sources described above, there are also a large number of nuclides for which no data are available. For these nuclides, which are mostly of short half-life, an approximate method described in references 2 and 12 has been employed to generate the dosimetric data. The methodology is described in the following section.

**Methodology for the estimation of dosimetric data**

**Short-lived radionuclides**

It is assumed that the value of  $e_i^{ing}$  for a radionuclide with a stable daughter can be represented as:

$$e_i^{ing} = C^{ing} N_i^{ing} E_i \tag{2}$$

where  $N_i^{ing}$  is the number of disintegrations within the body per unit activity intake of nuclide  $i$  by ingestion ( $Bq^{-1}$ ),  $E_i$  is the total energy equivalent of emissions from nuclide  $i$  for each radioactive decay (MeV) and  $C^{ing}$  is a parameter which is approximately a constant for a particular element  $j$  ( $SvMeV^{-1}$ ). A similar expression is used to represent  $e_i^{inh}$ . Note that the nuclide  $i$  is one of the isotopes of element  $j$ , and that all the biological factors in the definition of the coefficients are subsumed into the constant  $C$ . The value of  $E$  is given by the following formula:

$$E = 20E_\alpha + E_\beta + E_\gamma \tag{3}$$

where  $E_\alpha$  is the average  $\alpha$ -energy per decay (MeV),  $E_\beta$  is the average  $\beta$ -energy per decay (MeV) and  $E_\gamma$  is the average  $\gamma$ -energy per decay (MeV). The factor of 20 by which  $E_\alpha$  is multiplied is the value of the quality factor for  $\alpha$  particles recommended by the ICRP [12]. The values of  $N^{ing}$  and  $N^{inh}$  are calculated using the following equations:

$$N^{ing} = (1 - \exp(-\lambda t^{ing})) / \lambda \tag{4a}$$

$$N^{inh} = (1 - \exp(-\lambda t^{inh})) / \lambda \tag{4b}$$

where  $\lambda$  is the decay constant for the nuclide and the parameters  $t^{ing}$  and  $t^{inh}$  are the mean residence times of the nuclide within the body in the cases of ingestion and inhalation respectively.

Following reference 2 these are set to values of 3 days for  $t^{ing}$  and 7 days for  $t^{inh}$ . Equations 4 are strictly valid for nuclides that are short-lived compared to the assumed residency times; however, these equations are used for all radionuclides that are not long-lived  $\alpha$  emitters.

Data for all radionuclides of an element  $j$  with half-life less than 1 year are used to calculate a set of parameters  $C_j^{ing}$  and  $C_j^{inh}$  and, although these values are not true 'constants' for the element, in most cases the values for most isotopes of an element are similar. In reference 2 and in the present library the maximum of the values is conservatively taken as representing the element and defined as  $C_j^{ing}$  and  $C_j^{inh}$ . Note that this conservative approach means that many of the estimated values will be overpredicted. For all radionuclides where data are required,  $C_j^{ing}$  and  $C_j^{inh}$  are used with the decay data for the nuclide to calculate approximate values of  $e_i^{ing}$  and  $e_i^{inh}$ .

For some radionuclides for which prediction of dosimetric data is necessary there are no data for any nuclides of that element to be found in the standard references. In these cases data for an element with similar metabolic behaviour are used. Thus data for sodium are used for lithium, data for carbon are used for nitrogen and oxygen and data for silicon are used for boron.

Radionuclides with a radioactive daughter require a modification to equation 1 so that the energy deposited by the daughter is also included. Ignoring the *ing* and *inh* superfixes and using 0 for the parent, 1 for the first daughter, 2 for the second daughter, etc., then the extended equation is:

$$e_0 = C_0 N_0 (E_0 + \lambda_1 N_1 (E_1 + \lambda_2 N_2 (E_2 + \dots))) \quad (5)$$

If it is assumed that the correct coefficient has already been calculated for daughter 1 (i.e. including the effects of daughter 2 etc.), then equation 5 can be written concisely as follows:

$$e_0 = C_0 N_0 (E_0 + \lambda_1 e_1 / C_1) \quad (6)$$

### Noble gases

No values of committed effective doses per unit uptake for the noble gases exist in the literature and it is thus necessary to use  $C_j^{ing}$  and  $C_j^{inh}$  values for an element that is expected to behave in a similar metabolic manner. Following reference 12, the element chosen is yttrium because, like the noble gases, it is very insoluble. For all noble gas radionuclides the method described above is used but with residency times increased from the standard values. The values used are  $t^{ing} = 7$  days and  $t^{inh} = 500$  days. These values were suggested by Smith [12].



### Long-lived $\alpha$ emitters

For long-lived radionuclides decaying by  $\alpha$  emission, equation 1 is modified to exclude the dependency on  $N$  since, for long half-life nuclides, this becomes a constant (the residence time). The modified form is shown in equation 7:

$$e_i^{ing} = K_j^{ing} E_i \quad (7)$$

where  $K_j^{ing}$  is a 'constant' corresponding to  $C_j^{ing}$  used previously. In calculating values of  $K_j$ , only long-lived  $\alpha$  emitters of the same element are considered. For some radionuclides no other long-lived  $\alpha$  emitters exist and in these cases values of  $K_j$  for another element with similar metabolic behaviour are used. Thus cerium and neodymium are assumed to behave in a similar manner to samarium and hafnium and osmium to behave in a similar manner to gadolinium.

### Calculational method for dosimetric data

The processing system SAFEPAQ-II [3] used for the generation of the EAF cross section and decay data libraries is the natural place to include the calculational methodology of dosimetric data. A table in the Parameter database is defined during the building of the decay data library that contains values of the half-lives and energies required for the estimation of unknown coefficients. These data are used in the following steps to generate the estimates.

- Calculate all the elemental parameters  $C_j$ , in all cases using the maximum value from all the available data for each element.
- Calculate the reduced constants  $K_j$ .
- Considering each radionuclide in turn, check if data exists in the tables of known dosimetric data; if so use the data and mark the nuclide as 'done'.
- Considering each radionuclide in turn, check if the nuclide is marked as done; if not then check if the daughter nuclide is stable. If so, use the elemental parameters and equation 2 to evaluated approximate data and mark nuclide as done.
- Considering each radionuclide in turn, check if nuclide is marked as done; if not, then check if the daughter nuclide is marked as done. If so, use the elemental parameters to evaluated approximate data using equation 6 and mark nuclide as done. Continue to iterate this step until all nuclides are calculated.

The values of  $e_i^{inh}$ ,  $e_i^{ing}$  and the source of the data are added to the database table and it is then possible to print out a listing of the data that forms the EAF\_HAZ-2005 library. The various data sources used in the library are listed in Table 1.

**Table 1.** References of data sources for EAF\_HAZ-2005.

Data source	Reference
ICRP72	16
R245	8
KENDALL	10
NRPB-M	11
Calculated	Current approximate methodology

## Transport data

### Calculational method for transport data

The IAEA regulations [5] give generic values of the  $A_2$  coefficients that should be used for radionuclides not given individually. These values are shown in Table 2.

**Table 2.** Generic values of  $A_2$  coefficients.

Nuclide decay mode	$A_2$ (TBq)
Only $\beta$ or $\gamma$ emitting decay	0.02
$\alpha$ decays included	$9.0 \cdot 10^{-5}$

The SAFEPAQ-II processing system is used to compile the EAF\_A2-2005 library using values of decay modes contained in the Parameter database. Each radionuclide is considered in turn; if an entry is available in the IAEA regulations then this is used, otherwise the decay mode of the nuclide is checked and the correct generic value chosen from Table 2. The  $A_2$  values are added to the database table and it is then possible to generate a listing of the data that forms the EAF\_A2-2005 library. In the listing that follows an entry in the 'A<sub>2</sub> source' column of 'A2 value' means that the IAEA regulations give individual data; 'BETA' and 'ALPHA' entries indicate that generic values are used.

## Clearance data

The safe handling of radioactive waste is recognised as vital to ensure protection of human health and the environment. IAEA publish regulations on these issues, and reference 6 gives information on suggested clearance level values for a set of important radionuclides.

### Methodology for the calculation of clearance data

The clearance index ( $I_c$ ) for a material containing a single radionuclide  $n$  is calculated by equation 8, where  $A_n$  is the activity due to the nuclide and  $L_n$  is the clearance level for the nuclide. If  $I_c \leq 1$  then it is possible to clear the material.

$$I_c = \frac{A_n}{L_n} \quad (8)$$

Most materials contain a mixture of radionuclides, and in this case the clearance index is calculated by equation 9. Again, clearance is possible if  $I_c \leq 1$ .

$$I_c = \sum_i \frac{A_i}{L_i} \quad (9)$$

In equations 8 and 9, activities and clearance levels have units of  $\text{Bq kg}^{-1}$ .

Reference 14 gives clearance values for a number of nuclides and a general formula that can be used to calculate the level for any other nuclide. The formula is given in equation 10,

$$L_i = \min \left\{ \frac{1000}{E_{\gamma,i} + 0.1 \times E_{\beta,i}}, \frac{D}{e_i^{inh}}, \frac{D}{e_i^{ing} \times 10^2} \right\} \quad (10)$$

where:  $D = 20 \text{ mSv y}^{-1}$ , i.e. the dose limit for radiation workers [14], and for the  $i^{\text{th}}$  nuclide, the other quantities are:  $E_{\gamma,i}$  - effective photon emission energy (MeV);  $E_{\beta,i}$  - effective beta decay emission energy (MeV);  $e_i^{inh}$  - committed effective dose equivalent from inhalation ( $\text{Sv Bq}^{-1}$ ) and  $e_i^{ing}$  - committed effective dose equivalent from ingestion ( $\text{Sv Bq}^{-1}$ ). Note that these quantities are available in the EAF\_DEC-2005 and EAF\_HAZ-2005 libraries.

Equation 10 was used to calculate  $L_i$  values for all nuclides not given explicitly in reference 6.

## Contents of libraries

The contents of EAF\_HAZ-2005, EAF\_A2-2005 and EAF\_CLEAR-2005 are listed below. The nuclides that have been added (+) or changed (>) since EAF-2003 are indicated. Column 1 shows the ID of the nuclide as used in FISPACT, column 2 is the nuclide name, column 3 is the specific activity of the nuclide (not part of any library, but a quantity of relevance to hazards), columns 4 and 5 are the committed effective doses per unit uptake for ingestion and inhalation respectively, column 6 is the source of the biological data, column 7 is the A<sub>2</sub> value, column 8 is the source of the A<sub>2</sub> value, column 9 is the clearance value and column 10 is the source of the clearance value.

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
> 3	H-3	3.5569E+17	4.2000E-11	2.6000E-10	ICRP72	40.00000	A2 VALUE	1.00000E+05	IAEA-G-1.7
6	He-6	8.5821E+25	3.3234E-14	4.6113E-14	Calculated	0.02000	BETA	6.18142E+03	Calculated
> 7	Li-5	2.7828E+47	2.0868E-35	1.2642E-35	Calculated	0.02000	BETA	1.00000E+30	Calculated
10	Li-8	6.2090E+25	1.0196E-13	6.1768E-14	Calculated	0.00009	ALPHA	1.53035E+03	Calculated
11	Li-9	2.5935E+26	2.0942E-15	1.2687E-15	Calculated	0.02000	BETA	1.66800E+03	Calculated
> 12	Be-6	1.3869E+46	6.3343E-34	5.4716E-34	Calculated	0.02000	BETA	1.00000E+30	Calculated
> 13	Be-7	1.2932E+19	2.8000E-11	5.5000E-11	ICRP72	20.00000	A2 VALUE	1.00000E+04	IAEA-G-1.7
14	Be-8	7.4490E+41	4.1474E-31	3.5826E-31	Calculated	0.00009	ALPHA	4.82226E+28	Calculated
16	Be-10	8.2559E+11	1.1000E-09	3.5000E-08	ICRP72	0.60000	A2 VALUE	3.96493E+04	Calculated
17	Be-11	2.7424E+24	3.0235E-13	2.6117E-13	Calculated	0.00009	ALPHA	5.30923E+02	Calculated
+ 18	Be-12	1.4461E+27	1.2510E-15	1.0806E-15	Calculated	0.02000	BETA	2.24150E+02	Calculated
+ 19	Be-13	1.1892E+46	1.4074E-34	1.2157E-34	Calculated	0.02000	BETA	1.00000E+30	Calculated
20	B-8	6.7555E+25	4.0287E-14	1.9892E-14	Calculated	0.02000	BETA	1.51844E+08	Calculated
> 21	B-9	5.7975E+43	1.2613E-31	6.2279E-32	Calculated	0.02000	BETA	1.58561E+29	Calculated
24	B-12	1.7200E+27	3.7726E-15	1.8627E-15	Calculated	0.00009	ALPHA	1.38618E+03	Calculated
25	B-13	1.8503E+27	3.3793E-15	1.6685E-15	Calculated	0.02000	BETA	1.06230E+03	Calculated
+ 26	B-14	1.8486E+27	5.9360E-15	2.9309E-15	Calculated	0.02000	BETA	1.58479E+02	Calculated
+ 27	B-15	2.8195E+27	8.5834E-19	4.2381E-19	Calculated	0.02000	BETA	2.38059E+03	Calculated
> 28	C-9	3.6538E+26	2.9234E-14	2.1925E-14	Calculated	0.02000	BETA	1.65317E+02	Calculated
29	C-10	2.1637E+24	5.2207E-13	3.9155E-13	Calculated	0.02000	BETA	1.18427E+03	Calculated
30	C-11	3.0994E+22	2.4000E-11	1.8000E-11	ICRP72	0.60000	A2 VALUE	9.45180E+02	Calculated
> 33	C-14	1.6485E+14	5.8000E-10	5.8000E-09	ICRP72	3.00000	A2 VALUE	1.00000E+03	IAEA-G-1.7
34	C-15	1.1355E+25	2.2170E-13	1.6628E-13	Calculated	0.02000	BETA	2.55923E+02	Calculated
+ 35	C-16	3.4893E+25	2.1243E-14	1.5932E-14	Calculated	0.02000	BETA	4.72144E+03	Calculated
+ 36	C-17	1.2722E+26	6.0712E-14	4.5534E-14	Calculated	0.02000	BETA	2.89314E+02	Calculated
+ 37	N-11	7.5895E+46	2.8926E-34	2.1695E-34	Calculated	0.02000	BETA	1.00000E+30	Calculated
38	N-12	3.1574E+27	1.3351E-15	1.0013E-15	Calculated	0.02000	BETA	5.42005E+02	Calculated
39	N-13	5.3680E+22	1.2623E-11	9.4676E-12	Calculated	0.60000	A2 VALUE	9.34832E+02	Calculated
42	N-16	3.6576E+24	7.2753E-13	5.4564E-13	Calculated	0.00009	ALPHA	2.04522E+02	Calculated
43	N-17	5.8854E+24	1.1518E-12	8.6385E-13	Calculated	0.02000	BETA	4.66660E+03	Calculated
44	N-18	3.6781E+25	8.0407E-14	6.0305E-14	Calculated	0.02000	BETA	1.98954E+02	Calculated
+ 45	N-19	8.1069E+25	7.8399E-15	5.8799E-15	Calculated	0.02000	BETA	4.79544E+02	Calculated
+ 46	N-20	1.6055E+26	1.7126E-14	1.2845E-14	Calculated	0.02000	BETA	3.52957E+02	Calculated
47	O-14	4.2207E+23	4.0410E-12	3.0307E-12	Calculated	0.02000	BETA	2.94412E+02	Calculated
48	O-15	2.2761E+23	2.9984E-12	2.2488E-12	Calculated	0.02000	BETA	9.13843E+02	Calculated
52	O-19	8.1626E+23	1.0207E-12	7.6551E-13	Calculated	0.02000	BETA	8.50680E+02	Calculated
53	O-20	1.5377E+24	1.2034E-12	9.0256E-13	Calculated	0.02000	BETA	8.65876E+02	Calculated
+ 54	O-21	5.8121E+24	3.9172E-13	2.9379E-13	Calculated	0.02000	BETA	3.36313E+02	Calculated
+ 55	O-22	8.4328E+24	3.2432E-13	2.4324E-13	Calculated	0.02000	BETA	5.38705E+02	Calculated
+ 56	F-15	6.0496E+46	9.3996E-35	1.1318E-34	Calculated	0.02000	BETA	1.00000E+30	Calculated
+ 57	F-16	2.3717E+45	8.3124E-34	1.0009E-33	Calculated	0.02000	BETA	1.00000E+30	Calculated
58	F-17	3.8070E+23	6.8728E-13	8.2754E-13	Calculated	0.02000	BETA	9.14160E+02	Calculated
> 59	F-18	3.5231E+21	4.9000E-11	5.9000E-11	ICRP72	0.60000	A2 VALUE	1.00000E+04	IAEA-G-1.7
61	F-20	1.8922E+24	2.7479E-13	3.3087E-13	Calculated	0.02000	BETA	5.28707E+02	Calculated
62	F-21	4.6012E+24	7.3023E-14	8.7926E-14	Calculated	0.02000	BETA	1.68350E+03	Calculated
63	F-22	4.4743E+24	2.0833E-13	2.5085E-13	Calculated	0.02000	BETA	1.67056E+02	Calculated
64	F-23	8.1372E+24	1.6460E-13	1.9819E-13	Calculated	0.02000	BETA	3.42466E+02	Calculated
+ 65	F-24	4.3482E+25	3.4155E-14	4.1578E-14	Calculated	0.02000	BETA	2.14814E+02	Calculated
+ 66	Ne-17	2.2486E+26	5.4345E-16	7.5404E-16	Calculated	0.02000	BETA	1.44350E+04	Calculated
67	Ne-18	1.3865E+25	1.6846E-13	2.3374E-13	Calculated	0.02000	BETA	7.95925E+02	Calculated
68	Ne-19	1.2757E+24	8.9727E-13	1.2450E-12	Calculated	0.02000	BETA	8.94190E+02	Calculated

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
72	Ne-23	4.8799E+23	2.0141E-12	2.7945E-12	Calculated	0.02000	BETA	2.76397E+03	Calculated
73	Ne-24	8.5785E+22	3.1155E-11	4.4444E-11	Calculated	0.02000	BETA	1.60720E+03	Calculated
74	Ne-25	2.7738E+25	9.0967E-14	1.2622E-13	Calculated	0.02000	BETA	1.48368E+03	Calculated
+ 75	Ne-26	8.1496E+25	5.3706E-14	7.4517E-14	Calculated	0.02000	BETA	3.72435E+02	Calculated
+ 76	Ne-27	4.8313E+26	1.2294E-14	1.7058E-14	Calculated	0.02000	BETA	2.19572E+02	Calculated
77	Na-20	4.6779E+25	5.6135E-15	3.4006E-15	Calculated	0.02000	BETA	3.53732E+02	Calculated
78	Na-21	8.8392E+23	8.5147E-14	5.1581E-14	Calculated	0.02000	BETA	8.71688E+02	Calculated
> 79	Na-22	2.3104E+17	3.2000E-09	1.3000E-09	ICRP72	0.50000	A2 VALUE	1.00000E+02	IAEA-G-1.7
> 81	Na-24	3.2295E+20	4.3000E-10	2.7000E-10	ICRP72	0.20000	A2 VALUE	1.00000E+03	IAEA-G-1.7
82	Na-24m	8.6134E+26	1.7771E-16	1.1121E-16	Calculated	0.02000	BETA	2.12145E+03	Calculated
83	Na-25	2.8026E+23	2.0396E-13	1.2355E-13	Calculated	0.02000	BETA	1.70489E+03	Calculated
84	Na-26	1.4870E+25	1.0532E-14	6.3804E-15	Calculated	0.02000	BETA	3.97894E+02	Calculated
85	Na-27	5.0867E+25	3.4300E-15	2.0779E-15	Calculated	0.02000	BETA	6.89655E+02	Calculated
86	Na-28	4.8881E+26	4.6820E-16	2.8818E-16	Calculated	0.02000	BETA	5.71429E+02	Calculated
+ 87	Na-29	3.3549E+26	1.2478E-15	7.5593E-16	Calculated	0.02000	BETA	2.00805E+02	Calculated
+ 88	Na-30	2.8988E+26	1.4680E-15	8.8936E-16	Calculated	0.02000	BETA	2.26722E+02	Calculated
+ 89	Mg-21	1.6284E+26	4.5764E-15	2.2756E-15	Calculated	0.02000	BETA	5.05051E+02	Calculated
90	Mg-22	4.9194E+24	2.4501E-13	1.2155E-13	Calculated	0.02000	BETA	5.37953E+02	Calculated
91	Mg-23	1.6041E+24	5.5331E-13	2.7514E-13	Calculated	0.02000	BETA	8.39067E+02	Calculated
95	Mg-27	2.7259E+22	1.8465E-11	9.1820E-12	Calculated	0.02000	BETA	1.03632E+03	Calculated
96	Mg-28	1.9825E+20	2.2000E-09	1.2000E-09	ICRP72	0.30000	A2 VALUE	7.14416E+02	Calculated
97	Mg-29	1.1077E+25	1.8075E-13	8.9879E-14	Calculated	0.02000	BETA	4.71698E+02	Calculated
+ 98	Mg-30	4.1535E+25	7.1488E-14	3.5548E-14	Calculated	0.02000	BETA	3.90394E+02	Calculated
+ 99	Mg-31	5.8545E+25	6.6429E-14	3.3033E-14	Calculated	0.02000	BETA	2.36342E+02	Calculated
+ 100	Al-23	3.8602E+25	1.1245E-13	8.0321E-14	Calculated	0.02000	BETA	2.22855E+02	Calculated
101	Al-24	8.4185E+24	5.3811E-13	3.8436E-13	Calculated	0.02000	BETA	1.03103E+02	Calculated
102	Al-24m	1.3379E+26	3.4371E-14	2.4551E-14	Calculated	0.02000	BETA	1.71821E+03	Calculated
103	Al-25	2.3254E+24	4.0524E-13	2.8946E-13	Calculated	0.02000	BETA	8.47056E+02	Calculated
104	Al-26	7.0694E+11	3.5000E-09	2.0000E-08	ICRP72	0.10000	A2 VALUE	3.67282E+02	Calculated
105	Al-26m	2.5316E+24	3.5380E-13	2.5272E-13	Calculated	0.02000	BETA	8.55063E+02	Calculated
107	Al-28	1.1094E+23	9.2062E-12	6.5759E-12	Calculated	0.02000	BETA	5.24491E+02	Calculated
108	Al-29	3.6594E+22	2.1000E-11	1.5000E-11	NRPB-M	0.02000	BETA	6.76501E+02	Calculated
109	Al-30	3.8142E+24	4.8010E-13	3.4293E-13	Calculated	0.02000	BETA	2.67278E+02	Calculated
110	Al-31	2.1050E+25	9.3902E-14	6.7073E-14	Calculated	0.02000	BETA	2.83957E+02	Calculated
111	Al-32	3.9544E+26	4.5878E-15	3.2774E-15	Calculated	0.02000	BETA	1.21511E+03	Calculated
+ 112	Al-33	3.0852E+26	1.0457E-14	7.4744E-15	Calculated	0.02000	BETA	2.48645E+02	Calculated
+ 113	Al-34	2.9231E+26	1.4106E-14	1.0077E-14	Calculated	0.02000	BETA	1.82335E+02	Calculated
+ 114	Si-25	7.5883E+25	3.6725E-14	1.8133E-14	Calculated	0.02000	BETA	7.98085E+02	Calculated
115	Si-26	7.2667E+24	1.8093E-13	8.9334E-14	Calculated	0.02000	BETA	7.04771E+02	Calculated
116	Si-27	3.7093E+24	3.2548E-13	1.6070E-13	Calculated	0.02000	BETA	8.34697E+02	Calculated
> 120	Si-31	1.4287E+21	1.6000E-10	7.9000E-11	ICRP72	0.60000	A2 VALUE	1.00000E+06	IAEA-G-1.7
121	Si-32	1.2536E+15	5.6000E-10	1.1000E-07	ICRP72	0.50000	A2 VALUE	1.54619E+05	Calculated
122	Si-33	2.0482E+24	7.5739E-13	3.7466E-13	Calculated	0.02000	BETA	4.00000E+02	Calculated
123	Si-34	4.4350E+24	3.8811E-13	1.9163E-13	Calculated	0.02000	BETA	6.02410E+02	Calculated
+ 124	Si-35	1.5290E+25	2.0583E-13	1.0164E-13	Calculated	0.02000	BETA	2.74217E+02	Calculated
+ 125	Si-36	2.5767E+25	1.5495E-13	7.6507E-14	Calculated	0.02000	BETA	3.94788E+02	Calculated
126	P-28	5.5169E+25	5.1280E-14	1.2738E-13	Calculated	0.02000	BETA	1.97006E+02	Calculated
127	P-29	3.4790E+24	3.5685E-13	8.8640E-13	Calculated	0.02000	BETA	3.88035E+02	Calculated
128	P-30	9.2902E+22	7.6119E-12	1.8908E-11	Calculated	0.02000	BETA	8.57898E+02	Calculated
> 130	P-32	1.0589E+19	2.4000E-09	3.4000E-09	ICRP72	0.50000	A2 VALUE	1.00000E+06	IAEA-G-1.7
> 131	P-33	5.7688E+18	2.4000E-10	1.5000E-09	ICRP72	1.00000	A2 VALUE	1.00000E+06	IAEA-G-1.7
132	P-34	9.9086E+23	6.7448E-13	1.6754E-12	Calculated	0.02000	BETA	1.73631E+03	Calculated
133	P-35	2.5234E+23	2.5807E-12	6.4138E-12	Calculated	0.02000	BETA	5.93507E+02	Calculated
134	P-36	2.0718E+24	9.4343E-13	2.3434E-12	Calculated	0.02000	BETA	1.54583E+02	Calculated
+ 135	P-37	4.8839E+24	2.7840E-13	6.7860E-13	Calculated	0.02000	BETA	3.45158E+02	Calculated
+ 136	P-38	1.7164E+25	1.0477E-13	2.5137E-13	Calculated	0.02000	BETA	2.50035E+02	Calculated
+ 137	P-39	5.6332E+25	3.6959E-14	9.5636E-14	Calculated	0.02000	BETA	3.50612E+02	Calculated
+ 138	P-40	3.5985E+25	8.7988E-14	2.2139E-13	Calculated	0.02000	BETA	2.68462E+02	Calculated
+ 139	S-29	7.6982E+25	2.1465E-13	2.3059E-13	Calculated	0.02000	BETA	1.99258E+02	Calculated
140	S-30	1.1818E+25	6.4337E-13	6.9116E-13	Calculated	0.02000	BETA	5.50540E+02	Calculated
141	S-31	5.2388E+24	6.9309E-13	7.4458E-13	Calculated	0.02000	BETA	8.07944E+02	Calculated
> 145	S-35	1.5790E+18	7.7000E-10	1.9000E-09	ICRP72	3.00000	A2 VALUE	1.00000E+05	IAEA-G-1.7
147	S-37	3.7710E+22	1.5000E-11	1.3000E-11	NRPB-M	0.02000	BETA	3.31539E+02	Calculated
148	S-38	1.0756E+21	6.0000E-10	3.6000E-10	NRPB-M	0.02000	BETA	5.71755E+02	Calculated
149	S-39	9.3130E+23	5.5966E-12	6.7075E-12	Calculated	0.02000	BETA	4.98256E+02	Calculated
150	S-40	1.1602E+24	7.1538E-12	7.6853E-12	Calculated	0.02000	BETA	5.44366E+02	Calculated
+ 151	S-41	3.9158E+24	2.5361E-12	2.7245E-12	Calculated	0.02000	BETA	3.12144E+02	Calculated
152	Cl-32	4.3793E+25	4.3125E-14	1.6172E-14	Calculated	0.02000	BETA	2.13174E+02	Calculated
153	Cl-33	5.0409E+24	1.4007E-13	5.2526E-14	Calculated	0.02000	BETA	7.96052E+02	Calculated
154	Cl-34	8.0515E+24	8.3573E-14	3.1340E-14	Calculated	0.02000	BETA	8.10651E+02	Calculated
155	Cl-34m	6.3793E+21	9.7000E-11	7.4000E-11	NRPB-M	0.02000	BETA	4.94254E+02	Calculated
> 157	Cl-36	1.1979E+12	9.3000E-10	7.3000E-09	ICRP72	0.60000	A2 VALUE	1.00000E+03	IAEA-G-1.7
> 159	Cl-38	4.9257E+21	1.2000E-10	4.5000E-11	ICRP72	0.20000	A2 VALUE	1.00000E+04	IAEA-G-1.7
160	Cl-38m	1.5376E+25	4.7000E-14	1.7625E-14	Calculated	0.02000	BETA	1.48955E+03	Calculated

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
161	Cl-39	3.2110E+23	8.5000E-11	4.6000E-11	ICRP72	0.02000	BETA	6.52614E+02	Calculated
162	Cl-40	1.2893E+21	8.0984E-12	3.0369E-12	Calculated	0.02000	BETA	2.38265E+02	Calculated
163	Cl-41	2.9966E+23	3.1255E-12	1.1721E-12	Calculated	0.02000	BETA	4.89721E+02	Calculated
164	Cl-42	1.4625E+24	8.0795E-13	3.0415E-13	Calculated	0.02000	BETA	2.72730E+02	Calculated
+ 165	Cl-43	2.9434E+24	4.8574E-13	1.8780E-13	Calculated	0.02000	BETA	3.53736E+02	Calculated
+ 166	Cl-44	1.6941E+25	1.3735E-13	5.1584E-14	Calculated	0.02000	BETA	2.41580E+02	Calculated
+ 167	Cl-45	2.3190E+25	9.4178E-14	3.6380E-14	Calculated	0.02000	BETA	3.31962E+02	Calculated
+ 168	Ar-33	7.3139E+25	8.0459E-15	1.1164E-14	Calculated	0.02000	BETA	5.67215E+02	Calculated
169	Ar-34	1.4538E+25	1.4342E-13	1.9900E-13	Calculated	0.02000	BETA	7.49681E+02	Calculated
170	Ar-35	6.7238E+24	1.5444E-13	2.1428E-13	Calculated	0.02000	BETA	7.83668E+02	Calculated
172	Ar-37	3.7298E+24	2.7526E-11	2.9534E-10	Calculated	40.00000	A2 VALUE	1.78868E+06	Calculated
174	Ar-39	1.2620E+15	2.4057E-09	2.3801E-07	Calculated	20.00000	A2 VALUE	4.57344E+04	Calculated
176	Ar-41	1.5496E+21	3.0171E-10	4.1862E-10	Calculated	0.30000	A2 VALUE	7.51411E+02	Calculated
177	Ar-42	9.5519E+15	8.9875E-09	9.8628E-07	Calculated	0.02000	BETA	4.29522E+04	Calculated
178	Ar-43	3.0172E+22	2.6362E-11	3.9577E-11	Calculated	0.02000	BETA	5.95593E+02	Calculated
179	Ar-44	1.3335E+22	1.2160E-10	1.6873E-10	Calculated	0.02000	BETA	5.24659E+02	Calculated
180	Ar-45	4.3215E+23	4.5785E-12	6.7623E-12	Calculated	0.02000	BETA	3.14465E+02	Calculated
181	Ar-46	1.0810E+24	1.9575E-12	2.7161E-12	Calculated	0.02000	BETA	4.69484E+02	Calculated
+ 182	Ar-47	1.5313E+25	1.6760E-13	2.3186E-13	Calculated	0.02000	BETA	2.81433E+02	Calculated
183	K-36	3.3921E+25	5.0936E-14	1.2128E-14	Calculated	0.00009	ALPHA	1.71527E+02	Calculated
184	K-37	9.2086E+24	6.9291E-14	1.6509E-14	Calculated	0.02000	BETA	7.65287E+02	Calculated
185	K-38	2.4077E+22	3.3146E-11	7.8918E-12	Calculated	0.02000	BETA	3.02057E+02	Calculated
186	K-38m	1.1898E+25	5.1057E-14	1.2157E-14	Calculated	0.02000	BETA	7.92480E+02	Calculated
> 188	K-40	2.5858E+08	6.2000E-09	2.1000E-09	ICRP72	0.90000	A2 VALUE	1.00000E+04	IAEA-G-1.7
> 190	K-42	2.2338E+20	4.3000E-10	1.2000E-10	ICRP72	0.20000	A2 VALUE	1.00000E+04	IAEA-G-1.7
191	K-43	1.2158E+20	2.5000E-10	1.4000E-10	ICRP72	0.60000	A2 VALUE	1.00289E+03	Calculated
192	K-44	7.1511E+21	8.4000E-11	2.0000E-11	ICRP72	0.02000	BETA	3.94496E+02	Calculated
193	K-45	8.9271E+21	5.4000E-11	1.5000E-11	ICRP72	0.02000	BETA	5.10438E+02	Calculated
194	K-46	9.5599E+22	8.1528E-12	1.9411E-12	Calculated	0.02000	BETA	3.22352E+02	Calculated
195	K-47	5.0792E+23	1.3142E-12	3.1062E-13	Calculated	0.02000	BETA	3.56125E+02	Calculated
196	K-48	1.2798E+24	1.0183E-12	2.4246E-13	Calculated	0.02000	BETA	1.51860E+02	Calculated
+ 197	Ca-37	6.4492E+25	3.0362E-14	6.8389E-14	Calculated	0.02000	BETA	6.81663E+02	Calculated
198	Ca-38	2.4981E+25	1.8565E-13	4.1817E-13	Calculated	0.02000	BETA	6.19963E+02	Calculated
199	Ca-39	1.2461E+25	1.5853E-13	3.5709E-13	Calculated	0.02000	BETA	7.82957E+02	Calculated
201	Ca-41	3.1351E+12	1.9000E-10	1.8000E-10	ICRP72	-1.00000	A2 VALUE	1.38614E+06	Calculated
> 205	Ca-45	6.6052E+17	7.1000E-10	3.7000E-09	ICRP72	1.00000	A2 VALUE	1.00000E+05	IAEA-G-1.7
> 207	Ca-47	2.2674E+19	1.6000E-09	2.1000E-09	ICRP72	0.19000	A2 VALUE	1.00000E+04	IAEA-G-1.7
209	Ca-49	1.6297E+22	1.3097E-10	2.9499E-10	Calculated	0.02000	BETA	3.07305E+02	Calculated
210	Sc-40	5.7276E+25	5.5774E-14	2.7207E-14	Calculated	0.00009	ALPHA	1.34228E+02	Calculated
211	Sc-41	1.7087E+25	6.1670E-14	3.0083E-14	Calculated	0.02000	BETA	7.83595E+02	Calculated
212	Sc-42	1.4600E+25	6.9761E-14	3.4030E-14	Calculated	0.02000	BETA	7.86244E+02	Calculated
213	Sc-42m	1.6147E+23	9.7592E-12	4.7606E-12	Calculated	0.02000	BETA	2.30976E+02	Calculated
214	Sc-43	6.9352E+20	1.9000E-10	1.1000E-10	ICRP72	0.02000	BETA	9.75610E+02	Calculated
215	Sc-44	6.7168E+20	3.5000E-10	1.8000E-10	ICRP72	0.50000	A2 VALUE	4.55368E+02	Calculated
216	Sc-44m	4.5012E+19	2.4000E-09	1.4000E-09	ICRP72	0.02000	BETA	3.58997E+03	Calculated
218	Sc-45m	2.9383E+25	8.4469E-17	4.1204E-17	Calculated	0.02000	BETA	6.80272E+05	Calculated
> 219	Sc-46	1.2547E+18	1.5000E-09	6.8000E-09	ICRP72	0.50000	A2 VALUE	1.00000E+02	IAEA-G-1.7
220	Sc-46m	4.8574E+23	8.0867E-14	5.5122E-14	Calculated	0.02000	BETA	1.12551E+04	Calculated
> 221	Sc-47	3.0752E+19	5.4000E-10	7.3000E-10	ICRP72	0.70000	A2 VALUE	1.00000E+05	IAEA-G-1.7
> 222	Sc-48	5.5371E+19	1.7000E-09	1.1000E-09	ICRP72	0.30000	A2 VALUE	1.00000E+03	IAEA-G-1.7
223	Sc-49	2.4847E+21	8.2000E-11	4.0000E-11	ICRP72	0.02000	BETA	1.17195E+04	Calculated
224	Sc-50	8.1526E+22	1.4346E-11	6.9979E-12	Calculated	0.02000	BETA	2.97574E+02	Calculated
225	Sc-50m	2.3876E+25	5.1472E-14	2.5108E-14	Calculated	0.02000	BETA	3.72478E+03	Calculated
+ 226	Sc-51	6.6066E+23	1.9533E-12	9.5283E-13	Calculated	0.02000	BETA	3.94571E+02	Calculated
+ 227	Sc-52	9.7895E+23	2.2485E-12	1.0687E-12	Calculated	0.02000	BETA	3.00236E+02	Calculated
+ 228	Ti-41	1.2732E+26	1.2718E-17	9.3265E-18	Calculated	0.02000	BETA	6.94927E+02	Calculated
229	Ti-42	4.9975E+25	5.2280E-14	3.8338E-14	Calculated	0.02000	BETA	6.06061E+02	Calculated
230	Ti-43	1.9826E+25	7.2211E-14	5.4051E-14	Calculated	0.02000	BETA	7.72320E+02	Calculated
231	Ti-44	6.3729E+15	5.8000E-09	1.2000E-07	ICRP72	0.33000	A2 VALUE	7.19124E+03	Calculated
232	Ti-45	8.3736E+20	1.5000E-10	9.3000E-11	ICRP72	0.02000	BETA	1.09989E+03	Calculated
238	Ti-51	2.3544E+22	1.5000E-11	1.1000E-11	NRPB-M	0.02000	BETA	2.21509E+03	Calculated
239	Ti-52	7.8780E+22	1.2091E-11	8.2325E-12	Calculated	0.02000	BETA	4.91400E+03	Calculated
240	Ti-53	2.4108E+23	6.2010E-12	4.5474E-12	Calculated	0.02000	BETA	4.73709E+02	Calculated
+ 241	Ti-54	5.1534E+24	4.2999E-13	3.1533E-13	Calculated	0.02000	BETA	6.61566E+02	Calculated
+ 242	Ti-55	1.6499E+25	1.4570E-13	1.0685E-13	Calculated	0.02000	BETA	3.71470E+02	Calculated
243	V-44	1.0547E+26	9.4682E-15	6.8866E-15	Calculated	0.00009	ALPHA	2.14272E+02	Calculated
244	V-45	1.7223E+25	5.6937E-14	4.0831E-14	Calculated	0.02000	BETA	7.64526E+02	Calculated
245	V-46	2.1502E+25	4.0171E-14	2.9218E-14	Calculated	0.02000	BETA	7.67796E+02	Calculated
246	V-47	4.5449E+21	6.3000E-11	2.9000E-11	ICRP72	0.02000	BETA	9.29982E+02	Calculated
> 247	V-48	6.3073E+18	2.0000E-09	2.4000E-09	ICRP72	0.40000	A2 VALUE	1.00000E+03	IAEA-G-1.7
248	V-49	2.9909E+17	1.8000E-11	3.4000E-11	ICRP72	40.00000	A2 VALUE	7.66129E+05	Calculated
249	V-50	1.7781E+00	4.8588E-09	8.2460E-09	Calculated	0.02000	BETA	9.18697E+02	Calculated
251	V-52	3.5763E+22	1.4000E-11	9.2000E-12	NRPB-M	0.02000	BETA	6.43172E+02	Calculated
252	V-53	8.1113E+22	4.9329E-12	3.5879E-12	Calculated	0.02000	BETA	8.75579E+02	Calculated

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
253	V-54	1.5538E+23	6.7362E-12	4.8995E-12	Calculated	0.02000	BETA	2.36223E+02	Calculated
+ 254	V-55	1.1616E+24	6.7620E-13	4.9182E-13	Calculated	0.02000	BETA	1.07875E+03	Calculated
+ 255	V-56	3.1991E+25	5.3483E-14	3.8900E-14	Calculated	0.02000	BETA	3.01382E+02	Calculated
+ 256	V-57	2.2885E+25	7.0177E-14	5.1042E-14	Calculated	0.02000	BETA	3.41568E+02	Calculated
+ 257	V-58	3.5453E+25	2.8595E-14	2.0798E-14	Calculated	0.02000	BETA	1.18058E+03	Calculated
258	Cr-46	3.4926E+25	1.2395E-14	5.4322E-15	Calculated	0.02000	BETA	7.51202E+02	Calculated
259	Cr-47	1.7497E+25	1.6250E-14	6.4849E-15	Calculated	0.02000	BETA	7.54148E+02	Calculated
260	Cr-48	1.1214E+20	2.0000E-10	2.2000E-10	ICRP72	0.02000	BETA	2.31043E+03	Calculated
261	Cr-49	3.3919E+21	6.1000E-11	3.5000E-11	ICRP72	0.02000	BETA	9.03433E+02	Calculated
> 263	Cr-51	3.4229E+18	3.8000E-11	3.7000E-11	ICRP72	30.00000	A2 VALUE	1.00000E+05	IAEA-G-1.7
267	Cr-55	3.5771E+22	1.4021E-12	6.1449E-13	Calculated	0.02000	BETA	8.78011E+03	Calculated
268	Cr-56	2.0960E+22	6.8838E-12	3.0168E-12	Calculated	0.02000	BETA	6.51466E+03	Calculated
269	Cr-57	3.4742E+23	4.4573E-13	1.9534E-13	Calculated	0.02000	BETA	1.56250E+03	Calculated
270	Cr-58	1.0291E+24	2.7764E-13	1.2168E-13	Calculated	0.02000	BETA	7.21501E+02	Calculated
+ 271	Cr-59	1.5380E+25	1.8829E-14	8.3427E-15	Calculated	0.02000	BETA	3.57804E+02	Calculated
272	Mn-48	5.8004E+25	1.4111E-14	7.2715E-15	Calculated	0.02000	BETA	2.16708E+02	Calculated
273	Mn-49	2.2203E+25	3.3692E-14	1.8632E-14	Calculated	0.02000	BETA	7.38552E+02	Calculated
274	Mn-50	2.9527E+25	1.2451E-14	5.9766E-15	Calculated	0.02000	BETA	7.50587E+02	Calculated
275	Mn-50m	7.9582E+22	7.2126E-12	3.4620E-12	Calculated	0.02000	BETA	2.02184E+02	Calculated
> 276	Mn-51	2.9557E+21	9.3000E-11	4.1000E-11	ICRP72	0.02000	BETA	1.00000E+04	IAEA-G-1.7
> 277	Mn-52	1.6634E+19	1.8000E-09	1.4000E-09	ICRP72	0.30000	A2 VALUE	1.00000E+03	IAEA-G-1.7
> 278	Mn-52m	6.3474E+21	6.9000E-11	2.9000E-11	ICRP72	0.02000	BETA	1.00000E+04	IAEA-G-1.7
> 279	Mn-53	6.7894E+10	3.0000E-11	5.4000E-11	ICRP72	-1.00000	A2 VALUE	1.00000E+05	IAEA-G-1.7
> 280	Mn-54	2.8680E+17	7.1000E-10	1.5000E-09	ICRP72	1.00000	A2 VALUE	1.00000E+02	IAEA-G-1.7
> 282	Mn-56	8.0373E+20	2.5000E-10	1.2000E-10	ICRP72	0.30000	A2 VALUE	1.00000E+04	IAEA-G-1.7
283	Mn-57	7.5892E+22	1.2080E-12	5.7984E-13	Calculated	0.02000	BETA	5.40783E+03	Calculated
284	Mn-58	1.1050E+23	2.8469E-12	1.3665E-12	Calculated	0.02000	BETA	3.91645E+02	Calculated
285	Mn-58m	2.6683E+24	8.4913E-14	4.0758E-14	Calculated	0.02000	BETA	2.48196E+03	Calculated
286	Mn-59	1.5396E+24	8.5554E-14	4.2840E-14	Calculated	0.02000	BETA	1.27551E+03	Calculated
287	Mn-60	3.8903E+24	1.0329E-13	4.9580E-14	Calculated	0.02000	BETA	3.37610E+02	Calculated
+ 288	Mn-60m	3.8903E+24	1.0329E-13	4.9580E-14	Calculated	0.02000	BETA	3.37610E+02	Calculated
+ 289	Mn-61	1.0213E+25	5.5653E-14	2.6577E-14	Calculated	0.02000	BETA	3.79720E+02	Calculated
+ 290	Mn-62	7.6507E+24	1.0813E-13	5.1905E-14	Calculated	0.02000	BETA	2.61427E+02	Calculated
+ 291	Mn-63	2.4094E+25	3.1228E-14	1.4989E-14	Calculated	0.02000	BETA	3.02103E+02	Calculated
+ 292	Mn-64	7.4968E+25	1.3414E-14	6.4389E-15	Calculated	0.02000	BETA	2.27671E+02	Calculated
294	Fe-50	5.5698E+25	1.0451E-14	1.0264E-14	Calculated	0.02000	BETA	3.82292E+02	Calculated
295	Fe-51	2.6425E+25	1.8166E-14	1.7228E-14	Calculated	0.02000	BETA	7.33676E+02	Calculated
> 296	Fe-52	2.6973E+20	1.4000E-09	6.3000E-10	ICRP72	0.30000	A2 VALUE	1.00000E+04	IAEA-G-1.7
297	Fe-52m	1.7468E+23	2.5650E-12	2.3505E-12	Calculated	0.02000	BETA	2.61097E+02	Calculated
298	Fe-53	1.5441E+22	9.1782E-12	9.0141E-12	Calculated	0.02000	BETA	7.72232E+02	Calculated
299	Fe-53m	5.0930E+22	6.4681E-12	6.3524E-12	Calculated	0.02000	BETA	3.29524E+02	Calculated
> 301	Fe-55	8.8028E+16	3.3000E-10	7.7000E-10	ICRP72	40.00000	A2 VALUE	1.00000E+06	IAEA-G-1.7
> 305	Fe-59	1.8421E+18	1.8000E-09	4.0000E-09	ICRP72	0.90000	A2 VALUE	1.00000E+03	IAEA-G-1.7
306	Fe-60	1.4713E+11	1.1000E-07	2.8000E-07	ICRP72	0.20000	A2 VALUE	1.14067E+05	Calculated
307	Fe-61	1.9092E+22	8.4427E-12	8.1816E-12	Calculated	0.02000	BETA	6.68235E+02	Calculated
308	Fe-62	9.9110E+22	2.4356E-12	2.3920E-12	Calculated	0.02000	BETA	1.69348E+03	Calculated
309	Fe-63	1.0872E+24	2.2146E-13	2.1751E-13	Calculated	0.02000	BETA	1.72964E+03	Calculated
310	Fe-64	3.2641E+24	1.0151E-13	9.9694E-14	Calculated	0.02000	BETA	6.14251E+02	Calculated
311	Fe-65	1.6069E+25	3.0562E-14	3.0015E-14	Calculated	0.02000	BETA	3.96464E+02	Calculated
+ 312	Co-52	6.9803E+25	3.5938E-14	2.3112E-14	Calculated	0.02000	BETA	2.47863E+02	Calculated
+ 313	Co-53	3.2845E+25	3.6685E-14	2.7243E-14	Calculated	0.02000	BETA	6.94444E+02	Calculated
314	Co-54	4.0049E+25	1.9221E-14	1.4274E-14	Calculated	0.02000	BETA	7.34846E+02	Calculated
315	Co-54m	8.7133E+22	1.1947E-11	8.8718E-12	Calculated	0.02000	BETA	2.41854E+02	Calculated
> 316	Co-55	1.2039E+20	1.0000E-09	5.3000E-10	ICRP72	0.50000	A2 VALUE	1.00000E+04	IAEA-G-1.7
> 317	Co-56	1.1179E+18	2.5000E-09	6.7000E-09	ICRP72	0.30000	A2 VALUE	1.00000E+02	IAEA-G-1.7
> 318	Co-57	3.1220E+17	2.1000E-10	1.0000E-09	ICRP72	10.00000	A2 VALUE	1.00000E+03	IAEA-G-1.7
> 319	Co-58	1.1768E+18	7.4000E-10	2.1000E-09	ICRP72	1.00000	A2 VALUE	1.00000E+03	IAEA-G-1.7
> 320	Co-58m	2.2387E+20	2.4000E-11	1.7000E-11	ICRP72	40.00000	A2 VALUE	1.00000E+07	IAEA-G-1.7
> 322	Co-60	4.1865E+16	3.4000E-09	3.1000E-08	ICRP72	0.40000	A2 VALUE	1.00000E+02	IAEA-G-1.7
> 323	Co-60m	1.1087E+22	1.7000E-12	1.4000E-12	ICRP72	0.02000	BETA	1.00000E+06	IAEA-G-1.7
> 324	Co-61	1.1533E+21	7.4000E-11	5.1000E-11	ICRP72	0.02000	BETA	1.00000E+05	IAEA-G-1.7
325	Co-62	7.4887E+22	6.5134E-12	4.8370E-12	Calculated	0.02000	BETA	5.67192E+02	Calculated
> 326	Co-62m	8.0755E+21	4.7000E-11	2.1000E-11	ICRP72	0.02000	BETA	1.00000E+04	IAEA-G-1.7
327	Co-63	2.4207E+23	1.0519E-12	7.8119E-13	Calculated	0.02000	BETA	3.59829E+03	Calculated
328	Co-64	2.1763E+25	2.3697E-14	1.7598E-14	Calculated	0.02000	BETA	1.90752E+03	Calculated
329	Co-65	5.1425E+24	1.4498E-13	1.0766E-13	Calculated	0.02000	BETA	4.57600E+02	Calculated
330	Co-66	2.7524E+25	3.5620E-14	2.7153E-14	Calculated	0.02000	BETA	3.25521E+02	Calculated
+ 331	Co-67	1.4659E+25	6.9076E-14	5.1751E-14	Calculated	0.02000	BETA	3.23865E+02	Calculated
+ 332	Co-68	3.0693E+25	5.2364E-14	3.8887E-14	Calculated	0.02000	BETA	2.33946E+02	Calculated
+ 333	Co-68m	3.8366E+24	4.2341E-13	3.1444E-13	Calculated	0.02000	BETA	4.46479E+02	Calculated
+ 334	Co-69	2.7498E+25	5.7303E-14	4.2831E-14	Calculated	0.02000	BETA	2.95206E+02	Calculated
+ 335	Ni-53	1.7512E+26	6.7448E-15	3.3724E-15	Calculated	0.02000	BETA	1.59770E+03	Calculated
+ 336	Ni-54	5.4056E+25	2.4741E-14	1.2371E-14	Calculated	0.02000	BETA	3.09944E+02	Calculated
337	Ni-55	4.0192E+25	1.7001E-14	8.1802E-15	Calculated	0.02000	BETA	7.22909E+02	Calculated

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
338	Ni-56	1.4158E+19	8.6000E-10	1.0000E-09	ICRP72	0.02000	BETA	5.80920E+02	Calculated
339	Ni-57	5.7041E+19	8.7000E-10	5.3000E-10	ICRP72	0.02000	BETA	5.06014E+02	Calculated
> 341	Ni-59	2.9532E+12	6.3000E-11	4.4000E-10	ICRP72	-1.00000	A2 VALUE	1.00000E+05	IAEA-G-1.7
> 345	Ni-63	2.1232E+15	1.5000E-10	1.3000E-09	ICRP72	30.00000	A2 VALUE	1.00000E+05	IAEA-G-1.7
> 347	Ni-65	7.0864E+20	1.8000E-10	9.0000E-11	ICRP72	0.40000	A2 VALUE	1.00000E+04	IAEA-G-1.7
348	Ni-66	3.2329E+19	3.0000E-09	1.8000E-09	ICRP72	0.02000	BETA	1.53282E+05	Calculated
349	Ni-67	2.9698E+23	5.6766E-13	2.9511E-13	Calculated	0.02000	BETA	4.93643E+03	Calculated
350	Ni-68	3.2341E+23	1.2338E-12	6.1689E-13	Calculated	0.02000	BETA	1.32651E+03	Calculated
351	Ni-69	5.3117E+23	1.0410E-12	5.2778E-13	Calculated	0.02000	BETA	3.44353E+02	Calculated
352	Ni-70	3.5955E+25	1.7015E-14	8.5075E-15	Calculated	0.02000	BETA	6.55437E+02	Calculated
353	Ni-71	3.1635E+24	2.7372E-13	1.3686E-13	Calculated	0.02000	BETA	3.88003E+02	Calculated
354	Cu-56	3.4218E+26	9.5215E-15	5.9701E-15	Calculated	0.02000	BETA	1.90785E+02	Calculated
355	Cu-57	3.1458E+25	5.3726E-14	3.3818E-14	Calculated	0.02000	BETA	7.03235E+02	Calculated
356	Cu-58	2.2484E+24	7.0355E-13	4.3532E-13	Calculated	0.02000	BETA	5.34759E+02	Calculated
357	Cu-59	8.6898E+22	1.0845E-11	6.7103E-12	Calculated	0.02000	BETA	6.28141E+02	Calculated
358	Cu-60	4.7603E+21	7.0000E-11	3.4000E-11	ICRP72	0.02000	BETA	2.50000E+02	Calculated
359	Cu-61	5.5831E+20	1.2000E-10	7.8000E-11	ICRP72	0.02000	BETA	1.16144E+03	Calculated
360	Cu-62	1.1521E+22	6.0900E-11	3.7682E-11	Calculated	0.02000	BETA	8.77208E+02	Calculated
> 362	Cu-64	1.4279E+20	1.2000E-10	1.2000E-10	ICRP72	1.00000	A2 VALUE	1.00000E+05	IAEA-G-1.7
364	Cu-66	2.0691E+22	1.6000E-11	9.9000E-12	ICRP72	0.02000	BETA	5.29314E+03	Calculated
365	Cu-67	2.7988E+19	3.4000E-10	6.1000E-10	ICRP72	0.70000	A2 VALUE	7.63506E+03	Calculated
366	Cu-68	1.9759E+23	3.5133E-12	2.1739E-12	Calculated	0.02000	BETA	8.56898E+02	Calculated
367	Cu-68m	2.7311E+22	3.4662E-11	2.1447E-11	Calculated	0.02000	BETA	8.92538E+02	Calculated
368	Cu-69	3.3643E+22	1.2242E-11	7.9584E-12	Calculated	0.02000	BETA	3.07503E+03	Calculated
369	Cu-70	1.3264E+24	6.7781E-13	4.1940E-13	Calculated	0.02000	BETA	1.25000E+03	Calculated
370	Cu-70m	1.2700E+23	9.7448E-12	6.0296E-12	Calculated	0.02000	BETA	3.32889E+02	Calculated
371	Cu-71	3.0178E+23	3.5946E-12	2.2242E-12	Calculated	0.02000	BETA	7.19373E+02	Calculated
372	Cu-72	8.7920E+23	1.5387E-12	9.6657E-13	Calculated	0.02000	BETA	4.46532E+02	Calculated
+ 373	Cu-73	1.4675E+24	8.9749E-13	5.5719E-13	Calculated	0.02000	BETA	1.07780E+03	Calculated
+ 374	Cu-74	3.5255E+24	8.6635E-13	5.3606E-13	Calculated	0.02000	BETA	1.96375E+02	Calculated
+ 375	Cu-75	4.2813E+24	5.8951E-13	3.6476E-13	Calculated	0.02000	BETA	4.32582E+02	Calculated
376	Zn-58	1.1081E+26	2.5143E-14	1.7341E-14	Calculated	0.02000	BETA	3.23520E+02	Calculated
377	Zn-59	3.8547E+25	5.2940E-14	3.6512E-14	Calculated	0.02000	BETA	6.94444E+02	Calculated
378	Zn-60	4.8698E+22	1.9538E-11	1.2648E-11	Calculated	0.02000	BETA	6.12745E+02	Calculated
379	Zn-61	7.6878E+22	1.1880E-11	8.2182E-12	Calculated	0.02000	BETA	5.82751E+02	Calculated
380	Zn-62	2.0215E+20	9.4000E-10	5.5000E-10	ICRP72	0.02000	BETA	2.26142E+03	Calculated
381	Zn-63	2.8788E+21	7.9000E-11	3.7000E-11	ICRP72	0.02000	BETA	8.36188E+02	Calculated
> 383	Zn-65	3.0463E+17	3.9000E-09	2.2000E-09	ICRP72	2.00000	A2 VALUE	1.00000E+02	IAEA-G-1.7
> 387	Zn-69	1.7708E+21	3.1000E-11	2.8000E-11	ICRP72	0.60000	A2 VALUE	1.00000E+06	IAEA-G-1.7
> 388	Zn-69m	1.2226E+20	3.3000E-10	2.7000E-10	ICRP72	0.60000	A2 VALUE	1.00000E+04	IAEA-G-1.7
390	Zn-71	4.0035E+22	7.3975E-12	5.1020E-12	Calculated	0.02000	BETA	2.38317E+03	Calculated
391	Zn-71m	4.1492E+20	2.4000E-10	1.6000E-10	ICRP72	0.02000	BETA	6.14266E+02	Calculated
392	Zn-72	3.4668E+19	1.4000E-09	1.3000E-09	ICRP72	0.02000	BETA	6.14402E+03	Calculated
393	Zn-73	2.4356E+23	2.0493E-12	1.4237E-12	Calculated	0.02000	BETA	3.29598E+03	Calculated
394	Zn-73m	9.8683E+23	6.3726E-13	4.4204E-13	Calculated	0.02000	BETA	1.08588E+03	Calculated
395	Zn-74	5.9061E+22	1.8101E-11	1.2484E-11	Calculated	0.02000	BETA	2.63158E+03	Calculated
396	Zn-75	5.4614E+23	2.1498E-12	1.4827E-12	Calculated	0.02000	BETA	4.95786E+02	Calculated
397	Zn-76	9.6443E+23	1.5856E-12	1.0936E-12	Calculated	0.02000	BETA	6.85253E+02	Calculated
+ 398	Ga-63	2.0470E+23	5.0885E-12	2.4396E-12	Calculated	0.02000	BETA	6.41519E+02	Calculated
399	Ga-64	4.1373E+22	3.0792E-11	1.5893E-11	Calculated	0.02000	BETA	2.78629E+02	Calculated
400	Ga-65	7.0488E+21	3.7000E-11	1.7000E-11	ICRP72	0.02000	BETA	8.19672E+02	Calculated
401	Ga-66	1.8512E+20	1.2000E-09	4.4000E-10	ICRP72	0.02000	BETA	3.90778E+02	Calculated
402	Ga-67	2.2136E+19	1.9000E-10	2.4000E-10	ICRP72	3.00000	A2 VALUE	6.32911E+03	Calculated
403	Ga-68	1.5144E+21	1.0000E-10	4.9000E-11	ICRP72	0.50000	A2 VALUE	9.78474E+02	Calculated
405	Ga-70	4.7063E+21	3.1000E-11	1.6000E-11	ICRP72	0.02000	BETA	1.39470E+04	Calculated
> 407	Ga-72	1.1433E+20	1.1000E-09	5.3000E-10	ICRP72	0.40000	A2 VALUE	1.00000E+04	IAEA-G-1.7
408	Ga-73	3.2649E+20	2.6000E-10	1.4000E-10	ICRP72	0.02000	BETA	3.99770E+03	Calculated
409	Ga-74	1.1594E+22	7.3465E-11	3.7917E-11	Calculated	0.02000	BETA	3.20513E+02	Calculated
410	Ga-74m	5.9436E+23	1.4544E-12	7.5067E-13	Calculated	0.02000	BETA	2.23968E+04	Calculated
411	Ga-75	4.2789E+22	9.3290E-12	4.8150E-12	Calculated	0.02000	BETA	4.86347E+03	Calculated
412	Ga-76	2.0286E+23	4.9517E-12	2.5557E-12	Calculated	0.02000	BETA	3.33045E+02	Calculated
413	Ga-77	4.1739E+23	1.8766E-12	9.6460E-13	Calculated	0.02000	BETA	1.49658E+03	Calculated
+ 414	Ga-78	9.7564E+23	1.2486E-12	6.4581E-13	Calculated	0.02000	BETA	3.65798E+02	Calculated
+ 415	Ga-79	1.7628E+24	1.4099E-12	7.2767E-13	Calculated	0.02000	BETA	4.84731E+02	Calculated
+ 416	Ge-64	1.0248E+23	9.6920E-12	7.5850E-12	Calculated	0.02000	BETA	7.57002E+02	Calculated
+ 417	Ge-65	2.0802E+23	3.0627E-12	2.3386E-12	Calculated	0.02000	BETA	5.23560E+02	Calculated
418	Ge-66	7.7776E+20	1.0000E-10	9.1000E-11	ICRP72	0.02000	BETA	1.43906E+03	Calculated
419	Ge-67	5.5683E+21	6.5000E-11	2.5000E-11	ICRP72	0.02000	BETA	6.41355E+02	Calculated
420	Ge-68	2.6262E+17	1.3000E-09	1.4000E-08	ICRP72	0.50000	A2 VALUE	2.16732E+05	Calculated
421	Ge-69	4.3072E+19	2.4000E-10	2.9000E-10	ICRP72	0.02000	BETA	1.03950E+03	Calculated
> 423	Ge-71	5.9569E+18	1.2000E-11	1.1000E-11	ICRP72	40.00000	A2 VALUE	1.00000E+07	IAEA-G-1.7
426	Ge-73m	1.1448E+25	6.7923E-16	5.3157E-16	Calculated	0.02000	BETA	6.01736E+04	Calculated
428	Ge-75	1.1217E+21	4.6000E-11	3.6000E-11	ICRP72	0.02000	BETA	1.29786E+04	Calculated
429	Ge-75m	1.1680E+23	5.7607E-13	4.5133E-13	Calculated	0.02000	BETA	1.53473E+04	Calculated



ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
431	Ge-77	1.3339E+20	3.3000E-10	3.7000E-10	ICRP72	0.30000	A2 VALUE	8.75427E+02	Calculated
432	Ge-77m	1.0258E+23	1.3730E-12	1.0612E-12	Calculated	0.02000	BETA	5.95238E+03	Calculated
433	Ge-78	1.0262E+21	1.2000E-10	9.5000E-11	ICRP72	0.02000	BETA	3.31416E+03	Calculated
> 434	Ge-79	2.7690E+23	1.0821E-12	8.4685E-13	Calculated	0.02000	BETA	2.12314E+03	Calculated
> 435	Ge-79m	1.3561E+23	3.1990E-12	2.5036E-12	Calculated	0.02000	BETA	5.22739E+02	Calculated
436	Ge-80	1.7704E+23	2.6417E-12	2.0674E-12	Calculated	0.02000	BETA	1.88679E+03	Calculated
> 437	Ge-81	6.7867E+23	1.0106E-12	7.9136E-13	Calculated	0.02000	BETA	3.56125E+02	Calculated
> 438	Ge-81m	6.8772E+23	9.8839E-13	7.7396E-13	Calculated	0.02000	BETA	4.53683E+02	Calculated
+ 439	As-67	1.4673E+23	5.3618E-12	6.9269E-12	Calculated	0.02000	BETA	5.98684E+02	Calculated
440	As-68	4.0530E+22	1.7378E-11	2.9317E-11	Calculated	0.02000	BETA	2.54323E+02	Calculated
441	As-69	6.6253E+21	5.7000E-11	2.1000E-11	ICRP72	0.02000	BETA	7.93210E+02	Calculated
442	As-70	1.8913E+21	1.3000E-10	6.7000E-10	ICRP72	0.02000	BETA	2.33973E+02	Calculated
443	As-71	2.5044E+19	4.6000E-10	4.0000E-10	ICRP72	0.02000	BETA	1.69895E+03	Calculated
444	As-72	6.2003E+19	1.8000E-09	9.0000E-10	ICRP72	0.30000	A2 VALUE	5.31067E+02	Calculated
> 445	As-73	8.2503E+17	2.6000E-10	1.0000E-09	ICRP72	40.00000	A2 VALUE	1.00000E+06	IAEA-G-1.7
> 446	As-74	3.6758E+18	1.3000E-09	2.1000E-09	ICRP72	0.90000	A2 VALUE	1.00000E+04	IAEA-G-1.7
> 448	As-76	5.8025E+19	1.6000E-09	7.4000E-10	ICRP72	0.30000	A2 VALUE	1.00000E+04	IAEA-G-1.7
> 449	As-77	3.8820E+19	4.0000E-10	3.9000E-10	ICRP72	0.70000	A2 VALUE	1.00000E+06	IAEA-G-1.7
450	As-78	9.8437E+20	2.1000E-10	8.9000E-11	ICRP72	0.02000	BETA	6.81199E+02	Calculated
> 451	As-79	9.7838E+21	9.1784E-12	1.5391E-11	Calculated	0.02000	BETA	9.52381E+03	Calculated
452	As-80	3.1654E+23	9.7977E-13	1.6429E-12	Calculated	0.02000	BETA	9.73710E+02	Calculated
> 453	As-81	1.5631E+23	1.5246E-12	2.5607E-12	Calculated	0.02000	BETA	3.31345E+03	Calculated
454	As-82	2.5476E+23	1.3945E-12	2.3384E-12	Calculated	0.02000	BETA	1.51812E+03	Calculated
455	As-82m	3.7465E+23	1.3568E-12	2.2752E-12	Calculated	0.02000	BETA	3.15127E+02	Calculated
+ 456	As-83	3.7565E+23	1.4303E-12	2.5490E-12	Calculated	0.02000	BETA	4.63607E+02	Calculated
+ 457	As-84	9.0428E+23	1.0467E-12	1.8445E-12	Calculated	0.02000	BETA	1.80505E+02	Calculated
+ 458	Se-68	3.0719E+24	7.0942E-13	3.9566E-13	Calculated	0.02000	BETA	5.68189E+02	Calculated
+ 459	Se-69	2.2098E+23	7.9231E-12	2.9295E-12	Calculated	0.02000	BETA	4.76190E+02	Calculated
460	Se-70	2.4204E+21	1.2000E-10	7.6000E-11	ICRP72	0.02000	BETA	1.00659E+03	Calculated
> 461	Se-71	2.0721E+22	2.5635E-11	1.3946E-11	Calculated	0.02000	BETA	7.20461E+02	Calculated
462	Se-72	7.9937E+18	5.0000E-09	4.3000E-09	KENDALL	0.02000	BETA	2.73598E+04	Calculated
463	Se-73	2.2272E+20	2.1000E-10	2.1000E-10	ICRP72	0.02000	BETA	8.45309E+02	Calculated
464	Se-73m	2.3949E+21	2.8000E-11	2.2000E-11	ICRP72	0.02000	BETA	3.56761E+03	Calculated
> 466	Se-75	5.3898E+17	2.6000E-09	1.3000E-09	ICRP72	3.00000	A2 VALUE	1.00000E+03	IAEA-G-1.7
> 469	Se-77m	3.1260E+23	1.0902E-13	6.0566E-14	Calculated	0.02000	BETA	1.05507E+04	Calculated
471	Se-79	1.4965E+11	2.9000E-09	6.8000E-09	ICRP72	2.00000	A2 VALUE	1.90151E+05	Calculated
> 472	Se-79m	2.2604E+22	4.9752E-16	2.7640E-16	Calculated	0.02000	BETA	4.51514E+04	Calculated
> 474	Se-81	4.6752E+21	2.7000E-11	1.5000E-11	ICRP72	0.02000	BETA	1.43985E+04	Calculated
> 475	Se-81m	1.5010E+21	5.3000E-11	5.1000E-11	ICRP72	0.02000	BETA	3.76396E+04	Calculated
> 476	Se-82	1.1581E-03	1.5038E-08	2.2538E-08	Calculated	0.02000	BETA	9.10618E+02	Calculated
477	Se-83	3.7568E+21	4.7000E-11	3.4000E-11	ICRP72	0.02000	BETA	4.04858E+02	Calculated
> 478	Se-83m	7.1813E+22	6.7501E-12	4.3143E-12	Calculated	0.02000	BETA	9.19118E+02	Calculated
> 479	Se-84	2.6743E+22	1.6320E-11	1.1059E-11	Calculated	0.02000	BETA	2.11149E+03	Calculated
> 480	Se-85	1.5506E+23	6.9426E-12	3.8601E-12	Calculated	0.02000	BETA	3.93391E+02	Calculated
+ 481	Br-71	2.7496E+23	3.5591E-12	1.0680E-12	Calculated	0.02000	BETA	1.09890E+03	Calculated
> 482	Br-72	7.3825E+22	1.6743E-11	5.1601E-12	Calculated	0.02000	BETA	3.13134E+02	Calculated
> 483	Br-72m	5.4742E+23	2.2971E-12	7.0777E-13	Calculated	0.02000	BETA	1.81518E+04	Calculated
> 484	Br-73	2.8056E+22	2.2923E-11	7.3249E-12	Calculated	0.02000	BETA	6.07903E+02	Calculated
485	Br-74	3.7049E+21	8.4000E-11	3.8000E-11	ICRP72	0.02000	BETA	2.11149E+02	Calculated
486	Br-74m	2.0457E+21	1.4000E-10	6.2000E-10	ICRP72	0.02000	BETA	2.43072E+02	Calculated
487	Br-75	9.5724E+20	7.9000E-11	5.3000E-11	ICRP72	0.02000	BETA	8.00000E+02	Calculated
488	Br-76	9.4303E+19	4.6000E-10	4.1000E-10	ICRP72	0.40000	A2 VALUE	3.51494E+02	Calculated
489	Br-76m	4.1968E+24	1.1937E-14	9.6800E-15	Calculated	0.02000	BETA	2.94118E+04	Calculated
490	Br-77	2.6429E+19	9.6000E-11	8.4000E-11	ICRP72	3.00000	A2 VALUE	3.10943E+03	Calculated
491	Br-77m	2.1115E+22	2.5578E-13	1.4626E-13	Calculated	0.02000	BETA	6.94444E+04	Calculated
492	Br-78	1.3821E+22	2.9204E-11	8.8555E-12	Calculated	0.02000	BETA	8.80824E+02	Calculated
494	Br-79m	1.0839E+24	3.7048E-14	1.1234E-14	Calculated	0.02000	BETA	6.16665E+03	Calculated
495	Br-80	4.9461E+21	3.1000E-11	9.4000E-12	ICRP72	0.02000	BETA	6.69305E+03	Calculated
496	Br-80m	3.2899E+20	1.1000E-10	7.6000E-11	ICRP72	0.02000	BETA	3.28568E+04	Calculated
> 498	Br-82	4.0076E+19	5.4000E-10	6.3000E-10	ICRP72	0.40000	A2 VALUE	1.00000E+03	IAEA-G-1.7
499	Br-82m	1.3946E+22	2.5627E-12	2.0848E-12	Calculated	0.02000	BETA	6.58336E+04	Calculated
500	Br-83	5.8511E+20	4.3000E-11	4.8000E-11	ICRP72	0.02000	BETA	2.53217E+04	Calculated
501	Br-84	2.6071E+21	8.8000E-11	3.7000E-11	ICRP72	0.02000	BETA	5.34759E+02	Calculated
502	Br-84m	1.3817E+22	4.8550E-11	1.4722E-11	Calculated	0.02000	BETA	3.49528E+02	Calculated
503	Br-85	2.8580E+22	9.6292E-12	2.9284E-12	Calculated	0.02000	BETA	5.84795E+03	Calculated
504	Br-86	8.8333E+22	1.0763E-11	3.2637E-12	Calculated	0.02000	BETA	2.76855E+02	Calculated
+ 505	Br-87	8.6233E+22	4.9476E-13	1.5002E-13	Calculated	0.02000	BETA	2.83447E+02	Calculated
+ 506	Br-88	2.8773E+23	9.1879E-12	2.7860E-12	Calculated	0.02000	BETA	2.24316E+02	Calculated
+ 507	Kr-72	3.3734E+23	3.8970E-12	5.4668E-12	Calculated	0.02000	BETA	6.93001E+02	Calculated
+ 508	Kr-73	2.1196E+23	5.5161E-12	7.8153E-12	Calculated	0.02000	BETA	5.50055E+02	Calculated
509	Kr-74	8.1825E+21	6.1103E-11	1.0337E-10	Calculated	0.02000	BETA	8.18331E+02	Calculated
510	Kr-75	2.1592E+22	2.2012E-11	3.4761E-11	Calculated	0.02000	BETA	6.20617E+02	Calculated
511	Kr-76	1.0315E+20	9.0294E-10	2.0638E-09	Calculated	0.02000	BETA	2.34996E+03	Calculated
512	Kr-77	1.2167E+21	1.9241E-10	2.7088E-10	Calculated	0.02000	BETA	9.24984E+02	Calculated

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
514	Kr-79	4.1930E+19	9.0128E-10	1.2973E-09	Calculated	0.02000	BETA	3.84268E+03	Calculated
515	Kr-79m	1.0578E+23	5.2767E-13	7.5067E-13	Calculated	0.02000	BETA	2.04889E+04	Calculated
517	Kr-81	7.7842E+11	1.4033E-10	1.3908E-08	Calculated	40.00000	A2 VALUE	1.26464E+05	Calculated
518	Kr-81m	3.9081E+23	6.5995E-14	9.1568E-14	Calculated	0.02000	BETA	7.26750E+03	Calculated
521	Kr-83m	7.6418E+20	7.2203E-12	1.0018E-11	Calculated	0.02000	BETA	1.57007E+05	Calculated
523	Kr-85	1.4518E+16	2.7806E-09	2.6391E-07	Calculated	10.00000	A2 VALUE	3.66357E+04	Calculated
524	Kr-85m	3.0481E+20	1.7472E-10	2.4504E-10	Calculated	3.00000	A2 VALUE	5.47252E+03	Calculated
526	Kr-87	1.0491E+21	2.5737E-10	3.5710E-10	Calculated	0.20000	A2 VALUE	1.07875E+03	Calculated
527	Kr-88	4.6440E+20	1.3454E-09	1.8667E-09	Calculated	0.02000	BETA	5.03146E+02	Calculated
528	Kr-89	2.4682E+22	2.7599E-11	4.5915E-11	Calculated	0.02000	BETA	3.11818E+02	Calculated
+ 529	Kr-90	1.4363E+23	5.6908E-12	7.9443E-12	Calculated	0.02000	BETA	7.31797E+02	Calculated
+ 530	Rb-77	2.4115E+22	3.4248E-11	6.1186E-12	Calculated	0.02000	BETA	5.88235E+02	Calculated
531	Rb-78	5.0533E+21	1.7910E-10	3.1840E-11	Calculated	0.02000	BETA	2.32396E+02	Calculated
532	Rb-78m	1.5571E+22	5.7381E-11	1.0201E-11	Calculated	0.02000	BETA	2.95247E+02	Calculated
533	Rb-79	3.8605E+21	5.0000E-11	1.6000E-11	ICRP72	0.02000	BETA	6.65336E+02	Calculated
534	Rb-80	1.5361E+23	3.4298E-12	6.0974E-13	Calculated	0.02000	BETA	7.17360E+02	Calculated
535	Rb-81	3.1313E+20	5.4000E-11	3.4000E-11	ICRP72	0.80000	A2 VALUE	1.50466E+03	Calculated
536	Rb-81m	2.8204E+21	9.7000E-12	7.0000E-12	ICRP72	0.02000	BETA	2.36967E+04	Calculated
537	Rb-82	6.6714E+22	5.9755E-12	1.0623E-12	Calculated	0.02000	BETA	8.10241E+02	Calculated
538	Rb-82m	2.1870E+20	1.3000E-10	1.1000E-10	ICRP72	0.02000	BETA	3.40194E+02	Calculated
539	Rb-83	6.7596E+17	1.9000E-09	6.9000E-10	ICRP72	2.00000	A2 VALUE	2.01234E+03	Calculated
540	Rb-84	1.7186E+18	2.8000E-09	1.0000E-09	ICRP72	1.00000	A2 VALUE	1.10910E+03	Calculated
541	Rb-84m	4.0640E+21	1.8886E-11	3.5698E-12	Calculated	0.02000	BETA	2.55818E+03	Calculated
> 543	Rb-86	3.0186E+18	2.8000E-09	9.3000E-10	ICRP72	0.50000	A2 VALUE	1.00000E+05	IAEA-G-1.7
544	Rb-86m	7.9652E+22	1.1653E-12	2.2355E-13	Calculated	0.02000	BETA	1.82809E+03	Calculated
> 545	Rb-87	3.1730E+06	1.5000E-09	5.0000E-10	ICRP72	-1.00000	A2 VALUE	1.00000E+03	IAEA-G-1.7
546	Rb-88	4.4459E+21	9.0000E-11	1.6000E-11	ICRP72	0.02000	BETA	1.18570E+03	Calculated
547	Rb-89	5.0809E+21	4.7000E-11	1.4000E-11	ICRP72	0.02000	BETA	4.29713E+02	Calculated
548	Rb-90	3.0343E+22	1.9314E-11	3.4686E-12	Calculated	0.02000	BETA	4.24010E+02	Calculated
549	Rb-90m	1.7994E+22	4.1462E-11	7.4299E-12	Calculated	0.02000	BETA	2.61938E+02	Calculated
+ 550	Rb-91	7.8618E+22	1.2867E-11	2.2835E-12	Calculated	0.02000	BETA	4.01445E+02	Calculated
+ 551	Rb-92	1.0069E+24	2.1177E-12	3.4793E-13	Calculated	0.02000	BETA	1.34608E+03	Calculated
+ 552	Rb-93	7.8810E+23	2.9960E-12	5.0277E-13	Calculated	0.02000	BETA	4.58085E+02	Calculated
+ 553	Rb-94	1.6448E+24	1.6904E-12	2.7181E-13	Calculated	0.02000	BETA	2.27118E+02	Calculated
+ 554	Sr-78	3.3658E+22	7.5562E-12	4.7844E-12	Calculated	0.02000	BETA	7.25097E+02	Calculated
+ 555	Sr-79	3.9174E+22	3.4456E-12	2.6613E-12	Calculated	0.02000	BETA	6.83256E+02	Calculated
556	Sr-80	8.1860E+20	3.4000E-10	1.4000E-10	ICRP72	0.02000	BETA	2.42189E+03	Calculated
557	Sr-81	3.8552E+21	7.7000E-11	3.7000E-11	ICRP72	0.02000	BETA	6.22278E+02	Calculated
558	Sr-82	2.3078E+18	6.1000E-09	1.1000E-08	ICRP72	0.20000	A2 VALUE	1.19261E+05	Calculated
559	Sr-83	4.3147E+19	4.9000E-10	3.4000E-10	ICRP72	0.02000	BETA	1.26404E+03	Calculated
560	Sr-83m	1.0170E+24	2.8491E-14	1.9302E-14	Calculated	0.02000	BETA	4.32514E+03	Calculated
> 562	Sr-85	8.7738E+17	5.6000E-10	8.1000E-10	ICRP72	2.00000	A2 VALUE	1.00000E+03	IAEA-G-1.7
> 563	Sr-85m	1.2118E+21	6.1000E-12	4.3000E-12	ICRP72	5.00000	A2 VALUE	1.00000E+05	IAEA-G-1.7
> 566	Sr-87m	4.7513E+20	3.0000E-11	2.1000E-11	ICRP72	3.00000	A2 VALUE	1.00000E+05	IAEA-G-1.7
> 568	Sr-89	1.0756E+18	2.6000E-09	7.9000E-09	ICRP72	0.60000	A2 VALUE	1.00000E+06	IAEA-G-1.7
> 569	Sr-90	5.0967E+15	2.8000E-08	1.6000E-07	ICRP72	0.30000	A2 VALUE	1.00000E+03	IAEA-G-1.7
> 570	Sr-91	1.3398E+20	6.5000E-10	4.1000E-10	ICRP72	0.21000	A2 VALUE	1.00000E+04	IAEA-G-1.7
> 571	Sr-92	4.6552E+20	4.3000E-10	2.3000E-10	ICRP72	0.30000	A2 VALUE	1.00000E+04	IAEA-G-1.7
572	Sr-93	1.0229E+22	1.1171E-11	5.5039E-12	Calculated	0.02000	BETA	5.39084E+02	Calculated
> 573	Sr-94	5.9026E+22	2.2389E-12	8.3891E-13	Calculated	0.02000	BETA	6.61972E+02	Calculated
574	Sr-95	1.7521E+23	9.4372E-13	3.9482E-13	Calculated	0.02000	BETA	6.45136E+02	Calculated
575	Sr-96	4.1054E+24	4.0941E-14	2.5922E-14	Calculated	0.02000	BETA	8.95255E+02	Calculated
+ 576	Y-81	7.1241E+22	2.3986E-11	2.7186E-11	Calculated	0.02000	BETA	8.27815E+02	Calculated
577	Y-82	5.3632E+23	1.2019E-12	1.9619E-12	Calculated	0.02000	BETA	6.36943E+02	Calculated
578	Y-83	1.1844E+22	3.9037E-11	5.5203E-11	Calculated	0.02000	BETA	6.45578E+02	Calculated
579	Y-83m	2.9438E+22	1.4450E-11	2.0467E-11	Calculated	0.02000	BETA	7.66284E+02	Calculated
580	Y-84	1.0813E+24	4.4429E-13	6.1646E-13	Calculated	0.02000	BETA	6.57895E+02	Calculated
581	Y-84m	2.0725E+21	3.2566E-10	4.5186E-10	Calculated	0.02000	BETA	2.44499E+02	Calculated
582	Y-85	5.0940E+20	1.5000E-10	1.4000E-10	NRPB-M	0.02000	BETA	7.54318E+02	Calculated
583	Y-85m	2.8090E+20	3.2000E-10	2.5000E-10	NRPB-M	0.02000	BETA	7.08617E+02	Calculated
584	Y-86	9.1567E+19	9.6000E-10	4.7000E-10	ICRP72	0.02000	BETA	2.77639E+02	Calculated
585	Y-86m	1.6870E+21	5.6000E-11	2.8000E-11	ICRP72	0.02000	BETA	4.49620E+03	Calculated
586	Y-87	1.6613E+19	5.5000E-10	3.9000E-10	ICRP72	1.00000	A2 VALUE	2.18019E+03	Calculated
587	Y-87m	1.0351E+20	2.1000E-10	1.9000E-10	NRPB-M	0.02000	BETA	3.17773E+03	Calculated
588	Y-88	5.1540E+17	1.3000E-09	4.4000E-09	ICRP72	0.40000	A2 VALUE	3.70742E+02	Calculated
590	Y-89m	2.9253E+23	3.8295E-13	5.3134E-13	Calculated	0.02000	BETA	1.10848E+03	Calculated
> 591	Y-90	2.0117E+19	2.7000E-09	1.5000E-09	ICRP72	0.30000	A2 VALUE	1.00000E+06	IAEA-G-1.7
592	Y-90m	4.0429E+20	1.7000E-10	1.0000E-10	ICRP72	0.02000	BETA	1.56617E+03	Calculated
> 593	Y-91	9.0537E+17	2.4000E-09	8.9000E-09	ICRP72	0.60000	A2 VALUE	1.00000E+05	IAEA-G-1.7
> 594	Y-91m	1.5392E+21	1.1000E-11	1.1000E-11	ICRP72	2.00000	A2 VALUE	1.00000E+05	IAEA-G-1.7
> 595	Y-92	3.5638E+20	4.9000E-10	1.8000E-10	ICRP72	0.20000	A2 VALUE	1.00000E+05	IAEA-G-1.7
> 596	Y-93	1.2356E+20	1.2000E-09	4.2000E-10	ICRP72	0.30000	A2 VALUE	1.00000E+05	IAEA-G-1.7
597	Y-93m	5.4790E+24	4.3397E-14	3.2136E-14	Calculated	0.02000	BETA	1.45607E+03	Calculated
598	Y-94	3.8786E+21	8.1000E-11	2.8000E-11	ICRP72	0.02000	BETA	9.26526E+02	Calculated

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
599	Y-95	7.1164E+21	4.6000E-11	1.6000E-11	ICRP72	0.02000	BETA	8.37521E+02	Calculated
600	Y-96	8.1042E+23	4.6156E-13	6.4042E-13	Calculated	0.02000	BETA	2.41815E+03	Calculated
601	Y-96m	4.5239E+23	1.6002E-12	2.2202E-12	Calculated	0.02000	BETA	2.14061E+02	Calculated
602	Y-97	1.1641E+24	2.1572E-16	2.9931E-16	Calculated	0.02000	BETA	5.35332E+02	Calculated
603	Y-97m	3.5595E+24	1.5250E-13	2.0902E-13	Calculated	0.02000	BETA	5.02260E+02	Calculated
+ 604	Y-98	6.5582E+24	3.7648E-13	5.2236E-13	Calculated	0.02000	BETA	2.60184E+02	Calculated
+ 605	Y-98m	2.1314E+24	4.4471E-13	6.1690E-13	Calculated	0.02000	BETA	2.74409E+02	Calculated
+ 606	Zr-82	1.5921E+23	1.1207E-11	5.9423E-12	Calculated	0.02000	BETA	6.81825E+02	Calculated
+ 607	Zr-83	1.1440E+23	1.3872E-11	6.6706E-12	Calculated	0.02000	BETA	7.40741E+02	Calculated
608	Zr-84	3.2089E+21	4.0193E-10	1.9137E-10	Calculated	0.02000	BETA	9.77200E+02	Calculated
609	Zr-85	1.0423E+22	7.6822E-11	3.4540E-11	Calculated	0.02000	BETA	6.06796E+02	Calculated
610	Zr-85m	4.5095E+23	1.9246E-12	8.6927E-13	Calculated	0.02000	BETA	3.42231E+03	Calculated
611	Zr-86	8.1793E+19	8.6000E-10	4.3000E-10	ICRP72	0.02000	BETA	3.35537E+03	Calculated
612	Zr-87	7.6966E+20	3.1000E-11	2.8000E-11	NRPB-M	0.02000	BETA	1.00301E+03	Calculated
613	Zr-87m	3.4305E+23	2.8502E-13	1.6541E-13	Calculated	0.02000	BETA	4.06174E+03	Calculated
614	Zr-88	6.5896E+17	4.5000E-10	3.6000E-09	ICRP72	3.00000	A2 VALUE	2.54181E+03	Calculated
615	Zr-89	1.6635E+19	7.9000E-10	5.5000E-10	ICRP72	0.02000	BETA	3.80005E+03	Calculated
616	Zr-89m	1.8720E+22	8.5249E-12	4.2031E-12	Calculated	0.02000	BETA	1.55931E+03	Calculated
618	Zr-90m	5.5939E+24	9.0043E-14	4.2872E-14	Calculated	0.02000	BETA	4.31202E+02	Calculated
> 621	Zr-93	9.3054E+10	1.1000E-09	2.5000E-08	ICRP72	-1.00000	A2 VALUE	1.00000E+04	IAEA-G-1.7
> 623	Zr-95	7.9502E+17	9.5000E-10	5.9000E-09	ICRP72	1.40000	A2 VALUE	1.00000E+03	IAEA-G-1.7
> 625	Zr-97	7.0797E+19	2.1000E-09	9.2000E-10	ICRP72	0.40000	A2 VALUE	1.00000E+04	IAEA-G-1.7
626	Zr-98	1.3887E+23	4.2308E-12	2.0144E-12	Calculated	0.02000	BETA	1.09410E+04	Calculated
> 627	Zr-99	1.9182E+24	4.5485E-13	2.2211E-13	Calculated	0.02000	BETA	1.00472E+03	Calculated
628	Nb-86	5.5204E+22	7.3207E-12	4.8571E-12	Calculated	0.02000	BETA	2.56476E+02	Calculated
629	Nb-87	3.0784E+22	4.7723E-12	3.2945E-12	Calculated	0.02000	BETA	6.41026E+02	Calculated
630	Nb-87m	2.0971E+22	9.5013E-12	6.4878E-12	Calculated	0.02000	BETA	7.25426E+02	Calculated
631	Nb-88	5.4573E+21	6.3000E-11	2.8000E-11	ICRP72	0.02000	BETA	2.27273E+02	Calculated
632	Nb-88m	1.0145E+22	3.5960E-11	2.3887E-11	Calculated	0.02000	BETA	2.37643E+02	Calculated
633	Nb-89	6.4135E+20	2.7000E-10	1.2000E-10	ICRP72	0.02000	BETA	6.65070E+02	Calculated
634	Nb-89m	1.1855E+21	1.4000E-10	7.1000E-11	ICRP72	0.02000	BETA	4.97265E+02	Calculated
635	Nb-90	8.8330E+19	1.2000E-09	6.6000E-10	ICRP72	0.02000	BETA	2.35571E+02	Calculated
636	Nb-90m	2.4668E+23	4.6147E-13	2.5736E-13	Calculated	0.02000	BETA	1.15821E+04	Calculated
637	Nb-91	2.1398E+14	6.4000E-11	4.1000E-09	R245	0.02000	BETA	7.60230E+04	Calculated
638	Nb-91m	8.7266E+17	6.3000E-10	2.3000E-09	R245	0.02000	BETA	2.11065E+04	Calculated
639	Nb-92	4.1120E+09	1.1000E-09	3.8000E-08	KENDALL	0.02000	BETA	6.64848E+02	Calculated
640	Nb-92m	5.1790E+18	6.0000E-10	5.9000E-10	R245	0.02000	BETA	1.02984E+03	Calculated
> 642	Nb-93m	8.8288E+15	1.2000E-10	1.8000E-09	ICRP72	30.00000	A2 VALUE	1.00000E+04	IAEA-G-1.7
> 643	Nb-94	7.0476E+12	1.7000E-09	4.9000E-08	ICRP72	0.70000	A2 VALUE	1.00000E+02	IAEA-G-1.7
644	Nb-94m	1.1835E+22	2.4666E-13	1.6326E-13	Calculated	0.02000	BETA	6.33737E+04	Calculated
> 645	Nb-95	1.4555E+18	5.8000E-10	1.8000E-09	ICRP72	1.00000	A2 VALUE	1.00000E+03	IAEA-G-1.7
646	Nb-95m	1.4108E+19	5.6000E-10	8.8000E-10	ICRP72	0.02000	BETA	1.12304E+04	Calculated
647	Nb-96	5.1776E+19	1.1000E-09	6.6000E-10	ICRP72	0.02000	BETA	4.08266E+02	Calculated
> 648	Nb-97	9.9570E+20	6.8000E-11	4.5000E-11	ICRP72	0.60000	A2 VALUE	1.00000E+04	IAEA-G-1.7
649	Nb-97m	7.1790E+22	1.5616E-12	1.0334E-12	Calculated	0.02000	BETA	1.37018E+03	Calculated
> 650	Nb-98	1.5226E+24	7.8893E-14	5.2208E-14	Calculated	0.02000	BETA	1.00000E+04	IAEA-G-1.7
651	Nb-98m	1.3851E+21	1.1000E-10	5.8000E-11	ICRP72	0.02000	BETA	3.58551E+02	Calculated
652	Nb-99	2.9512E+23	3.7415E-13	2.6245E-13	Calculated	0.02000	BETA	2.98151E+03	Calculated
653	Nb-99m	2.7052E+22	4.9772E-12	3.4557E-12	Calculated	0.02000	BETA	1.11483E+03	Calculated
654	Nb-100	2.9842E+24	6.1879E-14	4.0949E-14	Calculated	0.02000	BETA	1.01145E+03	Calculated
655	Nb-100m	1.4406E+24	1.6534E-13	1.0942E-13	Calculated	0.02000	BETA	4.40692E+02	Calculated
+ 656	Nb-101	5.8259E+23	4.2756E-13	2.5525E-13	Calculated	0.02000	BETA	1.22175E+03	Calculated
+ 657	Nb-102	3.1505E+24	1.3153E-13	8.7039E-14	Calculated	0.02000	BETA	3.04544E+02	Calculated
+ 658	Nb-102m	9.5248E+23	4.0393E-13	2.6731E-13	Calculated	0.02000	BETA	4.30836E+02	Calculated
+ 659	Nb-103	2.7039E+24	1.2334E-13	8.2025E-14	Calculated	0.02000	BETA	1.02491E+03	Calculated
+ 660	Nb-104	5.0208E+24	9.8683E-14	5.7041E-14	Calculated	0.02000	BETA	2.94686E+02	Calculated
661	Mo-88	9.8910E+21	7.5616E-11	4.5379E-11	Calculated	0.02000	BETA	2.34908E+03	Calculated
662	Mo-89	3.8478E+22	1.6637E-11	1.1390E-11	Calculated	0.02000	BETA	7.18907E+02	Calculated
> 663	Mo-90	2.2746E+20	2.2000E-10	3.6000E-10	ICRP72	0.02000	BETA	1.00000E+04	IAEA-G-1.7
664	Mo-91	4.9403E+21	5.2888E-11	4.2597E-11	Calculated	0.02000	BETA	8.90678E+02	Calculated
665	Mo-91m	7.0422E+22	4.8263E-12	3.8873E-12	Calculated	0.02000	BETA	6.91471E+02	Calculated
> 667	Mo-93	4.7274E+13	3.1000E-09	2.3000E-09	ICRP72	20.00000	A2 VALUE	1.00000E+04	IAEA-G-1.7
668	Mo-93m	1.8219E+20	1.1000E-10	1.7000E-10	ICRP72	0.02000	BETA	4.29511E+02	Calculated
> 674	Mo-99	1.7776E+19	6.0000E-10	9.9000E-10	ICRP72	0.34000	A2 VALUE	1.00000E+04	IAEA-G-1.7
> 676	Mo-101	4.7221E+21	4.1000E-11	2.6000E-11	ICRP72	0.02000	BETA	1.00000E+04	IAEA-G-1.7
677	Mo-102	6.0952E+21	3.7848E-11	3.0484E-11	Calculated	0.02000	BETA	1.81399E+04	Calculated
678	Mo-103	5.9736E+22	4.8765E-12	3.9649E-12	Calculated	0.02000	BETA	1.30237E+03	Calculated
679	Mo-104	6.6950E+22	5.1961E-12	2.9111E-12	Calculated	0.02000	BETA	3.78788E+03	Calculated
680	Mo-105	1.0841E+23	4.6331E-12	3.8253E-12	Calculated	0.02000	BETA	4.01432E+02	Calculated
+ 681	Tc-90	5.8759E+23	1.1346E-12	7.8156E-13	Calculated	0.02000	BETA	6.58250E+02	Calculated
+ 682	Tc-90m	9.4269E+22	8.9592E-12	6.0631E-12	Calculated	0.02000	BETA	2.94183E+02	Calculated
+ 683	Tc-91	2.4369E+22	3.3685E-11	2.1275E-11	Calculated	0.02000	BETA	3.81243E+02	Calculated
+ 684	Tc-91m	2.3188E+22	3.1981E-11	2.0199E-11	Calculated	0.02000	BETA	5.95948E+02	Calculated
685	Tc-92	1.7202E+22	4.1191E-11	2.6015E-11	Calculated	0.02000	BETA	2.43546E+02	Calculated

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
686	Tc-93	4.5381E+20	5.5000E-11	3.5000E-11	ICRP72	0.02000	BETA	7.51529E+02	Calculated
687	Tc-93m	1.7214E+21	2.5000E-11	1.7000E-11	ICRP72	0.02000	BETA	1.24332E+03	Calculated
688	Tc-94	2.5284E+20	2.0000E-10	1.3000E-10	ICRP72	0.02000	BETA	3.75429E+02	Calculated
689	Tc-94m	1.4247E+21	1.0000E-10	4.6000E-11	ICRP72	0.02000	BETA	4.97141E+02	Calculated
690	Tc-95	6.1086E+19	1.8000E-10	1.1000E-10	ICRP72	0.02000	BETA	1.25231E+03	Calculated
691	Tc-95m	8.3457E+17	5.6000E-10	1.2000E-09	ICRP72	2.00000	A2 VALUE	1.38798E+03	Calculated
> 692	Tc-96	1.1770E+19	1.1000E-09	7.0000E-10	ICRP72	0.40000	A2 VALUE	1.00000E+03	IAEA-G-1.7
> 693	Tc-96m	1.4085E+21	1.2000E-11	7.5000E-12	ICRP72	0.40000	A2 VALUE	1.00000E+06	IAEA-G-1.7
> 694	Tc-97	5.2498E+10	6.8000E-11	1.8000E-09	ICRP72	-1.00000	A2 VALUE	1.00000E+04	IAEA-G-1.7
> 695	Tc-97m	5.5272E+17	5.5000E-10	4.1000E-09	ICRP72	10.00000	A2 VALUE	1.00000E+05	IAEA-G-1.7
696	Tc-98	3.2189E+10	2.0000E-09	4.5000E-08	ICRP72	0.70000	A2 VALUE	7.01951E+02	Calculated
> 697	Tc-99	6.3292E+11	6.4000E-10	1.3000E-08	ICRP72	0.90000	A2 VALUE	1.00000E+03	IAEA-G-1.7
> 698	Tc-99m	1.9506E+20	2.2000E-11	2.0000E-11	ICRP72	4.00000	A2 VALUE	1.00000E+05	IAEA-G-1.7
699	Tc-100	2.6444E+23	6.0569E-13	3.8254E-13	Calculated	0.02000	BETA	4.66200E+03	Calculated
700	Tc-101	4.8553E+21	1.9000E-11	1.2000E-11	ICRP72	0.02000	BETA	2.60419E+03	Calculated
701	Tc-102	7.7576E+23	2.9330E-13	1.8524E-13	Calculated	0.02000	BETA	3.63290E+03	Calculated
702	Tc-102m	1.5694E+22	2.3940E-11	1.5120E-11	Calculated	0.02000	BETA	3.84220E+02	Calculated
703	Tc-103	8.1125E+22	1.5285E-12	9.9053E-13	Calculated	0.02000	BETA	2.87134E+03	Calculated
704	Tc-104	3.6387E+21	8.0000E-11	2.9000E-11	ICRP72	0.02000	BETA	4.13052E+02	Calculated
705	Tc-105	8.7255E+21	2.5231E-11	1.7004E-11	Calculated	0.02000	BETA	1.62379E+03	Calculated
706	Tc-106	1.0948E+23	4.1425E-12	2.6619E-12	Calculated	0.02000	BETA	4.32259E+02	Calculated
+ 707	Tc-107	1.8592E+23	2.4520E-12	1.5479E-12	Calculated	0.02000	BETA	1.32293E+03	Calculated
+ 708	Tc-108	7.4815E+23	1.0551E-12	6.6637E-13	Calculated	0.02000	BETA	5.82751E+02	Calculated
+ 709	Tc-109	2.7374E+24	2.8831E-13	1.8014E-13	Calculated	0.02000	BETA	1.07147E+03	Calculated
+ 710	Ru-92	2.0736E+22	1.0623E-10	4.9726E-11	Calculated	0.02000	BETA	4.57697E+02	Calculated
+ 711	Ru-93	7.5250E+22	1.2784E-11	5.9866E-12	Calculated	0.02000	BETA	7.13267E+02	Calculated
+ 712	Ru-93m	4.1597E+23	2.8125E-12	1.3169E-12	Calculated	0.02000	BETA	4.66200E+02	Calculated
713	Ru-94	1.4292E+21	9.4000E-11	4.4000E-11	ICRP72	0.02000	BETA	1.92123E+03	Calculated
714	Ru-95	7.4544E+20	5.7000E-11	8.2000E-11	NRPB-M	0.02000	BETA	7.99616E+02	Calculated
> 716	Ru-97	1.7191E+19	1.5000E-10	1.1000E-10	ICRP72	5.00000	A2 VALUE	1.00000E+04	IAEA-G-1.7
> 722	Ru-103	1.1958E+18	7.3000E-10	3.0000E-09	ICRP72	1.00000	A2 VALUE	1.00000E+03	IAEA-G-1.7
> 724	Ru-105	2.4899E+20	2.6000E-10	1.8000E-10	ICRP72	0.60000	A2 VALUE	1.00000E+04	IAEA-G-1.7
> 725	Ru-106	1.2390E+17	7.0000E-09	6.6000E-08	ICRP72	0.20000	A2 VALUE	1.00000E+02	IAEA-G-1.7
726	Ru-107	1.7353E+22	2.6902E-11	1.2580E-11	Calculated	0.02000	BETA	2.20751E+03	Calculated
727	Ru-108	1.4327E+22	5.7396E-11	2.6866E-11	Calculated	0.02000	BETA	1.07673E+04	Calculated
728	Ru-109	1.1109E+23	9.0356E-12	4.1546E-12	Calculated	0.02000	BETA	4.53721E+02	Calculated
> 729	Ru-110	3.0141E+23	3.6986E-12	1.7313E-12	Calculated	0.02000	BETA	1.80245E+03	Calculated
730	Ru-111	1.7106E+24	6.9092E-13	3.2867E-13	Calculated	0.02000	BETA	1.07527E+03	Calculated
+ 731	Rh-95	1.4611E+22	3.0029E-11	2.3441E-11	Calculated	0.02000	BETA	3.90778E+02	Calculated
+ 732	Rh-95m	3.7396E+22	1.3983E-11	1.0758E-11	Calculated	0.02000	BETA	1.10011E+03	Calculated
733	Rh-96	7.3266E+21	8.1303E-11	5.7768E-11	Calculated	0.02000	BETA	2.45399E+02	Calculated
734	Rh-96m	4.8036E+22	1.2104E-11	8.5999E-12	Calculated	0.02000	BETA	7.81250E+02	Calculated
735	Rh-97	2.3034E+21	1.0314E-10	7.3507E-11	Calculated	0.02000	BETA	6.75219E+02	Calculated
736	Rh-97m	1.6193E+21	1.9268E-10	1.3722E-10	Calculated	0.02000	BETA	4.40412E+02	Calculated
737	Rh-98	8.1672E+21	4.4965E-11	3.1949E-11	Calculated	0.02000	BETA	5.35103E+02	Calculated
738	Rh-98m	2.0301E+22	1.9776E-11	1.4051E-11	Calculated	0.02000	BETA	4.10004E+02	Calculated
739	Rh-99	3.0340E+18	5.1000E-10	8.7000E-10	ICRP72	2.00000	A2 VALUE	1.96928E+03	Calculated
740	Rh-99m	2.4972E+20	6.6000E-11	4.0000E-11	ICRP72	0.02000	BETA	1.54914E+03	Calculated
741	Rh-100	5.5782E+19	7.1000E-10	3.5000E-10	ICRP72	0.02000	BETA	3.58939E+02	Calculated
742	Rh-100m	1.5138E+22	2.9558E-12	1.5406E-12	Calculated	0.02000	BETA	2.14638E+04	Calculated
743	Rh-101	3.9776E+16	5.5000E-10	5.4000E-09	ICRP72	3.00000	A2 VALUE	3.30426E+03	Calculated
744	Rh-101m	1.1031E+19	2.2000E-10	2.1000E-10	ICRP72	0.02000	BETA	3.26819E+03	Calculated
745	Rh-102	4.4725E+16	2.6000E-09	1.7000E-08	ICRP72	0.50000	A2 VALUE	4.70973E+02	Calculated
746	Rh-102m	2.2793E+17	1.2000E-09	7.1000E-09	ICRP72	2.00000	A2 VALUE	1.95877E+03	Calculated
> 748	Rh-103m	1.2048E+21	3.8000E-12	2.7000E-12	ICRP72	40.00000	A2 VALUE	1.00000E+07	IAEA-G-1.7
749	Rh-104	9.4971E+22	1.1909E-12	8.4614E-13	Calculated	0.02000	BETA	8.84393E+03	Calculated
750	Rh-104m	1.5427E+22	8.2915E-12	5.8913E-12	Calculated	0.02000	BETA	1.84697E+04	Calculated
> 751	Rh-105	3.1240E+19	3.7000E-10	3.5000E-10	ICRP72	0.80000	A2 VALUE	1.00000E+05	IAEA-G-1.7
752	Rh-105m	9.9475E+22	2.6307E-13	2.1427E-13	Calculated	0.02000	BETA	2.26645E+04	Calculated
753	Rh-106	1.3094E+23	1.3784E-12	9.7941E-13	Calculated	0.02000	BETA	2.79162E+03	Calculated
754	Rh-106m	4.9765E+20	1.6000E-10	1.1000E-10	ICRP72	0.02000	BETA	3.58245E+02	Calculated
755	Rh-107	2.9989E+21	2.4000E-11	1.7000E-11	ICRP72	0.02000	BETA	2.80728E+03	Calculated
756	Rh-108	1.0927E+22	3.1828E-11	2.2615E-11	Calculated	0.02000	BETA	4.24322E+02	Calculated
757	Rh-108m	2.3026E+23	1.1080E-12	7.8725E-13	Calculated	0.02000	BETA	1.40964E+03	Calculated
758	Rh-109	4.7910E+22	3.1880E-12	2.1358E-12	Calculated	0.02000	BETA	2.42578E+03	Calculated
> 759	Rh-110	1.3326E+23	3.0109E-12	2.1393E-12	Calculated	0.02000	BETA	3.74276E+02	Calculated
> 760	Rh-110m	1.1868E+24	2.3549E-13	1.6732E-13	Calculated	0.02000	BETA	1.77751E+03	Calculated
761	Rh-111	3.4214E+23	8.4768E-13	6.2193E-13	Calculated	0.02000	BETA	2.80505E+03	Calculated
762	Rh-112	9.8154E+23	6.7588E-13	4.3798E-13	Calculated	0.02000	BETA	3.48068E+02	Calculated
+ 763	Rh-112m	5.4851E+23	1.1248E-12	7.2358E-13	Calculated	0.02000	BETA	4.07852E+02	Calculated
+ 764	Rh-113	1.3591E+24	3.6434E-13	2.5709E-13	Calculated	0.02000	BETA	1.41185E+03	Calculated
+ 765	Rh-114	1.9807E+24	3.1914E-13	2.2676E-13	Calculated	0.02000	BETA	1.34576E+03	Calculated
+ 766	Rh-114m	1.9807E+24	3.9095E-13	2.7778E-13	Calculated	0.02000	BETA	3.67820E+02	Calculated
+ 767	Pd-96	3.5641E+22	4.7100E-11	5.1732E-11	Calculated	0.02000	BETA	7.96512E+02	Calculated

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
+ 768	Pd-97	2.3156E+22	5.2453E-11	5.7676E-11	Calculated	0.02000	BETA	3.95883E+02	Calculated
769	Pd-98	4.0143E+21	2.0637E-10	2.2667E-10	Calculated	0.02000	BETA	2.10970E+03	Calculated
770	Pd-99	3.2867E+21	1.1907E-10	1.3218E-10	Calculated	0.02000	BETA	7.67813E+02	Calculated
771	Pd-100	1.3306E+19	9.4000E-10	8.5000E-10	ICRP72	0.02000	BETA	9.19591E+03	Calculated
772	Pd-101	1.3567E+20	9.4000E-11	6.2000E-11	ICRP72	0.02000	BETA	2.80041E+03	Calculated
> 774	Pd-103	2.7649E+18	1.9000E-10	4.5000E-10	ICRP72	40.00000	A2 VALUE	1.00000E+06	IAEA-G-1.7
778	Pd-107	1.9035E+10	3.7000E-11	5.9000E-10	ICRP72	-1.00000	A2 VALUE	1.06333E+06	Calculated
779	Pd-107m	1.8331E+23	2.5006E-13	2.7465E-13	Calculated	0.02000	BETA	6.32355E+03	Calculated
> 781	Pd-109	7.9100E+19	5.5000E-10	3.7000E-10	ICRP72	0.50000	A2 VALUE	1.00000E+05	IAEA-G-1.7
782	Pd-109m	1.3563E+22	6.1252E-12	5.3623E-12	Calculated	0.02000	BETA	8.39061E+03	Calculated
784	Pd-111	2.6807E+21	7.9180E-11	9.4449E-11	Calculated	0.02000	BETA	7.80415E+03	Calculated
785	Pd-111m	1.9009E+20	5.2000E-10	4.8000E-10	NRPB-M	0.02000	BETA	2.49836E+03	Calculated
786	Pd-112	5.1041E+19	6.7071E-09	4.9396E-09	Calculated	0.02000	BETA	7.02347E+04	Calculated
787	Pd-113	3.9752E+22	1.2180E-11	1.3196E-11	Calculated	0.02000	BETA	4.81440E+03	Calculated
788	Pd-113m	3.6970E+22	1.3103E-11	1.4195E-11	Calculated	0.02000	BETA	1.00000E+06	Calculated
789	Pd-114	2.4928E+22	2.3513E-11	2.5825E-11	Calculated	0.02000	BETA	1.24271E+04	Calculated
> 790	Pd-115	1.4530E+23	6.7262E-12	6.6565E-12	Calculated	0.02000	BETA	6.34518E+02	Calculated
+ 791	Pd-115m	7.2595E+22	1.3449E-11	1.4235E-11	Calculated	0.02000	BETA	6.37077E+02	Calculated
+ 792	Pd-116	2.9042E+23	3.2952E-12	3.6192E-12	Calculated	0.02000	BETA	3.65230E+03	Calculated
+ 793	Pd-117	7.1405E+23	1.8011E-12	1.9349E-12	Calculated	0.02000	BETA	3.30589E+02	Calculated
+ 794	Pd-118	1.1419E+24	1.3965E-12	1.5338E-12	Calculated	0.02000	BETA	1.19717E+03	Calculated
795	Ag-100	3.4527E+22	1.3017E-11	8.6447E-12	Calculated	0.02000	BETA	2.81215E+02	Calculated
796	Ag-100m	3.1177E+22	1.2103E-11	8.0347E-12	Calculated	0.02000	BETA	3.66300E+02	Calculated
797	Ag-101	6.2109E+21	3.4427E-11	2.2690E-11	Calculated	0.02000	BETA	6.18429E+02	Calculated
798	Ag-101m	1.3343E+24	1.7221E-13	1.1358E-13	Calculated	0.02000	BETA	6.58111E+03	Calculated
799	Ag-102	5.2919E+21	4.0000E-11	1.8000E-11	ICRP72	0.02000	BETA	2.85225E+02	Calculated
800	Ag-102m	8.9042E+21	3.6367E-11	2.1690E-11	Calculated	0.02000	BETA	4.90918E+02	Calculated
801	Ag-103	1.0295E+21	4.3000E-11	2.7000E-11	ICRP72	0.02000	BETA	1.16591E+03	Calculated
802	Ag-103m	7.1162E+23	7.8731E-14	5.0055E-14	Calculated	0.02000	BETA	2.11864E+04	Calculated
803	Ag-104	9.6800E+20	6.0000E-11	3.7000E-11	ICRP72	0.02000	BETA	3.67782E+02	Calculated
804	Ag-104m	1.9986E+21	5.4000E-11	2.6000E-11	ICRP72	0.02000	BETA	7.74593E+02	Calculated
> 805	Ag-105	1.1151E+18	4.7000E-10	8.1000E-10	ICRP72	2.00000	A2 VALUE	1.00000E+03	IAEA-G-1.7
806	Ag-105m	9.1724E+21	3.0862E-13	2.6561E-13	Calculated	0.02000	BETA	2.66325E+05	Calculated
807	Ag-106	2.7371E+21	3.2000E-11	1.6000E-11	ICRP72	0.02000	BETA	1.32218E+03	Calculated
808	Ag-106m	5.3922E+18	1.5000E-09	1.1000E-09	ICRP72	0.02000	BETA	3.62888E+02	Calculated
810	Ag-107m	8.8540E+22	8.9760E-14	5.9729E-14	Calculated	0.02000	BETA	4.85997E+04	Calculated
811	Ag-108	2.6864E+22	1.9765E-12	1.3152E-12	Calculated	0.02000	BETA	1.19935E+04	Calculated
812	Ag-108m	2.9326E+14	2.3000E-09	3.7000E-08	ICRP72	0.70000	A2 VALUE	6.12871E+02	Calculated
814	Ag-109m	9.6305E+22	7.6678E-14	5.1024E-14	Calculated	0.02000	BETA	5.31672E+04	Calculated
815	Ag-110	1.5376E+23	6.5264E-13	4.3429E-13	Calculated	0.02000	BETA	6.56777E+03	Calculated
> 816	Ag-110m	1.7598E+17	2.8000E-09	1.2000E-08	ICRP72	0.53000	A2 VALUE	1.00000E+02	IAEA-G-1.7
> 817	Ag-111	5.8473E+18	1.3000E-09	1.7000E-09	ICRP72	0.60000	A2 VALUE	1.00000E+05	IAEA-G-1.7
818	Ag-111m	5.8083E+22	2.1923E-13	2.2952E-13	Calculated	0.02000	BETA	8.01345E+04	Calculated
819	Ag-112	3.2998E+20	4.3000E-10	1.7000E-10	ICRP72	0.02000	BETA	1.20111E+03	Calculated
820	Ag-113	1.9124E+20	3.9000E-10	2.5000E-10	NRPB-M	0.02000	BETA	6.75324E+03	Calculated
821	Ag-113m	5.3814E+22	1.5029E-12	9.7303E-13	Calculated	0.02000	BETA	7.34179E+03	Calculated
822	Ag-114	7.7969E+23	2.4314E-13	1.6179E-13	Calculated	0.02000	BETA	2.07711E+03	Calculated
823	Ag-114m	2.4430E+27	8.4119E-17	5.5975E-17	Calculated	0.02000	BETA	9.31932E+03	Calculated
824	Ag-115	2.9534E+21	6.0000E-11	2.9000E-11	ICRP72	0.02000	BETA	8.26315E+02	Calculated
825	Ag-115m	1.9530E+23	7.4204E-13	4.5263E-13	Calculated	0.02000	BETA	1.85393E+03	Calculated
826	Ag-116	2.2735E+22	1.2795E-11	8.5144E-12	Calculated	0.02000	BETA	4.41234E+02	Calculated
827	Ag-116m	3.4297E+23	7.4431E-13	4.9528E-13	Calculated	0.02000	BETA	6.69948E+02	Calculated
+ 828	Ag-117	4.9044E+22	4.3134E-12	2.6929E-12	Calculated	0.02000	BETA	8.17638E+02	Calculated
+ 829	Ag-117m	6.6862E+23	2.8077E-13	1.7741E-13	Calculated	0.02000	BETA	1.25809E+03	Calculated
+ 830	Ag-118	9.5677E+23	4.6082E-13	3.0664E-13	Calculated	0.02000	BETA	8.74493E+02	Calculated
+ 831	Ag-118m	1.7700E+24	2.8158E-13	1.8737E-13	Calculated	0.02000	BETA	6.15385E+02	Calculated
+ 832	Ag-119	1.6715E+24	3.4207E-13	2.0392E-13	Calculated	0.02000	BETA	6.60595E+02	Calculated
+ 833	Ag-119m	5.8462E+23	1.0296E-12	6.4181E-13	Calculated	0.02000	BETA	5.16849E+02	Calculated
+ 834	Ag-120	2.9751E+24	1.7178E-13	1.1431E-13	Calculated	0.02000	BETA	7.66295E+02	Calculated
+ 835	Ag-121	4.3151E+24	1.4276E-13	9.4412E-14	Calculated	0.02000	BETA	9.17431E+02	Calculated
+ 836	Ag-122	7.1326E+24	1.0119E-13	6.7335E-14	Calculated	0.02000	BETA	6.75676E+02	Calculated
837	Cd-102	1.2412E+22	1.0524E-10	1.0833E-10	Calculated	0.02000	BETA	1.25340E+03	Calculated
838	Cd-103	9.2604E+21	1.2282E-10	1.6276E-10	Calculated	0.02000	BETA	4.73037E+02	Calculated
839	Cd-104	1.1610E+21	5.4000E-11	3.5000E-11	ICRP72	0.02000	BETA	5.28312E+03	Calculated
840	Cd-105	1.1949E+21	4.7367E-10	6.3791E-10	Calculated	0.02000	BETA	7.80336E+02	Calculated
842	Cd-107	1.6635E+20	6.2000E-11	8.3000E-11	ICRP72	0.02000	BETA	4.57272E+04	Calculated
> 844	Cd-109	9.5988E+16	2.0000E-09	8.1000E-09	ICRP72	2.00000	A2 VALUE	1.00000E+03	IAEA-G-1.7
847	Cd-111m	1.2923E+21	1.1092E-10	1.4842E-10	Calculated	0.02000	BETA	3.30956E+03	Calculated
> 849	Cd-113	1.2597E+01	2.5000E-08	1.2000E-07	ICRP72	0.02000	BETA	1.00000E+03	IAEA-G-1.7
850	Cd-113m	8.5514E+15	2.3000E-08	1.1000E-07	ICRP72	0.50000	A2 VALUE	5.43747E+04	Calculated
> 852	Cd-115	1.8897E+19	1.4000E-09	1.1000E-09	ICRP72	0.25000	A2 VALUE	1.00000E+04	IAEA-G-1.7
> 853	Cd-115m	9.4273E+17	3.3000E-09	7.7000E-09	ICRP72	0.50000	A2 VALUE	1.00000E+05	IAEA-G-1.7
855	Cd-117	3.9832E+20	2.8000E-10	1.7000E-10	ICRP72	0.02000	BETA	8.83900E+02	Calculated
856	Cd-117m	2.9518E+20	2.8000E-10	2.1000E-10	ICRP72	0.02000	BETA	4.85666E+02	Calculated

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
857	Cd-118	1.1731E+21	6.6695E-10	8.9243E-10	Calculated	0.02000	BETA	4.05482E+04	Calculated
858	Cd-119	2.1750E+22	6.7562E-11	7.0093E-11	Calculated	0.02000	BETA	5.74059E+02	Calculated
859	Cd-119m	2.6594E+22	5.4742E-11	7.3000E-11	Calculated	0.02000	BETA	4.14546E+02	Calculated
860	Cd-120	6.8526E+22	1.6398E-11	2.1941E-11	Calculated	0.02000	BETA	1.48506E+04	Calculated
861	Cd-121	2.7618E+23	5.8424E-12	7.7368E-12	Calculated	0.02000	BETA	5.32155E+02	Calculated
862	Cd-121m	7.1922E+23	2.4700E-12	3.2766E-12	Calculated	0.02000	BETA	4.25018E+02	Calculated
863	Cd-122	5.9238E+23	2.7374E-12	3.6629E-12	Calculated	0.02000	BETA	1.22682E+03	Calculated
864	Cd-123	1.5436E+24	1.4985E-12	1.8878E-12	Calculated	0.02000	BETA	3.36010E+02	Calculated
+ 865	Cd-123m	1.8659E+24	1.2216E-12	1.5384E-12	Calculated	0.02000	BETA	4.01362E+02	Calculated
866	Cd-124	3.3686E+24	6.7135E-13	8.9831E-13	Calculated	0.02000	BETA	3.08150E+03	Calculated
867	Cd-125	4.7736E+24	5.5747E-13	7.4184E-13	Calculated	0.02000	BETA	3.04757E+02	Calculated
868	In-106	1.0594E+22	3.5292E-11	2.6116E-11	Calculated	0.02000	BETA	2.73823E+02	Calculated
869	In-106m	1.2632E+22	2.9732E-11	2.2001E-11	Calculated	0.02000	BETA	3.22061E+02	Calculated
870	In-107	2.0084E+21	7.7291E-11	5.7196E-11	Calculated	0.02000	BETA	6.43915E+02	Calculated
871	In-107m	7.7469E+22	2.7276E-12	2.0184E-12	Calculated	0.02000	BETA	1.55152E+03	Calculated
872	In-108	1.1116E+21	2.5034E-10	1.8525E-10	Calculated	0.02000	BETA	3.08005E+02	Calculated
873	In-108m	1.6253E+21	1.7484E-10	1.2938E-10	Calculated	0.02000	BETA	3.53245E+02	Calculated
874	In-109	2.5383E+20	6.6000E-11	4.2000E-11	ICRP72	0.02000	BETA	1.47984E+03	Calculated
875	In-109m	4.7910E+22	1.4463E-12	1.0340E-12	Calculated	0.02000	BETA	1.62866E+03	Calculated
876	In-109n	1.8252E+25	1.0301E-14	7.5277E-15	Calculated	0.02000	BETA	4.73934E+02	Calculated
877	In-110	2.1579E+20	2.4000E-10	1.3000E-10	ICRP72	0.02000	BETA	3.22479E+02	Calculated
878	In-110m	9.1517E+20	1.0000E-10	4.7000E-11	ICRP72	0.02000	BETA	6.16143E+02	Calculated
> 879	In-111	1.5532E+19	2.9000E-10	2.3000E-10	ICRP72	3.00000	A2 VALUE	1.00000E+04	IAEA-G-1.7
880	In-111m	7.9405E+21	5.9622E-12	4.4421E-12	Calculated	0.02000	BETA	2.09899E+03	Calculated
881	In-112	4.2292E+21	1.0000E-11	7.4000E-12	ICRP72	0.02000	BETA	3.17754E+03	Calculated
882	In-112m	3.0033E+21	1.8205E-11	1.3472E-11	Calculated	0.02000	BETA	2.13746E+04	Calculated
> 884	In-113m	6.1941E+20	2.8000E-11	2.0000E-11	ICRP72	2.00000	A2 VALUE	1.00000E+05	IAEA-G-1.7
885	In-114	5.0969E+22	1.1779E-12	8.7163E-13	Calculated	0.02000	BETA	1.23012E+04	Calculated
> 886	In-114m	8.4830E+17	4.1000E-09	9.3000E-09	ICRP72	0.50000	A2 VALUE	1.00000E+04	IAEA-G-1.7
> 887	In-115	2.6103E+02	3.2000E-08	3.9000E-07	ICRP72	0.02000	BETA	1.00000E+03	IAEA-G-1.7
> 888	In-115m	2.2495E+20	8.6000E-10	5.9000E-11	ICRP72	1.00000	A2 VALUE	1.00000E+05	IAEA-G-1.7
889	In-116	2.5362E+23	4.0953E-13	3.0306E-13	Calculated	0.02000	BETA	7.09572E+03	Calculated
890	In-116m	1.0993E+21	6.4000E-11	4.5000E-11	ICRP72	0.02000	BETA	3.96504E+02	Calculated
891	In-116n	1.6596E+24	4.9851E-14	3.5326E-14	Calculated	0.02000	BETA	1.28895E+04	Calculated
892	In-117	1.3587E+21	3.1000E-11	2.9000E-11	ICRP72	0.02000	BETA	1.39198E+03	Calculated
893	In-117m	5.1082E+20	1.2000E-10	7.2000E-11	ICRP72	0.02000	BETA	7.44823E+03	Calculated
894	In-118	7.0806E+23	2.1751E-13	1.6096E-13	Calculated	0.02000	BETA	1.93114E+03	Calculated
895	In-118m	1.3260E+22	1.8602E-11	1.3766E-11	Calculated	0.02000	BETA	3.59925E+02	Calculated
896	In-118n	4.1651E+23	6.1676E-13	4.5640E-13	Calculated	0.02000	BETA	1.16014E+04	Calculated
897	In-119	2.4379E+22	4.2012E-12	3.1089E-12	Calculated	0.02000	BETA	1.20849E+03	Calculated
898	In-119m	3.2505E+21	4.7000E-11	1.7000E-11	ICRP72	0.02000	BETA	8.62679E+03	Calculated
899	In-120	1.1303E+24	1.7630E-13	1.3046E-13	Calculated	0.02000	BETA	1.75877E+03	Calculated
900	In-120m	7.8405E+22	3.6760E-12	2.7202E-12	Calculated	0.02000	BETA	3.25762E+02	Calculated
901	In-120n	7.5350E+22	4.0504E-12	2.9973E-12	Calculated	0.02000	BETA	3.36700E+02	Calculated
902	In-121	1.4945E+23	9.7357E-13	7.0372E-13	Calculated	0.02000	BETA	9.72930E+02	Calculated
903	In-121m	1.4830E+22	8.3894E-12	6.0169E-12	Calculated	0.02000	BETA	4.52761E+03	Calculated
904	In-122	2.2827E+24	1.0069E-13	7.4513E-14	Calculated	0.02000	BETA	1.11982E+03	Calculated
905	In-122m	3.4240E+23	9.6606E-13	7.1488E-13	Calculated	0.02000	BETA	3.13914E+02	Calculated
906	In-122n	3.1704E+23	1.0749E-12	7.9544E-13	Calculated	0.02000	BETA	2.83286E+02	Calculated
907	In-123	5.6887E+23	3.8604E-13	2.4717E-13	Calculated	0.02000	BETA	8.05448E+02	Calculated
908	In-123m	7.1049E+22	2.7316E-12	1.7018E-12	Calculated	0.02000	BETA	3.74344E+03	Calculated
909	In-124	1.0527E+24	3.2681E-13	2.4184E-13	Calculated	0.02000	BETA	3.43575E+02	Calculated
910	In-124m	1.4036E+24	2.7895E-13	2.0642E-13	Calculated	0.02000	BETA	2.51545E+02	Calculated
911	In-125	1.4342E+24	1.6370E-13	1.1855E-13	Calculated	0.02000	BETA	6.77669E+02	Calculated
912	In-125m	2.7391E+23	9.6414E-13	7.1598E-13	Calculated	0.02000	BETA	2.43891E+03	Calculated
913	In-126	2.2100E+24	1.6661E-13	1.2329E-13	Calculated	0.02000	BETA	3.27310E+02	Calculated
914	In-126m	2.2863E+24	1.9025E-13	1.4078E-13	Calculated	0.02000	BETA	2.22097E+02	Calculated
+ 915	In-127	2.8599E+24	1.3848E-13	1.0508E-13	Calculated	0.02000	BETA	5.03233E+02	Calculated
+ 916	In-127m	8.8890E+23	5.3824E-13	3.8585E-13	Calculated	0.02000	BETA	1.28966E+03	Calculated
+ 917	In-128	3.6257E+24	1.4298E-13	8.8712E-14	Calculated	0.02000	BETA	2.98511E+02	Calculated
+ 918	Sn-107	2.2438E+22	2.3519E-11	5.4217E-11	Calculated	0.02000	BETA	5.34766E+02	Calculated
919	Sn-108	6.2592E+21	6.4832E-11	1.4945E-10	Calculated	0.02000	BETA	1.48017E+03	Calculated
920	Sn-109	3.5488E+21	7.2372E-11	1.6499E-10	Calculated	0.02000	BETA	4.32713E+02	Calculated
921	Sn-110	2.5731E+20	3.5000E-10	1.6000E-10	ICRP72	0.02000	BETA	3.42641E+03	Calculated
922	Sn-111	1.7770E+21	2.3000E-11	1.3000E-11	ICRP72	0.02000	BETA	1.91808E+03	Calculated
> 924	Sn-113	3.7180E+17	7.3000E-10	2.7000E-09	ICRP72	2.00000	A2 VALUE	1.00000E+03	IAEA-G-1.7
925	Sn-113m	2.9483E+21	2.4303E-12	5.7194E-12	Calculated	0.02000	BETA	4.91623E+04	Calculated
930	Sn-117m	3.0388E+18	7.1000E-10	2.4000E-09	ICRP72	0.40000	A2 VALUE	5.80832E+03	Calculated
933	Sn-119m	1.3868E+17	3.4000E-10	2.2000E-09	ICRP72	30.00000	A2 VALUE	5.21186E+04	Calculated
935	Sn-121	3.5652E+19	2.3000E-10	2.3000E-10	ICRP72	0.02000	BETA	8.68176E+04	Calculated
936	Sn-121m	1.9891E+15	3.8000E-10	4.5000E-09	ICRP72	0.90000	A2 VALUE	1.15899E+05	Calculated
938	Sn-123	3.0425E+17	2.1000E-09	8.1000E-09	ICRP72	0.60000	A2 VALUE	1.66708E+04	Calculated
939	Sn-123m	1.4116E+21	3.8000E-11	2.7000E-11	ICRP72	0.02000	BETA	5.29812E+03	Calculated
> 941	Sn-125	4.0123E+18	3.1000E-09	3.1000E-09	ICRP72	0.40000	A2 VALUE	1.00000E+04	IAEA-G-1.7

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
942	Sn-125m	5.8506E+21	1.6743E-11	3.9042E-11	Calculated	0.02000	BETA	2.34352E+03	Calculated
943	Sn-126	4.3411E+11	4.7000E-09	2.8000E-08	ICRP72	0.40000	A2 VALUE	1.48954E+04	Calculated
944	Sn-127	4.3507E+20	2.0000E-10	1.3000E-10	ICRP72	0.02000	BETA	5.24592E+02	Calculated
945	Sn-127m	1.3273E+22	1.1658E-11	3.1354E-11	Calculated	0.02000	BETA	1.49593E+03	Calculated
946	Sn-128	9.2030E+20	1.5000E-10	9.2000E-11	ICRP72	0.02000	BETA	1.60100E+03	Calculated
947	Sn-128m	5.0206E+23	6.2283E-13	9.7057E-13	Calculated	0.02000	BETA	4.95197E+02	Calculated
948	Sn-129	2.2486E+22	1.6774E-11	4.0351E-11	Calculated	0.02000	BETA	3.92619E+02	Calculated
949	Sn-129m	7.8213E+21	4.7015E-11	1.1322E-10	Calculated	0.02000	BETA	4.01919E+02	Calculated
950	Sn-130	1.4395E+22	2.5542E-11	5.8881E-11	Calculated	0.02000	BETA	4.13223E+03	Calculated
951	Sn-130m	3.1501E+22	1.2522E-11	3.0262E-11	Calculated	0.02000	BETA	4.17014E+02	Calculated
952	Sn-131	8.1755E+22	7.0183E-12	1.4818E-11	Calculated	0.02000	BETA	4.08497E+02	Calculated
953	Sn-131m	5.2099E+22	1.1404E-11	2.4152E-11	Calculated	0.02000	BETA	3.99872E+02	Calculated
954	Sb-112	7.2566E+22	4.4995E-12	2.3462E-12	Calculated	0.02000	BETA	3.33845E+02	Calculated
955	Sb-113	9.2425E+21	1.5486E-11	8.0816E-12	Calculated	0.02000	BETA	7.33676E+02	Calculated
956	Sb-114	1.7500E+22	1.5766E-11	8.2207E-12	Calculated	0.02000	BETA	3.50275E+02	Calculated
957	Sb-115	1.8862E+21	2.4000E-11	1.4000E-11	ICRP72	0.02000	BETA	1.09999E+03	Calculated
958	Sb-116	3.7909E+21	2.6000E-11	1.3000E-11	ICRP72	0.02000	BETA	4.39174E+02	Calculated
959	Sb-116m	9.9485E+20	6.7000E-11	4.9000E-11	ICRP72	0.02000	BETA	3.09741E+02	Calculated
960	Sb-117	3.5423E+20	1.8000E-11	1.7000E-11	ICRP72	0.02000	BETA	5.32453E+03	Calculated
961	Sb-118	1.6390E+22	6.9284E-12	3.6126E-12	Calculated	0.02000	BETA	1.12322E+03	Calculated
962	Sb-118m	1.9668E+20	2.1000E-10	1.2000E-10	ICRP72	0.02000	BETA	3.87132E+02	Calculated
963	Sb-119	2.5461E+19	8.0000E-11	3.6000E-11	ICRP72	0.02000	BETA	3.84387E+04	Calculated
964	Sb-120	3.6491E+21	1.4000E-11	7.3000E-12	ICRP72	0.02000	BETA	2.03788E+03	Calculated
965	Sb-120m	6.9952E+18	1.2000E-09	1.1000E-09	ICRP72	0.02000	BETA	4.05389E+02	Calculated
> 967	Sb-122	1.4701E+19	1.7000E-09	1.1000E-09	ICRP72	0.40000	A2 VALUE	1.00000E+04	IAEA-G-1.7
968	Sb-122m	1.3620E+22	2.6219E-12	1.5977E-12	Calculated	0.02000	BETA	1.25264E+04	Calculated
> 970	Sb-124	6.4727E+17	2.5000E-09	8.6000E-09	ICRP72	0.60000	A2 VALUE	1.00000E+03	IAEA-G-1.7
971	Sb-124m	3.6224E+22	1.0153E-12	6.2719E-13	Calculated	0.02000	BETA	2.22743E+03	Calculated
972	Sb-124n	2.7796E+21	8.0000E-12	5.9000E-12	ICRP72	0.02000	BETA	3.43036E+05	Calculated
> 973	Sb-125	3.8384E+16	1.1000E-09	1.2000E-08	ICRP72	1.00000	A2 VALUE	1.00000E+02	IAEA-G-1.7
974	Sb-126	3.0920E+18	2.4000E-09	3.2000E-09	ICRP72	0.40000	A2 VALUE	3.58965E+02	Calculated
975	Sb-126m	2.8929E+21	3.6000E-11	2.0000E-11	ICRP72	0.02000	BETA	6.10330E+02	Calculated
976	Sb-126n	3.0139E+23	3.5035E-13	1.9448E-13	Calculated	0.02000	BETA	3.81376E+05	Calculated
977	Sb-127	9.9139E+18	1.7000E-09	1.9000E-09	ICRP72	0.02000	BETA	1.44959E+03	Calculated
978	Sb-128	1.0061E+20	7.6000E-10	4.2000E-10	ICRP72	0.02000	BETA	3.19063E+02	Calculated
979	Sb-128m	5.2299E+21	3.3000E-11	1.5000E-11	ICRP72	0.02000	BETA	4.78076E+02	Calculated
980	Sb-129	2.0630E+20	4.2000E-10	2.5000E-10	ICRP72	0.02000	BETA	7.06428E+02	Calculated
981	Sb-129m	3.0491E+21	5.5293E-11	2.9144E-11	Calculated	0.02000	BETA	6.33767E+02	Calculated
982	Sb-130	1.3388E+21	9.1000E-11	5.3000E-11	ICRP72	0.02000	BETA	3.00026E+02	Calculated
983	Sb-130m	8.5003E+21	2.5233E-11	1.3157E-11	Calculated	0.02000	BETA	3.86038E+02	Calculated
984	Sb-131	2.3106E+21	1.0000E-10	4.4000E-11	ICRP72	0.02000	BETA	5.62430E+02	Calculated
985	Sb-132	1.2557E+22	1.9796E-11	9.5666E-12	Calculated	0.02000	BETA	4.00453E+02	Calculated
986	Sb-132m	1.8836E+22	1.3469E-11	6.5190E-12	Calculated	0.02000	BETA	3.76762E+02	Calculated
+ 987	Sb-133	2.1191E+22	1.5776E-11	4.7484E-12	Calculated	0.02000	BETA	4.08664E+02	Calculated
+ 988	Te-113	3.6243E+22	2.0166E-11	4.2734E-11	Calculated	0.02000	BETA	4.04953E+02	Calculated
989	Te-114	4.0268E+21	1.8222E-10	3.8603E-10	Calculated	0.02000	BETA	9.34006E+02	Calculated
990	Te-115	1.0438E+22	3.8891E-11	8.4332E-11	Calculated	0.02000	BETA	4.70345E+02	Calculated
991	Te-115m	9.0362E+21	4.9881E-11	1.0792E-10	Calculated	0.02000	BETA	3.93654E+02	Calculated
992	Te-116	4.0193E+20	1.7000E-10	1.1000E-10	ICRP72	0.02000	BETA	1.14155E+04	Calculated
993	Te-117	9.5982E+20	4.6000E-11	7.4000E-11	NRPB-M	0.02000	BETA	6.41108E+02	Calculated
994	Te-117m	3.4665E+25	2.3033E-15	4.2303E-15	Calculated	0.02000	BETA	3.74097E+03	Calculated
995	Te-118	6.8293E+18	2.7000E-09	2.2000E-09	NRPB-M	0.02000	BETA	4.90292E+04	Calculated
996	Te-119	6.0757E+19	1.7000E-10	1.7000E-10	NRPB-M	0.02000	BETA	1.29485E+03	Calculated
997	Te-119m	8.6679E+18	8.3000E-10	6.3000E-10	R245	0.02000	BETA	6.58931E+02	Calculated
999	Te-121	2.0856E+18	4.3000E-10	4.1000E-10	ICRP72	2.00000	A2 VALUE	1.72876E+03	Calculated
1000	Te-121m	2.5948E+17	2.3000E-09	5.7000E-09	ICRP72	3.00000	A2 VALUE	4.44529E+03	Calculated
>1002	Te-123	1.0770E+04	4.4000E-09	3.9000E-09	ICRP72	0.02000	BETA	1.00000E+03	IAEA-G-1.7
>1003	Te-123m	3.2840E+17	1.4000E-09	5.1000E-09	ICRP72	1.00000	A2 VALUE	1.00000E+03	IAEA-G-1.7
>1006	Te-125m	6.6690E+17	8.7000E-10	4.2000E-09	ICRP72	0.90000	A2 VALUE	1.00000E+06	IAEA-G-1.7
>1008	Te-127	9.7720E+19	1.7000E-10	1.4000E-10	ICRP72	0.70000	A2 VALUE	1.00000E+06	IAEA-G-1.7
>1009	Te-127m	3.4927E+17	2.3000E-09	9.8000E-09	ICRP72	0.39000	A2 VALUE	1.00000E+04	IAEA-G-1.7
>1011	Te-129	7.7543E+20	6.3000E-11	3.9000E-11	ICRP72	0.60000	A2 VALUE	1.00000E+05	IAEA-G-1.7
>1012	Te-129m	1.1088E+18	3.0000E-09	7.9000E-09	ICRP72	0.32000	A2 VALUE	1.00000E+04	IAEA-G-1.7
>1014	Te-131	2.1258E+21	8.7000E-11	2.8000E-11	ICRP72	0.02000	BETA	1.00000E+05	IAEA-G-1.7
>1015	Te-131m	2.9525E+19	1.9000E-09	9.4000E-10	ICRP72	0.50000	A2 VALUE	1.00000E+04	IAEA-G-1.7
>1016	Te-132	1.1339E+19	3.8000E-09	2.0000E-09	ICRP72	0.40000	A2 VALUE	1.00000E+03	IAEA-G-1.7
>1017	Te-133	4.1875E+21	7.2000E-11	2.0000E-11	ICRP72	0.02000	BETA	1.00000E+04	IAEA-G-1.7
>1018	Te-133m	9.4483E+20	2.8000E-10	8.7000E-11	ICRP72	0.02000	BETA	1.00000E+04	IAEA-G-1.7
>1019	Te-134	1.2419E+21	1.1000E-10	6.8000E-11	ICRP72	0.02000	BETA	1.00000E+04	IAEA-G-1.7
1020	Te-135	1.6284E+23	1.8428E-12	3.9547E-12	Calculated	0.02000	BETA	1.40056E+03	Calculated
+1021	I-116	1.2375E+24	1.8574E-11	2.5384E-12	Calculated	0.02000	BETA	7.36811E+02	Calculated
+1022	I-117	2.5872E+22	3.7329E-10	5.3187E-11	Calculated	0.02000	BETA	9.43396E+02	Calculated
1023	I-118	4.3172E+21	4.3194E-09	6.2825E-10	Calculated	0.02000	BETA	4.61467E+02	Calculated
1024	I-118m	6.9414E+21	3.0870E-09	4.5047E-10	Calculated	0.02000	BETA	2.74952E+02	Calculated

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
1025	I-119	3.0632E+21	2.2840E-09	3.2984E-10	Calculated	0.02000	BETA	1.09890E+03	Calculated
1026	I-120	7.1628E+20	3.4000E-10	1.0000E-10	ICRP72	0.02000	BETA	3.53357E+02	Calculated
1027	I-120m	1.0947E+21	2.1000E-10	8.8000E-11	ICRP72	0.02000	BETA	1.92311E+02	Calculated
1028	I-121	4.5248E+20	8.2000E-11	2.7000E-11	ICRP72	0.02000	BETA	2.28050E+03	Calculated
1029	I-122	1.5707E+22	6.2209E-10	9.2765E-11	Calculated	0.02000	BETA	9.32836E+02	Calculated
>1030	I-123	7.1501E+19	2.1000E-10	7.4000E-11	ICRP72	3.00000	A2 VALUE	1.00000E+05	IAEA-G-1.7
1031	I-124	9.3268E+18	1.3000E-08	4.4000E-09	ICRP72	1.00000	A2 VALUE	9.05305E+02	Calculated
>1032	I-125	6.5084E+17	1.5000E-08	5.1000E-09	ICRP72	3.00000	A2 VALUE	1.00000E+05	IAEA-G-1.7
>1033	I-126	2.9563E+18	2.9000E-08	9.8000E-09	ICRP72	1.00000	A2 VALUE	1.00000E+04	IAEA-G-1.7
1035	I-128	2.1765E+21	4.6000E-11	2.0000E-11	ICRP72	0.02000	BETA	6.18092E+03	Calculated
>1036	I-129	6.5404E+09	1.1000E-07	3.6000E-08	ICRP72	-1.00000	A2 VALUE	1.00000E+01	IAEA-G-1.7
>1037	I-130	7.2215E+19	2.0000E-09	6.7000E-10	ICRP72	0.02000	BETA	1.00000E+04	IAEA-G-1.7
1038	I-130m	5.9505E+21	2.5033E-10	4.1087E-11	Calculated	0.02000	BETA	7.24359E+03	Calculated
>1039	I-131	4.5903E+18	2.2000E-08	7.4000E-09	ICRP72	0.70000	A2 VALUE	1.00000E+04	IAEA-G-1.7
>1040	I-132	3.8503E+20	2.9000E-10	1.1000E-10	ICRP72	0.40000	A2 VALUE	1.00000E+04	IAEA-G-1.7
1041	I-132m	6.3544E+20	2.2000E-10	8.7000E-11	ICRP72	0.02000	BETA	2.76936E+03	Calculated
>1042	I-133	4.1943E+19	4.3000E-09	1.5000E-09	ICRP72	0.60000	A2 VALUE	1.00000E+04	IAEA-G-1.7
1043	I-133m	3.4897E+23	2.0749E-11	3.1973E-12	Calculated	0.02000	BETA	6.29997E+02	Calculated
>1044	I-134	9.8771E+20	1.1000E-10	5.5000E-11	ICRP72	0.30000	A2 VALUE	1.00000E+04	IAEA-G-1.7
1045	I-134m	1.4041E+22	1.2038E-10	2.0611E-11	Calculated	0.02000	BETA	3.98556E+03	Calculated
>1046	I-135	1.3003E+20	9.3000E-10	3.2000E-10	ICRP72	0.60000	A2 VALUE	1.00000E+04	IAEA-G-1.7
1047	I-136	3.6562E+22	5.0394E-10	7.5148E-11	Calculated	0.02000	BETA	3.86100E+02	Calculated
1048	I-136m	6.8249E+22	2.9266E-10	4.3642E-11	Calculated	0.02000	BETA	3.66166E+02	Calculated
+1049	I-137	1.2444E+23	4.0156E-11	5.9881E-12	Calculated	0.02000	BETA	6.97837E+02	Calculated
+1050	Xe-117	5.8527E+22	3.6360E-12	4.8508E-12	Calculated	0.02000	BETA	3.37507E+03	Calculated
+1051	Xe-118	9.8333E+21	5.1586E-11	7.0341E-11	Calculated	0.02000	BETA	1.47783E+03	Calculated
+1052	Xe-119	1.0087E+22	4.0368E-11	5.5433E-11	Calculated	0.02000	BETA	6.77354E+02	Calculated
1053	Xe-120	1.4504E+21	3.2993E-11	5.0092E-11	Calculated	0.02000	BETA	2.30256E+03	Calculated
1054	Xe-121	1.4349E+21	1.3969E-10	1.9464E-10	Calculated	0.02000	BETA	5.88156E+02	Calculated
1055	Xe-122	4.7294E+19	4.2200E-09	5.8732E-09	Calculated	0.40000	A2 VALUE	6.69308E+03	Calculated
1056	Xe-123	4.5343E+20	1.6301E-10	2.2737E-10	Calculated	0.70000	A2 VALUE	1.51837E+03	Calculated
1058	Xe-125	5.4929E+19	4.8998E-10	6.8655E-10	Calculated	0.02000	BETA	3.64994E+03	Calculated
1059	Xe-125m	5.9677E+22	8.2204E-13	1.1468E-12	Calculated	0.02000	BETA	7.71023E+03	Calculated
1061	Xe-127	1.0447E+18	3.2261E-09	3.5903E-08	Calculated	2.00000	A2 VALUE	3.52223E+03	Calculated
1062	Xe-127m	4.7259E+22	6.1425E-13	1.5470E-12	Calculated	0.02000	BETA	5.51418E+03	Calculated
1065	Xe-129m	4.2254E+18	1.9989E-09	6.5828E-09	Calculated	0.02000	BETA	1.42614E+04	Calculated
1068	Xe-131m	3.1092E+18	1.4795E-09	6.1183E-09	Calculated	40.00000	A2 VALUE	2.82008E+04	Calculated
1070	Xe-133	6.9333E+18	1.3051E-09	3.0000E-09	Calculated	10.00000	A2 VALUE	1.67353E+04	Calculated
1071	Xe-133m	1.6599E+19	1.5173E-09	2.8598E-09	Calculated	0.02000	BETA	1.66588E+04	Calculated
1073	Xe-134m	1.0749E+25	1.4959E-14	2.0756E-14	Calculated	0.02000	BETA	5.25223E+02	Calculated
1074	Xe-135	9.4553E+19	4.8538E-10	6.7346E-10	Calculated	2.00000	A2 VALUE	3.56832E+03	Calculated
1075	Xe-135m	3.2952E+21	2.6907E-11	3.7333E-11	Calculated	0.02000	BETA	2.26626E+03	Calculated
1077	Xe-137	1.3308E+22	1.0497E-11	1.4598E-11	Calculated	0.02000	BETA	2.59067E+03	Calculated
1078	Xe-138	3.5600E+21	1.0164E-10	1.3546E-10	Calculated	0.02000	BETA	8.38392E+02	Calculated
1079	Xe-139	7.5726E+22	5.8352E-12	8.0182E-12	Calculated	0.02000	BETA	9.09091E+02	Calculated
1080	Cs-122	1.6304E+23	2.2245E-12	1.1135E-12	Calculated	0.02000	BETA	6.65451E+02	Calculated
1081	Cs-122m	1.2681E+22	3.1745E-11	1.5888E-11	Calculated	0.02000	BETA	3.05335E+02	Calculated
1082	Cs-122n	9.5107E+24	3.8180E-14	1.9111E-14	Calculated	0.02000	BETA	2.70270E+05	Calculated
1083	Cs-123	9.6480E+21	1.6355E-11	8.1909E-12	Calculated	0.02000	BETA	9.93049E+02	Calculated
1084	Cs-123m	2.1226E+24	7.8734E-14	3.9428E-14	Calculated	0.02000	BETA	6.28931E+03	Calculated
1085	Cs-124	1.0937E+23	1.6910E-12	8.4550E-13	Calculated	0.02000	BETA	6.97350E+02	Calculated
1086	Cs-124m	5.3471E+23	3.9027E-13	1.9513E-13	Calculated	0.02000	BETA	3.18066E+03	Calculated
1087	Cs-125	1.2377E+21	3.5000E-11	2.3000E-11	ICRP72	0.02000	BETA	1.29366E+03	Calculated
1088	Cs-126	3.3692E+22	4.2217E-12	2.1109E-12	Calculated	0.02000	BETA	7.81861E+02	Calculated
1089	Cs-127	1.4619E+20	2.4000E-11	3.8000E-11	ICRP72	0.02000	BETA	2.48694E+03	Calculated
1090	Cs-128	1.5025E+22	6.5962E-12	3.2981E-12	Calculated	0.02000	BETA	1.02459E+03	Calculated
>1091	Cs-129	2.7935E+19	6.0000E-11	7.7000E-11	ICRP72	4.00000	A2 VALUE	1.00000E+04	IAEA-G-1.7
1092	Cs-130	1.7911E+21	2.8000E-11	1.4000E-11	ICRP72	0.02000	BETA	1.82017E+03	Calculated
+1093	Cs-130m	1.5467E+22	9.5392E-16	4.7696E-16	Calculated	0.02000	BETA	6.06676E+03	Calculated
>1094	Cs-131	3.8087E+18	5.8000E-11	4.7000E-11	ICRP72	30.00000	A2 VALUE	1.00000E+06	IAEA-G-1.7
>1095	Cs-132	5.6090E+18	5.0000E-10	3.0000E-10	ICRP72	1.00000	A2 VALUE	1.00000E+04	IAEA-G-1.7
>1097	Cs-134	4.7833E+16	1.9000E-08	2.0000E-08	ICRP72	0.70000	A2 VALUE	1.00000E+02	IAEA-G-1.7
>1098	Cs-134m	2.9777E+20	2.0000E-11	6.0000E-11	ICRP72	0.60000	A2 VALUE	1.00000E+06	IAEA-G-1.7
>1099	Cs-135	4.0854E+10	2.0000E-09	8.6000E-09	ICRP72	1.00000	A2 VALUE	1.00000E+05	IAEA-G-1.7
1100	Cs-135m	9.7301E+20	1.9000E-11	1.6000E-11	ICRP72	0.02000	BETA	6.24909E+02	Calculated
>1101	Cs-136	2.7282E+18	3.0000E-09	2.8000E-09	ICRP72	0.50000	A2 VALUE	1.00000E+03	IAEA-G-1.7
1102	Cs-136m	1.6165E+23	4.2989E-13	2.2592E-13	Calculated	0.02000	BETA	1.47420E+03	Calculated
>1103	Cs-137	3.2022E+15	1.3000E-08	3.9000E-08	ICRP72	0.60000	A2 VALUE	1.00000E+02	IAEA-G-1.7
>1104	Cs-138	1.5666E+21	9.2000E-11	4.3000E-11	ICRP72	0.02000	BETA	1.00000E+04	IAEA-G-1.7
1105	Cs-138m	1.7395E+22	8.9525E-12	4.2574E-12	Calculated	0.02000	BETA	2.20946E+03	Calculated
1106	Cs-139	5.4045E+21	2.7675E-11	1.3578E-11	Calculated	0.02000	BETA	2.15983E+03	Calculated
1107	Cs-140	4.6835E+22	3.8961E-12	2.1149E-12	Calculated	0.02000	BETA	5.63063E+02	Calculated
+1108	Cs-141	1.1877E+23	4.5741E-12	2.2500E-12	Calculated	0.02000	BETA	7.70416E+02	Calculated
+1109	Ba-123	2.0962E+22	2.0269E-11	1.0581E-11	Calculated	0.02000	BETA	1.77201E+03	Calculated



ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
1110	Ba-124	4.7445E+21	7.9170E-11	4.1292E-11	Calculated	0.02000	BETA	2.42777E+03	Calculated
1111	Ba-125	1.5913E+22	1.3891E-11	7.9043E-12	Calculated	0.02000	BETA	2.13372E+03	Calculated
1112	Ba-126	5.5253E+20	2.6000E-10	1.1000E-10	ICRP72	0.02000	BETA	1.76389E+03	Calculated
1113	Ba-127	4.3164E+21	2.6700E-11	1.5283E-11	Calculated	0.02000	BETA	1.28041E+03	Calculated
>1114	Ba-127m	1.7299E+24	7.0466E-14	4.0136E-14	Calculated	0.02000	BETA	1.24486E+04	Calculated
1115	Ba-128	1.5540E+19	2.7000E-09	1.4000E-09	ICRP72	0.02000	BETA	1.49923E+04	Calculated
1116	Ba-129	3.7793E+20	1.3630E-10	7.6445E-11	Calculated	0.02000	BETA	2.08681E+03	Calculated
1117	Ba-129m	4.2032E+20	2.5673E-10	1.3871E-10	Calculated	0.02000	BETA	8.23472E+02	Calculated
>1119	Ba-131	3.1954E+18	4.5000E-10	8.7000E-10	ICRP72	2.00000	A2 VALUE	1.00000E+04	IAEA-G-1.7
1120	Ba-131m	3.6401E+21	4.9000E-12	7.8000E-12	ICRP72	0.02000	BETA	1.13435E+04	Calculated
1122	Ba-133	9.4125E+15	1.5000E-09	1.0000E-08	ICRP72	3.00000	A2 VALUE	2.45097E+03	Calculated
1123	Ba-133m	2.2838E+19	5.4000E-10	4.6000E-10	ICRP72	0.60000	A2 VALUE	1.12270E+04	Calculated
1126	Ba-135m	2.9948E+19	4.3000E-10	3.6000E-10	ICRP72	0.02000	BETA	1.26638E+04	Calculated
1128	Ba-136m	9.9593E+24	1.5971E-14	8.3299E-15	Calculated	0.02000	BETA	5.17012E+02	Calculated
1130	Ba-137m	1.9904E+22	2.5846E-12	1.3480E-12	Calculated	0.02000	BETA	1.65315E+03	Calculated
1132	Ba-139	6.0293E+20	1.2000E-10	5.9000E-11	ICRP72	0.02000	BETA	7.36377E+03	Calculated
>1133	Ba-140	2.7104E+18	2.6000E-09	5.8000E-09	ICRP72	0.24000	A2 VALUE	1.00000E+03	IAEA-G-1.7
1134	Ba-141	2.7023E+21	7.0000E-11	3.4000E-11	ICRP72	0.02000	BETA	9.48187E+02	Calculated
1135	Ba-142	4.6247E+21	3.5000E-11	2.2000E-11	ICRP72	0.02000	BETA	1.23916E+03	Calculated
1136	Ba-143	2.0142E+23	2.9179E-12	1.3745E-12	Calculated	0.02000	BETA	1.01010E+03	Calculated
1137	La-128	1.0878E+22	1.9111E-11	8.2452E-12	Calculated	0.02000	BETA	3.20410E+02	Calculated
1138	La-129	4.6523E+21	1.8983E-11	8.3546E-12	Calculated	0.02000	BETA	9.27644E+02	Calculated
1139	La-129m	5.7822E+24	1.6287E-14	7.1593E-15	Calculated	0.02000	BETA	1.68067E+04	Calculated
1140	La-130	6.1554E+21	3.6723E-11	1.5852E-11	Calculated	0.02000	BETA	2.65252E+02	Calculated
1141	La-131	9.0074E+20	3.5000E-11	2.3000E-11	ICRP72	0.02000	BETA	1.44781E+03	Calculated
1142	La-132	1.8292E+20	3.9000E-10	1.6000E-10	ICRP72	0.02000	BETA	4.91642E+02	Calculated
1143	La-132m	2.1704E+21	3.3103E-11	1.3755E-11	Calculated	0.02000	BETA	2.03666E+03	Calculated
1144	La-133	2.2306E+20	9.9000E-12	1.1000E-11	NRPB-M	0.02000	BETA	6.48929E+03	Calculated
1145	La-134	8.0548E+21	6.4727E-12	2.7941E-12	Calculated	0.02000	BETA	1.26295E+03	Calculated
1146	La-135	4.4076E+19	3.0000E-11	1.4000E-11	ICRP72	0.02000	BETA	2.76152E+04	Calculated
1147	La-136	5.1864E+21	6.7868E-12	2.9297E-12	Calculated	0.02000	BETA	2.12766E+03	Calculated
1148	La-136m	2.6942E+25	1.5548E-15	6.7118E-16	Calculated	0.02000	BETA	6.48508E+03	Calculated
1149	La-137	1.6103E+12	8.1000E-11	8.7000E-09	ICRP72	6.00000	A2 VALUE	3.81018E+04	Calculated
>1150	La-138	9.1346E+05	1.1000E-09	1.5000E-07	ICRP72	0.02000	BETA	1.00000E+03	IAEA-G-1.7
>1152	La-140	2.0572E+19	2.0000E-09	1.1000E-09	ICRP72	0.40000	A2 VALUE	1.00000E+03	IAEA-G-1.7
1153	La-141	2.0938E+20	3.6000E-10	1.5000E-10	ICRP72	0.02000	BETA	7.12754E+03	Calculated
1154	La-142	5.3773E+20	1.8000E-10	8.9000E-11	ICRP72	0.02000	BETA	4.07432E+02	Calculated
1155	La-143	3.4443E+21	5.6000E-11	2.1000E-11	ICRP72	0.02000	BETA	3.92157E+03	Calculated
1156	La-144	7.1088E+22	1.6818E-12	7.3434E-13	Calculated	0.02000	BETA	4.20521E+02	Calculated
+1157	La-145	1.1902E+23	1.2068E-12	4.8106E-13	Calculated	0.02000	BETA	6.38978E+02	Calculated
+1158	La-146	4.5622E+23	4.9588E-13	2.1406E-13	Calculated	0.02000	BETA	4.04531E+02	Calculated
+1159	La-146m	2.8605E+23	7.1120E-13	3.0700E-13	Calculated	0.02000	BETA	6.48845E+02	Calculated
+1160	La-147	7.1025E+23	2.6695E-13	1.0453E-13	Calculated	0.02000	BETA	7.04225E+02	Calculated
+1161	Ce-129	1.5409E+22	2.0057E-11	4.8364E-11	Calculated	0.02000	BETA	5.49432E+02	Calculated
1162	Ce-130	2.1420E+21	1.5539E-10	3.7169E-10	Calculated	0.02000	BETA	1.60514E+04	Calculated
1163	Ce-131	5.3142E+21	1.6023E-11	4.9095E-11	Calculated	0.02000	BETA	1.35221E+03	Calculated
1164	Ce-131m	1.0628E+22	1.1851E-11	3.3732E-11	Calculated	0.02000	BETA	3.14218E+03	Calculated
1165	Ce-132	2.5043E+20	3.1000E-10	2.2000E-10	NRPB-M	0.02000	BETA	3.64047E+03	Calculated
1166	Ce-133	1.7844E+20	1.0000E-10	1.1000E-10	NRPB-M	0.02000	BETA	5.76336E+02	Calculated
1167	Ce-133m	5.3962E+20	8.9433E-11	2.3630E-10	Calculated	0.02000	BETA	1.80180E+03	Calculated
1168	Ce-134	1.1418E+19	2.5000E-09	1.3000E-09	ICRP72	0.02000	BETA	3.37610E+04	Calculated
1169	Ce-135	4.8573E+19	7.9000E-10	5.0000E-10	ICRP72	0.02000	BETA	1.21544E+03	Calculated
1170	Ce-135m	1.5471E+23	3.9907E-13	5.1824E-13	Calculated	0.02000	BETA	3.59712E+03	Calculated
1172	Ce-137	9.4103E+19	2.5000E-11	1.0000E-11	ICRP72	0.02000	BETA	2.43861E+04	Calculated
1173	Ce-137m	2.4628E+19	5.4000E-10	4.4000E-10	ICRP72	0.02000	BETA	1.32100E+04	Calculated
>1175	Ce-139	2.5268E+17	2.6000E-10	1.9000E-09	ICRP72	2.00000	A2 VALUE	1.00000E+03	IAEA-G-1.7
1176	Ce-139m	5.3566E+22	6.9888E-13	1.6777E-12	Calculated	0.02000	BETA	1.41918E+03	Calculated
>1178	Ce-141	1.0550E+18	7.1000E-10	3.8000E-09	ICRP72	0.60000	A2 VALUE	1.00000E+05	IAEA-G-1.7
1179	Ce-142	1.8655E+00	7.7317E-08	4.3152E-07	Calculated	0.00009	ALPHA	2.58674E+05	Calculated
>1180	Ce-143	2.4586E+19	1.1000E-09	8.3000E-10	ICRP72	0.60000	A2 VALUE	1.00000E+04	IAEA-G-1.7
>1181	Ce-144	1.1784E+17	5.2000E-09	5.3000E-08	ICRP72	0.20000	A2 VALUE	1.00000E+04	IAEA-G-1.7
1182	Ce-145	1.6274E+22	6.0263E-12	1.2065E-11	Calculated	0.02000	BETA	1.47648E+03	Calculated
1183	Ce-146	3.3576E+21	3.8913E-11	9.3077E-11	Calculated	0.02000	BETA	4.85437E+03	Calculated
1184	Ce-147	4.9844E+22	2.8399E-12	5.5642E-12	Calculated	0.02000	BETA	3.30728E+03	Calculated
1185	Ce-148	5.0390E+22	3.1525E-12	7.5406E-12	Calculated	0.02000	BETA	2.73224E+03	Calculated
1186	Ce-149	5.3901E+23	5.6871E-13	1.4486E-12	Calculated	0.02000	BETA	3.70572E+02	Calculated
1187	Pr-134	3.0559E+21	1.2178E-10	9.2458E-11	Calculated	0.02000	BETA	4.47099E+02	Calculated
1188	Pr-134m	4.7228E+21	7.8813E-11	5.9835E-11	Calculated	0.02000	BETA	4.47024E+02	Calculated
1189	Pr-135	2.1486E+21	8.3777E-11	5.2962E-11	Calculated	0.02000	BETA	1.05152E+03	Calculated
1190	Pr-136	3.9075E+21	3.3000E-11	1.4000E-11	ICRP72	0.02000	BETA	4.37637E+02	Calculated
1191	Pr-137	6.6136E+20	4.0000E-11	2.1000E-11	ICRP72	0.02000	BETA	2.57069E+03	Calculated
1192	Pr-138	3.4790E+22	4.4386E-12	3.7195E-12	Calculated	0.02000	BETA	1.07411E+03	Calculated
1193	Pr-138m	3.9826E+20	1.3000E-10	7.4000E-11	ICRP72	0.02000	BETA	3.99584E+02	Calculated
1194	Pr-139	1.8923E+20	3.1000E-11	2.0000E-11	ICRP72	0.02000	BETA	7.23233E+03	Calculated

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
1195	Pr-140	1.4668E+22	5.7119E-12	4.7865E-12	Calculated	0.02000	BETA	1.67515E+03	Calculated
>1197	Pr-142	4.2712E+19	1.3000E-09	5.5000E-10	ICRP72	0.40000	A2 VALUE	1.00000E+05	IAEA-G-1.7
1198	Pr-142m	3.3578E+21	1.7000E-11	1.7000E-12	ICRP72	0.02000	BETA	2.71518E+05	Calculated
>1199	Pr-143	2.4931E+18	1.2000E-09	2.4000E-09	ICRP72	0.60000	A2 VALUE	1.00000E+06	IAEA-G-1.7
1200	Pr-144	2.7976E+21	5.0000E-11	1.8000E-11	ICRP72	0.02000	BETA	6.50083E+03	Calculated
1201	Pr-144m	7.0061E+21	2.0602E-11	7.7276E-12	Calculated	0.02000	BETA	5.44102E+04	Calculated
1202	Pr-145	1.3380E+20	3.9000E-10	1.7000E-10	ICRP72	0.02000	BETA	1.05169E+04	Calculated
1203	Pr-146	1.9742E+21	8.7214E-11	7.3085E-11	Calculated	0.02000	BETA	8.75657E+02	Calculated
1204	Pr-147	3.4818E+21	3.3000E-11	1.8000E-11	ICRP72	0.02000	BETA	1.09170E+03	Calculated
1205	Pr-148	2.0719E+22	8.7299E-12	7.3156E-12	Calculated	0.02000	BETA	1.12063E+03	Calculated
1206	Pr-148m	2.3516E+22	8.2488E-12	6.9125E-12	Calculated	0.02000	BETA	8.95435E+02	Calculated
1207	Pr-149	2.0610E+22	1.1877E-11	1.1220E-11	Calculated	0.02000	BETA	1.89455E+03	Calculated
1208	Pr-150	4.5642E+23	4.3876E-13	3.6768E-13	Calculated	0.02000	BETA	1.28663E+03	Calculated
+1209	Pr-151	1.4633E+23	2.9317E-12	2.3626E-12	Calculated	0.02000	BETA	1.24642E+03	Calculated
+1210	Nd-135	4.1809E+21	3.4560E-11	1.8261E-11	Calculated	0.02000	BETA	7.30994E+02	Calculated
+1211	Nd-135m	9.3698E+21	1.8700E-11	1.0125E-11	Calculated	0.02000	BETA	5.66416E+02	Calculated
1212	Nd-136	1.0106E+21	9.9000E-11	5.4000E-11	ICRP72	0.02000	BETA	3.32668E+03	Calculated
1213	Nd-137	1.3198E+21	4.2084E-11	2.3541E-11	Calculated	0.02000	BETA	8.39081E+02	Calculated
1214	Nd-137m	1.9055E+24	3.6351E-14	2.0644E-14	Calculated	0.02000	BETA	2.76251E+03	Calculated
1215	Nd-138	1.6722E+20	6.4000E-10	2.5000E-10	ICRP72	0.02000	BETA	2.08030E+04	Calculated
1216	Nd-139	1.6882E+21	2.0000E-11	1.0000E-11	ICRP72	0.02000	BETA	2.07469E+03	Calculated
1217	Nd-139m	1.5176E+20	2.5000E-10	1.5000E-10	ICRP72	0.02000	BETA	3.69004E+02	Calculated
1218	Nd-140	1.0247E+19	2.8000E-09	2.0000E-09	R245	0.02000	BETA	3.52104E+04	Calculated
1219	Nd-141	3.3062E+20	8.3000E-12	5.0000E-12	ICRP72	0.02000	BETA	1.30685E+04	Calculated
1220	Nd-141m	4.7473E+22	5.4533E-13	3.2851E-13	Calculated	0.02000	BETA	1.42818E+03	Calculated
>1223	Nd-144	4.3798E+01	7.0161E-08	9.8620E-08	Calculated	0.00009	ALPHA	1.00000E+03	IAEA-G-1.7
>1226	Nd-147	2.9841E+18	1.1000E-09	2.4000E-09	ICRP72	0.60000	A2 VALUE	1.00000E+05	IAEA-G-1.7
>1228	Nd-149	4.5137E+20	1.2000E-10	8.9000E-11	ICRP72	0.50000	A2 VALUE	1.00000E+05	IAEA-G-1.7
1230	Nd-151	3.7075E+21	3.0000E-11	1.7000E-11	ICRP72	0.02000	BETA	1.00020E+03	Calculated
1231	Nd-152	4.0169E+21	1.4566E-11	8.7745E-12	Calculated	0.02000	BETA	5.05334E+03	Calculated
1232	Nd-153	8.5298E+22	8.1552E-13	5.0846E-13	Calculated	0.02000	BETA	4.27899E+03	Calculated
+1233	Nd-154	1.0470E+23	1.0380E-12	6.2529E-13	Calculated	0.02000	BETA	2.10504E+03	Calculated
+1234	Pm-135	6.3138E+22	5.4042E-12	4.7014E-12	Calculated	0.02000	BETA	3.49839E+02	Calculated
+1235	Pm-135m	7.7301E+22	4.1234E-12	3.5711E-12	Calculated	0.02000	BETA	4.47828E+02	Calculated
+1236	Pm-136	2.8701E+22	7.5779E-12	6.6619E-12	Calculated	0.02000	BETA	3.78620E+02	Calculated
+1237	Pm-136m	6.5304E+22	4.8440E-12	4.3293E-12	Calculated	0.02000	BETA	3.35458E+02	Calculated
+1238	Pm-137	2.1171E+22	7.4898E-12	6.7331E-12	Calculated	0.02000	BETA	5.52593E+02	Calculated
+1239	Pm-138	3.0266E+23	8.4231E-13	6.4629E-13	Calculated	0.02000	BETA	8.19309E+02	Calculated
+1240	Pm-138m	1.5601E+22	1.3635E-11	1.0033E-11	Calculated	0.02000	BETA	4.13068E+02	Calculated
+1241	Pm-139	1.2068E+22	1.1821E-11	1.0434E-11	Calculated	0.02000	BETA	8.76424E+02	Calculated
+1242	Pm-139m	1.6694E+25	8.9508E-15	7.9177E-15	Calculated	0.02000	BETA	1.04734E+04	Calculated
1243	Pm-140	3.2428E+23	4.4428E-13	4.2900E-13	Calculated	0.02000	BETA	7.97830E+02	Calculated
1244	Pm-140m	8.3568E+21	2.1177E-11	2.0292E-11	Calculated	0.02000	BETA	3.20718E+02	Calculated
1245	Pm-141	2.3622E+21	3.6000E-11	1.5000E-11	ICRP72	0.02000	BETA	1.23138E+03	Calculated
1246	Pm-142	7.2627E+22	1.0908E-12	1.0099E-12	Calculated	0.02000	BETA	9.94233E+02	Calculated
1247	Pm-143	1.2709E+17	2.3000E-10	1.5000E-09	ICRP72	3.00000	A2 VALUE	3.15829E+03	Calculated
1248	Pm-144	9.2482E+16	9.7000E-10	8.2000E-09	ICRP72	0.70000	A2 VALUE	6.42151E+02	Calculated
1249	Pm-145	5.1569E+15	1.1000E-10	3.6000E-09	ICRP72	10.00000	A2 VALUE	3.05362E+04	Calculated
1250	Pm-146	1.6391E+16	9.0000E-10	2.1000E-08	ICRP72	0.02000	BETA	1.30936E+03	Calculated
>1251	Pm-147	3.4338E+16	2.6000E-10	5.0000E-09	ICRP72	2.00000	A2 VALUE	1.00000E+06	IAEA-G-1.7
1252	Pm-148	6.0846E+18	2.7000E-09	2.2000E-09	ICRP72	0.02000	BETA	1.54056E+03	Calculated
1253	Pm-148m	7.9566E+17	1.7000E-09	5.7000E-09	ICRP72	0.70000	A2 VALUE	4.99814E+02	Calculated
>1254	Pm-149	1.4669E+19	9.9000E-10	7.3000E-10	ICRP72	0.60000	A2 VALUE	1.00000E+06	IAEA-G-1.7
1255	Pm-150	2.8859E+20	2.6000E-10	1.3000E-10	ICRP72	0.02000	BETA	6.38348E+02	Calculated
1256	Pm-151	2.7341E+19	7.3000E-10	4.6000E-10	ICRP72	0.60000	A2 VALUE	2.82107E+03	Calculated
1257	Pm-152	1.1115E+22	4.5784E-12	4.2390E-12	Calculated	0.02000	BETA	3.49379E+03	Calculated
1258	Pm-152m	6.1058E+21	1.3014E-11	1.2049E-11	Calculated	0.02000	BETA	6.28205E+02	Calculated
1259	Pm-152n	3.1801E+21	3.0054E-11	2.7826E-11	Calculated	0.02000	BETA	4.47701E+02	Calculated
1260	Pm-153	8.4247E+21	3.7322E-12	3.7658E-12	Calculated	0.02000	BETA	8.18771E+03	Calculated
1261	Pm-154	2.6587E+22	3.2874E-12	3.0437E-12	Calculated	0.02000	BETA	5.31651E+02	Calculated
1262	Pm-154m	1.6740E+22	5.3648E-12	4.9670E-12	Calculated	0.02000	BETA	5.14737E+02	Calculated
1263	Pm-155	5.6131E+22	1.4453E-12	1.3148E-12	Calculated	0.02000	BETA	2.44559E+03	Calculated
1264	Pm-156	1.0026E+23	1.1668E-12	1.1279E-12	Calculated	0.02000	BETA	4.31012E+02	Calculated
+1265	Pm-157	2.4403E+23	3.9477E-13	3.6690E-13	Calculated	0.02000	BETA	1.54823E+03	Calculated
+1266	Sm-136	7.1918E+22	5.4187E-12	3.1536E-12	Calculated	0.02000	BETA	3.18908E+03	Calculated
+1267	Sm-137	6.7709E+22	7.4393E-12	4.4756E-12	Calculated	0.02000	BETA	4.76758E+02	Calculated
+1268	Sm-137m	1.5234E+23	3.4039E-12	2.0487E-12	Calculated	0.02000	BETA	4.48531E+02	Calculated
+1269	Sm-138	1.6814E+23	3.4376E-11	1.8326E-11	Calculated	0.02000	BETA	7.57582E+02	Calculated
+1270	Sm-139	1.9511E+22	2.2421E-11	1.3348E-11	Calculated	0.02000	BETA	5.94884E+02	Calculated
+1271	Sm-139m	2.8081E+23	1.6044E-12	9.5587E-13	Calculated	0.02000	BETA	3.59195E+03	Calculated
+1272	Sm-140	3.3558E+21	8.7472E-11	5.5349E-11	Calculated	0.02000	BETA	1.60514E+03	Calculated
+1273	Sm-141	4.8401E+21	5.5832E-11	2.4148E-11	Calculated	0.02000	BETA	6.78426E+02	Calculated
+1274	Sm-141m	2.1845E+21	1.2816E-10	5.6224E-11	Calculated	0.02000	BETA	5.14165E+02	Calculated
1275	Sm-142	6.7633E+20	1.9000E-10	7.1000E-11	ICRP72	0.02000	BETA	1.01760E+04	Calculated

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
1276	Sm-143	5.5130E+21	1.0698E-11	6.5702E-12	Calculated	0.02000	BETA	1.77664E+03	Calculated
1277	Sm-143m	4.4254E+22	2.3386E-12	1.4331E-12	Calculated	0.02000	BETA	1.44624E+03	Calculated
1279	Sm-145	9.8056E+16	2.1000E-10	1.6000E-09	ICRP72	10.00000	A2 VALUE	1.51661E+04	Calculated
1280	Sm-146	9.0652E+08	5.4000E-08	1.1000E-05	ICRP72	0.00009	ALPHA	1.81818E+05	Calculated
>1281	Sm-147	8.4937E+05	4.9000E-08	9.6000E-06	ICRP72	-1.00000	A2 VALUE	1.00000E+03	IAEA-G-1.7
>1282	Sm-148	1.2828E+01	4.2120E-08	8.4996E-06	Calculated	0.00009	ALPHA	1.00000E+03	IAEA-G-1.7
>1285	Sm-149	4.4411E+01	1.3438E-07	1.9159E-07	Calculated	0.00009	ALPHA	1.48831E+05	Calculated
>1285	Sm-151	9.7383E+14	9.8000E-11	4.0000E-09	ICRP72	10.00000	A2 VALUE	1.00000E+06	IAEA-G-1.7
>1287	Sm-153	1.6377E+19	7.4000E-10	6.3000E-10	ICRP72	0.60000	A2 VALUE	1.00000E+05	IAEA-G-1.7
1289	Sm-155	2.0319E+21	2.9000E-11	1.7000E-11	ICRP72	0.02000	BETA	6.09548E+03	Calculated
1290	Sm-156	7.9109E+19	2.5000E-10	2.2000E-10	ICRP72	0.02000	BETA	6.90393E+03	Calculated
1291	Sm-157	5.4958E+21	8.2852E-12	5.1312E-12	Calculated	0.02000	BETA	1.87547E+03	Calculated
1292	Sm-158	7.9852E+21	1.1683E-11	7.5674E-12	Calculated	0.02000	BETA	2.64590E+03	Calculated
1293	Sm-159	2.3450E+23	7.7249E-13	4.4158E-13	Calculated	0.02000	BETA	1.52908E+03	Calculated
+1294	Eu-138	2.5010E+23	6.9175E-12	2.8692E-12	Calculated	0.02000	BETA	2.96445E+02	Calculated
+1295	Eu-139	1.6785E+23	7.2375E-12	3.1984E-12	Calculated	0.02000	BETA	5.43478E+02	Calculated
+1296	Eu-140	1.9371E+24	4.7363E-13	2.1726E-13	Calculated	0.02000	BETA	9.49369E+02	Calculated
+1297	Eu-141	7.4051E+22	1.0998E-11	4.0750E-12	Calculated	0.02000	BETA	7.39700E+02	Calculated
+1298	Eu-141m	1.0970E+24	7.3493E-13	2.7173E-13	Calculated	0.02000	BETA	1.33298E+03	Calculated
+1299	Eu-142	1.2255E+24	5.5096E-13	2.1447E-13	Calculated	0.02000	BETA	6.98636E+02	Calculated
+1300	Eu-142m	4.0180E+22	1.8972E-11	7.5158E-12	Calculated	0.02000	BETA	3.00759E+02	Calculated
1301	Eu-143	1.8485E+22	1.9745E-11	8.8873E-12	Calculated	0.02000	BETA	8.09389E+02	Calculated
1302	Eu-144	2.8435E+23	1.1840E-12	5.3212E-13	Calculated	0.02000	BETA	7.71426E+02	Calculated
1303	Eu-145	5.6259E+18	7.5000E-10	5.5000E-10	ICRP72	0.02000	BETA	7.44879E+02	Calculated
1304	Eu-146	7.2057E+18	1.3000E-09	8.0000E-10	ICRP72	0.02000	BETA	4.59846E+02	Calculated
1305	Eu-147	1.3726E+18	4.4000E-10	1.1000E-09	ICRP72	2.00000	A2 VALUE	1.99641E+03	Calculated
1306	Eu-148	5.9915E+17	1.3000E-09	2.6000E-09	ICRP72	0.50000	A2 VALUE	4.48051E+02	Calculated
1307	Eu-149	3.4847E+17	1.0000E-10	2.9000E-10	ICRP72	20.00000	A2 VALUE	1.46127E+04	Calculated
1308	Eu-150	2.4266E+15	1.3000E-09	5.3000E-08	ICRP72	0.70000	A2 VALUE	6.53278E+02	Calculated
1309	Eu-150m	6.0423E+19	3.8000E-10	1.9000E-10	ICRP72	0.70000	A2 VALUE	1.23536E+04	Calculated
>1311	Eu-152	6.4388E+15	1.4000E-09	4.2000E-08	ICRP72	1.00000	A2 VALUE	1.00000E+02	IAEA-G-1.7
>1312	Eu-152m	8.2288E+19	5.0000E-10	2.2000E-10	ICRP72	0.80000	A2 VALUE	1.00000E+05	IAEA-G-1.7
1313	Eu-152n	4.7702E+20	9.9000E-11	6.2000E-11	NRPB-M	0.02000	BETA	1.20872E+04	Calculated
>1315	Eu-154	1.0001E+16	2.0000E-09	5.3000E-08	ICRP72	0.60000	A2 VALUE	1.00000E+02	IAEA-G-1.7
1316	Eu-154m	9.7410E+20	1.4000E-12	2.0000E-12	NRPB-M	0.02000	BETA	1.21055E+04	Calculated
>1317	Eu-155	1.7619E+16	3.2000E-10	6.9000E-09	ICRP72	3.00000	A2 VALUE	1.00000E+03	IAEA-G-1.7
1318	Eu-156	2.0385E+18	2.2000E-09	3.4000E-09	ICRP72	0.70000	A2 VALUE	7.53016E+02	Calculated
1319	Eu-157	4.8674E+19	6.0000E-10	2.8000E-10	ICRP72	0.02000	BETA	3.40391E+03	Calculated
1320	Eu-158	9.5974E+20	9.4000E-11	4.7000E-11	ICRP72	0.02000	BETA	8.47458E+02	Calculated
1321	Eu-159	2.3409E+21	6.1859E-11	2.3740E-11	Calculated	0.02000	BETA	2.76329E+03	Calculated
1322	Eu-160	4.9432E+22	6.2059E-12	2.7892E-12	Calculated	0.02000	BETA	5.12069E+02	Calculated
+1323	Eu-161	1.0375E+23	2.6780E-12	1.2274E-12	Calculated	0.02000	BETA	1.85994E+03	Calculated
+1324	Eu-162	2.7717E+23	2.0137E-12	9.0505E-13	Calculated	0.02000	BETA	4.12286E+02	Calculated
+1325	Eu-163	4.2681E+23	1.4890E-12	6.6925E-13	Calculated	0.02000	BETA	5.60935E+02	Calculated
+1326	Gd-139	6.1314E+23	9.9628E-13	1.3517E-12	Calculated	0.02000	BETA	2.00746E+10	Calculated
+1327	Gd-140	1.8871E+23	4.1009E-12	6.4686E-12	Calculated	0.02000	BETA	4.99465E+02	Calculated
+1328	Gd-141	2.1146E+23	3.6397E-12	5.0424E-12	Calculated	0.02000	BETA	3.99876E+02	Calculated
+1329	Gd-141m	1.2083E+23	6.4459E-12	8.9425E-12	Calculated	0.02000	BETA	4.23777E+02	Calculated
+1330	Gd-142	3.2679E+22	1.5171E-11	2.1062E-11	Calculated	0.02000	BETA	1.34409E+03	Calculated
+1331	Gd-143	7.4885E+22	5.3323E-12	8.2985E-12	Calculated	0.02000	BETA	7.26744E+02	Calculated
+1332	Gd-143m	2.6076E+22	1.6043E-11	2.4966E-11	Calculated	0.02000	BETA	4.51060E+02	Calculated
+1333	Gd-144	1.0742E+22	3.2833E-11	5.1056E-11	Calculated	0.02000	BETA	7.37109E+02	Calculated
1334	Gd-145	2.0872E+21	4.4000E-11	2.0000E-11	ICRP72	0.02000	BETA	4.05778E+02	Calculated
1335	Gd-145m	3.3886E+22	4.1361E-12	3.6234E-12	Calculated	0.02000	BETA	1.44634E+03	Calculated
1336	Gd-146	6.8584E+17	9.6000E-10	6.4000E-09	ICRP72	0.50000	A2 VALUE	3.74995E+03	Calculated
1337	Gd-147	2.0708E+19	6.1000E-10	4.0000E-10	ICRP72	0.02000	BETA	7.96673E+02	Calculated
1338	Gd-148	1.2008E+15	5.6000E-08	2.6000E-05	ICRP72	0.00200	A2 VALUE	7.69231E+04	Calculated
1339	Gd-149	3.4605E+18	4.5000E-10	7.3000E-10	ICRP72	0.02000	BETA	1.89934E+03	Calculated
1340	Gd-150	4.8478E+10	5.2000E-08	8.3000E-05	KENDALL	0.00009	ALPHA	2.40964E+04	Calculated
1341	Gd-151	2.5816E+17	2.0000E-10	8.6000E-10	ICRP72	0.00009	ALPHA	1.34620E+04	Calculated
>1342	Gd-152	8.0673E+02	4.1000E-08	1.9000E-05	ICRP72	0.00009	ALPHA	1.00000E+03	IAEA-G-1.7
>1343	Gd-153	1.3136E+17	2.7000E-10	2.1000E-09	ICRP72	9.00000	A2 VALUE	1.00000E+04	IAEA-G-1.7
>1349	Gd-159	3.9310E+19	4.9000E-10	2.7000E-10	ICRP72	0.60000	A2 VALUE	1.00000E+05	IAEA-G-1.7
1351	Gd-161	1.1790E+22	4.9238E-12	8.0820E-12	Calculated	0.02000	BETA	2.21720E+03	Calculated
1352	Gd-162	4.7737E+21	2.8344E-11	4.4075E-11	Calculated	0.02000	BETA	2.16303E+03	Calculated
1353	Gd-163	3.7675E+22	5.1501E-12	8.0085E-12	Calculated	0.02000	BETA	4.93389E+02	Calculated
1354	Gd-164	8.0071E+22	3.0670E-12	4.7694E-12	Calculated	0.02000	BETA	9.88128E+02	Calculated
1355	Gd-165	5.9837E+22	3.8139E-12	5.9189E-12	Calculated	0.02000	BETA	9.95917E+02	Calculated
+1356	Tb-144	2.9001E+24	1.7635E-13	1.6409E-13	Calculated	0.02000	BETA	1.70156E+03	Calculated
+1357	Tb-144m	6.8238E+23	7.1088E-13	6.6149E-13	Calculated	0.02000	BETA	1.52219E+03	Calculated
+1358	Tb-145	2.3990E+21	1.4112E-10	1.0826E-10	Calculated	0.02000	BETA	4.07078E+02	Calculated
+1359	Tb-145m	9.7633E+22	2.7762E-12	2.0166E-12	Calculated	0.02000	BETA	4.24989E+02	Calculated
1360	Tb-146	3.5756E+23	6.6642E-13	6.2527E-13	Calculated	0.02000	BETA	6.79025E+02	Calculated
1361	Tb-146m	1.2437E+23	2.1632E-12	2.0277E-12	Calculated	0.02000	BETA	2.73898E+02	Calculated

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
1362	Tb-147	4.8154E+20	1.6000E-10	7.6000E-11	ICRP72	0.02000	BETA	6.07533E+02	Calculated
1363	Tb-147m	2.5828E+22	5.1471E-12	4.5487E-12	Calculated	0.02000	BETA	5.44722E+02	Calculated
1364	Tb-148	7.8385E+20	2.7000E-11	4.1000E-11	NRPB-M	0.02000	BETA	4.14027E+02	Calculated
1365	Tb-148m	2.1378E+22	8.3106E-12	8.5301E-12	Calculated	0.02000	BETA	3.41542E+02	Calculated
1366	Tb-149	1.8850E+20	2.5000E-10	4.9000E-09	ICRP72	0.00009	ALPHA	7.12144E+02	Calculated
1367	Tb-149m	1.1230E+22	1.2796E-10	1.1908E-10	Calculated	0.00009	ALPHA	6.95866E+02	Calculated
1368	Tb-150	2.2274E+20	2.5000E-10	1.1000E-10	ICRP72	0.00009	ALPHA	4.85437E+02	Calculated
1369	Tb-150m	8.0007E+21	1.6428E-11	1.5287E-11	Calculated	0.02000	BETA	4.21683E+02	Calculated
1370	Tb-151	4.3631E+19	3.4000E-10	2.3000E-10	ICRP72	0.00009	ALPHA	9.99400E+02	Calculated
1371	Tb-151m	1.1063E+23	1.6447E-13	1.2127E-13	Calculated	0.02000	BETA	1.28008E+04	Calculated
1372	Tb-152	4.3612E+19	5.8000E-10	5.5000E-10	NRPB-M	0.02000	BETA	7.13267E+02	Calculated
1373	Tb-152m	1.0650E+22	6.3690E-12	5.9597E-12	Calculated	0.02000	BETA	1.31062E+03	Calculated
1374	Tb-153	1.3500E+19	2.5000E-10	1.9000E-10	ICRP72	0.02000	BETA	3.22123E+03	Calculated
1375	Tb-154	3.5037E+19	6.5000E-10	3.6000E-10	ICRP72	0.02000	BETA	4.51834E+02	Calculated
1376	Tb-154m	8.3700E+19	9.1272E-10	8.3029E-10	Calculated	0.02000	BETA	7.72439E+02	Calculated
1377	Tb-154n	3.3193E+19	8.7000E-10	8.5000E-10	NRPB-M	0.02000	BETA	4.83232E+02	Calculated
1378	Tb-155	5.8573E+18	2.1000E-10	2.2000E-10	ICRP72	0.02000	BETA	5.56174E+03	Calculated
1379	Tb-156	5.9932E+18	1.2000E-09	1.2000E-09	ICRP72	0.02000	BETA	5.14448E+02	Calculated
1380	Tb-156m	3.0477E+19	1.7000E-10	2.1000E-10	ICRP72	0.02000	BETA	2.51286E+04	Calculated
1381	Tb-156n	1.4581E+20	8.1000E-11	9.6000E-11	ICRP72	0.02000	BETA	7.60495E+04	Calculated
1382	Tb-157	8.5143E+14	3.4000E-11	1.2000E-09	ICRP72	40.00000	A2 VALUE	9.12054E+04	Calculated
1383	Tb-158	4.6371E+14	1.1000E-09	4.6000E-08	ICRP72	1.00000	A2 VALUE	1.22835E+03	Calculated
1384	Tb-158m	2.5173E+23	2.2141E-14	2.0686E-14	Calculated	0.02000	BETA	3.09215E+04	Calculated
>1386	Tb-160	4.1783E+17	1.6000E-09	7.0000E-09	ICRP72	0.60000	A2 VALUE	1.00000E+03	IAEA-G-1.7
1387	Tb-161	4.3573E+18	7.2000E-10	1.3000E-09	ICRP72	0.02000	BETA	1.85752E+04	Calculated
1388	Tb-162	5.6531E+21	1.4860E-11	1.3827E-11	Calculated	0.02000	BETA	8.62069E+02	Calculated
1389	Tb-163	2.1897E+21	2.6036E-11	2.4227E-11	Calculated	0.02000	BETA	1.21714E+03	Calculated
1390	Tb-164	1.4146E+22	8.5883E-12	7.9916E-12	Calculated	0.02000	BETA	4.26076E+02	Calculated
1391	Tb-165	1.9991E+22	5.1535E-12	4.7759E-12	Calculated	0.02000	BETA	1.67813E+03	Calculated
1392	Tb-166	3.0199E+22	5.5473E-12	5.5052E-12	Calculated	0.02000	BETA	4.12455E+02	Calculated
+1393	Tb-167	1.3155E+23	1.6033E-12	1.4887E-12	Calculated	0.02000	BETA	6.65265E+02	Calculated
+1394	Tb-168	3.0301E+23	1.0446E-12	9.7204E-13	Calculated	0.02000	BETA	4.56754E+02	Calculated
+1395	Dy-147	7.0990E+22	6.2217E-12	3.0435E-12	Calculated	0.02000	BETA	4.28180E+02	Calculated
+1396	Dy-147m	4.8152E+22	1.1097E-11	5.5554E-12	Calculated	0.02000	BETA	7.03433E+02	Calculated
1397	Dy-148	1.5171E+22	5.6262E-12	3.8103E-12	Calculated	0.02000	BETA	1.44442E+03	Calculated
1398	Dy-149	1.1035E+22	3.0247E-11	8.3388E-11	Calculated	0.02000	BETA	4.21941E+02	Calculated
1399	Dy-150	6.4719E+21	3.4371E-10	1.8875E-10	Calculated	0.00009	ALPHA	3.93407E+03	Calculated
1400	Dy-151	2.5752E+21	1.8585E-10	1.0197E-10	Calculated	0.00009	ALPHA	7.36648E+02	Calculated
1401	Dy-152	3.2210E+20	2.5000E-10	7.3000E-09	NRPB-M	0.00009	ALPHA	3.98148E+03	Calculated
1402	Dy-153	1.1868E+20	1.4000E-10	1.4000E-10	NRPB-M	0.00009	ALPHA	1.44113E+03	Calculated
1403	Dy-154	3.0132E+10	5.8000E-08	2.3000E-05	KENDALL	0.00009	ALPHA	8.69565E+04	Calculated
1404	Dy-155	7.4843E+19	1.3000E-10	7.7000E-11	ICRP72	0.02000	BETA	1.55448E+03	Calculated
1406	Dy-157	9.0773E+19	6.1000E-11	3.0000E-11	ICRP72	0.02000	BETA	2.84344E+03	Calculated
1408	Dy-159	2.1052E+17	1.0000E-10	3.7000E-10	ICRP72	20.00000	A2 VALUE	2.13713E+04	Calculated
>1414	Dy-165	3.0121E+20	1.1000E-10	6.0000E-11	ICRP72	0.60000	A2 VALUE	1.00000E+06	IAEA-G-1.7
1415	Dy-165m	3.3530E+22	1.2251E-12	6.7086E-13	Calculated	0.02000	BETA	3.34528E+04	Calculated
>1416	Dy-166	8.5635E+18	1.6000E-09	1.9000E-09	ICRP72	0.24000	A2 VALUE	1.00000E+05	IAEA-G-1.7
1417	Dy-167	6.7218E+21	1.5759E-11	8.7005E-12	Calculated	0.02000	BETA	1.65289E+03	Calculated
1418	Dy-168	4.8737E+21	3.4667E-11	1.9257E-11	Calculated	0.02000	BETA	1.61991E+03	Calculated
1419	Dy-169	6.3517E+22	3.2375E-12	1.8110E-12	Calculated	0.02000	BETA	9.56948E+02	Calculated
1420	Dy-170	1.2040E+23	2.2964E-12	1.2756E-12	Calculated	0.02000	BETA	1.30493E+03	Calculated
1421	Dy-171	7.4446E+23	3.7443E-13	1.9173E-13	Calculated	0.02000	BETA	6.34397E+02	Calculated
+1422	Ho-152	1.6981E+22	5.7069E-11	2.2960E-10	Calculated	0.00009	ALPHA	5.93789E+02	Calculated
+1423	Ho-152m	5.5504E+22	1.8708E-11	7.2089E-11	Calculated	0.00009	ALPHA	2.92337E+02	Calculated
1424	Ho-153	2.2746E+22	5.5980E-12	5.4599E-12	Calculated	0.00009	ALPHA	9.41620E+02	Calculated
1425	Ho-153m	4.8741E+21	3.1573E-11	3.0578E-11	Calculated	0.00009	ALPHA	6.35001E+02	Calculated
1426	Ho-154	3.8194E+21	2.1852E-11	1.9321E-11	Calculated	0.00009	ALPHA	8.68372E+02	Calculated
1427	Ho-154m	1.3906E+22	1.0281E-11	9.0899E-12	Calculated	0.00009	ALPHA	5.01706E+02	Calculated
1428	Ho-155	9.3552E+20	3.7000E-11	2.0000E-11	ICRP72	0.02000	BETA	1.68919E+03	Calculated
1429	Ho-156	7.9672E+20	1.2845E-10	1.1357E-10	Calculated	0.02000	BETA	7.09079E+02	Calculated
1430	Ho-157	3.5185E+21	6.5000E-12	4.2000E-12	ICRP72	0.02000	BETA	2.13808E+03	Calculated
1431	Ho-158	4.0047E+21	4.8391E-11	4.2788E-11	Calculated	0.02000	BETA	6.46281E+02	Calculated
1432	Ho-158m	1.6315E+21	1.1878E-10	1.0503E-10	Calculated	0.02000	BETA	8.00000E+06	Calculated
1433	Ho-158n	2.0649E+21	9.1445E-11	8.0856E-11	Calculated	0.02000	BETA	3.65464E+02	Calculated
1434	Ho-159	1.3245E+21	7.9000E-12	6.1000E-12	ICRP72	0.02000	BETA	2.18780E+03	Calculated
1435	Ho-159m	3.1645E+23	7.7108E-14	6.4474E-14	Calculated	0.02000	BETA	9.06125E+03	Calculated
1436	Ho-160	1.7194E+21	7.0571E-11	6.2400E-11	Calculated	0.02000	BETA	5.81225E+02	Calculated
1437	Ho-160m	1.4500E+20	2.2000E-10	2.2000E-10	NRPB-M	0.02000	BETA	1.51987E+03	Calculated
1438	Ho-160n	9.0002E+23	1.4990E-13	1.3255E-13	Calculated	0.02000	BETA	8.69047E+03	Calculated
1439	Ho-161	2.9053E+20	1.3000E-11	6.0000E-12	ICRP72	0.02000	BETA	1.62567E+04	Calculated
1440	Ho-161m	3.8314E+23	4.7063E-14	3.7447E-14	Calculated	0.02000	BETA	8.74150E+03	Calculated
1441	Ho-162	2.8642E+21	3.3000E-12	2.8000E-12	ICRP72	0.02000	BETA	6.35413E+03	Calculated
1442	Ho-162m	6.4125E+20	2.6000E-11	2.1000E-11	ICRP72	0.02000	BETA	1.72236E+03	Calculated
1443	Ho-163	1.7765E+13	1.2408E-11	2.5600E-11	Calculated	0.02000	BETA	3.77357E+06	Calculated

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
1444	Ho-163m	2.3291E+24	8.5365E-15	7.5481E-15	Calculated	0.02000	BETA	4.12105E+03	Calculated
1445	Ho-164	1.4839E+21	9.5000E-12	8.4000E-12	ICRP72	0.02000	BETA	2.14662E+04	Calculated
1446	Ho-164m	1.1287E+21	1.6000E-11	1.2000E-11	ICRP72	0.02000	BETA	1.74777E+04	Calculated
>1448	Ho-166	2.6074E+19	1.4000E-09	6.5000E-10	ICRP72	0.40000	A2 VALUE	1.00000E+05	IAEA-G-1.7
1449	Ho-166m	6.6429E+13	2.0000E-09	1.2000E-07	ICRP72	0.50000	A2 VALUE	5.75274E+02	Calculated
1450	Ho-167	2.2406E+20	8.3000E-11	7.1000E-11	ICRP72	0.02000	BETA	2.63152E+03	Calculated
1451	Ho-168	1.3809E+22	7.3214E-12	6.4736E-12	Calculated	0.02000	BETA	1.09132E+03	Calculated
1452	Ho-169	9.3594E+21	7.6001E-12	6.8491E-12	Calculated	0.02000	BETA	1.84740E+03	Calculated
1453	Ho-170	1.4726E+22	1.1610E-11	1.0265E-11	Calculated	0.02000	BETA	5.21325E+02	Calculated
1454	Ho-170m	5.7123E+22	2.2914E-12	2.0261E-12	Calculated	0.02000	BETA	1.22565E+03	Calculated
1455	Ho-171	4.6074E+22	1.7339E-12	1.1396E-12	Calculated	0.02000	BETA	2.75482E+03	Calculated
1456	Ho-172	9.7107E+22	5.9435E-13	5.0021E-13	Calculated	0.02000	BETA	2.75482E+03	Calculated
+1457	Ho-173	2.4128E+23	1.3044E-12	1.0706E-12	Calculated	0.02000	BETA	5.98744E+02	Calculated
+1458	Er-153	7.3569E+22	4.4708E-11	6.9623E-11	Calculated	0.00009	ALPHA	4.47349E+08	Calculated
+1459	Er-154	1.2270E+22	7.4554E-11	9.9306E-11	Calculated	0.00009	ALPHA	9.29368E+04	Calculated
+1460	Er-155	8.4724E+21	1.7859E-11	2.1978E-11	Calculated	0.00009	ALPHA	5.72017E+02	Calculated
1461	Er-156	2.2880E+21	4.0512E-11	5.3967E-11	Calculated	0.02000	BETA	4.57400E+04	Calculated
1462	Er-157	2.3770E+21	1.6672E-11	1.9252E-11	Calculated	0.02000	BETA	3.17058E+03	Calculated
1463	Er-158	3.2631E+20	3.2000E-12	3.5000E-12	NRPB-M	0.02000	BETA	7.11238E+03	Calculated
1464	Er-159	1.2159E+21	5.3316E-11	6.9780E-11	Calculated	0.02000	BETA	1.11582E+03	Calculated
1465	Er-160	2.5365E+19	7.4000E-10	6.2000E-10	NRPB-M	0.02000	BETA	7.95805E+04	Calculated
1466	Er-161	2.2438E+20	8.0000E-11	4.8000E-11	ICRP72	0.02000	BETA	1.05612E+03	Calculated
1468	Er-163	5.6933E+20	2.4000E-12	2.1000E-12	NRPB-M	0.02000	BETA	2.45543E+04	Calculated
1470	Er-165	6.7852E+19	1.9000E-11	7.9000E-12	ICRP72	0.02000	BETA	2.60981E+04	Calculated
1473	Er-167m	1.0967E+24	1.0586E-14	1.4101E-14	Calculated	0.02000	BETA	7.85957E+03	Calculated
>1475	Er-169	3.0751E+18	3.7000E-10	1.0000E-09	ICRP72	1.00000	A2 VALUE	1.00000E+06	IAEA-G-1.7
>1477	Er-171	9.0209E+19	3.6000E-10	2.2000E-10	ICRP72	0.50000	A2 VALUE	1.00000E+05	IAEA-G-1.7
1478	Er-172	1.3679E+19	1.0000E-09	1.1000E-09	ICRP72	0.02000	BETA	1.89197E+03	Calculated
1479	Er-173	2.8734E+22	3.6941E-12	4.0227E-12	Calculated	0.02000	BETA	1.11607E+03	Calculated
1480	Er-174	1.2120E+22	1.6915E-11	2.2534E-11	Calculated	0.02000	BETA	1.18526E+03	Calculated
1481	Er-175	1.3557E+23	1.6067E-12	1.6315E-12	Calculated	0.02000	BETA	6.66978E+02	Calculated
+1482	Tm-158	1.0967E+22	1.7232E-11	4.0156E-11	Calculated	0.02000	BETA	5.36193E+02	Calculated
+1483	Tm-159	4.7839E+21	4.5129E-11	1.0473E-10	Calculated	0.02000	BETA	6.81979E+02	Calculated
1484	Tm-160	4.6276E+21	4.0583E-11	9.1237E-11	Calculated	0.02000	BETA	7.71209E+02	Calculated
1485	Tm-160m	3.5033E+22	1.1570E-12	2.2459E-12	Calculated	0.02000	BETA	4.56621E+03	Calculated
1486	Tm-161	1.1376E+21	1.1157E-10	2.4050E-10	Calculated	0.02000	BETA	9.97410E+02	Calculated
1487	Tm-162	1.9798E+21	2.9000E-11	1.6000E-11	ICRP72	0.02000	BETA	6.05290E+02	Calculated
1488	Tm-162m	1.0608E+23	6.4526E-13	7.1473E-13	Calculated	0.02000	BETA	3.24675E+03	Calculated
1489	Tm-163	3.9318E+20	5.3000E-11	5.9000E-11	NRPB-M	0.02000	BETA	7.69669E+02	Calculated
1490	Tm-164	2.1219E+22	3.2434E-12	7.5655E-12	Calculated	0.02000	BETA	1.29702E+03	Calculated
1491	Tm-164m	8.3212E+21	2.5393E-12	5.9231E-12	Calculated	0.02000	BETA	2.83978E+03	Calculated
1492	Tm-165	2.3386E+19	3.2000E-10	2.8000E-10	NRPB-M	0.02000	BETA	1.81617E+03	Calculated
1493	Tm-166	9.0750E+19	2.8000E-10	1.7000E-10	ICRP72	0.02000	BETA	5.13242E+02	Calculated
1494	Tm-167	3.1323E+18	5.6000E-10	1.1000E-09	ICRP72	0.80000	A2 VALUE	6.31712E+03	Calculated
1495	Tm-168	3.0900E+17	9.6000E-10	3.1000E-09	NRPB-M	0.02000	BETA	8.15408E+02	Calculated
>1497	Tm-170	2.2107E+17	1.3000E-09	7.0000E-09	ICRP72	0.60000	A2 VALUE	1.00000E+05	IAEA-G-1.7
>1498	Tm-171	4.0297E+16	1.1000E-10	1.4000E-09	ICRP72	40.00000	A2 VALUE	1.00000E+06	IAEA-G-1.7
1499	Tm-172	1.0602E+19	1.7000E-09	1.1000E-09	ICRP72	0.02000	BETA	1.86220E+03	Calculated
1500	Tm-173	8.1269E+19	3.1000E-10	1.8000E-10	ICRP72	0.02000	BETA	2.38777E+03	Calculated
1501	Tm-174	7.4067E+21	1.6186E-11	3.7754E-11	Calculated	0.02000	BETA	5.46150E+02	Calculated
1502	Tm-175	2.6220E+21	2.7000E-11	1.8000E-11	ICRP72	0.02000	BETA	8.28089E+02	Calculated
1503	Tm-176	2.0811E+22	6.3316E-12	1.4769E-11	Calculated	0.02000	BETA	5.58650E+02	Calculated
+1504	Tm-177	2.8760E+22	5.8939E-12	1.2624E-11	Calculated	0.02000	BETA	8.54369E+02	Calculated
+1505	Tm-178	7.8169E+22	3.5841E-12	7.1326E-12	Calculated	0.02000	BETA	4.88291E+02	Calculated
+1506	Tm-179	1.1660E+23	2.6039E-12	6.0072E-12	Calculated	0.02000	BETA	5.66412E+02	Calculated
+1507	Yb-159	3.1265E+22	7.4755E-12	8.6036E-12	Calculated	0.02000	BETA	1.60171E+03	Calculated
+1508	Yb-160	9.0622E+21	1.6232E-11	1.8132E-11	Calculated	0.02000	BETA	3.48328E+03	Calculated
+1509	Yb-161	1.0292E+22	1.7910E-11	1.9918E-11	Calculated	0.02000	BETA	9.23647E+02	Calculated
1510	Yb-162	2.2771E+21	2.3000E-11	1.4000E-11	ICRP72	0.02000	BETA	4.27307E+03	Calculated
1511	Yb-163	3.8641E+21	1.5668E-11	1.5792E-11	Calculated	0.02000	BETA	1.32450E+03	Calculated
1512	Yb-164	5.5962E+20	8.7922E-11	1.0153E-10	Calculated	0.02000	BETA	7.38711E+04	Calculated
1513	Yb-165	4.2606E+21	5.6736E-12	5.6560E-12	Calculated	0.02000	BETA	2.85063E+03	Calculated
1514	Yb-166	1.2325E+19	9.5000E-10	7.7000E-10	ICRP72	0.02000	BETA	1.11099E+04	Calculated
1515	Yb-167	2.3814E+21	6.7000E-12	6.9000E-12	ICRP72	0.02000	BETA	3.55341E+03	Calculated
1517	Yb-169	8.9341E+17	7.1000E-10	3.0000E-09	ICRP72	1.00000	A2 VALUE	2.96317E+03	Calculated
1518	Yb-169m	5.3715E+22	2.8971E-14	6.9715E-14	Calculated	0.02000	BETA	4.13208E+05	Calculated
>1524	Yb-175	6.5990E+18	4.4000E-10	7.3000E-10	ICRP72	0.90000	A2 VALUE	1.00000E+05	IAEA-G-1.7
1526	Yb-176m	2.0811E+23	1.8454E-13	2.1310E-13	Calculated	0.02000	BETA	1.09290E+03	Calculated
1527	Yb-177	3.4692E+20	8.8000E-11	6.9000E-11	ICRP72	0.02000	BETA	4.38596E+03	Calculated
1528	Yb-177m	3.6803E+23	1.1531E-13	1.0240E-13	Calculated	0.02000	BETA	5.98086E+03	Calculated
1529	Yb-178	5.2833E+20	1.2000E-10	7.5000E-11	ICRP72	0.02000	BETA	1.56838E+03	Calculated
1530	Yb-179	4.7604E+21	2.0836E-11	2.3490E-11	Calculated	0.02000	BETA	5.99880E+02	Calculated
1531	Yb-180	1.6109E+22	7.9965E-12	9.2342E-12	Calculated	0.02000	BETA	1.24533E+03	Calculated
+1532	Yb-181	3.8437E+22	3.0342E-12	3.5512E-12	Calculated	0.02000	BETA	7.00378E+02	Calculated

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
+1533	Lu-162	3.1358E+22	1.3281E-11	7.9637E-12	Calculated	0.02000	BETA	6.18685E+02	Calculated
+1534	Lu-163	1.0764E+22	5.3131E-11	3.5319E-11	Calculated	0.02000	BETA	2.33100E+02	Calculated
+1535	Lu-164	1.3515E+22	1.3439E-11	9.1896E-12	Calculated	0.02000	BETA	1.06940E+03	Calculated
+1536	Lu-165	3.9297E+21	4.6810E-11	3.0819E-11	Calculated	0.02000	BETA	7.45979E+02	Calculated
1537	Lu-166	1.5821E+22	1.4136E-11	9.3540E-12	Calculated	0.02000	BETA	4.58022E+02	Calculated
1538	Lu-166m	2.9594E+22	6.1374E-12	4.0299E-12	Calculated	0.02000	BETA	1.14325E+03	Calculated
1539	Lu-166n	1.9807E+22	1.1680E-11	7.7376E-12	Calculated	0.02000	BETA	4.65571E+02	Calculated
1540	Lu-167	8.0921E+20	2.3292E-10	1.5626E-10	Calculated	0.02000	BETA	9.74344E+02	Calculated
1541	Lu-168	7.5320E+21	4.9208E-11	3.3650E-11	Calculated	0.02000	BETA	2.25882E+02	Calculated
1542	Lu-168m	6.1830E+21	3.1390E-11	2.1465E-11	Calculated	0.02000	BETA	4.37139E+02	Calculated
1543	Lu-169	2.0151E+19	4.6000E-10	3.8000E-10	ICRP72	0.02000	BETA	8.20951E+02	Calculated
1544	Lu-169m	1.5443E+22	7.1883E-13	5.7694E-13	Calculated	0.02000	BETA	2.77778E+05	Calculated
1545	Lu-170	1.4198E+19	9.9000E-10	6.6000E-10	ICRP72	0.02000	BETA	3.95993E+02	Calculated
1546	Lu-170m	3.6661E+24	5.5409E-15	3.7232E-15	Calculated	0.02000	BETA	8.91266E+04	Calculated
1547	Lu-171	3.4259E+18	6.7000E-10	8.8000E-10	ICRP72	0.02000	BETA	1.53815E+03	Calculated
1548	Lu-171m	3.1307E+22	2.5066E-13	2.1757E-13	Calculated	0.02000	BETA	1.14546E+05	Calculated
1549	Lu-172	4.1939E+18	1.3000E-09	1.6000E-09	ICRP72	0.60000	A2 VALUE	5.08557E+02	Calculated
1550	Lu-172m	1.0936E+22	7.9530E-13	8.1652E-13	Calculated	0.02000	BETA	1.75812E+05	Calculated
1551	Lu-173	5.7247E+16	2.6000E-10	2.4000E-09	ICRP72	8.00000	A2 VALUE	5.72142E+03	Calculated
1552	Lu-174	2.1366E+16	2.7000E-10	4.2000E-09	ICRP72	9.00000	A2 VALUE	8.25390E+03	Calculated
1553	Lu-174m	1.9560E+17	5.3000E-10	4.2000E-09	ICRP72	10.00000	A2 VALUE	1.36329E+04	Calculated
>1555	Lu-176	2.0811E+06	1.8000E-09	7.0000E-08	ICRP72	0.02000	BETA	1.00000E+03	IAEA-G-1.7
1556	Lu-176m	1.7906E+20	1.7000E-10	1.2000E-10	ICRP72	0.02000	BETA	1.61812E+04	Calculated
>1557	Lu-177	4.0752E+18	5.3000E-10	1.2000E-09	ICRP72	0.70000	A2 VALUE	1.00000E+05	IAEA-G-1.7
1558	Lu-177m	1.7033E+17	1.7000E-09	1.6000E-08	ICRP72	0.02000	BETA	5.68254E+03	Calculated
1559	Lu-178	1.3766E+21	4.7000E-11	2.6000E-11	ICRP72	0.02000	BETA	4.62963E+03	Calculated
1560	Lu-178m	1.6925E+21	3.8000E-11	3.3000E-11	ICRP72	0.02000	BETA	9.08265E+02	Calculated
1561	Lu-179	1.4120E+20	2.1000E-10	1.2000E-10	ICRP72	0.02000	BETA	1.31579E+04	Calculated
1562	Lu-180	6.7826E+21	2.3386E-11	1.5992E-11	Calculated	0.02000	BETA	6.34921E+02	Calculated
1563	Lu-181	1.0985E+22	4.5868E-12	3.3397E-12	Calculated	0.02000	BETA	1.75778E+03	Calculated
1564	Lu-182	1.9117E+22	8.5007E-12	5.8129E-12	Calculated	0.02000	BETA	4.81719E+02	Calculated
+1565	Lu-183	3.9337E+22	7.4931E-12	3.3986E-12	Calculated	0.02000	BETA	1.23153E+03	Calculated
+1566	Lu-184	1.1343E+23	4.1629E-12	2.2137E-12	Calculated	0.02000	BETA	5.81034E+02	Calculated
+1567	Hf-163	6.4043E+22	2.7430E-12	5.3849E-12	Calculated	0.02000	BETA	1.31406E+03	Calculated
+1568	Hf-164	1.5155E+22	5.9774E-12	1.2026E-11	Calculated	0.02000	BETA	9.40448E+02	Calculated
+1569	Hf-165	2.4811E+22	3.6962E-12	7.2880E-12	Calculated	0.02000	BETA	1.82194E+03	Calculated
+1570	Hf-166	6.1957E+21	1.0849E-11	2.1200E-11	Calculated	0.02000	BETA	3.46837E+03	Calculated
+1571	Hf-167	2.0328E+22	3.8134E-12	7.5778E-12	Calculated	0.02000	BETA	1.34851E+03	Calculated
1572	Hf-168	1.5963E+21	6.7803E-11	1.3641E-10	Calculated	0.02000	BETA	2.32558E+03	Calculated
1573	Hf-169	1.2710E+22	2.8503E-12	5.8163E-12	Calculated	0.02000	BETA	8.69565E+02	Calculated
1574	Hf-170	4.2644E+19	4.8000E-10	3.2000E-10	ICRP72	0.02000	BETA	1.99124E+03	Calculated
1575	Hf-171	5.6007E+19	7.9438E-10	1.6448E-09	Calculated	0.02000	BETA	1.07067E+03	Calculated
1576	Hf-172	4.1148E+16	1.0000E-09	3.2000E-08	ICRP72	0.60000	A2 VALUE	8.31947E+03	Calculated
1577	Hf-173	2.8053E+19	2.3000E-10	1.6000E-10	ICRP72	0.02000	BETA	2.48873E+03	Calculated
>1578	Hf-174	3.8023E+01	7.6800E-08	3.6054E-07	Calculated	0.00009	ALPHA	1.00000E+03	IAEA-G-1.7
1579	Hf-175	3.9452E+17	4.1000E-10	1.2000E-09	ICRP72	3.00000	A2 VALUE	2.72081E+03	Calculated
1582	Hf-177m	2.1843E+24	1.2066E-14	2.4277E-14	Calculated	0.02000	BETA	9.15674E+02	Calculated
1583	Hf-177n	7.6494E+20	8.1000E-11	9.0000E-11	ICRP72	0.02000	BETA	8.31654E+02	Calculated
1585	Hf-178m	5.8645E+23	3.9181E-14	7.8830E-14	Calculated	0.02000	BETA	9.80352E+02	Calculated
1586	Hf-178n	2.3979E+15	4.7000E-09	2.6000E-07	ICRP72	0.02000	BETA	8.12690E+02	Calculated
1588	Hf-179m	1.2494E+23	5.7060E-14	1.1480E-13	Calculated	0.02000	BETA	4.01445E+03	Calculated
1589	Hf-179n	1.0750E+18	1.2000E-09	3.8000E-09	ICRP72	0.02000	BETA	1.05932E+03	Calculated
1591	Hf-180m	1.1716E+20	1.7000E-10	1.3000E-10	ICRP72	0.02000	BETA	9.92769E+02	Calculated
>1592	Hf-181	6.3001E+17	1.1000E-09	5.0000E-09	ICRP72	0.50000	A2 VALUE	1.00000E+03	IAEA-G-1.7
1593	Hf-182	8.0832E+09	3.0000E-09	3.1000E-07	ICRP72	-1.00000	A2 VALUE	4.55818E+03	Calculated
1594	Hf-182m	6.2172E+20	4.2000E-11	4.6000E-11	ICRP72	0.02000	BETA	9.99147E+02	Calculated
1595	Hf-183	5.9416E+20	7.3000E-11	5.7000E-11	ICRP72	0.02000	BETA	1.23153E+03	Calculated
1596	Hf-184	1.5301E+20	5.2000E-10	3.3000E-10	ICRP72	0.02000	BETA	3.38983E+03	Calculated
+1597	Hf-184m	4.7263E+22	1.0958E-12	2.1326E-12	Calculated	0.02000	BETA	1.04397E+03	Calculated
1598	Hf-185	1.0744E+22	8.9521E-12	1.8053E-11	Calculated	0.02000	BETA	4.54545E+02	Calculated
1599	Hf-186	1.6505E+22	3.7106E-12	6.3181E-12	Calculated	0.02000	BETA	1.92197E+03	Calculated
1600	Hf-187	2.1468E+22	6.0026E-12	1.3104E-11	Calculated	0.02000	BETA	7.62021E+02	Calculated
1601	Ta-170	6.0498E+21	3.2289E-11	1.8226E-11	Calculated	0.02000	BETA	8.60585E+02	Calculated
1602	Ta-171	1.7467E+21	1.3553E-10	9.5984E-11	Calculated	0.02000	BETA	5.22739E+02	Calculated
1603	Ta-172	1.0995E+21	5.3000E-11	3.5000E-11	ICRP72	0.02000	BETA	5.27371E+02	Calculated
1604	Ta-173	2.1360E+20	1.9000E-10	1.1000E-10	ICRP72	0.02000	BETA	1.82315E+03	Calculated
1605	Ta-174	5.6465E+20	5.7000E-11	4.3000E-11	ICRP72	0.02000	BETA	1.05597E+03	Calculated
1606	Ta-175	6.3123E+19	2.1000E-10	1.3000E-10	ICRP72	0.02000	BETA	1.18113E+03	Calculated
1607	Ta-176	8.1528E+19	3.1000E-10	2.0000E-10	ICRP72	0.02000	BETA	4.65918E+02	Calculated
1608	Ta-177	1.1619E+19	1.1000E-10	1.1000E-10	ICRP72	0.02000	BETA	1.42807E+04	Calculated
1609	Ta-178	4.1994E+21	1.9897E-12	1.3884E-12	Calculated	0.02000	BETA	8.11030E+03	Calculated
1610	Ta-178m	2.7598E+20	7.2000E-11	6.8000E-11	ICRP72	0.80000	A2 VALUE	8.55242E+02	Calculated
1611	Ta-179	4.5916E+16	6.5000E-11	5.6000E-10	ICRP72	30.00000	A2 VALUE	3.33493E+04	Calculated
1612	Ta-180	7.9747E+19	5.4000E-11	4.4000E-11	ICRP72	0.02000	BETA	1.91075E+04	Calculated

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
>1613	Ta-180m	4.0837E+01	8.4000E-10	2.6000E-08	ICRP72	0.02000	BETA	1.00000E+03	IAEA-G-1.7
>1615	Ta-182	2.3150E+17	1.5000E-09	1.0000E-08	ICRP72	0.50000	A2 VALUE	1.00000E+02	IAEA-G-1.7
1616	Ta-182m	8.1066E+24	1.4980E-16	3.6021E-16	Calculated	0.02000	BETA	2.98572E+05	Calculated
1617	Ta-182n	2.4139E+21	1.2000E-11	2.1000E-11	ICRP72	0.02000	BETA	3.58328E+03	Calculated
1618	Ta-183	5.1881E+18	1.3000E-09	2.1000E-09	ICRP72	0.02000	BETA	3.10974E+03	Calculated
1619	Ta-184	7.2451E+19	6.8000E-10	4.3000E-10	ICRP72	0.02000	BETA	5.90283E+02	Calculated
1620	Ta-185	7.6765E+20	6.8000E-11	4.8000E-11	ICRP72	0.02000	BETA	4.12906E+03	Calculated
1621	Ta-186	3.5630E+21	3.3000E-11	1.8000E-11	ICRP72	0.02000	BETA	6.85871E+02	Calculated
1622	Ta-187	2.2327E+24	1.0185E-13	8.0408E-14	Calculated	0.02000	BETA	4.54545E+02	Calculated
1623	Ta-188	2.2203E+24	9.3538E-14	6.5643E-14	Calculated	0.02000	BETA	4.54545E+02	Calculated
+1624	Ta-189	6.3660E+22	3.8767E-12	2.6892E-12	Calculated	0.02000	BETA	7.49251E+02	Calculated
+1625	Ta-190	1.4552E+24	2.2498E-13	1.5699E-13	Calculated	0.02000	BETA	4.88759E+02	Calculated
+1626	W-171	1.7094E+22	2.0318E-11	2.4394E-12	Calculated	0.02000	BETA	5.85630E+02	Calculated
1627	W-172	6.0691E+21	1.5167E-11	1.7540E-12	Calculated	0.02000	BETA	1.24750E+03	Calculated
1628	W-173	5.0494E+21	8.3203E-12	8.5346E-13	Calculated	0.02000	BETA	5.98802E+03	Calculated
1629	W-174	1.3635E+21	5.8891E-11	7.2022E-12	Calculated	0.02000	BETA	1.60429E+03	Calculated
1630	W-175	1.1696E+21	8.9392E-11	1.0514E-11	Calculated	0.02000	BETA	9.09100E+02	Calculated
>1631	W-176	2.6361E+20	1.0000E-10	4.1000E-11	ICRP72	0.02000	BETA	5.64135E+03	Calculated
1632	W-177	2.9124E+20	5.8000E-11	2.4000E-11	ICRP72	0.02000	BETA	1.09219E+03	Calculated
1633	W-178	1.2570E+18	2.2000E-10	7.2000E-11	ICRP72	5.00000	A2 VALUE	5.03444E+04	Calculated
1634	W-179	1.0367E+21	3.3000E-12	9.2000E-13	ICRP72	0.02000	BETA	1.84672E+04	Calculated
1635	W-179m	6.0746E+21	1.9063E-12	3.1666E-13	Calculated	0.02000	BETA	2.72480E+04	Calculated
>1637	W-181	2.2070E+17	7.6000E-11	2.7000E-11	ICRP72	30.00000	A2 VALUE	1.00000E+04	IAEA-G-1.7
1640	W-183m	4.3459E+23	3.1793E-14	3.7848E-15	Calculated	0.02000	BETA	6.95476E+03	Calculated
>1642	W-185	3.4782E+17	4.4000E-10	1.2000E-10	ICRP72	0.80000	A2 VALUE	1.00000E+06	IAEA-G-1.7
1643	W-185m	2.2569E+22	3.9382E-13	4.7925E-14	Calculated	0.02000	BETA	2.32894E+04	Calculated
>1645	W-187	2.6004E+19	6.3000E-10	1.9000E-10	ICRP72	0.60000	A2 VALUE	1.00000E+04	IAEA-G-1.7
1646	W-188	3.7014E+17	2.1000E-09	5.7000E-10	ICRP72	0.24000	A2 VALUE	8.43882E+04	Calculated
1647	W-189	3.2015E+21	3.2040E-11	3.7687E-12	Calculated	0.02000	BETA	7.61422E+02	Calculated
1648	W-190	1.2208E+21	9.4427E-11	1.1241E-11	Calculated	0.02000	BETA	5.07614E+03	Calculated
1649	W-191	2.1855E+24	9.2783E-14	1.1099E-14	Calculated	0.02000	BETA	4.54545E+02	Calculated
1650	W-192	2.8313E+22	4.4843E-12	5.3382E-13	Calculated	0.02000	BETA	1.53304E+03	Calculated
1651	W-193	2.1207E+22	1.3098E-11	1.5416E-12	Calculated	0.02000	BETA	7.65873E+02	Calculated
+1652	W-194	8.8087E+22	2.8885E-12	3.4445E-13	Calculated	0.02000	BETA	8.91266E+02	Calculated
+1653	Re-174	1.7389E+22	1.7433E-11	1.0692E-11	Calculated	0.02000	BETA	1.39535E+03	Calculated
+1654	Re-175	6.7495E+21	5.2122E-11	3.1463E-11	Calculated	0.02000	BETA	6.33367E+02	Calculated
+1655	Re-176	6.9776E+21	2.6826E-11	2.4542E-11	Calculated	0.02000	BETA	2.05903E+03	Calculated
+1656	Re-177	2.8083E+21	3.0313E-11	3.1723E-11	Calculated	0.02000	BETA	1.65691E+03	Calculated
1657	Re-178	2.9618E+21	2.5000E-11	1.4000E-11	ICRP72	0.02000	BETA	5.83090E+02	Calculated
1658	Re-179	1.9937E+21	4.0692E-11	2.6754E-11	Calculated	0.02000	BETA	9.26278E+02	Calculated
1659	Re-180	1.5888E+22	5.4915E-12	3.3325E-12	Calculated	0.02000	BETA	8.45094E+02	Calculated
1660	Re-181	3.2039E+19	4.2000E-10	2.5000E-10	ICRP72	0.02000	BETA	1.21536E+03	Calculated
1661	Re-182	9.9572E+18	1.4000E-09	1.2000E-09	ICRP72	0.02000	BETA	5.49753E+02	Calculated
1662	Re-182m	5.0200E+19	2.7000E-10	2.0000E-10	ICRP72	0.02000	BETA	8.20883E+02	Calculated
1663	Re-183	3.7713E+17	7.6000E-10	1.8000E-09	R245	0.02000	BETA	6.00962E+03	Calculated
1664	Re-184	6.9183E+17	1.0000E-09	1.9000E-09	ICRP72	1.00000	A2 VALUE	1.11495E+03	Calculated
1665	Re-184m	1.5868E+17	1.5000E-09	6.5000E-09	ICRP72	1.00000	A2 VALUE	2.48725E+03	Calculated
>1667	Re-186	6.8794E+18	1.5000E-09	1.1000E-09	ICRP72	0.60000	A2 VALUE	1.00000E+06	IAEA-G-1.7
1668	Re-186m	3.5631E+11	2.2000E-09	1.2000E-08	ICRP72	0.02000	BETA	1.49656E+04	Calculated
>1669	Re-187	1.4160E+06	5.1000E-12	6.3000E-12	ICRP72	-1.00000	A2 VALUE	1.00000E+03	IAEA-G-1.7
>1670	Re-188	3.6330E+19	1.4000E-09	5.4000E-10	ICRP72	0.40000	A2 VALUE	1.00000E+05	IAEA-G-1.7
1671	Re-188m	1.9900E+21	3.0000E-11	1.3000E-11	ICRP72	0.02000	BETA	1.21655E+04	Calculated
1672	Re-189	2.5252E+19	7.8000E-10	4.3000E-10	ICRP72	0.60000	A2 VALUE	1.08696E+04	Calculated
1673	Re-190	1.1814E+22	1.1061E-11	6.7120E-12	Calculated	0.02000	BETA	7.03730E+02	Calculated
1674	Re-190m	1.9108E+20	4.1000E-10	3.8000E-10	NRPB-M	0.02000	BETA	1.05097E+03	Calculated
1675	Re-191	3.7558E+21	1.2433E-11	7.7788E-12	Calculated	0.02000	BETA	1.33463E+04	Calculated
1676	Re-192	3.5072E+23	3.2160E-13	1.9516E-13	Calculated	0.02000	BETA	3.09745E+03	Calculated
1677	Re-193	2.1632E+24	1.2084E-13	7.2033E-14	Calculated	0.02000	BETA	4.54545E+02	Calculated
1678	Re-194	2.1517E+24	1.1548E-13	7.0257E-14	Calculated	0.02000	BETA	4.54545E+02	Calculated
1679	Re-195	2.0990E+23	1.0822E-12	6.0609E-13	Calculated	0.02000	BETA	7.63942E+02	Calculated
+1680	Re-196	5.3652E+23	6.4244E-13	3.8986E-13	Calculated	0.02000	BETA	4.84418E+02	Calculated
+1681	Re-197	4.3514E+23	7.8734E-13	4.7966E-13	Calculated	0.02000	BETA	6.15637E+02	Calculated
+1682	Re-198	9.2474E+23	4.6905E-13	2.8464E-13	Calculated	0.02000	BETA	4.27472E+02	Calculated
+1683	Os-175	2.8396E+22	2.8748E-11	3.0583E-11	Calculated	0.02000	BETA	5.14870E+02	Calculated
+1684	Os-176	1.3180E+22	3.3270E-11	4.6059E-11	Calculated	0.02000	BETA	9.40448E+02	Calculated
+1685	Os-177	1.4038E+22	2.8050E-11	3.6365E-11	Calculated	0.02000	BETA	6.13144E+02	Calculated
+1686	Os-178	7.8169E+21	3.1419E-11	3.2459E-11	Calculated	0.02000	BETA	1.17248E+03	Calculated
+1687	Os-179	5.9809E+21	5.5786E-11	6.1190E-11	Calculated	0.02000	BETA	7.55486E+02	Calculated
>1688	Os-180	1.7982E+21	1.7000E-11	1.5000E-11	ICRP72	0.02000	BETA	7.18570E+03	Calculated
1689	Os-181	1.4239E+22	4.1584E-12	4.4111E-12	Calculated	0.02000	BETA	2.62329E+03	Calculated
1690	Os-181m	3.6616E+20	8.9000E-11	6.5000E-11	ICRP72	0.02000	BETA	7.20254E+02	Calculated
1691	Os-182	2.8821E+19	5.6000E-10	3.8000E-10	ICRP72	0.02000	BETA	2.14460E+03	Calculated
1692	Os-183	4.8752E+19	2.0000E-10	2.3000E-10	NRPB-M	0.02000	BETA	1.56431E+03	Calculated
1693	Os-183m	6.4089E+19	1.9000E-10	2.1000E-10	NRPB-M	0.02000	BETA	9.97407E+02	Calculated

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
>1695	Os-185	2.7848E+17	5.1000E-10	1.6000E-09	ICRP72	1.00000	A2 VALUE	1.00000E+03	IAEA-G-1.7
>1696	Os-186	3.7413E+01	4.0092E-07	9.9830E-07	Calculated	0.00009	ALPHA	1.00000E+03	IAEA-G-1.7
1700	Os-189m	1.2769E+20	1.8000E-11	5.3000E-12	ICRP72	0.02000	BETA	2.25428E+05	Calculated
1702	Os-190m	3.6994E+21	4.0123E-11	4.2817E-11	Calculated	0.02000	BETA	6.24916E+02	Calculated
>1703	Os-191	1.6423E+18	5.7000E-10	1.9000E-09	ICRP72	2.00000	A2 VALUE	1.00000E+05	IAEA-G-1.7
>1704	Os-191m	4.6350E+19	9.6000E-11	1.6000E-10	ICRP72	30.00000	A2 VALUE	1.00000E+06	IAEA-G-1.7
1706	Os-192m	3.6856E+23	4.7695E-13	5.0898E-13	Calculated	0.02000	BETA	5.27398E+02	Calculated
>1707	Os-193	1.9701E+19	8.1000E-10	5.2000E-10	ICRP72	0.60000	A2 VALUE	1.00000E+05	IAEA-G-1.7
1708	Os-194	1.1387E+16	2.4000E-09	8.5000E-08	ICRP72	0.30000	A2 VALUE	1.80724E+05	Calculated
1709	Os-195	5.4897E+21	2.0011E-11	1.6683E-11	Calculated	0.02000	BETA	4.67822E+03	Calculated
>1710	Os-196	1.0172E+21	1.5365E-10	1.6397E-10	Calculated	0.02000	BETA	8.74973E+03	Calculated
1711	Os-197	6.2138E+23	3.5755E-13	3.8471E-13	Calculated	0.02000	BETA	1.26791E+03	Calculated
1712	Os-198	6.4087E+22	3.7442E-12	3.9956E-12	Calculated	0.02000	BETA	2.52525E+03	Calculated
1713	Os-199	5.7318E+22	6.7462E-12	8.0550E-12	Calculated	0.02000	BETA	7.95355E+02	Calculated
+1714	Os-200	1.3046E+23	3.4931E-12	3.6752E-12	Calculated	0.02000	BETA	1.04895E+03	Calculated
+1715	Os-201	2.2001E+23	2.7450E-12	2.8828E-12	Calculated	0.02000	BETA	6.43225E+02	Calculated
+1716	Ir-178	1.9547E+23	1.9658E-12	3.9037E-12	Calculated	0.02000	BETA	6.16017E+02	Calculated
+1717	Ir-179	2.9519E+22	1.3707E-11	2.7986E-11	Calculated	0.02000	BETA	5.63253E+02	Calculated
+1718	Ir-180	2.5773E+22	9.3745E-12	1.8598E-11	Calculated	0.02000	BETA	5.39569E+02	Calculated
+1719	Ir-181	7.8461E+21	1.7835E-11	3.5830E-11	Calculated	0.02000	BETA	7.27633E+02	Calculated
1720	Ir-182	2.5490E+21	4.8000E-11	2.4000E-11	ICRP72	0.02000	BETA	1.20948E+03	Calculated
1721	Ir-183	6.9138E+20	2.8941E-10	5.8375E-10	Calculated	0.02000	BETA	3.57119E+02	Calculated
1722	Ir-184	2.0875E+20	1.7000E-10	1.2000E-10	ICRP72	0.02000	BETA	5.73010E+02	Calculated
1723	Ir-185	4.5137E+19	2.6000E-10	1.9000E-10	ICRP72	0.02000	BETA	1.09092E+03	Calculated
1724	Ir-186	3.7474E+19	4.9000E-10	3.2000E-10	ICRP72	0.02000	BETA	6.12445E+02	Calculated
1725	Ir-186m	3.1177E+20	6.1000E-11	4.4000E-11	ICRP72	0.02000	BETA	6.93481E+02	Calculated
1726	Ir-187	5.9067E+19	1.2000E-10	7.9000E-11	ICRP72	0.02000	BETA	3.24797E+03	Calculated
1727	Ir-188	1.4865E+19	6.3000E-10	4.2000E-10	ICRP72	0.02000	BETA	4.75249E+02	Calculated
1728	Ir-189	1.9378E+18	2.4000E-10	6.0000E-10	ICRP72	10.00000	A2 VALUE	1.15492E+04	Calculated
>1729	Ir-190	2.1194E+18	1.2000E-09	2.4000E-09	ICRP72	0.70000	A2 VALUE	1.00000E+03	IAEA-G-1.7
1730	Ir-190m	5.4499E+20	8.0000E-12	1.0000E-11	ICRP72	0.02000	BETA	2.14268E+05	Calculated
1731	Ir-190n	1.9773E+20	1.2000E-10	8.3000E-11	ICRP72	0.02000	BETA	1.61914E+04	Calculated
1733	Ir-191m	4.4610E+23	2.1450E-14	4.3162E-14	Calculated	0.02000	BETA	1.17393E+04	Calculated
1734	Ir-191n	3.9744E+23	2.9110E-13	5.8574E-13	Calculated	0.02000	BETA	5.34009E+02	Calculated
>1735	Ir-192	3.4093E+17	1.4000E-09	6.6000E-09	ICRP72	0.60000	A2 VALUE	1.00000E+03	IAEA-G-1.7
>1736	Ir-192m	2.5168E+22	1.4361E-13	3.4021E-13	Calculated	0.02000	BETA	1.26872E+05	Calculated
>1737	Ir-192n	2.8592E+14	3.1000E-10	3.9000E-08	ICRP72	0.02000	BETA	5.10458E+04	Calculated
1739	Ir-193m	2.3616E+18	2.7000E-10	1.3000E-09	ICRP72	0.02000	BETA	1.02669E+05	Calculated
>1740	Ir-194	3.1216E+19	1.3000E-09	5.6000E-10	ICRP72	0.30000	A2 VALUE	1.00000E+05	IAEA-G-1.7
1741	Ir-194m	1.4541E+17	2.1000E-09	1.3000E-08	ICRP72	0.02000	BETA	4.27663E+02	Calculated
1742	Ir-195	2.3789E+20	1.0000E-10	7.1000E-11	ICRP72	0.02000	BETA	1.04167E+04	Calculated
1743	Ir-195m	1.5628E+20	2.1000E-10	1.7000E-10	ICRP72	0.02000	BETA	2.25530E+03	Calculated
1744	Ir-196	4.0963E+22	1.8507E-12	3.7240E-12	Calculated	0.02000	BETA	2.85714E+03	Calculated
1745	Ir-196m	4.2263E+20	1.2000E-10	1.6000E-10	NRPB-M	0.02000	BETA	3.97614E+02	Calculated
1746	Ir-197	6.0897E+21	1.0711E-11	2.1941E-11	Calculated	0.02000	BETA	3.36554E+03	Calculated
1747	Ir-197m	3.9686E+21	1.8382E-11	4.5404E-11	Calculated	0.02000	BETA	1.42769E+04	Calculated
1748	Ir-198	2.6356E+23	4.3700E-13	8.7932E-13	Calculated	0.02000	BETA	1.04895E+03	Calculated
1749	Ir-199	4.1373E+22	3.0452E-12	7.5591E-12	Calculated	0.02000	BETA	1.29870E+03	Calculated
1750	Ir-200	4.0214E+23	4.9751E-13	9.8048E-13	Calculated	0.02000	BETA	7.11339E+02	Calculated
+1751	Ir-201	1.1227E+23	2.1189E-12	4.1535E-12	Calculated	0.02000	BETA	7.23414E+02	Calculated
+1752	Ir-202	2.4313E+23	1.0823E-12	2.4010E-12	Calculated	0.02000	BETA	5.01337E+02	Calculated
+1753	Pt-181	4.5229E+22	4.0153E-11	7.8602E-12	Calculated	0.00009	ALPHA	4.98096E+08	Calculated
+1754	Pt-182	1.4705E+22	7.8400E-12	4.8271E-13	Calculated	0.00009	ALPHA	5.47786E+03	Calculated
+1755	Pt-183	5.8499E+21	2.9415E-11	5.7726E-12	Calculated	0.00009	ALPHA	6.79934E+08	Calculated
+1756	Pt-183m	5.3058E+22	4.4030E-12	8.6352E-13	Calculated	0.02000	BETA	8.49762E+02	Calculated
1757	Pt-184	2.1860E+21	5.5078E-11	9.0092E-12	Calculated	0.00009	ALPHA	5.50767E+02	Calculated
1758	Pt-185	5.2977E+20	3.7270E-10	7.0591E-11	Calculated	0.02000	BETA	3.75000E+02	Calculated
1759	Pt-185m	1.1398E+21	1.5947E-10	3.0116E-11	Calculated	0.02000	BETA	3.17682E+02	Calculated
1760	Pt-186	3.1176E+20	9.3000E-11	3.3000E-11	ICRP72	0.00009	ALPHA	1.52940E+03	Calculated
1761	Pt-187	2.6391E+20	3.7979E-10	7.1312E-11	Calculated	0.02000	BETA	9.40448E+02	Calculated
1762	Pt-188	2.5236E+18	7.6000E-10	4.2000E-10	ICRP72	0.80000	A2 VALUE	4.94306E+03	Calculated
1763	Pt-189	5.6353E+19	1.2000E-10	3.8000E-11	ICRP72	0.02000	BETA	3.31016E+03	Calculated
>1764	Pt-190	1.0565E+05	8.2000E-09	2.3000E-07	R245	0.00009	ALPHA	1.00000E+03	IAEA-G-1.7
>1765	Pt-191	8.7088E+18	3.4000E-10	1.1000E-10	ICRP72	3.00000	A2 VALUE	1.00000E+04	IAEA-G-1.7
1767	Pt-193	1.3710E+15	3.1000E-11	2.1000E-11	ICRP72	40.00000	A2 VALUE	2.89296E+04	Calculated
>1768	Pt-193m	5.7690E+18	4.5000E-10	1.2000E-10	ICRP72	0.50000	A2 VALUE	1.00000E+06	IAEA-G-1.7
1771	Pt-195m	6.1647E+18	6.3000E-10	1.8000E-10	ICRP72	0.50000	A2 VALUE	1.07643E+04	Calculated
>1773	Pt-197	2.9595E+19	4.0000E-10	8.5000E-11	ICRP72	0.60000	A2 VALUE	1.00000E+06	IAEA-G-1.7
>1774	Pt-197m	3.7063E+20	8.4000E-11	2.4000E-11	ICRP72	0.60000	A2 VALUE	1.00000E+05	IAEA-G-1.7
1776	Pt-199	1.1352E+21	3.9000E-11	1.2000E-11	ICRP72	0.02000	BETA	3.92157E+03	Calculated
1777	Pt-199m	1.5426E+23	4.1055E-13	1.1250E-13	Calculated	0.02000	BETA	2.87274E+03	Calculated
1778	Pt-200	4.6387E+19	1.2000E-09	2.2000E-10	ICRP72	0.02000	BETA	1.23215E+04	Calculated
1779	Pt-201	1.3847E+22	6.5481E-12	1.2073E-12	Calculated	0.02000	BETA	1.05003E+03	Calculated
>1780	Pt-202	1.3047E+19	4.8103E-09	1.2899E-09	Calculated	0.02000	BETA	1.47452E+04	Calculated



ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
+1781	Pt-203	5.0036E+22	2.3816E-12	4.6807E-13	Calculated	0.02000	BETA	9.77517E+02	Calculated
+1782	Au-185	8.6798E+21	6.2692E-11	5.8493E-11	Calculated	0.02000	BETA	5.74168E+02	Calculated
+1783	Au-186	3.5072E+21	8.1527E-11	8.7306E-11	Calculated	0.02000	BETA	4.65766E+02	Calculated
1784	Au-187	4.4298E+21	5.5580E-10	5.2682E-10	Calculated	0.00009	ALPHA	5.33117E+02	Calculated
1785	Au-187m	9.7071E+23	2.5457E-12	2.4130E-12	Calculated	0.02000	BETA	8.29807E+03	Calculated
1786	Au-188	4.1901E+21	3.7949E-11	3.7284E-11	Calculated	0.02000	BETA	4.86808E+02	Calculated
1787	Au-189	1.2828E+21	6.1335E-11	6.3052E-11	Calculated	0.02000	BETA	1.17925E+03	Calculated
1788	Au-189m	8.0211E+21	1.2771E-11	1.2898E-11	Calculated	0.02000	BETA	3.21602E+03	Calculated
1789	Au-190	8.5501E+20	1.7438E-10	1.6572E-10	Calculated	0.02000	BETA	5.01756E+02	Calculated
1790	Au-191	1.9174E+20	6.6000E-11	8.6000E-11	NRPB-M	0.02000	BETA	1.68296E+03	Calculated
1791	Au-191m	2.3760E+24	1.2898E-14	1.4135E-14	Calculated	0.02000	BETA	5.11509E+03	Calculated
1792	Au-192	1.2216E+20	1.7000E-10	2.0000E-10	NRPB-M	0.02000	BETA	5.24054E+02	Calculated
>1793	Au-192m	1.3590E+25	3.8452E-15	3.9997E-15	Calculated	0.02000	BETA	5.80369E+03	Calculated
1794	Au-193	3.4066E+19	1.3000E-10	1.2000E-10	ICRP72	2.00000	A2 VALUE	7.04151E+03	Calculated
1795	Au-193m	5.5467E+23	4.0272E-14	3.8053E-14	Calculated	0.02000	BETA	5.82140E+03	Calculated
1796	Au-194	1.5720E+19	4.2000E-10	2.4000E-10	ICRP72	1.00000	A2 VALUE	9.81797E+02	Calculated
1797	Au-194m	3.5867E+24	1.9053E-15	1.1132E-15	Calculated	0.02000	BETA	3.12500E+05	Calculated
1798	Au-194n	5.1239E+24	2.9956E-15	2.3586E-15	Calculated	0.02000	BETA	8.26446E+03	Calculated
1799	Au-195	1.3316E+17	2.5000E-10	1.7000E-09	ICRP72	6.00000	A2 VALUE	1.10011E+04	Calculated
1800	Au-195m	7.0197E+22	3.2012E-13	3.0699E-13	Calculated	0.02000	BETA	4.71076E+03	Calculated
1801	Au-196	3.9874E+28	4.4000E-10	3.7000E-10	R245	0.02000	BETA	2.09096E+03	Calculated
1802	Au-196m	2.6297E+23	2.8411E-14	2.6270E-14	Calculated	0.02000	BETA	9.43396E+04	Calculated
1803	Au-196n	6.1034E+19	4.5000E-10	7.1000E-10	NRPB-M	0.02000	BETA	3.61011E+03	Calculated
1805	Au-197m	2.7381E+23	1.0640E-13	1.0112E-13	Calculated	0.02000	BETA	4.10135E+03	Calculated
>1806	Au-198	9.0577E+18	1.0000E-09	8.6000E-10	ICRP72	0.60000	A2 VALUE	1.00000E+04	IAEA-G-1.7
1807	Au-198m	1.0611E+19	1.3000E-09	2.0000E-09	ICRP72	0.02000	BETA	1.80495E+03	Calculated
>1808	Au-199	7.7354E+18	4.4000E-10	7.9000E-10	ICRP72	0.60000	A2 VALUE	1.00000E+05	IAEA-G-1.7
1809	Au-200	7.1881E+20	6.8000E-11	3.5000E-11	ICRP72	0.02000	BETA	2.88184E+03	Calculated
1810	Au-200m	3.1017E+19	1.1000E-09	7.2000E-10	ICRP72	0.02000	BETA	4.98753E+02	Calculated
1811	Au-201	1.3314E+21	2.4000E-11	1.7000E-11	ICRP72	0.02000	BETA	1.30890E+04	Calculated
1812	Au-202	7.1761E+22	1.3466E-12	1.2796E-12	Calculated	0.02000	BETA	3.62427E+03	Calculated
1813	Au-203	3.8802E+22	1.4190E-12	1.3659E-12	Calculated	0.02000	BETA	7.12593E+03	Calculated
1814	Au-204	5.1417E+22	3.6531E-12	3.4716E-12	Calculated	0.02000	BETA	5.03651E+02	Calculated
+1815	Au-205	6.5684E+22	2.8638E-12	2.7215E-12	Calculated	0.02000	BETA	8.23803E+02	Calculated
+1816	Au-206	1.2745E+24	2.9134E-13	2.7686E-13	Calculated	0.02000	BETA	4.14479E+02	Calculated
+1817	Hg-186	2.7043E+22	1.1586E-11	9.5399E-12	Calculated	0.00009	ALPHA	2.36407E+03	Calculated
+1818	Hg-187	1.5504E+22	3.1902E-10	2.3624E-10	Calculated	0.00009	ALPHA	2.47170E+02	Calculated
+1819	Hg-187m	1.9584E+22	1.2014E-10	8.8848E-11	Calculated	0.00009	ALPHA	1.66472E+08	Calculated
+1820	Hg-188	1.1388E+22	5.9453E-10	4.4114E-10	Calculated	0.00009	ALPHA	1.54854E+03	Calculated
+1821	Hg-189	4.8442E+21	4.5746E-10	3.4011E-10	Calculated	0.00009	ALPHA	3.14369E+02	Calculated
+1822	Hg-189m	4.2317E+21	5.5253E-11	4.2043E-11	Calculated	0.02000	BETA	7.09728E+02	Calculated
1823	Hg-190	1.8311E+21	8.8307E-11	6.5474E-11	Calculated	0.02000	BETA	4.73516E+03	Calculated
1824	Hg-191	7.5373E+20	1.5549E-10	1.1970E-10	Calculated	0.02000	BETA	1.83836E+03	Calculated
1825	Hg-191m	7.1667E+20	1.6873E-10	1.2975E-10	Calculated	0.02000	BETA	6.84885E+02	Calculated
1826	Hg-192	1.2425E+20	2.2000E-10	2.2000E-10	NRPB-M	0.02000	BETA	3.85386E+03	Calculated
1827	Hg-193	1.5790E+20	8.2000E-11	7.5000E-11	ICRP72	0.02000	BETA	1.16551E+03	Calculated
1828	Hg-193m	5.0898E+19	4.0000E-10	2.6000E-10	ICRP72	0.02000	BETA	8.85308E+02	Calculated
1829	Hg-194	1.3122E+14	5.1000E-08	1.4000E-08	ICRP72	1.00000	A2 VALUE	3.92157E+05	Calculated
1830	Hg-195	6.0140E+19	9.7000E-11	7.3000E-11	ICRP72	0.02000	BETA	4.88998E+03	Calculated
1831	Hg-195m	1.4273E+19	5.6000E-10	5.3000E-10	ICRP72	0.70000	A2 VALUE	4.60193E+03	Calculated
>1833	Hg-197	9.1127E+18	2.3000E-10	3.0000E-10	ICRP72	10.00000	A2 VALUE	1.00000E+05	IAEA-G-1.7
>1834	Hg-197m	2.4631E+19	4.7000E-10	5.3000E-10	ICRP72	0.40000	A2 VALUE	1.00000E+05	IAEA-G-1.7
1837	Hg-199m	8.3054E+20	3.1000E-11	3.2000E-11	ICRP72	0.02000	BETA	4.55923E+03	Calculated
>1841	Hg-203	5.1084E+17	1.9000E-09	2.4000E-09	ICRP72	1.00000	A2 VALUE	1.00000E+04	IAEA-G-1.7
1843	Hg-205	6.5271E+21	5.4397E-12	4.0332E-12	Calculated	0.02000	BETA	1.65260E+04	Calculated
>1844	Hg-206	4.1443E+21	1.6768E-11	1.2433E-11	Calculated	0.02000	BETA	1.00000E+03	IAEA-G-1.7
1845	Hg-207	1.1590E+22	2.6855E-11	1.9911E-11	Calculated	0.02000	BETA	3.47303E+02	Calculated
1846	Hg-208	7.9642E+20	4.9351E-10	3.6591E-10	Calculated	0.02000	BETA	8.56825E+02	Calculated
1847	Hg-209	3.5477E+22	1.0928E-11	8.1021E-12	Calculated	0.02000	BETA	5.97693E+02	Calculated
+1848	Tl-192	3.3555E+21	8.7874E-12	7.9876E-12	Calculated	0.02000	BETA	4.98915E+02	Calculated
1849	Tl-193	1.6538E+21	6.0945E-12	5.5187E-12	Calculated	0.02000	BETA	1.76888E+03	Calculated
1850	Tl-193m	1.7086E+22	8.0849E-13	7.2231E-13	Calculated	0.02000	BETA	2.67113E+03	Calculated
1851	Tl-194	1.0869E+21	8.1000E-12	4.4000E-12	ICRP72	0.02000	BETA	1.40469E+03	Calculated
1852	Tl-194m	1.0935E+21	4.0000E-11	1.9000E-11	ICRP72	0.02000	BETA	3.94166E+02	Calculated
1853	Tl-195	5.1219E+20	2.7000E-11	1.5000E-11	ICRP72	0.02000	BETA	8.36855E+02	Calculated
1854	Tl-195m	5.9471E+23	3.2816E-14	2.1149E-14	Calculated	0.02000	BETA	2.69034E+03	Calculated
1855	Tl-196	3.2176E+20	4.9000E-11	6.6000E-11	NRPB-M	0.02000	BETA	5.49753E+02	Calculated
1856	Tl-196m	4.1930E+20	1.7000E-11	2.6000E-11	NRPB-M	0.02000	BETA	8.82784E+02	Calculated
1857	Tl-197	2.0736E+20	2.3000E-11	1.4000E-11	ICRP72	0.02000	BETA	2.37552E+03	Calculated
1858	Tl-197m	3.9245E+24	3.0316E-15	2.3031E-15	Calculated	0.02000	BETA	2.21288E+03	Calculated
1859	Tl-198	1.1039E+20	7.3000E-11	6.0000E-11	ICRP72	0.02000	BETA	4.99718E+02	Calculated
1860	Tl-198m	3.1330E+20	5.4000E-11	3.7000E-11	ICRP72	0.02000	BETA	8.24198E+02	Calculated
1861	Tl-199	7.8574E+19	2.6000E-11	1.9000E-11	ICRP72	0.02000	BETA	3.93267E+03	Calculated
>1862	Tl-200	2.2207E+19	2.0000E-10	1.3000E-10	ICRP72	0.90000	A2 VALUE	1.00000E+04	IAEA-G-1.7

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
>1863	Tl-201	7.9052E+18	9.5000E-11	4.4000E-11	ICRP72	4.00000	A2 VALUE	1.00000E+05	IAEA-G-1.7
>1864	Tl-202	1.9543E+18	4.5000E-10	1.9000E-10	ICRP72	2.00000	A2 VALUE	1.00000E+04	IAEA-G-1.7
>1866	Tl-204	1.7110E+16	1.2000E-09	3.9000E-10	ICRP72	0.70000	A2 VALUE	1.00000E+03	IAEA-G-1.7
>1868	Tl-206	8.0419E+21	7.5554E-13	6.5030E-13	Calculated	0.02000	BETA	1.00000E+03	IAEA-G-1.7
1869	Tl-206m	8.9830E+21	3.9966E-12	3.4399E-12	Calculated	0.02000	BETA	3.99232E+02	Calculated
1870	Tl-207	7.0467E+21	7.8844E-13	6.7862E-13	Calculated	0.02000	BETA	1.90563E+04	Calculated
1871	Tl-207m	1.5164E+24	1.3597E-14	1.1703E-14	Calculated	0.02000	BETA	8.50499E+02	Calculated
>1872	Tl-208	1.0949E+22	4.0614E-12	3.4957E-12	Calculated	0.02000	BETA	1.00000E+03	IAEA-G-1.7
1873	Tl-209	1.5132E+22	2.2085E-12	1.9009E-12	Calculated	0.02000	BETA	4.56475E+02	Calculated
>1874	Tl-210	2.5485E+22	1.5587E-12	1.4394E-12	Calculated	0.02000	BETA	1.00000E+03	IAEA-G-1.7
+1875	Pb-193	6.2158E+21	2.6459E-11	2.8716E-11	Calculated	0.02000	BETA	1.31406E+03	Calculated
+1876	Pb-194	2.9888E+21	3.3327E-11	3.0516E-11	Calculated	0.00009	ALPHA	9.29878E+02	Calculated
1877	Pb-195	2.3788E+21	3.2318E-11	2.4817E-11	Calculated	0.02000	BETA	3.38867E+03	Calculated
1878	Pb-195m	2.3788E+21	2.9000E-11	2.7000E-11	ICRP72	0.02000	BETA	5.84624E+02	Calculated
1879	Pb-196	9.5946E+20	1.5526E-10	2.1015E-10	Calculated	0.02000	BETA	1.13324E+03	Calculated
1880	Pb-197	3.5320E+21	3.1730E-11	3.2083E-11	Calculated	0.02000	BETA	5.93120E+02	Calculated
1881	Pb-197m	7.9074E+20	1.4150E-10	1.4306E-10	Calculated	0.02000	BETA	8.37802E+02	Calculated
1882	Pb-198	2.4517E+20	1.0000E-10	7.0000E-11	ICRP72	0.02000	BETA	2.29938E+03	Calculated
1883	Pb-199	3.8850E+20	5.4000E-11	3.7000E-11	ICRP72	0.02000	BETA	8.68056E+02	Calculated
1884	Pb-199m	2.8660E+21	1.4743E-11	1.3121E-11	Calculated	0.02000	BETA	5.67543E+03	Calculated
1885	Pb-200	2.6969E+19	4.0000E-10	3.5000E-10	ICRP72	0.02000	BETA	4.60660E+03	Calculated
1886	Pb-201	6.1377E+19	1.6000E-10	1.2000E-10	ICRP72	1.00000	A2 VALUE	1.29219E+03	Calculated
1887	Pb-201m	3.4049E+22	1.2338E-12	1.2280E-12	Calculated	0.02000	BETA	2.54868E+03	Calculated
1888	Pb-202	1.2357E+12	8.8000E-09	1.2000E-08	ICRP72	20.00000	A2 VALUE	1.41050E+04	Calculated
1889	Pb-202m	1.6081E+20	1.3000E-10	1.0000E-10	ICRP72	0.02000	BETA	5.02673E+02	Calculated
>1890	Pb-203	1.1009E+19	2.4000E-10	2.2000E-10	ICRP72	3.00000	A2 VALUE	1.00000E+04	IAEA-G-1.7
1891	Pb-203m	3.2695E+23	1.3612E-13	1.4443E-13	Calculated	0.02000	BETA	1.48985E+03	Calculated
1892	Pb-203n	4.2845E+24	3.5521E-14	3.7919E-14	Calculated	0.02000	BETA	5.18616E+02	Calculated
>1893	Pb-204	4.6320E-01	1.7474E-07	4.3634E-07	Calculated	0.00009	ALPHA	1.00000E+03	IAEA-G-1.7
1894	Pb-204m	5.0530E+20	2.1815E-10	2.3346E-10	Calculated	0.02000	BETA	4.78241E+02	Calculated
1895	Pb-205	4.2177E+09	2.8000E-10	8.5000E-10	ICRP72	-1.00000	A2 VALUE	1.66143E+04	Calculated
1898	Pb-207m	2.5053E+24	3.2423E-14	3.4698E-14	Calculated	0.02000	BETA	6.12370E+02	Calculated
>1900	Pb-209	1.7056E+20	5.7000E-11	6.1000E-11	ICRP72	0.02000	BETA	1.00000E+03	IAEA-G-1.7
>1901	Pb-210	2.8248E+15	6.9000E-07	5.6000E-06	ICRP72	0.02600	A2 VALUE	1.00000E+03	IAEA-G-1.7
1902	Pb-211	9.1340E+20	1.8000E-10	1.2000E-08	ICRP72	0.02000	BETA	8.82143E+03	Calculated
>1903	Pb-212	5.1406E+19	6.0000E-09	1.9000E-07	ICRP72	0.20000	A2 VALUE	1.00000E+03	IAEA-G-1.7
1904	Pb-213	3.2022E+21	3.2314E-10	1.0336E-07	Calculated	0.02000	BETA	1.29871E+03	Calculated
>1905	Pb-214	1.2130E+21	1.4000E-10	1.5000E-08	ICRP72	0.02000	BETA	1.00000E+03	IAEA-G-1.7
+1906	Bi-196	7.6069E+21	7.1683E-12	3.7232E-12	Calculated	0.02000	BETA	5.11248E+02	Calculated
+1907	Bi-197	3.7973E+21	1.0964E-11	5.0304E-12	Calculated	0.00009	ALPHA	5.61850E+02	Calculated
+1908	Bi-197m	7.0069E+21	7.4932E-11	3.5137E-11	Calculated	0.00009	ALPHA	1.06782E+03	Calculated
+1909	Bi-198	3.4113E+21	1.0944E-11	4.9611E-12	Calculated	0.02000	BETA	4.15657E+02	Calculated
+1910	Bi-198m	2.9654E+21	1.1770E-11	5.3226E-12	Calculated	0.02000	BETA	4.73030E+02	Calculated
+1911	Bi-198n	2.7382E+23	1.4325E-13	6.5047E-14	Calculated	0.02000	BETA	8.27815E+03	Calculated
+1912	Bi-199	1.2950E+21	1.8160E-11	8.1140E-12	Calculated	0.02000	BETA	7.32065E+02	Calculated
+1913	Bi-199m	1.4155E+21	2.2556E-12	6.8752E-13	Calculated	0.00009	ALPHA	8.86672E+09	Calculated
1914	Bi-200	9.5750E+20	5.1000E-11	3.3000E-11	ICRP72	0.02000	BETA	4.13223E+02	Calculated
1915	Bi-200m	1.1222E+21	1.4211E-11	6.5449E-12	Calculated	0.02000	BETA	6.42624E+02	Calculated
1916	Bi-201	3.2052E+20	1.2000E-10	6.6000E-11	ICRP72	0.02000	BETA	5.33789E+02	Calculated
1917	Bi-201m	5.8506E+20	2.8412E-12	9.8370E-13	Calculated	0.00009	ALPHA	7.03940E+09	Calculated
1918	Bi-202	3.4387E+20	8.9000E-11	5.5000E-11	ICRP72	0.02000	BETA	3.61781E+02	Calculated
1919	Bi-203	4.8571E+19	4.8000E-10	2.6000E-10	ICRP72	0.00009	ALPHA	4.20785E+02	Calculated
1920	Bi-203m	6.7871E+24	4.4759E-15	2.3489E-15	Calculated	0.02000	BETA	1.06383E+03	Calculated
1921	Bi-204	5.0654E+19	1.0000E-09	9.2000E-10	NRPB-M	0.02000	BETA	3.10752E+02	Calculated
1922	Bi-205	1.5393E+18	9.0000E-10	9.3000E-10	ICRP72	0.70000	A2 VALUE	5.90559E+02	Calculated
>1923	Bi-206	3.7570E+18	1.9000E-09	1.7000E-09	ICRP72	0.30000	A2 VALUE	1.00000E+03	IAEA-G-1.7
>1924	Bi-207	2.0122E+15	1.3000E-09	5.6000E-09	ICRP72	0.70000	A2 VALUE	1.00000E+02	IAEA-G-1.7
1925	Bi-208	1.7282E+11	1.4000E-09	4.0000E-09	R245	0.02000	BETA	3.76196E+02	Calculated
1926	Bi-208m	7.7792E+26	1.4821E-17	6.9530E-18	Calculated	0.02000	BETA	6.63482E+02	Calculated
>1928	Bi-210	4.5896E+18	1.3000E-09	9.3000E-08	ICRP72	0.60000	A2 VALUE	1.00000E+03	IAEA-G-1.7
1929	Bi-210m	2.0997E+10	1.5000E-08	3.4000E-06	ICRP72	0.02000	A2 VALUE	3.76203E+03	Calculated
>1930	Bi-211	1.5195E+22	6.3982E-11	3.0015E-11	Calculated	0.00009	ALPHA	1.00000E+03	IAEA-G-1.7
>1931	Bi-212	5.4199E+20	2.6000E-10	3.1000E-08	ICRP72	0.60000	A2 VALUE	1.00000E+03	IAEA-G-1.7
1932	Bi-212m	1.3127E+21	6.5778E-10	3.0858E-10	Calculated	0.00009	ALPHA	1.47767E+05	Calculated
1933	Bi-212n	3.6464E+21	4.6770E-10	2.1941E-10	Calculated	0.02000	BETA	7.64811E+03	Calculated
1934	Bi-213	7.1645E+20	2.0000E-10	3.0000E-08	ICRP72	0.00009	ALPHA	5.75935E+03	Calculated
>1935	Bi-214	1.6337E+21	1.1000E-10	1.4000E-08	ICRP72	0.00009	ALPHA	1.00000E+03	IAEA-G-1.7
>1936	Bi-215	4.3727E+21	2.5213E-10	2.7548E-10	Calculated	0.02000	BETA	1.00000E+03	IAEA-G-1.7
1937	Po-202	7.7114E+20	1.2029E-09	2.1909E-09	Calculated	0.00009	ALPHA	1.16850E+03	Calculated
>1938	Po-203	9.3475E+20	4.6000E-11	3.6000E-11	ICRP72	0.00009	ALPHA	1.00000E+04	IAEA-G-1.7
1939	Po-203m	2.8562E+22	1.0288E-11	1.5003E-11	Calculated	0.02000	BETA	6.15915E+02	Calculated
1940	Po-204	1.6101E+20	1.0000E-09	2.7000E-08	NRPB-M	0.00009	ALPHA	8.55432E+02	Calculated
>1941	Po-205	3.4053E+20	5.8000E-11	6.9000E-11	ICRP72	0.00009	ALPHA	1.00000E+04	IAEA-G-1.7
1942	Po-206	2.6665E+18	1.3000E-07	1.1000E-11	R245	0.00009	ALPHA	8.30496E+02	Calculated

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
>1943	Po-207	9.6586E+19	1.1000E-10	8.2000E-11	ICRP72	0.00009	ALPHA	1.00000E+04	IAEA-G-1.7
1944	Po-207m	7.2284E+23	2.5357E-13	3.8147E-13	Calculated	0.02000	BETA	8.95415E+02	Calculated
1945	Po-208	2.1706E+16	7.7000E-07	2.4000E-06	R245	0.00009	ALPHA	2.59740E+04	Calculated
1946	Po-209	6.2053E+14	7.7000E-07	2.4000E-06	R245	0.00009	ALPHA	2.59740E+04	Calculated
>1947	Po-210	1.6624E+17	1.2000E-06	4.3000E-06	ICRP72	0.02000	A2 VALUE	1.00000E+03	IAEA-G-1.7
>1948	Po-211	3.8342E+24	4.8715E-12	7.5563E-12	Calculated	0.00009	ALPHA	1.00000E+03	IAEA-G-1.7
>1954	Po-211m	7.7586E+22	2.4196E-10	3.7531E-10	Calculated	0.00009	ALPHA	6.70737E+02	Calculated
>1950	Po-212	6.5636E+30	3.3427E-18	5.1849E-18	Calculated	0.00009	ALPHA	1.00000E+03	IAEA-G-1.7
1951	Po-212m	1.3867E+32	3.2258E-21	5.0035E-21	Calculated	0.00009	ALPHA	8.82316E+02	Calculated
1952	Po-212n	4.3660E+22	6.6154E-10	1.0261E-09	Calculated	0.00009	ALPHA	1.09565E+04	Calculated
1953	Po-213	4.6662E+29	4.4668E-17	6.9285E-17	Calculated	0.00009	ALPHA	4.25293E+07	Calculated
>1954	Po-214	1.1822E+28	1.6089E-15	2.4997E-15	Calculated	0.00009	ALPHA	1.00000E+03	IAEA-G-1.7
>1955	Po-215	1.0907E+27	1.7044E-14	6.1917E-14	Calculated	0.00009	ALPHA	1.00000E+03	IAEA-G-1.7
>1956	Po-216	1.3328E+25	1.3035E-12	4.5629E-12	Calculated	0.00009	ALPHA	1.00000E+03	IAEA-G-1.7
1957	Po-217	1.9236E+23	9.6514E-11	6.3046E-09	Calculated	0.00009	ALPHA	2.07225E+08	Calculated
>1958	Po-218	1.0463E+22	1.4328E-09	8.4248E-09	Calculated	0.00009	ALPHA	1.00000E+03	IAEA-G-1.7
1959	Po-219	2.0784E+23	1.6242E-10	4.3471E-10	Calculated	0.02000	BETA	1.44300E+03	Calculated
1960	At-205	1.2970E+21	1.8623E-10	1.8679E-09	Calculated	0.00009	ALPHA	9.11577E+02	Calculated
1961	At-206	1.1514E+21	9.9360E-11	5.7951E-10	Calculated	0.00009	ALPHA	4.00038E+02	Calculated
1962	At-207	3.1121E+20	2.4000E-10	2.3000E-09	ICRP72	0.00009	ALPHA	4.99725E+02	Calculated
1963	At-208	3.4190E+20	2.0045E-10	2.0889E-09	Calculated	0.00009	ALPHA	3.28694E+02	Calculated
1964	At-209	1.0253E+20	1.1849E-09	1.1860E-08	Calculated	0.00009	ALPHA	4.35996E+02	Calculated
1965	At-210	6.8077E+19	5.9715E-09	6.4654E-08	Calculated	0.00009	ALPHA	3.35917E+02	Calculated
>1966	At-211	7.6181E+19	1.1000E-08	1.1000E-07	ICRP72	0.50000	A2 VALUE	1.00000E+06	IAEA-G-1.7
1967	At-212	6.2510E+24	4.2720E-13	4.2678E-12	Calculated	0.00009	ALPHA	4.68161E+10	Calculated
1968	At-212m	1.6547E+25	1.6526E-13	1.6510E-12	Calculated	0.00009	ALPHA	8.27417E+04	Calculated
1969	At-213	1.7816E+31	1.7626E-19	1.7608E-18	Calculated	0.00009	ALPHA	1.13471E+17	Calculated
1970	At-214	3.4957E+30	8.7161E-19	1.4713E-17	Calculated	0.00009	ALPHA	2.29459E+16	Calculated
>1971	At-215	1.9415E+28	2.5803E-16	2.5777E-15	Calculated	0.00009	ALPHA	1.00000E+03	IAEA-G-1.7
1972	At-216	6.4416E+27	4.6332E-16	1.3327E-13	Calculated	0.00009	ALPHA	1.50073E+13	Calculated
1973	At-217	5.9553E+25	4.5869E-14	1.8272E-11	Calculated	0.00009	ALPHA	3.24467E+06	Calculated
>1974	At-218	1.1967E+24	2.2410E-12	9.6444E-10	Calculated	0.00009	ALPHA	1.00000E+03	IAEA-G-1.7
>1975	At-219	3.5295E+22	1.3249E-10	2.2882E-09	Calculated	0.00009	ALPHA	1.00000E+03	IAEA-G-1.7
1976	At-220	8.4774E+21	5.3220E-10	8.8314E-09	Calculated	0.02000	BETA	8.63334E+02	Calculated
1977	At-221	1.3686E+22	3.4824E-10	7.9590E-08	Calculated	0.02000	BETA	1.42714E+03	Calculated
1978	At-222	3.4817E+22	8.1061E-11	2.7621E-09	Calculated	0.02000	BETA	7.03087E+02	Calculated
1979	Rn-208	1.3737E+21	3.0309E-09	4.8932E-09	Calculated	0.00009	ALPHA	1.85082E+03	Calculated
1980	Rn-209	1.1680E+21	1.2348E-09	1.7136E-09	Calculated	0.00009	ALPHA	9.22211E+02	Calculated
1981	Rn-210	2.3114E+20	2.7000E-08	3.6661E-08	Calculated	0.00009	ALPHA	1.61760E+04	Calculated
1982	Rn-211	3.7612E+19	9.4234E-08	1.3084E-07	Calculated	0.00009	ALPHA	5.22000E+02	Calculated
1983	Rn-212	1.3674E+21	4.8291E-09	6.7075E-09	Calculated	0.00009	ALPHA	4.14154E+06	Calculated
1984	Rn-213	7.8392E+25	1.0810E-13	1.4999E-13	Calculated	0.00009	ALPHA	1.85012E+11	Calculated
1985	Rn-214	7.2245E+30	1.3166E-18	1.8476E-18	Calculated	0.00009	ALPHA	1.51905E+16	Calculated
1986	Rn-215	8.4413E+29	1.9830E-17	2.7514E-17	Calculated	0.00009	ALPHA	1.00857E+15	Calculated
1987	Rn-216	4.2945E+28	4.0522E-16	5.6224E-16	Calculated	0.00009	ALPHA	4.93562E+13	Calculated
1988	Rn-217	3.5622E+27	4.6573E-15	6.4621E-15	Calculated	0.00009	ALPHA	6.18213E+06	Calculated
>1989	Rn-218	5.4707E+25	2.7744E-13	3.8528E-13	Calculated	0.00009	ALPHA	1.00000E+03	IAEA-G-1.7
>1990	Rn-219	4.8130E+23	3.0312E-11	7.1841E-11	Calculated	0.00009	ALPHA	1.00000E+03	IAEA-G-1.7
>1991	Rn-220	3.4124E+22	3.9775E-10	9.1952E-10	Calculated	0.00009	ALPHA	1.00000E+03	IAEA-G-1.7
1992	Rn-221	1.2591E+21	1.1425E-08	3.6418E-07	Calculated	0.00009	ALPHA	7.93821E+03	Calculated
>1993	Rn-222	5.6891E+18	1.4815E-06	7.0863E-06	Calculated	0.00400	A2 VALUE	1.00000E+03	IAEA-G-1.7
1994	Rn-223	1.2890E+21	5.3340E-11	5.3552E-11	Calculated	0.02000	BETA	2.54690E+03	Calculated
1995	Rn-224	2.9023E+20	3.1163E-10	4.3673E-10	Calculated	0.02000	BETA	3.86663E+03	Calculated
1996	Rn-225	6.8703E+21	2.0680E-11	2.8871E-11	Calculated	0.02000	BETA	1.14064E+03	Calculated
1997	Fr-218	1.9147E+27	1.4009E-12	5.4690E-12	Calculated	0.00009	ALPHA	1.42763E+10	Calculated
1998	Fr-219	9.0760E+25	3.8704E-11	1.1057E-10	Calculated	0.00009	ALPHA	5.16744E+08	Calculated
1999	Fr-220	6.9244E+22	3.5436E-08	1.7027E-06	Calculated	0.00009	ALPHA	1.07508E+05	Calculated
2000	Fr-221	6.4240E+21	3.5610E-07	2.3119E-05	Calculated	0.00009	ALPHA	3.25688E+04	Calculated
2001	Fr-222	2.1761E+21	7.2000E-10	1.4000E-08	ICRP72	0.02000	BETA	1.34186E+03	Calculated
>2002	Fr-223	1.4310E+21	2.4000E-09	8.9000E-10	ICRP72	0.00009	ALPHA	1.00000E+03	IAEA-G-1.7
2003	Fr-224	9.4106E+21	1.1651E-09	3.3716E-09	Calculated	0.02000	BETA	1.59490E+03	Calculated
2004	Fr-225	7.9273E+21	1.2788E-09	3.7031E-09	Calculated	0.02000	BETA	1.49070E+03	Calculated
2005	Fr-226	3.8474E+22	3.2388E-10	9.2523E-10	Calculated	0.02000	BETA	1.74520E+03	Calculated
2006	Fr-227	1.2406E+22	9.8994E-10	2.8183E-09	Calculated	0.02000	BETA	1.12790E+03	Calculated
2007	Fr-228	4.6936E+22	3.3876E-10	9.6762E-10	Calculated	0.02000	BETA	9.27644E+02	Calculated
2008	Ra-220	8.2490E+25	5.5273E-11	2.0160E-09	Calculated	0.00009	ALPHA	2.15054E+05	Calculated
2009	Ra-221	6.7453E+22	6.2522E-08	2.2804E-06	Calculated	0.00009	ALPHA	2.32981E+04	Calculated
2010	Ra-222	4.9478E+22	8.0329E-08	2.9316E-06	Calculated	0.00009	ALPHA	1.06300E+05	Calculated
>2011	Ra-223	1.8953E+18	1.0000E-07	8.7000E-06	ICRP72	0.00700	A2 VALUE	1.00000E+03	IAEA-G-1.7
>2012	Ra-224	5.9575E+18	6.5000E-08	3.4000E-06	ICRP72	0.02000	A2 VALUE	1.00000E+03	IAEA-G-1.7
>2013	Ra-225	1.4507E+18	9.9000E-08	7.7000E-06	ICRP72	0.00400	A2 VALUE	1.00000E+04	IAEA-G-1.7
>2014	Ra-226	3.6576E+13	2.8000E-07	9.5000E-06	ICRP72	0.00300	A2 VALUE	1.00000E+03	IAEA-G-1.7
>2015	Ra-227	7.2616E+20	8.1000E-11	4.6000E-10	ICRP72	0.02000	BETA	1.00000E+05	IAEA-G-1.7
>2016	Ra-228	1.0088E+16	6.9000E-07	1.6000E-05	ICRP72	0.02000	A2 VALUE	1.00000E+03	IAEA-G-1.7

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
2017	Ra-229	7.5938E+21	2.3354E-09	8.5330E-08	Calculated	0.02000	BETA	1.54960E+03	Calculated
2018	Ra-230	3.2520E+20	5.5224E-08	2.0143E-06	Calculated	0.02000	BETA	3.03033E+03	Calculated
2019	Ra-231	1.7541E+22	1.7083E-09	6.2294E-08	Calculated	0.02000	BETA	1.04134E+03	Calculated
2020	Ac-222	4.4765E+23	4.3126E-10	5.8975E-08	Calculated	0.00009	ALPHA	3.39124E+07	Calculated
2021	Ac-222m	2.8487E+22	6.6555E-09	8.9079E-07	Calculated	0.00009	ALPHA	2.24519E+06	Calculated
2022	Ac-223	1.4179E+22	1.6221E-08	1.7633E-06	Calculated	0.00009	ALPHA	2.53344E+05	Calculated
2023	Ac-224	1.7848E+20	7.0000E-10	1.3000E-07	ICRP72	0.00009	ALPHA	3.64371E+03	Calculated
2024	Ac-225	2.1470E+18	2.4000E-08	8.5000E-06	ICRP72	0.00600	A2 VALUE	5.02244E+04	Calculated
2025	Ac-226	1.7690E+19	1.0000E-08	1.3000E-06	ICRP72	0.00009	ALPHA	4.07103E+03	Calculated
>2026	Ac-227	2.6759E+15	1.1000E-06	5.5000E-04	ICRP72	0.00009	A2 VALUE	1.00000E+03	IAEA-G-1.7
>2027	Ac-228	8.2681E+19	4.3000E-10	2.5000E-08	ICRP72	0.50000	A2 VALUE	1.00000E+03	IAEA-G-1.7
2028	Ac-229	4.8446E+20	6.6526E-10	7.2623E-08	Calculated	0.02000	BETA	2.08879E+03	Calculated
2029	Ac-230	1.4874E+22	3.7355E-11	4.0610E-09	Calculated	0.02000	BETA	1.59236E+03	Calculated
2030	Ac-231	4.0149E+21	1.5995E-10	1.7380E-08	Calculated	0.02000	BETA	8.75485E+02	Calculated
2031	Ac-232	5.1397E+22	1.8382E-11	1.9982E-09	Calculated	0.02000	BETA	7.37109E+02	Calculated
2032	Ac-233	1.2353E+22	3.0403E-11	3.2044E-09	Calculated	0.02000	BETA	1.99820E+03	Calculated
2033	Ac-234	4.0534E+22	2.6905E-11	2.9317E-09	Calculated	0.02000	BETA	6.34397E+02	Calculated
2034	Th-224	1.7916E+24	1.8960E-10	1.9465E-10	Calculated	0.00009	ALPHA	2.91001E+04	Calculated
2035	Th-225	3.8646E+21	7.2953E-08	7.4903E-08	Calculated	0.00009	ALPHA	7.85238E+03	Calculated
>2036	Th-226	9.9612E+20	3.5000E-10	6.1000E-08	ICRP72	0.00009	ALPHA	1.00000E+06	IAEA-G-1.7
>2037	Th-227	1.1369E+18	8.8000E-09	1.0000E-05	ICRP72	0.00500	A2 VALUE	1.00000E+03	IAEA-G-1.7
>2038	Th-228	3.0323E+16	7.2000E-08	4.0000E-05	ICRP72	0.00100	A2 VALUE	1.00000E+03	IAEA-G-1.7
>2039	Th-229	7.8683E+12	4.9000E-07	2.4000E-04	ICRP72	0.00050	A2 VALUE	1.00000E+02	IAEA-G-1.7
>2040	Th-230	7.6262E+11	2.1000E-07	1.0000E-04	ICRP72	0.00100	A2 VALUE	1.00000E+03	IAEA-G-1.7
>2041	Th-231	1.9666E+19	3.4000E-10	3.3000E-10	ICRP72	0.02000	A2 VALUE	1.00000E+03	IAEA-G-1.7
>2042	Th-232	4.0573E+06	2.3000E-07	1.1000E-04	ICRP72	-1.00000	A2 VALUE	1.00000E+03	IAEA-G-1.7
2043	Th-233	1.3387E+21	1.8299E-10	1.7617E-10	Calculated	0.02000	BETA	1.27044E+04	Calculated
>2044	Th-234	8.5690E+17	3.4000E-09	7.7000E-09	ICRP72	0.30000	A2 VALUE	1.00000E+03	IAEA-G-1.7
2045	Th-235	4.2896E+21	2.0682E-10	2.1233E-10	Calculated	0.02000	BETA	1.42045E+03	Calculated
2046	Pa-226	1.7100E+22	8.1769E-10	2.1626E-07	Calculated	0.00009	ALPHA	9.24811E+06	Calculated
2047	Pa-227	8.0010E+20	4.5000E-10	8.0000E-08	ICRP72	0.00009	ALPHA	6.89705E+04	Calculated
2048	Pa-228	2.3113E+19	7.8000E-10	7.5000E-08	ICRP72	0.00009	ALPHA	8.46410E+02	Calculated
2049	Pa-229	1.5067E+19	1.3682E-09	3.7878E-07	Calculated	0.00009	ALPHA	1.09057E+03	Calculated
>2050	Pa-230	1.2070E+18	9.2000E-10	7.6000E-07	ICRP72	0.07000	A2 VALUE	1.00000E+04	IAEA-G-1.7
>2051	Pa-231	1.7476E+19	7.1000E-07	1.4000E-04	ICRP72	0.00040	A2 VALUE	1.00000E+03	IAEA-G-1.7
2052	Pa-232	1.5894E+12	7.2000E-10	1.0000E-08	ICRP72	0.02000	BETA	1.04907E+03	Calculated
>2053	Pa-233	7.6784E+17	8.7000E-10	3.9000E-09	ICRP72	0.70000	A2 VALUE	1.00000E+04	IAEA-G-1.7
>2054	Pa-234	7.3071E+19	5.1000E-10	4.0000E-10	ICRP72	0.02000	BETA	1.00000E+03	IAEA-G-1.7
>2055	Pa-234m	2.5406E+22	7.1887E-13	1.5787E-10	Calculated	0.02000	BETA	1.00000E+03	IAEA-G-1.7
2056	Pa-235	1.2231E+21	8.4038E-12	1.8512E-09	Calculated	0.02000	BETA	1.77677E+04	Calculated
2057	Pa-236	3.2388E+21	8.1914E-12	1.8044E-09	Calculated	0.02000	BETA	1.79368E+03	Calculated
2058	Pa-237	3.3734E+21	7.5136E-12	1.6552E-09	Calculated	0.02000	BETA	1.50150E+03	Calculated
2059	Pa-238	1.2706E+22	4.4618E-12	9.8285E-10	Calculated	0.02000	BETA	4.86539E+02	Calculated
2060	U-228	3.3527E+21	5.8069E-08	1.4418E-07	Calculated	0.00009	ALPHA	1.15359E+05	Calculated
2061	U-229	5.2372E+20	6.6923E-08	1.6641E-07	Calculated	0.00009	ALPHA	2.98850E+05	Calculated
>2062	U-230	1.0097E+18	5.6000E-08	1.6000E-05	ICRP72	0.00300	A2 VALUE	1.00000E+04	IAEA-G-1.7
>2063	U-231	4.9789E+18	2.8000E-10	4.0000E-10	ICRP72	0.00009	ALPHA	1.00000E+05	IAEA-G-1.7
>2064	U-232	8.1669E+14	3.3000E-07	3.7000E-05	ICRP72	0.00100	A2 VALUE	1.00000E+02	IAEA-G-1.7
>2065	U-233	3.5642E+11	5.1000E-08	9.6000E-06	ICRP72	0.00600	A2 VALUE	1.00000E+03	IAEA-G-1.7
>2066	U-234	2.3003E+11	4.9000E-08	9.4000E-06	ICRP72	0.00600	A2 VALUE	1.00000E+03	IAEA-G-1.7
>2067	U-235	7.9960E+07	4.7000E-08	8.5000E-06	ICRP72	-1.00000	A2 VALUE	1.00000E+03	IAEA-G-1.7
2068	U-235m	1.1384E+21	1.7106E-14	4.2473E-14	Calculated	0.02000	BETA	1.31579E+08	Calculated
>2069	U-236	2.3931E+09	4.7000E-08	8.7000E-06	ICRP72	0.00600	A2 VALUE	1.00000E+04	IAEA-G-1.7
>2070	U-237	3.0194E+18	7.6000E-10	1.9000E-09	ICRP72	0.02000	BETA	1.00000E+05	IAEA-G-1.7
>2071	U-238	1.2436E+07	4.5000E-08	8.0000E-06	ICRP72	-1.00000	A2 VALUE	1.00000E+03	IAEA-G-1.7
>2072	U-239	1.2400E+21	2.7000E-11	2.4000E-11	ICRP72	0.02000	BETA	1.00000E+05	IAEA-G-1.7
>2073	U-240	3.4256E+19	1.1000E-09	5.8000E-10	ICRP72	0.02000	BETA	1.00000E+05	IAEA-G-1.7
2074	U-241	6.4134E+21	7.7110E-11	1.9634E-10	Calculated	0.02000	BETA	1.20729E+03	Calculated
2075	U-242	1.7074E+21	2.6828E-10	6.6613E-10	Calculated	0.02000	BETA	2.48139E+04	Calculated
2076	U-243	1.0733E+22	8.0435E-11	1.9925E-10	Calculated	0.02000	BETA	9.18274E+02	Calculated
2077	U-244	1.0893E+22	8.5172E-11	2.1147E-10	Calculated	0.02000	BETA	1.53304E+03	Calculated
2078	U-245	1.4941E+23	7.3115E-12	1.7699E-11	Calculated	0.02000	BETA	7.45156E+02	Calculated
2079	Np-230	6.5746E+21	1.1827E-10	1.1084E-08	Calculated	0.00009	ALPHA	1.69103E+08	Calculated
2080	Np-231	6.1705E+20	2.0723E-10	8.6484E-09	Calculated	0.00009	ALPHA	8.20644E+02	Calculated
2081	Np-232	2.0396E+21	9.7000E-12	1.2000E-10	ICRP72	0.02000	BETA	8.11399E+02	Calculated
2082	Np-233	8.2468E+20	2.2000E-12	1.7000E-12	ICRP72	0.00009	ALPHA	7.90140E+03	Calculated
2083	Np-234	4.6935E+18	8.1000E-10	5.5000E-10	ICRP72	0.02000	BETA	9.08001E+02	Calculated
2084	Np-235	5.1893E+16	5.3000E-11	6.3000E-10	ICRP72	40.00000	A2 VALUE	1.34884E+05	Calculated
2085	Np-236	3.6866E+11	1.7000E-08	8.0000E-06	ICRP72	0.02000	A2 VALUE	5.65126E+03	Calculated
2086	Np-236m	2.1832E+19	1.9000E-10	9.0000E-09	ICRP72	2.00000	A2 VALUE	1.71601E+04	Calculated
>2087	Np-237	2.6075E+10	1.1000E-07	5.0000E-05	ICRP72	0.00200	A2 VALUE	1.00000E+03	IAEA-G-1.7
2088	Np-238	9.5867E+18	9.1000E-10	3.5000E-09	ICRP72	0.02000	BETA	1.49798E+03	Calculated
>2089	Np-239	8.5818E+18	8.0000E-10	1.0000E-09	ICRP72	0.40000	A2 VALUE	1.00000E+05	IAEA-G-1.7
>2090	Np-240	4.4586E+20	8.2000E-11	9.0000E-11	ICRP72	0.02000	BETA	1.00000E+04	IAEA-G-1.7

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
2091	Np-240m	3.9163E+21	8.4907E-12	3.6208E-10	Calculated	0.02000	BETA	2.46853E+03	Calculated
2092	Np-241	2.0763E+21	7.3944E-12	3.4742E-10	Calculated	0.02000	BETA	1.25303E+04	Calculated
2093	Np-242	5.2256E+21	1.1112E-11	4.7177E-10	Calculated	0.02000	BETA	1.01122E+03	Calculated
2094	Np-242m	1.3064E+22	2.8330E-12	1.2028E-10	Calculated	0.02000	BETA	2.92912E+03	Calculated
2095	Np-243	1.5471E+22	3.1272E-12	1.3205E-10	Calculated	0.02000	BETA	1.25565E+03	Calculated
2096	Np-244	1.2447E+22	6.6234E-12	2.8119E-10	Calculated	0.02000	BETA	7.06364E+02	Calculated
2097	Np-245	4.4356E+22	1.4420E-12	5.7820E-11	Calculated	0.02000	BETA	1.02145E+03	Calculated
2098	Np-246	1.0602E+23	9.1919E-13	3.9580E-11	Calculated	0.02000	BETA	6.00853E+02	Calculated
2099	Pu-232	8.7924E+20	3.0875E-08	3.6412E-08	Calculated	0.00009	ALPHA	2.17264E+03	Calculated
2100	Pu-233	1.4284E+21	3.8988E-10	4.5405E-10	Calculated	0.00009	ALPHA	3.02252E+02	Calculated
>2101	Pu-234	5.6298E+19	1.6000E-10	2.4000E-08	ICRP72	0.00009	ALPHA	1.00000E+05	IAEA-G-1.7
>2102	Pu-235	1.1699E+21	2.1000E-12	1.5000E-12	ICRP72	0.00009	ALPHA	1.00000E+05	IAEA-G-1.7
>2103	Pu-236	1.9323E+16	8.7000E-08	4.0000E-05	ICRP72	0.00300	A2 VALUE	1.00000E+03	IAEA-G-1.7
>2104	Pu-237	4.4991E+17	1.0000E-10	3.9000E-10	ICRP72	20.00000	A2 VALUE	1.00000E+05	IAEA-G-1.7
2105	Pu-237m	9.7829E+24	2.1449E-15	2.5469E-15	Calculated	0.02000	BETA	4.40529E+04	Calculated
>2106	Pu-238	6.3358E+14	2.3000E-07	1.1000E-04	ICRP72	0.00100	A2 VALUE	1.00000E+02	IAEA-G-1.7
>2107	Pu-239	2.2947E+12	2.5000E-07	1.2000E-04	ICRP72	0.00100	A2 VALUE	1.00000E+02	IAEA-G-1.7
>2108	Pu-240	8.3957E+12	2.5000E-07	1.2000E-04	ICRP72	0.00100	A2 VALUE	1.00000E+02	IAEA-G-1.7
>2109	Pu-241	3.8106E+15	4.8000E-09	2.3000E-06	ICRP72	0.06000	A2 VALUE	1.00000E+04	IAEA-G-1.7
>2110	Pu-242	1.4631E+11	2.4000E-07	1.1000E-04	ICRP72	0.00100	A2 VALUE	1.00000E+02	IAEA-G-1.7
>2111	Pu-243	9.6255E+19	8.5000E-11	8.6000E-11	ICRP72	0.02000	BETA	1.00000E+06	IAEA-G-1.7
>2112	Pu-244	6.7745E+08	2.4000E-07	1.1000E-04	ICRP72	0.00100	A2 VALUE	1.00000E+02	IAEA-G-1.7
2113	Pu-245	4.5061E+19	7.2000E-10	4.3000E-10	ICRP72	0.02000	BETA	2.31630E+03	Calculated
2114	Pu-246	1.8096E+18	3.3000E-09	8.0000E-09	ICRP72	0.02000	BETA	7.39251E+03	Calculated
2115	Pu-247	8.6141E+18	2.3262E-08	4.0413E-08	Calculated	0.02000	BETA	1.15075E+03	Calculated
2116	Am-237	4.0203E+20	1.8000E-11	2.6000E-11	ICRP72	0.00009	ALPHA	2.42994E+03	Calculated
2117	Am-238	2.9821E+20	3.2000E-11	1.9000E-10	ICRP72	0.00009	ALPHA	1.10699E+03	Calculated
2118	Am-239	4.0760E+19	2.4000E-10	2.4000E-10	ICRP72	0.00009	ALPHA	3.56631E+03	Calculated
2119	Am-240	9.5082E+18	5.8000E-10	4.3000E-10	ICRP72	0.00009	ALPHA	9.61941E+02	Calculated
>2120	Am-241	1.2681E+14	2.0000E-07	9.6000E-05	ICRP72	0.00100	A2 VALUE	1.00000E+02	IAEA-G-1.7
>2121	Am-242	2.9901E+19	3.0000E-10	2.0000E-08	ICRP72	0.02000	BETA	1.00000E+06	IAEA-G-1.7
>2122	Am-242m	3.8755E+14	1.9000E-07	9.2000E-05	ICRP72	0.00100	A2 VALUE	1.00000E+02	IAEA-G-1.7
>2123	Am-243	7.3892E+12	2.0000E-07	9.6000E-05	ICRP72	0.00050	A2 VALUE	1.00000E+02	IAEA-G-1.7
2124	Am-244	4.7038E+19	4.6000E-10	3.7000E-09	ICRP72	0.02000	BETA	1.14389E+03	Calculated
2125	Am-244m	1.0963E+21	2.9000E-11	1.6000E-10	ICRP72	0.02000	BETA	1.59163E+04	Calculated
2126	Am-245	2.3080E+20	6.2000E-11	5.6000E-11	ICRP72	0.02000	BETA	1.77881E+04	Calculated
2127	Am-246	7.2494E+20	5.8000E-11	6.9000E-11	ICRP72	0.02000	BETA	1.18101E+03	Calculated
2128	Am-246m	1.1309E+21	3.4000E-11	2.3000E-11	ICRP72	0.02000	BETA	9.39347E+02	Calculated
2129	Am-247	1.2799E+21	3.6016E-11	1.7533E-09	Calculated	0.02000	BETA	4.23625E+03	Calculated
2130	Am-248	3.9314E+21	3.2884E-11	1.6010E-09	Calculated	0.02000	BETA	8.52006E+02	Calculated
2131	Am-249	1.1687E+21	1.0722E-10	4.6837E-09	Calculated	0.02000	BETA	1.02529E+03	Calculated
2132	Am-250	5.4547E+21	3.0561E-11	1.5261E-09	Calculated	0.02000	BETA	6.55594E+02	Calculated
2133	Cm-238	2.0295E+20	8.0000E-11	4.9000E-09	ICRP72	0.00009	ALPHA	2.50000E+08	Calculated
2134	Cm-239	1.6168E+20	4.3523E-10	1.6988E-09	Calculated	0.02000	BETA	8.16163E+02	Calculated
2135	Cm-240	7.4540E+17	7.6000E-09	3.5000E-06	ICRP72	0.02000	A2 VALUE	5.71429E+05	Calculated
2136	Cm-241	6.1104E+17	9.1000E-10	3.7000E-08	ICRP72	1.00000	A2 VALUE	1.95755E+03	Calculated
>2137	Cm-242	1.2249E+17	1.2000E-08	5.9000E-06	ICRP72	0.01000	A2 VALUE	1.00000E+04	IAEA-G-1.7
>2138	Cm-243	1.8140E+15	1.5000E-07	6.9000E-05	ICRP72	0.00100	A2 VALUE	1.00000E+03	IAEA-G-1.7
>2139	Cm-244	2.9943E+15	1.2000E-07	5.7000E-05	ICRP72	0.00200	A2 VALUE	1.00000E+03	IAEA-G-1.7
>2140	Cm-245	6.3500E+12	2.1000E-07	9.9000E-05	ICRP72	0.00090	A2 VALUE	1.00000E+02	IAEA-G-1.7
>2141	Cm-246	1.1365E+13	2.1000E-07	9.8000E-05	ICRP72	0.00090	A2 VALUE	1.00000E+02	IAEA-G-1.7
>2142	Cm-247	3.3460E+09	1.9000E-07	9.0000E-05	ICRP72	0.00100	A2 VALUE	1.00000E+02	IAEA-G-1.7
>2143	Cm-248	1.5682E+11	7.7000E-07	3.6000E-04	ICRP72	0.00030	A2 VALUE	1.00000E+02	IAEA-G-1.7
2144	Cm-249	4.3541E+20	3.1000E-11	4.0000E-11	ICRP72	0.02000	BETA	2.08130E+04	Calculated
2145	Cm-250	6.6116E+12	4.4000E-06	2.1000E-03	ICRP72	0.00009	ALPHA	2.04082E+02	Calculated
2146	Cm-251	1.6493E+21	3.4957E-11	1.5163E-10	Calculated	0.02000	BETA	6.45578E+03	Calculated
2147	Bk-243	1.0601E+20	9.6953E-10	1.8132E-07	Calculated	0.00009	ALPHA	5.65911E+03	Calculated
2148	Bk-244	1.0921E+20	4.1359E-08	3.0857E-06	Calculated	0.00009	ALPHA	4.46309E+02	Calculated
2149	Bk-245	3.9907E+18	5.7000E-10	2.1000E-09	ICRP72	0.00009	ALPHA	3.19453E+03	Calculated
2150	Bk-246	1.0908E+19	4.8000E-10	3.3000E-10	ICRP72	0.02000	BETA	1.04456E+03	Calculated
2151	Bk-247	3.8821E+13	3.5000E-07	6.9000E-05	ICRP72	0.00080	A2 VALUE	8.69709E+03	Calculated
2152	Bk-248	5.9245E+15	3.2650E-06	5.3929E-04	Calculated	0.00009	ALPHA	3.70855E+03	Calculated
2153	Bk-248m	1.9722E+19	3.2775E-09	2.5362E-07	Calculated	0.02000	BETA	1.18871E+04	Calculated
>2154	Bk-249	6.0615E+16	9.7000E-10	1.6000E-07	ICRP72	0.30000	A2 VALUE	1.00000E+05	IAEA-G-1.7
2155	Bk-250	1.4413E+20	1.4000E-10	1.0000E-09	ICRP72	0.02000	BETA	1.06938E+03	Calculated
2156	Bk-251	4.9835E+20	3.8973E-10	2.7656E-08	Calculated	0.02000	BETA	2.43509E+03	Calculated
2157	Bk-252	7.8181E+20	6.8413E-10	4.7896E-08	Calculated	0.02000	BETA	9.06071E+02	Calculated
2158	Bk-253	2.8456E+19	1.3701E-09	1.3948E-07	Calculated	0.02000	BETA	1.68350E+04	Calculated
2159	Bk-254	1.4564E+21	1.1454E-09	4.0960E-08	Calculated	0.02000	BETA	8.04505E+02	Calculated
2160	Cf-244	1.4693E+21	7.0000E-11	1.4000E-08	ICRP72	0.00009	ALPHA	1.42857E+08	Calculated
2161	Cf-245	6.5111E+20	2.4032E-09	1.0317E-06	Calculated	0.00009	ALPHA	1.93855E+06	Calculated
>2162	Cf-246	1.3199E+19	3.3000E-09	4.5000E-07	ICRP72	0.00009	ALPHA	1.00000E+06	IAEA-G-1.7
2163	Cf-247	1.5085E+20	1.4051E-09	6.0292E-07	Calculated	0.00009	ALPHA	3.20513E+02	Calculated
>2164	Cf-248	5.8398E+16	2.8000E-08	8.8000E-06	ICRP72	0.00600	A2 VALUE	1.00000E+03	IAEA-G-1.7

ID	Nuclide	Act(Bq/kg)	e <sup>ing</sup> (Sv/Bq)	e <sup>inh</sup> (Sv/Bq)	Haz source	A <sub>2</sub> (TBq)	A <sub>2</sub> source	C(Bq/kg)	Clear source
>2165	Cf-249	1.5130E+14	3.5000E-07	7.0000E-05	ICRP72	0.00080	A2 VALUE	1.00000E+02	IAEA-G-1.7
>2166	Cf-250	4.0438E+15	1.6000E-07	3.4000E-05	ICRP72	0.00200	A2 VALUE	1.00000E+03	IAEA-G-1.7
>2167	Cf-251	5.8666E+13	3.6000E-07	7.1000E-05	ICRP72	0.00070	A2 VALUE	1.00000E+02	IAEA-G-1.7
>2168	Cf-252	1.9838E+16	9.0000E-08	2.0000E-05	ICRP72	0.00300	A2 VALUE	1.00000E+03	IAEA-G-1.7
>2169	Cf-253	1.0718E+18	1.4000E-09	1.3000E-06	ICRP72	0.04000	A2 VALUE	1.00000E+05	IAEA-G-1.7
>2170	Cf-254	3.1428E+17	4.0000E-07	4.1000E-05	ICRP72	0.00100	A2 VALUE	1.00000E+03	IAEA-G-1.7
2171	Cf-255	3.2086E+20	3.6430E-10	2.0768E-07	Calculated	0.02000	BETA	3.40468E+03	Calculated
2172	Es-249	2.7330E+20	2.4605E-10	2.0860E-08	Calculated	0.00009	ALPHA	3.28149E+03	Calculated
2173	Es-250	5.3914E+19	1.6825E-09	1.4216E-07	Calculated	0.02000	BETA	8.03361E+02	Calculated
2174	Es-250m	2.0885E+20	2.1000E-11	6.3000E-10	ICRP72	0.02000	BETA	6.82776E+03	Calculated
2175	Es-251	1.3994E+19	1.7000E-10	2.1000E-09	ICRP72	0.00009	ALPHA	1.17647E+08	Calculated
2176	Es-252	4.0631E+16	6.7777E-07	1.3389E-04	Calculated	0.00009	ALPHA	1.44424E+03	Calculated
>2177	Es-253	9.3256E+17	6.1000E-09	2.7000E-06	ICRP72	0.00009	ALPHA	1.00000E+05	IAEA-G-1.7
>2178	Es-254	6.9018E+16	2.8000E-08	8.6000E-06	ICRP72	0.00009	ALPHA	1.00000E+02	IAEA-G-1.7
>2179	Es-254m	1.1610E+19	4.2000E-09	4.7000E-07	ICRP72	0.00009	ALPHA	1.00000E+04	IAEA-G-1.7
2180	Es-255	4.7587E+17	4.3216E-07	5.0614E-05	Calculated	0.00009	ALPHA	3.95150E+04	Calculated
2181	Es-256	1.2348E+21	1.7017E-07	1.4439E-05	Calculated	0.02000	BETA	1.59684E+03	Calculated
2182	Es-256m	5.9575E+19	3.5213E-06	2.9922E-04	Calculated	0.02000	BETA	5.67964E+03	Calculated
2183	Es-257	8.1180E+23	2.6315E-13	4.6463E-11	Calculated	0.02000	BETA	2.99700E+03	Calculated
2184	Fm-250	9.2731E+20	1.4364E-10	2.9352E-08	Calculated	0.00009	ALPHA	6.81383E+07	Calculated
2185	Fm-251	8.7042E+19	3.1086E-11	6.3191E-09	Calculated	0.00009	ALPHA	6.04705E+03	Calculated
2186	Fm-252	1.8116E+19	2.7000E-09	3.2000E-07	ICRP72	0.00009	ALPHA	6.25000E+06	Calculated
2187	Fm-253	6.3632E+18	9.1000E-10	4.0000E-07	ICRP72	0.00009	ALPHA	1.07052E+04	Calculated
>2188	Fm-254	1.4085E+20	4.4000E-10	6.1000E-08	ICRP72	0.00009	ALPHA	1.00000E+07	IAEA-G-1.7
>2189	Fm-255	2.2682E+19	2.5000E-09	2.7000E-07	ICRP72	0.00009	ALPHA	1.00000E+05	IAEA-G-1.7
2190	Fm-256	1.7237E+20	1.9267E-08	3.9623E-06	Calculated	0.00009	ALPHA	5.04753E+05	Calculated
2191	Fm-257	1.8698E+17	1.5000E-08	7.1000E-06	ICRP72	0.00009	ALPHA	6.68662E+03	Calculated
2192	Fm-258	4.3711E+27	1.9797E-08	4.0714E-06	Calculated	0.02000	BETA	4.91235E+05	Calculated

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## ***Disclaimer***

Neither the author nor UKAEA accept responsibility for consequences arising from any errors either in the present documentation, or in the EASY-2005 system.

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Feedback on the use of EAF is welcomed. Please contact RA Forrest with comments or in case of problems.

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